STM_Validation_D2.5
STM ship systems ready for installation
2018_01_19
TEN-T PROJECT NO: 2014-EU-TM-0206-S

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1 Executive summary

1.1 STM Ship system overall description

A STM ship system is a set of functionalities that the ECDIS manufacturers involved in the STM Validation Project has implemented in their ECDIS. A more detailed description of what role the different parts in a STM Ship System can be found below.

At least one ECDIS workstation on the ship’s bridge shall be able to interact with the STM Module. The main functions are; to receive voyage plan (VP) for further processing until used for navigation, to send the VP used for navigation to the STM Module, to send ETA to the STM Module.

Communication between the ECDIS and the STM Module will ensure that the maximum possible degree of consistency in upheld between information held in the ECDIS and the STM Module. If information consistency decreases due to the status of communication link between the ECDIS and the STM Module the communication status and the age of information shall be known by both ends.

The STM Module is a set of software functions on some hardware located on the ship’s bridge. The STM Module may be integrated in the ECDIS, if certification allows, it may be integrated into an existing planning station or it may be running on a dedicated device which is supplied by the supplier.

Communication between the STM Module and Online access point will ensure that the maximum possible degree of consistency in upheld between information held in the STM Module and at the Online access point, depending on the online status of the ship. If information consistency decreases due to the status of communication links with the ship, the communication status and the age of information shall be known by both ends. If the ship is online but the bandwidth does not allow transfer of payloads, the receiving end shall be aware of that new information is stored in the sending end.

The online access point is constantly and stably connected to the internet and represents the ship towards other actors and services. The main functions in the online access point are the VIS, Port Information Service and the SeaSWIM Connector Service (SSCS). The Online access point may be implemented onboard the ship or at another location. Each VIS is attached to one (1) SSCS and each ship has one (1) VIS instance.

![Diagram of STM Ship System](image)

**Figure 1 - STM Ship System**
1.2 STM Architecture overview
The STM communication infrastructure architecture is a service-oriented architecture, see figure 2 below.

![Figure 2 – STM Architecture overview](image)

1.3 STM Ship System development process
The process to get to a final working STM Ship system installed on-board a ship has been divided into 4 different steps, first, a System Design Review (SDR) was held, after that a Factory Acceptance Test (FAT) were conducted, after the FAT was passed the Site Acceptance Test (SAT) were done on-board a ship. To ensure interoperability further testing between STM ship systems from different manufacturers and service providers within the STM domain has been carried out. For further details regarding SDR, FAT and SAT, see below bullets.

1.3.1 System Design Review
All ECDIS manufacturers made a System Description at an early state. SMA reviewed the System Description together during the System Design Review (SDR) with manufacturers to be sure about that, the manufacturers and SMA had a shared understanding about what was to be delivered. SDR is a contractual milestone where the ECDIS supplier receives payment.

1.3.2 Factory Acceptance Test
The FAT is a test that all requirements from the procurement documents are fulfilled. The FAT were conducted at manufacturers premises and online (using “Skype” and “Teamviewer”). Due to the complexity of the STM Ship system and some changed/new requirements, several FATs were conducted with all manufacturers. FAT is a contractual milestone where the ECDIS supplier receives payment. For detailed information what was tested, see Table 2 - SAT Protocol below.
<table>
<thead>
<tr>
<th>Event (# and Sub bullet)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Route exchange ship-ship</strong></td>
<td></td>
</tr>
<tr>
<td>1.1 Indication what ship is part of STM test bed to separate them from non STM ships</td>
<td></td>
</tr>
<tr>
<td>1.1.1</td>
<td></td>
</tr>
<tr>
<td>1.1.2</td>
<td></td>
</tr>
<tr>
<td>1.1.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.2 A choice is made to allow others (vessels and shore centres) to see new route message (AIS ASM).</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.1</td>
<td></td>
</tr>
<tr>
<td>1.2.2</td>
<td></td>
</tr>
<tr>
<td>1.2.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.3 Voyage is loaded for monitoring</strong></td>
<td></td>
</tr>
<tr>
<td>1.3.1</td>
<td></td>
</tr>
<tr>
<td>1.3.2</td>
<td></td>
</tr>
<tr>
<td>1.3.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.4 Ship broadcasts route message</strong></td>
<td></td>
</tr>
<tr>
<td>1.4.1</td>
<td></td>
</tr>
<tr>
<td>1.4.2</td>
<td></td>
</tr>
<tr>
<td>1.4.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.5 Own ship route message should be visualized on other ships ECDIS/ STM module</strong></td>
<td></td>
</tr>
<tr>
<td>1.5.1</td>
<td></td>
</tr>
<tr>
<td>1.5.2</td>
<td></td>
</tr>
<tr>
<td>1.5.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.6 Other ship acquires own ships route and displays it on ECDIS/ STM module</strong></td>
<td></td>
</tr>
<tr>
<td>1.6.1</td>
<td></td>
</tr>
<tr>
<td>1.6.2</td>
<td></td>
</tr>
<tr>
<td>1.6.3</td>
<td></td>
</tr>
<tr>
<td><strong>1.7 STM ship systems should be able to calculate CPA and intersection points between own/other-ships route segments (including leg speed), even if the routes are not crossing each other</strong></td>
<td></td>
</tr>
</tbody>
</table>
### 1.7.1

### 1.7.2

### 1.7.3

### 1.8 It Should be possible to do some kind of "Trial Manoeuvre" including own and other ships routes (including leg speed)

<table>
<thead>
<tr>
<th>1.8.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8.2</td>
</tr>
<tr>
<td>1.8.3</td>
</tr>
<tr>
<td>1.8.4</td>
</tr>
</tbody>
</table>

### 1.9 Ship Passes a waypoint, Updated route is broadcasted (i.e. one more waypoint is added in the end of the broadcasted route)

<table>
<thead>
<tr>
<th>1.9.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9.2</td>
</tr>
<tr>
<td>1.9.3</td>
</tr>
</tbody>
</table>

### 1.10 Ship sailing between two waypoints (long distance between these waypoints), In order for ship "arriving" into AIS coverage area to receive own ships route it should be broadcasted according to updating frequency in route message format

<table>
<thead>
<tr>
<th>1.10.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.10.2</td>
</tr>
<tr>
<td>1.10.3</td>
</tr>
</tbody>
</table>

### 1.11 Other ship is deviating from its voyage plan (in time or geographically) Ownship’s ECDIS STM Module should be able to adjust settings that triggers "notification" about that another ship is not following it’s voyage plan (e.g. other ships route changes colour)

<table>
<thead>
<tr>
<th>1.11.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.11.2</td>
</tr>
<tr>
<td>1.11.3</td>
</tr>
</tbody>
</table>

Table 1 - FAT Protocol

### 1.3.3 Site Acceptance Test

The SAT is a test that all requirements from the procurement documents are fulfilled. The SAT were conducted a ship selected by the ECDIS manufacturer. The main difference between the FAT and the SAT were that the STM Ship System was tested in the environment where it is supposed to be used, using the ship’s means of communication. For detailed information what was tested, see Table 2 - SAT Protocol below. SAT is a contractual milestone where the ECDIS supplier receives payment.
<table>
<thead>
<tr>
<th>Description of test step</th>
<th>OK, Not OK (Include Remarks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation of STM ship system education material/handbook to OOW</td>
<td>SAT will be conducted by ships officer. To test the training of onboard equipment users.</td>
</tr>
<tr>
<td>(According to requirement R-2.1:11. The Tenderer <strong>shall</strong> conduct appropriate training and documentation (manual) for onboard equipment users.)</td>
<td></td>
</tr>
<tr>
<td>Share route with STM Module Mockup including update of time/geography in rtz and Pilot Route Service over ships existing Internet Connection (SATCom and GPRS) (Test case: search for services add several actors to receive VP: STM module mockup and PRS as subscribers to VP)</td>
<td></td>
</tr>
<tr>
<td>Test that other multiple actors only receive 1 active route/in monitoring (status 7)</td>
<td></td>
</tr>
<tr>
<td>Test that other actors can request “access to” VP</td>
<td></td>
</tr>
<tr>
<td>Send and receive text message</td>
<td></td>
</tr>
<tr>
<td>Receive area in S-124</td>
<td></td>
</tr>
<tr>
<td>Send route from STM Module Mockup, when STM Ship system is down, due to loss if internet connection, turn on connection again, see if route is received</td>
<td></td>
</tr>
<tr>
<td>Ship-Ship Route Exchange test</td>
<td>NA</td>
</tr>
<tr>
<td>Test if other STM ship route is visible</td>
<td></td>
</tr>
<tr>
<td>Test if other STM ship route is NOT visible, when general choice is made not to share S2S-Route</td>
<td></td>
</tr>
<tr>
<td>Test CPA/TCPA/Intersection point calculation</td>
<td></td>
</tr>
<tr>
<td>Test Trial manoeuvre</td>
<td></td>
</tr>
</tbody>
</table>
Test that new leg is shown, when other ship passes a waypoint

Test what happens when other ship “leaves” its route in Speed/Geography

Test Interrogation of other ships route

Test “Smart” functions how/when to show other ship routes.

Test if what is supposed to be shown in ECDIS is shown there, and also test other STM Equipment on Ship

Test sending/receiving PCM

According to Requirement R-3.5:2, The STM ship system should log availability to online access point (the time when it’s possible to communicate)

<table>
<thead>
<tr>
<th>#</th>
<th>Check</th>
<th>Proof</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Service approved in integration test of public API</td>
<td>APPENDIX A Protocol from integration tests</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Service approved in operational tests</td>
<td>APPENDIX E Protocol from operational tests</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Correct service instance description</td>
<td>Service Instance Description in/to Service Registry</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Follows template (STM)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Correct description</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - SAT Protocol

1.3.4 Interoperability tests
Interoperability tests has been performed on both technical level and on operational. The tests involved two or more actors exchanging data to ensure both technical and operational interoperability. Automated scripts that tested the complete service interface also supported the technical interoperability tests. Next step is to involve test tools to test the interoperability, and the final interoperability test is end-to-end tests with that actual applications and services, such as interoperability test between ECDIS and its operator to a Shore centre application and its operator. Checklists used during the tests can be found below in Table 3 and Table 4.
<table>
<thead>
<tr>
<th></th>
<th>Correct Service Instance as XML in/to Service Registry</th>
<th>APPENDIX B Supportive checklist for XML to SR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>APPENDIX C Service Instance as XML</td>
</tr>
<tr>
<td>5</td>
<td>Information Security</td>
<td>APPENDIX D Information Security</td>
</tr>
</tbody>
</table>

Table 3 - Overall checklist regarding technical interoperability
<table>
<thead>
<tr>
<th>Step #</th>
<th>Test Step</th>
<th>Expected Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>POST voyagePlans</td>
<td>Accepts RTZv1.1STM</td>
</tr>
<tr>
<td>2.</td>
<td>POST textMessage</td>
<td>Accepts STM TXTv1.3</td>
</tr>
<tr>
<td>3.</td>
<td>POST area</td>
<td>Accepts S124v0.0.7</td>
</tr>
<tr>
<td>4.</td>
<td>POST voyagePlans/subscription</td>
<td>Accepts subscription according to parameters</td>
</tr>
<tr>
<td>5.</td>
<td>GET voyagePlans/subscription</td>
<td>Returns list of subscribed UVIDs</td>
</tr>
<tr>
<td>6.</td>
<td>DELETE voyagePlans/subscription</td>
<td>Deletes subscription according to parameters</td>
</tr>
<tr>
<td>7.</td>
<td>Request ACK</td>
<td>ACK received</td>
</tr>
<tr>
<td>8.</td>
<td>Send ACK on request</td>
<td>ACK sent</td>
</tr>
<tr>
<td>9.</td>
<td>Request callback to endpoint</td>
<td>Message received</td>
</tr>
<tr>
<td>10.</td>
<td>Send message to callback endpoint</td>
<td>Message sent</td>
</tr>
</tbody>
</table>

Table 4 - Checklist for VIS Technical Design
1.4 Findings during development phase

1.4.1 Certificates
During the development phase, it was discovered that the use of self-signed certificates caused problems, in order to solve these problems, the type of certificates need to be changed in the Maritime Connectivity Platform. This issue has delayed the development.

1.4.2 Maritime Connectivity Platform
The Maritime Connectivity Platform (MCP, former Maritime Cloud) is one of the core parts in the STM communication infrastructure. The fact that MCP is not directly controlled by the STM project, has delayed the development at several occasions.

1.4.3 Classification issue
During the end of the development phase, several of the ECDIS manufacturers encountered issues with their classification society (DNV-GL), due to the fact that some parts of the STM Ship System is in some way affecting the type approved ECDIS. DNV-GL also raised some concerns regarding cyber security.

1.4.4 RTZ
RTZ is a standardized format for route exchange (included in IEC 61174 ed. 4); this standard is used in STM, when exchanging voyage plans between the different stakeholders in STM. Even though RTZ is a standard, there has been several different interpretations of the standard. There is guidelines written to the RTZ standard. During the project, the amount of different interpretations has led to several updates of these guidelines. I.e. the level of clarity in a guideline to a standard is even more important than the standard itself.
1.5 Description of documentation submitted by the ECDIS manufacturers

1.5.1 Service instance description
The purpose of the service instance description document is to provide an operational description of the specific service instance. The document is intended to be read by service consumers in charge of selecting the service instance to consume. It contains following: Service Instance Identification, Service Instance Details, Acronyms and Terminology.

1.5.2 System design
In the System design document, the STM Ship system from respective ECDIS manufacturer is described in detail.

1.5.3 User manual
In the User manual document, the on-board operator can find information about how to operate the STM Ship System from respective ECDIS manufacturer.
## 2 Appendices

(Click on the boxes below to go to the different Appendices)

<table>
<thead>
<tr>
<th>STM Ship System</th>
<th>Description</th>
<th>Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transas STM Ship System</td>
<td>Service instance description and System Description User manual</td>
<td></td>
</tr>
<tr>
<td>Adveto STM Ship System</td>
<td>Service instance description System Description User manual</td>
<td></td>
</tr>
<tr>
<td>Wärtsilä SAM Electronics STM Ship System</td>
<td>Service instance description System Description and User manual</td>
<td></td>
</tr>
<tr>
<td>Furuno STM Ship System</td>
<td>Service instance description System Description User manual</td>
<td></td>
</tr>
</tbody>
</table>
60+ partners from 13 countries, containerising maritime information

Demonstrating the function and business value of the Sea Traffic Management concept and its services.
Seaing is believing!

SAFETY - ENVIRONMENT - EFFICIENCY

Swedish Maritime Administration ◦ SSPA ◦ Viktoria Swedish ICT ◦ Transas ◦ Chalmers University of Technology ◦ The Swedish Meteorological and Hydrological Institute ◦ Danish Maritime Authority ◦ Navicon ◦ Novia University of Applied Sciences ◦ Fraunhofer ◦ Carnival Corp. ◦ Italian Ministry of Transport ◦ SASEMAR ◦ Valencia Port Authority ◦ Valencia Port Foundation ◦ CIMNE ◦ University of Catalonia ◦ Norwegian Coastal Administration ◦ GS1 ◦ Cyprys University of Technology ◦ Port of Barcelona ◦ Costa Crociere ◦ Svitzer ◦ OFFIS ◦ Finnish Transport Agency ◦ Southampton Solent University ◦ Frequentis ◦ Wärtsilä SAM Electronics ◦ University of Flensborg ◦ Signalis ◦ Maritiem Instituut Willem Barentsz ◦ SAAB TransponderTech AB ◦ University of Oldenburg ◦ Magellan ◦ Furuno Finland ◦ Sikkerhetssenteret Rörvik ◦ University of Southampton ◦ HiQ

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Appendix:

Transas Voyage Information Service Service

- Service instance description and System Description
- User manual
Document No:

Title: Service instance description for Ship IMO9145176 Voyage Information Service

Date: 2017-06-22
### Document status

#### Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMA</td>
<td>Swedish Maritime Administration</td>
</tr>
</tbody>
</table>

#### Document History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Initials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>2017-06-22</td>
<td></td>
<td>Initial version</td>
</tr>
</tbody>
</table>

#### Review

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1 Introduction

1.1 Purpose of the Document
The purpose of this service instance description document is to provide an operational description of the specific service instance.

1.2 Intended Readership
This service instance description document is intended to be read by service consumers in charge of selecting the service instance to consume.
## 2 Service Instance Identification

The purpose of this chapter is to provide a unique identification of the service instance and describe where the service is in terms of the engineering lifecycle.

<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>STENA GERMANICA IMO9145176 Voyage Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ID</strong></td>
<td>urn:mrn:stm:service:instance:transas:imo:9145176</td>
</tr>
<tr>
<td><strong>Version</strong></td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Service Specification ID</strong></td>
<td>urn:mrn:stm:service:specification:sma:vis</td>
</tr>
<tr>
<td><strong>Service Specification Version</strong></td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Service Design ID</strong></td>
<td>urn:mrn:smt:service:design:sma:vis-rest-2.2</td>
</tr>
<tr>
<td><strong>Service Design Version</strong></td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The service shares voyage plans from the ship to interested parties. The service accepts incoming proposed updates on voyage plan, text messages and area (S124) messages. The service accepts subscription requests and requests for voyage plans.</td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td>Ship, VIS, TXT, S124, Voyage Information Service, Stena Germanica</td>
</tr>
<tr>
<td><strong>Provider</strong></td>
<td>Full name for the organisation that provides the information, ACRONYM &lt;urn:mrn:stm:org:transas: &gt;</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>Released for production</td>
</tr>
<tr>
<td><strong>IMO</strong></td>
<td>9145176</td>
</tr>
<tr>
<td><strong>MMSI</strong></td>
<td>266331000</td>
</tr>
</tbody>
</table>

*Table 1 - Service Instance Identification*
3 Service Instance Details

3.1 Overall description
The Ship Voyage Information Service provides interested parties with the ships voyage plan in RTZ format. The normal procedure is that the owner of the voyage plan nominates a set of interested parties. Nomination includes in this context both giving an interested party authorization to read the voyage plan and also adding the interested party to a subscription list, which gives the interested party an initial voyage plan and after that continuously all updates on the voyage plan. An interest party can also request to subscribe to voyage plans from the ship. Both the ship and the interested party can remove subscription. An interested party can also ask for all or specific voyage plans from the ship.

The service accepts incoming (uploaded) voyage plans in RTZ format, text messages in STM format and area message in S124 format.

3.2 Service coverage
The service covers the whole world.

3.3 Required input
Incoming voyage plans must be an RTZ version 1.1 with STM Extension according to the VIS Design 2.2.
Incoming text messages must be in STM TXT v1.3 format.
Incoming area message must be in S124 v0.0.7 format

3.4 Output from the service
Outgoing voyage plans are in RTZ v1.1 STM format
Outgoing text messages are in STM TXT v1.3 format

3.5 Functional description
TBD
3.6 Interaction diagram

3.6.1 Normal flow – ship share voyage plans
The normal procedure is that the ship or ship representative identifies all interested parties to the voyage and nominates them. Nomination in this context includes both giving access to the voyage plan and adding the interested party as subscriber on the voyage plan. A voyage plan is sent to the interested party when it is added as subscriber, and all the updates are sent to the interested party.

![Interaction diagram of ship share voyage plans](image-url)

*Figure 2 - Normal flow – ship share voyage plans*
3.6.2 Alternative flow – consumer requests voyage plan

The alternative procedure is that the ship has for some reason not nominated the interested party, and the interested party then requests to subscribe to voyage plans for the ship. The ship gets a notification and than either accepts or denies the request. If the interest parties request is accepted, the ship nominates the interested party and send the voyage plan.

![Diagram of the alternative flow - consumer requests voyage plan](image)

*Figure 3 - Normal flow – ship share voyage plans*
3.7 Allowed methods

The Ship Voyage Information Service is based on the Voyage Information Service design version 2.2 and handles all operations.

PRS handles interaction on the following methods:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Allowance/handling</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans incl ACK</td>
<td>Yes</td>
<td>RTZ v1.1 STM</td>
</tr>
<tr>
<td>Receive STM text messages</td>
<td>uploadTextMessage incl ACK</td>
<td>Yes</td>
<td>STM TXT v1.3</td>
</tr>
<tr>
<td>Receive area (S124) messages</td>
<td>uploadArea incl ACK</td>
<td>Yes</td>
<td>S124 v0.0.7</td>
</tr>
<tr>
<td>Return list of voyage plans on request</td>
<td>getVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1 STM</td>
</tr>
<tr>
<td>Accepts subscription request</td>
<td>subscribeToVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1 STM</td>
</tr>
<tr>
<td>Accepts removal of subscriptions</td>
<td>removeSubscriptionToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Accepts request for list of subscribed voyages</td>
<td>findSubscriptionsToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Allowed methods

Outgoing interaction

The Ship Voyage Information Service nominates actors internally and will send (upload) the voyage plan in RTZ format to the nominated interested parties.

The ship can send text messages in STM TXT format.

3.8 Constraints

The service has the following constraints.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans</td>
<td>Incoming parameter CallbackEndpoint is not handled by the service.</td>
</tr>
</tbody>
</table>

Table 3 - Constraints
## 4 Release Notes

<table>
<thead>
<tr>
<th>Version</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>The service is release in its first version.</td>
</tr>
</tbody>
</table>

*Table 4 - Release Notes*
This chapter shall include all references used in the service instance description. Specifically, the service specification document as well as the applicable service design description shall be listed.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Version</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>01.00</td>
<td>E2 Deliverable D3.4 - Service Documentation Guidelines</td>
</tr>
<tr>
<td>[3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[4]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 5 - References*
## 6 Acronyms and Terminology

### 6.1 Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIS</td>
<td>Voyage Information Service</td>
</tr>
</tbody>
</table>

Table 6 - Acronyms

### 6.2 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>The provision of something (a non-physical object), by one, for the use of one or more others, regulated by formal definitions and mutual agreements. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.</td>
</tr>
<tr>
<td>Service Consumer</td>
<td>A service consumer uses service instances provided by service providers. All users within the maritime domain can be service customers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Instance</td>
<td>One service implementation may be deployed at several places by same or different service providers; each such deployment represents a different service instance, being accessible via different URLs.</td>
</tr>
<tr>
<td>Service Instance Description</td>
<td>Documents the details of a service implementation (most likely documented by the service implementer) and deployment (most likely documented by the service provider). The service instance description includes (but is not limited to) service technical design reference, service provider reference, service access information, service coverage information, etc.</td>
</tr>
<tr>
<td>Service Interface</td>
<td>The communication mechanism of the service, i.e., interaction mechanism between service provider and service consumer. A service interface is characterised by a message exchange pattern and consists of service operations that are either allocated to the provider or the consumer of the service.</td>
</tr>
<tr>
<td>Service Operation</td>
<td>Functions or procedure which enables programmatic communication with a service via a service interface.</td>
</tr>
<tr>
<td>Service Provider</td>
<td>A service provider provides instances of services according to a service specification and service instance description. All users within the maritime domain can be service providers, e.g., authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
</tbody>
</table>

Table 7 - Terminology
Transas
Sea Traffic Management

Version: 3.01.350

Date of Issue: October 2017
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   Ship Product Line ......................................................................................................... 7
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   Ship-Ship AIS route exchange ..................................................................................... 21
      Ship-Ship AIS Routes Broadcasting ......................................................................... 21
      Requesting Monitored Route from AIS Target – Route Interrogation ..................... 22
      Reception of Route (Ship-Ship), Broadcast or Sent Direct to Requesting Ship ........ 22
      The AIS Route turns red once the ship deviates and sails out of the set XTD (geographical deviation) ......................................................................................... 22
      RDV Functionality (Route Intersection points and Meeting Points) ......................... 24
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GENERAL INFO. COMPONENT (ECDIS, FOS) INTERACTION BLOCK DIAGRAMS

Transas Ship Solution

1. **Planning Station:**
   - Voyage Planning /Optimization;
   - Route Exchange (Planning phase);
   - Sharing of voyage plan;
   - Route cross-check;
   - Area management;
   - Ability of subscribing to services (e.g. Pilot Services, Winter Navigation Services, Weather Routing services, etc.);
   - Ability of subscribing services to own personal information (e.g. Voyage Plans);
   - Granting access rights to Organizations.

2. **ECDIS:**
   - Route Exchange (Monitoring);
   - Data Presentation (Safety related);
   - Route Monitoring (Enhanced Tracking);
   - Schedule monitoring;
   - Ship to Ship Route Exchange over AIS;
   - Ship-Port ETA synchronization.

3. **STM Module:**
   - Ship to Shore Communication (FOS/STM);
   - Service Ordering (MSP);
   - Data presentation (none safety related);
   - Port Call Management (Arrival Time, Port Call Status);
   - Chat Service.


![Diagram showing interaction between Planning Station, ECDIS, and Transas Gateway](image-url)
**Main Components.**

- Transas Connected ECDIS (IEC 61174:2015, STM Module);
- Transas Navi-Planner (STM Module);
- Transas Gateway Translink (IEC 61162/450/460);
- Onboard Data Management System.
STM – Functions

- Ship-Shore Route Exchange:
  - Route Cross Check Service;
  - Route Optimization Service;
  - Route Monitoring and Navigational Assistance Service.
  - Nordic Pilot Route Service (service that provides routes from [to] pilot boarding places to [from] ports).

- Port Call Coordination:
  - Just-In-Time Arrival support - time of arrival coordination.

- Route Optimization;
- Enhanced Monitoring;
- Winter navigation:
  - Ice routing;
  - Ice breaker coordination (Waiting Position, Convoy Info, Text Message).

- Navigational Warning Area Management (IHO S-124 format).
- Chat.
- Ship-to-Ship Route Exchange over AIS.

Transas Fleet Operation Service

Transas FOS is a new scalable web-based service for ship owners and ship operators

The goal is to reduce work load and administrative burdens, enhance situation awareness, fleet monitoring and prevent errors and accidents.

The following services will be available for ship owner and test ships during the test campaign

- Enhanced Asset Monitoring - “ECDIS Tracking”, with every 15 secs positioning;
- Route monitoring and deviation notifications;
- Route Exchange services (Route Database Service);
- Advanced Intelligent Routing Service – service which is all about help in route planning. Highlighting the benefits of service as oppose to the traditional routing service that was widely used in the past;
- Chart Data Management online – smart way of digital data handling in terms of dynamically analysing the chart usage, chart update and purchasing history for multiple options within their fleet and find the most efficient utilization of vessels in terms of safety and cost;
- Remote Service;
- Performance Monitoring – Fleet Dashboard, a snap shot of key performance indicators;
- Ship-to-Shore Text Communication – Simple and very familiar way of operative information exchange.
STM Scope and Objectives

About STM

In the STM Validation Project, we will validate the concepts by connecting ships, Shore Centres, External services and Ports.

STM is an information sharing framework that primarily deals with the benefits that different parties can get if they share their route with others in real time. This is one of the fundamental pillars of STM: The shipping company/ship is always the information owner and shares the information they want with the parties they want.

The central feature is that the routes are shared directly from and to an ECDIS, which allows to see suggested routes, cut and paste and use the parts you want directly on the ECDIS. You can retrieve nautical information about the passage such as if there are any current Navigation Warnings on one's route or accept one of the Pilot suggested routes into the port.

Shore Centres can actively monitor ships in their area of responsibility, not only if they are following their route at any moment but also, if they have planned properly according to the latest information available.

Ports can get information of a ships ETA and Planned Time of Arrival (PTA) at a much earlier stage and this can make the port call much more efficient. Because of the port's ability to collaborate by means of the “Port CDM” tool, they can also convey a time when all port operators can receive the ship. This enables you to decide on slowing down and conducting “Just-In-Steaming” during the passage with the potential to save bunkers thereby having a positive impact on the environment etc.

An amazing side effect of this information sharing will be that ships will be able to share routes with each other. That is, you can see another vessel's current route in your own ECDIS. Here, however, you will only share a segment of the route, which will be transmitted over the AIS system, because the AIS bandwidth is not sufficient to share more. STM helps you plan a traffic situation before you end up in it. Here comes our second pillar: STM should not be used in COLREG situations. That is, when you are in a close quarter situation, always observe COLREGs.

The following main STM objectives can be singled out:

- The STM permits optimizing processes of data exchange among the sea-going ships, service providers, shore-based ship traffic managements services and sea transport regulatory agencies.
- The STM provides optimum solutions for the following participants involved in the sea navigation process:
  - Fleet operators (ship owners, support and supply services, etc.);
  - Vessel Traffic Management Systems;
  - Pilot services;
  - Information providers – state and private-owned services supplying hydrographic and weather information;
  - Navigators.

The diagram below shows relationship among the parties participating in the process of cargo transportation by the marine vessels. The STM objective is to unite all the participants in a single information space, which will ensure operational and commercial advantages for each of the participants, improve safety and reduce the harmful effect on the sea environment.
The STM uses the following communication technologies supplemented with solutions developed for ensuring information security:

- Ground communication technologies (3G/4G, WiMAX, AIS);
- Satellite communications (Inmarsat, Iridium, VSAT);
- Soft- and hardware solutions for providing safe Ship-Shore connections.

Based on these technologies and developments, Transas STM provides the following capabilities:

- Ship-Shore and Ship-Ship route exchange (Internet and AIS);
- Ship route generation and optimizing, used both ashore and on board;
- Delivery of nautical charts and their updates;
- Relay and presentation of safety related information (via the dedicated AIS VHF channel);
- Planning of ship calls at ports for the shipboard use and display of information on the ship arrival time.

Within the framework of accomplishing the aforementioned tasks, Transas develops the following product lines intended for certain groups of users:

- **SHIP** – products and services provided to the shipboard users;
- **FOS** – products and services provided to the shore users (ship owners and operators);
- **STC** – products and services provided to the shore users (VTS operators).
Ship Product Line

Within the framework of this product line, the following products are developed:

- Connected ECDIS – hard-and software suite interfaced with a set of sensors and devices like GPS, GLONASS, Gyro, Log, Radar Scanner, etc., used on board for accomplishing navigation tasks.

FOS Product Line

The Fleet Operations Solutions product developed within the framework of this line provides access to a set of services connected with the fleet management, planning, monitoring and analysis of the voyage accomplishment. The server part of the services may be both located in a cloud and installed direct on the customer office servers.
STC Product Line
The following products are developed within the framework of this line:

- Sea Traffic Control is an information system for the vessel traffic monitoring and management in the off-coast sea areas.

STM Components Interaction
The Connected ECDIS define the STM onboard segment.

The FOS, and STC define the STM shore-based segment.

The STM is used for establishing connection among different segments for the effective interaction and data exchange.

The connections schematic is shown in the diagram below:
It is assumed that there are two data exchange channels between the ship-ship and ship-shore services.

- Data exchange via the AIS VHF channel is intended for receiving current information on the ships' positions and motion parameters along with the brief operational information. The AIS data is supplied direct from the ship navigation system to other ships and shore-based VTS centre;
- Since the AIS channel throughput is limited, large amounts of data are transferred via the Internet secure channel. Data transmitted via the Internet is placed and processed in the Azure and Amazon public cloud services. Shore-based agencies use public cloud services. If the connection is available, the shipboard system synchronizes data with cloud services, the synchronized data stored in the ship system, so that the data on the ship may be available even in the absence of an Internet channel.

The services and data arrangement architecture is presented below:
The exchange of certain information among the STM segments is performed with the aid of services. Services are distributed among the products listed above. Functionality connected with the services is planned to be implemented on the stage-by-stage basis.

**STM FUNCTIONS**

**Service Register, ID Register (Service Ordering)**

**Identity Registry**

The Identity Registry enables identity management and authentication mechanisms.

**Service Registry**

The Service Registry allows businesses to efficiently discover and communicate with each other using certain services. The ultimate goal is to allow fast and reliable communication and interoperability among diverse applications with minimal human oversight.

In the context of service-oriented architecture, a service usually refers to a set of related software functionalities that can be reused for different purposes, together with policies that govern and control its usage.
The Service Registry will contain service specifications according to an envisioned Service Specification Standard and provisioned service instances implemented according to these service specifications. The Service Registry aims at improving the visibility and accessibility of available maritime information and services. This enables service providers, consumers, and regulatory authorities to share a common view on service standards and provisioned services. The Service Registry does not provide actual maritime information, but a specification of various services, the information they carry, and the technical means to obtain it. The Service Registry also provides the mechanisms to manage the lifecycle of service specifications and service instances.

As depicted below, the Service Registry enables the “provider” to “publish” information related to its service instances so that the “consumer” is able to “discover” them and obtain everything (e.g. interface information) required to ultimately use these services.

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Consumers</td>
<td>Consumer uses service instances provided by service providers. All users within the maritime domain can be service customers, e.g., ships and their crews, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Providers</td>
<td>Provides instances of services according to a service specification, e.g., deploys the service to the Service Registry. All users within the maritime domain can be service providers, e.g., ships and their crews, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Specification Implementers</td>
<td>Implementers of services from the service provider side and/or the service consumer side. Everybody can be a service implementer but mainly this will be commercial companies implementing solutions for shore and ship.</td>
</tr>
<tr>
<td>Service Specification Producers</td>
<td>Producers of service specifications in accordance procedures.</td>
</tr>
</tbody>
</table>
Voyage Information and Port Information Services

Navi-Planner Service Window

General

The Navi-Planner has a special Service Window in which the operator can see all the available services the vessel is holding subscription for and those services that are available to subscribe. The route can also be shared among the stakeholders who have editing rights.

From this service window, the user can obtain the following information:

- Services available for the ship to subscribe (with prices and some brief information describing the service).
- Services that the ship is already subscribed to.
- Status of shared information like Voyage Plan, Chat Messaging, MSI, etc.
- Information on the authorized users that have been given the access to ship’s information.

The Service Window shows all the possible services from the STM and Transas infrastructures.

All the stakeholders are registered in infrastructures like Transas infrastructure, Sea SWIM (Maritime Cloud) infrastructure or any others. Each of these infrastructures has Identity and Service Registries (IR and SR). The Service Window displays all the registered structures.

With the aid of IR and SR the user can promptly find the necessary services. The STM, Maritime Cloud Identity and Service Registries contain different attributes that help the user in the search Found stakeholder, which provides necessary service, can be added to Service Book for further operations (subscription, chat, sharing of selected route, etc.).

From the Service Window, users (Nav Officers, Fleet Ops operators or pilot) can subscribe to any service available in the list (via the Service Register).

The Service Window provides a capability to view all the subscribers and subscribed-to services.

To open Service Window press the Services button in the Route Editor page ribbon.
The Service Window consists of 2 parts:

- Service Registry group;
- Ship Service Book group.

**Find a service**

The Service Registry provides a capability to search for services by the following parameters:

- text,
- by using the filter

For the search-by-text in the cloud, use the search line to type key word contained in the service description and press the Search button.

To search by the filter, press the button.
In the filter window that will open up, select one or several criteria of search for the service:

- **By Route.** From the drop-down list containing all the routes available in the Navi-Planner, select the necessary one. The services will be searched for in the area through which the selected route passes.

- **LOCODE.** Use the input line to enter the LOCODE that the search is required to be made by.

- **Geoposition.** Press the Select area button. Use the cursor on the chart panel to select an area in which services will be searched for.

- **Service Provider.** Select the necessary provider from the drop-down list.

- **Type of service.** Select the necessary service type from the drop-down list (Voyage Information Services, Enhanced Monitoring, Winter Navigation, Weather Optimization, Traffic Optimization, etc.)

- **IMO.** Use the search field to enter the IMO number that the search is required to be made by.

- **MMSI.** Use the search field to enter the MMSI that the search is required to be made by.

To search for a service by the settings made, press the enabled Search by filter button.

To reset all the filter settings, press the Clear filter button.

The services found in the cloud and meeting the search criteria, are displayed in the Service Registry group table.
There is a capability to find a service in the table by the key word, and to sort the services in the alphabetic order with the aid of the button.

**STC-Gothenburg**

Provides voyage plans in RTZ 1.1 format, Area messages updates (S124 0.0.2) and support via text messages (TXT 1.3)

Add to book

Each service's row contains the Add to book and button.

**Add services to the Ship Service Book**

Press the Add to book to add a service to the Ship Service Book.

**STC-Gothenburg**

Provides voyage plans in RTZ 1.1 format, Area messages updates (S124 0.0.2) and support via text messages (TXT 1.3)

Unsubscribed

After the service has been added to the Ship Service Book, the button displays the service status (Subscribed or Unsubscribed).

Press the button to obtain brief information on the service.
**Ship Service Book**

Services selected by the user for the subsequent use are stored in the Ship Service Book.

The Ship Service Book also provides a capability to search for the necessary service by the text and to sort in the alphabetic order with the aid of the button.

Each service’s row contains the Send once, Share and buttons.

Press the button to open a chat window (see below) with the selected service for the details clarifications. The Chat Window will open automatically with the already selected service as an addressee. If the chat isn’t started yet, it will be offered to start the chat application.

Press the Send once button.

The drop-down list presents all the available routes. For one-time sending of the necessary route to the service, select it from the list.
Route Sharing

Press the Share button.

The drop-down list presents all the available routes. To send the necessary route to the service each time the route is modified, check the checkbox next to this route.

Press the Subscribe button to subscribe to the selected service's routes. After the service has approved the subscription, the button will be renamed to Unsubscribe.

To cancel the service subscription, press the Unsubscribe button.

If the service does not confirm your request for subscription, the button will be renamed to Denied.

Press the button to obtain brief information on the service (see the previous item).

A press on the button results in this service unsubscribing, as well as its unsubscribing from our routes that it was subscribed to.

A press on the button in the bottom part of the Ship Service Book results in the unsubscribing of all the services from our routes, as well as the deleting of the service list from the Service Book.

Subscribers Menu

Load the necessary route.

To open a menu for the selected route, press the Subscribers button in the Route Editor page ribbon. The drop-down list contains all the services that were added to the Ship Service Book of the Service Window.
If the selected route is not shared for some service, this service has the Subscribe button, otherwise, it is the Unsubscribe button. To share the selected route for some service, press the Subscribe button. To unsubscribe some service from the selected route, press the Unsubscribe button.

**Access Menu**

Load the necessary route.

To open a menu for the selected route, press the Access button in the Route Editor page ribbon.
The drop-down list contains all the organizations authorized in the STM system. Select the organization and press the Authorize button to grant rights of access to the selected route for all the services that this organization provides.

To deny access to the selected route, press the Unauthorize button.

**Grant Access**

If some service which out monitored route is not shared for, tries to get access to it, the following warning is displayed:

Press the Grant access to monitored route button to grant access or Deny access to deny access.

**Route Exchange during Planning and Monitoring**

**Internet-Aided Ship-Shore Route Exchange in RTZ Format**

The functionality permits route exchange between the ship and other stakeholders with the aid of the Internet via the TCP/IP protocol.

When a route plan is set for monitoring, it is automatically assigned with a unique voyage identifier (UVID).

Selected by default is the Current Voyage which is available to all the stakeholders with its own UVID. As the route itself is changed, the UVID remains unchanged. If a New Voyage is selected, the route with a new UVID will be sent to the stakeholders.
Select the necessary calculated schedule from the list.

Press the OK button.

The route will be loaded in the monitoring mode and will be automatically sent to all stakeholders who are subscribed to it (see above) or have a granted access to the ship monitoring route.

The shore-based route optimization services can make necessary changes and sends the corrected route back to the ship.

The shipboard operator can accept the changes made by the 3rd party route optimization services (the Save and review the suggestions button) or reject them (the Reject the suggestion button).
If the changes are accepted, the route will be loaded on the **Planning Route** panel under the “Route Name amended by Optimization Services”, and will be available for further editing.

As the ship is set for monitoring, it is automatically shared between all stakeholders who have a granted access to the monitoring route.

**Ship-Ship AIS route exchange**

**Ship-Ship AIS Routes Broadcasting**

The ECDIS has been supplemented with a capability to broadcast the own monitored route via the AIS.

The ship can transmit the monitored route segment in the broadcast mode (the broadcast period is set by the operator in the Broadcast Own Route input window).

The route can be broadcast via the AIS channels in the following modes:

- **ECDIS IMO type** (DAC: 001 FI: 27): Details: Up to 15 waypoints of the monitored route, no XTD, no Radiuses.
- **ECDIS STM type** (DAC: 265 FI: 01). Details: Up to 7 WP waypoints of the monitored route with Radiuses, no XTD.
- **VDES STM type** (DAC: 265 FI: 02). Details: Up to 10 WP waypoints of the monitored route with Radiuses and XTD.

Recommended settings for the **STM Ships**:

- Message type: **ECDIS STM type**
- Broadcast Own route default interval: **6 minutes** (for any message type).
Requesting Monitored Route from AIS Target – Route Interrogation

The ECDIS has implemented a capability to request the monitored route from the operator-selected target. The reply is sent by the relevant target via the AIS channel and is displayed in the table of received routes.

Reception of Route (Ship-Ship), Broadcast or Sent Direct to Requesting Ship

The route received via the AIS channel is automatically processed by the ECDIS and is displayed in the table of received routes.

The route can be output on the ECDIS screen direct by positioning free View cursor on the necessary STM AIS target. After 3 seconds of displaying of target’s card, the route will also displayed. The second way is direct from the table with the aid of the Show checkbox.

The AIS Route Label checkbox shows AIS targets transmitting their routes to be displayed on the ECDIS screen.

In this case, the “STM” (STM AIS type messages) or “RTE” (IMO Circ. 289 type messages) postfixes are shown next to the AIS target identifier, showing that this target’s route is available in the ECDIS database.

The AIS Route turns red once the ship deviates and sails out of the set XTD (geographical deviation)

The ECDIS implements a capability to notify the operator about abnormal situation on the STM participant ships. Two criteria are used:

- STM AIS target beyond its XTD or adjusted XTD limit in the ECDIS (adjusted manually or received via incoming VDES STM type AIS messages);
- STM AIS target exceeding one of the set CPA/TCPA values.

The setting is enabled on the Target Table page of the Targets panel.
If both checkboxes are unchecked, the functionality is disabled.

1. The By Target Out of XTD deviation checkbox is checked:

   ![Image of checkbox settings]

In this case, if an STM AIS target is following its route (New AIS ASM Route message) within the XTD range, no alerts are triggered ON.

   ![Image of route display]

**Note:** The route display can be turned off by Pick View cursor and long tap (3 sec) command or in the **IMO special messages** page of the **AIS** panel.

If STM AIS target is not following its route line and is out of its XTD range limit, the AIS route is automatically shown in red.

   ![Image of route display with red line]
STM Functions

The route will become red by such criteria even it is not displayed on the Chart panel.

2. The By CPA/TCPA criteria checkbox is checked:

![STM AIS Target Route](image)

The STM AIS target parameters exceed the both CPA/TCPA set values: the AIS route is automatically shown in red.

**RDV Functionality (Route Intersection points and Meeting Points)**

AIS targets are acquired for determining rendezvous (RDV) points on the **RDV** page of the **Route Data** display on the Control panel. All RDV calculation are based on the actual movement data, Speed-Over-Ground of the Ownship and AIS target.

![Route Data](image)

If a route received from STM AIS target crosses our route, the own ship position in the point of its route intersection with the AIS target’s route is shown on the Chart Panel with the ☷ symbol.
The ECDIS calculates the STM AIS target's position at the time when the own ship is going to cross the STM AIS target's route. On the chart panel, this position is indicated with a mark perpendicular to the STM AIS target's route.

The CPA RDV intersection points are shown as bold dots on the routes. These are the points of the own ship and STM AIS target's positions at the minimum CPA moment.

These points show the CPA RDV intersection points, referenced to the own ship route and STM AIS target route (normally with a perpendicular, as the own ship and AIS target positions may have some actual XTD values).

The **RDV** page shows the TTG to RDV and RDV time intersection point for the own ship.

The AIS target's route may not cross the own ship route (see example below):
In this case, the ECDIS shows only the CPA intersection points without or .

**Port Call Message Support**

Load route and schedule.

Open the Port Call page of the Planning Route panel and select the ports of departure and arrival from the list.

The ports of departure and arrival can also be entered manually. To do this, check the Manually entered LOCODE checkbox.
In the window, enter the LOCODE (5 symbols) and press the button. An inquiry about the availability of the Port CDM Service in the port entered will be sent. In this case, the LOCODE is shown in yellow. If the Port CDM Service for the port in question is successfully subscribed to, the LOCODE is shown in white, otherwise it is shown in red.

Select the waypoint for the Port Call Messages from the list.

Select the waypoint type from the Type drop-down list.

As a schedule for the monitored route is loaded, it is automatically sent to the Port CDM Service PTD for the port of departure, and PTA for the WPT set for the port of arrival.

On the Port Call page of the Route Data display, in the Control Panels display the WPT for which the Port Call Messages (PCM) with PTA will be sent.

The value is shown in yellow until the receipt confirmation is received from the Port CDM Service, whereupon this value will be shown in white.

In the STG window speed of proceeding to the specified WPT for the set PTA is displayed.
STM Functions

After the ship has started proceeding along the route, ETA with the current SOG at the selected WPT is regularly sent to the Port CDM Service. The ETA transmission frequency is set in the **PCM Settings** window. Press the PCM Settings button.

Press the PCM ETA Update Rules button.

From the drop-down list, select a rule for sending ETA to the Port CDM Service.

If the Standard menu item is selected, ETA is sent according to the following rules:

- 24 hrs in advance;
- 12 hrs in advance;
- 6 hrs in advance;
- 3 hrs in advance;
- 1 hr in advance;
- Each Day, 12.00 UTC - regardless of the arrival time.

With the Out of Schedule ETA Update checkbox checked, the PCM will be sent if there is out of schedule on assigned number of minutes for the selected WPT.

After the sending, the ETA value is shown on the **Port Call** page of the **Route Data** display.
The value is shown in yellow until the Port CDM Service receipt confirmation is received, whereupon the value will be shown in white.

The Port CDM Service sends a RTA (Recommended Time of Arrival) to the ship.

Upon the receipt of the RTA, the ECDIS screen displays the following notification.

The **Port Call** page of the **Route Data** display shows the RTA.

![Port call message RTA](image)

On the Navigational MASTER status station, the Accept and Decline buttons are enabled, the operator can accept (the Accept button) or reject (the Decline button) the RTA.

In the STG window speed of proceeding to the specified WPT for the set RTA is displayed.

As the Decline button is pressed, the ECDIS sends to the port the previously calculated time of arrival (PTA) at the selected waypoint, if **Send PTA after RTA rejection** checkbox is checked in in the **PCM Settings** window.

As the Accept button is pressed, a warning is displayed.

![Warning message](image)

**Note:** If in the schedule there are no data entered manually the warning doesn't appear.

Press Yes button.
The port RTA is accepted, and the current schedule is re-calculated for the monitored route. The PTA at the selected point is equal to the RTA.

A new schedule will be automatically loaded for monitoring. But in the monitored route, it will not be saved.

A new route will also be created, with the same geometry and with a new schedule that has the “XXX hh-mm-ss dd.MM.YY” name, where XXX is the monitored route name, hh-mm-ss dd.MM.YY is the RTA accept time and date.

If for some reasons it is impossible to create schedule with the sent RTA, it will be shown in orange (the Accept and Decline buttons are disabled).
If the ship has already arrived at the selected point, sent to the Port CDM Service is the ATA (Actual Time of Arrival).

**Area Message Management**

The ECDIS and NPL implement a capability to show navigation warnings (NW) issued on line with the S-124 standard.

The NW’s are received via the internet from the provider of this service. To this end, the ship is required to have a relevant subscription in the Service Window of the Navi-Planner application (see Navi-Planner Service Window paragraph above). In this case the NW’s are provided automatically or by planed route via “Send Once” (single route sending) function in the Service Window / Ship Service book section.

There is a capability to load the NW database manually with the aid of the Load button.

When a NW is received (or loaded manually) the Indications window on the Control panel displays the NW message indication.

The NW is displayed in the text form on the MSI page of the Overlays panel.
The NW's are displayed in the form of a table. When a NW is selected in the table, the detailed NW contents is displayed in a window under the table. The objects contained in the NW, and their coordinates are shown in a window on the right below the table. A double click on them moves their display to the centre of the Chart Panel.

The NW are also shown on the Chart Panel in the form of certain symbols, IEC 62288 (2014).
By using the free cursor, the user can display the NW contents in a special pop-up window on the Chart Panel.

![Image of STM Functions](image.png)

The context menu (Focus on map) can be used for the on-chart display of objects contained in the NW.

The NW in the table can be filtered by the following criteria:

- Warning type,
- Category,
- Date,
- Geographic area.

Search by the message contents is also implemented.

By default, all the received NW” are assigned with the “Danger” status. This is the reason why the Navigational hazard caution will be generated when any of these objects turn up within the safety frame.

The NW can be deleted by the operator. The deleted messages are stored on a local disk for 1 year and are then automatically deleted. These messages can be displayed by using the Show deleted button. On the Chart Panel, objects from these NW are shown in grey.

**Text Messaging**

The following capabilities are provided in the course of text message exchange:

- Exchange of text messages without a group chat capability;
- Local storage of message history;
- Search for users in the STM Identity Registry;
- Local storage of user list;
- Context search in the local user database.
Contact Selection

Run the STM Chat application and press the Show Contacts button.

The STM Chat Contact List window which will open up, contains a list of contacts whom the communication is already established with. Enter the contact's name first letters in the search line.

The list will display only those contacts whose names start with the entered combination of letters.

To request for a contact from the cloud, press the STM button. This will send a request with a Free Text contained in the search line.
For an advanced request press the Adv button.

Set the contacts search parameters:

- **ServiceType.** There may be the following service types:
  - Vessel (SHIP-VIS);
  - Route optimization (ROS-VIS);
  - Route check (RCS-VIS).
- **KeyWords** – set of key words for search;
- **IMO** – IMO number;
- **MMSI**;
- **UnLoCode** – port UN/LOCODE.

To send an advanced request, press the STM button.

Correspondence with the selected contact is maintained on the **STM Chat Messenger** page. The message is entered in the bottom window of the page.
STM Functions

At this stage, the Send button is unlocked. Correspondence between the user and the contact is displayed in the page’s top window.

Upon receipt of a message from another contact with whom the correspondence is currently not maintained, the top right corner of the window on the STM Chat Messenger page displays a notification in the form of a red flashing light.

In the case, the contact from whom the message has been received, is moved to the topmost line of the STM Chat Contact List. There is a red flashing light to the right of it, too.

If during the chat it is necessary to send the monitored route, press the Reference to VP button.
From the drop-down list, select the route that should be sent.

Press the OK button.

Type the message and press the Send button. The route will be sent.
If the Shore Centre has sent some Area, the **STM Chat Messenger** page looks as follows:

![STM Chat Messenger](image)

To request for a route referenced to this Area, press the **Get VP** button.

To convert the received Area, press the **Show Area** button.

![User Map](image)

A user map with sent objects will appear on the **Maps** panel.
Abbreviations and Explanations

- “Service and Service Registry (SR)”
  - A service is an action that provide support or work to someone (ship);
  - The work done by a service can be fully automated or it can include manual work by a human;
  - A service can be related to a specific geolocation or generic for the whole world;
  - A information service supports the operation service with information exchange, e.g. **Voyage Information Service**;
  - Available services are registered in **Service Registry**;
  - **Service Registry (SR)** is a catalogue with information of services;
  - **Service Registry** contain all necessary information a consumer need to use a service;
  - **Service Registry** is searchable with both text and geography

Example of services:
  - A ship can ask for **enhanced monitoring** as a service from a shore centre.
  - A ship can ask for **route optimization** from a service provider.
  - A ship or a shore centre can ask for **pilot routes from a service** that provides pilot routes.

- “Identity Registry (IR)”
  - **Identity Registry (IR)** is a catalogue of identities grouped in organisations, users, devices, vessels and services;
  - **Service Registry (SR)** and **Identity Registry (IR)** are a core parts of the Maritime Connectivity Platform.

- “Voyage Information Service (VIS)”
  - The **VIS** will be serving as the ship’s representation that will always be online, e.g. if a **VoyagePlan (VP)** is sent to a ship, when the ship is not online, the **VIS** will make sure the **VP** will be forwarded to the ship when it’s online again;
  - The **VIS** will make sure that all message contents that are used in STM is following the standards that are setup.

- “SeaSWIM”
  - **Sea System Wide Information Management (SeaSWIM);**
  - Secure exchanges are supported by requirements on encryption, authentication mechanisms, etc.;
  - Provides software and guidance to support actors to connect, translate and share existing information.
STM Functions

- **“Unique Voyage ID (UVID)”**
  - Invisible for the Navigational Officer and used for the Machine-To-Machine (M2M) voyage exchange;
  - A Voyage is a “route” that has a schedule “attached”, including departure and arrival time/date;
  - One Voyage ID (UVID) per voyage/passage between two consecutive ports without stops, berth to berth.

- **“Departure and Arrival times”**
  - **PTD**: Planned Time of Departure (Based on planned schedule information from the monitored route);
  - **ATD**: Actual Time of Departure (Based on actual departure event);
  - **PTA**: Planned Time of Arrival (Based on planned schedule, speed and distances to go from the monitored route);
  - **ETA**: Estimated Time of Arrival (Based on present Speed-Over-Ground, distance to go and schedule parameters of the monitored route);
  - **ATA**: Actual Time Of Arrival (Based on the actual arrival event to the specified route WP. It might be Berth, Pilot Boarding area or just waypoint);
  - **RTA**: Recommended Time Of Arrival (Ports Recommended Time of Arrival for a ship to e.g. for example to the Pilot Boarding Area).

- **“Port Synchronization (PortCDM)”**
  - Port Synchronisation: Ship and port communicates arrival times, using the ECDIS and its monitored route and schedule;
  - Swift ETA communications will enable more just in time arrivals;
  - **Port Collaborative Decision Making (PortCDM)**: Within a port, all different actors e.g. Linesmen, Tugboats, Stevedores etc. are sharing the same “timing picture” regarding a ship’s port call, enabling better planning and collective information regarding ETA/ETD for the ship to/from the port.

- **“Shore Centres (SC)”**
  - **A Shore Centre (SC) is similar to a VTS, the SC is covering a larger geographical area than a VTS. The services offered by the SC are user-selectable;**
  - **A Shore Centre** can receive and display Ship’s Voyage and send proposed changes in return;
  - **A Shore Centre** can perform **Enhanced monitoring** among other services.

  Example of Shore Centres:
  - **Tarifa SC** – Spanish Mediterranean Coast;
  - **Kvitsøy SC** – Entrance to Stavanger Norway;
  - **Horten SC** – Entrance to Oslo;
  - **Gothenburg SC** – Swedish West Coast and Baltic Region;
  - **Tallin SC** – Finnish Gulf.
Appendix:

Adveto Voyage Information Service Service

- Service instance description
- System Description
- User manual
## Document status

### Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adveto</td>
<td></td>
</tr>
<tr>
<td>Eskil Westermark</td>
<td>Adveto AB</td>
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### Document History

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### Review

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1 Introduction

1.1 Purpose of the Document
The purpose of this service instance description document is to provide an operational description of the specific service instance.

1.2 Intended Readership
This service instance description document is intended to be read by service consumers in charge of selecting the service instance to consume.
# 2 Service Instance Identification

The purpose of this chapter is to provide a unique identification of the service instance and describe where the service is in terms of the engineering lifecycle.

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<th>Name</th>
<th>Gabriella IMO8917601 Voyage Information</th>
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<td>Version</td>
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<tr>
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<tr>
<td>Service Design ID</td>
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<tr>
<td>Service Design Version</td>
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<td>Description</td>
<td>The service shares voyage plans from the ship to interested parties. The service accepts incoming proposed updates on voyage plan, text messages and navigational warnings and information. The service accepts subscription requests and single requests for voyage plans.</td>
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<tr>
<td>Keywords</td>
<td>Ship, VIS, TXT, S124, Voyage Information Service</td>
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*Table 1 - Service Instance Identification*
3 Service Instance Details

3.1 Overall description
The Ship Voyage Information Service provides interested parties with the ships voyage plan in RTZ format. The normal procedure is that the owner of the voyage plan nominates a set of interested parties. Nomination includes in this context both giving an interested party authorization to read the voyage plan and also adding the interested party to a subscription list, which gives the interested party an initial voyage plan and after that continuously all updates on the voyage plan. An interest party can also request to subscribe to voyage plans from the ship. Both the ship and the interested party can remove subscription.

An interested party can also ask for all or specific voyage plans from the ship.

The service accepts incoming (uploaded) voyage plans in RTZ format, text messages in STM format and area message in S124 format.

![Diagram of ship voyage information service](image)

3.2 Service coverage
The service covers the whole world.

3.3 Required input
Incoming voyage plans must be an RTZ version 1.1 with STM Extension according to the VIS Design 2.2.
Incoming text messages must be in STM TXT v1.3 format.
Incoming area message must be in S124 v0.0.7 format

3.4 Output from the service
Outgoing voyage plans are in RTZ v1.1 STM format
Outgoing text messages are in STM TXT v1.3 format

3.5 Functional description
TBD
3.6 Interaction diagram

3.6.1 Normal flow – ship share voyage plans

The normal procedure is that the ship or ship representative identifies all interested parties to the voyage and nominates them. Nomination in this context includes both giving access to the voyage plan and adding the interested party as subscriber on the voyage plan. A voyage plan is sent to the interested party when it is added as subscriber, and all the updates are sent to the interested party.

*Figure 2 - Normal flow – ship share voyage plans*
3.6.2 Alternative flow – consumer requests voyage plan

The alternative procedure is that the ship has for some reason not nominated the interested party, and the interested party then requests to subscribe to voyage plans for the ship. The ship gets a notification and than either accepts or denies the request. If the interest parties request is accepted, the ship nominates the interested party and send the voyage plan.

![Diagram of Alternative flow – consumer requests voyage plan](image-url)
3.7 Allowed methods
The Ship Voyage Information Service is based on the Voyage Information Service design version 2.2 and handles all operations.

PRS handles interaction on the following methods:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Allowance/handling</th>
<th>Comment</th>
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<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans incl ACK</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Receive STM text messages</td>
<td>uploadTextMessage incl ACK</td>
<td>Yes</td>
<td>STM TXT v1.3</td>
</tr>
<tr>
<td>Receive area (S124) messages</td>
<td>uploadArea incl ACK</td>
<td>Yes</td>
<td>S124 v0.0.7</td>
</tr>
<tr>
<td>Return list of voyage plans on request</td>
<td>getVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Accepts subscription request</td>
<td>subscribeToVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Accepts removal of subscriptions</td>
<td>removeSubscriptionToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Accepts request for list of subscribed voyages</td>
<td>findSubscriptionsToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
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</table>

Table 2 - Allowed methods

Outgoing interaction
The Ship Voyage Information Service nominates actors internally and will send (upload) the voyage plan in RTZ format to the nominated interested parties.

The ship can send text messages in STM TXT format.

3.8 Constraints
The service has the following constraints.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans</td>
<td>Incoming parameter callbackEndpoint is not handled by the service.</td>
</tr>
</tbody>
</table>

Table 3 - Constraints
4 Release Notes

<table>
<thead>
<tr>
<th>Version</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1.0</td>
<td>The service is released in its first version.</td>
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*Table 4 - Release Notes*
5 References

This chapter shall include all references used in the service instance description. Specifically, the service specification document as well as the applicable service design description shall be listed.

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<thead>
<tr>
<th>Nr.</th>
<th>Version</th>
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<td>[4]</td>
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Table 5 - References
6 Acronyms and Terminology

6.1 Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>VIS</td>
<td>Voyage Information Service</td>
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</tbody>
</table>

Table 6 - Acronyms

6.2 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Service</td>
<td>The provision of something (a non-physical object), by one, for the use of one or more others, regulated by formal definitions and mutual agreements. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.</td>
</tr>
<tr>
<td>Service Consumer</td>
<td>A service consumer uses service instances provided by service providers. All users within the maritime domain can be service customers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Instance</td>
<td>One service implementation may be deployed at several places by same or different service providers; each such deployment represents a different service instance, being accessible via different URLs.</td>
</tr>
<tr>
<td>Service Instance Description</td>
<td>Documents the details of a service implementation (most likely documented by the service implementer) and deployment (most likely documented by the service provider). The service instance description includes (but is not limited to) service technical design reference, service provider reference, service access information, service coverage information, etc.</td>
</tr>
<tr>
<td>Service Interface</td>
<td>The communication mechanism of the service, i.e., interaction mechanism between service provider and service consumer. A service interface is characterised by a message exchange pattern and consists of service operations that are either allocated to the provider or the consumer of the service.</td>
</tr>
<tr>
<td>Service Operation</td>
<td>Functions or procedure which enables programmatic communication with a service via a service interface.</td>
</tr>
<tr>
<td>Service Provider</td>
<td>A service provider provides instances of services according to a service specification and service instance description. All users within the maritime domain can be service providers, e.g., authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
</tbody>
</table>

Table 7 - Terminology
STM Ship system - Adveto ECDIS-4000  v2018-01-16

General
The platform for STM ship system is the Adveto ECDIS-4000 system. The computer is either a Hatteland HTC-01 PC and Hatteland 19” display or a Hatteland MMC24 panel PC using Windows XP or Windows 7 as operating system. The STM module is installed on the ECDIS-PC but can easily be moved to external PC if necessary for some reason. Since many of the testbed ships are HSC:s there is no room for additional displays the solution with STM-module on the ECDIS is to prefer.
SMA implementation of VIS/SPIS using the private interfaces is going to be used which means that use of SeaSwimConnector is out of scope.
Isolating STM functionality to a separate program module minimizes impact on navigation if STM-module for some reason is malfunctioning.
ECDIS and STM-module will have their own data storage/database implementations and transferring voyage plans, area info and text data using a named pipe connection.

Block diagram

Development environment
The existing ECDIS-4000 system is extended with a communication link to STM-Module using a named pipe. Existing system for Alarms/Indications is going to be used for messages to operator.
The develop environment for the STM-module is Microsoft Visual Studio 2015 and selected programming language is C#. GUI is designed using Windows Forms. According to IEC61174:2008 all user interface components in STM-module must use colour definitions from S-52 as chart and STM-user-interface is displayed on the same monitor.
Using the program NSwagStudio with “Appendix API Swagger (JSON)” (Voyage Information Service Design-Private Side) as input a VIS-client class in C# is generated.
Using “Appendix API Swagger (JSON)” (Ship Port Information Service Private Design) as input to NSwagStudio a SPIS-client class in C# is generated.

Usage of system
The combined ECDIS/STM system is designed to be used by officer on watch and/or master of the ship when necessary according to operating procedures.

ECDIS functionality

User Settings
Route segments sharing On/Off as default setting

Sensor Data I/O
Listen for route segment requests
Encode and send route segments messages
Decode and manage route segments messages

Display
Show STM-Marker for participating ships
Set display of route segments on/off per ship
Display Trial manoeuvre
Display route segments
Display areas
Display of STM notifications indicator

Data management
Garbage collection for route segments and area definitions
Send and receive routes to/from STM-module

Calculations
Calculate CPA/Intersection between own and other ships
Deviation checks for other ships
Set deviation limits per ship
Calculate Trial manoeuvre

GUI
Menu command to display STM Module on top

Communication ECDIS – STM-Module

Information consistency

Method
Named pipe

Functions
Transfer of routes
Transfer of area messages
Transfer of POI:s”, ETA,PTA,RTA ..... 
Transfer of notifications

STM-Module

Service Admin
Show available services
Set access rights to service providers
Set access rights for routes
Keep track of payload and transactions
Logging of access point availability
Logging of events

Functions
Send, receive and display text messages
Send and receive Routes to VIS
Manage Route subscriptions
Route subscription from a service provider
Keep track of route statuses/forward to ECDIS
Route/Area/Text to Services via VIS
Exchange route editing with ECDIS
Transfer route snippets from STM Module to ECDIS clipboard
Change route statuses
Send PTA / ETA from ECDIS to SPIS
Send RTA from SPIS to ECDIS
Notify OOW when info is available
“Flow point” from and to ECDIS

Communication STM-Module to Online Access Point
Ships normal Internet Connection

Online Access Point
General
The SMA VIS/SPIS private interface implementation will be used.
Communication method is HTTP(S).

UVID-generation
According to : STM Act2 SeaSWIM Testbed Specification  Date: 2016-11-18
the UVID shall have the following format:
“urn:mrn:stm:voyage:id:”<org>”.”<localid>”.

where <org> denotes a Voyage Information Service Provider and/or owner
of the voyage id. As SMA is the Service Provider we can use <org> stated by
SMA or simply “adveto”.
<localid> is generated from system serial number, date and time for actual
date.
Example when <org> is specified by service provider:
urn:mrn:stm:voyage:id:<org>:adveto20298-1712201018
Example when <org> is specified by voyage id owner:
urn:mrn:stm:voyage:id:adveto:20298-1712201018

VIS Client
Using the program NSwagStudio with “Appendix API Swagger
(JSON)” (Voyage Information Service Design-Private Side) as input
a VIS-client class in C# is generated.

SPIS Client
Using the program NSwagStudio with “Appendix API Swagger
(JSON)” (Ship Port Information Service Private Design
) as input
a SPIS-client class in C# is generated.
STM Appendix
ECDIS-4000

2nd edition
Version 2017-09-29

Adveto
Advanced Technology AB
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1 Preface

This document describes the use of the Adveto STM-Module in cooperation with ECDIS-4000. Extended functions for route transfer using AIS included in ECDIS-4000 is also described.

A cut from the document “MONALISA 2 0_D2.3.1-4.0
Sea Traffic Management –A Holistic View”:

“Sea Traffic Management (STM) is a concept for sharing secure, relevant and timely maritime information between authorized service providers and users, enabled by a common framework and standards for information and access management, and interoperable services. The scope of STM includes private, mandatory, and public service opportunities along the voyage, berth-to-berth.

More information about the STM fundamentals can be found in:

   Sea Traffic Management – Services in Practice Video
   STM Definitions and Clarifications -Power Point Presentation

It’s recommended to study these documents to get an understanding of terms and functions.
2 Overview

ECDIS-4000 in STM mode is a modified ECDIS-4000 system with an additional STM-module. ECDIS-4000 and STM-Module is connected by a technique called “Named pipe”. The STM-module can be run on either the ECDIS computer or a separate STM computer.

The STM-Module is connected to a Voyage Information Service (VIS) via internet. The VIS is a representation of the ship which is always online. When the ship is offline local copies of information are used. The local copies are stored on the STM PC:s disc and are updated as soon as the ship get internet connection.

The local copies are:
- Received messages - routes, text messages and nav warnings.
- Notifications - Indications that there are messages to download
- Voyage plans (VP:s) published by the ship. A voyage plan is a route with departure/arrival times.
- Service Instances – A list if services available to the ship. A service can be a service provider offering different kinds of services like weather routing, route optimization, safety check of route, VTS etc. To use a service the ship must be online.

All VIS:s are interconnected in the Maritime Connectivity Platform. Ships and service providers can exchange data regarding a ship’s voyage(s). The data can be route information, text messages, navigation warnings, port call messages and notifications.
3 AIS-functions

3.1 General
ECDIS-4000(STM) is capable of sharing route data between vessels using AIS equipment for communication within AIS range. The Route Message Broadcast is used as a means to indicate intended navigation to nearby vessels, allowing vessels to avoid ending up in a close quarter where the involved ships have to use the regulations in COLREG. The current and a fixed number of coming route legs of the monitored route is shared with other vessels. The use of this message requires that both the receiving and transmitting side has the appropriate communication equipment as well as presentation and navigation systems.

3.2 Route segmentation
The Route Message-payload is defined such that the current leg as well as up to six additional legs can be shared. If any of the waypoints within the next four legs is over 200 NM from previous waypoint, this will be treated as the last WP in the currently shared monitored route segment.

3.3 Message Broadcast triggers
A new Route Message broadcast shall be initiated by ECDIS when any of the below events occurs:

- Six minutes have passed since last Route Message broadcast
- A Route Message interrogation was received and over one minute has passed since last Route Message broadcast on that channel
- Any of the data in the last Route Message broadcast has been changed
- When passing a waypoint and turn is completed. In ECDIS-4000 turn is completed when ship is sailing on the new course and turn prediction functions is in straight course mode.
- The Monitored Route has been deactivated
- A Monitored Route is activated
3.4 Extensions to ECDIS-4000 AIS-functions

3.4.1 AIS-symbol in chart

3.4.1.1 Sleeping STM-target
A sleeping AIS-target where onboard system has STM-functionality is marked with the text [STM]

Figure 1 Sleeping STM Target

3.4.1.2 Active STM-target
An active AIS-target where onboard system has STM-functionality has the marker text [STM] attached to the name.

Figure 2 Active STM Target

3.4.1.3 Active STM-target with route segment
A STM Ship can send route segment messages using AIS as a data link. A maximum of seven legs can be transferred. Route segments are drawn using presentation color for AIS. Limits for speed and cross track deviations can be set individually for each target. If, for a certain ship, a value is out of limits the route segments for the actual ship are displayed with red color.

Figure 3 Route segments
3.4.1.4 Extensions in AIS-table for STM-target

An AIS-target with STM-capabilities selected for display in the AIS-table will show two extra buttons in the user interface. The button labeled “STM” located on the same row as MMSI-number controls visibility of route segments. If the button text has strikeout font route segments are invisible. Click the button to toggle route segment visibility. Default is to not show route segments.

As specified in 3.3 the time between two route segment broadcasts for a ship can be up to six minutes. To get actual data click the “ACQ”-button to send an interrogation request.

Figure 4 AIS Table
3.4.1.5 The STM Form in ECDIS-4000

A floating form showing data and controls for STM-functions can be displayed. The form contains:

- A checkbox controlling transmission of own ship’s route segments
- An Up-Down button to execute a Route Trial Manoeuvre
- A list showing data about AIS-targets with STM information

![Image of STM form]

*Figure 5 ECDIS STM Form*

The STM-form is displayed by clicking the menu item “STM – Sea Traffic Management” in the “ECDIS” menu.

![Image of menu with STM option]

*Figure 6 Show STM Form from menu*

The columns in the AIS-target list are:

- MMSI number of the ship
- Visibility of route segments in chart. By clicking the column visibility of route segments can be toggled.
- Name of the AIS-ship
- Cross track deviation
- Limit for cross track deviation. If limit is exceeded the route is
displayed using warning color

- Actual speed of AIS-ship
- Delta speed limit. If actual and planned speed is differing with greater value than delta speed limit the route is displayed using warning color (red)
- Leg speed for actual leg in route segment
- Distance for closest point of approach
- Time for closest point of approach

### 3.4.1.6 Set speed deviation limit

Click in column “dspd Lim” and the row for actual ship to set limit for deviation between actual and planned speed for an AIS-Target. An edit box is displayed. Type the new limit and press the “ENTER”-key, or double click with mouse cursor in the edit box to activate the value. Set value to 0 (zero) to disable warning.

![Figure 7 Set Speed Deviation Limit](image)

### 3.4.1.7 Set cross track deviation limit

Click in column “XTD Limit” to set cross track deviation limit for an AIS-Target. An edit box is displayed. Type the new limit and press the “ENTER”-key, or double click with mouse cursor in the edit box to activate the value. Set value to 0 (zero) to disable warning.

![Figure 8 Set Cross Track Deviation (XTD) Limit](image)
3.4.1.8 Route Trial Manoeuvre

Positions of own ship and AIS targets can be calculated along routes. Set the time with the up/down button in the “Route Trial Manoeuvre” frame. Ghost ship/AIS-symbols are shown in chart. CPA/TCPA is also calculated. Numerical values are shown in AIS-list. Meeting points are displayed in the chart showing connection lines between closest point on own and AIS-ship route.

Values for speed in calculations are treated as follows:
- Own ship speed is actual ship’s speed
- AIS target speed is target’s actual speed

Figure 9 Trial manoeuvre
4 STM-Module

4.1 Route, Voyage Plan and UVID

A route in the ECDIS-4000/STM context is a journey between two ports. It’s connection to real time is when the route is loaded for monitoring in ECDIS-4000 and ETA functions are activated.

A voyage plan (VP) in the ECDIS-4000/STM context is an ECDIS-4000 route with a Unique Voyage ID (UVID). The UVID is the identity used in all STM data exchange. The VP can include schedule information (departure and arrival times, speed settings)
4.2 Initialize and start

In a standard installation the STM-module is started and initialized from the ECDIS-4000 program module. At startup local data is loaded and the STM-module has the same information status as when it was last connected to the Maritime Connectivity Platform. See Chapter 2 Overview for a description of local copies.

ECDIS-4000 and STM-Module are two separate processes sharing the display. To switch between the processes use one of the following:

- Press ALT-TAB on the keyboard.
- Click in the title bar of ECDIS-4000 to get the ECDIS display as the topmost program
- Click the “Show STM-Module” in the About menu to get STM-Module as the topmost program.

![Figure 10 STM-Module main page](image)
4.3 **STM Module tabs**

The functions in the STM-Module are logically grouped in different tabs in the user interface.

![STM Module tabs](image1)

**Figure 12 STM Module tabs**

4.3.1 **Voyage and Port Information**

4.3.1.1 **ECDIS**

Once per minute the STM-Module check VIS for notifications. A notification is a short message for example telling the STM Module that new information can be downloaded from the VIS. If a notification is received in the STM-Module an indication is displayed in ECDIS-4000. A flashing “LED-like” symbol is shown in the ECDIS toolbar. According to the tooltip text an indication can be acknowledged by double clicking the symbol. The STM-Module is then brought to top of the display order and the flashing LED-symbol is removed.

![STM Notifications in ECDIS](image2)

**Figure 13 STM Notifications in ECDIS**

The STM Module can be made visible as described in 4.2

4.3.1.2 **Voyage Information Service**

The tab Voyage Information Service holds data and controls to manage
Voyageplans (VP:s). A voyage is a ”route” that has a schedule attached, including speed settings, departure and arrival time/date. The frame “Actual Voyageplan” has user interface to manually control sharing of voyage plan.

The frame “Voyageplan and services” has user interface to call services using a single voyage plan as input. The lists “Published VP:s” and “Received VP:s” show VP info.

![Figure 14 Voyage Information Service (VIS) tab](image)

One of the fundamentals of STM is to share a ships voyage plan with actors interested in the voyage (Shipping Company, port, agents …..). Receivers of VP are defined in a subscriber collection. The “Actual Voyageplan” frame allows the ship to do that. A more streamlined method is described in 4.4.

Actual voyage plan controls:
- **Route status** - Select status for VP to be shared. Values can be
  1. Original
  2. Planned
  3. Optimized
  4. Cross Checked
5 Safety Checked
6 Approved
7 Monitored
8 Inactive

- **Author** – Author of voyage plan
- **Share Voyage Plan** – Click this button to share the ship’s monitored VP with subscribers
- **Subscribers** – Shared VP:s are shared with subscribers. The subscribers of a specific VP are defined in the Subscriber Selection form.

![Subscriber selection](image)

*Figure 15 Subscriber selection*

Subscribers for actual UVID are preselected. Add and remove subscribers and click “Close” to remove the form. Actual selection can be set as default selection. More about Default Selection is covered in 4.4

- **View VP XML** – VP information is transferred in a data format called RTZ which is a variant of XML format. To see the actual VP in XML (or RTZ) click the button. The function is intended to be used for troubleshooting and is not a part of everyday use.
The actual VP can be sent to different service providers for actions like Route checks, weather routing, routing services etc. The VP is sent only once. The service provider is selected in the dropdown control below the buttons.

**Figure 16 VP in XML format**
Voyageplan and services controls:

- **Authorize Identities** – Give someone access to published VP:s

![Authorize Identities](image)

*Figure 17 Authorize Identities*

- **Call Service with VP** – Actual VP is sent once to service provider
- **Subscribe** – VP:s published by a service provider are received.
- **Get All VP:s** – All VP:s published by service provider are downloaded

Published VP:s and Received VP:s show UVID, status and publish date for own and received VP:s. By clicking column headers different columns can be used for sorting. Clicking a column twice toggles sort order.

Published VP:s controls:

- **Make active** – Selected VP is transferred to ECDIS and set as planned route
- **Delete VP** – The VP is removed from the VIS and is no longer accessible for subscribers,
Received VP:s controls:
- **Display in ECDIS** – The VP is transferred to ECDIS:s planned route
- **To ECDIS Clipboard** – The VP is transferred to ECDIS:s clipboard. The route edit form in ECDIS can be used to paste clipboard data in an ongoing edit session.

### 4.3.1.3 Ship Port Information Service

When this document is written the Port Information Service is under revision. User interface and documentation will be updated as soon as SPIS functions are implemented and tested.

![Port Information Service UI](image-url)

*Figure 18 Port Information Service UI*
4.3.2 Area and text messages

A text message is a short message containing text and optionally geographic information. Example of use is directions sent from an icebreaker to a ship waiting for assistance. Area messages are messages using a format called S-124. Example of use are navigational warnings or meteorological warnings. The STM Module can send and receive text message and receive Area (S-124) messages.

The “Area and Text Message” tab shows a list of received text and area messages. List columns are From/Nav Warning, Geo, Thread (id), publish date, UVID ad ID. By clicking column headers different columns can be used for sorting. Clicking a column twice toggles sort order. Click a row in the From/Nav Warning column to display text content of a message.

Figure 19 Area and Text Message tab

Click a row in the From/Nav Warning column to display text content of a message.
The character X in the Geo column indicates that a geographical reference is attached to the message. Click Geo column for a row to zoom in at the message location in the ECDIS.

Figure 20 Text Message content

Figure 21 Example of Text Message area on chart
Figure 22 and Figure 23 show content and chart for a S-124 message.

Figure 22 Area (S-124) text content

Figure 23 Area (S-124) message on chart
The “Send Text Message” frame contains user controls to create and send text messages.

“Send Text Message”-frame controls:
- **Receiver** – Dropdown control for receiver selection
- **Author** – Author of the message
- **Subject** – Subject of message. Visible in column Thread for received messages
- **UVID** – Reference to a VP. Not mandatory and does not have to be the actual VP. To get actual VP UVID click the button.
- **Request Point From ECDIS** – Get a position from ECDIS. Click the button, switch to chart display to click at position and then return to STM Module.
- **Radius** – A radius to define a circular area can be attached to the point
- **Request Area From ECDIS** - Get an area from ECDIS. Click the button, switch to chart display to click at the positions and then return to STM Module. To close the area press keyboard SHIFT key when the last point of the area is clicked.
Figure 25 Input of area for text message

- **Valid From / Valid To** – Tick these check boxes to specify a validity period for the message. Set dates in the “Date and Time” controls
- **Send Text Message** - Click the button to send the text message
4.3.3 Notifications

A notification is an indication that there is a message to download. The message can be a VP, a text message or a nav warning. Once per minute the STM Module checks for notifications waiting to be downloaded. Error and status information can also be sent as notifications.

List columns are From, Receive date and UVID received messages. By clicking column headers different columns can be used for sorting. Clicking a column twice toggles sort order.

The arrival of notifications is indicated in both ECDIS and STM module. To acknowledge:

- In ECDIS double click the LED-symbol. STM Module becomes visible.
- In STM Module select the Notifications tab.

![Figure 26 Notifications tab](image)

![Figure 27 Indications of new Notification](image)
The STM Module checks for new notifications once per minute. Click “Get Notifications” button to make a direct check.

The content of the notification list is normally notifications received since last start of STM Module. Click “Show Saved Notifications” to see all notifications.
To download all waiting messages, click the button “Get Messages”

4.3.4 Services
All actors in the Maritime Connectivity Platform are registered in the Service Registry. This can be ships, VTS:s, ports etc.
The Services tab shows available services and is source for different dropdown controls in the STM Module. If a subset of available services is displayed reflecting a “Find Services” search all dropdowns will contain just the search result.

![Figure 28 Services tab with result of a search on Service Type](image)
The search criteria for a “Find Service” action can either be Free Text (overrides all other parameters) or:

- **Point from ECDIS** – Get a position from ECDIS. Click the button, switch to chart display to click at position and then return to STM Module.
- **Along Actual VP**
- **Area from ECDIS** - Get an area from ECDIS. Click the button, switch to chart display to click at the positions and then return to STM Module. To close the area press keyboard SHIFT key when the last point of the area is clicked.
• **UnLoCode** - The five-character UN code e.g. SEGOT for Gothenburg
• **Keywords** - Keywords are registered in Service Registry. **Service**
• **Type** – Dropdown list is populated with registered service types

### 4.3.5 Identities

The identities tab shows a list with organizations registered in the service registry. To authorize an organization, see 4.3.1.2 Authorize Identities button. Refresh the list by clicking the “Find Identities” button.

![Figure 31 Identities tab](image-url)
### 4.3.6 Connection Status

The “Connection Status” tab shows connection and disconnection events for the connection to VIS. This list is only updated by clicking the Refresh button. At STM Module startup the list is empty.

![Connection Status tab](image)

*Figure 32 Connection Status tab*
4.3.7 System

The system tab contains tools and displays for development purposes. For normal use the only information is ECDIS-connection status. “ECDIS is connected” means that ECDIS-4000 and STM Module communicates.

ECDIS-link controls:
- **Get Monitored VP** – Get the monitored route from ECDIS
- **Get Planned VP** – Get Planned route from ECDIS.

Use “Actual Voyageplan” controls to use the VP from ECDIS.

Special controls:
- **Refresh Published VP:s** – Click this button to refresh the list of VP:s published.
- **Load RTZ from file** – Load a VP saved on disc in RTZ format as actual VP for further processing.

Figure 33 System tab
4.4 STM-Module and ECDIS interaction

4.4.1 Loading an existing route

The following example show how to share a voyage plan with a minimum of work.

Scenario is a ship sailing on a route “Trelleborg-Svartklubben” and the voyage plan including a UVID:

urn:mrn:stm:voyage:id:adveto:Viking20298-Trelleborg-Svartklubben-1709271435

The STM Module shows:

![Figure 34 STM Module shows UVID](image)

Route status is set to Monitored. Only one route can be the monitored route and it’s the UVID that identifies a route as a unique voyage plan. After finished voyage a new voyage is initiated. Loading a new route for monitoring implies that the STM Module and VIS must be notified in some way.

Route ”Svartklubben-Falsterborev” is loaded in ECDIS:
When OK is clicked the route is set to be the monitored route.

The STM Module detects the change of monitored route and want to know how to handle the UVID.
There are three alternatives:

- **Create a New UVID** – A new voyage is initialized with a new UVID. The actual VP display is changed to:

  ![Figure 37 Create new UVID](image)

  *Figure 37 Create new UVID*

  In the UVID:

  `urn:mrn:stm:voyage:id:adveto:Viking20298-Svartklubben-Falsterborev-1709271448`

  Some parts can be recognized. The ECDIS route file name `Svartklubben-Falsterborev` (without extension .MDB) is included. The last ten characters of the UVID is date and time when the route is loaded in ECDIS. Note that status for previous VP has changed to approved and the new voyage is set to status Monitored.

- **Cancel** – Nothing is sent to VIS. This can be useful if ECDIS for some reason has to be restarted using the same route.

- **Select an existing UVID** – The route is altered but it’s still the same voyage. VIS is updated.
4.4.2 Create a new route and load it for monitoring

Create a new route using normal route editing tools in ECDIS-4000. When the route is ready for use save it with a suitable name.

The simplest way to make our new route ready for use is to select the Route menu and click:

1. Clear Route Edit Data
2. Clear Monitored Route
3. Open Route for Edit

STM Module detects that a new route has been loaded and wants to know how to treat UVID. Let’s create a new a new UVID by clicking the “Create a New Unique Voyage ID (UVID)”-button.
When our new route/Voyage Plan is set as monitored it will be shared with subscribers.

**Figure 41 New voyage plan set as monitored**

### 4.4.3 Notification in an ECDIS-4000

This is a notification from a VIS where we have a subscription.

**Figure 42 New voyage plan is available**
### 4.4.4 Calling a Service creating Route snippets

The route in previous example has its endpoint near a position marked as Pilot Boarding place in the chart. In this example we’ll use a service to get a route snippet to extend our route. In the “Services”-tab we can search for a suitable service. Click the dropdown control “Service Type” to see what type of services that are available. We have selected type ROUTE_CATALOGUE-VIS. Click “Find Services” and the result can be like in Figure 43.

![Figure 43 Find a service](image)

To call a service select the tab “Voyage Information Service”. In the frame “Voyageplans and services” there is a dropdown control to select service provider and a command button to perform the call.

![Figure 44 Voyageplans and services frame](image)

To call the service select service provider by clicking the dropdown control, select “Nordic Pilot Route Service”. Check that our VP is Fredrikshamn-Trubaduren and status is monitored. Next step is to click the button “Call Service with VP”.

The result from Nordic Pilot Route Service comes as three notifications, two routes and a text message.

![Figure 45 Three notifications](image)

To get routes and text message click the “Get Messages”- button. The text message informs us that the service has not been able to find a departure pilot route.

![Figure 46 Route not found text message](image)

The two suggested arrival routes can be found in list of Received VP:s.

![Figure 47 Suggested arrival routes](image)

To see the pilot route in the ECDIS select route in the list and click the button “To ECDIS Clipboard”. Route information in clipboard is shown as a solid line using same colour as planned route.

![Figure 48 Route snippet 1 displayed on ECDIS chart](image)
To insert preferred pilot route in the ships route select the command “Edit Route” in the “Route” menu of the ECDIS.

To insert new route segments in our existing route right click on the row No 2 Trubaduren the get the popup menu. Select item “Paste”,

Use Paste to insert clipboard data after selected row. Paste Before (selected row) is the only way to insert data before the first waypoint.
After paste out screen looks like this;

![ECDIS Screen after paste](image)

**Figure 52 ECDIS Screen after paste**

The waypoints Trubaduren and Pilot Boarding # 1 is almost on the same position so one of them can be deleted. After deletion of wp Trubaduren and setting planned route as monitored STM-Module detects the change and a UVID is requested.

![Set UVID](image)

**Figure 53 Set UVID**
Resulting route after edit

**Figure 54 Resulting route**

Remember to safety check and save the updated route.

### 4.4.5 Calling a service that will modify the route

In this example we will call a service that will modify schedule, number of waypoints and waypoint positions of the original route. The service is available as “SSPA Route Optimization Service”. In the Service description from SSPA we can read:

“Optimization is performed based on bunker consumption/total vessel resistance, i.e. the returned route aims to be the most efficient route from A to B. The service accounts for water depth (resistance increase from shallow waters) as well as the influence of weather (wind, current and waves). Please note that weather is only accounted for during a period...
consisting of 5 days ahead and 7 days prior to the current date, i.e. a rolling 12 day-period is covered. Submitted routes with waypoints outside this period will be optimized without influence of weather condition.”

Our original route looks like this in the Route Editor.

Figure 55 The original route

The route is loaded for monitoring. The STM-Module shows:

Figure 56 STM Module ready to call service

Select service provider and click “Call Service with VP”. When an optimization result is available a notification is received.
Click the “Get Message” button get the new voyage plan. Comparing the original and the optimized routes we can find new waypoints, moved waypoints and new speed settings.
Figure 59 List of wp:s for optimized route

Remember to safety check and save the new route.

4.4.6 End of voyage

There are three different ways to end a voyage in the VIS.

1 Load a new route for monitoring in the ECDIS and let the STM-Module create a new UVID. The old VP will change status to approved.

2 Set VP status to inactive

3 Delete the VP by selecting it in the list of published VP:s and then click the “Delete VP” button.
Appendix:

Wärtsilä SAM Voyage Information Service Service

- Service instance description
- System Description and User manual
Document No:

Title: Service instance description for Ship Pearl
Seaways IMO8701674 Voyage Information Service

Date: 2018-01-11
## Document status

### Authors

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<tr>
<th>Name</th>
<th>Organisation</th>
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<td>Wärtsilä</td>
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<td>2018-01-12</td>
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<td>Initial version</td>
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### Review

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1 Introduction

1.1 Purpose of the Document
The purpose of this service instance description document is to provide an operational
description of the specific service instance.

1.2 Intended Readership
This service instance description document is intended to be read by service consumers in
charge of selecting the service instance to consume.
2 Service Instance Identification

The purpose of this chapter is to provide a unique identification of the service instance and describe where the service is in terms of the engineering lifecycle.

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<tbody>
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<td>Pearl Seaways</td>
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<tr>
<td><strong>ID</strong></td>
<td>urn:mrn:stm:service:instance:wartsila:imo8701674</td>
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<td><strong>Version</strong></td>
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<tr>
<td><strong>Service Specification ID</strong></td>
<td>urn:mrn:stm:service:specification:sma:vis</td>
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<tr>
<td><strong>Service Specification Version</strong></td>
<td>2.2</td>
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<tr>
<td><strong>Service Design ID</strong></td>
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</tr>
<tr>
<td><strong>Service Design Version</strong></td>
<td>2.2</td>
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<tr>
<td><strong>Description</strong></td>
<td>The service shares voyage plans from the ship to interested parties. The service accepts incoming proposed updates on voyage plan, text messages and navigational warnings and information. The service accepts subscription requests and single requests for voyage plans.</td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td>Ship, VIS, TXT, S124, Voyage Information Service</td>
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<td><strong>Provider</strong></td>
<td>Wärtsilä</td>
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<tr>
<td></td>
<td>urn:mrn:stm:org:wartsila</td>
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<tr>
<td><strong>Status</strong></td>
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<td>8701674</td>
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<tr>
<td><strong>MMSI</strong></td>
<td>219945000</td>
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*Table 1 - Service Instance Identification*
3 Service Instance Details

3.1 Overall description
The Ship Voyage Information Service provides interested parties with the ship's voyage plan in RTZ format. The normal procedure is that the owner of the voyage plan nominates a set of interested parties. Nomination includes in this context both giving an interested party authorization to read the voyage plan and also adding the interested party to a subscription list, which gives the interested party an initial voyage plan and after that continuously all updates on the voyage plan. An interested party can also request to subscribe to voyage plans from the ship. Both the ship and the interested party can remove subscription.
An interested party can also ask for all or specific voyage plans from the ship.

The service accepts incoming (uploaded) voyage plans in RTZ format, text messages in STM format and area message in S124 format.

3.2 Service coverage
The service covers the whole world.

3.3 Required input
Incoming voyage plans must be an RTZ version 1.1 with STM Extension according to the VIS Design 2.2.
Incoming text messages must be in STM TXT v1.3 format.
Incoming area message must be in S124 v0.0.7 format

3.4 Output from the service
Outgoing voyage plans are in RTZ v1.1 STM format
Outgoing text messages are in STM TXT v1.3 format

3.5 Functional description
TBD
3.6 Interaction diagram

3.6.1 Normal flow – ship share voyage plans

The normal procedure is that the ship or ship representative identifies all interested parties to the voyage and nominates them. Nomination in this context includes both giving access to the voyage plan and adding the interested party as subscriber on the voyage plan. A voyage plan is sent to the interested party when it is added as subscriber, and all the updates are sent to the interested party.

![Interaction diagram]

*Figure 2 Interaction with service*
3.6.2 Alternative flow – consumer requests voyage plan

The alternative procedure is that the ship has for some reason not nominated the interested party, and the interested party then requests to subscribe to voyage plans for the ship. The ship gets a notification and then either accepts or denies the request. If the interest parties request is accepted, the ship nominates the interested party and send the voyage plan.

![Figure 3 Alternative interaction with service](image-url)
3.7 Allowed methods

The Ship Voyage Information Service is based on the Voyage Information Service design version 2.2 and handles all operations.

PRS handles interaction on the following methods:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Allowance/handling</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans incl ACK</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Receive STM text messages</td>
<td>uploadTextMessage incl ACK</td>
<td>Yes</td>
<td>STM TXT v1.3</td>
</tr>
<tr>
<td>Receive area (S124) messages</td>
<td>uploadArea incl ACK</td>
<td>Yes</td>
<td>S124 v0.0.7</td>
</tr>
<tr>
<td>Return list of voyage plans on request</td>
<td>getVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Accepts subscription request</td>
<td>subscribeToVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Accepts removal of subscriptions</td>
<td>removeSubscriptionToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Accepts request for list of subscribed voyages</td>
<td>findSubscriptionsToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Allowed methods

Outgoing interaction

The Ship Voyage Information Service nominates actors internally and will send (upload) the voyage plan in RTZ format to the nominated interested parties.

The ship can send text messages in STM TXT format.

3.8 Constraints

The service has the following constraints.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans</td>
<td>Incoming parameter callback Endpoint is not handled by the service.</td>
</tr>
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</table>

Table 3 - Constraints
## 4 Release Notes

<table>
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<th>Version</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1.0</td>
<td>The service is released in its first version.</td>
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*Table 4 - Release Notes*
5 References

This chapter shall include all references used in the service instance description. Specifically, the service specification document as well as the applicable service design description shall be listed.

<table>
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<th>Nr.</th>
<th>Version</th>
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<td>[1]</td>
<td>V.2.2</td>
<td><a href="http://stmvalidation.eu/vis/">http://stmvalidation.eu/vis/</a></td>
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<td>[4]</td>
<td>0.0.7</td>
<td><a href="http://stmvalidation.eu/schemas/">http://stmvalidation.eu/schemas/</a></td>
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Table 5 - References
6 Acronyms and Terminology

6.1 Acronyms

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<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>VIS</td>
<td>Voyage Information Service</td>
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Table 6 - Acronyms

6.2 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>Service</td>
<td>The provision of something (a non-physical object), by one, for the use of one or more others, regulated by formal definitions and mutual agreements. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.</td>
</tr>
<tr>
<td>Service Consumer</td>
<td>A service consumer uses service instances provided by service providers. All users within the maritime domain can be service customers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Instance</td>
<td>One service implementation may be deployed at several places by same or different service providers; each such deployment represents a different service instance, being accessible via different URLs.</td>
</tr>
<tr>
<td>Service Instance Description</td>
<td>Documents the details of a service implementation (most likely documented by the service implementer) and deployment (most likely documented by the service provider). The service instance description includes (but is not limited to) service technical design reference, service provider reference, service access information, service coverage information, etc.</td>
</tr>
<tr>
<td>Service Interface</td>
<td>The communication mechanism of the service, i.e., interaction mechanism between service provider and service consumer. A service interface is characterised by a message exchange pattern and consists of service operations that are either allocated to the provider or the consumer of the service.</td>
</tr>
<tr>
<td>Service Operation</td>
<td>Functions or procedure which enables programmatic communication with a service via a service interface.</td>
</tr>
<tr>
<td>Service Provider</td>
<td>A service provider provides instances of services according to a service specification and service instance description. All users within the maritime domain can be service providers, e.g., authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
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Table 7 - Terminology
# Operating Instructions

## ECDISPILOT Platinum STM

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1 About these Operating Instructions

WARNING

Do not forget to read the chapter on general safety measures. This is obligatory to read! See page 23.

In this chapter, you will find general information about these operating instructions which have been delivered with your ECDISPILOT Platinum STM. It informs you about:

- Aim, scope and Validity
- Structure of these Operating Instructions
- How to use the hyper-links

There will also be the case that you are basically familiar with the ECDISPILOT Platinum STM but only need punctual information on one specific topic or detail. In order to find information on such specific subjects, you can use the

- List of contents
- Index of key words
- Quick start guide with brief operating instructions (for navigation)
- List of abbreviations

This document uses inter-active hyper-links to refer a text paragraph on another page. You may click to a hyper-link like the one at the end of this paragraph and read more details on the referenced page, and you can come back to the origin by just using the two keys:

[ALT] + [ ] together (in Adobe Acrobat Reader, other readers may differ)

Please try it now to jump to page 21 and back.
1.1 Aim, Scope and Validity of these Operating Instructions

WARNING

The ECDISPILOT Platinum STM must only be operated by persons who have passed the relevant mandatory training on the respective systems and applications. Only reading these operating instructions cannot replace such training.

These operating instructions describe how the ECDISPILOT Platinum STM and its software applications work, and how to operate the applications.

Since the operating instructions are generic for a family of products, some information and functions or features described may not be used in your specific installation. This depends on the customisation of your system.
1.2 Structure of the Operating Instructions

When reading through or skimming through the overall operating instructions, it is always a good idea to go from general to more specific subjects, i.e. to start with this general part of the operating instructions and then continue with the part describing the application you wish to learn about. Again, in the descriptions of the applications, read the introductory chapters before getting into detail. Otherwise you might miss information which is assumed to be understood in the chapters describing specific details.

The general structure of any Platinum operating instruction is based on a fixed introduction with GENERAL part and SYSTEM DESCRIPTION, followed by system specific main chapters, i.e. RADAR FUNCTIONS, NAVIGATION TOOLS, FLEET CONTROL, or OPERATOR PANELS, and finally some general chapters about maintenance, alarms, lists and indexes at the end.

1.3 How to Scroll through this Document

You may scroll from page to page by using the scroll down keys on your keyboard. You can also jump to a dedicated page by entering the page number in your Adobe Acrobat Reader. The page number which is shown in the top line of the reader is the same as printed in the bottom line of the document.

This document uses inter-active hyper-links to refer a text paragraph on another page.

You may click to a hyper-link like the one at the end of this paragraph and read more details on the referenced page, and you can come back to the origin by just using the two keys [ALT] + [ ] together (in Adobe Acrobat Reader, other readers may differ)

Please try it now to jump to page 19 and back.

1.4 Typographical Conventions

The typographical conventions used in the operating instructions are kept simple, but still it is essential that you are sure to understand their meaning before reading the instructions. The following special signs are used for specific purposes:

- [ ] (square brackets)
- < > (triangular brackets)
- { } (curly brackets)

These signs are used as shown in the following examples on the next page:
### Expression

<table>
<thead>
<tr>
<th>Expression</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[KEY NAME]</td>
<td>This convention is used to refer to a key on an onscreen keyboard or a computer keyboard. Example: Press [ALARM LIST] to view the Alarm List. This means that you must press the key with the text &quot;ALARM LIST&quot; written on it, in order to view the Alarm List.</td>
</tr>
<tr>
<td>[KEY] + [2nd KEY]</td>
<td>This convention is used to refer to a key combination. Example: Press [ALT]+[F4] to close the window. This means that you must press and hold the [ALT] key, and while holding the [ALT] key you have to press [F4].</td>
</tr>
<tr>
<td>[ ▲ ][ ▼ ][ ◄ ][ ►]</td>
<td>The symbols in the square brackets refer to the respective arrow keys on operator panels.</td>
</tr>
<tr>
<td>Abcd List</td>
<td>Heading capitalization and bold typeface are used when directly referring to names of ECDISPILOT Platinum STM functions and UI elements. Example: Select <strong>Color &amp;</strong> in the main menu. From any mode you can call up the Alarm List by pressing the [ALARM LIST] key on the panel.</td>
</tr>
<tr>
<td>Main &gt; Sub-menu &gt; Sub-Sub-menu</td>
<td>This is an abbreviated way for: Click on Main, then on Sub-menu and afterwards on Sub-Sub-menu.</td>
</tr>
<tr>
<td>☞</td>
<td>This symbol indicates a hint.</td>
</tr>
<tr>
<td>&lt;variable&gt;</td>
<td>Describes a text string of variable length and contents. Example: The display will show &lt;duty engineer&gt;. This means that the display will show the name of the selected duty engineer, e.g. &quot;3RD ENGINEER&quot;.</td>
</tr>
<tr>
<td>{nnn}</td>
<td>Describes a number with a fixed number of digits which is input or output. The number of letters inside the brackets describes the number of digits. Example: Enter a channel number in the format {nnn}. You have to use zeros (0) to fill the empty spaces, if the number is less than 100 (e.g. 056).</td>
</tr>
<tr>
<td>{nnn.}</td>
<td>Like {nnn}, but there may be a decimal point at any place in the number, or none. Example The value is displayed in the format {nnnn.}. In the example the value may be, e.g. &quot;12.35&quot; or &quot;450.6&quot; or &quot;0045&quot;. When entering such values, the decimal point will sometimes be preset by the system.</td>
</tr>
<tr>
<td>DD-MMM-YYYY</td>
<td>The date in international format which is used in the system. Example: 21 AUG 2009 for the 21st of August 2009.</td>
</tr>
<tr>
<td>HH:MM:SS</td>
<td>The time format used in the system. The 24 hour format is used. Examples: 06:30:00 stands for half past six and 0 seconds in the morning (6:30 am) and 23:58:00 is two minutes to midnight.</td>
</tr>
</tbody>
</table>

Table I / 1 Typographical conventions in these operating instructions
2 Safety Precautions

This chapter describes general safety measures to be taken into account when working with or on the ECDISPILOT Platinum STM. In the chapters describing the ECDISPILOT Platinum STM you will find further important safety notes and warnings which are specific to the context.

2.1 Warnings and Notes in these Operating Instructions

A three-level system of warnings is used in these operating instructions which is a mix of ANSI and ISO standards. The different warning levels have the following meaning:

**DANGER**
This sign is used whenever severe injuries or even death will occur as consequence of un-awareness or disregard of the described safety rules.

**WARNING**
This sign is used whenever severe injuries or even death may occur as consequence of un-awareness or disregard of the described safety rules.

**CAUTION**
This sign is used when special care must be taken to prevent unexpected consequences such as damage to equipment, incorrect or incalculable operation and behavior of equipment.

**Notes & Hints:** This symbol indicates useful notes and hints which will ease understanding the system or speed up operation.
2.2 General Safety Note

![WARNING]

You are obliged to read these operating instructions prior to operation and to adhere to the operating instructions in operation in order to prevent possible danger and to ensure compliance with the designated use of the equipment. Prevention of danger includes that operator personnel are trained and authorized for safe operation of the equipment. We assume no liability for damage due to improper operation which could have been prevented.

NOTE:
Further potential danger when working with and on the ECDISPILOT Platinum STM is described in the respective sections on these processes.

As a very general rule, keep your workplace clean and tidy, it helps preventing accidents! Ensure unobstructed access to all workstations, operator panels, controls, and relevant switchgear cabinets in order to enable instant response to alarms!

2.3 Authorisation and Qualification of Personnel

![DANGER]

Only authorized persons may operate the ECDISPILOT Platinum STM. Danger for persons, things and the environment in case of improper operation or maintenance and repair of the ECDISPILOT Platinum STM. Only authorized persons are permitted to carry out cleaning and maintenance work, or troubleshooting on the ECDISPILOT Platinum STM!

Persons authorized to operate the system are specially instructed and trained operating personnel of the user. Persons authorized to carry out cleaning, maintenance, and troubleshooting are the specially trained and skilled personnel of the user as well as Wärtsilä SAM Electronics GmbH personnel being qualified by training, knowledge and experience. Persons operating or servicing the ECDISPILOT Platinum STM must be familiar with the general safety regulations and specific safety systems and they must have passed all required training and must have read the relevant operating instructions and manuals before starting work.
2.4 Commissioning

⚠️ DANGER

DANGER! WORK IN PROGRESS! DO NOT SWITCH!

It is not permissible to connect the ship’s mains to the system before setting-to-work by a qualified and authorized person. The mains must be switched off (e.g. by means of a common isolating switch or a circuit breaker) in the ship’s supply or the mains cable must be disconnected until commissioning is carried out.

2.5 Chart Updates and Safety Inspections

Inspect and survey the safety systems at intervals prescribed by the responsible classification society or other relevant authorities.
Start-up and Shut-down of MFDs (Multi-Function-Displays)

**WARNING**
As long as the ship is at sea and in operation, the ECDISPILOT Platinum STM must be fully operational, i.e. the ECDISPILOT Platinum STM and its applications must not be shut down. UPS systems must not be deactivated.

The ECDISPILOT Platinum STM and the related consoles and the electronics equipment are permanently up and running. They are only completely shut down by qualified authorized service personnel in case of servicing and repair. The system components are then separated from the mains using a main switch on the bridge. When switching on the mains supply again, the equipment will start-up automatically without further user action.

This section describes how to use the shut-down function, if this is required, e.g. if the power supply has to be switched off during a dockyard period, or if an individual workstation (MFD) shall be switched off for specific reasons. Proceed as follows to switch off a workstation (MFD):

1. Click to the **Menu** button in the bottom left corner and then to **Display Off**.
2. In the window which is displayed, select **Power Off** and click to **OK**.
   (The other option **Restart** can be used to re-boot the workstation)
3. Separate the unit from the mains using the mains switch on the bridge.

This way, the ECDISPILOT Platinum STM program is terminated and the PC is shut down. The display will be switched off automatically.

If the option **Exit** instead of **Restart** or **Power Off** is selected, a service password is required, to enter the operating system level (only for service purposes).

**WARNING**
Please avoid to switch off a MFD without having completed the described shut-down procedure. The TFT display will probably function in a normal manner when just switching off the power and then switching it on again. However, and this applies to all types of PCs used: if, at the moment it is switched off, the PC accesses the hard disk, the hard disk might be in seldom cases permanently damaged resulting in system failure of the MFD and loss of data.

To switch on the MFD use the main power switch at the front of the workstation PC (if appl., refer to the drawings in the delivery documents). It will then automatically start up and run in normal operating state, Super Home is displayed. From here select the RADAR or ECDIS application. If the MFD is already up and running and displaying a screensaver, just move the trackball slightly to display the graphical user interface of the MFD.
### 3.1 Automatic Restart of MFDs

The workstations or MFDs (Multi Function Display) are fitted with an automatic restart function.

If in case of any identified abnormality, i.e. input of undefined data from a third party system, the Platinum application is blocked, the MFD is automatically started again.

The re-start, which can take between 20 and 180 seconds, will bring back the affected MFD in normal operation. If one MFD is restarted, the other MFDs are not affected and can be used to continue the nautical tasks.

After restart the MFD shows the home menu. Select one of the Platinum applications like RADAR, ECDIS, or AUTOMATION to continue the required bridge tasks from this MFD.
4 Protected Access to MFDs (Multi-Function-Displays)

The Platinum system is protected against unauthorized use by four passwords for user activities on levels one to four. All four passwords are set during system commissioning by the service engineer. They can not be changed during operation.

In addition the access to an MFD can be restricted to viewing functions only. This mode is recommended for slave workstations outside of the bridge, i.e. in a crew cabin, in the engine control room, or in public areas on the vessel. All menus with control functions are blocked. This mode is set during system commissioning by the service engineer. It can not be changed during operation.

4.1 Password Protection

Level 4 Password

The top level password is protecting the access to the file and operating system. The standard operating procedures for leaving the Platinum application are protected by the level four password. This applies i.e. if the option Exit instead of Restart or Power Off is selected from the main menu. In that case the level four password is requested. That means that the MFD cannot be used like an office PC, e.g. to install software and run applications other than the applications related to NACOS Platinum.

The same applies to safety relevant operating steps like adjusting the escalation time of alerts or adjusting the headmarker of the RADAR antenna. Again the level four password is required and this procedure is for service only.

Further on the level four password has to be used for settings which will change the configuration of the Platinum system, i.e. the appearance of menus or the use of templates.

Level 3 Password

The level three is used i.e. for the assignment of channels in the automation system.

Level 2 Password

Operating steps, which are related to approval or other restrictions which are not safety relevant, i.e. the selection of transmitter frequencies, are protected by a password on level 2. The same applies to the editing of maps on top of the chart or signing of a route.

Level 1 Password

Not in use, for future extensions.
4.2  Restricted Access to Navigational Functions

In this mode the access to a specific MFD is restricted concerning navigational functions and settings.

It is recommended for slave workstations outside of the bridge, i.e. in a crew cabin, in the engine control room, or in public areas on the vessel.

All navigational menus with control functions are blocked. The individual text of control entries is presented in gray instead of white.

An example is shown to the right. All entries in the various sub-menus for navigational settings are blocked and displayed with gray text.

The selection for a navigation sensor, i.e. for position or speed, is blocked as well. It is displayed but can not be changed.

Some entries in the tools list are simply missing, i.e. the whole route planning function.

The restricted access to navigational functions is set during system commissioning by the service engineer and can not be changed during operation.
4  Protected Access to MFDs (Multi-Function-Displays)
QUICK START GUIDE
1 Default and User Settings

1.1 Overview

The S-Mode is a pre-defined setting of the ECDIS and RADAR presentation in order to meet the most typical navigational scenarios. It can be used during change of the watch to give the next nautical officer a well-known presentation regardless of the last operating sequence carried out before. It might be helpful also for the pilot on entering the bridge.

The S-Mode button can be found in the bottom left menu line (see red arrow below).

Pressing the S-Mode button for **ECDIS** leads to default settings for more than 70 presentation parameters as defined by the ECDIS test standard IEC 61174 Ed.4. One of these parameters is the range which is set to 3 NM. Please compare to RADAR where the default setting is 6 NM. A detailed list can be found in the main chapter **SETTINGS** on page 110.

For **RADAR** the number of presentation parameters is smaller, but nevertheless comprehensive. As already mentioned the range is set to 6 NM. The parameters for RADAR are introduced on page 111.

The S-mode button has no effect on other settings like ARCS or ENC selection, target handling, disabled dangerous target alarm, sensor selection, vector length, disabled alarm horn, disabled AIS transmitter, or other. The user has to ensure that these settings are suitable for the actual traffic scenario.

The resulting screen after pressing the S-Mode button in ECDIS is as follows:

![ECDIS Screen with S-Mode Button](image_url)
1.2 Favorite Settings for RADAR and ECDIS

Clicking to the star next to the S-Mode button in the bottom menu line will open the list of user-specific control settings. Select one pre-defined set and most of the user-specific control settings will be set to the initially saved values.

Click to Favorite Settings to edit a new set or to save, delete, rename, or view the currently selected set.

All other settings remain as they have been set before, e.g. routes, user symbols, navigation lines, parallel index lines, gain, sea filter, and rain filter.

The user-specific control settings can be used e.g. for adapting the RADAR and the ECDIS quickly to different sailing modes like harbor, confined, or open sea. The sets for RADAR and ECDIS are independent of each other and have to be maintained and selected separately.

Fig. II / 2 User-specific Control Settings
2 Man Overboard Function (MOB)

In case of a man overboard event just click to the corresponding symbol in the bottom line of the menu bar:

Further steps are described on page 218.

Fig. II / 3 Man Overboard Function
2 Man Overboard Function (MOB)
3 Brief Operating Instructions

The following pages are presenting brief operator instructions.
General Info about Operating

Switching On/Off: The system starts automatically after power-on from main switch-board with the Super Home Menu. The system is permanently up and running. It is only shut down by service personnel in case of repair.

Select ECDIS: Click to the Chart Symbol or the selection lines underneath.

Operating the Trackball or Mouse: Use trackball or mouse to move cursor to desired field and then briefly press DO (left key on mouse). Most functions are operated with DO, clicking with MORE (right key on mouse) opens a context menu with several entries, where one has to be selected with DO.

ASCII Keyboard: Optional device for editing routes and symbols, it is more convenient compared to the soft keys which are available in the basic package.

Navigation Sidebar: The important functions are arranged in the top left area, they are described on page 2. This area is permanently available.

Settings and Tools Sidebar: Various menus for Settings and Tools can be individually arranged by the user in the bottom left area. Select the Settings button in the bottom menu line or the Tools button to open a menu of a specific function group.

Zoom and Pan Control

Click on slider in top left corner of chart to adjust zoom factor for ECDIS chart display. Use the pan buttons to off-centre the own ship. Click on the centre button to re-centre the screen.

Target Acquisition (if AIS and/or RADAR are connected)

Start Target Tracking: Move pointer on top of a target. Pointer becomes either a gun site or a hand, click to it. In case of a gun site symbol the object is marked automatically as ARPA or AIS target and tracking process starts. In case of a hand symbol a menu pops up. Select either ARPA or AIS and tracking is started as well.

Highlight a Target: Click to a tracked target in the chart, the corresponding entry is highlighted in the target list. Click to another target and that one is highlighted. Click on any entry in the list and the corresponding target in chart is marked with a square.

With CPA/TCPA Alarm: Open the menu Settings > Targets, and activate CPA/TCPA. Set limits for CPA and TCPA up to the nautical situation. A tracked target falling short of CPA/TCPA will cause an alarm. With Auto ACQ AIS the automatic activation of dangerous AIS targets can be selected.

Cancel Tracking: Click on a target symbol with MORE, a context menu opens, select Target, a sub-menu opens, choose Cancel to stop tracking for an ARPA, AIS or All targets.

With Guard Zone (with AIS option)

Open the menu Settings > Guard Zones, and activate zones 1 and/or 2.

Adjust Range: Click on the arc that defines the guard zone and use the small handle to drag the zone to the desired size.

Adjust Angle: Click on the angle line that defines the guard zone, use small handle to drag the zone to the desired angle (relative to ship heading, i.e. the guard zone turns with ship’s heading).

Acquisition: Any radar and AIS target entering the zones will be acquired/activated, an alarm will be raised. After acknowledgement the automatic target tracking begins.

Alarms

The latest unacknowledged alarm with highest priority shows up in a permanent alarm headline. The priority is shown on the left side, here it is an alarm (red), also warning (orange), and caution (yellow). Silence horn and acknowledge as required. Click on the Alerts/Warnings or Cautions button to open the full list or Cautions only.

Routes

are based on waypoint lists and stored in files. One or more routes can be selected and overlaid on the chart. The pre-planned track is displayed automatically on the chart. One route can be defined as the System Route.

Select a Route: Select Tools > Route Explorer, select a folder and from there a route. Open the route. Open waypoint list via context menu (MORE click on route entry). Click to Route in top line to select Save, Close, Activate, Schedule, Print Passage Plan, Notes, Reverse or Check Route. Arrange columns by shifting title, add or hide columns.

Check a Route: Check covers safety contour, shallow water objects, own safety lines, and danger highlight areas. The result is shown in the waypoint list by small icons in front of the waypoint numbers.

Activate a Route: Click on route entry. A checked route as system route. It will change its colour from orange to red and will be distributed for system-wide use, i.e. for track control, chart depth monitoring, and voyage planning via context menu. (click with MORE on route entry).

Chart and Route Monitoring

Monitor Chart Objects: Open Settings > ECDIS Alerts and set Distance and Width of Look-Ahead Sector as required. Activate Safety Contour Alarm, Special Area, and Obstruction ahead indication as required.

Monitor Own Ship Draught: Set draught in Settings>Draught menu as required for chart monitoring.

Monitor System Route: Open as above and activate Critical point on route alarm for waypoint approach and Cross-track alarm for route deviation. In a distance as set above before the next WOP (wheel-over point) an alarm is raised. The cross track error limit for alarm is taken from the actual route leg in the XTD LIM column of waypoint list.

Chart Maintenance

Navigate to Super Home menu and click on Maintenance > Nautical Charts. Select Chart Database and Mode. The following modes are available:

Display: provides an overview of installed cells, permits and certificates.

Maintenance: provides functions for verifying cells, and deleting cells and permits. Update: provides functions for updating cells, and storing as well as restoring user symbols and routes on USB stick.

Manual Update Editor: From overview of installed charts use Pan and Zoom control to navigate to the cell to be updated. Click on it with MORE and choose Manual ENC Update Editor > Select ENC Cell. Click on the cell. Open the Updates expander. Click on Session Setup in the Update expander and enter the Manual ENC Update Session Data. Then, click on Set. A click on Clear will erase all entered data, Cancel will close window without any further action.
**Display**

- **Orientation**: Select Head Stab (1), Head Up (2), North Up (3), or Course up (4).
  - 1: Heading points upwards, chart view moves with yawing of ship, bearing scale stabilised with gyro showing true bearing. 2: As above, but bearing scale fixed to bow.
  - 3: Geographic north points upwards, chart view is stabilized with gyro.
  - 4: Course at the instant of switch-on of this mode points upwards, chart view is thereafter stabilized with gyro, re-orientation by MORE click on Course-up indicator. After switch-over and re-orientation, the target trails are not influenced; they remain visible in the new mode.

- **Range**: Select from 0.25 NM to 96 NM or 250 m or 500 m for docking. In all ranges distances are stated in NM and speeds in kn.

- **REF**: Select Reference Position CCRP (1), Radar (2), Track (3).
  - 1: measurements stated relative to conning position (CCRP)
  - 2: relative to selected radar antenna (only if radar is part of Platinum system)
  - 3: measurements stated relative to System Position (at bow) which is used for look ahead sector and track control.

- **Stabilisation**: Select True Motion (1), Relative Motion (2) or Browse (3).
  - 1: Chart view is fixed; own ship symbol moves across the screen, chart area orientation is North-Up or Course-Up, own ship symbol is reset before chart area boundary is reached; reset takes place at 70% offset, can be set under Settings > True Motion.
  - 2: Own ship’s position is fixed; chart view moves relative to own ship, you may choose between Head-Up, North-Up and Course-Up.
  - 3: Planning Mode in which a desired chart is set regardless of own position by manual selection of the operator.

- **Rings**: Switch ON fixed range rings with reference position as the centre. The radii of the rings are depending on the selected range with ring distances of typically 1/8 or 1/5 of display range.

**Position**

- The default setting is AUTO. The best available sensor is chosen automatically. If a sensor fails, the backup sensor (if available) is chosen and a warning is given.

**Tools and Settings**

- Click to the Tools symbol in the sidebar or to the Settings symbol in the bottom menu line and select one of the available tools or settings.

**Parallel Index Lines (PI)**

- Select Tools > Pilotage. Select one to four lines by checking the boxes in the PI group. Selected lines are superimposed in the chart appearing as displayed last time. Distance of a line is altered by clicking on it, a small “handle” appears, click and drag line to desired distance. Bearing is altered by clicking on it, then click and hold line anywhere but not on the small handle and rotate it to the desired bearing. The balloon text shows the actual bearing and distance data of the line.

**EBL and VRM**

- Select Tools > EBL&VRM Each toolset offers a variable range marker (VRM) and electronic bearing line (EBL). EBL: Check EBL box in toolset, EBL is superimposed on chart, appears as displayed last time, after bearing by a click on it, handle appears, click & hold handle, pull line to desired bearing, and pull origin to desired position. VRM: Check VRM box in toolset, VRM is superimposed on chart, appears as displayed last time, alter by a click on it, 4 handles appear, click & hold to pull the ring.

**User Symbols**

- Select Tools > User Symbols. Open list of available symbols, areas, lines or text by a click to (+), select an item, click into chart area to place it where required. Your entry is stored permanently in the databases of all workstations. Remove entry by selecting it again, then click with MORE, select User Symbols and Delete. Check Visibility Group Setting, should be Global (or see manual).

**Past Track**

- Select Settings > Own Ship Symbol and check Past Track or 2nd Past Track. Set Track Length in h and Time Labels in min. Choose Reset to clear screen and start again.

**ENC Depth Display**

- Select Settings > Depth Contour and drag the sliders to adjust the range of the different coloured safety zones. The blue and light-blue zones are used for the non-navigable area. They coincide with the draft of the vessel plus safety margin. The grey-white and white zones are used for the navigable area. Set sliders properly with sufficient safety margin! Go to Settings > Draught to set your ship’s draft at bow and stern.

**ECDISPILOT**

Brief Operating Instructions – Page 2 – Permanent Area – Sidebar Area

- Heading & Speed

  - The default setting is AUTO. The best available sensor is chosen automatically. If a sensor fails, the backup sensor (if available) is chosen and a warning is given.

  - Click & select a sensor manually if required. For heading a manual input of the value is not available. Any gyro offset has to be input at the compass system (except of Platinum configured for Simulation Mode). For speed a manual value can be entered. Click on the STW line (speed through water), select Set Speed and enter the value. Finally select Manual to activate the setting. Speed over ground SOG can be set manually as well, select Set Speed and Set Drift, key in the values, then activate Manual. The course over ground COG is calculated. A Yellow Symbol in front of a sensor label indicates a manually entered value.

  - A Red Symbol shows sensor or system failure.

- Vectors and Trails

  - **REF**: Select REL or T(reue) for stabilisation of vectors etc. If there is any doubt about own ship’s speed data, use REL vectors and REL stabilisation for collision avoidance!

- **Charts**

  - Select ENC, ARCS (option), C-Map (option) or other. Adapt chart display settings under Settings > Chart.

  - Select one of the chart categories Base, Primary, Standard, All, or Customized to adapt the details of the chart, i.e. text, symbols, to the actual nautical situation.

  - The Base mode comprises coastlines (high water), own ship safety contour, underwater dangers, and other dangers. Choose advanced settings like chart symbols or light descriptions as required.

- **Targets**

  - **Fusion**: Select Off, ARPA or AIS to merge targets with priority on ARPA or AIS (if fusion limits are met).

  - **Sleeping**: Select All AIS, Class A, Class B, Navigate, or none of sleeping targets to be displayed. In any case all received AIS target info is processed and causes an alarm when entering guard zones. Automatic acquisition of dangerous targets can be switched on under Settings > Targets (see page 1).

  - **Triad**: Switch ON to open the Triad Manoeuvre Window. Set Orientation to REL and REF for vectors to REL. The window shows current course & speed, radius used last time, start delay, and time instant of simulation. Set planned course, speed, and radius. Set start delay for course and/or speed manoeuvre. Walk along time axis by moving the time slider and observe critical manoeuvre situations.

- **Headings & Speeds**

  - The default setting is AUTO. The best available sensor is chosen automatically. If a sensor fails, the backup sensor (if available) is chosen and a warning is given.

  - For heading a manual input of the value is not available. Any gyro offset has to be input at the compass system (except of Platinum configured for Simulation Mode). For speed a manual value can be entered. Click on the STW line (speed through water), select Set Speed and enter the value. Finally select Manual to activate the setting. Speed over ground SOG can be set manually as well, select Set Speed and Set Drift, key in the values, then activate Manual. The course over ground COG is calculated. A Yellow Symbol in front of a sensor label indicates a manually entered value.

  - A Red Symbol shows sensor or system failure.
SYSTEM DESCRIPTION
1 Overview

1.1 Platinum System Layout

The NACOS Platinum system is the state-of-the-art integrated Navigation-Automation-Control-System from Wärtsilä SAM Electronics GmbH.

It is based on a number of MFDs (Multi-Function-Displays also called MFDs), which are connected to each other by a ring network. Each MFD is providing a set of applications for the main bridge tasks. If one MFD fails, the user can continue the main tasks from any other MFD in the network.

Below figure provides an overview of a complete NACOS Platinum installation.

The system layout is divided into four layers as follows:

- On the top layer we have the navigation sensors (radar, GPS, log, wind, etc.).
- The next layer is given by the multi-function displays (MFD) installed in the bridge consoles. They provide the workstations for traffic surveillance, manoeuvring, etc.
- The next layer describes the field processing devices of the automation system distributed all over the vessel and the related operating panels and monitors.
- The last layer is given by the automation sensors.
1.2 Platinum System Interfaces

For Navigation the NACOS Platinum system is providing several interfaces as follows:

- Two sensor interfaces, each with five serial in/out channels, are feeding serial data messages from the navigation sensors (gyro, log, GPS, wind,...) into the ring network. The most important sensors like the gyro are connected to both interfaces in parallel. If one interface fails, the same data from the other one are automatically used. Some sensors are doubled and connected to both interfaces. If one sensor fails, data from the second one from the other interface are automatically used. Manual switch over between sensors and interfaces is possible as well.

- Two or more radar transceivers are feeding raw video and target data into the network. If one transceiver fails, an alarm is given and the user can switch over manually to another transceiver.

- One AIS unit is feeding received target data into the network. Own ship data like system position, speed, name of vessel, etc. are transmitted via AIS to all ships in the area. If the AIS unit fails, the user can activate an optional back-up AIS unit which is typically part of the Safe-Return-to-Port bridge (SRtP).

- One NAVTEX receiver is receiving safety messages. Via sensor interface they are fed into the network available on all MFDs. A back-up is typically not applied but possible.

For automation the NACOS Platinum system is providing various interfaces for engine monitoring and control, for rudder and propeller indication and control, for generator monitoring, for pumps and valves and a wide range of all other automation components. Data are collected via field processing devices and distributed throughout the network. They can be displayed and controlled by any MFD (workstation) in the system.

In a combined navigation and automation system the navigation network ring is coupled via managed switches with the automation network ring. Traffic from navigation side not required in the automation network is filtered by network protocol IGMP. So the load on the networks is under control at any time.
## 2 MFD (Multi-Function Display)

### 2.1 General

The bridge tasks like ROUTE PLANNING, ROUTE MONITORING, COLLISION AVOIDANCE, AUTOMATION and other are provided by the corresponding NACOS Platinum applications. These applications are operated using a standardized MFD.

This MFD is based on a Personal Computer which has been prepared for maritime applications. A shock and vibration damping installation platform is protecting the harddrive and other electronics and additional EMC measures have been implemented. This PC with the complete SW package consisting of the operating system and the Platinum applications is called **Display Electronics**.

The user interface is the same on each MFD, i.e. the MFDs on-board are standardized. All Platinum applications can be made available on any MFD.

MFDs are comprising the **Display Electronics** with installation platform, the **Widescreen Monitor**, and the **Operating Device**.

Operating can take place either with a **Trackball** optionally combined with **Radar and Track Control** keyboard or, for planning and automation control stations, simply with standard mouse and ASCII keyboard.

When the MFD is started, a basic screen is displayed, which is referred to as **Super Home** from where you have access to all functions and information which are available on the specific MFD.

If the MFD is already running, select **Super Home** from the main menu or click ![Super Home](image.png) in the bottom right menu bar to switch over to Super Home.
2.2 Display Electronics

The Display Electronics is the heart of the MFD (Multi-Function Display) or MFD and based on a Personal Computer prepared for maritime applications. A shock and vibration damping installation platform is protecting harddrive etc. and additional EMC measures have been implemented.

The Display Electronics comprises the PC hardware, the operating system (adapted to auto start and protected access) and the Platinum application software. A dongle is required to run the Platinum application.

The application software is operating under Windows 7. The user interface has been designed with WPF (Windows Presentation Foundation). Direct access to Windows has been blocked. The MFD cannot be used like an office PC, e.g. to install software and run applications other than the applications related to NACOS Platinum. Access to the operating system for service is possible but protected by password.
2.3  TFT Monitors

2.3.1  Navigation Monitors

The NACOS Platinum user interface is displayed on a 22" or 26" TFT monitor which is an integrated part of the MFD. The monitor is switched on and off automatically together with the MFD. To adjust the monitor’s settings, use the software functions and controls of the Platinum application.

Nominal Viewing Distance and Recommended Installation

The monitors are designed according to the requirements in IEC 62288. According to chapter 4.6.1.2 of this IEC test standard the largest dimension of a symbol for operational information shall have at least 5 mm/m (17 min of arc) at the nominal viewing distance, and include at least 16 pixels.

The applications provide text heights as follows:
- Large font with 5.5 mm for operational information
- Medium size font with 4.5 mm for
- Normal size font with 3.5 mm
- Small font with 2.5 mm

The small font is not used for navigation related tasks.

- The large size font is used for navigation related information (i.e. heading value, position, speed) and determines the nominal viewing distance with 1 meter for both monitors.

This is sufficient for sitting positions in front of one of the MFDs (typically 0.8 meter) as well as for a standing position in front of the center steering console (typically 1.0 meter). In this case the console has a depth of max. 0.8 meter.

Color Distortions on Monitors with Flat Screens (TFT Monitors)

If the display content on a TFT monitor has remained unchanged for a long period of time and is then replaced by a different display, an effect can occur which is known from cathode ray tubes: the previous display is still faintly visible in the form of discoloration. In the case of TFT monitors, in contrast to monitors with cathode ray tubes, this effect is reversible and therefore cannot be regarded as a defect. If the monitor is operated for a long time (several hours or days) with a different display, the discoloration disappears.

2.3.2  Automation Monitors

For the automation applications the above monitors for navigation may be used as well. In addition a series of standard desktop monitors starting from 19” is available.
2.4 Operating Units

An MFD at the bridge is operated in minimum by the Platinum Trackball. All analogue radar functions like gain, filter etc. can be operated by SW menus.

If a text input is required, a virtual SW ASCII menu will automatically show up if the cursor is set into any input line (if the system is configured for external ASCII keyboard, this SW menu is suppressed).

2.4.1 The RADAR and TRACKPILOT Keyboard

If the RADARPILOT application is included in your system, several RADAR functions can be operated as well from the RADAR Keyboard installed optionally in the left part of the operating console. For details please refer to the main section about RADAR FUNCTIONS.

If the TRACKPILOT application is included in addition in your system, it is operated from the TRACKPILOT Keyboard installed in the right part of the operating panel. For details please refer to the main section about TRACKPILOT.

2.4.2 The ASCII Keyboards

If an MFD is used as a planning station it can be optionally equipped with an integrated ASCII keyboard. It is installed in the left part of the console alternatively to the RADAR keyboard. It works like a common computer keyboard, except for the fact that the back-light can be dimmed.

For special applications i.e. in the wing a sealed (IP67) version is available. It comes along with an integrated trackball.

For planning stations in the back of the bridge a standard mouse and keyboard solution is applicable as well. They are attached to each delivery of a MFD in any case.
2.4.3 Trackball and Mouse

All user interface controls are operated by the mouse or trackball which is connected to the respective MFD. Even if you are already familiar with using input devices like mouse or trackball, you will find one or the other important note in this section.

To start an operating step move the pointer on the screen by moving the trackball or mouse. Move the pointer to the desired position on the screen, e.g. to a text item, a numerical value, a symbol, or any desired position e.g. on the PPI. The shape of the pointer changes when you point at different elements on screen. The pointer’s shape depends on the application and the element you point at.

When you point at a click-sensitive (clickable) element on screen then you can press and release (click) one of the trackball keys to display information or activate a function. The possible types of clicks are explained separately. The specific effect of clicking depends on the key used, the element you clicked, and the operating situation. This is described in the specific parts of these operating instructions. Desktop trackball or mouse have two different buttons, DO and MORE key. The functions of the DO and MORE keys are described in the following.
2.4.4 DO and MORE Key of Mouse or Trackball

DO Key
The most frequently used of the keys is the DO key, i.e. the middle key on the built-in trackball and the left button of the desktop trackball and mouse. Most elements on screen respond to this key by opening a menu from which you can select frequently used functions.

In these operating instructions, "clicking" always means pressing the DO key. When you have to press the MORE key or the right mouse/trackball button, this will be explicitly explained in the instructions.

MORE Keys
On the built-in trackballs the two keys are situated above the DO key, The right one is called MORE key. The left key has no function. On the desktop trackball and mouse, this is the right button. The functions of the MORE key depend on the element you point at on screen. In some cases pressing the MORE key opens menus, in other cases additional information are displayed. However, not all elements which can be operated by means of the DO key will also respond to the MORE key.

Scroll Wheel
If a scroll wheel is available, it can be used to scroll down lists or to zoom into or out of charts. Only mouse and desktop trackball may be equipped with a scroll wheel.

Types of Clicks
In ECDISPILOT Platinum STM you point at elements on screen and click or press the MORE key to display information or cause action. The following types of clicks are possible:

<table>
<thead>
<tr>
<th>Click</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single click of left key or DO key</td>
<td>Perform action. This means pressing and immediately releasing again the DO key of the built-in trackball, or the left mouse or trackball key respectively. When you click on a button, this will start a process or open a dialogue. when you click on dropdown menus, this will open the menu. In a menu, to select an item, click on the item with a single click. A single click will also select and thus highlight an entry in a list.</td>
</tr>
<tr>
<td>Double-click of left key or DO key</td>
<td>In tables, a double-click will open a cell for editing. A cursor is displayed, and you can change the respective value like a text field. Editing resembles editing cells in Microsoft Excel. An example for such a table is a waypoint list that contains the waypoint number, name, position and some other properties, which you can change in that table by double-clicking on the cells. When you click on a folder icon in folder structures, which you will find, e.g., in the Automation application, a double-click opens that folder and lists the subordinated contents.</td>
</tr>
<tr>
<td>Press the MORE key or right-click using mouse or desktop trackball</td>
<td>Get information, in many cases via a context menu. This is used for providing you with object-specific menu items, such as menus for properties and maintenance. These functions also provide access to adjustments, particularly in the Automation application. Examples are: acknowledging alarms, displaying properties, etc.</td>
</tr>
</tbody>
</table>

Table III / 1 Types of clicks in ECDISPILOT Platinum STM
3 Style Guide

The NACOS Platinum design is the result of the efforts of a multidisciplinary usability team consisting of specialists from Wärtsilä SAM Electronics GmbH, Chalmers University (Gothenburg, Sweden) and TNO Human Factors (Soesterberg, The Netherlands).

In addition to high quality and reliability of the cost-effective solution, the main focus of the NACOS Platinum system is on usability, modularity and scalability, ease of installation, commissioning and servicing, as well as integration with third-party systems.

3.1 Screen Layout

The general screen layout is divided into two main areas: the sidebar and the application area.

The sidebar on the left provides access to details and functions of the applications. This sidebar is described in the subsequent sections beginning on page 52.

The application area located on the right shows the main window of the active application. It can show the RADAR video, the ECDIS chart or automation mimics etc. The general behavior of the application area is described on page 69.

![General screen Layout of the Platinum System](image)

The general screen layout, especially the size of the different areas, may vary between the different available applications.
### 3.1.1 Title Bar

The title bar provides information and functions which are permanently available in the system.

![Title bar of AUTOMATION application]

The figure above shows an example of the title bar with the AUTOMATION application being the active application. The name of the application, i.e. AUTOMATION, RADAR, ECDIS is indicated in the title bar. Further functions of the title bar are:

**Dimming**

You can use the moon and sun buttons in the top left corner of the title bar to toggle between the available colour schemes for different ambient light conditions. Alternatively you can use the keys on the console or the appropriate entry in the menu.

When the screen is hardly readable due to changing light conditions, you can increase brilliance by pressing stepwise all three mouse buttons at the same time.

However, you can also individually adjust the dimming of the screen. Press the **MORE** key (right-click) while pointing to the moon or sun button to open the **Dimming** menu. To adjust the settings, click on the right or left of the slider or drag the slider. The new value is shown on the right and the screen settings are adjusted accordingly.

☞ There are no knobs or other controls on the monitor(s) to adjust the brightness.

**Date and Time**

are displayed permanently in the title bar:

![Date and Time display]

**Alive Indication**

There are different possibilities available to verify the alive status of the MFD which are listed and explained below:

- **The Time Display**

  The system provides feedback that it is still active and operating, i.e. alive. This is specifically indicated on each MFD in the title bar of the HMI by the seconds changing in the time display.

  If picture freeze occurs, all data on the screen as well as the display of the seconds will be frozen, so that the operator is able to notice this fault.

- **The Cursor and HMI**

  Picture freeze caused by the computer or the graphics adapter of the MFD can also be recognized by the fact that moving the trackball or the mouse does no longer change the cursor position on the screen.

- **The Monitor**

  A green LED at the lower right corner of the MFD monitor indicates the running connection to the MFD computer. If the connection is lost or disturbed, the LED will stay green but start flashing once per second and the screen will normally become dark. If the LED changes to orange the monitor is in standby mode waiting for sync signal, red indicates the switched off status. The LED will flash red in case of excessive temperatures.
3.1.2 Sidebar

The width of the sidebar in each application is fixed, but it varies from application to application. The sidebar consists of a permanent area, a non-permanent area, a title bar and a menu bar, which are explained in the subsequent chapters.

Fig. III / 5 Platinum Sidebar, Examples for Navigation and Automation
3.1.3 Sidebar - Permanent Area

The upper half of the sidebar is the permanent area. It shows status information and controls that are mandatory according to regulations and thus must be permanently visible. This area can never be overlapped or hidden by permanent pop-ups or dialogue windows.

The height of the permanent area is fixed except of an additional group for the optional TRACKPILOT control.

The width is fixed as well, except for an additional group for transceiver control if the RADAR application has been selected. The figure below shows the permanent area of the RADAR application and the permanent area of the automation application:

Fig. III / 6 Sidebar – Permanent areas for RADAR and Automation
### 3.1.4 Sidebar - Non-Permanent Area

The lower half of the sidebar is the non-permanent area. It shows on user request selected menus for **Settings** and **Tools**. Several expanders can be kept open at the same time.

- Click to the **Settings** symbol in the bottom menu line to open the settings bar and select one function (navigation).
- Click to the **Tools** symbol in the sidebar to open the tools bar and select one of the tools (navigation as well as automation).

The menus are grouped and stacked by means of so-called tabs. Click on a tab to view the related menu.

The figure below shows an example of the non-permanent area of the RADAR application:

![Fig. III / 7 Sidebar – example of the non-permanent area](image)

The next figure shows an example of the non-permanent area of the automation application:
3.1.5 Menu Bar and Full Screen Mode

Main Menu and Menu Bar
The main menu provides functions for navigation between applications and screens in the Platinum system.
To open the menu, click on the Menu button in the bottom left corner of the menu bar.

Fig. III / 8 Main Menu

Full Screen Mode
The Full Screen Mode is a mechanism that switches the display to a full screen view showing the application area only.

-> Full screen mode is available only for ECDIS in browse mode. It is not available for RADAR, for ECDIS in monitoring mode, for TRACKPILOT in master mode, and for AUTOMATION.

To switch to the full screen mode, click on the button (Full Screen) in the menu bar (visible depending on the application):

Once in Full Screen mode, the full screen button becomes the open sidebar button .
No other controls will be visible. To open the sidebar again, simply click on the button in the bottom left corner. The sidebar will then be restored.
3.1.6 Split Window (Navigation)

The **Split Window Mode** is a mechanism that divides the application area into two or more fixed windows showing further instances of the same application or additional tables, lists, etc..

-> Split window mode is not available for RADAR, for ECDIS in monitoring mode, and operating the TRACKPILOT in master mode.

To switch over to the split window mode, click to one of the symbols in the top right corner of the screen. Symbols marked in gray can not be activated, this split mode is not available for the current application.

A typical example for a split window mode is the ECDIS screen layout as shown below. One ECDIS has been set to ENC chart mode, the other one to raster chart mode. In addition a waypoint list is shown. The corresponding split window mode is shown in the top right corner.

One of the two split windows is always the active one. It is marked with a blue top line and the cursor is active in this window. Relevant settings shown in the sidebar to the left, i.e. orientation, range, are displayed for the active window. Just click into the other split window to see the other values.
3.1.7 Split Window (Automation)

The **Split Window Mode** is a mechanism that divides the application area into two or more fixed windows showing further instances of the same application or additional tables, lists, etc..

To switch over to the split window mode, click to one of the symbols in the top right corner of the screen. Symbols marked in grey can not be activated, this split mode is not available for the current application.

A typical example for a split window mode is the screen layout as shown below. The AUTOMATION application has been set to full size at the right window and to one detail of the same application in the other window. In addition an alarm list is shown. The corresponding split window mode is shown in the top right corner.

One of the two split windows is always the active one. It is marked with a blue top line and the cursor is active in this window. Just click into the other split window to see the other values.
3.2 Lists & Tables

Wherever useful in ECDISPILOT Platinum STM, system data which have a record structure are displayed in lists, e.g. alarms, track details, etc.

![Target List Example](image_url)

Fig. III / 10 Example 1: Target List

The target list shows the currently tracked RADAR, SART, and AIS targets. Using the scrollbar on the right you can scroll up and down the list.

Lists have a header, a details pane, and a footer. You can change the sorting order by clicking on a column heading. The sorting order is indicated by a small arrow. For example, the arrow up in the Name column indicates that the list is sorted by the Name column in alphanumerically ascending order. When you click on the Name column again, this will revert the sorting order to descending.

In some lists the sorting order is predefined. For example, the Alarm list must be sorted chronologically. Hence it is predefined that the Alarm list is sorted by the time column in descending order starting with the oldest alarm. The width of a column can be adjusted by dragging the separator line between two column headings. In some cases adjusting of width may be disabled. Also showing, hiding and reordering of columns can be enabled or restricted in the individual case.

The footer of a list in some cases contains the number of list entries.
3.3 Dialogues

Dialogues are opened when you click on buttons or they are opened by the system as a response to actions or events, e.g. in case of error. Message dialogues and popup edit windows need to be differentiated, and they are explained in the following.

**Popup Edit Windows**

When you wish to adjust a value, in many cases you will click on an Adjust button to open a separate popup edit window. Such a window contains:

- Edit fields with a label in front. The edit field will allow input of text. Also, the small up-down arrows are provided that increments/decrements the value. In rare cases a slider might also be available.
- An indication of the range the value can have (for example 0 - 360°).
- OK button and a Cancel button. The OK preferably uses a more specific verb that is applicable to the specific action, like 'Adjust' or 'Send'.

**Toolips**

Toolips are an interface element that is used to provide you with instant information on elements you see on screen. Toolips are small text pop-ups which are displayed when you simply point at elements on screen. After a short delay, a small popup is displayed with a short description informing you about the function or meaning of the element you pointed at. After a short while, the tooltip is faded out so that you can see all screen information again.

The figure below shows an example of a tooltip, which is displayed when you point at the dropdown menu to select the radar source which is located in the permanent area of the radar application.

**Tooltip of a dropdown menu**

When you open the menu and move the trackball pointer down the list of menu items, tooltips are displayed for the individual menu items:

Please note that you will not find tooltips on all elements on screen but on important display elements and controls such as buttons and dropdown menus. Also, many screen objects like the tools, chart symbols and targets in the PPI of the radar can have tooltips to supply relevant information such as distance, bearing and ETA, or the own ship's position.
3.4 Overview of Controls

Most of the controls used in the ECDISPILOT Platinum STM applications are very similar to the known controls used by Microsoft Windows. The picture below shows some examples of the controls:

![Examples of ECDISPILOT Platinum STM controls](image)

The individual controls shown in the figure are described in the following sub-sections.
3.5 Details of Controls

**Fields**

In ECDISPILOT Platinum STM, values in form of text, numbers, slider settings, check boxes, etc. are generally referred to as fields. A field consists of the value and a label, the field name. Some of the fields are read-only, they only serve for information purposes. In other fields, the values can be adjusted.

**Field Groups**

Field groups are represented on the ECDISPILOT Platinum STM user interface by a thin frame line above and below a group of fields. The frame indicates that the fields inside belong together, i.e. that they belong to the same subject or to a group of related items. Field groups have a name which is a kind of heading for the fields inside the group.

**Sliders**

By using sliders you can set a value within a possible range. The current value is indicated as you drag the slider to either side (here 50). The minimum value here i.e. is 0%, the maximum value is 100%. Simply clicking on the slider’s handle displays the current value of the slider.

When you click on the slider next to the current value, this will increase or decrease the value by 10 or another predefined value.

**Push Buttons**

Push buttons resemble buttons in the real world. When you press them, something will happen. When you click on a push button on screen an action will be carried out or details will be displayed. The purpose of a button is indicated by its label, in some cases tooltips are provided.

The **Hide Video / Overlay** buttons are spring-loaded. They are only active as long as the appropriate button of the pointing device is pressed.

**Dropdown Menus**

Dropdown menus are indicated by a small downward arrow next to a field. To open the menu, click on the arrow. To select a different value for the field, click the desired item at the dropdown menu. The field is then updated accordingly. To close the menu without making any changes, just click on any free area on screen or press the [ESC] button on the keyboard.

**Check Boxes**

Check boxes indicate that there is an option that can be set or not. In the example in the figure to the right, the parallel index lines (PI) 1 to 4 are ticked off, i.e. not selected and thus de-activated. If they are ticked on this is indicated by the small check mark. To select a check box, just click on it so that it is ticked on. To clear the check box again, click on it so that the check mark disappears.
3.6 Further Details of Controls

Scroll Bars

Scroll bars are displayed when the contents does not fit into a menu, box, or list, etc. You can then use scroll bars to move the display up and down or sideways to view hidden parts. To scroll the display in small steps you can click on the scroll arrows at the end of the scrollbar. To page through the display in larger steps click on the scrollbar or drag the scroll box.

Spin boxes

Spin boxes are used to display and adjust numeric values. To adjust the value you can enter the new value directly in the text box. Alternatively, you can use the small arrow buttons. When you click on the small arrows and hold the trackball button, then the velocity value in the example will increase or decrease continuously until you release the button again. A single click on one of the buttons will increase or decrease the value by one increment step.

Keys for Numeric Values

Whenever it is possible or needed to enter a numeric value, the appropriate keys will be displayed in the control window. Select the value to be changed and enter the desired value by clicking the appropriate keys.

Zoom and Pan Control

The zoom and pan control consists of a slider to adjust the zoom factor for, e.g., the ECDIS chart, and the compass control with pan buttons, which you can use to move the image section currently displayed.

To zoom in in increments, click on , you will then see more details on the respective display. However, the overall area displayed is smaller. To zoom out again, click on the . You will then see less details but you will have a better general overview of, e.g. an electronic chart displayed.

To pan the display, use the panning arrows of the compass control. For example, if you click on then the display moves to the right in increments to view a different image section of a chart or whatever is displayed. The effect is like travelling with the eye over a large map.

To center the display, e.g. after panning, just click on the icon once.
3.7 Alert Icons

Alarms, Warnings, and Cautions are generically summed up under the term Alerts and they are characterized by their priorities. From SW version 1.1 onwards these priorities have been redefined in order to meet the new Bridge Alert Management (BAM) standard MSC.302(87) and the new INS standard IEC 61924-2:

1. An **Emergency Alarm** indicates immediate danger to human life or to the ship and requires immediate action. The alarm source is not the ECDISPILOT Platinum STM system but i.e. a separate fire alarm system. The emergency alarm is marked with a red triangle.

2. An **Alarm** requires immediate attention and action of the bridge team, to avoid a hazardous situation, i.e. heading invalid. The emergency alarm is marked with a red triangle.

3. A **Warning** requires immediate attention to make the bridge team aware of conditions which may become hazardous. The warning is marked with an orange circle.

4. A **Caution** indicates a condition which still requires attention. It is marked with a yellow square.

Table III / 2 Color and Symbol Code for the Alert Indications

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Priority and Classification</th>
<th>Criteria for the Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="red_triangle" alt="" /></td>
<td>1 Emergency Alarm</td>
<td>Alarms which indicate that immediate danger to human life or to the ship and its automation exists and that immediate action must be taken. Emergency alarms are specified in the Code on Alerts and Indicators, 2009(resolution A.1021(26)).</td>
</tr>
<tr>
<td><img src="triangle" alt="" /></td>
<td>2 Alarm</td>
<td>Conditions requiring immediate attention and action by the bridge team to avoid any kind of hazardous situation and to maintain the safe operation of the ship; and escalation required as alarm from not acknowledged warning.</td>
</tr>
<tr>
<td><img src="circle" alt="" /></td>
<td>3 Warning</td>
<td>Conditions or situations which require immediate attention for precautionary reasons, to make the bridge team aware of conditions which are not immediately hazardous, but may become so.</td>
</tr>
<tr>
<td><img src="exclamation_mark" alt="" /></td>
<td>4 Caution</td>
<td>Awareness of a condition which still requires attention out of the ordinary consideration of the situation or of given information.</td>
</tr>
<tr>
<td><img src="green_square" alt="" /></td>
<td>5 Event</td>
<td>Status change which does not require attention, it is used for control purposes. It is marked with a green square.</td>
</tr>
<tr>
<td><img src="red_square" alt="" /></td>
<td>Sensor Alarm</td>
<td>A sensor signal is missing</td>
</tr>
<tr>
<td><img src="yellow_square" alt="" /></td>
<td>Manual Set</td>
<td>A sensor signal is missing and the value has been entered manually by the operator</td>
</tr>
</tbody>
</table>

For more details please refer to the main chapter about ALARMS, WARNINGS, AND CAUTIONS.
### 3.8 Mouse Pointers and Clicks

In the Platinum system you will experience that the shape of the mouse or trackball pointer will change in different situations as you move it over the screen. The basic shape is always the arrow used to open menus and options on screen. In text fields, the pointer becomes a text edit caret; on dividers, the pointer turns into a double arrow indicating that you can resize something, and so on. The full set of shapes is used for navigation. For automation a subset with arrow, hand, and text caret is used.

<table>
<thead>
<tr>
<th>Pointer</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>✨ Arrow</td>
<td>Standard pointer when you are not pointing at any specific object on screen in the application area but when you point at menus, fields and other controls in the sidebar, in dialogues, or in frames showing lists etc.</td>
</tr>
<tr>
<td>✱ Cross hair</td>
<td>Standard pointer when you are not pointing at any specific object on screen in the application area.</td>
</tr>
<tr>
<td>✨ Gun site</td>
<td><strong>One target:</strong> When the mouse pointer is over one target, the cross hair pointer indicates that the target can be acquired. A single left click acquires the target. <strong>Multiple targets:</strong> When the mouse pointer is over multiple targets, the cross hair pointer indicates that the targets can be acquired. A single left click opens a menu that displays the relevant acquisition options (for instance Acquire RADAR, Acquire AIS, Acquire Both, Escape). When the mouse pointer is over an acquired target a box around the target indicates that it is already acquired and properties / data of the target can be accessed. A single right click displays the properties in a tooltip or popup. This popup should automatically hide after a few seconds.</td>
</tr>
<tr>
<td>✰ Pointing hand</td>
<td>When the mouse pointer is over a clickable object, the pointing hand indicates that the object is clickable. Both left and right clicks can have an effect.</td>
</tr>
<tr>
<td>←, ↑, →</td>
<td>When the mouse pointer is over a moveable object, for example a &quot;handle&quot; of a variable range marker, the arrows indicate the direction in which the handle of the object can be moved.</td>
</tr>
</tbody>
</table>

Table III / 3 Mouse pointers

Table III / 4 RADAR and ECDIS pointers
3.9 Consistent Manual Inputs & Erroneous Input Handling

Consistent Manual Inputs

Consistent manual input menus are used throughout the Platinum system. Numerical values are entered either by a keypad, spin boxes, or roll boxes depending on the editing task. An example with keypad, and spin box is shown to the right. This keypad and this spin box are used for most of the manual inputs.

Erroneous Input Handling

Manual inputs are checked automatically and they are either limited or even blocked accompanied by a warning.

In the example to the right an input value of 100 exceeds the internal limit for this data field. A yellow warning sign is given and the OK button is blocked.

In the next example the spin box has reached its maximum value which has been internally specified for this input. The data field is blocked to this maximum value. A rapid change is achieved by just scrolling into the other direction.

In the third example to the right a roll box has been limited to a pre-defined set of values from 00:30 min up to 5:00 min. There is no other choice for the operator available.
3.10 Handling of Automatic Control Functions (Navigation only)

Compared to an automation system, where most of the functions are automated in order to achieve a 24 h watch-free operation, an integrated navigation system is mainly supporting the manual operating of the vessel.

Nevertheless a few functions are automated as well, these are:
1. Automatic Track Control along a pre-planned route (optional, see TRACKPILOT section)
2. Automatic Speed Control along a pre-planned route (optional, see SPEEDPILOT section)
3. The Automatic Sensor Selection (default setting)

In general automatic control functions are, depending on their safety level, either optionally activated by the user (track control, speed control) or set per default (sensor selection). They are indicated during the active phase and monitored.

If an automatic control function fails or remains with invalid input data, the function is deactivated or set to a safe intermediate level and a warning is given.

Automatic control functions can be override at any time by the user.

**Track Control**

An example is given by the TRACKPILOT. A separate rudder selector switch is used to change from manual to automatic operation. In case of a failure the system switches first back to heading mode and finally switches off accompanied by an alarm. The user can switch back at any time to the manual mode.
3.11 Indication of Operating Mode

As far as the INS is concerned the operating mode is defined here as a pre-defined setting of user controls like gain, filter, range, orientation, selected sensors, chart, dimming, etc.

Several sets of controls can be edited, and administrated in the Platinum system. They are called favorite settings. One favorite setting can be activated at the time.

Favorite settings can be named according to the passage, i.e. open sea, coastal, piloting, anchoring, harbor. Or they can be assigned to user names like 1st officer on watch.

The operating mode, which has been set as the last one is indicated if the cursor is moved over the favorite settings icon in the bottom menu line.

This last operating mode could have been changed by an operator in the meantime. He could have changed one of the individual parameters. If in doubt just select this mode again to ensure proper settings.

The set of parameters comprises local ones concerning the own workstation as well as global ones concerning the whole Platinum system. For more details please refer to page 34.

There are other operator modes available like service, simulation, and training. They are indicated by individual solutions depending on the application.
4 Applications

The following main applications are available for the NACOS Platinum system:

- **ECDISPILOT** (includes route planning and monitoring)
- **RADARPILOT** (includes route planning)
- **CONNINGPILOT**
- **TRACKPILOT**
- **AUTOMATION**

An MFD, where the ECDISPILOT application is installed, is called ECDISPILOT. This product name is written at the top left frame corner of the monitor (not on the screen!).

An MFD, where the RADARPILOT application is installed, is called RADARPILOT. This product name is written at the top left frame corner of the monitor.

An MFD, where both applications, ECDISPILOT and RADARPILOT, are installed, is called MULTIPilot. This product name is written at the top left frame corner of the monitor.

RADAR- and MULTIPilot can be combined with the TRACKPILOT application. In that case the keyboard of the corresponding MFD is fitted with the joystick and labeled with TRACKPILOT. Further on the hardware is extended by an extra TRACKPILOT electronics unit as well as a special TRACKPILOT interface. The TRACKPILOT application does not have its own user interface but is integrated in the sidebar of the RADARPILOT and ECDISPILOT applications.

The TRACKPILOT can be extended with the optional SPEEDPILOT, a speed-control subsystem running on the same electronics unit and using the same interface unit as the TRACKPILOT.

If the TRACKPILOT application is included, the CONNINGPILOT application may be added as well. It can be used if an TRACKPILOT interface is included in a system configuration.

The CONNINGPILOT application may be added to each of these three products as an option. In this case the user can switch between the ECDIS-/RADARPILOT application or the CONNINGPILOT application during operation. This option is not written on the frame of the monitor.

The CONNINGPILOT application can be displayed as well on a second monitor connected to the MFD. Further on the CONNINGPILOT application can be installed on a separate MFD and displayed separately. In these cases the product name CONNINGPILOT is written at the top left frame corner of the separate monitor.

Each product can be combined with the optional AUTOMATION application. In that case the Platinum home page shows the AUTOMATION application in addition and the MFD is connected via network to the automation subsystems with data processing unit, various sensor interfaces and operating panels for bridge, engine room and cabin.
4.1 RADAR Application

The RADAR application shows the raw video as well as the radar targets processed by the antenna unit which has been selected by the operator. The new IP RADAR technology allows the operator to switch via network to any assigned antenna unit on-board (one or more X-band as well as one or more S-band units).

Advanced filter techniques are used for clutter suppression and enhanced small target detection. Various navigation tools are available for collision detection and calculation based on the pre-processed targets. AIS targets from a separate AIS transponder unit are processed exactly in the same way as radar targets. RADAR and AIS targets can be merged together.

The user may edit his own user symbols and route data on a separate layer under the radar presentation.

If an ECDIS application is installed in addition (MULTIPILOT), the RADAR can be used in "Chart Radar" mode. It provides an ECDIS background within the bearing scale on the PPI. Chart data bases for ENC are used. The Chart Radar is approved as ECDIS back-up.
4.2 ECDIS Application

The ECDIS application presents the own ship embedded in an ENC chart. Various tools are available for route planning and voyage execution, for navigation, for route checking, for shallow water warning and for collision avoidance.

AIS targets from a separate AIS transponder unit and radar targets are processed together and merged in the same way as for the RADAR application. 1)

Fig. III / 14 Overview of the ECDIS Screen

1) A standalone ECDISPILOT does not process RADAR targets.
4.3 CONNING Application

The CONNING application provides an overview of the navigational situation of the vessel. It displays all navigation data and if fitted with the optional engine interface also rudder and propulsion related data. The presentation varies with the individual propulsion and generator layout of the vessel. An individual layout is shown below.

![Overview of the Conning Screen](image)

Fig. III / 15 Overview of the Conning Screen
4.4 TRACKPILOT Application (option)

The TRACKPILOT application controls the vessel for constant heading, course or along a pre-planned track as prepared with the ECDIS planning function. A common control principle in all its operating modes is the radius steering, used during course change maneuver, operated manually or in automated control modes.

With the option SPEEDPILOT the speed of the vessel along the different legs of the route can be controlled to reach the final destination at a pre-planned time.

Additional manual operating modes are Set Lever and Set Speed and the optional Set RPM mode.
4.5 AUTOMATION Application (option)

The AUTOMATION application provides remote indicators and controls for the complete automation system on-board. Subsystems may include main engine control, fuel supply, cooling, generators, fire detection, electric power distribution, ballast, etc.

Fig. III / 18 Overview of the Automation Screen
SETTINGS
1 Overview

This main chapter is dealing with the long-term settings which are typically done for a longer period, i.e. several passages. Settings which are required for each voyage again, are described together with the functional description, i.e. CHART FUNCTIONS for ECDIS related items.

Most of these long-term settings for your ECDISPILOT Platinum STM system are available from the Settings bar. Click to the Settings Symbol in the bottom left line of the screen (as shown by a red arrow in the screenshot to the right) and the Settings bar will open for about 30 sec. Select your required item.

If the setting bar disappears, just open gain. The display time has been limited in order not to cover important navigational information more than absolutely necessary.

Depending on the system configuration the entries may slightly deviate from the screenshot shown here.

Please refer to the footnotes on the next page for any deviations.

Especially if no ECDIS application is installed on your system (i.e. only RADARPILOT), the corresponding menu entry for Chart is not available.

The menu entry for Radar (not visible here) is available only if the RADARPILOT Platinum application is installed on your system and ECDISPILOT is just selected. It supports Radar Transmitter control from the ECDIS user interface. In Radar mode these settings can be controlled directly from the Radar application.

Most of the expanders are described in this main chapter about SETTINGS.

Menu entries for TRACKPILOT and SPEEDPILOT related settings are visible only if these options are installed.

In that case please refer to the subsequent main chapters about TRACKPILOT and SPEEDPILOT for a description of the corresponding settings.
### 1.1 Structure of the Settings Bar

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<th>Details</th>
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<td></td>
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<td>Access to Trackpilot service tools</td>
<td></td>
</tr>
</tbody>
</table>

1) Wind from SW 2.1 onwards
2) NAVTEX Alerts from SW 2.1 onwards
3) Only available in ECDIS
4) Setting of true motion reset only available in ECDIS
5) Only for MULTIPilot in ECDIS mode
6) Only if second sensor of same kind is connected
7) Only if SPEEDPILOT is installed
8) Only if TRACKPILOT is installed
2  AIS Settings (if AIS is connected)

The AIS Transponder System provides AIS data from other vessels (i.e. identity, position, speed, course, and cargo) and objects around the own ship in a radius of about 20 NM (in reach of VHF radio). At the same time it transmits own AIS data (as above) to other vessels in the vicinity (up to 20 NM as above).

If the AIS transponder on board is connected to the ECDISPILOT Platinum STM, data from other vessels are displayed as symbols on top of the ECDIS chart or radar PPI.

The AIS system uses four different categories of symbols as follows:
- AIS targets: ships that are equipped with an AIS system
- SAR aircraft: search-and-rescue airplanes or helicopters
- Aids-to-Navigation: navigation marks, e.g. beacons and buoys
- Base stations: Equipment for controlling the AIS system, e.g. as a component of a traffic control center.

The AIS targets and SAR aircraft can be activated and tracked in the same way as radar/ARPA targets. Please refer to the separate main chapter about TARGET HANDLING.

Select one of the settings in the AIS group from the Settings Bar:

1. **AIS Settings** for switching off the AIS transmitter, for reducing power, or for activating LR mode. 1)

2. **Channel Management** for checking AIS channels & zones and power setting (this is a check only)

3. **Target Fusion** for setting the fusion limits of Radar and AIS targets (distance, course, & speed) (applicable in any case, settings are controlling the Platinum SW)

Those settings, which have to be updated for each voyage, are described in the main chapter about **AIS, NAVTEX Printer, and other Subsystems**, i.e.:

- **Voyage** data with destination and ETA
- **Status** with Power Off, and LRIT response, and display of SARTs
- **Channel** settings with low power mode for loading tankers and mooring

(applicable only if AIS is connected bi-directional, if editing of input fields is blocked, settings have to be made from the separate AIS Minimum Keyboard, also called MKD)

All operating actions can be performed on any workstation without the need for a particular switch-over procedure. As far as the AIS settings and the information transmitted are concerned, the last operating action applies.

1) If editing of input fields is blocked, settings have to be made from the separate AIS Minimum Keyboard, also called MKD. The reason is that the AIS system is not connected bi-directional to ECDISPILOT Platinum STM.
2.1 Transmitter ON/OFF and Long-range Mode

2.1.1 (Earlier AIS Model)

Select **AIS Settings** to enter the menu.

Check the displayed information and adjust if necessary.

If the **Adjust** buttons are not accessible, any update of the stored information has to be entered from the separate operating unit (MKD) of the AIS transponder.

**Transmitter**

Indicates whether the transmitter is switched ON or OFF. Prevent the AIS transponder from transmitting completely by setting this entry to **OFF** (if AIS is connected for remote operation). Otherwise use the separate operating unit (MKD) of the AIS transponder for switching off.

![CAUTION]

The transmitter should not be switched off except in justified exceptional cases, because when it is switched off, own ship can no longer be detected as a target by other ships and cannot participate in the communication between ships, equipped with AIS. The status **Transmitter On/Off** is stored with date and time in the **Event Log** and can also be called up after an accident at sea.

**Low Power Mode**

For safety reasons (possible explosion) the transmitting power of AIS transponders on tankers shall be reduced to low power during loading and unloading.

**LR Interrogation Mode**

This line indicates the long-range interrogation mode of the AIS transponder system. The transponder can be interrogated about own AIS data by using other communication systems, i.e. a SATCOM system. Because this interrogation can be done over long distances compared to the typical VHF range for AIS, it is called "long-range interrogation".

The interrogating station, i.e. a vessel traffic service center or harbor authority, specifies which data are requested. The reaction of the AIS electronics unit can be set by means of the **Long-Range Interrogation Mode**.

- **Auto**: In the case of an interrogation, the reply is sent automatically. For the purpose of information, the **AIS Interrogation** alarm appears; it should be acknowledged in the usual way.

- **Manual**: In the case of an interrogation, the **AIS Interrogation** alarm appears. By acknowledgment, the **AIS Interrogation** dialogue appears. The reply is sent with the **Reply** button or is instead prevented with the **Close** button.
2.1.2 Transmitter ON/OFF and Long-range Mode (AIS Model after 2010)

Select **AIS Settings** to enter the menu.

Check the displayed information 1) and adjust if necessary.

If the **Adjust** buttons are not accessible, any update of the stored information has to be entered from the separate operating unit (MKD) of the AIS transponder.

---

**Transmitter**

Indicates whether the transmitter is switched ON or OFF. Prevent the AIS transponder from transmitting completely by setting this entry to **OFF** (if AIS is connected for remote operation). Otherwise use the separate operating unit (MKD) of the AIS transponder for switching off.

---

**LR Interrogation Mode**

This line indicates the long-range interrogation mode of the AIS transponder system. The transponder can be interrogated about own AIS data by using other communication systems, i.e. a SATCOM system. Because this interrogation can be done over long distances compared to the typical VHF range for AIS, it is called "long-range interrogation".

The interrogating station, i.e. a vessel traffic service center or harbor authority, specifies which data are requested. The reaction of the AIS electronics unit can be set by means of the **Long-Range Interrogation Mode**.

- **Auto**: In the case of an interrogation, the reply is sent automatically. For the purpose of information, the **AIS Interrogation** alarm appears; it should be acknowledged in the usual way.

- **Manual**: In the case of an interrogation, the **AIS Interrogation** alarm appears. By acknowledgment, the **AIS Interrogation** dialogue appears. The reply is sent with the **Reply** button or is instead prevented with the **Close** button.

---

**Display SART in Test Mode**

indicates whether an AIS-SART (SART = Search And Rescue Transmitter) in test mode will be displayed in the chart or radar PPI. Set to ON or OFF as required. For the presentation of SARTS please refer to page 97.

---

1) **Low Power Mode**: For safety reasons (possible explosion) the transmitting power of AIS transponders on tankers is automatically reduced to low power during loading and unloading. No user operation is required as long as the type of vessel is configured during installation to **Tanker** and the navigation status is **Moored** and not moving faster than 3 kn (valid for transponders acc. to new IEC standard 61993-2 ed. 2.0 from 2010-10-19).
2.2 Channel Management

The AIS system is using two VHF radio channels for data exchange between vessels. They are set by default.

The correct selection and setting of channels depending on the zone where your ship is sailing is done automatically by the AIS Transponder System.

It is important to keep these settings as they are because the AIS system cannot function unless all AIS transponders communicate on the same VHF channels and with the correct bandwidth.

⚠️ CAUTION
It is also possible to make a setting manually, but this should only be done in exceptional cases and following the advice of a local administration received by radio, publications, etc. and only after having informed the ship’s command personnel accordingly.

Please refer to the main chapter about AIS, NAVTEX and other Subsystems for more information about the list of status data, the channel setting, and any further settings (chapter only included in NACOS Platinum Navigation system documentation).
### 2.3 Target Fusion

An ARPA target and an AIS symbol may represent the same object. In order to determine if this is the fact, ARPA and AIS data for distance, speed and course are compared. If the difference in data are within preset limits, the targets will be associated if this function is activated. In this case, only one of the symbols is shown. Anyway, both targets will be continuously tracked. The blanked-out symbol will appear again automatically if the differences in data exceed the preset limits.

The limits required for this function are set here.

It is possible to define the priority for showing an object as ARPA or AIS targets for the case that target fusion is active for a tracked target. This means that one of the symbols can be suppressed on the PPI. Additionally, it can be defined for a single selected target on the PPI to show the suppressed symbol for a limited period of time.

#### Fusion Distance
If the distance is less than the set limit, the ARPA and AIS target are displayed as one target. Choose between 0.1 and up to 0.3 NM.

#### Fusion Course
If the course difference is less than the set limit, the ARPA and AIS target are displayed as one target. Choose between 5 and up to 35 degree.

#### Fusion Speed
If the speed difference is less than the set limit, the ARPA and AIS target are displayed as one target. Choose between 0.5 and up to 1.5 NM.

### 2.4 AIS Test (SAAB R5 only)

This function initiates a test call to a neighboring AIS station. The MMSI and strength of the received call are indicated (available in the list of settings only if SAAB R5 AIS is connected bi-directional, otherwise please initiate test call from separate MKD).
3 Settings for Alerts

This chapter describes settings required for individual alert handling. According to the new Radar Performance Standard the ECDISPILOT Platinum STM system is based on a four level alarm system with external alarms having the highest priority followed by internal alarms, warnings, and cautions.

The permanent Alarms menu comprises all functions for alarm handling. It provides access to the alarm list, to the switch for silencing the alarm horn, and to the settings for ECDIS alerts and own ship look ahead sector.

If the alarm list is opened by the Alarm List button (blue arrow). It always shows the complete list of alarms, warnings and cautions, independently of the previously made selections of filters or priorities in the list.

The list then shows the newest alarm entry at the top of the alarm window.

Close the list with a click on the small triangle left of the Alarm expander (red arrow).

More details about the alarm list can be found in the main chapter ALARMS, WARNINGS, AND CAUTIONS.
3.1 Setting Alert Limits

**Depth Limit**

Enter the depth limit and check the corresponding box for an alarm.

**Under-Keel-Clearance**

Enter the under-keel-clearance and check the corresponding box for an alarm.

**Wind Limit**

Enter the wind speed limit in kn or m/s considering the damping period (the period where the wind speed exceeds the limit at all times) and the measurement method (relative wind speed compared to ship’s speed or true wind speed).

![Alert Limits](image)

3.2 Escalation of Alerts

For navigational alarms the escalation time period which expires until an unacknowledged warning is automatically changed into an alarm can be set here.

![Escalation](image)

This setting is protected by a password level 4.
### 3.3 ECDIS Alerts and Look-Ahead Sector

#### Alerts

The first three alerts are part of the chart monitoring:

1. Activate the **Safety Contour Alarm** if you wish to have an alarm on crossing the safety contour indicating shallow water areas. For the setting of the safety contour please refer to Depth Contour (see page 92).

2. Activate the **Navigational Hazard Caution**, if you wish to have a (visual) indication on approaching a hazard like buoy, beacon, pipeline, cable, offshore platform, wreck, fishing zone, mooring area, ice zone, or similar.

3. Activate the **Special Areas Caution** if you wish to have an indication or warning on crossing an own safety line, dangerous area, or dangerous user symbol like a wreck. It can be chosen whether this notification will be raised as a caution or warning.

The next two are part of the track monitoring:

4. Activate the **Critical point on route alarm** if you wish to have an alarm on reaching the next wheel-over point.

5. Activate the **Cross-track alarm** if you wish to have an alarm on cross deviation from the planned track. The limit can be set during route monitoring.

Please refer to the main chapter about ROUTE PLANNING AND MONITORING for more details.

#### Look-Ahead Sector

**Show on Chart** activates a virtual sector in front of the ship, formerly known as "guard sector".

For this ECDIS Monitoring function, the program constructs a monitoring sector (ahead sector) with an adjustable sector width and length which can be defined here.

In the example, the sector has a length of one mile and a width of 250m at its end. The guard sector opens out from own position in the direction of the ship's movement and is carried along with the ship. The monitoring is performed both with the look ahead sector and with own position (i.e. the own ship contour). It takes place for chart objects as activated above and for user symbols like wrecks, and obstructions. The monitoring is therefore independent of whether the display of these objects is switched on or off.

Whenever a monitored object is within the defined range of the sector or it touches or overlaps the ship's contour, an alarm is raised.

Even when the function **Show on Chart** is switched off for display, in any case the defined look-ahead sector monitors against the objects under **Alerts** in the frame below.

It might be an advantage to switch off the look-ahead sector monitoring if the speed is very low or the ship is stationary.
3.4 Acquisition / Guard Zone Settings

Open the Guard Zone menu under Settings.

Two independent acquisition/guard zones can be switched on in order to acquire automatically all radar targets and sleeping AIS targets entering the zones. The acquisition/guard zones are switched on and off by checking the controls Zone 1 and/or Zone 2.

If the acquisition/guard zone is switched off, automatic target acquisition does not take place any longer. Targets already acquired will be tracked further on.

If a target has not been tracked before entering the acquisition/guard zone, the Target Auto-Acquired alarm appears.

If a target has already been tracked when it entered the acquisition/guard zone - the Target Entered Guardzone alarm appears.

After acknowledgment of the alarm, the automatic target tracking starts and afterwards

- it is marked with the flashing symbol or if the function TRUE SCALED TARGETS is active, the AIS target can be shown with the true scaled outlines in the small ranges.
- The capacity of the target tracker is restricted to 40 activated and 240 sleeping targets.

If there are already 95% of the maximum number of ARPA targets or 95% of the maximum number of AIS targets being tracked or acquired, the Check ARPA/AIS Target Capacity warning appears. In this case, at least one unimportant target must first be deleted before another target can be acquired.

If there are already 100% of the maximum number of ARPA targets or 100% of the maximum number of AIS targets being tracked or acquired, the ARPA/AIS Target Capacity Exceeded alarm appears. In this case, at least one unimportant target must first be deleted before another target can be acquired.

Setting the Range of the Acquisition/Guard Zone

Example shown for Guard Zone 1: Click on the arc that defines the acquisition/guard zone and use the small handle to drag the zone to the desired size.

The outer limit can be set to a range value between 1.5 NM and 20 NM.

Setting the Angle of the Acquisition/Guard Zone

Click on the angle line that defines the acquisition/guard zone and use the small handle to drag the zone to the desired angle.

The angle can be set to a value between 5° and 360°. The setting takes place relative to the heading direction, i.e. the acquisition/guard zone turns with the ship’s heading.
3.5 NAVTEX Alerts

NAVTEX alerts received from an external NAVTEX system are presented as a warning in the alarm management of your MFD. They have to be acknowledged by the user like all other alerts and as a result an answer is sent to the connected NAVTEX system stopping the local audible alert.

In some areas the number of NAVTEX warnings is quite large and it is important to switch off those alerts which are not necessary for the actual nautical task.

This can be done under NAVTEX Alerts form the SETTINGS bar as shown to the right.
3.6 Dangerous Targets Settings

**Dangerous Targets On**
This function is activated under Settings -> Target. Targets which are tracked by the ARPA and also AIS targets can automatically be marked as dangerous targets by the automatic collision avoidance computation if their closest point of approach (CPA/TCPA) is lower than the limits set in the Alarm Limits group. As a result,
- the Dangerous Target alarm appears,
- the target which has caused the alarm is indicated on the chart by means of the flashing symbol or ; if a sleeping AIS target has caused the alarm, that target is automatically acquired in beforehand. The flashing of the symbol stops after the alarm Dangerous Target for the appropriate target has been acknowledged. The alarm is kept in the alarm list.

**Auto ACQ. AIS Targets (Auto Acquired AIS Targets)**
In particular cases, it might be required to prevent AIS targets from being acquired by the collision avoidance computation, for example to avoid unnecessary alarms in port or at other berths caused by AIS targets. In this case the check box must be cleared.

**Limits for Closest Point of Approach (CPA)**
The limit for the distance to the closest point of approach of a target can be set here. If a target gets closer then the set limit, it is automatically marked as dangerous target and the alarm Dangerous Target is raised. Choose between 1.0 and 10 NM.

**Limits for Time to Closest Point of Approach (TCPA)**
The limit for the time to closest point of approach of a target can be set here. If the time of the TCPA gets shorter then the set limit, it is automatically marked as dangerous target and the alarm Dangerous Target is raised. Choose between 1 and 10 min.

**AIS Lost Target**
Check this box if an alarm for a lost AIS target shall be given.
This chapter describes settings required for the individual presentation of
- charts
- the depth contours
- the ECDIS hazards
- the own ship symbol
- the own routes
- the targets
- the true motion reset
- and user symbols.

Select one of the items from the **Settings** bar to open the corresponding menu.
4.1 Settings for Chart Presentation (if ECDISPILOT is installed)

**Categories**

Select one of the display categories for the details that are to be shown in the chart.

- **Base** is providing coast lines and obstacles only and is not sufficient for navigation.
- **Primary** is covering Base plus buoys and beacons and is used for chart radar.
- **Standard** is sufficient for voyage planning and monitoring.
- **All** contains above categories and all other display groups of the electronic chart.
- **Custom** allows the user to make all settings individually. Click to **Adjust** to select each item.

The selected category (Base, Primary, Standard, All, Custom) is indicated in the top status line of the application area.

A plus sign (+) after the category is shown, if additional groups have been selected. A minus sign (−) after the category is shown, if additional groups have been deselected.

Moving the cursor on top of the Category field opens a small information window with details about the selected or deselected groups.

When vector charts are being used, it must be ensured at regular intervals (e.g. after a change of watch) that all of the necessary display groups are being displayed. Not even the Display Standard setting guarantees the completeness of the display.

**Advanced**

- **Text** Labels can be switched on in steps: none, important, primary, all, and custom. Click to **Adjust** to customize the presentation.
- **Symbols and Areas** Select between paper chart or simplified presentation.
- **Additional Information** Check corresponding controls for national language, lights, accuracy, and highlighted information. Consider scale dependant display of information.
- **Highlight Updates** None, Last or All updates are highlighted depending on the choice.

**Date Dependent Displayed Features**

- **Within Current Date**: Date dependent objects are displayed only if they have a date matching with the current system date.
- **Within Selected Range**: Date dependent objects are displayed only if they have a date within the range entered under viewing date start and end.

**Background for No-Data Areas**

If RADARPILOT is installed, and selected, this menu line is shown. Select the background for No-Data areas in Chartradar mode (ENC=ON), either dark or no-data pattern.
4.2 Settings for Safety Contour and Depth Presentation (in ECDIS)

Check the draught of your own vessel as shown here in the Depth Contour menu (red arrow). If not ok, set the correct value (see page 100) and come back.

Select the number of different depth shades (two or four). The following example applies to four shades. Then select the depth value in meters for each shade by shifting the corresponding slider.

- Set the Shallow Contour slider (the top one) to an appropriate value of a few meters.
- Set the Safety Depth slider (which gives the alarm) according to your ship's draught plus safety margin of a few meters.
- Set the Safety Contour slider (the next one) close to it.
- Finally set the Deep Contour slider as appropriate (i.e. 3x ship draught).

As a result on the electronic chart the colours will indicate the depth as adjusted in the above dialogue, from light brown (land) to light blue and white. In chart radar mode the colour scheme for night is used.

The whole colour scheme for day and night is shown in the diagram below.
4.3 Settings for Presentation of ECDIS Hazards

According to the new ECDIS Standard IEC 61174 Ed. 4.0 any hazards in the ECDIS which appear either in the look ahead sector or on the planned route corridor have to be additionally highlighted.

This presentation feature can be switched off by the user individually.

Click to the Settings symbol in the bottom line and select ECDIS Hazards from the list of settings.

- The menu as shown to the right is opened.
- Check the boxes of those items which you would like to highlight during route monitoring in the ECDIS.
- In general it is recommended to activate all three groups:
  1. Crossing safety contour ¹)
  2. Approaching navigational hazards
  3. Crossing special areas (with all sub-areas)
- If the presentation is overloaded, specific settings can be switched off.
- In S-mode all settings are activated (see page 108).

Examples for the presentation of the three ECDIS hazards are given below:

1) Crossing a safety contour with the look ahead sector is indicated by a red border line

2) Navigation hazard ahead within the look ahead sector is indicated with a yellow square

3) Crossing a special area with the look ahead sector, here PSSA (particularly sensitive area), is indicated by a yellow border line

¹) Refer to page 92 for setting the depth value for the safety contour
4.4  Own Ship Symbol

The own ship presentation can be configured to the actual nautical requirements.

The **Minimized Symbol** consists of two concentric circles representing the position of the CCRP of the own ship.

**Prediction**

If the prediction has been activated, a curved headline is shown in addition to the own ship symbol. Select **Alternate Color** to change the color of the curved headline for easier identification.

**True Scaled Outline**

Activate this function to show the own ship true to scale with length and beam size parameter as stored in the ship configuration data.

The **True Scaled Outline** is available only in the smaller ranges 1) if the beam size is displayed larger than 3 mm on the screen. It cannot be displayed in larger ranges.

**Stern and Heading Line**

Add stern (--- - - -) and heading (------) line by clicking into the corresponding box. Both lines are displayed as far as the edge of the PPI.

**Past Track (only for ECDIS)**

Add **Past Track** and **2nd Past Track** to your own ship symbol and select the **Track Length** in hours and the density of **Time Labels** in minutes.

Click to the Drop button to add in addition **Manual Labels** to the Past Track.

In compliance with the IEC Radar standard this function is available only for ECDIS. In RADAR mode the second part of the menu is hidden. Please refer to the Vector & Trails function in the Navigation Sidebar for displaying a short Plot of the own ship in RADAR mode (See page 148).

1) Normally (depending on the size of the ship) 1,5 or 0,75 NM and below
4.5 Route Presentation

Before route editing is started, the settings for displaying the route in the application area should be checked.

Please refer to the separate main chapter about ROUTE PLANNING AND MONITORING for more details.

Refer to the following picture to identify the items that can be superimposed as additional information to the route.

![Diagram of route settings]

Fig. IV / 2 Settings for the Route Display
4.6 Display of Targets

Labels for ARPA and AIS targets and the visibility of ATONS can be switched on and off by a click to the corresponding box.

ARPA Targets are shown with the radar transceiver number selected at the MFD and the target number 1). If a ship name has been entered by the user in the target list, this name is displayed instead of the number.

AIS AToNs are marked with their name.

AIS Acquired Targets and AIS Sleeping Targets are marked with the received MMSI, Call sign, or Ship Name. Just select the corresponding type from the list.

The true scaled outline for AIS Acquired Targets is automatically selected if the same setting has been made for the own ship presentation, please refer to page 94. This outline is shown only if the AIS target delivers the ship dimensions and if the resulting beam of the target symbol in the PPI exceeds 3 mm. In all other cases the AIS symbol is still shown.

AIS AToNs (AIS Aids-to-Navigation) are virtual or real navigation marks which are reported by AIS transponders. They are used as a replacement for buoys, lighthouses, etc.

Real AToNs have a transponder which is physically at the position of the navigation mark. They are visualized by a square with a thin pink frame as shown in the screenshot to the right.

Virtual AToNs have a transponder which is physically somewhere else, i.e. at a shoreside base station. They are visualized by a square with a dashed thin pink frame and a cross inside.

For more information use the cursor to point to the AtoN symbol of interest, the cursor tool tip changes from standard indication to an extended one with AtoN information.

- The AtoN is not listed in the target list and it is monitored like a chart object
- If the Obstruction Ahead ECDIS alert is set, and the look ahead sector of own ship reaches an AtoN, the Crossing a Danger warning is raised
- If the Safety Contour Alarm is set, and the look ahead sector of own ship reaches the AtoN, this alarm is raised

SAR Aircrafts and Vessels are equipped with AIS transponders. The type of ship is set correspondingly to SAR aircraft or SAR vessel. Special symbols are used for presentation in ECDIS and Radar as follows:

The SAR aircraft symbol is oriented in the direction of the COG of the aircraft. The length of the symbol is 6 mm.

The SAR vessel symbol is oriented in the direction of the COG of the vessel.

---

1) If ARPA targets are received from external radar, only the target number is available.
4.7 Display of AIS-SART, AIS-MOB, and AIS-EPIRB Devices

AIS Search and Rescue Transmitters are typically available as hand-held devices on the bridge or in a lifeboat (called AIS-SART), or integrated into a life vest (called AIS-MOB), or as a floatable EPIRB (called AIS-EPIRB).

They are transmitting the position of the device as derived from an integrated GPS receiver.

If the AIS transponder on your own ship is receiving such a message instead of the standard AIS symbol a special symbol is used for presentation in ECDIS and Radar as follows:

The SART symbol for all three applications (SART, MOB, and EPIRB) is represented by a crossed circle in red colour.

If a SART device is transmitting in test mode instead of active mode the colour changes from high-lighted red to orange. The display of SARTS in test mode can be suppressed under AIS settings (for later AIS models), see also page 81. The display of SARTs in active mode can not be suppressed.

By moving the cursor to the SART symbol a window opens with more detailed information where the name of the target is either SART, EPIRB, or MOB and the status can be ACTIVE or TEST.

The example to the right is showing an MOB ACTIVE device (Man-over-Board).

At the same time the AIS SART is also shown in the target list.

If many targets are tracked, the entry may be at the end of the list and not visible depending on sort order settings.

So just click to the small triangle in the top line (red arrow) of the target list and select the entry Show AIS SARTs to see i.e. the AIS MOB target at once.

An AIS-MOB and a manually set MOB symbol are handled completely different.

- **The manually set MOB Symbol** is starting on the actual ship position, it can be corrected manually if required, and is drifting with set values for wind and current.

- **The automatically set AIS-MOB Symbol** is controlled only by the received AIS messages from the SART which is integrated in the life vest. It can not be corrected in position, it is not connected to any manually set MOB symbol and can not be merged with any manually set MOB symbol.
4.8 TM - True Motion Settings

As far as the screen stabilization is concerned, there is a choice between True Motion, Relative Motion and Browse mode (Browse only for ECDIS).

The browse mode can be used for ECDIS planning. It allows you to jump to any location in the chart independent from the own ship position.

True Motion and Relative motion mode are showing the own ship in the screen center as follows:

- **True Motion in General**
  
The position of not moving targets (buoys, beacons, land or lighthouses) is fixed, also the chart in the background is fixed; the own ship symbol moves across the screen. The PPI/chart area orientation is North-Up or Course-Up. Automatically by means of a true motion reset (TM reset), the own ship symbol on the PPI/chart area is reset in good time before the PPI/chart area boundary is reached; this resetting is done in such a way that the larger part of the PPI/chart area lies ahead of the own ship.

**True Motion for ECDIS (TM)**

For the ECDIS application the appropriate value for the automatic True Motion Reset can be set by means of the slider in the Settings > Settings > TM dialogue.

Just pick up the slider with the right mouse button and adjust as required. Manual reset can be done with the pan buttons in the top left chart area.

- **REL Motion**
  
Own ship’s position is fixed; the chart or radar video moves relative to own ship in accordance with the movement of own ship. As far as the PPI/chart area orientation is concerned, it is possible to choose between Head-Up, North-Up and Course-Up.
4.9 Presentation of User Defined Symbols

Users can drop individual symbols selected from a library into a chart in addition to the existing chart symbols. These symbols are called user symbols. Various user symbols are available starting from different buoys, lighthouses, wrecks, radio stations etc. Lines, areas, and events can be dropped as well.

The presentation of these user symbols can be adapted individually by the menu shown to the right. The parameters are the same as for the chart symbols, choose between Simplified or Paper Style and Text Labels in four steps from none to all.

Further-on the visibility group can be selected. Click to the box Show All to see all user symbols irrespective of the group they are assigned to.

Select a user defined group to see only symbols which have been assigned to a group before.

Click to Select User Defined Groups to open the sub-menu as shown to the right for further details.

The menu presents a list of all user defined groups and their current visibility status.

In the example the group for Glasgow Approach is On, the same applies to Bristol Approach.

Click to the small triangle at the end of each group related line to set this group to On, Off, or depending on the active route. If the cursor is moved over the route entry, a tool-tip opens to indicate the catalog where this route can be found.

☞ If a group is set to Depend on Route, all symbols of this group are visible, as long as this route is active.

☞ Several groups of symbols can be set to always visible (On) or to depending visible (Depend on Route) at the same time.

☞ A typical example are two groups of symbols supporting the approach of an inland river harbour. One group is supporting the upstream route and the other one is supporting the downstream route. So one group is set depending on the active upstream route and the other is set depending on the active reverse route.
5 Sensor Settings

The Sensor Setting group provides a menu for the draught setting of vessel and for the sensor monitoring.

5.1 Draught Settings

Click to the entry **Draught** in the Settings list to open the Draught menu with settings for Draught Fore and Aft.

Click to **Adjust** to change the settings.

The larger of the two values will be displayed in the menu for setting the Depth Contour.

The set own ship’s draught will only limit the adjustment of the safety contour in the depth line menu to the lower side.

The safety contour slider can only be set to larger values. The ENC depth monitoring alarm is not affected by the own ship’s depth, it is only affected by the set safety contour.
5.2 Sensor Monitoring

The navigation data of the selected sensors can be automatically monitored by making a comparison with the corresponding data of redundant sensors (if connected, i.e. 2nd gyro).

If a limit value is exceeded, an alarm appears. You can specify whether the monitoring shall take place and what the alarm limit value should be. Furthermore, you can choose between several comparison sensors.

For position monitoring, it is also possible to decide whether the limit value is to be automatically adapted to suit the sensor types that are being monitored.

The settings are made in the Sensor Integrity Monitoring dialogue under Settings > Sensors:

Entering the Limit Value

For each activated monitoring function a limit can be entered after clicking on the small triangle right of the limit indication (see blue arrows in above screenshot). The value is stored and will be re-called if the monitoring function is switched off and then on again.
Behavior if the Limit is Exceeded
Each monitoring function generates an individual monitoring alarm if the limit is exceeded. All these alarms are ending with ... **DIFFER**. They are indicated in the alarm list as all other alarms.

Failure of a Sensor which is being Monitored
Each monitoring function generates an individual monitoring alarm as soon as the signals of the sensor used for monitoring are no longer available. They are all ending with ... **LOST**. Remedy by selecting a different sensor, or by switching off the monitoring function.

Automatic Setting of the Position Monitoring Limit
For position monitoring, AUTO mode too can be selected after clicking to the monitoring mode field (see red arrow). In AUTO mode, the limit is automatically adapted to suit the types of position sensors that are being compared.
5.3 Remove Sensors from Auto Selection

If one of the sensors shall not be considered by the automatic sensor selection, i.e. because it turned out to be less reliable during a voyage, this sensor can be excluded from the auto selection. Just clear the corresponding check box in the menu below.

De-select i.e. the second DGPS sensor if it shall not be used automatically as the primary sensor.
The S-Mode is a pre-defined setting of the ECDIS and RADAR presentation in order to meet the most typical navigational scenarios. It can be used during change of the watch to give the next nautical officer a well-known presentation regardless of the last operating sequence carried out before. It might be helpful also for the pilot on entering the bridge.

The S-Mode button can be found in the bottom left menu line (see red arrow above).

Pressing the S-Mode button for **ECDIS** leads to default settings for more than 70 presentation parameters as defined by the ECDIS test standard IEC 61174 Ed.4. One of these parameters is the range which is set to 3 NM. Please compare to RADAR where the default setting is 6 NM. A detailed description can be found on the subsequent pages.

For **RADAR** the number of presentation parameters is smaller, but nevertheless comprehensive. As already mentioned the range is set to 6 NM. The detailed parameters for RADAR are described on page 111 and following.

The S-mode button has no effect on other settings like ARCS or ENC selection, target handling, disabled dangerous target alarm, sensor selection, vector length, disabled alarm horn, disabled AIS transmitter, or other. The user has to ensure that these settings are suitable for the actual traffic scenario.

The resulting screen after pressing the S-Mode button in ECDIS is as follows:

![Overview of the S-Mode for ECDIS](image-url)
6.1 Default Sidebar Settings for ECDIS

Clicking to the S-Mode button in the bottom line and confirming the selection will pre-set the navigation sidebar settings as follows:

- **Orientation** is set to North-up
- Range is switched to 3NM
- Reference is switched to Ground
- Vector and Trail length is set to 6 min
- Plots and Prediction are switched off
- **Stabilization** is set to True
- **Range Rings** are switched off
- **Vector Mode** is set to True
- **Target Fusion** is on with AIS on priority, Sleeping Targets are switched on, trial mode is switched off
- **Heading and Speed** source settings remain unchanged
- **Position** source settings remain unchanged, the geodetic datum is always WGS 84, any other datum is rejected and a warning is given
- **Charts** selection remains unchanged

Click the S button above for Default or S-Mode and confirm selection as shown below by clicking to Change settings to ‘Standard’.

![Image of ECDIS settings](image)

see page 165 for a description of the other buttons

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Fig. IV / 4 Default Sidebar Settings for ECDIS
6.2 Default Presentation Settings for ECDIS

Clicking to the S-Mode button in the bottom line and confirming the selection will pre-set the presentation settings as follows:

**Chart** is set to category standard ¹ with paper chart symbols, important text only, plain boundaries, no light descriptions, no full length sectors, no extra symbols, no quality indication, and no highlighted updates.

**Date and Scale Dependent Objects** are displayed within effective dates/scales.

¹) Category standard does not guarantee the completeness of the display. Ensure at regular intervals (e.g., after a change of watch) that all of the necessary display groups are being displayed.

**Admiralty Information Overlay (AIO)** settings remain unchanged, but any additional information layer, weather, tide, AML, and also AIO is cleared from display.

**Depth Contour** is set to 2 shades without labels, shallow water pattern is off and shallow water danger is on, safety depth and contour remain unchanged.

**Own Ship** is set to true scale off, heading line on, past track on with 12 h length and 30 min time labels.

---

See page 108 for ECDIS Hazards!
The following presentation settings are not affected:

Selected **Route** including route parameters, **Target** labels and AtoNs, and **User Symbols**

---

---

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6.3 Default Alert Settings for ECDIS

Clicking to the S-Mode button in the bottom line and confirming the selection will pre-set the alert settings as follows:

**ECDIS Alerts**

The following three alerts are activated:

1) Crossing safety contour alarm
2) Navigation Hazard ahead caution
3) Crossing special area caution

are activated,

the Look Ahead Sector is set to 6 min but not shown on chart.

The rest remains unchanged.

**Escalation** time for unacknowledged warnings remains as set before, after this period any unacknowledged warning turns into an alarm

**Guard Zones** remain unchanged

---

TARGETS

The Dangerous Target Alarm is activated, CPA is set to 2.0 NM and TCPA to 12 min.

The rest remains unchanged.

Fig. IV / 6  Default Alert Settings for ECDIS
6.4 Default Hazard Presentation Settings for ECDIS

Clicking to the S-Mode button in the bottom line and confirming the selection will pre-set the ECDIS hazard presentation alert settings as follows:

**ECDIS Hazards**

The presentation of all three hazard groups is activated:

- Show crossing safety contour
- Show navigation hazards ahead
- Show crossing special areas on chart including all subareas
6.5 Default Layer Settings for ECDIS

The presentation of additional information on top of the electronic chart is structured in different layers. A click into the chart area with MORE and the selection of **Layer** opens the menu for setting the visibility of the different layers. Typically these have been set according to the individual needs of a previous user.

Clicking to the S-Mode button in the bottom line and confirming the selection will pre-set the layer settings as follows:

**ECDIS Layers**
- **Radar Video** is deactivated.
- **Targets** are deactivated.

The rest remains unchanged.
## 6.6 Summarized List of Default Settings for ECDIS

<table>
<thead>
<tr>
<th>Setting</th>
<th>Default or S-Mode Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display category</td>
<td>ECDIS Standard display</td>
</tr>
<tr>
<td>Chart related selector: Accuracy</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Date dependent objects</td>
<td>current date</td>
</tr>
<tr>
<td>Chart related selector: Highlight date dependent</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Full light lines</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Highlight Info</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Highlight document</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Unknown</td>
<td>On</td>
</tr>
<tr>
<td>Chart related selector: Contour labels, if provided</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: Four shades, if provided</td>
<td>Off</td>
</tr>
<tr>
<td>Chart related selector: National language, if provided</td>
<td>Remain unchanged</td>
</tr>
<tr>
<td>Chart related selector: Paper chart / Simplified symbols</td>
<td>Paper chart</td>
</tr>
<tr>
<td>Chart related selector: Plain / Symbolized boundaries</td>
<td>Important text</td>
</tr>
<tr>
<td>Chart related selector: Text group layer</td>
<td>Around own ship with appr. offset</td>
</tr>
<tr>
<td>Selected sea area</td>
<td>3 NM</td>
</tr>
<tr>
<td>Range</td>
<td>True motion, north-up</td>
</tr>
<tr>
<td>True motion reset</td>
<td>10 % from display edge</td>
</tr>
<tr>
<td>Geodetic datum, if selectable</td>
<td>WGS84</td>
</tr>
<tr>
<td>Manual updates (see 5.9.2)</td>
<td>If applied i.e. displayed if available</td>
</tr>
<tr>
<td>Mariner's notes (see 5.4.1)</td>
<td>If applied i.e. displayed if available</td>
</tr>
<tr>
<td>Selected route</td>
<td>Last selected route, incl. route parameters</td>
</tr>
<tr>
<td>Past track</td>
<td>On</td>
</tr>
<tr>
<td>Past track length and time labels</td>
<td>On, 12h and 30 min</td>
</tr>
<tr>
<td>Look-ahead time</td>
<td>6 min</td>
</tr>
<tr>
<td>Any edit window (for example route plan)</td>
<td>Exit</td>
</tr>
<tr>
<td>Position data source</td>
<td>remain unchanged</td>
</tr>
<tr>
<td>Safety contour and safety depth</td>
<td>remain unchanged</td>
</tr>
<tr>
<td>Cross track limit</td>
<td>remain unchanged</td>
</tr>
<tr>
<td>Graphical indication, crossing safety contour during route planning</td>
<td>On</td>
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<tr>
<td>Graphical indication of prohibited areas, etc. during route planning</td>
<td>On</td>
</tr>
<tr>
<td>Distance to prohibited areas, etc.</td>
<td>remain unchanged</td>
</tr>
<tr>
<td>Graphical indication of crossing safety contour during monitoring</td>
<td>On</td>
</tr>
<tr>
<td>Graphical indication of prohibited areas etc. during monitoring</td>
<td>On</td>
</tr>
<tr>
<td>Graphical indication of navigational hazards during route monitoring</td>
<td>On</td>
</tr>
<tr>
<td>Object highlight, selected object, track display from log</td>
<td>Cleared from display</td>
</tr>
<tr>
<td>Cursor pick and any additional window (tides, AML, etc.)</td>
<td>Closed</td>
</tr>
<tr>
<td>Any additional information layer, i.e. weather, tides; AML</td>
<td>Cleared from display</td>
</tr>
<tr>
<td>Chart update, Chart information exchange</td>
<td>Aborted</td>
</tr>
<tr>
<td>Colour differentiation test diagrams</td>
<td>Closed</td>
</tr>
<tr>
<td>Update review</td>
<td>Off</td>
</tr>
<tr>
<td>Chart 1</td>
<td>Closed</td>
</tr>
<tr>
<td>Units</td>
<td>m, NM, kn</td>
</tr>
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<td>Crossing Safety Contour Alarm</td>
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</tr>
<tr>
<td>Approaching a navigational hazard caution</td>
<td>On</td>
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<tr>
<td>Crossing special areas</td>
<td>Caution</td>
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<tr>
<td>Vector time (length)</td>
<td>6 min</td>
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<tr>
<td>Vector mode</td>
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<tr>
<td>Symbol for target association</td>
<td>AIS</td>
</tr>
<tr>
<td>Collision warnings</td>
<td>AIS</td>
</tr>
<tr>
<td>Radar and AIS target association</td>
<td>AIS</td>
</tr>
<tr>
<td>AIS target filtering</td>
<td>not provided</td>
</tr>
<tr>
<td>AIS true target outline</td>
<td>Off</td>
</tr>
<tr>
<td>Display of Radar Image overlay and tracked Radar and AIS targets</td>
<td>Off</td>
</tr>
<tr>
<td>Target past positions and trails</td>
<td>Off</td>
</tr>
<tr>
<td>Lost target warning and warning range</td>
<td>Off and 12 NM</td>
</tr>
<tr>
<td>AIS Interrogation</td>
<td>Off</td>
</tr>
<tr>
<td>Own ship true outline</td>
<td>Off</td>
</tr>
<tr>
<td>LOP source Indication</td>
<td>Off</td>
</tr>
<tr>
<td>User selected time for warning escalation</td>
<td>user set</td>
</tr>
<tr>
<td>Suppression of indication of user selected MSI messages based on first character of NAVTEX code field</td>
<td>Remain unchanged</td>
</tr>
<tr>
<td>Suppression of indication of user selected messages based on time and distance from own ship</td>
<td>No</td>
</tr>
<tr>
<td>Brightness and contrast controls, if software controlled</td>
<td>Calibrated setting</td>
</tr>
</tbody>
</table>
6.7 Default Settings for RADAR

Clicking to the S-Mode button in the bottom menu line will pre-set most of the Navigation Sidebar settings to default values as shown in the subsequent screenshots.

All other settings remain as they have been set before, e.g. routes, user symbols, navigation lines, parallel index lines, gain, sea and rain filter rain.

The default settings can be used e.g. for pilots or new crew members to familiarize with the equipment.

Orientation is set to North-up
Range is switched to 6 NM
Reference is switched to Ground
Vector and Trail length is set to 6 min
Plots and Prediction are switched off
Vector Mode is set to Relative
Charts are switched off
Target Fusion is off, and Sleeping Targets are switched on, trial mode is switched off
EBL1 and VRM1 are switched on, EBL2 and VRM2 are off

Stabilization is set to True Motion
Range rings are switched off

Fig. IV / 7 Default or S-Mode Settings for RADAR
SETTINGS

6 Default or S-Mode Settings

Page 112
GENERAL FUNCTIONS
1 The Consistent Common Reference System (CCRS)

This navigation system is designed as a Consistent Common Reference System (CCRS). It references all horizontal measurements such as target range, bearing, relative course, relative speed, closest point of approach (CPA) or time to closest point of approach (TCPA) to one single point on-board, the Consistent Common Reference Point (CCRP), typically the conning position of the bridge.

The offset between the installation location of a navigation sensor i.e. for position, speed, or heading and the CCRP is compensated by the ECDISPILOT Platinum STM system 1).

The CCRP can be selected by the user, the default setting is the conning position 2). The relations are shown in the following two diagrams.

![Diagram of CCRP on ECDIS](image)

**Fig. V / 1 CCRP on ECDIS**

For measurements relative to the own ship (EBL, VRM, Cursor, target data) on the ECDISPILOT Platinum STM the Conning Position is used normally. In contrast to a RADAR system, where the reference may also be the position of the radar antenna, in a stand-alone ECDIS no alternative reference position than the Track Control position can be selected by the operator.

---

1) If a RADAR application is installed, the offset between a radar antenna position and the CCRP is compensated as well. If multiple antennas are installed, there is a provision for applying different position offsets for each antenna in the radar system. The offsets are applied automatically when any radar sensor is selected

2) For comparison with radar it can be set to the just selected radar antenna.
1 The Consistent Common Reference System (CCRS)
2  Graphical User Interface

2.1  Super Home

Super Home is the first screen that is displayed on screen after start-up of the MFD. Super Home will help you in quickly starting the main applications, and provide help in finding specific functions through the home pages of the individual applications. When you are working with the system, you can return to Super Home by using the Super Home shortcut in the main menu or the button.

Super Home provides links to:

- All main applications’ start pages: RADAR, ECDIS monitoring, ECDIS planning, Conning and Machinery / Automation
- Secondary applications like AIS, Autopilot, Maintenance and possibly third party applications
- Documents that help you getting started.

Super Home has a title bar and menu bar, for details see page 119. Clicking on the button will open the Super Home page regardless of the current active application.

The top row of applications of the Super Home page displays the main or primary applications that are installed in the system, in the example: RADAR, ECDIS, Machinery, and Conning. The thumbnail pictures of the applications are click-able and will link to the respective application. For example, if you click on the RADAR thumbnail, this will open the RADAR application.

The first link below the thumbnail of a main application is the link to the start page of the application. Additional links will lead you to important functions in the applications. The second line of thumbnails contains shortcuts to groups of functionality that are considered a logical group or additional application.

For familiarization with the product, it is possible to select from the quick-links:

- Take the Tour opens a presentation with a short introduction into the operating.
- Read Documentation opens a PDF viewer with this manual.

![Super Home Page](image-url)
2.2 Application Screen Layout

Each application comprises two main areas: the sidebar and the application area.
The sidebar on the left provides access to details and functions of the applications.
The application area located on the right shows the main window of the active application, i.e. the ECDIS chart or a RADAR indicator.

![General Screen Layout of the ECDISPILOT Platinum STM](image)

The general screen layout, especially the size of the different areas, may vary between the different available applications.
2.3 Title Bar

The title bar provides information and functions which are permanently available in the system.

Fig. V / 4 ECDIS Title Bar

The figure above shows an example of the title bar with the ECDIS application being the active application. The information and functions provided are explained in the following.
2.3.1 Dimming

You can use the moon and sun buttons in the top left corner of the title bar to change the dimming of the screen \(^1\). Alternatively you can use the keys on the console or the appropriate entry in the menu.

When the screen is hardly readable due to changing light conditions, you can increase dimming by pressing stepwise all three mouse buttons at the same time.

Five different color & brilliance schemes are available for different ambient light conditions. The back-light brilliance is toggled between 20\%, 35\%, 60\%, 80\% and 100\%. The color set is toggled between day, dusk and night.

☞ The brilliance of the monitor does not change stepwise, in fact it changes smoothly from the previous setting to the actual desired value.

You can also individually adjust the back-light brilliance of the screen. In this case the color set is not affected. If you press the MORE key (right-click) on the sun or moon button the Dimming menu is opened. To adjust the settings, click on the right or left of the slider or drag the slider. The new value is shown on the right and the screen's settings are adjusted accordingly.

☞ There are no knobs or other controls on the monitor(s) to adjust the dimming.

<table>
<thead>
<tr>
<th>100%</th>
<th>20%</th>
</tr>
</thead>
</table>

Fig. V / 5 Color Schemes of the Color & Settings

The use of the dimming controls may inhibit visibility of information, particularly when using the night color tables!

---

\(^1\) Changing brilliance means toggling between available color and brightness schemes for different ambient light conditions.
2.3.2 Central dimming function

Press the MORE key (right-click) on the sun or moon button to open the Dimming menu and check the box for Take part in central dimming.

Now the function is as follows:

If the dimming is changed at one MFD (workstation), all MFD in the same dimming group will take part. The dimming group is configured during commissioning, typically groups are main bridge, STB wing, or PT wing.

Changing the brilliance with the brilliance slider only has no effect on other MFDs (workstations) independent from the central dimming setting.

If the central dimming box is not checked, dimming is adjusted only individually for this MFD.

Datapilot monitors take part in central dimming as well but have no own controls for dimming. They just follow the MFDs in the same group. Datapilots can be set only to the five pre-defined color & brightness settings with 20% back-light in minimum. They can not be manually set down by a slider to 5% like MFDs.

Remote Dimming: An MFD may be configured during commissioning to broadcast its dimming level to dedicated remote devices like universal data displays.

The dimming level is coded in four steps (day, dusk, night, off) and is transferred via NMEA message DDC on a serial line. Once configured this function has to be switched on and off at the remote device.
Both date and time are displayed permanently in the title bar:

Click here to change date and time

Fig. V / 6 Date and Time Display

The yellow caution symbol indicates that external synchronization of system time is not available – so that system time is running on the internal clock in the time-master DPU.

Once the external time source becomes available again, i.e. from received ZDA sentence of GPS receiver, the time is adjusted accordingly, and the yellow symbol disappears. In that case no user settings are possible. The same applies for system layouts where the time is received from a central time server system (see below).

If your system has been configured during installation for internal time only, the yellow symbol will not appear. To set Date/Time if the GPS time is missing, click to the right of the time indication (see red arrow in above screenshot), a dialogue window opens.

The operation of the controls is self-explanatory, do not forget to click on Apply for each subgroup (UTC Time, Time Zone, Display) which has been corrected. Click on Close to leave the dialogue.

**Note:**

The Date/Time setting is synchronized system-wide; settings made on one ECDISPILOT Platinum STM system are also available on all other connected stations.

**System-wide the time is referenced to UTC.**

The display of the time at an individual MFD can be set by the user either to UTC or to local time which may be the time of any time zone or the ships time.
2.3.4 External Time Source with NTP Protocol (optional)

Normally ECDISPILOT Platinum STM receives the ZDA message with date and time from GPS receiver. Optionally it can be configured for date and time from external time server via Ethernet.

In this case the Network Time Protocol (NTP) is used and a firewall is inserted between time server and Platinum network. In addition the Date and Time menu shows an entry for the selection of the time source and for differences in time.

The operation is as follows:

Open the Date and Time menu and select AUTO [source name] or a specific Time Server (TS).

In AUTO mode the most suitable time server is selected automatically, the received time is applied to Platinum.

Selecting either time server TS 1 or TS 2 locks this time server to Platinum. If a warning is shown (orange circle with !), this time server deviates more than the set limit (here 10 sec) from the current system time and its time is no longer applied to Platinum.

You should check the reason for this deviation carefully and if clarified you may use the Accept button to overwrite the warning. In this case the received time is applied again to Platinum.
3 Alive Indication

There are different possibilities available to verify the alive status of the PC which are listed and explained below. In general, if the Platinum application is blocked, the MFD or the PC are automatically started again (see also page 27). This could happen in case of any identified abnormality, i.e. input of undefined data from a third party system.

The Time Display
The system provides feedback that it is still active and operating, i.e. alive. This is specifically indicated in the title bar by the seconds changing in the time display.

If picture freeze occurs, all data on the screen as well as the display of the seconds will be frozen, so that the operator is able to notice this fault.

The Cursor and the Application
Picture freeze caused by the computer or the graphics adapter of the PC can also be recognized by the fact that moving the trackball or the mouse does no longer change the cursor position on the screen.

If the computer or its application software has a severe fault it can also happen that the cursor is still moving but a click on any menu button is no longer working correctly.

The Monitor
A green LED at the lower right corner of the monitor indicates the running connection to the PC computer. If the connection is lost or disturbed, or the display has been switched off, the LED will stay green but start flashing once per second and the screen will normally become dark. If the LED changes to orange the monitor is in stand-by mode waiting for sync signal, red indicates the switched off status. The LED will flash red in case of excessive temperatures.

The Panel PC
The Panel PC combines monitor and PC in one system. Therefore the status of the LED is slightly different. A green LED at the lower right corner of the monitor indicates the running PC. If the LED changes to orange the monitor is in standby mode waiting for the correct full resolution sync signal from the internal PC, red indicates the starting sequence where the PC is just loading the BIOS. The LED will flash red in case of excessive temperatures. If the display has been temporarily switched off by the user or the Panel PC has been switched off, the LED is off as well.
4 The Navigation Sidebar

As mentioned before, the screen is divided into the application area and the sidebar.

![Navigation Sidebar](image)

The sidebar itself is divided into the Navigation Sidebar and the Tools Sidebar. The Navigation Sidebar contains the navigation data controls and indicators. The Tools Sidebar provides menus for presentation, settings and tools. The elements are grouped. In the following chapters, each group of the Navigation Sidebar will be described separately.

---

1) Later SW versions coming along with slightly different graphical design
4.1 Display

This group affects the general settings of the application area:

- the screen orientation (North-up, Head-up,...)
- the movement of the own ship on the screen
- the display range and the range rings
- the CCRP, i.e. the reference point on your ship used for calculation of the system data like COG, SOG, CTW/STW and position and for calculation of the ship-relative data like bearing and distance of EBL and VRM and the cursor in the application area.

Details can be found in the subsequent chapters.
4.1.1 Orientation

Displays a radar video or chart picture in three different ways:

- **Head-Up**: The heading of own ship points upwards, the radar video or chart picture is moving with the yawing of the ship

- **North-Up**: Geographic north points upwards, the radar video or chart picture is stabilized with the gyro heading

- **Course-Up**: The course which exists at the instant of switch-on or re-orientation of this mode points upwards, the radar video or chart picture is thereafter stabilized with the gyro heading. In Course-Up Mode a click with **MORE** on the Course-Up indicator takes over the current heading as the new reference heading.

☞ After switch-over and re-orientation, the target trails are not influenced; they remain visible in the new mode.

☞ Selection of **Head-Up** automatically switches back the ECDIS to Monitoring mode because the Planning or Browse mode is only supported in **North-Up** and **Course-Up** orientation.

In later SW versions one mode is added as follows:

- **Head Stab (was Head Up with gyro before)**: The heading of own ship points upwards, the radar video or chart picture is moving with the yawing of the ship. The bearing scale is stabilized with the gyro signal showing the true bearing ¹).

- **Head Up (was Head Up without gyro before)**: The heading of own ship points upwards, the radar video or chart picture is moving with the yawing of the ship. The bearing scale is fixed showing the relative bearing to bow (the standard mode for radar operation as known from the very first days of radar usage on-board).

All other modes remain as described above!

¹) The definitions for Head Stab and Head Up are following the new Edition 2 of the IEC radar standard 62388.
4.1.2 Range

The display range can be chosen from a selection of ten nautical ranges (PPI radius between 0.25 NM and 96 NM) and two docking ranges (PPI radius 250 m and 500 m).

☞ In the nautical range and also in the docking ranges, all distances are stated in NM and all speeds in kn.

☞ If the range selection is done by means of the radar keyboard, the ranges are selected stepwise (up or down).

☞ If instead of ENC an ARCS chart has been selected by the user, the range indication is given by the available scales of the installed ARCS charts and displayed i.e. like 1 : 75.000

The Range can also be set by means of the optional radar keyboard or by the zoom control.
Fixed range rings can be displayed. Range rings are concentric circles with the reference position as their center \(^1\), and are situated at equal distances from one another.

Depending on the selected range, the radii of the rings and the distances between them are different:

<table>
<thead>
<tr>
<th>Range</th>
<th>250m</th>
<th>500m</th>
<th>0,25NM</th>
<th>0,5NM</th>
<th>0,75NM</th>
<th>1,5NM</th>
<th>3NM</th>
<th>6NM</th>
<th>12NM</th>
<th>24NM</th>
<th>48NM</th>
<th>96NM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Ring</td>
<td>50m</td>
<td>100m</td>
<td>0,05NM</td>
<td>0,1NM</td>
<td>0,25NM</td>
<td>0,25NM</td>
<td>0,5NM</td>
<td>1,0NM</td>
<td>2NM</td>
<td>4NM</td>
<td>8NM</td>
<td>16NM</td>
</tr>
</tbody>
</table>

Table V / 1  Range Rings

\(^1\) For reference position see page 115
4.1.4 REF - Reference for CCRS

The Reference Position for all nautical tasks carried out by the user on his ECDISPILOT Platinum STM workstation is fixed to the CCRP (conning) and the Track position at the bow. For radar applications the Radar position is added in the selection list.
4.1.5 Screen Stabilization

Examples for True/Relative Motion and Head-/North-/Course-Up

The figures on the next two pages are showing screen excerpts from two possible instants of the same scenario.

They are shown schematically for the five possible Monitoring display modes as there are True Motion, Centered Display, North-up Relative Motion, Course-up relative Motion, and Head-up Relative Motion:

Instant 1
- Own ship's course 60°, speed 20 kn
- Two moving targets, courses 60° and 150°, speed 10 kn for both
- Two fixed targets
- Two grid lines showing the alignment of the electronic chart

Instant 2
The same scenario, but after an own ship's course change to 10° (all other data unchanged).
Displays of the following are set: Own ship symbol, course and speed vectors, past plots of the targets.
Except in the case of True Motion, the center of the screen excerpt shown is the own ship's position that was set with Set center function of the context menu in the PPI/Chart Area.
☞ The display of the own ship symbol is depending on user selection and on the selected display range if "true scaled" is switched on in the Presentation tab.
**True Motion** (with true vectors and past plots)

**centered Display** (with true vectors and past plots)

Fig. V / 8  Display in the Modes True Motion and centered Display
In this mode, the headline is shown as a short, thick line.

**North-Up RM** (with *relative* vectors and past plots)

**Course-Up RM** (with *relative* vectors and past plots)

**Head-Up RM** (with *relative* vectors and past plots)

Fig. V / 9  Display in the Modes North-Up RM, Course-Up RM and Head-Up RM
4.2 Navigation Sensors

This chapter describes the navigation sensors available in the system. The main navigation sensors used for the heading, speed and position instruments are monitored depending on the "sensor selection mode". Those sensors which are available twice or more in the installation can be supported by an automatic selection mode indicated by AUTO in the different displays.

⚠️ CAUTION

The automatic selection mode is the default setting after start or restart of the system.

- If the selection mode is AUTO the switching over to another sensor of the same type is done with a warning indicating the new sensor selection.
- In AUTO mode the switch over to a manual sensor (Manual Speed or Manual Position) is accompanied by an alarm if the manual data have not been set before.
- If the manual sensor selection is chosen the switching over to the backup sensor must be done manually after the respective alarm or warning has been given.
- In the meantime (until a new sensor has been selected) the system is using the last valid values of the disturbed or faulty sensor which produced the alarm.
- It is required to perform the switch over to the new sensor as soon as possible, but not before its data have been checked for plausibility and correctness.

⚠️ CAUTION

In any case (in manual or automatic sensor selection mode) the set data for the sensors running in manual mode must be checked regularly and a real sensor must be selected as soon as possible.

Details are given in chapter ALARMS as required in the explanations to the different sensor alarms.
4.2.1 Integrity Marking of Sensors

In ECDISPILOT Platinum STM a qualitative marking of sensors by alarm icons is used.

For this purpose the main navigation sensors used for the instruments in the permanent area are continuously monitored by the system. If the signal of a sensor is no longer received or is corrupted, or if it is marked invalid by the sensor itself or by the navigation system internal sensor monitoring, a respective "sensor timeout" or a "sensor invalid" alarm message is given for the faulty sensor.

In case of activated AUTO selection mode another connected sensor (if available) is automatically connected to the ECDISPILOT Platinum STM application and the data remain available and valid.

If this is not possible, or if the manual selection mode is used, the sensor will be marked invalid by an alarm icon shown before the sensor label in the instruments displayed on the permanent area.

This can happen for the heading (HDG), speed through water or over ground (STW or SOG), and for course over ground (COG) labels in the Heading & Speed group and for the position data.

If the manual input mode is selected (caused by sensor failure or decision of the operator) and the manually set data are used for any navigation sensor, this will be shown by the icon, which is indicating manual input mode.

On a vessel at sea manually set sensor data are generally to be treated as doubtful and with low integrity as they must permanently be monitored and adapted to the real situation by the operator.
4.2.2 General about Heading and Speed

This group displays information about the actual values for heading and speed and offers the possibilities to choose different heading and speed sensors 1).

In front of each depiction of one of the sensors, there may be a symbol indicating a warning or an alarm.

<table>
<thead>
<tr>
<th>Yellow</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Yellow Symbol]</td>
<td>![Red Symbol]</td>
</tr>
<tr>
<td>Input from the process is disconnected in the software, and the value is entered manually by the operator</td>
<td>Error in the Control and Supervision system, the indication is invalid or the value received from the sensor is outside the legal limits</td>
</tr>
</tbody>
</table>

Table V / 2 Integrity Marking for Heading/Speed Sensor Data

---

1) The sensor selection list is depending on the navigation sensors connected to the system.
4.2.3 HDG - Heading Sensor

The value for heading is the direction the bow of the own ship is pointing at. It is derived from the compass system of the ship. Behind the heading value, the actual choice and the selection mode of the heading sensor is displayed.

**Auto**

Means that the heading sensor is chosen by the system automatically. The best available sensor will be used. If a failure occurs on the actual sensor, the backup sensor is chosen, if available, and a warning is given.

**Gyro x**

From the number of gyro compasses that are connected to the system, one can be chosen to be used as heading sensor. Sensor selection mode is manual.

**Manual**

The actual course of the own ship can be entered manually. In case a manual value is present, the indication of the value is preceded by a yellow circle in the same line.

---

1) only if option for simulators has been set

---

CAUTION

Be aware that a missing or wrong speed input to the compass system can also produce remarkable course errors.
4.2.4 General about Speed Sensors

Speed sensors are treated as part of the CCRS. (See page 115 for details). This means that the indicated speed data and the speed vector displayed in the PPI/chart area are valid for the reference selected for the CCRS, see page 130.

It must be ensured that an approved SDME (Speed and Distance Measuring Equipment) is connected, that means that all speed sensors must accord to IEC 62388 (2007) and to IMO resolution MSC.96(72).

There may be several speed sensors connected to the system. One of them is chosen by the system on start-up. In the case of speed sensors which transfer the longitudinal speed only, the drift and set can be entered manually, because those devices cannot detect the effect of leeway and current. As an alternative to selection of a speed sensor, it is also possible to input the speed manually, if necessary.

The speed sensors also include position sensors which transfer not only the position but also the speed and course made good. Compared to the present-day state of the art, they generally do not meet the IMO Performance Standards for SDME (Speed and Distance Measuring Equipment, IMO resolution MSC.96(72). Therefore, they might not be configured in the system, and so it might not be possible to select them for speed input.

Two different values for the speed of the ship are displayed:

- **STW: Speed through Water**
  Only the longitudinal speed (i.e. the speed in ship’s direction) is indicated behind STW. An arrow-head describes the ahead or astern velocity. The speed through water results in a speed vector described by CTW, STW. The speed through water often is not equal to the speed over ground, set and drift may influence the measurement. Speed logs for water speed (single axis log) often do only measure the longitudinal speed, i.e. the speed mainly produced by the propulsion of the ship. In this case the CTW is equivalent to the actual heading.
  The resulting velocity is also indicated as a CTW/STW vector on the HMI and graphically in the PPI/chart area.

- **SOG: Speed over Ground**
  The speed over ground is the most accurate and best way to determine the ship’s speed. It is often measured by two-axis logs, Doppler-logs or alternatively by position sensors which calculate the ship’s speed from the difference of positions and the time elapsed while sailing.
  The resulting velocity is indicated as a COG/SOG vector on the HMI and graphically in the PPI/chart area.
4.2.5  **STW - Speed through Water** ¹)

Next to the depiction STW there is a small indication like an arrow-head. This is the speed vector indicator. It shows the direction of the vector addition of the longitudinal and the transversal own ship’s speed through water.

If the ship is moving straight forward through the water, the arrow head points upward, if it is moving straight backward, the arrow head will point downward.

The arrow head may also point into any other direction, then the transversal speed component makes the ship move sideways through the water ²).

**AUTO**

Means that the STW or water-speed sensor is chosen by the system automatically. The best available sensor will be used. If a failure occurs on the actual sensor, the backup sensor is chosen if available, and a warning is given.

**Log x**

The selected speed log is used as system sensor for water speed. The sensor selection mode is manual.

**Manual**

The actual STW of the own ship can be entered manually. In case a manual value is presently used, the indication of the value is preceded by a in the same line.

Before having changed the speed sensor to manual mode, use the **Set Speed...** function in order to enter the desired value, which should match as good as possible to the real speed through water of your ship.

---

¹) The selected CTW/STW vector for speed through water is used as the data source for Water Stabilization of the targets in the radar PPI/chart area.

²) Transversal speed information is only available if a 2-axis speed log is connected.
4.2.6   COG - Course over Ground ¹)

The value for course over ground is calculated
- by use of the heading and the log sensors (a bottom-track-log for example) or
- computed from the measured values of a sensor and additional information (a water-track-log and the values for drift and set for example).
- It can also be computed from the difference of own-ship positions within a specified time (normally delivered by a position sensor in a specific telegram).

The method the COG is computed depends on the sensors selected. For example, in case of the speed log its longitudinal and transversal speed values together with the heading value are used to calculate the true course vector over ground. The system decides itself and chooses the best and most accurate way to compute the COG. In any case the indicated COG is based on the data received from the speed sensor shown behind the SOG value.

☞ The COG/SOG instrument in the Navigation Sidebar displays course and speed over ground as a data pair describing the direction and the length of the speed vector over ground.

¹) The selected COG/SOG vector for speed over ground is used as the data source for Ground Stabilization of the targets in the radar PPI/chart area.
4.2.7 SOG - Speed over Ground

**AUTO**

Means that the speed over ground sensor is chosen by the system automatically. The best available sensor will be used. If a failure occurs on the actual sensor, the backup sensor is chosen and a warning is given.

**Manual Sensor Selection**

**Log x**

The selected speed log is used as system sensor for ground speed. If the selected log is a single axis log, it is advisable to enter set and drift to correct for tidal currents.

**GPS x**

Position sensors may be selected as input for SOG values. See also hint on page 138 for details.

**REF TGT**

Speed input can only be selected on radar systems and if, as a minimum, one tracked target is selected as a reference target (shown as \[ \bigcirc \] on the PPI).

**STW**

Sets the SOG to the same value as STW. In this case it is advisable to enter set and drift to correct for tidal currents.

⚠️ If set and drift are not set or initialized, it may happen that the COG/SOG data will be made invalid.
4.2.8 Set Drift

Depending on the choice of sensors, the values for direction and strength (speed) of the drift are computed by the system or they have to be entered by the user, in order to get an accurate measurement for COG and SOG. In order to enter the set and drift manually, open the drop-down lists for SOG, click on Set Drift... and enter the values in the appropriate fields.

Afterwards, click on Set to accept the values entered.

Manual

The actual STW of the own ship can also be entered manually. In case a manual value is presently used, the indication of the value is preceded by a in the same line.

Before having changed the speed to manual mode, use the Set Speed... function in order to enter the desired value.

Setting a manual speed value for the SOG instrument often also requires the manual Set and Drift input, in order to correct for the set and drift created by wind and waves and the current.

CAUTION

Manual speed and REF TGT speed input are only to be used as temporary solution. In both cases it must be observed repeatedly if the values used are still valid and stable.
4.2.9 General about Position Sensors

The position display indicates the Lat/Lon values, the position status and its selection mode.

With Adjust, the position data can optionally be corrected for position errors. In front of each depiction of the values LAT/LON, there may be a symbol indicating a warning or an alarm as follows:

<table>
<thead>
<tr>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>The sensor is disconnected from the application, and the value is entered manually by the operator</td>
</tr>
<tr>
<td>Red</td>
<td>Error in the Control and Supervision system, the indication is invalid or the value received from the sensor is outside the legal limits</td>
</tr>
</tbody>
</table>

Table V / 3 Integrity Marking of Position Sensor Data

Position sensors are treated as a part of the CCRS. See page 115 for details. This means that the LAT/LON values indicate the position of the selected reference (CCRP/RADAR/Track). For this function the sensor locations defined on service level are utilized.

CAUTION

- When using the system as a planning system, position coordinates obtained from a chart with a datum deviating from WGS 84 must be converted to WGS 84 User Symbols and route data.
- The only position receivers that may be connected to the NACOS Platinum system are those that output the position values in the geographical reference system WGS84 via an interface as per IEC 61162-1.
- It must be ensured that an approved EPFS (Electronic Position Fixing System) is connected, that means that all position sensors must accord to IEC 62388 (2007) and to IMO resolution MSC. 112(73).

If more than one position sensor is connected to the system, a position monitoring function will automatically be activated and will be running on the PC 1).

The data transmitted from a position sensor to the system may contain additional information about validity, sensor type, sensor mode etc. These data are combined in the sensor label shown in the position display, examples are as follows:
- Types: GP (for GPS), GL (for GLONASS), GA (for Galileo), LC (for LORAN C), IN (for INS)...
- Modes: A (for autonomous), D (for differential), P (for Precision), R (for RTK), F (for float RTK)...
(Modes E (for Estimated), M (for Manual), S (for Simulation) are not accepted as valid input data)

1) This function is a mandatory requirement for ECDIS.
4.2.10 Position Sensor Selection

Changing the position sensor will also have an effect on the position monitoring function. The sensor selection list is dependent on number, type and mode of the position sensors connected to the system.

**AUTO**

Means that the position sensor is chosen by the system automatically. The best available sensor will be used. If a failure occurs on the actual sensor, the backup sensor is chosen and a warning is given.

**mGPS n**

Selects the desired position sensor from the list of available sensors in the system.

- **m** indicates the sensor mode,
- **GPS** may be replaced by another sensor type,
- **n** indicates the sensor number.

As long as the mouse pointer is positioned above the depiction of a sensor, the position data delivered by this sensor and also the offset position of the sensor from the actual CCRP position are displayed in a tool tip window.

**Manual DR**

As long as **Manual DR** is selected, the manually entered position will be used as the basis for all further position calculations by dead-reckoning. This method uses the gyro heading and the speed of the selected COG/SOG speed sensor to estimate the own-ships position. In case a manual value is present, the indication of the value is preceded by a ▼ in the same line.

**CAUTION**

The accuracy of the dead-reckoned position (shown in the position display as: **Manual DR**) must be checked continually, because its accuracy is very poor and its position error is increasing over time. For safety reasons, an available position-sensor must be selected as soon as possible.

**Set Estimated...**

The actual position can be entered manually by means of the on-screen keyboard.

After a position sensor failure the last valid data received from the sensor are automatically present in the input fields. Be sure to correct the data input if the last valid data taken over from the sensor are no longer valid.
In addition to the selectable position plot of the 2nd position sensor (see 2nd Past Track) for display in ECDIS mode, the ECDISPILOT Platinum STM system provides a sensor integrity monitoring.

If a second and independent sensor is available for one type of navigation data (i.e. position, or speed,...), an additional sensor monitoring can be activated.

The main sensor is monitored by comparing its data with the selected secondary sensor. Limit values can be set by the user.

If the secondary sensor is not available or is showing a large deviation from the primary sensor, a warning is given. In addition this new status is indicated next to the sensor data field with a yellow symbol similar to the caution symbol as used for alerts. The same yellow symbol appears, if the monitoring for this sensor is switched off by the user.

### Dead-Reckoning

Integrity monitoring of position data is supported by two monitoring processes in parallel:

1. The first process compares the selected position sensor (i.e. GPS 1) with the selected secondary position sensor (i.e. GPS 2). If the comparison fails, the Position Monitoring Warning is given.

2. The second process compares the selected position sensor (as above) with a dead-reckoning position (DR) based on SOG and COG. If the comparison fails, the DR Monitoring Warning is given. By acknowledging this warning, the DR process is automatically reset.

The yellow caution symbol shown above in front of the position menu appears, if both position monitoring processes fail or have been switched off.
4.2.12 General about Position Adjust

For various reasons, it can happen that the position of the electronic chart on the screen is not in agreement with reality (i.e. with the ship’s own position). In such cases, the **Position Adjust** function offers the possibility of adding the necessary correction value to the system position.

Position Adjust is used to correct a constant position-error (position offset) of the selected position sensor or of a manually set position in Manual DR mode.

---

**CAUTION**

The Position Adjust function must be used extremely carefully! An offset is added to the received position data, which will have an impact on all applications based on or using position data!

---

**How to Detect a Position Offset**

If the displayed LAT/LON position is incorrect, the videos and the target symbols of fixed point-targets (e.g. buoys or landmarks) do not coincide with the chart symbols of these targets or with the user made symbols that are entered at the correct positions in the chart.

A position offset of the position sensor can also be made visible without displaying the chart background on a radar, if you observe the coincidence of AIS target symbols with their target videos:

- If all targets have an offset in the same N/E direction, a position error is very probable.
- If all targets have the same bearing offset, it is more probable that either the radar itself or the compass system needs to be adjusted.
4.2.13 Correction by Position Adjust

The position error can be corrected manually by making the video or symbol of a fixed target coincide with its chart symbol:

1. Switch on a sufficiently small display range to be able to observe and measure the position offset. If no radar targets are available as a reference use other means to determine the position error.

2. Click on the Adjust button in the Position display. In the input dialogue which then opens, key in the North and East values of the offset you want to eliminate. South and West values must be set as negative values.

Note: If the chart object is located north / east of the relevant radar target you must key in a North / East value and vice versa. With other words: you must shift the chart object to the radar or ARPA target.

3. Clicking on Set in the input dialogue takes over the offset value 1).

4. As a result, the correction values displayed in the Adjust dialogue take effect as a position offset and this offset is added to the position data of the sensor.
   - The entire track and chart synthetics move by an amount equal to the position offset. With other words the own ship's position jumps on the screen (the PPI / chart area) exactly by that offset.
   - The position offset that is entered continues to be displayed in the Adjust dialogue.
   - In this way, each direction (N/S and E/W) can be corrected by up to 999 m.
   - The LAT / LON data are marked with the manual input symbol as long as a position offset is applied.

5. Check that the other symbols of the chart and the AIS target symbols too now coincide as well as possible with their radar echoes. If necessary, the steps 2 to 3 can be repeated to correct the position offset.

Deleting the Position Offset

The position offset can only be deleted manually by clicking on the Adjust button and entering 0 m for each direction.

The position offset is not deleted automatically when a different position sensor is selected.

Check regularly whether the position offset is still valid, especially after a change of positional accuracy from DGPS to GPS and vice versa or after selection of another position sensor.

When the watch is changing over, the selected offset must definitely be pointed out to the new officer of the watch.

1) 1) Click on Cancel if you want to discard all inputs
4.3 Vector and Trails

Basically, the display of vectors and trails depends on the way of speed determination within the system.

Speed Over Ground (SOG), the so-called Bottom-Track, or Speed Through Water (STW), the so-called Water-Track can be used in order to compute the vectors for the own ship and the targets.

The speed vectors of the own ship and of targets, the trails of targets, the past-position plot and the path prediction for the own-ship can be configured here.

The speed vector, the target trails and the target’s past position plot can be displayed as true or relative.

The own ship’s position plot is only displayed as true plot, i.e. it is independent of the T/REL (True/Relative) setting.

The setting T for true or REL for relative measurements is valid for all vectors and trails within all navigational applications of a workstation.

As mentioned before, the calculation principles for relative or true data have some important differences:

The relative data are calculated directly by the ARPA. The ARPA uses the plots of consecutive antenna scans in order to calculate relative course and speed of the target. Out of this, CPA and TCPA can be calculated.

In order to calculate true data of a target, the own ship’s course and speed must be known. The accuracy of the true data calculation depends on the accuracy of the sensors from which the own ship’s course and speed are provided.

CAUTION

If there is any doubt that the own ship’s speed data are not correct, use the REL target data and PPI presentation for collision avoidance purposes!
### 4.3.1 Ground / Water Stabilization

For true vectors and trails it can be selected if the ground speed or water speed based stabilization shall take place. Ground stabilization is normally used for all kind of navigational functions. Water stabilization is often used for anti-collision functions. In case of relative display mode, the stabilization is not relevant.

Select

- **Ground**
  
  for Bottom Track computation. The speed over ground (see COG/SOG) will be used to determine the true vectors and trails.

- **Water**
  
  for Water Track computation. The speed through water (see CTW/STW) will be used to determine the true vectors and trails.

The position plot of the own ship and the path prediction are always ground stabilized (i.e. use the COG/SOG vector).
4.3.2 Vector

The direction of the own ship speed vector corresponds to the existing course of the own ship. The length corresponds to the existing speed of own ship.

Together with the calculated speed vectors of the tracked targets, the display of the speed vector can be switched on and off, and the time represented by the displayed vectors can be specified. Furthermore, it can be seen from the vector symbol of own ship whether the vector is relative to the sea (Water selected in Stabilization = one arrow-head) or relative to the bottom (Ground selected in Stabilization = two arrow-heads).

Vectors of targets can be displayed as true or relative. In relative vector mode the own ship’s vector is not shown.

The length of the vectors depends on the time that is selected in the drop-down list, choose between Off, and 1 to 9 minutes.
4.3.3 Trails

For radar echoes moving on the PPI, video trails can be displayed. These trails can be used as synthetic afterglow of the target video. Trails are generated from previous antenna scans and can be varied as follows:

- The display of trails can be switched on and off.
- Their length can be specified.
- If the screen stabilization is set to **Rel. Motion**, the trails can be displayed with the PPI/chart area orientation North-Up and Course-Up relative to own ship or with true (absolute) orientation, i.e. in relation to the sea bottom or water stabilized.
- The trail history can be deleted so that they have to build up again
  - by the setting **Off** in the menu and selecting the time again
  - by a **MORE** click into the PPI and selecting **Clear Trails**

In the true display mode, trails make it possible to reach a conclusion quickly about the maneuver performed by radar targets. In the relative display, the trails provide a quick overview of the danger situation (a constant bearing can quickly be recognized). However, only qualitative information can be obtained from them.

### CAUTION

If the trails are lengthened, they reach the new specified length only after the time difference (i.e. in the case of switching over from 4 to 12 minutes, 8 minutes will pass before the trails correspond to a length of 12 minutes).

The reduction of the trail length too takes some time.

**Switching the Display of the Trails On and Off**

The display of the trails is switched on and off by clicking on the **Trails** field.

**Specifying the Length of the Trails**

Click on the **Trails** field with the **MORE** key; then, in the dialogue that is opened as a result, click on the desired time

In the **Trails** field, the length currently being selected is indicated, i.e. the **max.** length of the trails on the PPI.

**Switching the Trails to Relative or True Display**

The switch-over is performed by clicking into the **Relative/True** field in the **Vectors & Trails** group. This selection is then also valid for target vectors and their past plots.

**Deletion of Trails**

Click on the PPI area with the **MORE** key. In the dialogue that is opened as a result, click **Clear Trails** with the **DO** key.

The trails are also deleted whenever a switch-over occurs which changes the entire radar video transceiver selection or range, but they then appear again and build up over time.
4.3.4 Plot

The past position plot corresponds to the past movement of the own ship. There are four time markers on the position plot. The distance apart in time can be set. The setting of the time marker spacing also defines the entire length of the plot that is displayed. This setting and the on/off switching of the past plot display take place in common with the past plots and time markers of the targets.

Plots can not be deleted, so that they do not have to build up again after switching them off.

The length of the past plot depends on the time that is selected in the drop-down list. Choose from Off, and 15 sec to 12 minutes. The plots can be displayed as relative or true. In REL mode the own ship's plot is not shown. The way of displaying plots is switched together with the vectors and trails of targets in combination (T/REL selection).

---

⚠️ CAUTION

If the time interval for past position plots is lengthened, it reaches the new specified length only after the time difference has passed (i.e. in the case of switching over from 6 to 12 minutes, 6 minutes will pass before the past position plots correspond to a length of 12 minutes).

The reduction of the interval too takes some time.
4.3.5 Predict

In the small display ranges up to 1.5 NM, depending on the size of the symbol, it is possible to display the probable track (the predicted path) along which the own ship will travel if it maintains its existing rate of turn and its existing speed. The prediction time can be set here.

In comparison to the own ship symbol in true scale, the prediction graphics is drawn with thinner lines.

The prediction length can be set by the time value in the drop down list belonging to the Predict setting. Choose between Off, and 10 to 90 sec.

In later SW versions (> 2.0) the colour of the prediction graphics can be adapted. Please refer to the main chapter about GENERAL SETTINGS and there to Own Ship Symbol.
4.4 Charts

Switching on the chart display

The chart overlay can be switched on and off by the Charts drop down menu.

The chart content itself can be adjusted to an operator selectable level. Select Presentation, Chart and Display from the expander in the Display Sidebar to access the details of possible settings. On the same expander the displayed depth contours and depth shades can be set.

Determining the edition number

In order to determine the edition number of the presentation library, right-click into the application area and choose Chart Information.

In the lower part of the application area, a new window opens. Click on Chart Legend, Presentation, Presentation Library. In the Details group the edition number is displayed.

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1) The Charts Drop Down Menu and the Charts Status Line are only active if the ECDIS application is installed. If only RADAR is installed, the drop down menu remains inactive.
4.4.1 The Chart Status Line

The **Chart Status Line** is always visible if a chart application is active.

![Chart Status Line Diagram](image)

**Warning Field**

Non ENC (with yellow or orange warning symbol), this is only visible if the ENC vector charts on screen and at least one part of the screen is filled with data from a "Non Official Vector Chart".

In the Cursor-Tool-Tip of this part of the screen the text: "**Non-IHO data may not be used for navigation. Please refer to paper chart.**" will be visible in that part of the screen.

**Category Field** (see also main chapter about CHART FUNCTIONS)
- **Standard** is the IHO Standard selection for visible chart objects
- **Base** is the IHO Definition for the minimum required selection of visible chart objects
- **All** means that all chart objects are visible, except objects for data quality indication
- **Customized** means that the user's selection of visible chart objects is displayed
  - If in the **Customized** mode at least one visibility group is switched off, then the appropriate mode and an additional '-' character will be displayed.
  - If in the **Customized** mode at least one visibility group is added, then the appropriate mode and an additional '+' character will be displayed.

In the Cursor-Tool-Tip of this part of the screen the details of the actual selections are displayed.

**Date Dependent Field**

**Always**: Is only visible if in the presentation menu the selection button "Date Dependent" is set to "Always". In the Cursor-Tool-Tip of this part of the screen the text: "**Date dependent objects are always visible. Information displayed may be incorrect for the present date and time.**" will be visible.

**Depth Field**

**[m]**: The actual units for chart depth values belonging to the chart cell at the own ships position in True or Relative Motion mode or at the center position of the chart area in **Browse** mode.

**Status Field**

**Over-scaled Xn.n**: The chart cell at the own ships position in True or Relative Motion Mode or at the chart center position in Browse Mode is displayed with a larger scale than defined for this cell. The actual over-scale factor is displayed as Xn.n. (e.g. X2.5 means that the chart is displayed with Range 2.5 times smaller than normally defined).

The text **Better scale available** will be displayed here (additionally) if a chart is available at the same position with a better 'Navigation purpose' (smaller scale). More chart details will be made visible if you change to a smaller display range scale. The text **No ENC available** will be displayed here if no chart with an appropriate scale exists at the own ship's position. In the Cursor-Tool-Tip of this part of the screen a detailed text will be displayed additionally.
4.5 Display of Targets

ARPA and AIS targets can be displayed simultaneously on the chart/PPI. In some cases it is possible that one and the same object is tracked as an ARPA target and also activated as an AIS target. If the ARPA and AIS target have similar data for distance, course and speed, they can be merged. This means that they are treated as one target as long as the similarity is existing. The limits for the similarity of the data can be defined by the operator.

In other cases it is possible that the two targets are treated as two different objects.

Anyway under Fusion, the system can be set in a way that one type of targets has priority being displayed. Nevertheless, both types of targets are still tracked or remain activated in the background.

Independent of the selected priority in the chart/PPI it can be selected for an individual target which data and graphics shall be shown. Additionally it can be selected under Sleeping which type of sleeping AIS targets are to be displayed continuously.

With the selection Trial the trial maneuver function can be activated or switched off.

Fusion

Defines temporarily the priority for showing the ARPA or AIS target symbol and target data in case that the defined target association limits are fulfilled.

See at page 79 for details about target fusion function and settings.

Sleeping Targets

AIS targets are divided in Class A or Class B targets.

- Class A are commercial vessels,
- Class B are leisure crafts

With this selection list it can be chosen which types of sleeping AIS targets are displayed in the PPI continuously and are available in the target list.

Later SW versions are providing one further entry called Navigate for the selection of all targets which are not mooring or anchoring. But if a target has set its AIS parameters to mooring or anchoring and is moving with more than 3 Kn it is still displayed.

Even if the AIS target display is switched off for above mentioned vessels (i.e. even if None is selected), all received AIS target information is continuously processed in the background. In any case those AIS targets being classified as Dangerous can be activated automatically if this function is not switched off. If AIS targets are already tracked and their display is switched off in the above menu, already activated targets remain in the PPI and in the target list.
4.6 Trial Maneuver

The Trial Maneuver simulates a planned maneuver of the own ship including tracked or plotted targets. The simulation is started based on the present values for heading, course and speed as well as the complete currently valid target scenario.

The trial maneuver can be set as follows:
- simulation of a course change, including the radius to be used by the ship during the maneuver,
- the delay until the beginning of the simulated maneuver (the Delay) and by
- simulation of a speed change at the instant of the maneuver.

The simulation itself is executed by shifting the Time slider to the desired point of time. It can be stopped in between at any time and continued afterwards. Setting the slider back to zero will update the own ship presentation and the target scenario to present values.

☞ It is recommended to use the trial maneuver function in relative vector mode in order to evaluate the change of the relative target data first.

☞ If true vectors are used, it is recommended to select a speed sensor with water stabilization (Set the stabilization, REF to Water in the Vector & Trails group).

The scenario to the right shows a simulation with the own ship sailing for further 5 min (delay) into the initial direction and then turning to 252 deg.

Target 24, which is listed in the target list, is passing with a CPA of 2.43 NM. Target 6 is far away.

If the delay for the planned maneuver is reduced, target 24 will be on collision course.
4.6.1 Switching On the Trial Maneuver Dialogue Window

- Switch to REL in the Vector & Trails group of the Navigation Sidebar.
- In the Targets group choose On for the Trial control.
- After having finished the simulation choose Off to close the menu or click to the Close icon of the dialogue window.

The Trial Maneuver dialogue window appears in the PPI or chart area with the following data:

- Course: The currently existing course (the course is changed when the ship is turning) 1)
- Speed: The currently existing speed (the value is constant and taken as start speed) 1)
- Radius: The radius with which the maneuver is to be simulated. If the dialogue has not been used before, the minimum radius is displayed, otherwise it shows the last used radius.
- Delay: 0 minutes. Can be set for simulation of a delayed start of the course and speed maneuver.
- Time: 0 minutes. Must be set for simulation of the time instances during the maneuver.
- Target list: The latest SW version includes up to three most critical targets at the bottom of the menu with simulated target data.

The following changes occur in the PPI or chart area after activation of the trial maneuver function 2):

- In the lower region of the application area a large T symbol is shown to indicate the trial mode and that after starting the simulation by moving the time slider, the symbols and vectors of the targets are no longer displayed in accordance with the real situation.
- The vectors and the video trails (if any exist), are displayed relative and the own ship is shown without vector but always with the correct present heading line.
- Past position plots are not displayed during the trial maneuver, but (if Plot is in the switched on state) they are continuously built up in the back-ground and are visible again as soon as the trial maneuver is ended.

☞ As long as the Time bar remains at zero position the display content and the target list still correspond to the real situation. The vector display (of the targets) must be switched on during observation of the maneuver.

1) The resultant value used for the display of the own ship speed vector during simulation
2) The radar video and the true or relative target trails are updated as normal and are not influenced by the maneuver simulation.
4.6.2 The Trial Maneuver in REL Vector Mode

In relative display mode, a collision course can be recognized from the fact that the vector of a target is pointing towards the own ship symbol (constant bearing).

A maneuver of your own ship must be simulated which avoids this constant bearing while at the same time fulfilling other conditions (e.g. keeping within the channel, avoiding shallow water and obstructions, avoiding other ships, etc.).

Depending on the used display range a suitable vector length should be set so that the results of the trial maneuver are clearly visible.

The general screen-stabilization and the alignment of the heading line may remain unchanged, or can be set by the operator as required. With other words, the Trial Maneuver can be observed in Head Up, North Up or Course up orientation.
4.6.3 Simulating a Course Maneuver

Use the **Course** and **Radius** slider to set the desired amount of course change and the radius with which the maneuver is to be simulated.

During adjustment, the simulated course change is displayed in form of a curved headline. A change of max. +/- 180° relative to your present course can be simulated. The heading and the present course is updated automatically if your ship is turning during the maneuver simulation.

After course and radius have been set, use the Time slider to simulate your ship sailing along the pre-planned course change. All displayed targets will move accordingly with their current speed and course and the change of their relative vectors will show the further development of the scenario step by step.

The time setting can be done continuously by moving the slider or (by clicking) stepwise in 5 sec increments up to 30 min complete duration.

Because of the REL Vector Mode, the relative speed vectors are rotated and change their length by the simulated course-change. If one of the targets will change its status from dangerous to not dangerous and vice versa, this will be shown by a change of their symbol's color.

Also during the trial maneuver the collision calculations take place, which would indicate a dangerous target symbol in red color as soon as the anti-collision limits are infringed.

---

1) The collision calculations of the trial maneuver simulation implement the same alarm limits for CPA and TCPA as set for the normal target tracking in the **Dangerous Targets** group of the **Settings > Targets** menu.
4.6.4 Setting the Delay and the Speed of the Simulated Maneuver

Use the Delay slider to set the time that is to pass before the simulated maneuver begins.

The future situation at the point in time defined by the delay value is now displayed in form of a modified own ship track line ahead (along the present course direction) and the previously defined course change is shown at a distance ahead, calculated from the present speed and the delay time.

The maneuver simulation itself must be controlled as described above with a movement of the Time slider or clicking into the Time bar.

If no suitable maneuver can be found by means of these two settings, a speed change must be simulated:

**Simulation of a Speed Change**

Use the Speed slider to set the speed at which the ship is to travel from the beginning of the simulated maneuver onwards.

Because of the REL Vector Mode, the simulated course-change causes a change in the directions and lengths of the targets speed vectors.
4.6.5 The Trial Maneuver in True Vector Mode

In True Vector Mode, the trial maneuver is displayed with true vectors for the targets and own ship. Both the radius planned for the course change maneuver and the acceleration behavior for the speed change that is set, and the delay are taken into account. All settings made in REL vector mode can still be changed in the True vector mode.

The switch-over between True and REL Vector Mode is performed in the Vector & Trails group by clicking on the REL or T selection button.

☞ It is possible at any time to switch between the two vector modes without any loss of data or information. In both modes the same state of the maneuver is shown on the screen, if no other trial maneuver setting is changed.

☞ It is recommended to use the true trial maneuver together with a speed sensor giving speed through water. This can be selected as in normal operation mode of the system by selecting REF Water instead of REF Ground in the Vector & Trails group.

☞ Whenever it is not sure that the calculated data or the used sensor data are correct and stable, it is recommended to perform the Trial maneuver in REL mode (see above).

As a result of the switch-over into True Vector Mode, the following changes occur:

- True vectors and true target trails are displayed. Past positions of targets remain invisible as long as the Trial maneuver is running.
- Own ship and all targets are shown at their currently existing positions with their true vectors as long as the Time value is set to 0:00 min.
- The trial maneuver line is displayed. It represents the track on which the ship would perform the simulated maneuver. The Radius displayed in the maneuver dialogue is taken into account for calculation of the course change.

The simulated maneuver-settings can now be changed in the same way as described above for the relative maneuver mode:

Use the Course, Speed, Radius or Delay slider to set the desired parameters with which the maneuver is to be simulated and move the Time slider to see the future development of the scenario.
4.6.6 Checking the Trial Maneuver

By means of Time, the instant of time that is to be considered can be set:
- Click on the Time bar slider and, with the trackball, vary the time instant that is to be displayed
- or -
- click on the slider bar, but not to the slider, to produce 5 sec time increments stepwise.

By continuous variation, a synchronized display of the simulated own ship positions and target positions takes place. If, for all time values, an adequate distance between own ship symbol and the target symbol is displayed, the trial maneuver will not show a dangerous approach.

Also during the true trial maneuver the collision calculations 1) take place, which would indicate a dangerous target symbol in red color as soon as the anti-collision limits are infringed.

If necessary, any of the trial maneuver settings can now be changed and the check can be repeated.

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1) The collision calculations of the trial maneuver simulation implement the same alarm limits for CPA and TCPA as set for the normal target tracking in the Dangerous Targets group of the Settings > Targets menu.
4.6.7 Further Information about the Trial Maneuver

- The maneuver can be observed with relative or true vectors. As during normal operation, the vector mode is to be set in the **Vector & Trails** group. This setting will also have an effect on the trails and the past position plots before the maneuver function is started.

- In both of the vector modes, the maneuver radius that can be set and the acceleration ¹) for the set speed-changes are taken into account additionally to the planned course change.

- At any time before or during the simulation, you can change between **T** and **REL** maneuver vector mode, without changing other simulation parameters.

☞ The target tracking / plotting and the manual and automatic target acquisition are not interrupted during the execution of a maneuver, but no new sleeping AIS targets can be activated manually. This means also that the target list under **Tools > Targets > List** at all times displays the currently valid data of the target tracking process and **not** the trial maneuver data.

☞ Contrary to targets already being tracked by the ARPA, radar targets which are in the state of "under evaluation" (i.e. being in "acquisition status") will not be taken into account for the trial maneuver.

☞ As long as the Trial maneuver is active, the **Dangerous Targets** function (ARPA and AIS) is automatically **On**, independently of the settings under **Settings > Targets > Dangerous Targets** and **AUTO ACQ AIS Targets** respectively.

¹) The min. and max. radius and the acceleration behavior of the ship are entered at service level during setting-to-work.
The menu bar provides functions to navigate between applications and screens. To open the menu, click on the **Menu** button in the bottom left corner of the display. The menu resembles the Start menu of MS Windows 7. The figure below shows an example of a menu which is displayed when clicking on the **Menu** button. Depending on the installed applications it might look different:

![Opened Main Menu](image)

**Select one of the items from left to right to:**
1. Open the Settings Bar
2. Take a screen snapshot
3. Jump to Super Home Page
4. Set the Default Settings according to IEC Standard
5. Select one of the prepared Favorite Settings

**In case of a Man-over-Board event just click here:**
The MOB symbol will be placed at current own ship position as a marker. Further steps are described in NAVIGATION TOOLS on page 218.*

*not for FOC manual

When you are moving the mouse or trackball pointer over the buttons of the menu bar, you will experience a roll-over effect indicating the button you are currently pointing at. This will help you to pinpoint the right button for the current operating situation even in case of emergency.
6 Voyage Recording

Background

The ECDIS application is recording the main navigation data in a permanent data base on the hard-disc of the PC. The recorded data are accessible by the operator via screen printout with a data viewer.

Voyage Data Recording

Data recording is done automatically, no operator action is required. Data are stored every 10 sec for a period of 90 days. Older data are deleted automatically.

Voyage Data Replay

Select Voyage Replay from Super Home Page. The voyage replay menu opens with one opened Voyage Replay page.

Enter date and time of the period of interest and set the filter if required for Ship Data, LOPS (Lines of Position) and Chart Data.

Click to the Filter Voyage Data bar underneath. A complete list of data is displayed.

Open another viewer i.e. for a different period by pressing the left top bar Start Voyage Recording Replay. This can be done again for further viewers.

Close a viewer by clicking the cross in the top tab line (see red arrow).
7 Operator Activity Monitoring ("Dead-Man" Switch)

The ECDISPILOT Platinum STM is monitoring the operator activity. Each time any of the operating devices is used, an activity message is sent out to a connected or integrated Bridge Navigational Watch Alarm System (BNWAS).

The message format in the standardized NMEA 0183 (IEC 61162) format is as follows:

$--EVE,142319.71,NACOS,Operator Activity*23

EVE is the message identifier followed by the time, a self-explaining text and a checksum.

This message is given once if in the last 10 sec at least one operator activity has been monitored.

Operator activities are monitored for each key and each control of the RADAR and TRACKPILOT keyboard, for the trackball, and for the ASCII keyboard, the trackman, and the HP standard mouse at the planning station.

If this retrigger message is missing, the connected BNWAS will automatically alert the Master or another qualified OOW.

Fig. V / 15 Operating Devices for Activity Monitoring
CHART FUNCTIONS
1 Introduction and Start

This chapter describes the chart related functions of the ECDISPILOT Platinum STM. It is applicable to all SW versions from 2.0 onwards.

If not already visible, the chart presentation has to be switched on by clicking to the corresponding button in the navigation side bar.

Select one of the available charts, i.e. ENC or IHO-ENC, C-Map ENC, ARCS, C-Map Prof. The standard selection is ENC or IHO-ENC. For differences in conjunction with ARCS charts please refer to page 192.

The screenshot above shows the chart in Head-up mode. Please refer to the north indicator in the top left corner. Some of the navigation tools are shown as an overlay. They are described in the main chapter NAVIGATION TOOLS.

Fig. VI / 1 Elements of the Chart Area
1.1 ECDIS Modes

ECDIS Monitoring Mode

In this mode the ship’s position is relevant for the displayed chart and related data. Different modes for the display orientation of the ship’s movement and screen position can be chosen (same as with radar), but the own ship’s symbol will never leave the Application Area.

ECDIS Planning Mode

⚠️ CAUTION ⚠️

In this mode the chart section on the screen can be displayed regardless of the own ship’s position.

The section can be moved wherever it is desired. When the selected chart area includes the ship’s position, it is displayed also in planning mode.

Even if the ship is not displayed in the chart while the browse mode is active, the monitoring functions for the present own ship’s position will be carried out and warnings (depth alarm, safety contour, etc.) will be given.

The settings for the range and the use of the slider will of course influence the display of the chart. Some other displays and functions in the sidebar may be grayed out since they are only relevant for Monitoring Mode.

The Planning mode is activated by the selection of Browse instead of True Motion or Relative Motion. The Browse mode will automatically be activated in case no position calculation for the own ship is possible.

The Browse mode is possible in North Up and Course Up. Selection of Head Up in Browse mode leads to the Monitoring mode.
1.2 Cursor Pick and Context Menus

Context Menus with MORE (pick at a position)

Context menus are available in the Chart Area in ECDIS mode. Details of the menus are described in the subsequent chapters. This chapter shall give an overview about the entire context related functionality.

By a MORE click (cursor pick) into the application area a context menu is opened which contains all possible user actions at the current pick position.

One example is the chart information providing details of the chart at the position just picked. Please refer to the overview below. Chart information has been highlighted in red.

Please note that not all of the listed entries are referenced to a chart position. Some of them like layer or chart 1 are independent of the picked position.

---

**Fig. VI / 2 Context Menus in the Application Area**

**Context Menus with DO (click to an object)**

Some context menus are related to an object on top of the chart, i.e. a waypoint. If more than one object are found at a picked location, a context menu opens and the operator must select the operation which he wants to access.

**Examples:**

- Waypoint 9 / Leg 009-010 / PI3:
  The waypoint symbol, the leg behind waypoint 9 or the Parallel Index Line 3 can be selected.
1.3 The Chart Information Window

With a **MORE** click within the PPI/Chart area and then on **Chart Information** in the context menu, the Chart Information Window is opened.

In this window, information about details of the chart database and the chart cells can be displayed.

![The Chart Information Window](image)

Fig. VI / 3 The Chart Information Window
1.4 Full Screen Mode and Split Window

1.4.1 Full Screen Mode

The ECDIS can be operated in two display modes: With Sidebar or with hidden Sidebar. Depending on the number of workstations in your navigation system it may not be possible to hide the Sidebar 1).

For Full Screen Mode, click the button in the Menu bar, to restore the sidebar, click the button on the lowest left edge of the screen.

With Sidebar, the screen looks like this:

![Sidebar Mode for ECDIS](image)

---

1) The Full Screen Mode is an option for larger systems where at least two workstations are left in Sidebar mode to indicate the navigation data. This option is not available for ECDISPILOT Basic.
With the Sidebar hidden, the chart covers the whole screen:

![Chart Mode](image)

Fig. VI / 5 Full Screen Mode for ECDIS

### 1.4.2 Split Window

The **Split Window Mode** is a mechanism that divides the application area into two or more fixed windows showing further instances of the same application or additional tables, lists, etc..

- Split window mode is not available for ECDIS in monitoring mode.

To switch over to the split window mode, click to one of the symbols in the top right corner of the screen.

Symbols marked in gray cannot be activated, this mode is not available for the current application.
1.5 The Pan and Zoom Control

The zoom control consists of a slider to adjust the range setting or the zoom factor for the ECDIS chart display. The compass control consists of pan buttons (the name pan has been used because the four buttons are forming a kind of a fry pan), which you can use to move the image section currently displayed.

![Diagram of compass control with 4 pan arrows and slider to adjust zoom factor]

To zoom in incrementally, click on , you will then see more details on the respective display. However, the overall area displayed is smaller. To zoom out again, click on the . You will then see less details but you will have a better general overview of, e.g. an electronic chart displayed.

Using the slider or the controls switches the range for radar or the zoom factor for ECDIS in the steps described later on.

To move the display, use the pan buttons. For example, if you click on then the display moves to the right in increments to view a different image section of a chart or whatever is displayed. The effect is like traveling with the eye over a large map.

To center the display just click on the icon once.

-> It is also possible to off-center and re-center the ship by means of the context menu.

-> The scale can also be set in the permanent area.
1.6 The ECDIS Chart1

The ECDIS Chart1 is a tab that can be opened in the application area. It shows a legend of the symbols used in the charts, ordered by categories like depth, seabed, traffic routes etc.

-> The Chart1 also contains test pictures for color and contrast examination.

To open the Chart1, right-click in the application area and select from the context-menu.

Use the pan control to slide the depiction up/down. Use the slider to adjust the size.

Click to the cross at the end of the tab to close Chart1 (outside this screenshot).

Select from the categories to navigate directly to the desired symbols.

Fig. VI / 7 ECDIS Chart 1
1.6.1 Use ECDIS Chart1 to Check Correct Display of IHO Pres. Lib. 4.0 Symbols

For a graphical way to establish that the ECDIS is correctly displaying the new symbols introduced in IHO S-52 Presentation Library edition 4.0 the Mariner can check ECDIS Chart 1.

ECDIS chart 1 is a legend of the entire set of symbols that may be used within an ENC, it is installed on all type approved ECDIS systems.

The new symbols introduced in IHO Presentation Library edition 4.0 are listed to the right as follows:

1. **Magenta ‘d’ symbol is used with features that have a temporal attribute populated** - in the example to the right both buoys are marked with the ‘d’ symbol, the first has a periodic use and the second has an end date of 27th August 2014. Select Chart Display Info (AB1) from the ECDIS Chart1 menu to quickly access these symbols in Chart1.

2. **Caution highlight for use when features pose a danger to the vessels intended track** - a typical example is a navigational hazard within the look ahead sector of own vessel. It is marked with a yellow double-line. Select Chart Display Info (AB1) from the ECDIS Chart1 menu to quickly access these symbols in Chart1.

3. **Automatic update symbols for identifying where changes to the ENC’s have occurred** - in the example to the right a deleted object, area or line is marked with short brown dashes as shown. An updated object, area or line is marked with small brown circles. Select Chart Display Info (AB2) from the ECDIS Chart1 menu to quickly access these symbols in Chart1.

The ECDIS Data Presentation and Performance Check which was earlier used to check the correct display and to highlight if there were any known ENC display anomalies present in the ECDIS system is no longer applicable and necessary, please refer to page 181 for more details.
1.6.2 Open About Menu to Check IHO Presentation Library Edition Number

All ECDIS must have a function to display the edition number of the IHO Presentation Library that is in use within the ECDIS. The new IHO ECDIS Presentation Library Ed. 4.0 and the new ECDIS test standard IEC 61174 Ed. 4 state:

‘The edition number of the PresLib installed must be available to the Mariner on request’.

All Mariners must familiarize themselves with the function in their ECDIS that will display the edition number of the IHO Presentation Library as this varies across ECDIS manufactures. This function will be required when Port State Control officers want evidence that the ECDIS is up-to-date to the latest IHO standards. MSC.1.Circ.1503:

‘Additionally, ECDIS software should be kept up to date such that it is capable of displaying up-to-date electronic charts correctly according to the latest version of IHO’s chart content and display standards’.

A list of current IHO Standards in force is maintained on the IHO website.

http://www.iho.int/mtg_docs/enc/ECDIS-ENC_StdsIn_Force.htm

The SW version numbers can be accessed by clicking to the Menu button at the bottom left of the screen and opening the About menu. It shows the various numbers and side information as follows:

1. Name and IMO number of vessel
2. SW version number
3. Build number of the Platinum application
4. SW version of the sensor interface
5. Database build number
6. Workstation number, i.e. MFD-xx
7. Operating time since power on
8. About for Module versions and various connected units like ECDIS with applicable standards, i.e. here the Presentation Library S-52 Annex A Ed. 4.0.1.
1.6.3 Background - IHO ECDIS Data Presentation and Performance Check

Please find additional information about ECDIS Performance Check in the following lines form IHO:

In October 2011 the IHO issued the ECDIS Data Presentation and Performance Checks, two fictitious ENC cells intended to assist Mariners identifying if their ECDIS was using the latest IHO S-52 Presentation Library, edition 3.4. The dataset also highlighted if there were any known ENC display anomalies present in the ECDIS system.

Mariners were asked to run a series of quick ECDIS tests using the check datasets to ascertain if they were experiencing a display issue. If the system was found to be running an old IHO Presentation Library or had a more serious display anomaly Mariners were advised to contact their ECDIS manufacturer to obtain software patches and investigate further to resolve the issues. Results of the tests were to be sent to the IHO to inform the IMO, national Hydrographic Offices and for use in revising IHO standards.

The IHO ECDIS Data Presentation and Performance Checklist were not ever intended for, and are not suitable to be used as a Port State Inspection / Carriage compliance test for ECDIS.

To further address the ECDIS display anomalies and improve the ECDIS user experience the IHO issued S-52 Presentation Library edition 4.0 in September 2014.

The principal benefit of upgrading ECDIS systems to the latest IHO Presentation Library will be the reduction in audible alarms, helping ease the issue of alarm fatigue on the bridge whilst maintaining safety at sea. The introduction of an alert model based on the requirements in the IMO ECDIS Performance Standard will also harmonize ECDIS alarm and indication behavior across different manufacturers systems.

A number of new symbols have been added to the IHO Presentation Library edition 4.0. These symbols will identify features that require an indication highlight, the location of automatic ENC updates and ENC features that have a temporal attribute.

A number of other significant changes in the S-52 Presentation Library have come directly from Mariner feedback. For example, the names of Fairways and Anchorage Areas will now appear on the ENC display and a hover over function for certain charted features has been introduced.

The IHO co-ordinated with the IEC to align issue dates of S-52 and IEC 61174 – ECDIS Operational and performance requirements, methods of testing and required test results, and as a result in Aug 2015 IEC 61174 edition 4.0 was published in Aug 2015. These standard updates affect all new ECDIS systems and new installations from Aug 19th 2015. Current ECDIS users have until Aug 31st 2017 to update their systems to comply with the ECDIS software updating guidance in MSC.1/Circ.1503.

Changes to the IHO S-52 Presentation Library introduced in edition 4.0 will invalidate the tests contained in IHO ECDIS Data Presentation and Performance Checks which were specifically designed and developed for ECDIS using IHO S-52 Presentation Library edition 3.4 or earlier.

An ECDIS type approval certificate showing conformance with tests in edition 4.0 of IEC 61174 demonstrates the ECDIS does not have any of the identified ENC display anomalies. The guidance on page 179 describes the method by which Mariners can check the ECDIS Platinum display for the new ENC symbols contained in the new IHO S-52 Presentation Library edition 4.0.
1.7 Color and Contrast Examination

The Chart1 offers two test pictures, one for color reproduction and one for contrast examination. With these pictures it can be confirmed that the brightness of the monitors is perfectly set according to the environment and that all objects can be identified clearly and easily by the user.

In ECDIS mode move mouse pointer into the chart area, open menu with MORE (right mouse button) and select Open ECDIS Chart 1, open again with MORE (right mouse button) another sub-menu, and select either Color Test Diagram or Gray Scale Test Diagram.

Check if you can see all diagonal lines in the Color Test Diagram and check if you can see all gray bars of the Gray Scale Diagram separately. Adjust Contrast and Brightness if necessary. The color settings of the monitors can not be changed, they are factory set.
The SW version of your ECDISPILOT Platinum STM can be accessed from the Super Home page (see also page 180). For compatibility of your ECDIS system with international standards please refer to the following link: http://www.sam-electronics.de/fileadmin/user_upload/Diverse_PDF_Dateien_ANC/Platinum_ECDIS_Compliance_List_2017.pdf

This link is updated as soon as new standards are coming up, the status from 2017 is given below:

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Symbols, areas, lines and labels (collectively called objects in the following) are individually stored electronically in a separate data base and are displayed in the vector chart. **Object classes** (complete sets of similar objects) are grouped into **display groups**; for example, the object class **Restricted Areas** together with the object class **Military Practice Areas** and other similar object classes are forming the display group **Cautionary Areas**. An appropriate and, at the same time, uncluttered display can be achieved by selecting only those display groups which are required for the actual nautical task. Furthermore, for a number of objects (e.g. buoys), there is a choice between two symbol presentations. Irrespective of this, the number of text labels displayed can be influenced.

![ECDIS Display Groups](image)

*Fig. VI / 9 ECDIS Display Groups*
### 2.1 Categories of Display Groups

IMO has defined three categories for the selection of display groups that are to be shown:

- **Base**: Consists of the display groups which, as a minimum requirement, definitely have to be displayed. They can not be influenced by the user and they are shown all the time. They are normally not sufficient for safe navigation (only coast lines and obstacles).

- **Standard**: Contains the display groups which are normally necessary for voyage planning and voyage monitoring (all standard display groups as shown below)

- **All**: Contains above two categories and all other display groups which are available in the electronic chart

For the CHARTRADAR one further category is defined in the IEC 62388 test standard:

- **Primary**: The **Primary Chart Information Set** covers the display base plus fixed and floating aids to navigation (buoys and beacons, details on following page).

In addition to these pre-defined categories another one named **Custom** has been added. In this category, all settings can be made individually.

The allocation of display groups into the three categories is basically described in IMO Res. MSC.232 (82) which has replaced the older recommendation A.817 (19) in the year 2008.

Following this paper the **Base** category in Platinum contains display groups as follows:

- coastlines (high water)
- own ship's safety contour
- isolated underwater dangers of depths less than safety contour
- isolated dangers within safe water (i.e. overhead wires)

Further-on scale, range and north arrow, units of depth and height, and display mode are shown all the time.

For the definition of the **Standard** and **All** category the S-52 object classes have been used. The selection list according to IEC 61174 Ed. 3 (year 2008) is shown in the left screenshot.

For the new SW Version Platinum 2.1 the selection list has been extended according to the new Edition 4 (year 2015) of the IEC 61174 Standard. This list is shown to the right. It provides a more specific adaptation of the chart presentation to the mariner's needs.
2.2 Select a Category

Click to the toothed wheel in the bottom menu bar and select Chart from the Settings bar to open the Chart menu. ¹)

Select the required category:

**Base, Primary, Standard, All, or Custom.**

If the latter is selected, the Adjust button is available and can be used to open the Adjust Category Custom menu.

Now the display groups can be adjusted individually.

If the AIO option is installed for display of Admiralty Information Overlay, the lower part of the menu is visible. Four settings for the AIO overlay are available. Check as required.

---

¹) The design of the lower part of the Chart menu depends on the SW version. From Platinum SW Version 2.1 onwards, there are more functions which can be set by the mariner.
2.3 Select the Primary Chart Information Set (PCIS)

The PCIS includes coastlines, own ship’s safety contour, and dangers to navigation as listed in IMO Res. MSC.232(82) for the Base category plus fixed and floating aids to navigation (buoys and beacons). For the display of this PCIS just select the Primary category.

When vector charts are being used, it must be ensured at regular intervals (e.g. after a change of watch) that all of the necessary display groups are being displayed. Not even the Display Standard setting guarantees the completeness of the display.

2.4 Indication of Category in the Status Line

The selected category (Base, Primary, Standard, All, Custom) is indicated in the top status line of the application area.

A plus sign (‘+’) after the category is shown, if additional groups have been selected.

A minus sign (‘-’) after the category is shown, if additional groups have been deselected.

Moving the cursor on top of the Category field opens a small information window with details about the selected or deselected groups.

2.5 Not for Polar Regions (>85 deg)

The ECDISPILOT Platinum STM system is not approved for operation in polar regions, this is the area beyond 85 degree north or beyond 85 degrees south. Later versions will include this optional function.

If the own vessel is sailing in this area the Caution SI038 "Latitude Exceeded" is given.

In this case paper charts have to used.

The chart presentation is not affected.
2.6  Advanced Chart Settings

Click to the toothed wheel in the bottom menu bar and select Chart from the Settings bar to open the Chart menu.

Check the settings for symbols, areas, text, and lights and adapt as required. From Platinum SW version 2.1 onwards a few more settings are available. Please refer to the second red box.

**Text Labels**
- **None**: No text
- **Few or Important**: Only the most important text labels
- **Normal or Primary**: The text labels that are normally adequate for navigation appear
- **All**: All text labels contained in the chart appear.
- **Custom**: Click to Adjust to open a submenu for individual selection of text labels

**Symbols and Areas**
For symbols and areas you can define, if paper chart or simplified presentation is preferred.

**Additional Information**
- **Names in National Language**: Select as required
- **Light Descriptions**: Light descriptions are displayed
- **Full Length Light Sectors**: Light sectors are displayed true to scale
- **Accuracy Symbols (Indicate Data Quality)**: Quality of chart data is indicated
- **Highlight**: Select if Updates, Information, and Documents are to be highlighted.

---

1) From SW 2.1 onwards
2.7  Switch on Conditionally Displayed Features

Click to the toothed wheel in the bottom menu bar and select Chart from the Settings bar to open the Chart menu.

Earlier SW Versions

- **Date dependent**: buoys which are deployed seasonally, are e.g. presented only at time periods given in the ENC. Select **Within Effective Dates** to display them only during the time periods as indicated in the ENC. Otherwise select **Always Visible**.

- **Scale dependent**: objects which are not present in all scales, are either presented **Within Effective Scales** or they are **Always Visible**, select as required.

**SW Version 2.1**

The scale dependent function is available as before but has been moved to the upper part.

The date dependent function has been extended. Now a range with start and end date can be entered either for date dependent setting or for the review update.

Set **Review Updates** to **None** if the range entry shall be used for the **Date Dependent** function or vice versa.

Enter a viewing date range with start and end to see all objects which are indicated with a date or period in this range.
2.8 Depth Contour

Click to the toothed wheel in the bottom menu bar and select **Depth Contour** from the Settings bar to open the **Depth Contour** menu.

Check the draught of your own vessel as shown here in the **Depth Contour** menu (red arrow). If not OK, set the correct value under SETTINGs and Draught Settings and come back.

Select the number of different depth shades (two or four). The following example applies to four shades. Then select the depth value in meters for each shade by shifting the corresponding slider.

- Set the **Shallow Contour** slider (the top one) to an appropriate value of a few meters.
- Set the **Safety Depth** slider (which gives the alarm) according to your ships draught plus safety margin of a few meters.
- Set the **Safety Contour** slider (the next one) close to it.
- Finally set the **Deep Contour** slider as appropriate (i.e. 3x ship draught).

As a result on the electronic chart the colours will indicate the depth as adjusted in the above dialogue, from light brown (land) to light blue and white. The whole colour scheme for day and night is shown in the diagram below.
2.9 Tool Tip Information

If the cursor is moved over a chart object like a lighthouse, a buoy, a wreck, or a landmark, the additional information in the chart database, which is linked to this object, is shown in a tool tip.

The example to the right shows a light house with different sectors (green, white and red).

Move the cursor to the base point of the light house symbol and a tool tip with a list of the different light sectors as found in the chart database will open.

The sort order of the list is random as found in the database.

If another object like a landmark is found at the same location this one is listed as well.

From SW version 2.1 onwards the list entries are sorted.

The actual visible sector according to the true bearing to the object is displayed first.

In addition the text is summarized for a better overview.
3 Display of Raster Charts

Background

There are different types of raster charts in use, the ECDISPILOT Platinum STM is supporting the most popular type called ARCS. This ARCS chart type is the electronic form of the well-known British Admiralty Charts. They are published by the Admiralty Raster Chart Service (ARCS) which also publishes the paper charts. They do not conform to the IHO standard S-57 and do not fulfil the requirements of SOLAS Regulation V20 concerning the keeping of up-to-date charts. The display of this chart type takes place in the Raster Chart Display System (RCDS), which, in the ECDISPILOT Platinum STM, is part of ECDIS. A license for their use can be obtained from any authorized distributor.

-> At the present time, electronic charts are permitted to be used as a replacement for the official (paper) charts if, and only if, the electronic charts contain ENC data. If ENC data are not available, they may be replaced by ARCS data, but only if special permission is obtained from the flag nations for this.

![Raster Chart on ECDIS](image-url)
3.1 Change to ARCS and Select Chart Style

Change to ARCS presentation by clicking into the indication field in the Charts group which can be found in the permanent side bar. A list with the available chart types is opened, select ARCS.

Select chart scale

After having changed to ARCS the Display group on top of the permanent side bar changes its appearance, the range indication (well known from radar) changes into a scale indication. By clicking into the indication field, a list with all available charts of the active area is opened. This active area is the center of the screen or the own ship’s position. Select the chart which is appropriate for your navigational task. Further-on a box appears for Automatic Largest Scale. Check the box and the ECDISPILOT Platinum STM will always select automatically the largest available scale.

Open pop-up window for additional chart information

There may be several charts with the same scale, but all of them will include the active area. By pointing the cursor to a scale, a pop-up window appears with more details about one of these available charts. Charts where the license has expired for more than a month are still listed, but marked in gray and can no longer be selected.
3.2 Status Line and Position Failure Indication

**Status Line**

In the top left corner of the chart area the chart status line is shown.

It indicates from left to right the most important status data of the active chart. For raster charts it shows the chart type (here ARCS), the chart number (here 1411), the dimension of depth figures (here [m]), and the actual status i.e. **Better scale available or ENC data available** for the area of interest.

If there is no raster chart available for the actual sailing area, the status **No RNC available** is indicated in the status line and the system switches back to the ARCS vector display mode.

In this mode the scale indication disappears and the corresponding range in NM is indicated.

---

**Position Failure Indication**

A position failure due to manually set position is indicated by a yellow symbol next to the LAT and LONG field in the position menu..
3.3 Chart Information Window

Open the chart information window by clicking with the right mouse button into the chart area and selecting Chart Information. Open the directories of interest and read the additional information. The function is not position sensitive, the window shows all available information for the selected chart.

3.4 No Radar Overlay

Various overlays can be activated on top of the chart by clicking with the right mouse button into the chart and selecting layers. Switch on the required layers and adjust the brightness individually. The radar overlay which is available with ENC charts is suppressed in ARCS mode due to the difficulties of chart projection.

3.5 Not for Polar Regions (>85 deg)

The ECDISPILOT Platinum STM system is not approved for operation in polar regions, this is the area beyond 85 degree north or beyond 85 degrees south. Later versions will include this optional function.

If the own vessel is sailing in this area the Caution SI038 "Latitude Exceeded" is given.

In this case paper charts have to used.

The chart presentation is not affected.
### 3.6 Chart Datum and Datum Mismatch

All ARCS charts are presented in WGS-84 coordinates. If a chart has been produced under a local datum and the shift to this datum is published in Chart information, this shift is automatically applied for the correct presentation of the chart. If no datum shift information is available, a datum mismatch message is shown in the status line.

**CAUTION**

ARCS charts which have been produced under a local datum may have a position grid. As this grid has been printed onto the chart during production it cannot be shifted by the ECDISPILOT Platinum STM system. So a scenario may occur, where the operator is moving the mouse to a grid line in local datum which is labelled i.e. with LAT 001°25' and the cursor is showing at the same time the corresponding WGS-84 position which might be 001°26'. For navigation purposes only the WGS-84 indication from cursor or from the navigation tools (EBL, VRM, PI-Line) should be used, the local grid should never be used!

---

![Fig. VI / 11 Raster Chart with Local Datum](image)

According to its data, this route should exactly follow the lines of the grid.

Due to the fact that the grid has been produced using a local datum, the chart has been shifted by the system.
3.7  ECDIS Alerts and RCDS Options

**ECDIS Alerts**

The ARCS chart cannot release any ECDIS alerts, the information about depth, wrecks, tide, etc. is only printed onto the chart and is not available for the ECDISPILOT Platinum STM application program.

If the user has set user symbols in an area, with ARCS coverage, these are checked as usual during the voyage and depending on the symbol and the settings an alarm or indication is raised (please refer to ECDIS chapter 5.5).

If also ENC charts are available on your ECDISPILOT Platinum STM system for the actual voyage, these are automatically checked as usual against depth and obstacles in the background also if the system is in ARCS presentation mode (please refer to ECDIS chapter 5.2).

**RCDS Options**

In contrast to ENC charts there are no chart categories available in the RCDS mode.
AIO is available as an option for the ECDISPILOT Platinum STM system.

AIO is a service from the United Kingdom Hydrographic Office (UKHO) and provides Notices to Mariners, and additional information like reported navigational hazards, as a separate overlay on top of the Admiralty Vector Charts.

The overlay includes all Admiralty Temporary & Preliminary Notices to Mariners (T&P NMs) in force worldwide and additional information that relates to ENCs, published as ENC Preliminary NMs (EP NMs).

The overlay can not be used in conjunction with any other electronic charts, not with ENC and not with raster charts.

The overlay has its independent version numbering which is not related to that one of the Admiralty Vector Chart System. An earlier AIO version can be used in conjunction with actual AVCS charts but it is recommended to have corresponding versions.

AIO data for the whole world are stored currently in a single cell, called GB800001. Further cells may be added later by AVCS. This cell has to be installed first together with the corresponding permit before usage. Please refer to the DATA MAINTENANCE chapter for an installation guide.

### 4.1 Using the Overlay in the Navigation Process

The Admiralty Information Overlay contains additional information that is considered navigationally significant and may affect your voyage. This information should be referred to when planning your passage and may also be temporarily displayed during route monitoring.

When planning your passage it is normal to review all charts (and therefore ENCs) that are expected to be used on the passage. When these charts are reviewed the Overlay should be turned on and any features that could affect the planned route should be investigated. Those features that are significant for the planned passage should be marked i.e. by a user symbol or by a note attached to a waypoint.

Sufficient information should be attached to the user symbol or waypoint note to inform the navigator of the action to be taken when they are encountered on passage.

The Overlay information may temporarily be displayed when navigating. To avoid too much information obscuring the chart display the Overlay should normally be turned off and should only be turned on for brief periods when required for reference.

---

1) Text passages about AIO have been taken from the AIO User Guide V1.0 and adapted to the operating procedures applying to the ECDISPILOT Platinum STM system.
4.2 Displaying the Overlay

Click to the toothed wheel in the bottom menu bar (1), select Chart from the Settings bar (2) to open the Chart Presentation menu (3).

In the lower part of the chart presentation menu there are four check boxes arranged where you can activate or deactivate temporary and preliminary chart information as well as information objects.

Once activated the notices for mariners (NM) and objects are displayed as an overlay to the chart.

**Temporary & Preliminary Notices**

Areas where temporary notices are valid, are marked with a red polygon with red hatched fill which indicates the area affected by the NM (4).

Preliminary notices are marked in the same way, but in green.

Each NM carries the same NM number that is used in the Admiralty Notices to Mariners Bulletin. This number can be switched off by deactivating the box Show Names of Objects. Each NM provides the full text of the NM included as an associated text file. Access to this text is as follows:

Right click to the marked area opens a menu. Click to Chart Information and to Temporary or Preliminary Notice under AIO Contents (5) to read the desired notice (6). Any associated diagrams can also be viewed.

**ENC P Notices**

The same marking of areas (red polygon with red hatched fill) and the same procedure is valid for ENC P NMs (EP NM). They contain additional information that is specific to ENC’s and cannot be published as a standard Admiralty T&P NM. Each NM is allocated a unique EP NM number.

**No Information Objects**

Where there is no equivalent scale Admiralty paper chart, the UKHO does not have any additional information and the Overlay shows a ‘No Overlay’ feature. This feature is displayed as a gray polygon with a gray hatched fill indicating the area where there is no overlay information.

-> Additional information, such as local T&P NMs, may be available in these areas from other sources. When navigating in these areas, seafarers should ensure that all appropriate sources of information have been consulted.
5  ECDIS Replay ¹)

Background
The ECDIS application is recording navigation sensor data, actual chart, DR position (if used) and basic TRACKPILOT & SPEEDPILOT data in a permanent data base on the hard-disc of the workstation. The recorded data are accessible for the operator by the ECDIS Replay function as described here.

Alternatively the history list of these data can be viewed (see under GENERAL FUNCTIONS page 166).

ECDIS Recording
Data recording is done automatically, no operator action is required. Data are stored every 10 sec for a period of 90 days. Older data are overwritten.

Open ECDIS Replay Menu
Click to the MENU button in the bottom left corner and select ECDIS Replay. The corresponding operating menu for ECDIS Replay opens.

Setting the Replay
By default the local database on your MFD is set. Keep the default or select a File with replay data from an USB stick.

Enter the Time Frame of interest, by default a period of one day is set.

Starting the Replay
With the symbol keys of the Voyage Replay menu, you can now control the timing of the replay in a manner similar to that of a video recorder (see the illustration to the right).

During replay, a large, R appears in the chart area.

Use the accelerator button in the bottom right corner to speed up the replay by up to 5 times.

Switch on vector, trails or plots to see the details of your replayed passage on top of the chart.

During replay the navigation sensor data in the sidebar are displayed for the replay scenario and not for the actual position of your ship. But the ECDIS application is still running in the background generating i.e. the ECDIS alerts for the actual traffic scenario of your ship.

¹)  Available from SW version 2.1.02 onwards
5.1 ECDIS Replay in Context

During replay of a voyage recording, the ECDISPILOT application uses the recorded data instead of the actual data from navigation sensors for the presentation of the own ship.

The display used during the recording, the display mode, the track that may have been used, the switched-on menus, etc. are not recorded. Therefore, these settings can be operated freely when the voyage recording is being replayed.

While the voyage recording is being replayed, the own ship symbol and all own ship data appear on the screen as usual. You can then operate the ECDISPILOT application largely as if the ship were currently moving according to the data displayed.

The alert management, which is common for a bridge system, is still related to the actual scenario of your own ship and not to the replay scenario. The same applies for the system track and the track monitoring.

5.2 Replay Monitoring

Click to the View button to open a list of available monitoring windows, open one or more monitors and view the recorded data during replay.

Click to View and select one or more points from the list of monitored items

View general information about the record: ship name, IMO no, SW version, MFD no, no of records, start date, end date

The LOP position fix monitor shows the position fix which has been used for Dead Reckoning (seldom used)

The replay monitor shows a red indication for each area where replay data are available

The ECDIS Charts Monitor shows the ENC cells used during the recorded scenario

The Trackpilot Replay monitor shows the most important data of recorded TP operation, a similar window is available for the Speedpilot
TARGET HANDLING ON ECDIS
1 Overview

The following section is applicable from SW version 2.x onwards.

The Target Tool provides menus for target handling. The most important function is the target list showing the acquired/activated targets. The list can be sorted according to distance of target, time to reach target etc. Another important function is the critical target menu showing detailed data of the closest target. Further-on AIS receive and transmit messages can be processed.

Many of the target related functions are activated by a click on the target, the target tools tab is not used. These functions are described here as well.

☞ A radar echo that is supposed to be taken in account is called an acquired target.

☞ An AIS target that is supposed to be taken in account is called an activated target.

Targets can be acquired/activated manually using the trackball or automatically by the system. This description first gives an overview of types of targets and their treatment in the system. If necessary, cross references to manual/automatic target acquisition are noted.

Two types of targets can be handled on the ECDISPILOT Platinum STM, ARPA targets and AIS targets. For the target processing, the AIS electronics unit and the ARPA electronics of the radar are considered as two independent sensors whose display and operating procedures take place on one and the same monitor.

The two sensors deliver data independently, the data of both sensors are used for the collision avoidance computation, which takes place in the background of all actions. It can raise alarms if objects are on collision course.

This chapter describes the handling of AIS targets and ARPA targets presented on ECDIS.

Operating steps in relationship to the raw video which are specific for the RADAR are covered by the RADAR FUNCTIONS section.
2 ARPA Targets in ECDIS

ARPA targets are any kind of radar targets received from a host radar application either operated on the same workstation or on a remote system. In case of a remote system the target information is received by the NMEA message TTM. In this case the green center spot is missing and these targets have already been acquired by the radar system. ARPA targets can be of the following kind:

<table>
<thead>
<tr>
<th>ARPA targets in ECDIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>An acquired target that is tracked by the ARPA electronics. Its past track and speed/direction vector can be shown.</td>
</tr>
<tr>
<td>A selected target, which is an acquired target whose data are marked in the target list.</td>
</tr>
<tr>
<td>ARPA targets may have an ID displayed on the top right of the symbol. The ID consist of consecutive number generated by the system.</td>
</tr>
</tbody>
</table>

Table VII / 1 Symbols of ARPA Targets in ECDIS

See the chapters below for further information.
3 AIS Targets in ECDIS

AIS targets are all targets whose data are received by the AIS electronics unit. All AIS targets are visible per default after switch-on of the system.

The display of groups of AIS targets (Class A, Class B, all) may be switched off by the operator.

AIS targets can be of the following kind:

<table>
<thead>
<tr>
<th>AIS targets in ECDIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A sleeping AIS target is a target that is displayed in the PPI. Its data are evaluated by the collision avoidance computation.</td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>An activated AIS target is displayed with detailed data such as heading line, ROT indicator, true scaled outline (if available and the PPI scale is small enough), speed/direction vector, and past track. Its data are evaluated as above. Activation is either manually by the operator or automatically by an acquisition guard zone.</td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>If the dangerous target function is switched on under Settings any AIS target, sleeping or activated, and falling within the TCPA/CPA limits of the collision avoidance computation is activated (if not done already) and is presented as a dangerous target flashing in red. After acknowledgment it is shown steady red.</td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>An activated AIS target, which has been selected and whose data are marked in the target list</td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /></td>
</tr>
<tr>
<td>AIS targets may have a label displayed at the bottom right of the symbol. The label shows the call-sign or ship name or MMSI.</td>
</tr>
</tbody>
</table>

Table VII / 2 Symbols of AIS Targets in ECDIS
4 Target Fusion

Target Fusion

Due to the fact that an AIS target normally produces a radar echo, the symbols are displayed close to each other:

In this case, it is possible to decide whether the object is to be treated as AIS target or as ARPA target. In terms of an improved display readability, the objects can be merged if they meet some boundary conditions. That means, that they are displayed only as AIS or as ARPA target.

☞ The number of ARPA and AIS targets being tracked should be kept as small as possible; the presence of too many targets causes confusion on the screen and distracts the operator's attention from what is really important. Targets that are no longer relevant should be deleted or deactivated (AIS).

☞ In the case of tracked targets entering a clutter area (rain or sea clutter), a "target swap" might occur; parts of the rain front are suddenly being "tracked". A target swap can also occur if there are targets situated close together or close to land. In the case of target swaps, no warning is given.

If a ship has been acquired both as a ARPA target and as an AIS target, it may only appear as an AIS or ARPA target if both target data are matching (target fusion).

The priority for the entire display or for selected targets can be defined.

ARPA and AIS targets can be merged and therefore treated as one target as long as their target data are similar in some categories and limits.
5 Manual Target Selection

An activated AIS target (click on the target first to activate it, a vector is shown) as well as an acquired ARPA target can be selected. Then, its data are displayed in the target list.

To do so, click on the activated AIS target or the acquired ARPA target with **DO**. The target will be marked with a broken frame. The target data are marked in the target list with blue color. Only one target can be selected at a time.

![Selected targets]
6 Automatic Target Activation

AIS targets can be activated automatically.

There are two possibilities to activate targets automatically:

By means of the collision avoidance computation for dangerous targets:
- The collision avoidance computation observes every target in the PPI. For any of those targets, the closest point of approach (CPA) and the time until the CPA is reached (TCPA) are computed and compared with operator-defined limits. If the CPA and TCPA values of a target fall short of the limits, the target is marked (ARPA) or activated (AIS) and an alarm is raised.

By means of the acquisition/guard zones:
- Two of those zones can be switched on in order to perform automatic target acquisition/activation. Any target that enters one of the zones will be marked/activated and an alarm is raised.

![Settings for collision avoidance computation, i.e. Dangerous Targets](image1)

![Settings for Acquisition/Guard Zones](image2)
7 Prerequisites for the Collision Avoidance Computation

The collision avoidance computation can be performed only if the relative speed between own ship and the target is known. This must be determined from the speed vector over ground (SOG, COG) transmitted from the AIS target and from the own speed vector over ground. The own speed vector over ground is mainly determined from the Bottom Track data of the selected speed sensor; otherwise, it is determined with the aid of the SOG/COG of the selected position sensor.

If an AIS target is not transmitting SOG and COG, no collision avoidance computation takes place for this target. Therefore, the target cannot be acquired automatically. If it is already being tracked, no Dangerous Target alarm occurs in the case of a dangerous approach. The symbol of this AIS target is displayed dashed.

If, because of missing data or caused by sensor selection, the own speed vector over ground cannot be determined, then for all AIS targets the collision avoidance computation and the Dangerous Target alarm do not take place. The symbols of all AIS targets are then dashed. Three minutes after the occurrence of this situation, the AIS NO CPA ALARM, SOG LOST alarm appears.
8 Deletion and Loss of Targets

An AIS target is tracked automatically until
- it is deleted manually or
- it is lost.

A tracked AIS target is lost if the AIS electronics unit does not receive any more signals from that target within the specified time.

If an AIS target is lost within a distance of 16 NM, a LOST TARGET (n) alarm appears and the symbol of the lost target changes its shape and flashes until the alarm is acknowledged.

Deletion of a Target

Click on the target with the MORE key, and then choose Target from the context menu and click on the desired action with the DO key.

An ARPA target received from NMEA interface via TTM message has to be deleted on the host radar system.
9 Target List

The target list provides an overview about all targets followed up by the system ¹).

The columns of the displayed table are self-explanatory, they can be sorted ascending or descending by clicking on the appropriate title of the column. More recent versions are providing a separate column for the Age of the target data. In the screenshot shown here the message from the SART is already 10 sec old.

Sorting takes place in the instant of the click, afterwards the sequence of the entries remains static, even if the values of the sort criterion change.

If a target is selected in the chart/PPI area (refer to the symbol below the red arrow in the screenshot to the right), it is also highlighted with blue color in the target list as shown here, it might be necessary to scroll the list up or down in order to find the blue line.

If the pointer is moved on the depiction Capacity, a hovering window is displayed showing the percentage of memory usage for targets. If 95% of the maximum capacity is reached, an indication is given. If the maximum capacity is exceeded, an alarm is given.

Maximum number of targets:

<table>
<thead>
<tr>
<th>Type of Target</th>
<th>Maximum Number ¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARPA</td>
<td>40</td>
</tr>
<tr>
<td>AIS Activated</td>
<td>40</td>
</tr>
<tr>
<td>AIS Sleeping</td>
<td>240</td>
</tr>
</tbody>
</table>

¹) If system-wide target list is enabled, this number is configurable and can be quite large, please move the cursor to the depiction Capacity to see the actual percentage of memory usage.

Table VII / 3 Maximum Number of Targets

¹) The list includes all tracked ARPA targets and all activated AIS targets. The most important target data of any target can also be assessed directly in the chart/PPI. Just move the cursor on the target and a hovering target data window is opened.
9.1 Critical Target and Details of a Selected Target

In order to display detailed data of a critical target (especially AIS targets), just click with MORE (right-click) to one of the target rows and choose Show Details from the context menu.

You may also cancel the acquisition of this target or for all targets.

Select if the target list shall be sorted automatically.

The two small windows underneath the target data row will display more target data like BCR, BCT, HDG, ROT and if available the AIS data like length, beam, draught etc.

Choose, depending on the target type, one of the following sort options if auto sort is activated:
- Show All
- Show Acquired
- Show AIS-SART
- Show AIS-ATON

The following abbreviations are used for the presentation in the list:

**CPA** - The designation Closest Point of Approach means the minimum distance between the own ship and the target at the closest point of approach.

**TCPA** - The Time to Closest Point of Approach means the time until the CPA is reached.

**BCR** - The Bow Crossing Range means the distance between the own ship and the target when the target crosses the heading line of the own ship.

**BCT** - The Bow Crossing Time means the time that will pass until the target crosses the heading line of the own ship.

Target details are also available by a tool tip which opens if the pointer is moved across an activated or acquired target in the PPI or chart area.
NAVIGATION TOOLS
1 Overview of Navigation Tools

For access to the Navigation Tools click to the TOOLS button next to the Alarms menu.

The TOOLS bar will be opened. It is divided into several groups as shown to the right.

Select one of the entries of the Navigation Tools group as required.

The following functions are available:

1. The **MOB Drift** calculation for the man-over-board symbols can be found on page 221.

2. The two **Electronic Bearing Line** and **Variable Range Marker** (EBL&VRM) tool sets for measuring the bearing and range of chart objects/targets are described on page 220.

3. The **User Symbols** (User Sym) tool set for adding various navigation symbols for lighthouses, wrecks, beacons etc. in the chart wherever information is missing are described on page 225.

4. The **Pilotage** lines (also called **Parallel Index Lines**) for establishing a safe corridor for navigation are described on page 241.

5. The **Anchor Watch** monitor for automatic alarm in case of ship leaving the anchor watch zone is described on page 242.

6. The **Lines of Position** (LOP) tool set for the verification of own ships position by taking optical bearings of known landmarks is described on page 248.

7. The Distance and Speed tool provides an indication of the sailed distance based on bottom track as well as water track. It is described on page 258.

This group is extended by a number of options depending on the actual installation:

- The Optical Bearing Device (ODB) function for automatic input and processing of optical bearings is described on page 253.

- The Optical Detection Device (ODD) function provides control of a camera or any other sensor which shall be focused on a tracked ARPA or AIS target. It is described on page 259.

- The **NAVTEX** remote access with the list of received NAVTEX messages is introduced on page 261.

- The **HELO** function for guiding a helicopter landing is described on page 265.

**If an option is active, it is listed in addition in the Navigation Tools group.**
2 MOB Drift Calculation

In case of a Man-over-Board event just click to the corresponding symbol in the bottom line of the menu bar:

The result is as follows:

The man-over-board symbol is shown under your own ship symbol in the chart.

This new user chart object symbol will soon appear free as your own ship sails further ahead.

Delete a MOB Symbol:

Select a MOB symbol which has been dropped before by clicking to it with DO (left click). The symbol is then marked with a small handle. Click with More (right click) anywhere into the PPI/Chart area, to open the context menu. Select Delete Man Overboard. Repeat the procedure for each further MOB symbol.

Set Wind and Drift:

Select the entry MOB Drift from the NAVIGATION TOOLS bar, and select one of the 5 MOB menus. The numbers 1-5 correspond to the number of the MOB symbol in the chart. Set wind and current to the actual values. The estimated drift is calculated automatically and individually for each MOB.

The MOB symbol will move according to the settings made.

Hide the MOB symbol if required by clearing the MOB box in the Settings-MOB menu.

Like other user symbols the MOB symbol is distributed bridge-wide to all navigation workstations (MFD).

The MOB function is available for up to five separately tracked MOB symbols. They are dropped one after the other, each time the MOB button in the bottom line of the menu bar is clicked. Values for wind and speed can be entered separately for each MOB symbol. If the MOB is clicked another time, nothing will happen. One of the existing symbols has to be deleted before.
3  EBL & VRM - Bearing Line, Range Marker and Rulers

Two **Electronic Bearing Line** and **Variable Range Marker** (EBL&VRM) tool sets are available for measuring the bearing and range of chart objects/targets. One of the two sets is shown in the screenshot below. Operating is described on the following page. For quick distance measurements two **Rulers** are available. They are described on page 223.

In addition some of the other tools like parallel index lines, lines of position, and user symbols are shown in the screenshot below. They are described in the subsequent chapters.
3.1 EBL - Electronic Bearing Line

With the EBL, the bearing of an object with respect to own ship or the bearing between two objects can be determined.

After switch-on by means of a click in the Tool Set group, the electronic bearing line is superimposed on the chart. It appears with the same data as they have been displayed last time.

Alter the bearing of the EBL by a left-click on it in the chart. The EBL is now displayed with a small "handle" in its center. Click and hold the line anywhere to pull it to the desired bearing.

Change the origin of the bearing line by a left-click on it in the chart and pull its origin to the desired position.

☞ Switch the EBL off and on again in order to re-center it to the own ship.

☞ If the display range is reduced when the EBL is in the switched-on state, the EBL might be situated outside the visible range. Switch the EBL off and then on again, to return it to the visible range.

The current bearing is displayed in the Tool Set group. To switch off the display of the EBL, clear the check box in the Tool Set group.

Latitude-Dependent Errors in the Display of the EBL

With the type of projection used for the longitude/latitude grid in the ECDIS, the parallels of latitude become more strongly curved with increasing latitude, while the meridians converge increasingly with increasing distance from the equator (i.e. the direction of a meridian at the edge of the chart is not 0° - 180° but might be 358° - 182°); in other words, their directions no longer correspond to the degree scale at the edge of the chart.

In contrast to this, the EBL is always displayed as a straight line; its bearing displayed as an EBL value has a deviation. The following table shows the maximum bearing deviation for the various latitudes and range settings.

<table>
<thead>
<tr>
<th>Distance of EBL from Own Ship</th>
<th>Geographical Latitude</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 °</td>
</tr>
<tr>
<td>10 NM</td>
<td>&lt; 0.1 °</td>
</tr>
<tr>
<td>20 NM</td>
<td>0.1 °</td>
</tr>
<tr>
<td>40 NM</td>
<td>0.2 °</td>
</tr>
<tr>
<td>60 NM</td>
<td>0.4 °</td>
</tr>
<tr>
<td>80 NM</td>
<td>0.5 °</td>
</tr>
</tbody>
</table>

Table VIII / 1 Latitude-Dependent Errors of the EBL
3.2 VRM - Variable Range Markers

With the variable range markers, the distance of an object from own ship or (in conjunction with the EBL) the distance between two objects can be measured.

After switch-on by means of a click in the Tool Set group, the variable range marker is superimposed in the PPI. It appears with the same data as they have been displayed last time.

Alter the range of the VRM by a left-click on it in the chart. The VRM is now displayed with four small "handles". Click and hold one of the handles and pull the ring to the desired radius.

The origin of the range circle can be changed only if both EBL and VRM are switched on. Please refer to page 222 how to operate EBL and VRM jointly.

The current radius of the VRM is displayed in the Tool Set group. To switch off the display of the VRM, clear the check box in the Tool Set group.

If the display range is reduced when the VRM is in the switched-on state, the VRM might be situated outside the visible range. Switch the VRM off and then on again, to return it to the visible range.
3.3 Operating VRM and EBL Jointly

If the EBL and the VRM in one Tool Set have been switched on both, they are linked to each other.

Move the cursor to the intersection point of both, a cross appears, and by left-click and hold draw them to the jointly desired values for range and bearing.

Move the cursor to the center point of both (the own ships position) and by a left-click draw them to the desired new position.

To re-center it to the own ship, switch off and on again the EBL.
3.4 Rulers for Quick Distance Measurements

Two rulers using the same colour as VRM/EBL are available which are operated in the same way but independently of each other. They can be used as an alternative to VRM/EBL in order to determine in a simple way the bearing and range between any objects situated in the PPI or chart area.

All information given here for ruler 1 is also applicable to ruler 2.

1. Click into the PPI or chart area either to a point of interest or to any point by means of MORE, and in the context menu which then opens up click on **Rulers**. Select **Ruler 1 or 2**.

2. A ruler is now drawn between your initial point of interest and the current cursor position.

3. Click to the small handle at the current cursor position again and draw the ruler to a second point of interest.

4. Move the cursor to one of the handles on the ruler, now you can read distance and bearing in the bottom part of the tooltip.

5. The rulers remain fixed at the position they are set, i.e. they also move out of the PPI. They cannot be changed but can only be deleted and set again.

6. Delete a Ruler by clicking again into the PPI or chart area and in the context menu which then opens up click on Rulers. Select Ruler 1 or 2 to deactivate them.

7. Modify a Ruler by clicking on the small handle at one end and draw it to a new position. then, click on the new position.

8. By clicking on the origin, the origin becomes the end of the line and vice versa.

![Range = 1.555 NM, Bearing = 243.0 deg](image)
3.5 Drift Compensated Ruler for Dead Reckoning (Optional Tool)

A further and drift compensated ruler is available as an optional tool for dead reckoning. It is used to determine CTW and STW (course and speed through water) if a certain target position shall be reached with a given current. This tool is more an additional planning tool. During the passage the autopilot is doing this task automatically. It is set to a desired course over ground (COG) and is steering the vessel at a course through water (CTW).

For manual planning please proceed as follows:

1. Click into the PPI or chart area to a point of interest (here marked with A) by means of MORE, and in the context menu which then opens up click on 1Drift Comp....

2. A ruler is now drawn between point (A) and the current cursor position representing COG and SOG (blue line).

3. Click to the small handle at the current cursor position again and draw the ruler to a second point of interest (B).

4. The triangle shown depends on the drift. Large drift values will generate a typical triangle where the blue line is the course of interest and the brown line is the course which has to be steered in order to get to point (B).

5. Move the cursor to one of the handles on the ruler, now you can read distance and bearing in the bottom part of the tooltip.

6. The ruler remains fixed at the position it is set, i.e. it also moves out of the PPI. It cannot be changed but can only be deleted and set again.

7. Delete a ruler by clicking again into the PPI or chart area and in the context menu which then opens up click on Drift Compensated Ruler again.

8. Modify the Ruler by clicking on the small handle at one end and draw it to a new position. then, click on the new position.

9. By clicking on the origin, the origin becomes the end of the line and vice versa.

10. The drift value which is used for the triangle is automatically taken from the calculated difference between bottom track and water track sensors. Change this drift value manually by clicking again into the PPI or chart area and in the context menu which then opens up click on Edit Drift Compensated Ruler.

11. A menu is opened where you can enter a forecasted drift independent from the value which has been calculated.
4 User Symbols

User symbols are individual user made chart objects which can be inserted into the workstation database in order to supplement the radar presentation or official electronic charts.

User symbols can be assigned globally, as available in earlier SW versions, or to a user defined group or to any route which is already stored on your ECDISPILOT Platinum STM system (latest SW version).

The assignment is made initially when a symbol is dropped into the radar presentation or into the chart according to the setting shown in the top line (red arrow).

Ensure that this line, if available, shows **Global** if nothing else is required from your side. The assignment can be changed at any time later.

User symbols which have been dropped by the user are stored permanently in the databases on all connected workstations. Deletion of a selected symbol is one method to remove user symbols from these databases (the only method in earlier SW versions). Further-on all symbols assigned to a certain group, to a route, or all symbols globally can be deleted with the Edit function as marked above. In addition they can be stored on external memory devices like USB memory sticks. See main chapter DATA MAIN- TENANCE for details (page 401).

The user symbols panel of the Display expander provides different object categories:
- Symbols (position fix, anchorage area, beacons, lights, platforms, radio stations and wrecks etc)
- Areas (highlighted danger areas and feature areas, see page 230)
- Lines (safety lines, feature lines and clearing lines, see page 232)
- Events and text (for free text information and cautions, see page 234)

The figure to the right shows examples of these categories.

Switching On and Off the display of all user symbols is achieved by a MORE click into the PPI/chart area, select Layer from context menu and set/clear the box for **User Symbols**.

If only those symbols shall be visualized, which belong to a certain group or route, go to the Tab Presentation > **User SYM** (see page 236).
4.1 Placing a User Symbol - Graphic Mode

With this method, the user symbol can be placed in the chart area by means of the trackball/mouse. The procedure is explained here by means of the user-symbol beacon cardinal.

Before starting to drop new user symbols please check if the visibility group as indicated in the top line is set to your requirements, Global, Group, or Route. If uncertain, refer to page 236 for details.

Select a Symbol

Open the User Symbols part of the Display expander and click on the + in front of the desired category (Symbols, Areas, Lines, Events).

A list of the different symbols in the selected category will be shown. Use the vertical scrollbar to see the complete list.

Choose one symbol and select the appropriate check box if the symbol is to have a Top-mark or an indication for a Light. Not every symbol can be set to have a top-mark or a light.

A name for the object and additional information text can be entered in the text boxes.

Dropping and Adjusting the Symbol

Click to highlight the desired symbol icon, move the pointer into the PPI/Chart area and click again to drop the symbol at the desired position.

The object will be shown with an object abbreviation in front of its name. In the example, bn means beacon. If the pointer is moved upon the object, additional information is displayed as shown here.

Click to the symbol with DO (left-click), click again and hold, draw the symbol to the desired location in the chart.

Symbol Information

Select a symbol which has been dropped before by clicking to it with DO (left click). The symbol is then marked with a small handle.

Click with More (right-click) anywhere into the PPI/Chart area, to open the context menu.

Select Chart Information -> User Symbols -> Other -> Beacon, cardinal to see detailed information about this user symbol.
4.2 Adjusting a Symbol - Numeric Mode

Select a symbol which has been dropped before by clicking to it with DO (left click).

The symbol is then marked with a small handle.

Click with More (right-click) anywhere into the PPI/Chart area, to open the context menu 1).

In the context menu, select User Symbols and Set Coordinates of Beacon, cardinal.

Enter the desired position in the pop-up window.

Finally click to Set to adjust the user symbol to the desired position.

If the data entry window shows UTM entry fields instead of Latitude and Longitude fields, please refer to the following page for switching back to latitude/Longitude data entry mode.

The exact location of a symbol

Each user symbol shows a small orange line at the bottom with a ring at the end, this ring is the indication for a user symbol and is not related to the center location. The symbol itself is shown here in the paper chart style setting.

Another example is given here for the simplified chart style setting.

The center location of a symbol is marked with a small quad after having clicked on it with the DO (left-click) button as shown here.

1) Alternatively select a symbol from the tab menu (see page 226), right-click anywhere into the chart area, and the data entry window will open as well. Input the position and click to set and the symbol is placed at the desired location.
4.3 Adjusting a Symbol - UTM Data Entry

The UTM System (Universal Transverse Mercator) is a world-wide coordinate system. It is supported by later ECDISPILOT Platinum STM versions 1).

Select a symbol which has been dropped before by clicking to it with DO (left click).

The symbol is then marked with a small handle.

Click with More (right-click) anywhere into the PPI/Chart area, to open the context menu.

In the context menu, select User Symbols and Set Coordinates of Position Fix.

The Data Entry Window for Setting Coordinates is opened.

Click with More (right-click) anywhere into the data entry window area to open another context menu.

In this context menu switch-over to Universal Transverse Mercator (UTM).

The Data Entry Window changes to the UTM Input Format.

1) It divides the earth surface (from 80° South to 84° North) in 6° wide vertical stripes (zones), which are separately levelled with the optimal Mercator projection and covered with a Cartesian coordinate system. The system can be based on WGS 84 and is step by step introduced for land surveying.
The **Data Entry Window** shows the values in UTM format which have been automatically calculated from the current position of the selected user symbol in Lat/Long format.

Enter the precise coordinates in UTM format.

Finally click to **Set** to adjust the user symbol to the exact position.

The UTM format mode remains for all symbols until it is switched back by opening the context menu again and switching-over to **Geodetic Latitude and Longitude**.

*Since the Latitude and Longitude coordinates are based on WGS84, also the UTM coordinates will be based on WGS84.*
4.4 Placing an Area

Select an Area

Editing of areas is following the same basic principles as described above for symbols (graphical point objects).

Before starting to drop new user symbols please check if the visibility group as indicated in the top line is set to your requirements, Global, Group, or Route. If uncertain, refer to page 236 for details.

Open the User Symbols part of the Display expander and click on the + in front of the desired category (here Areas).

Choose a Danger highlight or a User’s feature area and enter a name for the area. Additional information text can be entered in the text box.

Danger Highlight

A Danger Highlight is a red colored filled area which can be detected by the chart monitoring function. Click on the Danger highlight icon first, and then click with DO in the PPI/Chart Area to set the first vertex of the area. The moving cursor is then followed by a connection line to the previously set graphical point of the area. In this way an area with 3 vertex points as a minimum can be set. There is no upper limitation for the number of points which can be created for one and the same area.

To close the area after the last vertex is set,
- click into the last connection line with MORE or
- set the last point directly on the first one
to end the edit mode and to complete (close) the created area.

User’s Feature

Editing of Feature Areas is following the same principles as shown above for Danger Highlights.

Several areas with different transparency (No Fill / 25 / 50 / 75 %) can be created and drawn on the electronic chart. In contrast to the Danger Highlight a Feature Area cannot be detected by the chart monitoring function.
4.5 Removing or Modifying an Area

Select the area by a click on one of the vertex points.

The handle shown at the vertex indicates the selection of this area.

A click with MORE on the handle or anywhere in the chart area shows the context menu.

Select Delete: Danger highlight to delete the complete area.

If you want to modify the shape of the area choose Delete Point to delete just one point of the area or select Continue Area to add further points to this area until the modify mode is ended by a MORE click in the PPI/Chart area.

Removing and modification of Feature Areas is done in the same way as described above.
4.6 Placing a Line

Editing of **Lines** is following the same principles as shown for Danger Highlight areas.

Before starting to drop new user symbols please check if the visibility group as indicated in the top line is set to your requirements, **Global, Group, or Route**. If uncertain, refer to page 236 for details.

In the selection list under **Tools -> NAV -> User Sym** open the list of available lines by a click on the (+) symbol.

Select if you want to create an **Own Safety** or **MARPOL Line** or a **User’s Feature** line by a click on the entry in the selection list. Refer to the next page for the Danger Bearing Line.

**Own Safety Line or Own MARPOL Line**

An Own Safety Line is a line with orange color and with short hachure lines pointing to the dangerous side. It can be monitored by the chart monitoring function. You can create several safety lines at different locations each having a variable number of vertex points, but a defined start and a defined end.

Click on the Own Safety Line icon first, and then click with DO in the PPI/Chart Area to set the first vertex of the line. The moving cursor is then followed by a connection line to the previously set graphical point of the line. In this way a line with 2 vertex points as a minimum can be set. There is no limitation for the number of points which can be created.

To **end the line** after the last vertex is set, click into the last connection line with MORE to end the edit mode and to complete the created line.

The orientation of the **Own Safety Line** (the dangerous / not dangerous side) can be changed by a click in the context menu on **Reverse Own Safety Line**.

The handling for the **MARPOL Line** is the same, the color is green/red, an alarm is given on crossing from both sides.

**User’s Feature Line**

Several line styles with 4 different patterns (solid / dashed / dotted / dashed-dotted) and 1 or 2 pixels line width can be created and drawn on the electronic chart. In contrast to the Own Safety Line the User’s Feature Line cannot be monitored by the chart monitoring function, no alarm is given.

Removing and modification of Safety and Feature Lines is done in the same way as shown above for Areas via selection of the line on the screen and subsequent operation via the context menu by a MORE click on the selected line. You can choose to delete one single point or the complete line.
4.7 Danger Bearing or Clearing Lines

Danger Bearing Lines (also called Clearing Lines) shall indicate a limitation of the course to be steered in certain sea areas. For this purpose a 
- NMT Not More Than and a NLT Not Less Than line can be set.

In the selection list under Tools -> NAV -> User Sym open the list of available lines by a click on the (+) symbol. Select Danger Bearing by a click on the entry. Select NMT or NLT and set the line as required. Check if the visibility group is set to your requirements, Global, Group, or Route. Go to page 236 for any changes.

The course value not to be exceeded is calculated automatically and is indicated together with the line and a direction arrow. The clearing lines can only have two points (start and end point).

To delete the line again, click on the start or end point and then with MORE > User Symbols > Delete: Danger bearing the deletion can be executed.

The visibility group has been set to User Defined, just check if this setting is correct or if Global or Route is needed.

Fig. VIII / 1 Set a Clearing or Danger Bearing Line
4.8 Events and Text

Editing of Events and Text Notes is another feature of the user object editor. You can drop Events which have the symbol and add text to it.

Additionally you can drop either a text object as Information or as Caution. The procedure is identical for both objects.

The description for setting, modification and deletion is equivalent to the operation of point symbols, i.e. you must select the relevant entry under User Sym, Events and Text, click on the respective icon, add a text and then click into the PPI/chart area where the text note or the event marker shall be located.

After selection and marking by the orange handle you can move the event marker or text note to another location or delete it from the screen and from the storage device.

Check if the visibility group is set to your requirements, Global, Group, or Route. Go to page 236 for any changes.
4.9 Switching Off the User Symbol Layer

User symbols are displayed on a separate layer on top of the basic chart or PPI area. They are covered by higher prioritized objects as follows:

- by chart objects
- by the radar video
- by navigation tools (EBL, VRM, and LOP)
- and by the own ship symbol and ARPA and AIS targets (highest priority)

Nevertheless, if in doubt, and if a user symbol covers a basic chart information, the whole user symbol layer with all symbols, regardless to which group they are assigned, can be switched off as follows:

Do a MORE click into the PPI/chart area, select Layer and clear the box for User Symbols.

It can be necessary, to check this setting if user symbols are not visible in the chart or PPI area, just activate the setting again.
4.10 Assigning User Symbols to a Visibility Group

A new symbol which shall be dropped into the PPI/ chart area is assigned either globally, or to a user defined group or to an existing route as indicated in the top line of the Edit User Symbol menu (see red arrow in the screenshot below). Just select the required assignment as described below before dropping a symbol.

Global Group

All user symbols which are dropped into the PPI/ chart area are visible at all times.

User Defined Group

All group related user symbols which are dropped into the PPI/ chart area are visible as long as their visibility group is switched on. Go to the Tab Presentation > User SYM to select the visible groups of symbols. Before assigning any symbol to a group, this group has to be defined.

Just click to Edit and New User Defined Group to add a new group to the database.

The remark in the yellow box applies here as well.

Route Related Group

All route related symbols which are dropped into the PPI/ chart area are visible as long as their related route is activated. Before assigning any symbol to a route, this route has to be defined (see ROUTE PLANNING AND MONITORING).

The remark in the yellow box applies here as well.

Of course the location of the symbol has to be included in the actual view on the screen and the user symbol layer has not to be switched off.

Switching ON the User Defined Visibility Groups

Please refer to page 99 for details.
4.11 Modifying Assignment & Details of User Symbols

Select a symbol which has been dropped before by clicking to it with DO (left click).
The symbol is then marked with a small handle.

Click with More (right-click) anywhere into the PPI/ chart area, to open the context menu.

In the context menu, select User Symbols -> Edit Details.
Change the name and the remark for this user symbol if required.

Change the Visibility Groups if required, set to Global, User Defined, or Route.

If Global is selected, no further settings have to be made. Click to Set to assign the symbol to the global group.

If Route is selected, the opened routes are already indicated. Select a route and click to Set to assign the symbol to the route. If no route is open, you have to open one before.

If User Defined is selected, click to the next field to select one of the available groups. Click to Set to assign the symbol to this group.

If the assignment shall be made to more than one group or route, just click to Edit and to Add additional assignment to add a further line with another group or route.

If an assignment shall be deleted, click to Edit and to Remove Entry to withdraw this line.

Click to Cancel if the new settings shall be discarded.
4.12 Protecting All User Symbols of a Group against Unintended Shifting

All user symbols of a user defined visibility group can be protected against unintended shifting. The protection only applies to shifting of a symbol, area, line, or event/text, on the screen by using the cursor. It does not apply to editing the coordinates of a symbol in a menu. This function is always available.

Setting the Protection for a new User Defined Visibility Group

Click to Edit and enter a name for a new user defined visibility group.

The protection for this group can be set directly in this menu.

The protected visibility group is indicated with a closed padlock next to the name.

Changing the Protection for an Existing User Defined Visibility Group

If the protection for an existing user defined visibility group shall be changed, click to the Settings button in the bottom menu bar, select User Symbols from the Settings bar and click to the button Select User Defined Groups.

Now the available user defined groups are listed and the protection for a certain group, here named Elbe can be changed.

Just click to the small arrow after the word protection and select the necessary setting. A protected group is marked with a padlock.
4.13 Table-based Editor for Lines and Areas

Editing a new line or a new area is additionally supported by a table-based editor. Each segment of a linked line or each segment of the contour line of an area is represented by two consecutive points in a table. They can be edited point by point by entering new position data or by changing data.

Open the Tools bar and select a visibility group, here the User Defined group Elbe has been selected.

Select i.e. a Line with details, here User’s feature has been selected, and enter a name (here fishing border) and a remark (here May - Sep).

The line can be edited now by drawing it from point to point on the screen.

Alternatively click to the button Edit Coordinates in Table to edit the line in a table.

The Edit Coordinates Button is active only as long as the drawing process of the line is not completed.

Once a line has been edited it can be changed by a click to the line (a small handle appears) and right click (MORE) to this small handle to open the context menu.

Select User Symbols and Edit Coordinates in Table to open the table again and change any data.

The table to the right shows a linked line with several interpolation points. The coordinates of each point can be adjusted, and new points can be inserted at any place in the table.

Just double-click to one of the lines and the the editor window is opened.

Note that in case an area is described by the table, the first and the last point are identical.
5  Pilotage or Parallel Index Lines

There are four independent Parallel Index Lines available. Each of them can be adjusted individually.

The PI group is available in the RADAR application directly from the RADAR sidebar and in the ECDIS application from the EBL & VRM menu which can be selected from the TOOLS bar.

Depending on the setting in the PI group, the bearing is displayed as true (T) or relative (R) bearing. After switch-on by means of a click in the PI group (red arrow), the lines are superimposed on the chart.

When parallel index lines are switched on, they appear in the form in which they were set last. If the display range has been reduced in the meantime, they might be situated outside the visible range.

Alter the distance of a line by a left-click on it. The line is now displayed with three small "handles". Click and hold the center handle and drag the line to the desired radius.

Change the bearing of a line again by a left-click on it. Then click and hold the line anywhere but not on the small handles and rotate it to the desired bearing.

Adjust the length of a line again by a left-click on it. Then click and hold the line at one of the outer handles and draw to the desired length.

The balloon-text shows the actual data of the line.

To reset PI lines, right-click into the chart and choose RESET PI Lines from the context menu.

Parallel Index Lines can be stored as a set of four under a file name (here Kiel Canal) in a directory (here Elbe Approach).

Use the buttons as shown to the right, to create a new PI-Line Set, to load an existing one or to load the previous or next one.
6 Anchor Watch Monitor

6.1 Overview

An anchor watch monitor is available as an optional function for the ECDISPILOT Platinum STM system.

In this case the context menu which opens on right click into the chart area is showing one more entry called Anchor Watch. Click to this entry to open the list of available functions as shown to the right.

The anchor watch monitoring function is based on a watch sector, which is set at the position where the anchor is dropped. Click to Create here or Create at Ships Position to create a watch sector.

Click to Edit to set the anchor side, the number of anchor shackles used (length of anchor chain and size of watch sector) and the maximum drift speed.

Click to Activate as soon as the anchor chain has been brought out by drifting or maneuvering backwards.

Now the anchor watch monitor is active and if one of the following conditions occur, a corresponding alarm is raised:

1. The speed of your vessel exceeds the set speed limit (typically 1 or 2 kn).
2. Your vessel is moving a certain distance from the anchor position (calculated from number of shackles and water depth).
3. Your vessel touches the contour of the anchor watch sector.

In addition if the vessel finally is leaving the anchor watch sector, a further alarm is raised.

The detailed operating steps are described in the subsequent text.
6.2 Set the Anchor Position

The anchor watch sector is placed with its end at the position where the anchor will be dropped or has been dropped. The center line follows the ships heading.

The anchor position can be set as follows:
1. At current ships position, PRT or STB
2. At cursor position
3. At user symbol

These options are described further below:

At Current Ship Position
Right-click into the chart area opens the context menu. Select Anchor Watch and Create at Ships Position, either Port or Starboard. The end of the watch sector is set to the actual position of the PRT or STB anchor hawse pipe ¹). This end is marked with a user symbol for anchorage area. If you move the cursor to this symbol a tooltip is opened showing the length and direction of the watch sector.

At Cursor Position
Right-click into the chart area opens the context menu, select Anchor Watch and Create here. The end of the watch sector is set to the actual cursor position and is marked with a user symbol for anchorage area as above.

At User Symbol
Select User Symbols from the Tools bar, open the symbols list and select Anchorage area. Select a symbol and place it into the chart area. Any existing user symbol for anchorage area which has been placed earlier, can be used as well.

Click to the center of the symbol to show a small square. Right-click to this square opens the context menu as above with the additional option Create from User Symbol.

¹) The location of the anchor hawse pipe has been entered by a service engineer during system commissioning into the ships configuration. If no entry has been made, the end of the anchor watch sector falls into the conning position, and you may shift it to the desired location manually.
6.3 Perform the Anchoring Maneuver

During the anchoring maneuver the anchor is dropped out and the vessel is moving slowly backwards into the anchor watch area.

Distance and bearing are indicated in the tool-tip which opens when the cursor is moved over the anchorage area. The distance is starting with 0 when anchor dropping is initiated.

As soon as the anchor is in place, the number of shackles and the actual depth should be checked and adjusted if necessary.

Click to the anchor watch area and right-click into the chart area to open the context menu.

Select Anchor Watch and Edit.

Enter the number of shackles actually used for the anchoring maneuver and the actual depth. Finally click to the Set button.

☞ If in doubt about the basis for the shackle length just move with the cursor to the word Shackles in the menu. A small tool-tip opens showing the configured length of one shackle in meter 1).

☞ The depth can be set automatically if a depth value is available from a connected echosounder. In this case the Take auto. Depth button is highlighted and not shaded in gray. Just click to the button and the actual depth is used for monitoring. If the depth changes afterwards, just click to the button again to take the actual value again.

The size of the anchor watch sector is then adjusted automatically according to the length of the chain and the water depth 2).

Adjust Angle Size of Sector

Depending on wind and tidal current forecast the angle size of the sector may be adjusted as well.

Click to one of the sector contour lines to mark them. Then click and hold to one of the small handles. Move the cursor to adjust the angle size. Any symmetric or asymmetric setting can be chosen.

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1) The length of one shackle is a configuration value which has been set during the commission by a service engineer.

2) The sector length is used to monitor dragging of the anchor. The length is calculated by applying the Pythagoras theorem. One side of the triangle is the straight length of the chain and the other one is the water depth. The curve of the chain (the catenary), which is a hyperbolic cosine function is approximated here by a straight line. So the alarm will appear a little bit later providing a small safety margin against false alarms.
6.4 Activate & Deactivate the Monitor, Change Settings, Check Area

Once the own ship is fully inside the anchor watch sector, the semi-transparent orange background color of the sector changes slightly to more intensity.

Insert a speed limit for drift control.

Now the anchor monitoring function can be activated.

**Activate Area**

Right-click into the chart area and select Anchor Watch and **Activate**. Now the monitoring function is started and the editing function is blocked.

The semi-transparent background color changes again to more intensity and to a more red color.

**Deactivate Area**

Right-click into the chart area and select Anchor Watch and **Deactivate**. Now the monitoring function is stopped and the editing function is released.

The red background color changes to less intensity with a semi-transparent color.

**Change the Area**

If during monitoring any settings of the area have to be changed, i.e. angle size of sector, shackles, depth, or speed limit, just **Deactivate** the area, apply the changes and **Activate** again.

**Change Speed Alarm**

The speed alarm can be set in the Edit Anchor Watch menu, right-click into the chart area and select Anchor Watch and Edit. Insert an appropriate value for Speed, i.e. 1 to 2 kn. If no speed limit alarm is required, just leave it at zero speed (0 = speed alarm OFF).

**Check the Area**

Right-click into the chart area and select Anchor Watch and **Check Area**.

The anchor watch area is now checked against ECDIS data. Critical points are marked.

Just move the cursor over one of the marked areas to see the tip-tool with the related text.

In the example here CROSS-CHANNEL FERRIES have to be considered in the anchoring area.
6.5 Delete the Monitoring Sector

When the anchor is heaved up again, the monitoring sector can be deleted.

First deactivate the area if not already done. Right-click into the chart area and select **Anchor Watch** and **Deactivate**.

Then click right-click again into the chart area and select **Anchor Watch** and **Delete** and one of the two entries:

**Anchor Watch Area Only**

This entry is deleting the anchor sector only but not the anchor symbol at the top of the sector. Choose this entry if the same anchoring place shall be visited once a day again.

**Anchor Watch Area & User Symbol**

This entry is deleting the anchor sector and the related user symbol at the top of the sector. Choose this entry if this place shall not be visited again.

6.6 Alarms During Anchor Monitoring

As already listed in the introduction, there are four alarm conditions associated with anchor monitoring. They are listed in the screen-shot to the right:

1. The speed of your vessel exceeds the set speed limit.
2. The vessel is exiting the anchor watch area, which means is touching the contour of the sector at one of the two sides or at the back.
3. The anchor is dragging, which means the vessel is touching the contour of the sector at the back.
4. The vessel is out of the anchor watch area.
6.7 Optional Anchor Watch Display

An optional anchor watch display is available as a ship specific extension.

If available, an entry in the Tools list called Anchor Watch is shown. Click to this entry to open the display in the tools area at bottom left.

The Anchor Watch display provides an anchor watch top line with continuous indication of the anchor position, the actual distance, and the bearing to the anchor position (distance is starting with 0 when anchor is dropping is initiated).

Further it shows the propulsion set which is individual for the own ship and has to be designed during project engineering. The propulsion set graphics is typically a replication of parts of the individual CONNING page.
The **Lines of Position** function is supporting three methods for the verification or determination of the own ship's position without using any position sensor information.

The three methods are based on fixed objects in the vicinity of the own ship which are also plotted in the chart, for example light-houses. The range and bearing of these objects have to be taken by optical means like pelorus (bearing plate) or binoculars. The three methods are:

- Known Bearing and Range to a known landmark
- Cross Bearing (two bearings) to two known landmarks
- Transferred Base Line to one known landmark

**The Lines of Position Menu**

Click to reset data of the selected LOP. See useful information below

Click to enter data for the chosen LOP

Click to transfer the appropriate base line.

Sets the position fix. (Button is only active if data has been entered in the fields above). See also important remark below

Use calculated position data for Dead Reckoning. (Button is only active in case the position sensor is set to Manual DR.)
7.1  LOP - Known Bearing and Range to a Landmark

From the ship’s bridge, the true bearing $\phi$ and range $r$ of a landmark with known position, i.e. a lighthouse, are taken by optical means (pelarues, binoculars).

Based on these two values and the position of the landmark in the chart the LOP function calculates the position of your own vessel. It can be dropped into the chart as a new position fix.

With just another click the own ship symbol which is shown in the chart is shifted to this new position fix. Precondition is that the position sensor input has been set in advance to Manual DR (dead reckoning) or in case all sensors have failed, it may be already active in this mode.

The procedure is as follows:

1. Move the cursor to the landmark in the chart. With MORE (right-click) open the context menu. Select the entry Create LOP.

2. A line starting at the landmark with zero degree is shown. Draw the line with the cursor to the bearing which has been taken by optical means (i.e. 208 degree as shown in the first screenshot above).

3. Open the LOP expander from the ECDIS sidebar as shown to the right. The bearing has been filled in already in line 1.

4. Click to Adjust to open the Set Line of Position window as shown in the next screenshot.

5. Enter the range value which has been taken by optical means. Adjust the bearing if not exact enough. Adjust the position of the lighthouse if not exact enough.

6. Click to the Set button in the bottom line. The range value is taken over into line 1 of the above LOP expander.

7. The LOP expander is now showing the resulting position fix. Click to the Drop Pos Fix button to drop a user symbol for position fix in the chart. In the above screenshot from the chart this position fix is marked with the number 1016.

8. Switch over the position sensor input to Manual DR as shown below (if not already done automatically).

9. Click to Set DR Origin in the LOP expander to shift the own ships position to the new position fix. The own ship symbol in the chart moves accordingly as shown above.
7.2 **LOP - Known Bearing to two Landmarks (Cross Bearing)**

From the ship’s bridge, the true bearings $\phi_1$ and $\phi_2$ of two fixed objects with known position, i.e. two lighthouses, are taken by optical means (pelarun, binoculars).

The intersection point of these two base lines is the actual position of your ship. If the two base lines intersect in a rather acute or flat angle, a third fixed object with its base line can be added.

Based on the intersection point and the position of the two landmarks in the chart the LOP function calculates the position of your own vessel. It can be dropped into the chart as a new position fix.

With just another click the own ship symbol which is shown in the chart is shifted to this new position fix. Precondition is that the position sensor input has been set in advance to **Manual DR** (dead reckoning) or in case all sensors have failed, it may be already active in this mode.

**The procedure is as follows:**

1. Move the cursor to the first landmark in the chart. With **MORE** (right-click) open the context menu. Select the entry **Create LOP**.

2. A line starting at the landmark with zero degree is shown. Draw the line with the cursor to the bearing which has been taken by optical means (i.e. 208 degree as shown in the first screenshot above).

3. Do the same with a second landmark.

4. Open the **LOP** expander from the ECDIS sidebar as shown to the right. The two bearings have been filled in already in line 1 and in line 2.

5. Select either LOP 1 or LOP 2 in the top line (see red arrow) and click to **Adjust** to open the **Set Line of Position** window for LOP 1 or LOP 2. Adjust the bearing and the position of the lighthouse if not precise enough. Click to the **Set** button in the bottom line. The adjusted values are taken over into lines 1 and 2 of the above **LOP** expander.

6. The **LOP** expander is now showing the resulting position fix. Click to the **Drop Pos Fix** button to drop a user symbol for position fix in the chart. In the above screenshot from the chart this position fix is marked with the number 1012.

7. Switch over the position sensor input to **Manual DR** as shown in the previous chapter.

8. Click to **Set DR Origin** in the **LOP** expander to shift the own ships position to the new position fix. The own ship symbol in the chart moves accordingly as shown to the right.
7.3  LOP - Known Bearing at two Times (Transferred Base Line)

The ship is sailing with known and constant speed and course. The true bearing $\phi_1$ of a fixed object with known landmark (i.e. a lighthouse) is taken and entered into the system (marked with LOP 1 in the screenshot).

After a while the true bearing $\phi_2$ of the same landmark is taken again. Due to the fact that the ship’s position has changed, the true bearing does now have another value (marked with LOP 2 in the screenshot).

Now the base line LOP 1 is shifted in parallel along the track the ship has been made.

The intersection point of the new base line (LOP 2) and the shifted (transferred) base line (LOP 1*) is the actual position of the ship.

The procedure is as follows:

1. Move the cursor to the first landmark in the chart. With MORE (right-click) open the context menu. Select the entry Create LOP.

2. A line starting at the landmark is shown. Draw the line with the cursor to the bearing which has been taken by optical means (i.e. 224.9 degree as shown here).

3. Wait during the ship is sailing an appropriate distance.

4. Open the LOP expander from the ECDIS sidebar as shown to the right. The first bearing has been filled in already in line 1.

5. Select LOP 2 from the top menu line (see red arrow).

6. Move the cursor again to the landmark in the chart. With MORE (right-click) open the context menu. Select the entry Create LOP. Draw the line with the cursor to the new bearing (here 157.3 degree).

7. Click to the check box LOP 1 to activate the transfer of the line. The transferred line is shown in the above screenshot from chart and marked with 10:15 TPL.

8. The LOP expander is now showing the resulting position fix. Click to the Drop Pos Fix button to drop a user symbol for position fix in the chart. In the above screenshot this position fix is marked with the time 10:15.

9. Click to Set DR Origin as described in the previous chapters to shift the own ships position to this new position fix. Please have in mind, that the ship might have travelled in the meantime again a considerable distance as shown in the above screenshot.
7.4 Further Hints on Lines of Position

Difference between position drop fix symbol and intersection point

After having clicked on **Drop Pos Fix**, the calculated position is displayed on the screen by means of a symbol and additional information.

*It may happen that the symbol of the position fix is not displayed at the same position as the intersection of the base lines.*

This is not a fault! The base lines are displayed as straight lines within a Mercator projection. But in reality, they should be displayed as slight curves, with a radius depending on the actual geographical position of the ship. The calculation of the Drop Position Fix takes this fact into account and may deliver a slightly different position than the graphical method does.

The more northern or southern the ship's position is, the more different are the calculated and graphically determined positions.

**Useful Information:**

The position data from LOP 1 is automatically copied into the LOP 2-tab after **Set** has been clicked, the position data from LOP 2 is automatically copied into the LOP 3-tab after **Set** has been clicked. This makes it easier to work with the data, especially when using transferred base lines.

Clicking on **Reset** on LOP 1 erases all data in all tabs, clicking on **Reset** on LOP 2 erases data in LOP 2-tab and LOP 3-tab. Clicking on **Reset** on LOP 3 erases data only in LOP 3.

All actions taken with respect to LOP are stored in the voyage recording.
The **Optical Bearing Device** function is similar to the **LOP** function as described in the previous chapter, but here the bearing value is not entered manually but taken over from an optical bearing device. This function is available only as an option to the **ECDIS** application.

Up to three optical bearing devices (OBD) can be connected to the Platinum system. They are typically placed in the port wing, in the centre and in the starboard wing. The correct position of each device in relation to the CCRP has been configured during installation. As a result all bearings taken with these devices are converted to the CCRP.

The principle of operation is that a bearing is taken of a visible object (which is shown in the ECDIS as well), and the fix button at the OBD is pressed. In that instant a message is sent to the Platinum system with OBD number and bearing value. The received data are shown in the OBD LOP lines (see below screenshot).

By pressing the fix button again at the same or another OBD the next line is filled with data. If the received data are not correct, just press the **Clear** button and redo.

If the box in front of the data line is checked, the data are visualized in the ECDIS as well.

Two methods based on fixed objects in the vicinity of the own ship (i.e. light-houses, land marks) are available:
- Cross Bearing (two or three bearings) to two or three known landmarks
- Transferred Base Line to one known landmark

### The Optical Bearing Device Menu

- One or more OBD can be chosen for display
- Check the box to display the LOP in the chart. If --.--° is displayed, take a bearing first.
- Indication of the calculated ship's position
- Click to transfer the appropriate base line.
- Click to reset data of the selected LOP.
- Sets the position fix (button active only if data have been entered in the fields above).
- Use calculated position data for Dead Reckoning (Button active only in case the position sensor is set to **Manual DR**).
8.1 OBD - Known Bearing to two Landmarks (Cross Bearing)

From the ship's bridge, the true bearings $\phi_1$ and $\phi_2$ of two fixed objects with known position, i.e. oil platform and buoy, are taken with the OBD.

They are automatically entered into the Platinum system and shown in the chart as bearing lines.

In the example to the right one line has been taken at 15:59, the second one at 16:00.

The intersection point is showing the position of your own vessel (of the CCRP) in the chart.

It can be marked as a new position fix (here with 16:00).

If a manual position input is required (i.e. all sensors failed) it takes just another click to set this position as a starting point for dead reckoning.

☞ If the two base lines intersect in a rather acute or flat angle, a third fixed object with its base line can be added.

☞ If the time between taking the two bearings is longer (one or more minutes) it is recommended to check the Transferred LOP 1 box to take into account the travelled distance.

The procedure is as follows:

1. Take two bearings with the OBD and open the OBD expander if not open yet.
2. The two bearings have been filled in already automatically in line 1 and in line 2 as shown in the right screenshot.
3. The bottom line is showing the resulting position fix.
4. Click to the Drop Pos Fix button to drop a user symbol for position fix in the chart. In the above screenshot this position fix is marked with the time 16:00 and EP (ensure that chart presentation settings include little or more text).
5. If required, switch over the position sensor input to Manual DR as shown in the previous chapter.
6. Click to Set DR Origin in the OBD expander to shift the own ships position to the new position fix. The own ship symbol in the chart moves accordingly.
8.2 OBD - Known Bearing at two Times (Transferred Base Line)

The ship is sailing with known and constant speed and course. The true bearing $\phi_1$ of a fixed object with known landmark (here harbour entrance mark) is taken with the OBD.

After a while the true bearing $\phi_2$ of the same landmark is taken again. Due to the fact that the ship’s position has changed, the true bearing does now have another value (marked with LOP 2 in the screenshot).

Now the base line LOP 1 is shifted in parallel along the track the ship has been made.

The intersection point of the new base line (LOP 2) and the shifted (transferred) base line (LOP 3) is the actual position of the ship.

**The procedure is as follows:**

1. Take two bearings with the OBD and open the OBD expander if not open yet.
2. The two bearings have been filled in already automatically in line 1 and in line 2 as shown in the right screenshot.
3. Check the Transferred LOP1 box.
4. The **bottom line** is showing the resulting position fix.
5. Click to the Drop Pos Fix button to drop a user symbol for position fix in the chart. In the above screenshot this position fix is not marked with time and EP (if required set chart presentation settings to little or more text).
6. If necessary, switch over the position sensor input to Manual DR as shown on page 257.
7. Click to **Set DR Origin** to shift the own ships position to this new position fix. Please have in mind, that the ship might have travelled in the meantime again a considerable distance as shown in the above screenshot.
8.3 OBD - Shifting the Bearing Lines

If the bearing lines taken with the OBD are not matching the landmarks in the chart, these bearing lines have to be shifted in parallel to hit the landmarks. In that case the resulting position fix is not matching the ships position in the chart. A correction of the ships position can be achieved by switching over to dead reckoning and taking over the position fix as DR origin.

The procedure is as follows:

1. Take two bearings to two different navigational marks (here oil platforms) with the OBD and open the OBD expander if not open yet.
2. The two bearings have been filled in already automatically in line 1 and in line 2 of the menu.
3. Click to the first bearing line to activate it (here BL1).
4. Pick-up the small handle shown and shift the bearing line until it hits the navigational mark in the chart (Prod G14-B) as shown in the screenshot below.
5. Click to the second bearing line to activate it (here BL2).
6. Pick-up the small handle shown and shift the bearing line until it hits the navigational mark in the chart (Prod G16a-B) as shown in the right screenshot.
7. Click to the Drop Pos Fix button to drop a user symbol for position fix in the chart (here marked with EP and the time 09:05).
8. If required set DR origin as shown on the next page.
8.4 OBD - Set DR Origin

If the ship's position as determined by the navigation sensors differs significantly from the resulting position fix taken by OBD (i.e., due to a sensor failure), switching over to dead reckoning can be used.

The procedure is as follows:

1. Click to the small triangle in the Position WGS84 group and select Manual DR for dead reckoning.

2. Click to Set DR Origin in the OBD menu as described in the previous chapters to shift the own ship's position to this new position fix.

3. The resulting situation is shown in the screenshot to the right. The own ship symbol matches the position fix.

4. It is important to update the dead reckoning in short intervals and to rectify the navigation sensors.
9 Speed and Distance Indicator

In former times most vessels had a distance log which was connected to the speed log to calculate and visualize the sailed distance. Some speed logs, i.e. Doppler logs provided an integrated indication of the sailed distance. Today class notations like DNV GL require a speed and distance indicator at the monitoring workstation and it should reflect the actually used speed mode, either water or bottom track. Due to the fact that the space for separate indicators such as log operating panels is limited at the workstation, an integrated solution as part of the navigation tool set is provided.

Select the entry Speed and Distance from the NAVIGATION TOOLS bar to open the corresponding menu as shown above.

It provides two speed indicators, one for speed through water (STW) and one for speed over ground (SOG). Both are showing longitudinal speed ▲ and in addition the transversal speed at bow and stern (calculated with ROT or from a separate sensor).

The sailed distance over ground and through water is logged by two trip counters 1 & 2 automatically, initialization or switch-on is not required. Each of the two counters shows the sailed distance through the water and over ground. Each of the two counters can be reset separately.

In the example above trip counter 1 shows a sailed distance of 803.1 NM through the water and 849.6 NM over ground. Trip counter 2 has the same values.

The speed and distance menu is available at all Platinum workstations as part of the ECDIS and RADAR application and in addition available in the CONNING application. All speed and distance menus are showing the same data, there is one pair of trip counters 1 & 2 for a vessel only.

A reset from any workstation will reset one of these two counters.
10  ODD - Optical Detection Device (optional tool for RADAR)

The Optical Detection Device (ODD) function provides control of a camera or any other sensor which shall be focused on a tracked ARPA or AIS target or on a fixed position. This function is available only as an option to the RADAR application.

One optical detection device can be connected to the Platinum system. It is typically placed in the port wing, at the bow or at the starboard wing. The correct position of the device in relation to the CCRP has been configured during installation. As a result all bearings sent to this device are corrected in relation to the mounting position of the device on-board.

The principle of operation is that the operator is taking a bearing of an ARPA or AIS target or a fixed position, which is shown in the RADAR, and a control button in the ODD menu is pressed. In that instant a message is sent to the ODD with the corrected bearing value. This value is used by the ODD to focus the target or the fixed position. If the vessel or the target or both are moving, the message to the ODD is updated automatically.

Open the Tools Bar and click to ODD - Optical Detection Device.

As a result, the ODD symbol is set in the PPI around own ship's position. At the same time, the ODD dialogue appears in the bottom sidebar.

Shift the ODD symbol to a tracked target or a fixed position. In the screenshot to the right the symbol has already been shifted to a tracked target.

Select in the ODD menu if a target, as shown here, or a position shall be focused.

Now the distance and bearing and also the LAT/LONG values of the focused target or position are shown.

Deactivate the Show Symbol check box if necessary, i.e. if the symbol is shading important chart information.

Set the master check box to fetch control from another workstation.
NAVIGATION TOOLS

10 ODD - Optical Detection Device (optional tool for RADAR)
The NAVTEX receiver is a Narrow Band Direct Printing (NBDP) device operating on the frequency 518 kHz (some equipment can also operate on 490 and 4209.5 kHz), and is a vital part of the Global Maritime Distress and Safety System (GMDSS). One example is shown to the right.

It automatically receives Maritime Safety Information such as Radio Navigational Warnings, Storm/Gale Warnings, Meteorological Forecasts, Piracy Warnings, Distress Alerts, etc. (full details of the system can be found in IMO Publication IMO-951E - The NAVTEX Manual).

Each message begins with a start of message function (ZCZC) followed by a space then four B characters. The first, (B1), identifies the station being received, the second, (B2), identifies the subject i.e. Navigational Warning, Met Forecasts, etc., and the third and fourth, (B3 + B4), form the consecutive number of the message from that station. This is followed by the text of the message and ends with an end of message function (NNNN).

The NAVTEX system broadcasts COASTAL WARNINGS that cover the area from the Fairway Buoy out to about 250 nautical miles from the transmitter; the transmissions from some transmitters can be received out to 400 nautical miles and even further in unusual propagation conditions.

Modern NAVTEX receivers include an INS port which is programmed to transfer the received messages and its alarm messages optionally to an external system. The NAVTEX receiver can be connected to the ECDISPILOT Platinum STM system by means of its INS (Integrated Navigation System) port, so these text messages and alarms can be made available on any of the workstations (MFDs) in the Platinum system. The screenshot below shows the presentation of received NAVTEX messages on the Platinum system.

For identification of the received messages the above mentioned B-characters are combined to a message identifier (ID) shown in the list of NAVTEX messages.

The identifier SA85 describes i.e. a message from the NCC Hamburg with a navigational warning.

The identifier SA85 describes i.e. a message from the NCC Hamburg with a navigational warning.
11.1 Open the List of NAVTEX Messages

The NAVTEX message list is available from the Tools bar. Click to the TOOLS button next to the Alarms menu to open the bar.

Click to the NAVTEX entry in the bar to open the list of received messages ¹).

- **Click to Get Stored** to download all stored messages from the NAVTEX receiver and display them in the list.
- **Click to Show Message** to display the complete text of the blue highlighted message. In general the latest message is automatically highlighted. But any other message can be highlighted just by clicking to the corresponding message line. The message will be displayed in a new window. Close this window by a click to the small cross or by clicking Show Message again.
- **Click to Settings** to change the receiver frequency and filters for stations and message types.
- **Right click to a message line to Reset** the NEW mark (*), to remove the check-mark, or to print or delete a blue highlighted message, or all marked messages.

The message will be displayed in a new window:

¹) The NAVTEX entry is shown only if a NAVTEX receiver has been configured during commissioning.
11.2 Acknowledge a Warning from NAVTEX Receiver

A NAVTEX receiver can send the following warnings to the connected ECDISPILOT Platinum STM system (see also page 438):

- NAVTEX Off-line
- NAVTEX New Message
- NAVTEX NAV Warning
- NAVTEX MET Warning
- NAVTEX SAR Information
- NAVTEX RX Malfunction
- NAVTEX BIST Failure
- NAVTEX General Failure

Any of these NAVTEX warnings is listed in the ECDISPILOT Platinum STM system alarm list and can be acknowledged from there (if the NAVTEX receiver is connected bi-directional). The acknowledgment is sent back to the NAVTEX system and is stopping the alarm horn at the NAVTEX receiver.

The NAVTEX warnings can be switched off individually at the Platinum system. Open the list of SETTINGS, click to NAVTEX Alerts and choose the required warnings. 1)

11.3 NAVTEX Settings

In general the NAVTEX receiver is designed for a fixed and predefined service. A few settings only are available by the Settings button. Click to this button for access to the following parameters:

- **Frequency**: Select one of the three available RX frequencies for NAVTEX operation. The standard frequency is 490 kHz.
- **Stations**: They are identified by a letter A to Z. Select all stations of interest, if in doubt just select all stations.
- **Messages**: The message type is identified again by letters A to Z. Select all message types of interest. If in doubt select all message types.

1) Switching off NAVTEX warnings is available from SW 2.1 onwards
12 Current Prediction (optional tool for ECDIS)

The MULTIPILOT Platinum can be improved by an optional tool for current prediction. It predicts precise current data for a certain sea area derived from the moon phase and from oceanographic weather data. The coverage is worldwide. This tool is based on an additional SW package and periodically updated current and weather data. The update scheme is similar to ECDIS.

If the current prediction tool is activated, an additional entry is available in the Tools bar. Open the Tools bar (red arrow) and click to the Current Prediction entry. The current prediction menu is opened in the bottom left area of the screen. It provides the following functions:

- **Activate Auto select** if current data according to your actual ship position shall be loaded for visualization.
- **Interpolate** between two time sets of current data, i.e. between 12:30 and 13:00 UTC, or select nearest time set or step through time sets with previous and next.
- **Click to Select File** to open a GRIB file with current data for another area.
- **Click to Show Info** to view details about the selected GRIB file.
- **Current data along an active route**
  - Each data point comprises the time, here 12:00 UTC, a symbol according to the size of current and to the direction and the value in knots.
  - **Click to Show Symbols and/or Values** button to show corresponding data.
13 Helicopter Guidance (optional tool)

13.1 Characteristics

The landing path is defined by a triangle of 20° (10° to each side of the center line) and a fixed length of 2.0 NM. The center line is marked every 0.5 NM. The landing path is rotatable around a fixed pivot point, typically the center of the landing area. This pivot point is defined during system commissioning.

The orientation of the helicopter landing path can be set by the operator to any value either relative to own ship or true to north.

The default value is minus 180 deg or 0 deg relative. It depends on the location of the pivot point.

If the pivot point is in front of the CCRP (conning position at the bridge), it is assumed that the landing area is at the bow, and the HELO is approaching from 0 deg relative.

If the pivot point is after the CCRP, it is assumed that the landing area is in the back, and the HELO is approaching from minus 180 deg relative.

13.2 Basic Operating

- Open the HELO expander and switch-on by means of the check box the presentation of the landing path.
- The landing path is shown with the default bearing and length.
- Click the triangle right of the bearing indication to enter another bearing for the approach.
- Select True or Relative bearing by means of the drop down-menu. The default setting is relative bearing (R).
13.3  Identify the Helicopter

In the first step identify the helicopter radar and/or AIS target on the radar screen. Keep in mind that it might not be visible for the radar if the helicopter is still flying high (above 500 m).

Some helicopters especially the SAR helicopters are fitted with a maritime AIS transponder where the ship type has been set to SAR aircraft. In this case instead of the standard AIS symbol the AIS SAR Aircraft symbol is shown. It is oriented in the direction of the COG of the aircraft. The length of the symbol is about 6 mm.

13.4  Adjust the HELO Landing Path

- Click on one of its lines to display the handles.
- Afterwards, the bearing of the landing path can be altered by drag and drop. The distance values at the scale are always presented in an upright position.
- As long as the path is dragged, the balloon text shows the current bearing.
- Adjust the landing path.
- Choose True if the landing path shall remain independent from further course changes of the ship, i.e. if the HELO shall approach against the wind.
- Choose REL if the landing path shall be fixed against the ships superstructure, i.e. the HELO shall approach from a certain angle against ships heading (because other directions are not suitable, the HELO would collide with ships superstructure).
- Reset the check box to hide the HELO landing path again when the landing has been finished.
ROUTE PLANNING AND MONITORING
Route Planning

This chapter describes the route related functions of the ECDISPILOT Platinum STM. It is applicable to all SW versions. If menus between SW version 1.x and 2.x are different, this has been documented in the corresponding text.

Route planning is based on sailing routes consisting of waypoints and straight legs between two adjacent waypoints. These waypoints are defined by their geographical coordinates in WGS-84 format (the standard format of satellite navigation receivers and electronic charts).

A sailing route can be edited before a voyage takes place and can be checked well in advance against unsafe depth areas and any obstructions as indicated in the ENC.

A number of sailing routes, i.e. all North-Sea Routes can be stored together in a common catalog. Several catalogs can be managed by the ECDISPILOT Platinum STM.

Once a sailing route has been properly edited and checked it can be used for manual or automatic steering. If a course has to be changed at a waypoint, a wheel-over point depending on the ships ability to turn is automatically calculated during route editing and inserted into the route. If the ship reaches this wheel-over point during the voyage a warning is given to the helmsmen to start the course change maneuver.

For each leg of a route the navigator can define a maximum possible speed. Based on this input the ECDISPILOT Platinum STM will calculate either a planned speed in order to reach the final destination in a given time or an Estimated Time of Arrival (ETA) based on the maximum speed settings.

Route planning comprises the following steps:

Before starting with route planning prepare charts for the whole voyage. Please refer to the main chapter about Chart Maintenance for further details. Then continue as follows:

1. Consider waypoint names, sequence, sub routes, and turning radius for wheel over point
2. Set the display of the route
3. Set the display of the chart
4. Open a catalog for routes
5. Open an existing route or create a new route
6. Add or insert waypoints in graphical mode
7. Work with the waypoint list
8. Save, rename or delete a route
9. Start check of the route
10. Result of geometrical check
11. Result of ENC check
12. Protect the route by signing it

- These steps are described one by one in the subsequent sub chapters 1.1 to 1.12.

In chapter 2 the route monitoring which is applied during the voyage is described, and in chapter 3 special settings, further information, and variants of SW versions are discussed.

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1) ARCS charts which are based on raster images have no information about depth and obstructions and cannot be used for checking a route.
1.1 Consider at the Beginning

Numbering of Waypoints
Each route has a first waypoint and a last one. During editing, all waypoints are automatically numbered consecutively, beginning at 1 for the first waypoint. All route functions refer to this sequence.

Naming of Waypoints
In addition to the number, every waypoint can be named by an entry in the waypoint list. This will support later identification of a waypoint.

Sequence of Waypoints
The sequence of waypoints can only be sailed in the direction for which it has been generated. However, the direction of a route can be reversed by means of a simple operating step during editing and then processed further.

Dividing a Route into Parts
There is practically no limit to the number of waypoints or to the length of a route. Thus, the entire route between two ports can be defined as one pre-planned track. But it might be appropriate to divide the entire distance up into individual routes.

For example, if a port is approached from various directions along various routes, it might be appropriate to perform separation into the port-related segment that is identical for all routes and the part that is specific for the route concerned. In this way, the data relating to the port need to be input once only, and the maintenance of these data only has to take place in one dataset.

Wheel Over Point
For the course change at the waypoint, the radius of the turn must be specified. The default value is 1 NM and can be modified by the user according to the actual maneuverability of the vessel. Based on this radius the beginning of the maneuver is computed, the track curve leaves the track line 1) at the wheel over point (WOP), and after completion of the maneuver it goes over to the next track line.

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1) Track line is a line joining two consecutive waypoints, also called leg in these operating instructions.
1.2 Set the Display of the Route

Browse Mode on ECDIS

If you want to edit the route graphically on the electronic chart, it is advisable to switch into the **Browse** mode in order to be able to show any part of the sea where the route shall be located.

Route Display Settings

Before route editing is started, the settings for displaying the route in the chart should be made.

Open the **Settings** bar and select the **Route** entry (Settings->Route in earlier SW versions).

Refer to the following picture to identify the items that can be superimposed as additional information to the route. The setting of the safety corridor is described on page 309. At the beginning you may just use a default value of 0.5 NM.
1.3 Set the Display of the Chart

1. Open the **Settings** bar and select the **Draught** entry (Settings->Draft in earlier SW versions). Enter the actual draft of your vessel (here i.e. 8.5 and 8.8 m). It is required for a correct setting of the safety depth in the next step.

(Earlier SW versions have a slightly different appearance, first the value for Aft and then for Fore is shown).

2. Open the **Settings** bar and select the **Depth Contour** entry (Presentation->Chart->Depth in earlier SW versions). Set the appropriate **Safety Depth** (here i.e. 14 m) for raising an alarm and the corresponding **Safety Contour** for displaying the safety contour line in the chart.

3. Consider that the automatic route check is performed in any case against the **ENC** data independent from the chart selected for display. But if ARCS has been chosen for display, the menu shown to the right is temporarily not available.

4. Switch on the display of the user made symbols, lines and areas in the context menu of the PPI/Chart area under **Layer > User Symbols**.  

5. Adjust the **Range** so that cells of the electronic vector chart or raster charts which contain the nautically relevant information for the planned route are displayed.

6. Check whether chart cells having the appropriate navigational purpose are present for the entire track, at least over the width corresponding to the **Safety Corridor** setting or to the **Track Limit** contained in the route data-set.

7. For those areas of the planned route which are not covered by suitable **ENC** data cells, all nautically relevant objects along the route can be marked by means of own Safety Lines or Danger Highlights.

8. If raster charts are used, then all nautically relevant objects along the route must be marked by means of own Safety Lines or Danger Highlights for the entire track, at least over the width corresponding to the track limit.

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**CAUTION**

If no ENC cells are available for a route or parts of a route an actual paper chart has to be used as the main basis for navigation

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1) The available functions of the context menu may vary with operating mode and SW version

2) This is prescribed for ships with DNV approval and using raster charts.
1.4 Open a Catalog for Routes

Open a Catalog

Open the Tools bar and select the Route Explorer entry (Tools->Routes->Explorer in earlier SW versions). In the left menu the list of route catalogs is shown. Click to one catalog in order to see the routes contained in this catalog. These routes are then shown in the right window.

Delete or Rename a Catalog 1)

A click with MORE (right-click) to one of the catalogs opens a context menu for Delete or Rename a Catalog.

Select one function with DO (left-click).

The entry Rename will open another window for editing the name of the catalog.

Enter a name from the keyboard and close with OK.

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1) Compared to earlier versions of the NACOS Platinum system route catalogs can not be created separately. The catalog name is a property of the route. If a new route is created, a catalog name is assigned as well. The catalog name is used as a sort criteria for routes. Deleting a catalog means to delete all routes which have this catalog name as a property. But the catalog name can not be deleted separately.
1.5 Open an Existing Route or Create a New Route

Open and Display a Route

Open the Tools bar and select the Route Explorer entry (Tools->Routes->Explorer in earlier SW versions). Select a catalog as shown in the previous sub chapter.

Mark a route name by clicking on it one time (DO or left-click, will be highlighted in blue), and then

- click to the Open button,
- or open the context menu with MORE (right-click) and there click on Open or
- just double-click to the route name.

Once the route has been opened it is shown as an orange colored line in the corresponding chart.

A route can display its waypoints and additional data also as a list. For this purpose right-click on the route name and select Waypoint List from the context menu (in some versions the list is opened already if the route is opened or activated).

The route data are then displayed in the lower part of the chart area in form of a waypoint list.

Create, Delete or Rename a Route

A click with MORE (right-click) into the window for routes opens again the context menu as above with further functions for New Route, Save, Save As..., Delete Route, or Rename Route. Select one function with DO (left-click).

The entries Save As..., Delete Route and Rename Route are only possible when a route is selected (marked in blue).

Enter a name from the keyboard, select a catalog, and additional information, and close with OK.

After having entered the name of a new route the first waypoint named Initial waypoint appears in the center of the screen which is also the current ship’s position if the ship is centered (red arrow).

At the same time, you can select Waypoint List from the context menu as above so that the waypoint list appears in the lower part of the chart area showing already the initial waypoint (next page).

Click on the waypoint symbol to mark it. The marked waypoint is displayed with a handle and can now be moved to the desired starting point of the route. Pointing with the cursor to the waypoint opens an information window with position, route name, etc.
1.6 Add or Insert Waypoints in Graphical Mode

In the previous chapters (see page 274) we have learned, how to create a new route with just one initial waypoint or how to open an existing route with a number of waypoints. In any case the subsequent step is to add or insert further waypoints.

The easiest way is the graphical input mode with the mouse. This mode is described here. For the text input please refer to the subsequent chapter about editing of further route data (see page 278).

Add one or more Waypoints

To add waypoints, click on the first or the last waypoint symbol of the route to mark it (see red arrow). Then right-click anywhere in the chart to open the context menu.

In the context-menu, click on Route->Continue Route to set the next waypoint.

From now on the cursor is displayed with a dashed connection line to the previously set waypoint and each click with DO (left-click) adds a new waypoint symbol on the screen. Its position is added at the end or the beginning of the waypoint list.

Stop the sequence of adding waypoints by a click with MORE (right-click), ensure that the mouse is not moved during right-click.

Insert a Waypoint

To insert a waypoint, click on the nearest waypoint symbol of the route to mark it (see red arrow). Then right-click anywhere in the chart to open the context menu.

In the context-menu, click on Route->Insert Before or Insert After to add a waypoint. The position of the new waypoint is inserted in the waypoint list.

Insert a Waypoint on a Leg

Click on the leg to select it; a marker is shown in the middle of this leg.

Via the context menu you then have access to the function Route->Insert Waypoint here.

In any case the new inserted waypoint will be set in the middle of the leg which then must be moved manually to the wanted position in the chart.

Move a Waypoint

Click with DO on the waypoint symbol to select it. When the selection mark is shown, click on it and hold the DO key and then move the waypoint symbol to the intended position on the screen.
1.7 Working with the Waypoint List

The waypoint list provides an overview about all route parameters. Opening of the list has been shown in the previous sub-chapters. The list has two views, a Planning View with Waypoints and a Scheduling View with Legs (or track segments).

The most important parameters are the waypoint number, the name, the position, the turning radius (RAD) at the waypoint, the time of arrival (ETA) at this waypoint, and the calculation mode for ETA.

They are included in the first view. The name has to be inserted manually. All other data are generated automatically during the graphic editing mode, but can be changed later.

Most of the data in the second view are generated as well by the ECDISPILOT Platinum STM by using default values for the parameters, these can be changed later. A detailed list of all parameters is given on page 306.

The columns of both views can be arranged or even hidden by the operator and they can be individually printed out. More details can be found on the next two pages.

![Waypoint List - Planning View](image-url)
1.7.1 Planning View of the Waypoint List

The screen-shot below is showing the Planning view of the Variable Waypoint List:

- **Save** is storing the edited route data on the hard disc, details can be found on page 280. **Close** is closing the route without saving.
- **Activate** is starting the route monitoring process during a voyage, details can be found on page 290.
- With **Setup** and **Print Passage Plan** the columns of the opened waypoint list can be sorted for print-out and finally printed out on paper, refer to page 304 for details.
- With **Notes** a small editor is opened to enter notes and hints for this route.
- The function **Reverse Route** is changing the sailing direction. Waypoints are automatically numbered in the opposite direction. Store under another name with **Save As** from route expander.
- With **Check Route** an automatic check of the route for geometric mismatch and ENC objects is started, refer to page 281 for details.
- The position data shown here are inserted automatically based on the position, where the first waypoint and subsequent waypoints have been graphically set by the operator. For each new waypoint that is set by a mouse click, a new line in the waypoint list is added.
- Click to one of the waypoints in the list with **MORE** (right-click) and select Edit Waypoint or Edit Leg to modify data by text input (refer to page 278 and following for details).
1.7.2 Edit Waypoint Data

To edit further data of a waypoint, click with DO on this waypoint in the chart, then right-click anywhere in the chart to open the context menu.

In the context-menu, click on **Route-> Edit Waypoint** to open the waypoint editor.

If you want to delete the selected waypoint, just click to **Route-> Delete** in the context menu.

### Name of the Waypoint

First give a name to this waypoint to ensure easier identification.

### Position of the Waypoint

Check the position which results from placing the waypoint graphically into the chart, adjust if necessary. Activate the Parameter Point if no turn should take place at this waypoint (see also page 307).

### Radius at this Waypoint

Check the required turning radius at this waypoint, default is 1 NM, adjust if necessary (see also page 308).

### ETA at this Waypoint

Check the estimated arrival time at this waypoint, set to **Specify** if it is a fixed time or to **Calculate** if it depends on a predefined speed (default is 25 kn). More details can be found on page 294.

### Notes for this waypoint

Enter any notes and hints which are important for navigation at this waypoint.

Finally press **OK** and the waypoint list will show the following updated line for waypoint no 5:
1.7.3 Edit Leg Data

The **Edit Leg to Waypoint** menu is available by a right click into a waypoint line of the waypoint list.

Select **Edit Leg...** from the context menu.

The **Edit Leg to Waypoint** menu is available in addition by clicking to the desired leg in the graphical route presentation.

Right click to the small handle which is showing up now opens the context menu.

Select **Route** and **Edit Leg...**

Some of the leg parameters are set to default values, change and complete as follows if required:

**Controller** The controller mode defines, if the route is executed automatically by the TRACKPILOT, or by the DP system, or manually by the operator.

☞ If **manual** is chosen, the radius in the **Edit Waypoint** menu can be set to 0 without error message, see page 278.

**Sail** choose between RL (rhumb line) and GC (great circle) for this leg, default is RL with constant course, see also TRACKPILOT chapter

**Economy** rudder economy on this leg, used in TRACKPILOT mode, typical value is 3, see also TRACKPILOT chapter

**Max. Speed** maximum speed set by the operator as an upper limit for the calculated speed (typical value is speed at 80% of max. engine power)

**Course Limit and XTD Limit**

Alarm limit for deviation from planned course and route, used for ECDIS monitoring, valid on this leg, typically 15 deg and few hundred meter (see page 288)

**Port Corridor**

Corridor for monitoring ECDIS obstacles and depth along own track, typical value 1 NM, each side can be set individually, here port side is set

**Starboard Corridor**

Corridor for monitoring ECDIS obstacles and depth along own track, typical value 1 NM, each side can be set individually, here starboard side is set
1.8 Save, Rename or Delete a Route

Routes as shown in the waypoint list are not automatically stored to the file system on the ECDISPILOT Platinum STM. Be sure to Save all your changes at the latest after completion of route editing. During long editing sessions intermediate saving of data is recommended 1).

**Save in the WP List**

Select the Route pull-down menu in the headline of the waypoint list by clicking with DO (left-click) to the text Route (see red arrow)! Then click with DO to Save.

**Save in the Route Expander**

A route can also be saved from the route expander. Just click with DO (left-click) into the right window of the expander, a context menu is opened. Then click with DO to Save.

If you want do discard your changes made to the selected route, use Save As to store the version with the changed dataset under a new file name. The initial route remains with the old data set under the old name.

You may also delete the selected route with Delete or rename the selected route with Rename. If you rename a route the old name and the old route content is deleted from the route list.

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1) Refer to page 297 for details on storing data on USB devices.
1.9  Start Check of the Route

Before a route can be used for sailing it has to pass an automatic check of the geometrical shape, i.e. minimum turning radius and only if this check was successful a second check for obstructions or shallow water areas contained in the ENC takes place.

Start the Check in the WP List

Select the Route pull-down menu in the headline of the waypoint list by clicking with DO (left-click).

Then click with DO to Check Route (green arrow).

If the route has been reloaded, the check results from a previous check are lost and the check must be done once again. In this way it is ensured that the check is repeated with the actually valid draft dependent depth contour settings of the most up-to-date electronic chart.

Comment on the Results

The possible results of the check are described on the next two pages, but in general it can be stated as follows:

- When the entire preplanned track is shown without red ring symbols along the route and no alarm icons are shown any more in the waypoint list, the check program did not find any violations.
- It may happen that errors or warnings remain displayed but in reality there is no serious problem going along that route. The quality of the check-results is mainly depending on the contents of the electronic charts.
1.10 Results of Geometrical Check

If the check of the geometrical shape was not successful, a message window as shown here to the right appears.

The corresponding waypoint is marked in the waypoint list with a yellow warning sign (depending on SW version, the sign may be slightly different).

Just point with the cursor to this sign and a small tool-tip comes up with more details about the violation of the geometrical shape.

The yellow sign is by default in the first column of the list but can be set by the user to any position as required (depending on SW version the sign may be slightly different, in later SW versions a yellow square is used).

In this case the position of waypoint 6 has to be modified such that the next waypoint can be reached with the set minimum radius of 0.50 NM.

The part where the set minimum radius is too large compared to the geometric shape which has been edited, is also marked in the graphic presentation of the route (see red arrow in the small picture to the right).

- This marked line and the corresponding yellow warning sign are also already shown during editing.

Adjust the waypoint so that the marked line disappears or decrease the set minimum radius in the waypoint list. The lowest value which can be input here is 0.3 NM.

In addition a minimum distance of 200 m between two waypoints should be fulfilled.

- Start with a new check after correction of the route.
1.11 Results of the Check against ENC Chart and User Symbols

The check against the ENC chart comprises:
- check against the Safety Contour which has been set by the operator, see page 272
- check against the chart objects with a depth less than the Safety Contour Value
- check against Own Safety Lines and Danger Highlight Areas
- in addition all navigational warnings for this area are listed

The results of the route verification are shown in the waypoint list by small icons.

The yellow sign is by default in the first column of the list but can be set by the user to any position as required (depending on SW version the sign may be slightly different, in later SW versions a yellow square is used).

Pointing on it with the cursor, gives again additional information on the check-results as a tool-tip. An example is given below (cursor pointed to WP 5):

![Waypoint List Example](image)

The results of the verification process are also made visible in form of red rings displayed along the route, an example is given below. Here the cursor has been set one after the other to the red rings of the anchorage area, the depth area and the wreck. In this picture all three tool-tips are shown at the same time to give an overview. On the ECDISPILOT Platinum STM only one is shown at a time:

![Route Verification Example](image)

For the verification of the route, the chart cells with the highest precision available on the system are used as the basis. They might therefore differ from the cells used for the display. Because of this, messages might occur which initially are in contradiction to the presentation of the pre-planned track in the vector chart.

If the check showed passages which can not be sailed, the route has to be re-directed and checked again. But typically a few warnings will still remain. In any case the route can be activated after check independent from the results and number of warnings.

1) To clarify supposed contradictions of this kind, it is helpful to switch to a different range setting and to use the Chart Info box where required.
1.12 Protect the Route against any Changes

Once a route has passed successfully the geometrical and the chart-related check it should be protected against any unintended or unauthorised changes.

Select the desired route from the list of routes and open the route action list with a right click on this route entry.

Select the entry Sign Route.

The level 2 password menu opens. Enter the password and continue.

The Sign Route menu opens.

It indicates that this route has now been signed. To close the menu click to OK or to the cross in the top right corner.

Now, if there are any changes made to this signed route and this route is then activated, these changes will be operative i.e. for track control, but they can not be stored. The original route is not affected by these changes.

If this changed route shall be stored, it has to be stored under another name.

The signed route is marked with a small lock symbol in front of the route name.

If the cursor is moved over the route name, a status line Signed on: date is shown. 1)

The only way to change the signed route is to store it under a new name and delete the signed version. The signed route can be deleted at any time.

---

1) If earlier routes from NACOS 1000 have been imported into a Platinum system, these routes are not supporting the extended data structure with the Signed character. They can not be signed. The status indicator is showing "Legacy route" for these routes. Save these old routes under another name. Afterwards they can be signed like actual Platinum routes.
2 Route Monitoring

During the voyage, the ECDISPILOT Platinum STM performs a number of nautical checks. This process is running on workstations with ECDISPILOT Platinum STM application independently from each other.

If defined criteria, based on the ECDIS performance standards, are infringed, an appropriate alarm is given when the respective monitoring function has been switched on by the user.

The monitoring functions are based on the look-ahead sector as set by the user. An example is shown in the screenshot to the right. If a waypoint, a wheel-over point, any obstacle, danger area or shallow water area are falling into this sector, an alarm or a warning is raised. The look ahead sector can be set such that an alarm well in advance is given.

The monitoring function can be divided into chart monitoring and track monitoring as follows:

**Chart monitoring**
- raises an alarm if any dangerous chart object or user symbol \(^1\) contained in the ENC are falling into the look ahead sector
- raises an alarm if the safety depth (required for the own vessel and set by the user), is larger than the depth indicated in the chart taking into account the length and the width of the look-ahead sector
- is performed in any case independent from an activated route, monitoring is just based on the look-ahead sector checking the area in front of the own ship independent from sailing on a route or somewhere else
- is performed in the background and always based on ENC charts independent from the chart as selected by the user (i.e. ARCS, or C-Map Prof.).
- If no ENC is available the check is carried out only against user symbols which have been placed by the operator in advance on the planned route.

**Track monitoring**
- raises an alarm if the own ship is deviating from the activated route (also called System Route) more than the XTD limit which has been set by the user for the actual leg
- raises an alarm if the next wheel-over point is touched by the look-ahead sector
- can be performed independent from the selected chart (ENC, ARCS, or C-Map Prof.) and also if no charts are available for a certain area

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\(^1\) Only those user-made symbols which are classified as obstructions (like own safety line, danger highlight, buoys, beacons, lighthouses, landmarks, etc.) generate an alarm in the monitoring process.
2.1 Preconditions for Chart and Track Monitoring

The following prerequisites must be fulfilled:

- The best possible sensors for position and speed over ground must be selected.
- By means of a comparison between the available position sensors, a check must be performed to ensure that the selected position sensor is supplying correct and accurate position data.
- If an ENC vector chart is used, it must be available for the entire navigated area. Otherwise, own safety lines and danger highlights must be placed by the operator as **User Symbols** along the planned route where the vector charts are missing.
- If a raster chart is used, own safety lines and danger highlights for all potentially dangerous areas and objects must be placed for the entire navigated area.
- The safety contour value must have been set correctly - see following sections.
- The used route must have been successfully checked and reasonable settings for the track limit (i.e. the monitoring strip for the deviation from route alarm) must have been made for each leg.
- The latest relevant nautical warning information received by radio must be taken into account, possibly by the editing of own safety lines or danger highlights or by manual ENC update (see main chapter about **Chart Maintenance**).
- The check of the used planned route should, if necessary, be repeated after incorporation of the received warning information.
- The alarm criteria must be correctly set - see the following sections.

In the case of doubt and once per year, the monitor performance must be checked. Please refer to the main chapter about **HW and SW Maintenance**.
2.2 Settings for Chart Monitoring

**Safety Contour**

Open the **Settings** bar and select the **Depth Contour** entry (Presentation->Chart->Depth in earlier SW versions).

Set the safety contour by shifting the safety depth glider with the cursor to a safe value depending on the actual draft (see also page 272), i.e. a value of 2.0 to 3.0 m below keel.

**Look-Ahead Sector**

Open the **Settings** bar and select the **ECDIS Alerts** entry (Alarms->Own Ship in earlier SW versions).

Set the look-ahead sector to a value which gives enough time for any measures in case of an alarm, use the combined setting of time and distance, whatever comes first will raise the alarm. Activate **Show on Chart** to see the sector as a yellow beam.

**ECDIS Alerts**

Open the **Settings** bar and select the **ECDIS Alerts** entry.

Set the ECDIS alerts to the actual nautical requirements of the passage, if in doubt activate all of them.

The first three are part of the chart monitoring as described on page 291.

The next two are part of the track monitoring as described on page page 292.
2.3 Additional Settings for Track Monitoring

Cross-Track Limit

The cross-track limit is set in the waypoint list, the default value is 1.000 m.

Open the list and enter a value which is adapted to your navigation. In open sea a value of 1.000 m might be appropriate. In narrow waterways a value even as low as 100 to 200 m might be useful depending on the accuracy of the selected position sensor.

For each leg of the route an individual value can be entered. If the route is continued with further waypoints the last setting is copied to each new line.

XTD Limit in the Planning View of the WP List

Ensure that the XTD column is set to visible, see page 276. Click with MORE (right-click) into the waypoint line and select Edit Leg. Open the editor and enter the new value under XTD Limit.

2.4 Additional Settings for ECDIS Hazards

From SW version 2.1 onwards an additional function for highlighting ECDIS hazards within the look-ahead sector or the route corridor is available (this is just an indication, no alert is given). This presentation feature can be switched off by the user individually (see page 93). In S-mode all three groups are activated:

1. Crossing safety contour 1)
2. Approaching navigational hazards
3. Crossing special areas (with all sub-areas)

1) Refer to page 92 for setting the depth value for the safety contour
2.5 ECDIS Hazards List

ECDIS hazards which have been detected within the look-ahead sector or the route corridor (see also page 288) are presented in a hazard list. This detection is independent from the visualization of the look-ahead sector or corridor. If the look-ahead sector is not shown the detection is still in operation.

Open the ECDIS Hazards List by clicking to the corresponding entry in the list of Tools (1). Move the cursor over an entry in the list to see more details (2).

The capacity of the list is limited to 42 entries. If more hazards are occurring, only the closer ones are kept in the list.

The list is independent from the graphical presentation of ECDIS Alerts. Even if the presentation of hazards has been switched off in the ECDIS Hazards menu under Settings, they are still presented in the list.

In general it is recommended to adjust the size of the look ahead sector and the safety contour depth to reasonable values so that the number of listed hazards is reduced to a few as shown in figure (3) below.
2.6 Activate a Route for Monitoring

System Route

Select a route from the route expander (it is marked in blue), and click to the Activate button 1).

If the route was already open and has just been checked, it is activated at once, otherwise an automatic check takes place.

In any case the activated route will change its color from orange to red and will from now on be distributed to other ECDISPILOT Platinum STM (or workstations) for system-wide use.

The route is displayed with all warnings (red rings) inside the safety corridor resulting from last check. If no corridor has been set, or if the corridor is changed during monitoring, no warnings will appear.

The activated route is treated as System Route until it is deactivated again or until another one is activated. The System Route has the following properties:
- it cannot be deleted from the screen,
- it cannot be modified or reloaded,
- it is used for chart and track monitoring
- it is used for calculation of all data shown in the Route Monitoring window,

Alternative Routes

Even if you have activated a route, it is possible to load other routes from your catalogs and to display them as well as to edit, modify and save them without interfering with the activated System Route.

All loaded routes can be displayed with their waypoint lists in the lower part of the application area. Each route has an own tab showing the route name. Clicking on the respective tab of a route brings the selected waypoint list into the foreground. If another route shall be used as activated route, it must be loaded and checked beforehand.

Previously used waypoint lists can be switched off from being displayed by clicking on the small cross in the Route Name tab of the waypoint list. But they still have to be closed with the button in the headline of the route expander.

Copy a Route

If you want to create a copy of a opened or activated route, use Save As... in order to store it under another name to the same catalog.

1) As described earlier, the route can also be activated from the buttons in the top line of the WP list, see page 277.
2.7 Chart Monitoring

Warning against Sailing into an Area of Insufficient Depth

When a Safety Contour or another area with insufficient depth (less than the set safety contour value) is touched by the look ahead sector, e.g. an object belonging to the object class Land Area, the Crossing Safety Contour alarm appears in the alarm list.

The safety contour is formed from all objects of the object classes Land Area and Inter-tidal Area and from the objects of the object classes Depth Area or Dredged Area whose depths are equal to or the next size greater than the value entered as Safety Contour.

For this monitoring, the cells with the highest precision available in the chart database are used. They might be different from the cells being used for display. It is therefore helpful to use another display.

The output of the safety contour alarm can be generally suppressed by means of the Safety Contour Alarm check box under Alarms > ECDIS Alerts.

Monitoring against Chart Objects

If the look ahead sector touches an ECDIS object such as Restricted Area, Caution Area, Traffic Separation Zone or Buys, Beacons, etc., the alarm Crossing Special Area appears in the alarm list. This alarm appears as well if objects are touched which belong to particular object classes and are provided with depth information (e.g. Underwater Rocks, Wrecks) and whose depth is less than the value entered as Safety Contour.

Again the output of these alarms can be generally suppressed by means of the check boxes Crossing Special Area. For the Special Area alert monitoring, the priority in the alarm list can be set to warning or caution level. Cautions are announced without activation of the buzzer.

Monitoring against User Symbols

If an Own Safety Line is touched or crossed by the guard sector, the Navigation Hazard Ahead caution appears in the alarm list. The alert appears only if the own safety line is touched from within the safe area. The own safety line is indicated by a hachured line, where the non safe side of the area behind is indicated by a series of short small lines.

The same alarm is issued if one of the user-made Symbols (e.g. buoys, beacons, wrecks or other underwater hazards) is touched by the look-ahead sector.

If an area belonging to the object class Danger Highlight is touched by the look ahead sector, the alert Crossing Special Area appears.

Again the output of these alarms can be generally suppressed by means of the check boxes Navigation Hazard Ahead and Crossing Special Area.
2.8 Track Monitoring

Monitoring of the Track
Open the Tools bar and select the Voyage Monitoring entry (Tools->Routes->Monitoring in earlier SW versions).

Open the Route Monitor and use the actual track data to keep the vessel on track.

The monitor is showing the cross track deviation as well as distance and course to the next wheel over point and to the next waypoint.

Alarm on Deviation from Route
If the deviation of the own ship's position from the pre-planned track is greater than the Cross-track alarm limit set in the System Route under XTD LIM for the current leg, the alarm message Deviation from Route appears.

Open the Settings bar and select the ECDIS Alerts entry (Alarms->ECDIS Alerts in earlier SW versions) to activate the relevant alarm function.

The off-track limit value currently valid for the actual leg is displayed in the XTD LIM column of the waypoint list.

Alarm on Approaching the next Waypoint
When the remaining traveling time to the next wheel over point (WOP) becomes less than the value of the look ahead distance or the time displayed in the ECDIS Alerts menu (Alarms->Own Ship in earlier SW versions), the alarm message Approach to Waypoint appears.

By switching off the function Critical point on route alarm, the output of this alarm can be suppressed for this workstation, even if the other route related alarms are not suppressed.
3 Route Scheduling

The **Time Schedule** function provides the **Calculated Speed** for reaching the final waypoint of a route within a given time frame defined by **Departure Time** and **Arrival Time** (also called ETA, estimated time of arrival).

Alternatively the time frame is calculated for a **Planned Speed**. The time frame can be defined either by a given **Departure Time** or a given **Arrival Time**. The missing parameter is calculated.

**Time Schedule with Planned Time Frame**

The default setting for a new route is the actual time used as the **Departure Time** at WP1. It is shown in the field **ETA/ETD**. The default ET Mode is set to **Calculated**.

For each new waypoint which is added to the route, the arrival time at this waypoint using the default speed of 25 kn is calculated.

The time frame can be defined by setting the departure time (ETA/ETD field) at WP1 and the arrival time at the last WP to the required time (again ETA/ETD field). Further-on the ET Mode has to be set to **Departure** at WP1 and **Arrival** at the last WP.

Now the **Time Schedule** function calculates the required speed considering the maximum speed limit which can be set for each leg individually.

**Time Schedule with Planned Speed**

The default setting for a new route is the actual time used as the **Departure Time** at WP1. The default ET Mode is set to **Calculated**.

For each new waypoint which is added to the route, the arrival time at this waypoint using the default speed of 25 kn is calculated.

The resulting **Arrival Time** is shown for each waypoint and also for the last WP in the field **ETA/ETD** without any further operating steps.

In many cases the default speed of 25 kn has to be adjusted to the individual performance of the vessel which might be in addition different for each leg of the route.

The general setting for all legs of the route is done in the top line of the WP list, an additional setting for selected individual legs of the route is done in the corresponding field for calculated speed (**calc. SPD**) in the selected data line.

- In both cases the computation is done each time again when you enter a route parameter which is changing the route distances, the relevant speed values or the ETA/ETD values.

- In both cases the calculated speed for each leg is displayed under **calc. SPD** in the waypoint list, and can be used by the operator as the current speed setting during manual speed control. The calculated speed values are in any case limited to the **MAX SPD** values which may be defined differently for each single leg of the entire route.

- Additional to the time and speed data the entire sailing time will be displayed to the right of the **Planned Speed** controls or at the bottom of the WP list.

- If you load or reload a route, or a new one has been created, the program will set all **calc. SPD** values to the **MAX SPD** values contained in the route. At the same time a time schedule will be calculated based on these speed values and the first and last waypoint will contain the implicitly resulting departure and arrival time.
3.1 Enter Time Schedule in WP List

**Planned Speed Mode** - This mode is the default mode. The two larger screenshots below are showing the initial settings after having entered a new route. The ETA times are automatically set to the actual time, the arrival time in the last ETA field is calculated based on the Planned Speed setting of 8 kn.

**ETA Mode** - Change to this mode by setting the Mode in the waypoint editor menu at bottom left from calculated to specify. Enter a new time for the first waypoint and a new arrival time for the last waypoint. The Speed is automatically updated, here from 8 to 2.6 kn. Refer to the two small screenshots to see the difference between the two modes.

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Fig. IX / 4 Time Schedule on WP List
3.2 Monitoring the Time Schedule During a Voyage

The Time Schedule Monitor is a visual tool supporting the operator in the accurate execution of a planned schedule.

The Time Schedule Monitor is based on an orange rectangle starting at the planned time at waypoint 1 of the activated track and running along this track with the pre-planned speed. As long as the own ship symbol is inside the box, it is sailing according to the plan.

The monitor is started as follows:

First activate a route, than check the box Show Schedule Box in the Options menu of the waypoint list as shown below.

If the activated route has a time schedule with a departure time for the first waypoint and arrival times (ETA) for the subsequent waypoints a rectangle with an orange outline will be shown at departure time enclosing the first waypoint. The display of the rectangle is independent from the actual position of the ship. The rectangle will move along the track according to the time schedule. It will arrive at the last waypoint at the time which has been entered for ETA at the last waypoint. This is again independent from the own ship position.

As long as the own ship is sailing on schedule the rectangle will enclose always the own ship symbol. Both objects, own ship symbol and the rectangle will move along the track matching as long as the schedule is matched.

If the ship is sailing too slow, it will be caught up by the back of the rectangle, if it is too fast, it will touch the front line of the rectangle.

By observing the graphical presentation the operator can easily adjust the speed so that the planned arrival time will be met.

If a route is activated i.e. half an hour later than the departure time the rectangle is placed at the location where the ship should be after half an hour of sailing.

If a route is activated earlier, the rectangle will start to move at the planned departure time only.

The length of the rectangle is equivalent to the distance which the own ship can sail in two minutes. The width is identical with the safety corridor of the route which has been set during the editing phase. It is typically a value between 0.5 and 3 NM.

At the same time the actual deviation from schedule is displayed in the headline of the waypoint list.

In the example shown below the arrival waypoint is Las Palmas Pilot, this is WP (15), and the distance is 1692.5 NM with an ETA of 19th Aug 2013 02:30 with 10.8 kn. The actual delay is two days and 8:30 hours.
3.3 Automatic Rescheduling of a Voyage

The Time Schedule Monitor function as described in the previous chapter can be combined per configuration setting with an automatic rescheduling function. This automatic function has to be activated during system commissioning by a service engineer (latest SW version).

If available it initiates an automatic re-scheduling whenever the ship is caught up by the monitoring rectangle. The rescheduling will change the speed settings for the upcoming legs either slowing down or speeding up but taking into account any speed limitations and the maximum speed of the ship.
4 Route Export and Import (Back Up and Printout)

Routes can be exported from the ECDISPILOT Platinum STM system by three different ways:

- The complete set of routes which are stored on the ECDISPILOT Platinum STM system can be stored on an USB memory stick for later back up purpose. The export can be carried out from any workstation on-board. All workstations are using the same data base.

- Selected routes and directories can be exported from ECDISPILOT Platinum STM system to an USB memory stick in order to process them on third party systems. The routes are exported with a basic data format describing just waypoints and legs but sufficient to be used directly for track control.

- The passage plan for a selected route can be printed out on paper or into an XPS file.

Routes can be imported into the ECDISPILOT Platinum STM system by two different ways:

- The complete set of routes which have been backed up earlier can be loaded again into the ECDISPILOT Platinum STM system in order to restore the route data base. Each route is loaded with its full data set with all ECDISPILOT Platinum STM specific data. It is important to note, that all routes which are on the system already, are overwritten by this procedure. The back-up can originate from your current workstation, from any other workstation on your ship, or from any other ship with a ECDISPILOT Platinum STM system.

- Selected routes and directories can be imported into the ECDISPILOT Platinum STM system in order to add routes which have been generated on third party systems. The routes are loaded with a basic data format describing just waypoints and legs but sufficient to be used directly for track control. Those routes which are on the ECDISPILOT Platinum STM system already, are not overwritten by this procedure.

The different ways are described in detail on the following pages.
4.1 Backup of Routes

User-defined Routes can be saved on USB memory stick. This is important for backup i.e. if a display electronics unit has been exchanged and all routes shall be restored. Further-on the routes can be distributed to other ships fitted with Platinum systems as well.

1. Navigate to the Super Home menu and click on Maintenance > Nautical Charts.

2. As a result, the world chart together with a main selection sidebar and a protocol window appear.

☞ If the chart maintenance is started for the first time after power-on, the database will be checked automatically. This will take some minutes but is not indicated, please just wait. Any errors will be displayed in the protocol window underneath the world map.

3. In the Tool bar chose to Backup/Restore Routes. In earlier SW versions operating is similar with the expander.

4. In the Function group, select Backup Routes.

5. Under Backup to choose the device which is to be used as backup media, typically an USB memory stick which has to be inserted before.

6. Click to Browse to open a window in which the archive directory and/or path can be selected. Existing routes in this archive directory will be overwritten. A warning is given before.

-or-

7. If a new archive directory is to be added, check New Archive and enter the desired directory name.

8. Click on Start: Backup Routes.

☞ The backup may take some minutes depending on the number of routes.

When the backup is completed a corresponding message is shown.

In an integrated system with several MFDs (workstations) connected to each other by the network, each MFD has stored the same route data. Backup is only required from one of these MFDs. Restoring is overwriting the route data of all MFDs (workstations).
4.2 Restoring of Routes

User-defined Routes can be restored from USB memory stick. This is important if i.e. a display electronics unit has been exchanged and the route directory shall be built up again with exactly the contents. Further-on the routes can be distributed to other ships fitted with Platinum systems as well.

- The restore step will always overwrite all existing routes on your system. After any restore activity your display electronics shows exactly a one-to-one copy of the contents on your USB memory stick.

- If sets of routes from different sources shall be combined, they have to be merged first on the USB device and afterwards the complete set of routes can be copied to your workstation. Routes from former NACOS systems XX-4 and XX-5 with Radar 1000 and 1100 can be imported as well.

1. Navigate to the Super Home menu and click on Maintenance > Nautical Charts.

2. As a result, the world chart together with a main selection sidebar and a protocol window appear.

- If the chart maintenance is started for the first time after power-on, the database will be checked automatically. This will take some minutes but is not indicated, please just wait. Any errors will be displayed in the protocol window underneath the world map.

3. In the Tool bar chose to Backup/Restore Routes. In earlier SW versions operating is similar with the expander.

4. In the Function group, select Restore Routes.

5. Under Selected Path: choose the device which is to be used as restore media.

6. Click to Browse to open a window in which the archive directory and/or path can be selected.

7. Click on Start: Restore Routes.

- The restoring procedure may take some minutes depending on the number of routes.

When the restoring is completed a corresponding message is shown.

In an integrated system with several MFDs (workstations) connected to each other by the network, each MFD has stored the same route data. Restoring is only required to one of these MFDs. Restoring is overwriting the route data of all MFDs (workstations).
4.3 Exporting Routes to Third Party System

The NACOS Platinum system comes along with a route data export function. It is achieved by exporting selected routes or a whole Platinum directory either in XML file format, in NACOS xx-4/5 format, or in RTZ 1.1 format to an USB memory USB stick.

1. Insert an USB memory stick to the display electronics.
2. Open the Route Explorer from the list of Tools.
3. Select a Catalog, here Baltic.
4. Select with DO the route to be exported, here DEWAR-DELUE.
5. Select further routes by pressing CTRL and clicking at the same time to further route file entries.
6. Open the context menu with a right-click into the list of routes. Select the entry Export Route. Select one of the export formats from the submenu.
7. The selected routes are exported containing the most important route data. 1)
8. Alternatively select a route directory in the left column.
9. Open the context menu with a right-click into the list of routes. Select the entry Export Route. Select one of the export formats from the submenu.

The routes are stored in the directory "RouteExchange" on the USB memory stick. If not existing, it is automatically generated.

1) User symbols attached to a route are not included in the export file.
ECDISPILOT Platinum STM
Operating Instructions

4.3.1

ROUTE PLANNING AND MONITORING
4 Route Export and Import (Back Up and Printout)

NACOS Platinum Standard XML Route Data Format
A typical NACOS Platinum route data format is shown in the following example:
The Header data block introduces each route data file:
<?xml version="1.0" encoding="utf-8" ?>
<RouteModel
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="http://www.sam-electronics.de/2010/reducedRouteModel.xsd">
<Name xmlns="">Rostock Seekanal</Name>
The Waypoint data block is repeated for each waypoint:
<Waypoints xmlns="">
<Name>Pagenwerder</Name>
<Latitude>0.94538441945694</Latitude> (=54°09.992’ N)
<Longitude>0.21119316376426958</Longitude> (=012°06.029’ E)
<Notes>Keep STB</Notes>
<SailMode>1</SailMode> (=RL or rhumb line)
<Radius>1852</Radius> (=1 NM)
</Waypoints>

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4.3.2 NACOS Platinum RTZ Route Data Format

```xml
<?xml version="1.0" encoding="utf-8"?>
<route xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" version="1.1" xmlns="http://www.cirm.org/RTZ/1/1">
  <routeInfo routeName="HAM-BRUNS" vesselName="SAM SERVICE 2" vesselMMSI="211003521" vesselIMO="9151539" vessel-SpeedMax="24.9999991760913" />
  <waypoints>
    <defaultWaypoint radius="1">
      <leg starboardXTD="0.539956803455724" portsideXTD="0.539956803455724" safetyContour="926" geometryType="Loxodrome"/>
    </defaultWaypoint>
    <waypoint id="1" name="Initial waypoint" radius="1">
      <position lat="53.546004365728" lon="9.86194236110694"/>
      <leg starboardXTD="0.539956803455724" portsideXTD="0.539956803455724" safetyContour="926" geometryType="Loxodrome"/>
    </waypoint>
    <waypoint id="2" radius="1">
      <position lat="53.5481105733862" lon="9.83881509920576"/>
      <leg starboardXTD="0.539956803455724" portsideXTD="0.539956803455724" safetyContour="926" geometryType="Loxodrome"/>
    </waypoint>
    <waypoint id="3" radius="1">
      <position lat="53.5554686790386" lon="9.79503639637289"/>
      <leg starboardXTD="0.539956803455724" portsideXTD="0.539956803455724" safetyContour="926" geometryType="Loxodrome"/>
    </waypoint>
    <waypoint id="4" radius="1">
      <position lat="53.5685320214504" lon="9.6646929161496"/>
      <leg starboardXTD="0.539956803455724" portsideXTD="0.539956803455724" safetyContour="926" geometryType="Loxodrome"/>
    </waypoint>
  </waypoints>
</route>
```
4.4  Importing Routes from Third Party System (also NACOS xx-4 or -5)

Route data import is achieved by loading selected routes in XML or text file format from an USB memory stick into the ECDISPILOT Platinum STM system.

1. Insert an USB memory stick to the Platinum display electronics and open the Route Explorer Menu from the list of Tools.

2. Select the route catalog where the imported routes shall be stored.

3. Open the context menu with right-click to the left Route Explorer window and select the entry Import Routes.

   ☞ This entry is only selectable, if a RouteExchange directory is on your USB stick.  

4. A sub-menu for Select Routes for Import into the Ships Database is opened.

5. It shows the available catalogs (directories) under RouteExchange.

6. Select one of the catalogs, here Hamburg, and all routes in this catalog are shown and highlighted. Just press the Import button to transfer all these routes.

7. Otherwise click to the desired routes one by one to delete the default selection and select those of interest, then press the Import button.

1) The routes on your USB stick have to be kept in a top level directory named RouteExchange. This directory has to be structured in further sub-directories (named e.g. Baltic Sea, North Sea) where the routes are stored. The RouteExchange directory can be created on the Chartpilot of a NACOS xx-4 or -5 system during the route export procedure, use Edit New Folder and Apply, or automatically on a Platinum system by exporting any route to your USB stick, or finally also on any host PC with a Windows explorer. The necessary sub-directories are generated automatically by a NACOS XX-4 or -5 system.
4.5 Printing out a Passage Plan

The waypoint list provides a function to print out the actually presented route as a passage plan. An example is shown to the left.

WP List

The version with the variable WP list is combined with a variable passage plan. Click to Route->Set-up Passage Plan to arrange the print-out as shown below.

Afterwards click to Route->Print Passage Plan and choose one of the options. For each option a corresponding sub-menu is opened for the selection of the directory or fax address.

Customize Variable Passage Plan

The columns of the plan can be arranged individually before print-out. Select A4 or US letter paper and portrait or landscape format.

Drag the columns as required, right click on a column to add or remove them, or use the Add button to add another parameter to the right. In the last position the actually available space on the paper is shown in percent.
5 Further Information for Route Planning

The following sub-chapters are describing further special functions for route planning which are not initially required during first editing and first application of the route monitoring function:

- Overview of route parameters
- Parameter points
- Predefined radius
- Setting the safety corridor
- Repetition of alarms
## 5.1 Overview of Route Parameters

### Waypoint Parameters

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No.</td>
<td>Waypoint sequence number, starting with 1, automatically increased</td>
</tr>
<tr>
<td>2</td>
<td>Name</td>
<td>Enter a name for this waypoint to identify it during the voyage, i.e. land's end</td>
</tr>
<tr>
<td>3</td>
<td>LAT</td>
<td>Latitude of this waypoint (in WGS-84), automatically set by shifting the waypoint</td>
</tr>
<tr>
<td>4</td>
<td>LON</td>
<td>Longitude of this waypoint (in WGS-84), automatically set by shifting the waypoint</td>
</tr>
<tr>
<td>5</td>
<td>RAD</td>
<td>Radius in NM of the planned turn at this waypoint, default 1 NM, set as required</td>
</tr>
<tr>
<td>6</td>
<td>ETA/ETD</td>
<td>Estimated Time of Arrival or Departure for this waypoint, set as required</td>
</tr>
<tr>
<td>7</td>
<td>ET Mode</td>
<td>Select Calculated, Arrival, or Departure as method for calculating ETA/ETD</td>
</tr>
<tr>
<td>8</td>
<td>PP</td>
<td>Set to PP if no course change shall take place at this waypoint ¹)</td>
</tr>
<tr>
<td>9</td>
<td>Notes</td>
<td>Enter hints, cautions, warnings which are displayed during the voyage at this waypoint</td>
</tr>
</tbody>
</table>

¹) Parameter Points are points where only additional parameters like speed, notes etc. are changing. See page 307 for details.

### Leg Parameters

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>From - To</td>
<td>The two waypoints enfolding this track segment or leg, automatically inserted</td>
</tr>
<tr>
<td>11</td>
<td>DIST</td>
<td>Length of the leg in NM including length of any curved track line, calculated</td>
</tr>
<tr>
<td>12</td>
<td>BRG</td>
<td>Bearing of the leg, also course over ground to be steered on this leg, calculated</td>
</tr>
<tr>
<td>13</td>
<td>calc. SPD</td>
<td>Calculated speed for a leg, in ETA mode autom. updated, for manual speed setting</td>
</tr>
<tr>
<td>14</td>
<td>MAX SPD</td>
<td>Maximum speed set by the operator as an upper limit for the calculated speed</td>
</tr>
<tr>
<td>15</td>
<td>CRS LIM</td>
<td>Course limit valid on this leg (option not used here)</td>
</tr>
<tr>
<td>16</td>
<td>XTD LIM</td>
<td>Alarm limit for deviation from planned route, used for ECDIS monitoring</td>
</tr>
<tr>
<td>17</td>
<td>Sail</td>
<td>Select sailing mode RL or GC on this leg (default is rhumb line with constant course)</td>
</tr>
<tr>
<td>18</td>
<td>ECON</td>
<td>Rudder economy on this leg (not used, option in combination with Trackpilot)</td>
</tr>
</tbody>
</table>

Table IX / 1 Overview of Route Parameters
5.2 Parameter Points

Select the leg of the route displayed on the screen and by a click with MORE open the Route context menu in the application area. A click on Insert a Waypoint Here first inserts a normal waypoint in the middle of the leg.

Select the new inserted waypoint in the list (check the waypoint number) and activate the PP (Parameter Point) check box. This waypoint will now be displayed with a small square symbol.

With the graphical cursor on this symbol and pressing down the DO key you can now move the parameter point along the preplanned track line. Releasing the DO key will fix the Parameter Point's position on the leg.

- Do not shift the parameter point into the curved part of the displayed route.

Repeat the above procedure in order to add more parameter points on a leg.

- Do not shift a new parameter point across already available parameter points.

Note:
The insertion of parameter points on a leg does not create any course change at these points.

With other words, a parameter point is not part of the course change alarm management (No Waypoint Approach and no Wheel Over Point alarms).

But by use of parameter points you can easily add changes of route parameters like

- Off Course Limit (CRS LIM) and Off Track Limit (XTD LIM)
- Sailing Mode (Sail Mode)
- Rudder Economy (ECON)
- Planned Speed (MAX SPD)

on different parts of a leg.

Changing the planned speed on a leg is done by changing the MAX SPD value, which then also changes the Calc. SPD value in the Route List.
5.3 Predefined Radius

- During editing of the route, it is advisable to check and adjust the radius for the first waypoint. The default value is 1.00 NM. This radius will be copied to all other added waypoints until you set another radius. In this way it can be verified "on-line" during editing if geometric constraints (matching of length of the legs, radius, and amount of course change) are violated.

- It is recommended first to use an initial radius for sailing with nominal speed which could later be adjusted for your needs and depending on the results of the verification of the route on the chart display. The initial radius should create a rate of turn far below the maximum rate of turn you would normally accept for your ship under the planned loading conditions.

- The predicted steady state turn-rate at a waypoint caused by the planned radius can easily be estimated by the calculation:

\[
\text{ROT [°/min]} \sim \frac{\text{sailing speed [kn]}}{\text{radius [NM]}}
\]

<table>
<thead>
<tr>
<th>Speed</th>
<th>Radius</th>
<th>ROT [estimated]</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 kn</td>
<td>1.00 NM</td>
<td>~ 25 °/min</td>
</tr>
<tr>
<td>25 kn</td>
<td>0.50 NM</td>
<td>~ 50 °/min</td>
</tr>
<tr>
<td>12 kn</td>
<td>1.00 NM</td>
<td>~ 12 °/min</td>
</tr>
<tr>
<td>10 kn</td>
<td>0.10 NM</td>
<td>~ 100 °/min</td>
</tr>
</tbody>
</table>

Be sure not to plan too small radius values at high speed which might guide your helmsmen to apply too high and possibly dangerous turn-rates on your ship.

5.3.1 Minimum Turning Radius

Considering the above table the minimum input value for the turning radius is restricted to a value between 0.1 and 0.5 NM depending on the ships size and turning ability. This limit is configured during system commissioning. It can be further reduced for i.e. seismic vessels to 0.03 NM on request.

This limit applies to track, heading and course mode.

If the vessel is steered manually, there is no limit for route planning, the minimum radius is zero.

5.3.2 Maximum Turning Radius

Considering the need to perform unambiguous maneuvers and a precise calculation of the track the maximum input value for the turning radius is restricted to 3 NM. This can be extended for large vessels during system commissioning to 4 NM.

This value applies in any case, either manually steered or in automatic mode.
5.4 Setting the Safety Corridor

The pre-planned route can roughly be checked during editing already if an appropriate Safety Corridor is selected under **Settings > Route**. The displayed corridor around the route helps to support the operator during creation of the route when the display area covers the sea area of the route or of parts of it.

At any time during editing the width of the safety corridor can be adjusted for the visible part of the route. In any case it is then valid for the complete route.

If you use a new route for the first time it could be sufficient to define a general minimum passing distance (for instance 250 m or another safe value) in order to be on the safe side when the program checks the route for the first time.

Details, like adapting the radius, the track limit and other values could be adjusted following the messages about violations after the route checking function has been executed.

5.5 Repetition of Alarms

**CAUTION**

An alarm is only repeated if an object belonging to a different object class is touched or if the same object class is touched within a smaller distance or time.

If, for example, the ship is sailing along a line of buoys and is too close to them, the alarm **Crossing a Danger** appears only for the first buoy, but it can be acknowledged and remains in the alarm list until this type of violation is no longer found within the guard sector. Thereafter a new violation can activate the same alarm again.
SEA TRAFFIC MANAGEMENT
1 Introduction

1.1 The Concept of Sea Traffic Management (STM)

STM is an information sharing framework that primarily deals with the benefits that different parties can get if they share their route with others in real time.

This is one of the fundamental pillars of STM: The shipping company/ship is always the information owner and shares the information they want with the parties they want. The more players that share, the better the common position and the more you can optimize.

1.2 What is STM Validation Project?

The purpose with the project is to validate the effects of STM with regards to Safety, Environment and Efficiency. In the STM Validation Project, we will validate the concepts by collecting data and opinions from connected ships, Shore Centres, external services and ports.

We do this in the test beds in the Mediterranean and the Nordic countries, but also in the European Maritime Simulator Network (EMSN), which is a simulator network of up to 30 simulator bridges around Europe that can operate in the same scenario.

But the most important part of the project are the vessels. STM has 300 vessels in the World's largest marine test bed. You are the ones on board that can test, evaluate and give us opinions that lead STM forward. We look forward to having you as pilots for the project and being able to share your thoughts and experiences. We are building future navigation together!

1.3 Welcome on board STM!

The concept is built on a just-in-time philosophy and in order to arrive, just in time, we need some help on the way. In order to gain access to all the information that you can benefit from, a lot of searching has to be done and if you trade to a lot of different countries, this is not that easy. But it is not just about information available today but also about new information and in STM, the new information comes from the vessels. With the ships sharing their voyage plan you can optimize for various things. To a great extent, it is already done today within large shipping companies that have the resources for it, but here we open up a market that everyone can use.

The central feature is that the routes are shared directly from and to an ECDIS, which allows you to see suggested routes, cut and paste and use the parts you want directly on the ECDIS. You can retrieve nautical information about the passage such as if there are any current Navigation Warnings on one's route or accept one of the Pilot suggested routes into the port.

Shore Centres can actively monitor ships in their area of responsibility, not only if they are following their route at any moment but also if they have planned properly according to the latest information available.

Ports can get information of a ships Estimated Time of Arrival (ETA) and Planned Time of Arrival (PTA) at a much earlier stage and this can make the port call much more efficient. Because of the port's ability to collaborate by means of the “Port CDM tool”, they can also convey a time when all port operators can receive the ship. This enables you to decide on slowing down and conducting “Just-In-Steaming” during the passage with the potential to save bunkers thereby having a positive impact on the environment etc.
Ship-Ship-Route Exchange

An amazing side effect of this information sharing will be that ships will be able to share routes with each other. That is, you can see another vessel’s current route in your own ECDIS. Here, however, you will only share a segment of the route, which will be transmitted over the AIS system, because the AIS bandwidth is not sufficient to share more. STM helps you plan a traffic situation before you end up in it.

Here comes our second pillar: STM should not be used in COLREG situations. That is, when you are in a close quarter situation, always observe COLREGs.

1.4 Where do I find STM Information?

STM information is available in the STM user Forum at http://stmvalidation.eu/user-forum.

A five minute general overview can be found on YouTube at https://youtu.be/JZgKnMMq1Eg.

1.5 Expected Involvement from Ships

Use services - Ships are expected to share their voyage plan with shore centres and make use of appropriate STM services

Questionnaires/Interviews - Will be held with crew members to validate the concept. The project asks you to Log ship to ship route exchange experiences in user forum, possibility to effect future systems!

STM Validation Centre - A service that the project for validation purposes request all ships to always share their voyage plan with

1.6 System Overview

The STM services can be grouped into four areas:

1. Voyage Management is a concept for maritime services based on standards and open interfaces.

2. Flow Management services will support both onshore organizations (i.e. VTS) and ships in optimizing overall traffic flow through areas of dense traffic and areas with particular navigational challenges.

3. Port Collaborative Decision Making services will increase the efficiency of port calls for all stakeholders through improved information sharing, situational awareness, optimized processes, and collaborative decision making during port calls.

4. System Wide Information Management (SWIM) will facilitate data sharing using a common information environment and structure (e.g., the Maritime Cloud). This ensures the interoperability of STM and other services.

A common technical protocol for route exchange has been developed and was approved as an annex to the international standard IEC 61174-4 in August 2015. This was an enormous achievement and a prerequisite for further development and deployment of Sea Traffic Management.
1.7 System Functions

The STM functions are optionally available on each ECDISPILOT or MULTIPILOT Platinum.

In order to activate them the two configuration settings for AIS related ship-ship functions and route management related ship-shore functions have to be enabled during system commissioning.

In addition a Microsoft SQL database server has to be installed at least on one or on two workstations.

The main difference between a Platinum system with STM option and a standard Platinum system is as follows:

**Ship-to-Ship Functions based on AIS**

1. If an own route is active, the next few waypoints of this route are reported periodically via AIS message 8 to other ships (message 8 is available with nearly every standard AIS transponder).
2. If the presentation of AIS target routes is activated, the next few waypoints of other ships are displayed on top of the ECDIS.
3. Trial manoeuvre is simulated along own route and along received target routes instead of own and target straight course line.

**Voyage Planning Functions**

1. Create a new route or open a route
2. Add or insert waypoints
3. Save, rename or delete a route
4. Append or paste a route segment into a route

**Ship-to-Shore Functions based on Voyage Plan**

1. Send a voyage plan to a selected service for planning purposes and receive an updated plan (voyage plan includes geometrical route, schedule and ship parameters).
2. Upload a voyage plan the maritime cloud, authorize a number of services to read the plan, optimize the route and the schedule.
3. Download updated voyage plan from shore, compare with previous version and apply as new and active plan.
4. Receive and replay text messages with shore-based services or with other vessels.
5. Receive and save area call with information about restricted sailing areas.
6. Export and import routes to/from USB stick in STM and other formats.

1.8 System Configuration

A typical system configuration for a medium sized container ship or Ro-Ro ferry is shown below. It comprises five workstations MFD 1 to MFD 5. The bridge tasks are distributed as follows:
1. MFD 1 is the main workstation for **collision avoidance**. It is sensor master for navigation sensors and radar antenna unit 1. The MULTIPILOT Platinum application with radar and ECDIS is used.

2. MFD 2 is the back-up workstation for **collision avoidance**. It is sensor master for the back-up navigation sensors and radar antenna unit 2. The MULTIPILOT Platinum application with Radar and ECDIS is used here as well.

3. Both MFDs are feeding alternatively the CONNING monitor for the **navigational status**.

4. MFD 3 is the workstation for **route monitoring**. It provides the ECDISPILOT Platinum application and the back-up STM SQL database server.

5. MFD 4 is the back-up workstation for **route monitoring**. It provides the ECDISPILOT Platinum application and the back-up STM SQL database server.

6. MFD 5 is the workstation for **route planning**. It provides the ECDISPILOT Platinum application and the STM SQL database server. It is directly connected to the shore-based STM server by a firewall and a SATCOM or GSM unit.

STM functions are available as follows:

- MFD 5 for Voyage Planning includes STM ship-shore functions and SQL data server
- MFD 3 for Route Monitoring includes back-up SQL data server
- All MFDs include STM AIS functions and STM on-board functions

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* MFD 5 for Voyage Planning includes STM ship-shore functions and SQL data server
* MFD 3 for Route Monitoring includes back-up SQL data server
* All MFDs include STM AIS functions and STM on-board functions
2 Ship-to-Ship Functions based on AIS Messages

Ships with STM system can broadcast the next few waypoints of the activated route to other ships in the vicinity (via AIS, around 20 NM). This function can be inhibited by the user. This function is disabled when S-mode is switched on.

Ships with STM system can receive the next few waypoints of other ships in the vicinity (via AIS, again about 20 NM). The display of the received waypoints has to be enabled by the user. This function is disabled when S-mode is switched on.

In addition to the standard CPA/TCPA calculation the STM system calculates a route-based CPA. It is derived from the extrapolated movement of the own ship on the own route against the extrapolated movement of a target ship on its route. This CPA is called RCPA (Route Closest Point of Approach). The same goes for RTCPA.

Further-on the STM system provides a route-based trial manoeuvre. It is again derived from the extrapolated movement of the own ship on the own route against the extrapolated movement of target ships on their route. Compared to the straight forward extrapolation, these route based methods are much more realistic and can clarify critical traffic situations much easier.

2.1 Settings

Enable or Disable the Broadcast of own Waypoints

Click on Settings symbol in the bottom left line of the screen (as shown by a red arrow in the screenshot to the right) and the Settings bar will open for about 30 sec. Select AIS Settings.

If the setting bar disappears, just open again, the display time has been limited not to cover important information.

Select AIS Settings and there Enabled or Disabled for the Route Message Output as required.

Enable or Disable the Display of Received Target Routes

Click on the Settings symbol in the bottom left line of the screen (see red arrow as shown above) and the Settings bar will open. Select Target from the Presentation group.

Activate the AIS Acquired box under Routes and set Mode to All or Selected.

Now the routes of AIS acquired targets are shown, either selected targets or all of them.
2.2 Broadcast of Own Waypoints, Long Leg Handling

If the route message output is enabled, see settings on previous page, the last waypoint (WP n) and up to six following waypoints (WP n+7) of the active route are transferred to the AIS system for broadcast via AIS message 8 to all ships in the VHF range. The information in message 8 is structured as follows:

1. The last waypoint in the AIS route message is fully qualified, while intermediate waypoints are defined as the difference from the previous waypoint in the route. This way of defining intermediate waypoints saves bits but limits the maximum length of those legs.

2. In cases where representable length is insufficient, the total route segment reported in a message is cut short and the “intermediate” waypoint becomes the last waypoint (VWP n) in the message. The route message payload is defined such that the current leg as well as up to six additional legs can be shared.

3. If all legs of the route segment have a length less than about 200 NM, the message goes out as specified above. The last waypoint (WP n) is described by its latitude and longitude, followed by up to seven waypoints described by the difference in minutes both for latitude and longitude (maximum of 209 minutes) to the previous one. Finally the waypoint n+7 is described again by its latitude and longitude.

4. If the own ship is sailing somewhere on a leg longer than 209 minutes in latitude or longitude (more or less about 209 NM depending on actual latitude), the message contains the last (WP n) and the following waypoint (WP n+1) only.

5. If the own ship is sailing on a longer leg but closer than 209 minutes in latitude or longitude to the next waypoint, a virtual waypoint (VWP n) is set behind the own ship. This waypoint is the first one of the standard sequence as described above.

6. If the ship is sailing on a longer leg but closer than 209 minutes in latitude or longitude to the next waypoint, followed by another longer leg, a virtual waypoint (VWP n) is set again behind the own ship. This waypoint is the first one, the next one (WP n+1) is described by the difference and the last one (WP n+2) is described by the full latitude and longitude. No further waypoints are broadcast.

The description above is for information only the STM Ship system will take care that above rules will be executed correctly. The information might help to evaluate a traffic situation where the received route changes its appearance from time to time due to the length of the legs.
2.3 Display of Received Target Route

If the display of target routes is enabled (see last page), the received STM AIS targets are presented with their intended route. This route is marked with a thin black dashed line.

2.3.1 Cursor Tool-Tip for Route Segment

If the cursor is moved over parts of the received route, the details of the individual legs are displayed in a tool-tip as shown to the right.

The upper part of the tool-tip presents standard cursor information with cursor position, and range and bearing to own ship.

The lower part of the tool-tip presents STM route specific data with distance of the leg, planned speed on this leg, and type of leg (rhumbline or great circle).

2.3.2 Update of Target Routes

The route message is transmitted so that all vessels in receiving range have accurate information at a reasonable delay, without creating unnecessary load on the VHF data links. A new route message is initiated when any of the below events occurs:

- Six minutes have passed since last time
- A route message interrogation was received and >1 minute has passed since last time
- Data in the route message have been changed, i.e. planned speed or arrival time
- When passing a waypoint
- The monitored route has been deactivated (an empty route message is sent)
- A monitored route is activated

The route message is transmitted only if the route is active.
2.3.3 Display of Turns at a Waypoint

A transmitted STM AIS message comprises the last waypoint which has just been passed by the vessel and the subsequent waypoints in front of the vessel.

In our example to the right the last waypoint is WP3 and the next ones are WP4 and following.

Each waypoint is described by a position and a radius. The radius is required to draw the precise continuation of the track in the curve. In addition the last waypoint before the curve WP2 is required. If it is omitted, receiving systems would draw a straight line from WP3 to WP4.

So as a general rule, as long as the vessel is sailing along the curved part along a waypoint, the STM AIS station transmits not only the last waypoint but also the waypoint before.

**If no turning radius is transmitted**

If the received turning radius is zero, the track jumps from one bearing value to the other one as shown in the screenshot to the right.
2.3.4 Display of Route-based CPA and TCPA

If the cursor is moved over an STM AIS target, here the target STM SAM Service 2, the details of the individual target are displayed as follows:

The upper part of the tool-tip presents standard cursor information with cursor position, and range and bearing to own ship. The centre part shows AIS target data including the CPA which results from a linear interpolated course of the target vessel and the speed of the vessel. The lower part of the tool-tip presents route based target data:

1. RCPA is the closest point of approach if the target ship and the own ship are moved along their planned routes with actual speed.
2. The same applies to RTCPA which is the time to this closest point of approach.
2.3.5 Warning if Target Ship Deviates from Route

If a target is deviating from its route by exceeding a certain user set XTD, it is shown with a small black line linked to a small handle on its route.

In addition the target route is changed in color from black to gray like a not-activated button.

The background is that this route is no longer as important for considering the navigational situation compared to the previous case where the target was still on route.

The gray route is also shown if the corresponding target is not in the actually visible area of the chart.

The limit for the target deviation can be set by the user as follows:

Click on the Settings symbol in the bottom left line of the screen (red arrow) and the Settings bar will open. Select Target Deviation from the Sea Traffic Management group.

Enable the target supervision. Set the limit as appropriate between 250 and 1000 m.

2.4 Route-based Trial Manoeuvre

The STM module includes a route-based extension for the standard trial manoeuvre. It simulates the movement of the own ship on its activated route compared to the simulated movement of target ships on their reported route. Compared to the straightforward simulation of the standard trial manoeuvre, this route-based method is much more realistic and can clarify critical traffic situations much easier.
Click on the **Trial** button in the navigation sidebar to open the Trial Manoeuvre Menu.

Click the check box for **STM Route**.

Activate an STM AIS target of interest, target data are marked blue in the target list. The own route should be activated as well.

Use the **Time** slider to see the ship symbols moving along their intended routes.

If the check box for **STM Route** is deactivated, the simulation takes place along the straight forward predicted path and not along the routes.

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### 2.4.1 Speed Values Used for Simulation

The default speed setting is **Actual Speed** for the own route as well as the target route.

If the check box for **Planned Speed** is set, the planned speed from own route as well as from target route is used for simulation.

If the slider for own **Speed** is touched this value is taken for the simulation of the own speed. The other settings are inhibited and not used in STM mode.
3 Voyage Planning Functions

3.1 Open a Route or Create a New Route in STM Route Browser

Open and Display a Route

Open the Tools bar and select the Route Browser (STM) entry. Routes are stored in a database. Each route can have a catalog name. Use the filter function to list routes with a certain catalog name or other criteria (parts of the name etc.).

Mark a route entry by clicking on it one time (DO or left-click, it will be highlighted in blue), and then

- click on the Open button,
- or open the context menu with MORE (right-click) and there click on Open or
- just double-click the route name.

Waypoints and additional data of a route can be displayed also as a list. For this purpose right-click on the route name and select Waypoint List from the context menu (in some versions the list is opened already if the route is opened or activated). The route data are then displayed in the lower part of the chart area in form of a waypoint list.

Create, Delete or Rename a Route

A click with MORE (right-click) into the window for routes opens again the context menu as above with further functions for New Route, Save, Save As..., Delete Route, or Rename Route. Select one function with DO (left-click).

Some entries like Save As..., Delete Route and Rename Route are only possible when a route is selected (marked in blue).

In case of a new route enter a name from the keyboard, select a catalog if required and additional information, and close with OK.

After having entered the name of a new route the first waypoint named Initial waypoint appears in the center of the screen which is also the current ship’s position if the ship is centered (red arrow).

At the same time, you can select Waypoint List from the context menu as above so that the waypoint list appears in the lower part of the chart area showing already the initial waypoint (next page).

Click on the waypoint symbol to mark it. The marked waypoint is displayed with a handle and can now be moved to the desired starting point of the route. Pointing with the cursor to the waypoint opens an information window with position, route name, etc.
3.2 Add or Insert Waypoints in Graphical Mode

In the previous chapters (see page 324) we have learned, how to create a new route with just one initial waypoint or how to open an existing route with a number of waypoints. In any case the subsequent step is to add or insert further waypoints.

The easiest way is the graphical input mode with the mouse. This mode is described here. For the text input please refer to page 276 about editing of further route data.

Add one or more Waypoints

To add waypoints, click on the first or the last waypoint symbol of the route to mark it (see red arrow). Then right-click anywhere in the chart to open the context menu.

In the context-menu, click on Route->Continue Route to set the next waypoint.

From now on the cursor is displayed with a dashed connection line to the previously set waypoint and each click with DO (left-click) adds a new waypoint symbol on the screen. Its position is added at the end or the beginning of the waypoint list.

Insert a Waypoint

To insert a waypoint, click on the nearest waypoint symbol of the route to mark it (see red arrow). Then right-click anywhere in the chart to open the context menu.

In the context-menu, click on Route->Insert Before or Insert After to add a waypoint. The position of the new waypoint is inserted in the waypoint list.

Insert a Waypoint on a Leg

Click on the leg to select it; a marker is shown in the middle of this leg.

Via the context menu you then have access to the function Route->Insert Waypoint here.

In any case the new inserted waypoint will be set in the middle of the leg which then must be moved manually to the wanted position in the chart.

Move a Waypoint

Click with DO on the waypoint symbol to select it. When the selection mark is shown, click on it and hold the DO key and then move the waypoint symbol to the intended position on the screen.
3.3 Save, Rename or Delete a Route in STM Route Browser

Routes as shown in the waypoint list are not automatically stored to the file system on the ECDISPILOT Platinum STM. Be sure to Save all your changes at the latest after completion of route editing. During long editing sessions intermediate saving of data is recommended ¹).

Save in the WP List

Select the Route pull-down menu in the headline of the waypoint list by clicking with DO (left-click) to the text Route (see red arrow)! Then click with DO to Save.

Save in the Route Expander

A route can also be saved from the route expander. Just click with DO (left-click) into the right window of the expander, a context menu is opened. Then click with DO to Save or Save Route as...

If you want do discard your changes made to the selected route, use Save As to store the version with the changed dataset under a new file name. The initial route remains with the old data set under the old name.

You may also delete the selected route with Delete Route.

Open the List of STM Functions

Click with DO to the STM entry to open the list of applicable STM Functions. They are described on the next pages.

¹) Refer to page 401 for details on storing data on USB devices.
3.4 Append a Route Segment to the Main Route

The typical scenario for this function is that you have requested a pilot service and received and saved a route segment, i.e. the pilot route for the approach to harbour. The same applies for an icebreaker service or a VTS service.

In this case both routes, the received pilot route, here *Pilot to GOT*, and your main route, here *NEW YORK-GOT*, are available in the route browser.

**Proceed as follows to append the route segment to the main route:**

Open both routes in the route browser, open the waypoint list.

Click to the *Pilot to GOT* tab to bring this route in front.

Right-click a waypoint in the pilot route and **Select All** to choose all waypoints.

Right-click again a waypoint and select **Copy**.

Click to the main route tab to bring this route in front.

Right-click the last waypoint and select **Append**.

The pilot route is now added to your main route, the numbering is updated, the voyage ID of your main route remains as before.

In the graphical presentation at the point where the two routes are appended we can find now in our example WP 42 followed by WP 43 (of the merged route) and underneath still WP 1 (of the pilot route), see screenshot to the right.

If you now close the pilot route, the merged route will remain showing the clear sequence from WP 42 to WP 43 and following.

-> *Do not choose the other way round by copying all waypoints of your main route into the pilot route. In this case your voyage ID changes to that one of the pilot route and the VTS is in doubt what happened.*
3.4.1 Paste a Route Segment into the Main Route

The typical scenario for this function is that you have requested a pilot service and received and saved a route segment on your route, i.e. the detailed passage through an archipelago.

In this case both routes, the received pilot route, here Pilot to GOT, and your main route, here NEW YORK-GOT, are available in the route browser.

Proceed as follows to paste the route segment into the main route:

Open both routes in the route browser, open the waypoint list.

Click to the Pilot to GOT tab to bring this route in front.

Right-click a waypoint in the pilot route and Select All to choose all waypoints.

Right-click again a waypoint and select Copy.

Click to the main route tab to bring this route in front.

Right-click the waypoint where you want to insert the route segment and select Paste.

The pilot route is now inserted into your main route behind the selected waypoint. The numbering is updated, the voyage ID of your main route remains as before.

In the graphical presentation at the later point where the two routes are merged we can find now in our example WP 47 followed by WP 48 (of the merged route) and underneath still WP 6 (of the pilot route), see screenshot to the right.

If you now close the pilot route, the merged route will remain showing the clear sequence from WP 47 to WP 48 (here the last one).

-> Do not choose the other way round by copying all waypoints of your main route into the pilot route. In this case your voyage ID changes to that one of the pilot route and the VTS is in doubt what happened.
4 Ship-to-Shore Functions based on the Voyage Plan

A ship with STM system, in short STM Ship, can send her voyage plan or parts of it for optimization by various service providers and organizations to a shore-based server via SATCOM or GSM.

This server keeps a copy of the on-board voyage plan together with additional information, i.e. a list of available service providers and a list of authorized subscribers. This copy of ship data on the server is called Ship Instance.

During the introduction phase of STM this server with various Ship Instances (one for each vessel) is operated by the Swedish Maritime Administration. Later any other international approved organization could operate this server as part of the Maritime Cloud.

The following ship-to-shore functions are available to manage the voyage plan, they are described on the subsequent pages:

1. The STM Ship can generate a voyage plan, it comprises the geometrical route, the schedule and ship parameters like name, ID, size, maximum waves, GM, etc.

2. The STM Ship can send its voyage plan directly to a selected service for route optimization, update of schedule, route cross check, or for monitoring. This plan is not stored in the Ship Instance in the Maritime Cloud. The STM Ship receives any updated plan in the message browser. The user can check and store the plan in the on-board database.

3. The STM Ship can authorize selected service providers to subscribe to its active voyage plan. For this function the STM Ship uploads its active voyage plan to the Ship Instance in the Maritime Cloud (that one which is used for route monitoring and track control). Each time, the plan changes, i.e. status or schedule, a copy is stored in the Ship Instance in the Maritime Cloud.

4. Authorized service providers can optimize and update the voyage plan. Each time an update is done, the STM Ship is informed by a notification and can download the message.

5. The optimization process could focus on i.e. reduced fuel consumption, sailing around bad weather areas or congestion points, etc.

6. The STM Ship can compare the downloaded voyage plan with the current plan, and confirm, reject, or cancel the changes. If applicable it executes the updated voyage.

7. The STM Ship can sent out text messages to other services to support its own voyage planning. The transmitted and received messages are stored in a database. They can be presented in a communication thread under a certain subject.

8. The STM Ship can relate text messages to a voyage. They are communicated with the voyage ID (UVID) as a reference.

9. The STM Ship can receive and present an area message in S-124 format. This message could contain i.e. a restricted sailing area due to a military exercise or a sail race. After confirmation by the user the coordinates of the restricted area are automatically transferred into a user symbol on top of the ECDIS.

4.1 Send Voyage Plan to Selected Service

This function provides a quick procedure to send the own actual voyage plan to any ship- or shore-based service. The actual voyage plan in this context comprises the currently open and highlighted route plus corresponding schedule and ship parameters.

A typical service will respond with a text message and an updated route, i.e. a pilot route for harbour approach. Open the message browser to see the received information.
This function is sending the voyage plan once only. Authorization of the selected service is not required. The service of interest is selected from a small sub-list which has to be configured before first use under Settings -> Find Services, see page 330.

### 4.1.1 Procedure

Open the Route Browser (STM) from the tools list.

Select a route of interest, here TRL-SVK, and open it.

1. Right-click the route entry marked in blue opens the route context menu (1).
2. Click with **DO** to the **STM** entry to open the list of applicable STM Functions (2).
3. Click **Use Service** to open the sub-list of services (3).
4. Select a service, here Nordic Pilot; now the voyage plan comprising the geometrical route, the schedule and the ship parameters is sent to this selected service (4).
5. If required move the cursor over a service entry to see a tool-tip with more details about this service (5).

### 4.1.2 Set-up List of Services

The list of Services has to be set-up once before use. It is stored locally and remains unchanged until an update of the list is carried out. The list is not related to any route.

1. Open the **Settings** bar and click **Find services** (1).
2. Enter one or more search keywords to restrict the service entries, here the keyword pilot has been chosen to see pilot services only (2).

3. In addition a service type like SHIP-VIS can be selected as a search criteria (3).

4. Click Search (4) to see a sub-list of services of interest (5).

5. Click an individual service in this list and to the Add button (6).

6. If the list of services is ready, click Ok, the menu is closed.
4.1.3 Display Response from Selected Service

If a voyage plan has been sent to a selected service this service responds with certain messages:

1. It generates an acknowledgement (ACKNOWL) that a request has been received (1).
2. It generates a text message (TXT), i.e. that no arrival pilot routes have been found that matched the ship route (2).
3. It generates i.e. a suggested arrival route (RTZ) to meet the pilot (3).

These messages can be displayed as follows:

- Open the Tools bar and select the Message Browser from STM group.
- Click one of the received messages.
- The screenshot below shows the RTZ message with received route.
- Click Save to store the received route in the Catalog as shown. Change the default Catalog by clicking to the small triangle and select another one or add a new one.
- Open the Route Browser to see the stored route, open it and display the waypoint list as shown in the screenshot below.
4.2 Upload Voyage Plan to Your Vessel Instance in the Maritime Cloud

This function uploads your actual voyage plan to your Vessel Instance (VIS) in the Maritime Cloud. The actual voyage plan in this context comprises again the currently open and highlighted route plus corresponding schedule and ship parameters.

The Maritime Cloud is a server computer located somewhere in the internet. It provides a Vessel Instance for each registered vessel. This instance is a copy of the actual on-board voyage related data and can be used by authorized organizations. The server computer is operated by a maritime organization like SMA or IHO or a private organization i.e. a company. The Platinum STM Ship System uses a server currently available from SMA (Swedish Maritime Organization).

Once the voyage plan has been uploaded, it is automatically updated when changed and the user can authorize organizations to read the plan and can subscribe to various services of these organizations. Authorization of the organization and the selected service is related to the voyage plan and always required. A new voyage plan requires authorization again although the organization in question might have been authorized for a previous voyage plan already. A typical service will respond to a new or changed voyage plan with a text message and an updated route, i.e. a weather optimized route for sailing in heavy sea. Refer to

4.2.1 Procedure

Open the Route Browser (STM) from the Tools bar, select a route of interest, and open it.

1. Right-click the route entry which is marked in blue, the route context menu opens (1).
2. Click with DO to the STM entry to open the list of applicable STM Functions (2).
3. Click Send to VIS (STM) to send the route, the schedule and ship parameters (together called voyage plan) to your VIS in the Maritime Cloud (3).
Set Access Rights for Your Uploaded Voyage Plan

A voyage plan, which has been uploaded to your VIS in the Maritime Cloud is protected against access by unauthorized services or other parties. Access is possible only by authorized organizations for selected services. The authorization and selection of services is set by the user on-board as follows:

Open the Route Browser (STM) from the Tools bar.

Select a route which has been uploaded already, here GOTH-BARC, and open it.

1. Right-click the route entry which is marked in blue, the route context menu opens (1).
2. Click with DO to the STM entry to open the list of applicable STM Functions (see no 2 on previous page).
3. Click Access to open the authorization menu (see no 3 on previous page for similar step).
4. Check one or more boxes of acceptable organisations to authorize (4).
5. Use scroll bar to see right part of the list, click on the Subscription button of an authorized organisation, authorization means that the box is checked (5).
6. Subscribe to the special services offered by the authorized organisation, here the services of icebreakers ALE, ATLA, and FREY are selected (6).
4.2.3 Display Response from Subscribed Service

If a voyage plan has been uploaded to your VIS and you have subscribed to a service of an authorized organization, this service, depending on his individual procedures, will responds with certain messages:

1. First it generates an acknowledgement (ACKNOWL) that a subscription has been received (1).
2. Then it generates a text message (TXT), i.e. that an arrival pilot route has been found (2).
3. Finally it generates i.e. a suggested arrival route (RTZ) to meet the pilot (3).

Please note: other services might have different procedures!

These messages can be displayed as follows:

- Open the Tools bar and select the Message Browser from STM group.
- Click on one of the received messages.
- The screenshot below shows the RTZ message with received route.
- Click databaseSave to store the received route in the Catalog as shown. Change the default Catalog by clicking to the small triangle and select another one or add a new one.
- Open the Route Browser to see the stored route, open it and display the waypoint list as shown in the screenshot below.
4.3 Compare Received Voyage Plan with own Voyage Plan

A comparison is possible between voyage plans with the same voyage ID. If i.e. the own actual voyage plan is sent to a service for optimization, it is received back with optimized geometry but the ID remains unchanged. In this case the comparison will be successful. If a voyage plan is sent to a pilot service just for identifying the destination harbour, and a pilot route is received from shore for the final approach, this one will have a different ID and can not be compared. Start with the following steps before comparison:

- Upload an own voyage plan to the VIS in the Maritime Cloud (see page 330)
- Subscribe to a service of an organization (see page 330)
- Receive and save an updated or optimized route (see page 332)

4.3.1 Compare Route Procedure

Now right-click the route of interest to open the **Compare Route** menu. It shows all routes which have been received from shore as a result of an optimization or update. Choose one route for comparison and click **Ok**.

- Note, these routes are not listed in the route browser, they are hidden behind their original routes in the database. The compare function only can display them.

The **Route Comparison Results** menu opens. It shows the route title, and the date and version of route, which has been used for comparison, and the values which have been changed. In this example one waypoint has been changed.

Details about the changed parts are marked in the waypoint list and in the graphical presentation of the route. Both, graphic and waypoint list, are shown on the next page.

Finally the compared route can be rejected or accepted.

If you click **Accept**, the original route is replaced by the received route and can be used for route monitoring.

If you click **Reject**, the changed version of the route is deleted from the database. The original one remains.

- Note, this rejected route is still available in the message browser. Open the received message again and save the route once more to have it available for further comparisons as long as the received message has not been deleted in the message browser.
4.3.2 Route Comparison Results, Waypoint List and Graphical Presentation

Route comparison results are displayed both in the waypoint list and in the graphical presentation. Open the **Compare Route** menu, select a version of the received route for comparison and click Ok.

Now the comparison is carried out and the results are listed in the **Route Comparison Results** menu, continue as follows:

Open the waypoint list, the changed parts of the route are highlighted in yellow. Moving the cursor over the highlighted areas will open a tool-tip with more details of the comparison.

Browse through the chart and adjust the scale until your route is visible in the chart.

Switch-off the chart to have a uniform grey background where changes are clearly visible.

The changed parts of the route are highlighted in yellow in the route graphics. Moving the cursor over the highlighted areas will open a tool-tip with more details of the comparison.

The example below shows the same route as described on the previous page with a modified waypoint number 8. This waypoint has been shifted to North, it is displayed in white colour. The related waypoint list contains a highlighted entry for WP 8.
4.4 Automatic Port Call Message (PCM) when Passing a Waypoint

Each time a waypoint is passed, the STM Ship System sends out a Port Call Message (PCM) to destination port. This message contains the waypoint location and the actual time ATA of arrival at this waypoint.

The STM Port Services can use the PCM to update the information from the earlier received voyage plan including the initial schedule.

A pre-condition for this automatic function is the initial authorization of a receiving STM Port Service when uploading the voyage plan into the maritime cloud. This STM Port Service and the destination port in your voyage plan have to refer to the same port code, i.e. SEGOT for Gothenburg 1).

If a service has not been selected or the two codes do not match, the Port Call Message is not sent out.

Please refer to the procedure for subscribing to a service as described on page 334.

The following example shows a possible entry in the list of available services:

![Authorize Identities](image)

4.5 Send Text Message

A text message could contain i.e. a request for an individual service, a question about a passage, or a report about an event. Two text message functions are available, this one described here is independent of a route and not related to a voyage ID. The other one, described on the next page is related to a voyage ID.

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1) In the STM system ports are identified by their UNLOCODE, a five character acronym of the port name. The first two characters define the country of the port, here SE for Sweden and the last three characters refer to the name of the port, here GOT for Gothenburg.
Open the **Message Browser** (STM) from the **Tools** list.

- Click on the **New Text Message** button in the top left corner.
- The **STM Text Message** menu opens.
- Enter any free text for your **Author** identification
- Click on **Search**... button to select a service.
- The **Search Service** menu opens.
- Select a service and click **Ok**.

- Continue with the validity period, enter an optional period or leave the fields empty.
- Keep the optional position field empty or click on one of the arrows to load actual ship position.
- Enter any text as a subject for your message and finally enter the message itself.
- The length of the message is restricted to ........

Click on the **Send** button to send the message out independent and without any relation to a voyage plan.

The server on the receiving side generates a notification message that the text has been received properly, but it does not say anything that it has been read (see screenshot to the right).

### 4.5.1 Send Text Message Related to a Voyage Plan
Open the **Route Browser** (STM) from the **Tools** list.

- Click on a voyage of interest, right-click on this voyage opens the list of route functions, select **STM (1)**. From STM menu select **Send Text Message (2)**.

- The **STM Text Message** menu opens. The procedure is identical to the last one (see page 338).

- Enter any free text for your **Author** identification
- Click on **Search...** button to select a service.
- The **Search Service** menu opens.
- Select a service and click **Ok**.

- Continue with the validity period, enter an optional period or leave the fields empty.
- Keep the optional position field empty or click on one of the arrows to load actual ship position.
- Enter any text as a subject for your message and finally enter the message itself.
- The length of the message is restricted to ........

Click on the **Send** button to send the message out related to the voyage plan (UVID).

The server on the receiving side generates a notification message that the text has been received properly, but it does not say anything that it has been read (see screenshot to the right).
4.6 Receive and Display an Area Message

An area message is sent out by a VTS or similar service and describes a sector where increased attention of the navigator is required. It contains the corner points in geographical coordinates and a describing text.

- Open the **Message Browser** (STM) from the **Tools** list.
- Click to a S124 message which so far typically contains an area message. If too many messages are listed, use the **Filter** function by entering S124.
- Click on the received S124 message, typically the latest one, to see the contents.
- The **STM Area Message** menu opens, it shows ID, date and title of the message and the name of the area.
- In the example below a **Test of geometry** message was received.

![STM Area Message](image)

- Click the small arrow next to the **Area** name to centre the chart at this location (in browse mode). Click **Save** to store the reported area as a user symbol in the chart. It can be deleted later with the same functions as any user symbol. See page 231 for changing an area).

![Screenshot](image)

- The screenshot to the right shows the received area after having saved it.
- Click the information point at the received area to see a tool-tip with more details of the user's feature, here test of geometry point.
- Click the frame of the area to see a tool-tip with more details of this user feature, here small craft with 5 crew members is in a drift.
4.7 Route Import and Export

Route Import and Export is available for four different formats including RTZ 1.1 with STM extensions for

4.7.1 Export Procedure

Open the Route Browser (STM) from the tools list.

Select a route of interest, here NEW YORK-GOT, it could be either open or closed.

1. Right-click the route entry marked in blue opens the route context menu (1).

2. Click with DO to the Export Route entry to open the list of export formats, this entry is available only if a USB stick is applied to your actual workstation (2).

3. Click Route Exchange Format (RTZ) V1.1. w/ STM extensions to store a copy of the selected route in the directory RouteExchange (this directory is automatically generated if not already on your stick).

-> If there is already a file with the same name on your USB stick a warning will be given.

4. A printout of the stored route is shown below. It starts with general information about the route and the vessel followed by the waypoints, here WP 1 and 2.
4.7.2 Import Procedure

Open the Route Browser (STM) from the tools list and select any route.

1. Right-click the route entry marked in blue opens the route context menu (1).

2. Click with DO to the Select Routes for Import entry to open the list of directories. This entry is available only if a USB stick is applied to your actual workstation (2).

3. Click Import to store a copy of the selected route or directory in your workstation (3).

4. Existing routes with identical name are not overwritten but stored with their date. In the example below two routes NEW YORK-GOT are stored in the same directory but with different date (4).
5 STM Definitions

5.1 Voyage (UVID)

A voyage is a “route” that has a schedule “attached”, including departure and arrival time/date

UVID = unique Voyage ID

One Voyage ID (UVID) per voyage between two consecutive ports, berth to berth

New Voyage when?

A new voyage is “started” when departing from a destination. A new Voyage ID must be set, automatically or manual, on the new voyage when it is planned and shared with other actors.

UVID will/might be essential for hinterland communication regarding cargo etc.

Even though shipping companies today might have a voyage number for a “roundtrip”, within the STM Validation project, each (as described above) voyage shall have an unique UVID

5.2 Route Status

In STM the Route (Voyage plan) might have the following statuses:

1. Original
2. Planned for voyage
3. Optimized
4. Cross checked
5. Safety Checked
6. Approved
7. Used for monitoring
8. Inactive

For flowchart describing above, visit User Forum at http://stmvalidation.eu/user-forum.

5.3 Arrival Times in STM

ETA: Estimated Time of Arrival (Based on present speed and distance to go, might include schedule)

PTA: Planned Time of Arrival (Based on planned speed and distances to go)

RTA: Recommended Time Of Arrival (Ports Recommended Time of Arrival for a ship to e.g. Pilot Boarding Ground)
5.4 Shore Centre

A shore centre (SC) is similar to a VTS, the SC is covering a larger geographical area than a VTS. The services offered by the SC are user-selectable.

A shore centre can receive and display ship’s Voyage and send proposed changes in return.

A Shore centre can perform Enhanced monitoring among other services.

Visit user forum for more information.

5.5 Shore Center Locations and Coverage Areas

- Tarifa SC – Spanish Mediterranean Coast
- Kvitsøy SC – Entrance to Stavanger Norway
- Horten SC – Entrance to Oslo
- Gothenburg SC – Swedish West Coast and Baltic Region
- SC - Joint Operation Centre Denmark
- Tallin SC – Finnish Gulf (TBD)
- St. Petersburg SC (TBD)

5.6 Port Synchronisation (PortCDM)

Port Synchronisation: Ship communicate their PTA and, if possible, their ETA to the port. Port may respond with RTA to the ship based on status and readiness from actors in the port.

Swift communications about arrival times will enable more just in time arrivals.

Port Collaborative Decision Making (PortCDM): Within a port, all different actors e.g. Linesmen, Tugboats, Stevedores etc. are sharing the same “picture” regarding a ship’s port call, enabling better planning and collective information regarding ETA/ETD for the ship to/from the port.
5.7 SeaSWIM

Sea System Wide Information Management (SeaSWIM)
Defines a common vocabulary and secure communication patterns that enables an interoperable sharing of information between existing systems
RTZ (New International Route format) is one of the common vocabularies
VIS is one of the common communication patterns
Secure exchanges is supported by requirements on encryption, authentication mechanisms, etc.
Provides software and guidance to support actors to connect, translate and share existing information

Fig. X / 1 SeaSWIM Overview

5.8 VIS

VIS = Voyage Information Service
The VIS will be serving as the ship’s representation that will always be online, e.g. if a Voyageplan (VP) is sent to a ship, when the ship is not online, the VIS will make sure the VP will be forwarded to the ship when it’s online again.
The VIS will make sure that all message contents that are used in STM is following the standards that are setup.
5.9 Service

A service is an action that provide support or work to someone.
The work done by a service can be fully automated or it can include manual work by a human.
A service can be related to a specific geolocation or generic for the whole world.
A information service supports the operation service with information exchange, e.g. Voyage Information Service.
Available services are registered in Service Registry.
Example
- A ship can ask for enhanced monitoring as a service from a shore centre
- A ship can ask for route optimization from a service provider
- A ship or a shore centre can ask for pilot routes from a service that provides pilot routes.

5.10 Service and Identity Registry

- When a search for a service is done in the STM ship system, the service registry is called
- Service Registry (SR) is a catalogue with information of services
- Service Registry contain all necessary information a consumer need to use a service
- Service Registry is searchable with both text and geography
- Service Registry is open to read, but specific access is required to update or register a new service
- Identity Registry (IR) is a catalogue of identities grouped in organisations, users, devices, vessels and services
- Service Registry and Identity Registry are a core parts of the Maritime Connectivity Platform

For more information visit www.stmvalidation.eu

5.11 The Optimization Process

Voyage plan optimization can take place on board or ashore. A typical example for an on board optimization is automatic generator switching depending on the hotel load. If the hotel load increases during lunch time, it might be more efficient to take the speed of the vessel down in order to have some electrical energy left for the kitchen, instead of switching on another generator which is not operated at optimal load point. When lunch time is over, the speed has to be increased in order to keep the overall time schedule. This kind of optimization depends on local load scenarios and engine configuration, and is not so suitable for a remote service.

An example for optimization at shore is the sequencing of vessels approaching a harbour so that no ship has to wait or to speed up too much. In this case information about other vessels and the berthing situation in the harbour is required and this information is available in a VTS centre at shore. This is a typical scenario for the STM services.
The STM services will provide a wide range of different optimization methods, covering i.e. weather routing, shallow water routing, archipelago routing, one-way routing, and berthing management.
AIS, VDR, Printer and other
In addition to the ARPA electronics, the Universal Shipborne Automatic Identification System (AIS) automatically provides the ship’s nautical officers with important information about nearby vessels or other relevant objects within VHF range.

The AIS system transmits own ship AIS data cyclically via two defined VHF channels and receives the corresponding data from other ships and objects within VHF range that are equipped with AIS systems.

The AIS Transponder System provides AIS data from other vessels (i.e. identity, position, speed, course, and cargo) and objects around the own ship in a radius of about 20 NM (in reach of VHF radio). At the same time it transmits own AIS data (as above) to other vessel in the vicinity (up to 20 NM as above).

If the AIS transponder on board is connected to the ECDISPILOT Platinum STM, data from other vessels are displayed as symbols on top of the ECDIS chart or radar PPI.

The AIS system uses four different categories of symbols as follows:

- AIS targets: ships that are equipped with an AIS system
- SAR aircraft: search-and-rescue airplanes or helicopters
- Aids-to-Navigation: navigation marks, e.g. beacons and buoys
- Base stations: Equipment for controlling the AIS system, e.g. as a component of a traffic control centers.

The first two categories, the AIS targets and SAR aircrafts, can be activated and tracked in the same way as radar/ARPA targets. The latter two categories are displayed just as a symbol in the chart.

The own ships data, which are transmitted cyclically via AIS, can be entered into the system as follows:

Select **Tools** to open the tools bar with several entries in the AIS group which typically have to be checked and updated for each voyage:

- **Voyage Data** with destination and ETA on page 352.
- **Event Log** on page 353
- **Status Indication** with 24 entries from UTC, POSN ... to Version on page page 356 and page 357.

Two further entries nearly at the bottom of the tools bar are related to safety messages. Select either **Received or Transmit Safety Message** for any safety related communication via AIS.

Select **Settings > AIS** to enter menus for basic AIS settings like VHF channel, TX OFF, LR interrogation, SART in test mode, target fusion, and for transmitter test. For details refer to page 79.

**Master Operation**

All operating actions can be performed on any workstation without the need for a particular switch-over procedure. As far as the AIS settings and the information transmitted are concerned, the last operating action applies.
1.1 AIS Voyage Data

Select **Tools > AIS > Voyage** (or **Voyage Data**) to enter the menu.

Check the displayed information for your voyage and adjust if necessary.

If the **Adjust** buttons are not accessible, any update of the stored information has to be entered from the separate operating unit of the AIS transponder (also called MKD = Minimum Keyboard Display).

*The data lines have the following purpose:*

**DEST** The destination of your voyage

**ETA** The estimated time of arrival at destination

**Persons on Board** The number of persons on board

**Draft** The draft of your own vessel as automatically taken from your ECDISPILOT Platinum STM system. For entering the draft in your system please refer to the small note at the bottom of this page.

**State** The navigational state as defined by the international standard ITU-R M.1371 for AIS, select from the predefined values in the scroll down list:

<table>
<thead>
<tr>
<th>Under way using engine</th>
<th>Restricted Maneuverability</th>
<th>Aground</th>
</tr>
</thead>
<tbody>
<tr>
<td>At anchor</td>
<td>Constrained by draught</td>
<td>Engaged in fishing</td>
</tr>
<tr>
<td>Not under command</td>
<td>Moored</td>
<td>Under way using sails</td>
</tr>
</tbody>
</table>

**Cargo** The cargo type as defined by the same standard, select from the predefined values in the scroll down list:  1)

| No hazardous goods     | Hazardous goods class X, Y, Z, or OS | No additional information |

*Entering the draft in your ECDISPILOT Platinum STM System*

Open the own ship’s draught menu under **-> Settings - > Draught** and set **Fore** and **Aft** draught of your vessel.

The larger of the two values will be displayed in the menu for setting the depth lines and transferred to the AIS Transponder System. After an update of the draft this transfer may take a few minutes until the transponder data set has been updated.

---

1) For more information about classes of hazardous goods refer to page 359.
1.2 AIS Event Log (with SAAB R5 only)

Open the Event Log to check On and Off times of the AIS Transponder. This information is stored in a non-volatile memory of the ECDISPILOT Platinum STM system and can be retrieved at any time i.e. by shipping operators and administrations (available if SAAB R5 AIS is connected).
1.3 Show List of Received AIS Safety Messages

The AIS unit can receive safety related messages from other stations. These messages are transferred to the ECDISPILOT Platinum STM system. Up to 50 messages are stored there. If the maximum number of messages is reached, the oldest messages will be deleted automatically. New messages will generate a caution 1) in the alarm system to alert the operator of viewing the message text in the target related message list.

New Safety Message

When the AIS transponder receives a safety message, it is sent to the connected interface and the AIS New Safety Message caution appears in the alarm list of the ECDISPILOT Platinum STM system. 2)

The operator must open the safety message list via Tools > Target > Received Safety Message (or RX Msg) in order to have access to all received and temporarily stored messages.

- The list is sorted according to the receive time of the messages; the latest (newest) entry is shown at the top of the list. The sorting sequence of the list cannot be changed.
- Any message from the same source with the same text as already received will not be stored again, but its time marking in the list will be updated. In this way it will show up in the first line again.

Operating in the List

The width of the columns in the list can be modified if required, but none of the columns can be made completely invisible. If the lines get longer than the width of the window, a horizontal slider will be shown which can be used to move to invisible parts of the window.

A vertical slider is shown if the number of list entries does not fit into the window. Scroll to the top of the list to see the newest (last received) message.

1) Earlier SW versions will generate a warning as required by the AIS test standard. Due to high number of received safety messages in Eastern sailing areas the audible sound of these warnings is distracting the crew from nautical tasks. Therefor a received safety message is indicated as a caution, which is just a yellow sign in the alarm list and no audible sound.

2) Depending on the system layout it might be necessary to acknowledge the alarm at the MKD (Minimum Keyboard Display) of the connected AIS system as well.
If a single line in the message box is selected with right-click (MORE), the full message text is shown in the sub-menu below. A sub-menu opens with entries for selecting the corresponding target in the radar or the chart presentation or for deleting this line or for deleting all message lines.

After having opened a message it is marked afterwards by a checked box as message has been read. The corresponding caution is deleted from the alarm list.

### 1.4 Transmit AIS Safety Message

In the basic configuration the AIS transponder cannot be controlled remotely. The transmit function has to be performed from the MKD (Minimum Keyboard Display) of the transponder.

In a full navigation system the remote line is typically activated and the transmit function can be performed from the TX Msg menu as shown in the lower right screenshot.

Edit a new safety related message and transmit it to all ships in the AIS range or acknowledge a received AIS safety message to the originator as follows:

Open the **Tx Msg** menu under **Tools->Target->TxMsg**.

First edit the text, select the address and then click to **Send**.

If **To Selected** has been chosen as address, the message is sent to the originator of the safety message, which has been selected in the list under the **Rx Msg menu** as shown above.
1.5 Show Status Information (Entries 1-12)

Select **Settings > AIS > Status** to enter the menu.

Check the displayed information in the 25 lines of the drop-down list.

Any update of the stored information, as far as voyage related data is concerned, can be entered in the **Voyage** and **Channel** tab. Further data can be entered at the separate Minimum Keyboard Display unit (MKD) of the AIS Transponder, or for selected transponder types during commissioning with the Integration Manager (IM), please refer to the Technical Manual Platinum ED 3200 G 100.

**Power (not shown for all transponder types)**, Level of power (low, high) transmitted by the AIS system, as set in the **Channel** tab.

**UTC Sync** Status of the internal clock of the transmitter, either **Valid** or **Invalid**, as received via GPS of the AIS unit. 1)

**POSN** Source of position which is transmitted by the transponder, could be internal GPS receiver or bridge wide system position, the latter is preferred.

**SOG/COG** Source of transmitted SOG/COG data. (**External** or **Internal**).

**PA** Position accuracy, normally > 10 m, but with RAIM in use below 10 m.

**RAIM** Indication for Receiver Autonomous Integrity Monitoring, if available, the GPS/GNSS receiver uses about 6 or more satellites and can detect errors in the position calculation without taking into account further sensors (i.e. gyro).

**HDG** Status of the heading data (**Valid** or **Invalid**)

**ROT** Indicated as **Valid**, **Invalid**, or **Other source**, the latter means no approved ROT sensor is used, only the direction, but not the rate of heading change is transmitted.

The fields **DIM A** to **DIM D** are showing the distance of the reference point (CCRS) to bow, stern, port and starboard side in meters. The reported position is referenced against this point (can be set by MKD or IM).

**COG, SOG, HDG** are showing data derived from navigation system.

---

1) The UTC Sync status field and other fields remain empty as long as the workstation (MFD) has not received a message from the transmitting AIS unit after a restart of the MFD. If the transmitter is switched off, no update of the status fields is received, the latest received data are shown.
1.6 Show Status Information (Entries 13-25):

Further additional information is described here section by section of the drop-down list:

**LAT/LON, Length, Draft**

These fields are showing dynamic data as received from ECDISPILOT Platinum STM system.

**Destination, ETA, Type**

These fields are showing voyage data which have been entered in the **Voyage** menu.

**Info** The same information as set in the **Voyage** menu, but now received from transponder.

**Nav State** The same information as set in the **Voyage** menu, but now received from transponder.

**MMSI** Maritime Mobile Service Identity (MMSI), a nine digit number in order to uniquely identify the own ship radio station (set by MKD or IM)

**Name** of own vessel (set by MKD or IM)

**Callsign** Radio call sign of own vessel, in former times used to identify the own ship radio station, today replaced by the MMSI (set by MKD or IM)

**IMO** The IMO number of the vessel used by administrations to uniquely identify your ship (set by MKD or IM)

**Version** The type and the version number of the transponder as received from transponder hardware.
1.7 Useful Information

1.7.1 The Type of Your Own AIS System

The interface between an AIS transponder electronics unit and the display/operating unit (here ECDISPILOT Platinum STM) is standardized.

Any type approved class A transponder can be connected to the ECDISPILOT Platinum STM system with the following functions:

1. All the voyage related functions can be controlled from the ECDISPILOT Platinum STM user interface (voyage data, transmitter status).

2. The complete set of settings and status information, as actually stored in the AIS transponder unit, can be checked from the ECDISPILOT Platinum STM user interface (voyage data, all status data). This function is more important for periodic checks or the yearly radio survey and not necessarily for the daily routine. This check comprises 25 entries, but does not allow any changes. Changes, i.e. of the MMSI, can be done with the separate Minimum Keyboard Display (MKD) of the transponder.

For selected AIS transponder systems the MKD function for settings and status indications has been included in the ECDISPILOT Platinum STM user interface.

This function has to be activated during commissioning. Please refer to the NACOS Platinum Technical Manual for details of commissioning and the details of parameters which can be set, i.e. MMSI, and GPS antenna location.
1.7.2 SOLAS Chapter VII - Carriage of Dangerous Goods

SOLAS Chapter VII - Carriage of dangerous goods
requires among other things the declaration of hazardous substances contained in the cargo.

MARPOL 73/78, Reg. 6, Annex II
Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
defines the following 4 categories for noxious substances:

<table>
<thead>
<tr>
<th>Category</th>
<th>Hazard to marine resources or human health</th>
<th>Harm to amenities or other legitimate use of the sea</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Major hazard</td>
<td>Serious harm</td>
</tr>
<tr>
<td>Y</td>
<td>Hazard</td>
<td>Harm</td>
</tr>
<tr>
<td>Z</td>
<td>Minor hazard</td>
<td>Minor harm</td>
</tr>
<tr>
<td>OS (other substances)</td>
<td>No classification under X, Y, or Z according to Regulation 6.1</td>
<td>Considered to present no harm</td>
</tr>
</tbody>
</table>

OS* These substances are not subject to the provisions in Annex II
Discharges of non-classified substances are prohibited.
1.7.3  AIS Channel Management - Frequency

The AIS system cannot function unless all AIS systems communicate on the same VHF channels and unless the communication bandwidth and the transmission level are correctly set. The settings needed for this are normally made automatically as described in the following.

---

**CAUTION**

It is also possible to make a setting manually, but this should only be done in exceptional cases and following the advice of a local administration received by radio, publications, etc. and only after having informed the ship's command personnel accordingly.

VHF channels 2087 (161.975 MHz) and 2088 (162.025 MHz) are used worldwide for the two AIS channels.

As default values, AIS channel A uses the VHF channel 2087, the AIS channel B uses the VHF channel 2088, and for both channels, the bandwidth setting is **Auto**, and transmission is performed with power level **High**. Every mobile AIS station operates on these two channels. A mobile AIS station is thus capable of receiving two messages, from two different stations concurrently, provided that it does not transmit at the same time.

In particular geographical regions or situations, i.e. due to local RF interference, it is necessary to deviate from these settings. The necessary values are received via the AIS channels from a local VTS center, harbor administration etc.

These data also contain the information about the region in which these settings are to be used, including the transition zone surrounding that region.

The switch-over is performed automatically when the ship is located in the transition zone. This is done in the following steps:

- As soon as the ship reaches the boundaries of the transition zone, one AIS channel is set to the different VHF settings (with the other AIS channel remaining unchanged) and the alarm Channel management changed is shown. As a result, the targets situated inside and on either side of the transition zone are now seen and the ship is also seen by these targets; see the diagram.

- On leaving the transition zone, the second AIS channel is also switched over to the different VHF settings.

The general effect is that a ship which is not located in the transition zone does not see any targets located behind the transition zone.

The transponder is capable of managing 8 different zones automatically. Each zone is described by the South-West and North-East corner of a rectangle.

Each zone may have different channel management settings. Administrations may set your AIS by special messages automatically to a certain locally required setting. You can check these settings, which are stored in your AIS, by opening the tabs for channel and zone. You can toggle from one to the next settings by using the **Next** button. Although manual setting is also available, it is strongly recommended not to use the manual function. This should only be done on special advice of a local administration i.e. by radio or other means if the automatic function is not available from coastal side. There is a severe risk, that due to manual setting the own ship is no longer visible to other ships as an AIS target and that you will not see any other AIS targets on your system. Normally, the default setting should be on channels 2087 and 2088 and should have no position entered. Bandwidth is on **Auto**, Power is on **High**.
1.7.4 AIS Channel Management - Zone Data

The Channel Tab shows the frequency and zone related information of the eight data sets for channel and zone which are stored in the AIS transponder.

Select **Settings > AIS > Channel Management** to enter the menu.

In the bottom part of the menu the subgroup about zones is indicated. The first two groups for Northeast and Southwest show the diagonal corner points of the zone. The next group shows the transition zone as described in the introduction to this chapter. The default values for the corner position are empty fields.

☞ Any entries should only be made on advice of an administration as explained before.

☞ Any values might also have been set automatically by received AIS command messages from a local VTS center. They will become active if the own vessel reaches the defined zone.
1.8 **AIS Hot Standby with SAAB R5 SUPREME AIS Transponder**

According to IMO rules one transponder system has to be installed on a SOLAS vessel. For higher demands in terms of availability the R5 SUPREME AIS Transponder system can be installed in a “Hot Standby” configuration where two complete R5 SUPREME AIS systems are used to get full redundancy. Each transponder system has its own transponder electronics, its own GPS and VHF antenna, and its own sensor inputs. Both transponders are receiving the system data for heading, position and speed from the ECDISPILOT Platinum STM system. The only interconnection required between the two systems in the hot standby pair is a RS422 serial cable between the two R5 SUPREME AIS transponders.

One transponder will be in standby mode and be silent while the other transponder is active and operates as a normal Class A transponder. If the active transponder stops working the standby transponder will wake up and take over the transmissions. The transponders will continuously synchronize static and voyage data so that the same information is sent out on the VHF link regardless of which transponder is active.

The systems will monitor each other and the system with the best current status will be used as the active system while the other is in standby mode. If both transponder systems have exactly the same status, the system configured as “Primary” will be chosen as the active system. Important criteria will be considered when selecting the transponder with the best status. These criteria are listed below in decreasing severity:

1. Alarms for Tx & Rx channel malfunction
2. Antenna VSWR exceeded
3. UTC synchronization invalid
4. Sensor data lost or invalid or low quality
5. Connection to ECDISPILOT Platinum STM system or minimum keyboard lost
1.9 Checking AIS Hot Standby Status at Platinum System

If a hot standby configuration has been installed and configured, the hot standby status is available as first entry in the status protocol.

1. Open the list of **Tools**

2. Select **Status** from the AIS group.

3. Check **Status**, here the standby mode is enabled (or active) with the primary transponder as the active one (transmitting) and the secondary transponder is in standby mode (not transmitting). Both transponders are continuously checking their quality parameters, the better one switches to active mode, the other one to standby. No user settings can be made.

1.10 Checking Hot Standby Status at Transponder Operating Unit (optional)

If a separate operating unit (also called minimum keyboard display or MKD) has been installed for the transponder system, the hot standby status is indicated with icons in the status bar.

The following hot standby icons can be shown:

1. Operating as the active (transmitting) transponder in the hot standby pair.
2. No communication with the other unit.
3. Operating as the standby (silent) transponder in the hot standby pair.
4. Not transmitting
5. AIS message received
6. Navigational status is i.e. one of "Not under command", "Restricted manoeuvrability...". 
2  VDR- Voyage Data Recorder (if connected)

The VDR is continuously recording important nautical, engine and safety-related data collected from ship navigation sensors, from door contacts, from water contacts, etc. In addition it records a screenshot from the most important workstations every 15 sec, and audio data from microphones distributed over the bridge.

The recorded data are stored on three different media 1)

- Long-term memory (HDD) as part of the VDR processor electronics (for 30 days)
- Floating free device with 406/121,5 MHz radio beacon (EPIRB) (for 48 hours)
- Fire and water protected capsule (FRM) mounted to the ships hull (for 48 hours)

Operation is fully automatic, no user actions are required except of some special cases, the first one is the manual restart of the VDR in case of a failed integrity check, the second one is the operation performance test (OPT) according to the new VDR performance standard, and the third one is the incident back-up.

These can be carried out from the separate VDR user interface which comes along with any VDR.

If a VDR 4300, 4350, or 4360 is used, these steps can be carried out from the ECDISPILOT Platinum STM system. Operating is described in the subsequent passages.

2.1  Manual Restart of VDR (VDR 4300, 4350, 4360)

Open the Super Home menu and select VDR or open the pop-up menu in the lower left corner and select VDR.

Click to the Restart button in the top left corner of the screen 2), confirm your step, and the central processor of the VDR system will be initialized.

A restart should only be performed if the alarm VDR Integrity Check Failed has appeared.

The status indication will change from Recording to Initializing. After some ten seconds the VDR is recording again.

---

1) Earlier VDR models 4300 and 4350 are having 12 hours on FRM, 24 hours on HDD, and no EPIRB
2) If an earlier VDR model, i.e. VDR 4350 or 4300, is connected, the design of the menu is slightly different, but the restart button is available at the same location.
2.2 Operation Performance Test (VDR 4360 only)

This latest VDR model is providing an Operation Performance Test (OPT) as required by the new IEC standard 61996-1 (2012). It supports a check of all interfaces of the VDR by displaying the received data. Access to the OPT is as follows:

Open the **Super Home** menu and select **VDR** or open the pop-up menu in the lower left corner and select **VDR** as shown on the previous page.

The VDR page is opened. Select a test, i.e. GPS, from the list of available interfaces and click to **Start OPT**.

Check if the time stamp of the latest received NMEA telegrams, here VTG and GLL is within a few seconds behind the actual time. Compare to the time shown in the top line (red arrows). Click to PASS to finish the test. Click to FAIL if the telegram is missing, or marked with red values, or far behind the actual time.

Step through all the tests and confirm with PASS or FAIL for each test. The test for the video channels is displaying the latest screen shots of the Radar and ECDIS workstations, see page 367 for more details. They are updated every 15 sec.

The test for one of the microphones delivers back a status indication for this audio channel (running, passed, or failed). If the test is positive just click to PASS, otherwise to FAIL.
2.3 VDR Error Messages (VDR 4360 only)

Open the Super Home menu and select VDR or open the pop-up menu in the lower left corner and select VDR as shown before.

Click to the tab Error Detail Status to open the list of error messages. This list is updated automatically every 60 sec in the background. It shows the internal error messages of the VDR. They are related to the configured interfaces of the VDR.

In addition there are a few overall alarm messages generated by the VDR. These are sent to the ECDISPILOT Platinum STM system and displayed in the navigation alert list. Please refer to the main chapter ALARMS, WARNINGS, AND CAUTIONS for a list of these alarms.
2.4 VDR Grabbing Strategy (VDR 4360 only)

With the latest VDR performance standard IEC 61996-1 (2013) the Radar image grabbing and recording strategy was changed from Platinum SW version 2.1.x onwards.  

A set of MFDs (typically MFD 01 to 04 or MFD 01 to 05) which needs to participate in the radar recording strategy has to be defined during system commissioning.

Additionally a set of supervised radar transceivers (typically TX01 Main X-Band and TX02 Main S-Band) has to be defined.

**Recording Strategy:**

1. Initially two MFDs are recorded. Highest priority is given to those two MFDs of the initially defined set, which are selected by the operator as transceiver masters for the supervised radar transceivers.

2. In case all supervised transceivers are in standby the Primary and the Secondary MFD will be recorded.

3. The selected ECDIS monitoring MFD will be unconditionally recorded. The maximum number of supervised ECDIS MFDs is limited to two.

**Special Cases:**

If case 2) applies and the Primary or Secondary MFD are switched as a master for another transceiver (which is not configured for supervision) this transceiver is recorded. In general transceivers are recorded in time slots one after the other, one slot for X-Band, one slot for S-Band, further slots are assigned for combined transceivers. In order to avoid any overlapping with the recorded stream from X- or S-Band, the other transceivers (not configured for direct supervision) are recorded during the combined time slots. The TX label in the tool is marked accordingly.

---

1) Version 1.5.9 or higher on the VDR SW providing dynamic OPT required
2.5 VDR Incident Back-up (VDR 4300 and 4350 only)

The final recording media of the VDR 4300 and 4350 is storing the last 12 hours. The HDD is storing the last 24 hours. These data are overwritten continuously, so that only the data recorded last are available for evaluation in each case.

With the function Incident Backup, a copy of the data stored on the hard disk drive for the last 12 hours can be saved there permanently. For evaluation of the backup data, see the Operating Instructions of the VDR.

Initiating an incident backup: Click to the Incident Backup button, and confirm with yes. After a short while, the alarm VDR Backup is Running indicates that the backup is being made. The backup will take less than 5 minutes under normal conditions. During this time, the Incident Backup button is insensitive to operation. Both actions also occur when the backup is initiated by the corresponding key of the Data Concentrator; see the Operating Instructions of the VDR. All other operations are still possible on the MFD anyhow.

The data saved through the incident backup are only overwritten when another backup is performed. If Restart is activated, an incident backup which is running at that moment will be aborted.

This function is not required for the new generation of VDRs (i.e. VDR 4360), because they are coming along with a much longer storage time of 30 days.
3  Tender Tracking (optional)

Tender Tracking allows the ECDISPILOT Platinum STM system to track a number of tenders directly on the Radar/ ECDIS display.

Each tender to be tracked must be equipped with a Tender Tracking transmitter whose data are received on board and fed into the ECDISPILOT Platinum STM system for display.

In order to make the tender(s) visible as symbol(s) on the screen,
- right-click in an empty space of the application area,
- in the context-menu, check Tender Tracking

by means of the slider, the brightness of the superimposed symbols of the tenders may be set.

The tenders are then displayed as small circles with a speed vector according to the settings for Vector and T/R in the Vector & Trails group. Tender symbols have plots.

These plots can be displayed in different colours if this option has been set during system commissioning (see next page).

When the pointer is moved upon a tender symbol, a hovering window pops up to display additional data of the tender.

The color of the tender symbol (not that of the plots) represents the alert status of the tenders:

<table>
<thead>
<tr>
<th>Color</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>No alert</td>
</tr>
<tr>
<td>Orange</td>
<td>MOB-trak alert (On the tender, the MOB alert has been triggered)</td>
</tr>
<tr>
<td>Red</td>
<td>Tender Tracking Panic alert (On the tender, the alert button has been pressed)</td>
</tr>
</tbody>
</table>
3.1 Coloured Plots for Tender Tracking (optional)

Tender symbols can be extended with coloured plots. This optional feature can be used to indicate additional depth information from the tender. The tender has to be equipped with an echo sounder.

The received water depth from one or more tenders is assessed by the ECDISPILOT Platinum STM system as follows:

- **Green plot** - depth is sufficient for the main vessel
  - >= Safety Contour

- **Orange plot** - depth is dangerous for the main vessel
  - < Safety Contour but > Safety Depth

- **Red plot** - depth is not sufficient for the main vessel
  - < Safety Depth

If the cursor is moved to one of the plotted points, a tooltip is shown with position, range and bearing of the tender and the measured water depth.

The colour of the tender symbol remains green independent from the measured depth as long as MOB or panic button are not activated.
4 System Printer

The ECDISPILOT Platinum STM system can be complemented with a system printer. This printer is added to one of the MFD (workstations) via USB connection. A printout can be initiated from each MFD in the network. Print data are then routed by the Windows operating system to that MFD, where the printer is connected and automatically printed there (configuration during commissioning required).

The latest SW version is also prepared for network connection. In this case the network printer is connected to one of the switches in the network. Print data are routed to the switch and from there directly to the printer. The operation is the same as before. The system configuration has to be updated for network printer operation 1).

The system printer is used i.e. for printing out NAVTEX messages automatically, further-on for printing out screenshots and passage plans.

Print-out of a Screenshot

Click to the camera symbol in the bottom line, select print screen and choose one of the printers listed in the small context menu. The complete contents of the screen is printed out on A4 paper.

Alternatively the screenshot can be printed out to an XPS file at the default location, or if an USB stick is connected to this MFD, also to this stick.

Print-out of a Passage Plan

If a waypoint list has been opened (see ROUTE PLANNING AND MONITORING), click to Route in the top line of the list and select Print Passage plan. Choose a printer from the context list.

1) Depending on the system status (new or updated required), the printer driver has to be installed on each MFD, the bandwidth limitation in the switch has to be configured for this service and the network printer must have the IP address 172.16.6.x. Supported printers are HP Officejet 6000 and HP Color Laser Printer CP1525N (old), HP Officejet 6100 and HP Color Laser Printer M451dn (actual)
DATA MAINTENANCE
1 Overview

This volume describes the chart and route maintenance related functions of the ECDISPILOT Platinum STM. It is applicable to all SW versions. Most screenshots have been taken from SW 2.x but they are applicable to 1.x as well, the main difference is the selection of functions from the toolbar and not from tab expander.

Navigate to the Super Home menu and click on Maintenance > Nautical Charts.

As a result, the world chart together with a main selection sidebar and a protocol window appear.

The main selection sidebar provides access to the electronic charts (i.e. ENC, ARCS, C-map), and to the back-up and store routines for routes and user symbols. These are described in the subsequent chapters.

If the maintenance is started for the first time after power-on, the database will be checked automatically. This will take some minutes but is not indicated, please just wait. Any errors will be displayed in the protocol window underneath the world map.

Background operation

To use the ECDISPILOT Platinum STM for other purposes while prolonged maintenance sequences are running automatically, just navigate to the main menu and choose the appropriate application. As soon as the maintenance program running in the background needs an operator action, a message is shown. Any workstation in the system can be used for maintenance, but it is recommended to use always the same one, i.e. the planning station.
1.1 Chart Maintenance Application Area

After having selected a mode and a function, and depending on this action two subareas are opened in the application area as shown below.

The bottom information area provides a protocol window. Several protocols can be opened at the same time, but only the protocol selected in the top expander row is displayed at one time.

The action area on the right side provides lists of cells or permits. Again several lists can be opened at the same time, but only the list selected in the top expander row is displayed at one time. Buttons are available for sorting, deleting, or updating list elements. Click to the column header of the appropriate detail to sort the list in ascending/descending sequence.
1.2 Display Expander

The display expander is used to set up the graphic view of the world chart as shown in chapter 1.1.

In addition it provides an overview of the number of installed cells for different navigational purposes (coastal, harbor etc.) and the total number of cells.

For access to the Display Expander open the toolbar and select Display (in earlier SW versions select Display from the tab expander).

If an alarm indicator, a small triangle, is displayed in front of one of the navigational areas, an error has been found at least in one cell of this category.

Select one or more navigational areas by checking the small box in each line and restrict the display to those cells which are of interest.

Detailed information is available by selecting Display -> Functions -> Show Installed Charts (See chapter 1.7).

Coloring by

The cells displayed in the graphic view are shown with a colored frame. Depending on the settings in coloring by (see red arrow in above screen shot), the cell status or the licensing status is determining the frame color.

<table>
<thead>
<tr>
<th>Cell Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>An error has occurred while the data have been checked</td>
</tr>
<tr>
<td>Green</td>
<td>Chart is okay</td>
</tr>
</tbody>
</table>

Source of Licensing (not ARCS)

<table>
<thead>
<tr>
<th>Color</th>
<th>License</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Green</td>
<td>IHO ENC license</td>
</tr>
<tr>
<td>Blue</td>
<td>C-Map ENC license</td>
</tr>
<tr>
<td>Yellow</td>
<td>ENC cells not requiring a license (i.e. US coast from NOAA)</td>
</tr>
<tr>
<td>Red</td>
<td>Error</td>
</tr>
</tbody>
</table>

**Hint:** ARCS charts do not have the coloring by license function!
The electronic charts for your ECDISPILOT Platinum STM are stored separately on each ECDISPILOT Platinum STM. They have to be updated in regular intervals.

After initial installation from the base media (from CD/DVD, USB stick, or portable USB drive) the charts are updated typically in a weekly schedule from the update media. During the update process the already installed charts are checked and it might be necessary to insert the base media again if requested by the update application during the update process.

The update can be carried out by using again update media like CD/DVD, USB stick, or portable USB drive. The procedures will take some time, because the chart cells are processed on the ECDISPILOT Platinum STM, in case of ENC they are also decrypted and converted into an internal file format. This improves the chart presentation speed during later ECDIS operation. Some points have to be considered when carrying out maintenance:

1. The initial installation can take several hours. Even an update may require a considerable length of time. Therefore, perform this task in good time before the start of the voyage.
2. The chart maintenance work must be carried out so that the databases of all ECDISPILOT Platinum STMs always have the same status. This is ensured if the notes given here are observed and the sequences described are followed.
3. An easily determined indication of unequal states of the databases of the ECDISPILOT Platinum STMs is when the number of cells/ charts displayed for one ECDISPILOT Platinum STM is different from the others.
4. An update of an installation can only be performed if the corresponding base installation has been installed before. Update CD/DVD, which are issued typically each week or sometimes every few weeks, are cumulative. They contain all previous updates starting from the latest issued base CD. Today the version date of the corresponding base CD is often written on each update CD.
5. If any errors are occurring during operation or update which cannot be solved by deleting single cells, it is recommended to remove the database completely. The corresponding function is available in the mode Maintenance as Remove complete ENC database. The new installation will take several hours and the ship should stay in harbour for a longer time!
6. In addition to the IHO ENC which has been described above, it is alternatively possible to install the C-Map ENC. The database on your ECDISPILOT Platinum STM system for IHO ENC cells and C-Map ENC cells is one and the same. Please refer to page 392.

-> If an installation shall be changed from C-Map ENC to IHO ENC or vice versa it is strongly recommended to remove the database completely on all workstations (MFDs) one by one with the corresponding maintenance function Remove complete ENC database (see also page 399) ¹).

¹) Has to be carried out for each workstation separately.
2.1 Permits and Certificates

Permits
The ENC cells and ARCS charts are protected against unauthorized use by permits. The permits are individual for each vessel. They are supplied by the chart distributor in a permit file called PERMIT.TXT (in case of ENC) or GB.LCN and GB.NCP (in case of ARCS). These files have to be stored on the ECDISPILOT Platinum STM system together with the cells or charts by the user.

Wärtsilä SAM Electronics GmbH as the manufacturer of ECDIS equipment is generating an individual user identification (UID) per vessel. This UID is hidden and stored in the Platinum dongle, which comes along with each MFD (workstation). The hidden UID is used by Wärtsilä SAM Electronics GmbH to create a public User Permit which allows the customer to request a Permit File from the chart distributor. Once the license has been bought, the Permit File is sent to the customer.

Typically the Permit File is received via email from the chart supplier and has to be stored on an USB stick for further use at the ECDISPILOT workstations. The cells or charts are typically delivered on CD/DVD or USB stick.

Certificates (only IHO ENC)
The chart cells are further-on signed to provide assurance that chart data are from approved source and are not manipulated. The signature will be checked during the installation of the chart cells and will fail, if anybody has changed the data contents of the cells which come along on CD, DVD, USB stick, or via Ethernet.

The signature of the chart cells is checked against the IHO certificate. This certificate can be downloaded from the IHO website (IHO.CRT). This certificate must be installed on your ECDISPILOT Platinum STM.

Until the end of the year 2013 the main chart distributors deliver a private certificate on each IHO ENC media, those chart cells are checked against this private certificate. If a chart distributor is using a private certificate and do not deliver this certificate on the IHO ENC media, it is possible to install such a private certificate on the ECDISPILOT Platinum STM too.

During installation of cells the ECDISPILOT Platinum STM will check the cells against the certificate as follows:
1. Check against IHO certificate (IHO.CRT). If the IHO certificate is already stored on your computer, the check will be carried out against this certificate.*
2. If the above check fails, a second check against any distributor certificates (XYZ.CRT) on your ECDISPILOT Platinum STM will be carried out.
3. If no certificate is installed or is valid, the search will be extended to the actual IHO ENC media.
4. If no valid certificate can be found, the installation process is stopped.

*Hint: The check 1) against IHO certificate will fail, if cells protected by a private certificate from the individual distributors are installed (all cells until the year 2013). After this check a warning with the identification SSE26 is given. This warning is repeated for each CD or DVD again and can be ignored at this time.
### 2.2 Installation of IHO ENC and ARCS Permits

Insert your media with the permit.txt file (in case of ENC) or the corresponding ARCS permit file, typically it is an USB stick or a portable USB drive. This file will contain one permit for each chart cell, typically some hundred permits. You may have different permits for charts or cells from different chart suppliers on your system.

Open the **Functions** menu from the toolbar if not open already.

Check **Chart Database**, set to IHO ENC or ARCS.
Select **Mode**, the default is **Display**, set to **Update**.

Once the **Mode** has been set to **Update** the **Functions** menu is modified with subgroups for **Source** and **Destination** as shown in the next screenshot.

Select the **Functions**, the default setting is **Choose Function**, set to **Install and Update Permit Database**.

Select the **Source** for the permits update. It could be either a removable USB Stick, or USB drive. In the example here a removable stick has been selected. If the media has a label, it is shown here.

Check the **Selected Path**. The ECDISPILOT Platinum STM will display any permit files laying on top of the directory automatically. If nothing is found, open **Browse** to search manually for the subdirectory with the permit file. Ensure that you select the one which belongs to the relevant permits. Finally click to **Select "Data Set"**.

The **Destinations** entry is set per default to the present workstation (**this one**), where the update is carried out. No other selection is possible and required.

Press **Start** to activate the update if it is not started automatically.

A protocol of the update is shown in the bottom of the main application area.

**Finally the USB stick can be removed without any further steps!**

**Hint for ENC and ARCS:** Expired permits are not deleted automatically. They remain and have to be deleted manually.

The reason is i.e. in case of ENC that they can be used to install old cells even if they have been expired and new permits have not been received yet (issue date of cell is older than expiry date of permit). An expired permit does not allow the installation of a new cell.
2.3 Installation of Certificates (only for IHO ENC)

Licensed IHO ENC cells are protected by a public key according to the S-63 standard from IHO. This public key is part of a certificate. Until the end of the year 2013 the main chart distributors delivered chart cells protected by a private certificate on each IHO ENC media.

With the transition to the new IHO S-63 1.1 specification, distributors of official IHO ENC data will change over to the IHO certificate step by step. The certificate is no longer delivered together with the licensed cells. To obtain this new certificate it is recommended to visit the IHO website and download the file "New IHO Certificate Expires 2033". It might be also available from your chart distributor.

The Installation Procedure is as follows:

Insert your media with the IHO.CRT file, typically an USB stick. Open the Functions menu from toolbar.

Check Chart Database, set to IHO ENC.

Select Mode, the default is Display, set to Update.

Once the Mode has been set to Update the Functions menu is modified with subgroups for Source and Location as shown to the right. Select Functions, the default setting is Choose Function, set to Install Certificate.

Select the Source for the certificate. In the example a removable stick with the label "GEMISCHT" has been selected. If the media has a label, it is shown here.

Check the Selected Path. The ECDISPILOT Platinum STM will display any certificate laying on top of the directory.

If nothing is found, open Browse to search manually for the subdirectory with the IHO.CRT file. Ensure that you select the IHO.CRT file. Finally click to Select "Data Set".

The Location entry is fixed to your MFD.

Press Start to activate the update. A confirmation request is shown. Compare the public key of the certificate shown in the protocol window at the bottom with the information in IHO publications if available. Confirm the installation. The message window for successful update is shown.

Now the USB stick can be removed without any further steps!

If during the IHO ENC update the certificate can not be found, the message SSE 05 is shown. In this case carry out the procedure as described above. Private certificates stored on your MFD can be deleted. The IHO certificate can not be deleted. It can be overwritten by a more recent IHO certificate.
2.4 Update of Charts from Media or from another Workstation (MFD)

Insert your latest update media, either CD/DVD, or USB stick, or portable USB drive. It may be either a base update (all chart cells) or a weekly update (a few chart cells only).

Open the Functions menu from the toolbar.

Set Chart database to IHO ENC or ARCS (or other) depending on the charts which you want to update.

Select Mode, the default setting is Display, set to Update. Once the mode has been set to Update the Functions menu is modified with subgroups for Source and Destinations as shown in the next screenshot (see red arrows).

Select the Functions, the default setting is Choose Function, set to Update IHO ENC Database or to Update ARCS Database.

Select the Source for the update. It could be either a CD/DVD, a removable USB Stick, or USB drive. In the example here a CD ROM has been selected. If the media has a label, it is shown.

Check the Selected Path. The ECDISPILOT Platinum STM will display any chart data laying on top of the directory automatically. If nothing is found, open Browse to search manually for the subdirectory. For IHO ENC the directory name is ENC_ROOT, for ARCS there are three directories named CHARTCAT, MISC, and RASCHTS.

Another workstation (MFD) may be selected as a source as well, but only, if on that workstation the update has already been performed by applying the latest update media.

The Destinations entry is set per default to the present workstation (this one), where the update is carried out. No other selection is possible and required.

Press Start to activate the update if it is not started automatically.

A protocol of the update is shown in the bottom of the main application area. Message windows as described on the next page will appear in the overview chart to inform about the progress and any obstacles.

During the update you might be asked to insert one after the other the base media (i.e. ARCS RC 1 to RC 11), insert media of interest, and after that the update media will be requested again. Just follow the instructions given on the screen.

Some of the above steps like selecting the Update Mode will be started automatically if an appropriate update CD/DVD is inserted. Just follow the instructions on the screen.

After the update those cells which have been marked as canceled by the update medium or where a permit is missing are presented for manual deletion, refer to page 387.
2.5 Messages during Chart Update

IHO ENC or ARCS (or other) Data Exchange Set found

If a media is inserted and a function has not yet been selected or if a data exchange set is found which is not known to the system, the Chart Update Wizard appears. It informs the user that chart data are available on the media. Select either Show Contents or Update and the procedure is continued as before.

Base Media are Needed

If the weekly update comprises information for cells, which cannot be found on your PC (wrong edition, not installed, etc.) the base media for those countries, which are listed in the bottom of the protocol window, have to be inserted. In case of ARCS you are asked to insert one of the base media CD (RC1 to RC11).

Insert Next Base Media

During the update process for the base media this message will appear if another base media (CD or other) with the remaining base cells has to be inserted.

Update Cells can not be Installed

If an update media is inserted and base cells are still missing or have not been updated to the previous update, a warning is given. Load the corresponding base cells.
2.6 Display Contents of Your own MFD or another MFD (workstation)

Open the **Functions** menu from the toolbar.

Verify that **Chart database** is set to the correct chart type, IHO ENC or ARCS (or other).

Verify that **Mode** is set to its default setting (**Display**), just leave it to **Display**.

Select **Functions**, the default setting is **Choose Function**, set to one of the shown options.

Select **Apply on** to choose the own MFD (workstation) or another connected MFD.

Click on **Start** to confirm the settings and open the list of cells, or permits, or certificates. At the same time the related cells are shown as green 1) squares in the world chart.

If an MFD (your own or other) has been selected before, the installed cells, permits, or certificates will be shown in a new tab of the protocol window in the list. This list is not available for CD drive or USB stick.

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1) Coloring depends on cell status or source of licensing as selected in the Display menu, see page 377.
2.7 Display ENC Update Status Report (S-63 Ed. 1.2)

2.7.1 Introduction

In addition to the general reporting functions for installed cells, permits, and certificates which have been described in the previous chapter, the new ENC test standard requires a very specific ENC update status report. This report function has been added to the Platinum SW and is available from SW version 2.1 onwards.

**Now users and authorities can check quickly if all installed licensed ENC cells are up-to-date.**

Each time an update with official ENC cells according to S-63 Ed. 1.2 is performed, the corresponding products list which comes along with the base or update media (CD, DVD, USB stick) is stored on your ECDIS system. This list contains information about the latest version of each cell from a certain service provider (i.e. AVCS, PRIMAR) and is related to a reference date.

When the update report is generated, the relevant reference date for each cell is compared with the actual date. If the time difference is more than four weeks (28 days), the status of this cell is set to "Not up to Date" according to IHO S-63 definition. This is independent from the fact whether the version of the cell is identical to the latest version in the products list.

If the time difference is less than four weeks (28 days) the version of each cell is checked individually against the products list and the status is set individually.

If necessary the status is extended, i.e. "Not up to Date" and "License is missing", and an appropriate action is suggested in the last column. If a cell is not licensed (i.e. from NOOA or from C-Map SENC import) the status is set to "Unknown" according to IHO S-63 definition.

2.7.2 Generating the Report

Open the Functions menu from the toolbar.

Verify that Chart database is set to the correct chart type IHO ENC.

Verify that Mode is set to its default setting (Display), just leave it to Display.

Select Functions, the default setting is Choose Function, set to Show ENC Update Status Report.

Select Apply on to choose the own MFD (workstation) or another connected MFD.

Click on Start to confirm the settings and to open the ENC Update Status Report.

-> Generating the report may take some minutes depending on the number of installed cells.
2.7.3 The ENC Update Status Report in Detail

The report comprises a general overview with vessel name, reference date of ENC update and a chart status summary.

Further on a list of all installed IHO-ENC cells is shown. For each cell the edition, the update, the issue date, the expiry date, the status and the recommended action are given.

The whole list can be sorted to each of these attributes. Just click to the small arrow next to the label in the top line of the list. Clicking twice will reverse the sort order.

An explanation for the status indication is given in the introduction to this chapter.

If there are ENC cells from more than one data server installed on your system, the status report is given for each server separately. In the example below reports are presented for data Server GB (AVCS) and Data Server GB (AIO AVCS), but it could be also PRIMAR.
2.8 Maintenance of Charts on your Workstation

Open the Functions menu from the toolbar.
Verify that Chart Database is set to the correct chart type, IHO ENC or ARCS,(or other)
Set Mode, to Maintenance.
Select Functions, the default setting is Choose Function, set to one of the shown options.
Location is set per default to the drive of your workstation (MFD). It can not be changed. Maintenance can only be performed for this workstation

Click Start to activate the maintenance procedure. Depending on your selection the cells, permits, or certificates are listed on the right top side of the screen and can be deleted individually.

For sorting by name or status click to the corresponding field in the header row.
It is recommended to delete all those cells, permits, and certificates which have been expired, or cancelled or are no longer valid.

Select the cells which shall be deleted, and click to Continue. A warning will appear that the selected items will be deleted. Confirm the step and the items are deleted.

If a mistake has been made, the missing items can be installed again from your media.
Finally the list is closed by pressing Cancel.
Further-on Functions are available for
- Deleting Manual ENC Updates (see page 389)
- Verifing installed cells. The result with actual cell status is displayed in the protocol window.
- Deleting a list of known media
- Remove complete database (ENC or ARCS whatever is selected above)
2.9 Installation/ Maintenance of Admiralty Information Overlay

The Admiralty Information Overlay (AIO) is available as an option for the NACOS Platinum Navigation system. It contains all Admiralty Temporary & Preliminary Notices to Mariners (T&P NMs) and provides additional preliminary information that is specific to ENCs, such as reported navigational hazards that have been incorporated on paper charts but have not yet been included in ENCs. The overlay is available only for Admiralty Vector Charts!

2.9.1 Installing Overlay Permits

The Overlay data is protected in the same way as ENCs and requires a permit to unlock the data. Please notify your Admiralty Chart Agent if you wish to use the Overlay on your ECDISPILOT Platinum STM system so that the Overlay permit can be added to the Chart Permit files issued to you.

The Overlay permit will be loaded at the same time as your ENC permits when the Chart Permit files are loaded (see page 380). When the Overlay is added to your AVCS licence the Overlay permit will be added to the Chart Permit files issued for all ECDIS registered on the licence.

2.9.2 Installing Overlay Data

The Overlay data is provided on a single weekly CD that contains both base data and all updates up to the date of issue. Therefore only the latest CD is required for installation and all others can be discarded. The Overlay data is loaded in to the display system in the same way as ENC data.

2.9.3 Updating the Overlay

Updates to the Overlay are issued weekly on CD, along with the weekly AVCS Update CD, and are also available over the Internet through e-Navigator. Updates on CD should be loaded in the same way as loading ENC updates (see page 382).

The data volume in each weekly update is normally small. However it is necessary to issue a New Edition of the Overlay every 6 months, which consolidates all update data into a base data set. This New Edition may be over a hundred megabytes in size which will make it impractical for most users to download over the Internet and an Admiralty Information Overlay CD should be used.

When an Overlay new edition is issued (see above), the new edition must be installed before any further updates can be applied. For users who normally update over the Internet this means that an Overlay update CD will need to be installed before further Internet updates can be applied.
3 Manual ENC Update Editor

It is possible to edit the IHO or the C-Map ENC cells and only these by means of a chart editor. The edited elements of the cells are stored as a separate file. The ENC cell itself is not modified. If a manually updated cell is opened, the corresponding chart area is displayed and in addition the ENC Manual Update.

3.1 Opening the Chart Editor

In Super Home click on Nautical Charts.

The Overview of the installed charts is opened. This may take some time, because the database is checked before the charts are displayed.

If no installed charts are displayed (no rectangles appear on the screen), open the Functions expander and set Destination to MFD n (this one).

![Nautical Charts Editor - Overview](image)

Fig. XII / 2 Nautical Charts Editor - Overview

If the database is changed in between, the editor is closed without storing.
3.2 Select Cell to be Updated

Use the **Pan and Zoom** control and/or the **Set Chart center** function in order to navigate to the cell that is to be updated. As already known, the chart can be shifted using the drag-and-drop functionality by means of the **More** button.

As soon as the desired cell is displayed, click it with **More** and choose **Manual ENC Update Editor > Select ENC Cell** and click the cell that is to be updated.

If more than one ENC cell is available at this place, a list of cells is presented, select one of them. It will be marked in dark red. Click to it with **More** and continue as above.

![Fig. XII / 3 Selecting a cell](image)

The cell is displayed then. If it is not already opened, open the **Updates** expander.
3.3 Start Update Session

The cell and its chart data can be updated now.

Click on Session Setup in the Update expander and enter the Manual ENC Update Session Data. Then, click on Set. A click on Clear will erase all entered data, Cancel will close the window without any further action.

In the editor window the entries for the categories of objects which can be edited are now active.

A new object can be placed now or existing objects can be modified. This works in the same way as the usage of User Symbols.

The display of the cell can be zoomed in for easier editing, afterwards a click on View Cell will display the cell in full size again.

The update session can be ended without any changes by clicking on Undo and Abort.

All actions are stored in the session log, as long as the session has not been ended by a click on Save and Exit.

If the operator activates another application while the manual ENC update is done, the performed actions of the manual update do not get lost, in fact, all alterations will still be present when the operator returns to the manual update editor.

To view the session log, click on Show Session Log. This function is only available as long as the current setup has not been left with Undo and Abort or Save and Exit.
4  Maintenance of C-Map Charts

Two types of C-Map chart products are supported by your ECDISPILOT Platinum STM system, C-Map Professional and C-Map ENC. Both are delivered in CM 93/3 format. The maintenance procedure for both is nearly identical, and described in the following chapters.

C-Map Professional is a private database and C-Map ENC contains the official ENC data like IHO ENC. The maintenance procedure for C-Map ENC is different from that one for IHO ENC cells. It is especially different from that one for IHO ENC charts which has been described in the previous chapters. The differences are mainly caused by the handling of the media and the licenses.

The database on your ECDISPILOT Platinum STM system for IHO ENC cells and C-Map ENC cells is one and the same.

In principle both cell types can installed and maintained together in this single database. But if a cell for a certain area, either IHO ENC or C-Map ENC, has been installed already, the other type can not be installed on top. The earlier one has to be deleted first.

-> So it is strongly recommended in order to keep the maintenance work on an acceptable level, to install one type of ENC cells only on your system.

If an installation shall be changed from C-Map ENC to IHO ENC or vice versa it is strongly recommended to remove the database completely on all workstations (MFDs) one by one with the corresponding maintenance function Remove complete ENC database (see also page 399) 1).

---

1) Has to be carried out for each workstation separately.
4.1 Request of C-Map Permits

C-Map charts are protected by C-Map permits. They have to be requested from your chart supplier. For this request the C-Map ID of your ECDISPILOT Platinum STM is required. It is identical for all ECDISPILOT Platinum STM installations on one ship. It can be read out from any ECDISPILOT Platinum STM installed on your ship. This section shows you how to export this ID. Just follow the steps below:

1. Insert an USB stick into one of the USB sockets of your workstation (MFD).
2. Set **Chart Database** to **C-Map Professional/C-Map ENC**
3. Set **Mode** to **Maintenance**
4. Select **Export C-Map System ID** under **Functions**.
5. Select your USB stick under **Export media** if not already pre-set. Use the **Browse** function to switch over to a certain directory on your stick.
6. Click to **Start** to write the C-Map ID to your USB stick.
7. It is stored in an ASCII file named **USER.USR** on the selected path on your stick.
8. Send this file to your chart distributor to identify your vessel for any C-Map chart order. Indicate the area you are interested in and the type of database (ENC or Professional).
9. You will receive the C-Map permits in a file named **PASSWORD.USR** (typically per email) and the C-Map charts on exchange data media (typically DVD).

The protocol window to the left is shown after successful completion of the Request C-Map Permit procedure.

A C-Map Professional chart is organized in zones and areas, for each zone and area a permit with the corresponding zone and area number is required.

E.g. zone 0 is the whole world but with little detail, zone 1 is Europe, and zone 2 is the Mediterranean.

A C-Map ENC comes along with one permit for each cell.
4.2 Installation of C-Map Permits

After having received the C-Map permits and the C-Map database media from your chart supplier at first the installation of the C-Map permits has to be done. Copy the C-Map permits file to your USB stick and insert it into an USB socket of the planning workstation. Insert further-on the database media with the cells.

Select **C-Map Professional/C-Map ENC** and **Update** as shown in the right figure and set **Functions** to **Install and Update Permit Database**.

The database media are also required to install the permits!

1. Insert the latest database media into the drive.
2. Select the database media (in Display or Update mode) first, if this has not been done already before.
3. You may be asked by the system to insert the second C-Map update CD/DVD and finally the first one again. Just follow the advices.
4. Select your USB stick as the source and if necessary browse to the path on your stick where the latest **password.usr** file is stored.
5. **Start the procedure**.

-> Everytime when the database supplier has provided a new password.usr file, this file has to be installed first before any new cells are installed.

-> The permits for C-Map Professional are covering a whole zone.

-> The permits for C-Map ENC are covering single cells only. If a new database media is installed it **is important to update the permits as well**. Otherwise a new cell contained in the update database would not be covered by a permit.
### 4.3 Installation of C-Map Charts

After having installed the C-map permits the C-Map cells can be installed. The USB stick with the permits can be taken away now; it is not required for the following steps. Just keep the latest C-Map DVD in the drive or insert it again and follow the next steps 1):

1. Select **C-Map Professional/C-Map ENC** and **Update** as shown in the right figure and set **Functions** to **Update C-Map Professional/C-Map ENC Database**.
2. Select the CD-ROM drive as the source.
3. You may be asked by the system to insert the second C-Map update CD/DVD and finally the first one again. Just follow the advices.
4. Start the procedure.
5. The number of cells for installation can be quite comprehensive and the procedure can take an hour or two.

![Image](https://via.placeholder.com/150)

The protocol window above is shown after successful completion of the C-MAP data base installation.

-> It is important to note that the permits have to be installed first before any update of cells can be carried out.

-> For C-Map and especially C-Map ENC the latest permit file has to be installed together with the latest database media version.

-> After having installed the licensed C-Map cells this initial data base has to be updated in regular intervals.

---

1) The actual C-Map Professional media comes along as a single DVD, the C-Map ENC is distributed on two DVD’s. The user is asked during the loading procedure to insert the second DVD if necessary.
4.4 Request of C-Map Real-time Update (RTU)

After having installed all licensed C-Map cells the data base has to be updated in regular intervals. This can be done for small changes within cells in real-time by email (typically every week or more often). This section and the following one describe the real-time update (RTU). The RTU starts with a status check of your current system. The result is sent to Jeppesen by email. After a few minutes you will receive an update file, which has to be loaded into your ECDISPILOT Platinum STM. Just follow the next steps:

1. Select **C-Map Professional/C-Map ENC and Maintenance** as shown in the right figure and set **Functions** to **Export RTU request**.

2. Insert your USB stick and check the Export media which should show your USB as destination for export, select if required.

3. Browse to destination if required.

4. **Start the procedure**.

5. The RTU request file, which is named `Prof_YY.MM.DD_hh.mm.ord` is written onto your stick and has to be sent by email to Jeppesen chart service (update@c-map.no). This email must not have any entry in the subject line and also not in the text area.

**Hint:** The RTU update should be applied to fill in the gap between two versions of the base database. As soon as a new database version is available on-board it should take priority over the RTU update. The reason is that the RTU update is providing only limited patches to existing cells. A complete update is available only from the new base media.

**In any case after each update from the latest base media an RTU update should be done to receive the latest updates.**
4.5 C-Map Real-time Update (RTU)

After having sent the RTU request file to Jeppesen you have received a few minutes later the RTU update file named *.ans. Load this file to your USB stick. Just follow the next steps:

1. Insert your USB stick with the received *.ans file into your ECDISPILOT Platinum STM and check the Source media which should show the USB stick as the source for update, select manually if necessary.
2. Select C-Map Professional/C-Map ENC and Maintenance and set Functions to RTU Update of chart data base.
3. Start the procedure.

The information from the RTU answer file is used to update the cells installed on your ECDISPILOT Platinum STM system. No further action is required. If no answer file from Jeppesen has been received, contact the support service of your chart supplier.

![RTU Update Process](image)
4.6 Update of Charts with new Version from base media

As soon as a new version of the base media is available on-board, the update from this DVD has to be performed. This is typically the case after some weeks for C-Map Professional or each week for C-Map ENC.

In case of new C-Map permits (if new password,usr received) the new permits have to be installed first. Then just follow the next steps:

1. Insert the new DVD into the DVD drive.
2. Select C-Map Professional/C-Map ENC and Update and set Functions to Update C-Map Professional/C-map ENC Database.
3. Start the procedure.
4. Sometimes a list of cancelled cells for replacement is shown. They have to be deleted. Just confirm deletion of the listed and marked cells.
5. The update is performed and finally a protocol with the updated cells is shown.

The below screenshots show the update protocol with the list of cells which have been installed and the final message window that the update is completed.

In any case after each update from the latest base media an RTU update should be done to receive the latest updates.
5 Remove Complete Database

This function is removing the complete chart database for all types of charts (IHO ENC, C-Map ENC, ARCS, C-Map prof. etc.) with all cells, permits and their related status on one single workstation (MFD).

It should be used carefully after having checked all alternative options.

Especially it should be ensured that all necessary media as well as the permits are available for a complete new installation.

**This new installation will take several hours and the ship should stay in harbour for a longer time.**

This remove function is typically used i.e. if the sailing area is changed or if the database is in a faulty condition arising from cells which can not be deleted.

It is also used if the complete database shall be changed from IHO ENC to C-Map ENC or vice versa. In this case it is recommended to remove the old database first before loading any new cells.

1. Select **C-Map Professional/C-Map ENC** and **Maintenance** and set **Functions** to **Remove complete ENC database**.

2. Start the procedure.

3. A window appears showing the number of cells that will be deleted.

4. Read the information of this window and confirm. The ENC cells and corresponding permits are deleted.
6 Remote Update of Workstations

Once an update from CD/DVD or USB stick has been carried out on one workstation (see page 382), i.e. the planning station, this updated database can be loaded from any workstation in the network.

The **Remote Update** is providing a powerful function for the update of a number of workstations in one operating step.

Open the **Functions** menu from the toolbar.

Set **Chart Database** as required (ENC, ARCS, C-Map or other).

Select **Mode**, the default setting is **Display**, set to **Update**.

Select **Functions**, the default setting is **Choose Function**, set to **Update Remote ENC Databases**.

The **Source** for the update is this workstation (**this one**). No other selection is possible.

The **Destinations** entry can be set as required. Select all workstations from the list which shall be updated.

Press **Start** to activate the update.

An overview protocol of the update is shown in the bottom of the main application area. It comprises a list of all MFDs with their actual update status, and after having finished the update, the final result of the update.

Detailed protocols can be requested from each MFD by pressing the corresponding **Show Protocol** button.

The number of cells should be identical for all workstations (MFDs). On the source workstation (MFD) use the **Display Expander** to find out the number of cells (please refer to page 377). If the numbers are different, please check and if in doubt, especially if the number of cells on the target workstation is larger than that on the source workstation, remove the complete database on all workstations (refer to page 399).
7 Backup/Restore of Routes and User Symbols

The user-defined Routes and also the User Symbols can be saved to devices like USB HDD or USB memory sticks. This makes it possible to transfer those data to other systems or replacement modules.

Start Backup/Restore Procedure

In order to backup routes or user defined symbols, follow these instructions:

1. In the tabs of the expander, chose whether to backup Routes or User Sym

2. In the Function group, select whether the data are to be backed up or restored. (The following example refers to the backup-function. The restore-function works similar, but the Archive group is then inactive.

3. Under Backup to: choose the device which is to be used as backup/restore media.

4. Click Browse to open a window in which the backup file and/or path can be selected. Select the path and, if an existing archive is to be used, choose that archive, in which the data are to be stored. Existing files are overwritten.

   -or-

5. If a new archive file is to be added, check New Archive and enter the desired name.

6. Click on Start: Backup <data>. (<data> represents the chosen type of data, Routes or User Sym)

Browser window with content of selected path
WORKSTATION MAINTENANCE
1 Hardware

1.1 Display Electronics

The display electronics is based on a HP Compaq PC mounted on a shock damping frame. Periodically it is recommended to check the following points:

<table>
<thead>
<tr>
<th>Checkpoint</th>
<th>Period</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock damping frame</td>
<td>yearly</td>
<td>Check free movement of frame</td>
</tr>
<tr>
<td>Power cable</td>
<td>yearly</td>
<td>Check tight fitting and proper connection</td>
</tr>
<tr>
<td>Network cable</td>
<td>yearly</td>
<td>Check tight fitting and proper connection</td>
</tr>
<tr>
<td>USB cables</td>
<td>yearly</td>
<td>Check tight fitting and proper connection</td>
</tr>
<tr>
<td>Cooling air inlet at the front</td>
<td>half-yearly</td>
<td>Release from dust with vacuum cleaner, if necessary repeat at shorter interval</td>
</tr>
</tbody>
</table>

Table XIII / 1Periodical Maintenance Work for Display Electronics

1.2 Monitor

The color reproduction produced by the monitors must be correct. In the case of doubt and once per year, the monitor performance must be checked based on the Chart1 presentation. Please refer to CHART FUNCTIONS.

1.3 Sensor Interface, Network Switch, 24 VDC Power Supply

No special recommendations, network cables are separately fastened and power cables are screwed to terminal clamps.
2 Software

2.1 SW Version

The SW version can be accessed from the Super Home page by opening the Menu on bottom left side and clicking on About.

The information window shows data as follows:

- Designation of the equipment with NACOS Platinum series
- Name and IMO number of the vessel as configured in the data base
- SW version number
- Build number of the NACOS Platinum application
- SW version of the sensor interface PLC
- Data base build number
- Machine name of the display electronics, i.e. MFD-01
- Operating time since power on
- Module version information about various connected units like ECDIS chart data base, radar transceiver, and AIS (both if connected)

2.2 SW Updates

Software updates can only be carried out by authorized service personnel. For more information with regards to software updates of ECDISPILOT Platinum STM Systems please contact:

NACOS_update@sam-electronics.de.

For the actual IHO standards please refer to: 1)
http://www.iho.int/mtg_docs/enc/ECDIS-ENC_StdsIn_Force.htm

For ECDIS compatibility please refer to the following link: 2)

These standards can be found in addition in the About window, see above chapter 2.1 SW Version

1) Link was updated on 19th January 2017
2) Link was updated on 19th January 2017
ALARMS, WARNINGS, AND CAUTIONS
1 General Information

Alarms, Warnings, and Cautions are generically summed up under the term Alerts and they are characterized by their priorities.

From SW version 1.1 onwards these priorities have been redefined in order to meet the new Bridge Alert Management (BAM) standard MSC.302(87) and the new INS standard IEC 61924-2:

1. An **Emergency Alarm** indicates immediate danger to human life or to the ship and requires immediate action. The alarm source is not the ECDISPILOT Platinum STM system but i.e. a separate fire alarm system. The emergency alarm is marked with a red triangle.

2. An **Alarm** requires immediate attention and action of the bridge team, to avoid a hazardous situation, i.e. heading invalid. The emergency alarm is marked with a red triangle.

3. A **Warning** requires immediate attention to make the bridge team aware of conditions which may become hazardous. The warning is marked with an orange circle.

4. A **Caution** indicates a condition which still requires attention. It is marked with a yellow square.

5. An **Event** indicates a status change which does not require attention, it is used for control purposes. It is marked with a green square and related to automation only.

From SW 2.x the design of the top alarm line has been slightly redesigned. This version is described in the subsequent text.

The symbols are used in the following manner:

Placed in front of the alarm line in the alarm list as shown in the right example:

```plaintext
[Exemplary alarm list]
```

Placed in front of a label in the navigation sidebar, i.e. to indicate the status of a sensor:

```plaintext
[Exemplary navigation sidebar]
```

**Emergency Alarms, Alarms** and **Warnings** are accompanied by a permanent or short sound signal emitted by a buzzer located in the front frame of the monitor or in a panel.
1.1 Priority and Classification of Alerts

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Priority and Classification</th>
<th>Criteria for the Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Emergency Alarm</td>
</tr>
<tr>
<td>⚠️</td>
<td></td>
<td>Alarms which indicate that immediate danger to human life or to the ship and its automation exists and that immediate action must be taken. Emergency alarms are specified in the Code on Alerts and Indicators, 2009(resolution A.1021(26)). In the ECDISPILOT Platinum STM system this is i.e. an alarm from an external fire alarm system.</td>
</tr>
<tr>
<td>⚠️</td>
<td>2</td>
<td>Alarm</td>
</tr>
<tr>
<td>📣</td>
<td></td>
<td>Conditions requiring immediate attention and action by the bridge team to avoid any kind of hazardous situation and to maintain the safe operation of the ship; and escalation required as alarm from not acknowledged warning. In the ECDISPILOT Platinum STM system this is i.e. a dangerous target alarm.</td>
</tr>
<tr>
<td>📣</td>
<td>3</td>
<td>Warning</td>
</tr>
<tr>
<td>📣</td>
<td></td>
<td>Conditions or situations which require immediate attention for precautionary reasons, to make the bridge team aware of conditions which are not immediately hazardous, but may become so. In the ECDISPILOT Platinum STM system this is i.e. a warning that certain sensor data are invalid.</td>
</tr>
<tr>
<td>!</td>
<td>4</td>
<td>Caution</td>
</tr>
<tr>
<td>!</td>
<td></td>
<td>Awareness of a condition which still requires attention out of the ordinary consideration of the situation or of given information. In the ECDISPILOT Platinum STM system this is i.e. a caution that the selected position sensor has reported a greater position-deviation than is usual for this type of sensor.</td>
</tr>
<tr>
<td>🟢</td>
<td>5</td>
<td>Event</td>
</tr>
<tr>
<td>🟢</td>
<td></td>
<td>Status change which does not require attention, it is used for control purposes. It is marked with a green square.</td>
</tr>
<tr>
<td>⚠️</td>
<td>Sensor Alarm</td>
<td>A sensor signal is missing</td>
</tr>
<tr>
<td>⚠️</td>
<td>Manual Set</td>
<td>A sensor signal is missing and the value has been entered manually by the operator.</td>
</tr>
</tbody>
</table>

Table XIV / 1 Color and Symbol Code for the Alert Indications

A flashing symbol for any alert means that it has not been acknowledged yet.

A steady symbol indicates an acknowledged or rectified status of an alert. More information about the actual status is indicated by different signs like exclamation point, arrow, or check mark. Please refer to the next chapter for more details.
1.2 State of Emergency Alarms and Alarms

Emergency Alarms and Alarms are processed nearly in the same way. They are indicated with a red triangle and for Emergency Alarms with a permanent signal from the horn and for Alarms with three short signals from the horn repeated every 7 sec.

If an emergency alarm or an alarm is coming up, it is indicated as active and unacknowledged as shown in the first line of the below table.

If this alarm is silenced by the operator, the alarm state changes to silenced as shown in the second line.

If this alarm is acknowledged by the operator, the state changes to acknowledged as shown in the third line.

If the responsibility for this alarm is transferred to another device, the state changes to transferred as shown in the fourth line.

If this alarm is no longer active, the state changes to rectified as shown in the fifth line.

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Alert State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Red Triangle]</td>
<td>Active - unacknowledged</td>
<td>Flashing symbol and horn:</td>
</tr>
<tr>
<td></td>
<td>Emergency Alarm: Permanent Sound</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alarm: 3x short signal repeated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>every 7 sec</td>
<td></td>
</tr>
<tr>
<td>![Red Triangle]</td>
<td>Active - silenced</td>
<td>Flashing symbol and silent horn</td>
</tr>
<tr>
<td>![Red Triangle]</td>
<td>Active - acknowledged</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td>![Red Triangle]</td>
<td>Active - responsibility transferred</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td>![Red Triangle]</td>
<td>Rectified - unacknowledged</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td>![Red Triangle]</td>
<td>Normal</td>
<td>No symbol and no horn</td>
</tr>
</tbody>
</table>
1.3 State of Warnings, Cautions, and Events

Warnings are processed like alarms but indicated with a yellowish orange circle instead of a red triangle and only two short signals of the horn repeated every 30 sec.

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Alert State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active - unacknowledged</td>
<td>Flashing symbol and 2x short signal repeated every 30 sec</td>
</tr>
<tr>
<td></td>
<td>Active - silenced</td>
<td>Flashing symbol and silent horn</td>
</tr>
<tr>
<td></td>
<td>Active - acknowledged</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td></td>
<td>Active - responsibility transferred</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td></td>
<td>Rectified - unacknowledged</td>
<td>Steady symbol and silent horn</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>No symbol and no horn</td>
</tr>
</tbody>
</table>

Cautions and Events are processed on a lower level with one single state only. They are indicated by a yellow or green square instead of yellowish orange and there is no signal from the horn.

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Alert State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active - not rectified</td>
<td>Steady symbol, silent horn</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>No symbol and no horn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color &amp; Symbol</th>
<th>Alert State</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active - not rectified</td>
<td>Steady symbol, silent horn</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>No symbol and no horn</td>
</tr>
</tbody>
</table>
1.4 Category of Alerts

Alerts are in addition to their priority also distinguished by their category. The main criteria for the category is the decision support which is required to rectify the alert.

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria for Classification</th>
</tr>
</thead>
</table>
| A        | The information required for the decision support is directly related to the function generating the alert on a certain MFD, i.e.: 1. Danger of Collision 2. Danger of Grounding.  
All local alarms generated by a workstation are category A alerts. |
| B        | No additional information for decision support is required, i.e.: 1. Position Timeout 2. Gyro Lost  
All global alarms generated by the navigation system are category B alerts. |
| C        | The information required for decision support is not available at the bridge, the alert cannot be acknowledged from the bridge, more information is required about the status and treatment of the alert, e.g. certain alerts from the engine.  
All automation alerts are category C alerts.  
If a MFD for the automation alarm system is transferred to the bridge, the category of their alerts changes to B |

In general the category is kept in the background and not indicated to the user. Alerts are automatically classified according to their category and treated either as local, global or automation alerts. There is no need for the operator to take care about the category.
1.5 The Alarm List

The Alarm List provides an overview about all active **Alarms, Warnings and Cautions**. All entries are sorted according to their priority. Please refer to the next page for the applied sort order of priorities. The alarm list can show six entries at one time. A Scroll Sidebar and Go Top and Go Bottom pushbuttons are provided to navigate within the full list.

![Alarm List](image)

The alarm list can show six entries at one time. A Scroll Sidebar and Go Top and Go Bottom pushbuttons are provided to navigate within the full list.

If the alarm list is opened, it always shows the complete list of alarms, warnings and cautions, independent of the previously made selections of filters or priorities in the list. The list then shows the **latest unacknowledged high priority** alarm entry at the **top** of the alarm window.

![Alarm List](image)
1.6 Example of an Alarm

Additionally to the alarm designation, supplemental information is displayed for each alarm in the list. In the above example, the ECDIS application (EI) on system -03 has originated the alarm. More details are given in the entry of the alarm list as shown below:

The alarm number is **M03EI001**, where **M03** is the number of the workstation (MFD), **EI** is the indication for the ECDIS application, **001** is the internal fault number. See list of alarms for further information. The status is **Alarm**, which means that the alarm is still active (in alarm state).

Status indications can be for example:

<table>
<thead>
<tr>
<th>Normal</th>
<th>Comm. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm</td>
<td>Ch. Error (Channel Error)</td>
</tr>
<tr>
<td>Sens Fail (Sensor Failure)</td>
<td>SW. Error (Software Error)</td>
</tr>
<tr>
<td>Dev. Fail (Device Failure)</td>
<td></td>
</tr>
</tbody>
</table>
1.7 Indication of Open Alarms, Warnings, and Cautions

Open Alarms, Warnings, and Cautions are indicated by small colored symbols in the list buttons.

1. A bell in the button is indicating any unacknowledged alarm (red) or warning (orange) in the list.
2. A red triangle is indicating any acknowledged but still active or unrectified alarm in the alert list.
3. An orange circle is indicating any acknowledged but still active or unrectified warning in the alert list.
4. A yellow square is indicating any active caution in the list.
5. If no symbol is visualized there are no open alarms, warnings, or cautions in the list (no need to open it).

Unacknowledged Alarms in the list
Warnings in the list
Cautions in the list
1.8 Priority of Alerts

The priority order for alerts is based on 11 levels.

For practical reasons it is important only to know, that first all unacknowledged alerts are listed following the four priorities with emergency alarm on top (only used in combined systems), alarms, warnings, and cautions.

They are followed by the rectified alerts and finally by the acknowledged alerts as follows:

1. Active unacknowledged Emergency Alarms in order which they occur
2. Active unacknowledged Alarms in order which they occur
3. Active unacknowledged warnings in order which they occur
4. Rectified unacknowledged Emergency Alarms in the order which they occur
5. Rectified unacknowledged Alarms in the order which they occur
6. Rectified unacknowledged warnings in the order which they occur
7. Acknowledged Emergency Alarms in the order which they occur
8. Acknowledged Alarms in the order which they occur
9. Acknowledged warnings in the order which they occur
10. Cautions in the order which they occur
11. Events in the order in which they occur

New alarms are put on the top of the alarm list.

The order in which they occur is defined by the time stamp of first occurrence of an alert.
1.9 Operating when an Alert comes up on one Workstation (MFD)

When an alarm ⚠️ or warning ⏪ is raised, the workstation (MFD) generating this alarm or warning, will activate its horn and display the corresponding symbol in the alarm line and in the alarm list.

Other workstations will display ⚠️ ⚠️ or ⏪ ⏪ but no horn is activated. The crossed triangle or circle means that the alarm or warning cannot be acknowledged from this workstation (MFD).

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>The Display Changes to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First switch off the acoustic alarm, use the Stop Horn button in the alarm line or just press F11 on the keyboard. This initial stop horn step can be done from any workstation or panel on the bridge.</td>
<td>⚠️ or ⏪</td>
</tr>
<tr>
<td>2</td>
<td>Remove the cause for the alarm or warning, perform any actions to avoid possible danger.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Acknowledge the alarm or warning: Click on Acknowledge in the alarm line or press F12 on the keyboard Click on Acknowledge All in the heading of the Alarm list</td>
<td>⚠️ or ⏪</td>
</tr>
</tbody>
</table>

-> If the horn is not stopped within 30 sec, a backup call is activated on all panels.

-> If an alarm or warning is not acknowledged within 30 sec after switching off the horn, the horn is reactivated and the symbol changes accordingly back to the initial state. Unacknowledged warnings are in addition escalated to alarms after a delay time.

-> If alerts are unacknowledged for more than 60 sec (automation alerts 3-5 min), an all operator call is activated on all panels.

-> The entry in the alarm list is including always an indication of the source of alarm or warning, i.e. the MFD number, so that the operators knows where to acknowledge this alarm or warning.

-> If an alarm or warning is received from an external device, it is displayed only, no horn is activated, and it has to be acknowledged at that external device.

<table>
<thead>
<tr>
<th>State</th>
<th>Condition</th>
<th>The Display Changes to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If the cause for an alarm or warning disappears before it is acknowledged, it will be set to rectified.</td>
<td>⚠️ or ⏪</td>
</tr>
<tr>
<td>2</td>
<td>If the responsibility for an alarm or warning has been handed over to another device, it will be set to transferred (option, depending on external devices).</td>
<td>⚠️ or ◀️ (</td>
</tr>
</tbody>
</table>
### 1.10 Operating when an Alert comes up on several Workstations (MFD)

When the same alarm 🔴 or warning 🔴 is raised on two or more workstations (MFD) they will activate their horns and display the corresponding symbol in the alarm line and in the alarm list.

Typically this scenario appears, if a global alert is generated which can be solved without additional information for decision support (category B alert, i.e. a sensor failure).

In general global alerts will trigger all workstations, but the number of workstations activating the horn can be limited during commissioning in order to avoid high sound pressure on the bridge, typically one workstation at the center bridge and one on each wing are selected, but in minimum two. In addition panels can activate their buzzer.

Other workstations will display 🔴 or 🔴 but no horn is activated.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>The Display Changes to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First switch off the acoustic alarm, use the <strong>Stop Horn</strong> button in the alarm line or just press F11 on the keyboard. This initial stop horn step can be done from any workstation or panel on the bridge.</td>
<td>🔴 or 🔴</td>
</tr>
<tr>
<td>2</td>
<td>Remove the cause for the alarm or warning, perform any actions to avoid possible danger.</td>
<td>(none)</td>
</tr>
<tr>
<td>3</td>
<td>Acknowledge the alarm or warning (can be done from any workstation or panel): Click on <strong>Acknowledge</strong> in the alarm line or press F12 on the keyboard Click on <strong>Acknowledge All</strong> in the heading of the Alarm list</td>
<td>🔴 or 🔴</td>
</tr>
</tbody>
</table>

All further remarks from the previous page are valid here as well!

-> As described earlier under **Category of Alerts** more information for decision support is required to solve any automation alerts (category C alerts). This information is not available at a single workstation. Therefore the same global alarm handling as described above is applied here. Horns are activated on the same workstations as for category B alerts, depending on the attended/ unattended status of the alarm system, and the "Always on Bridge" attribute.
1.11 Escalation of Warnings

Depending on the type, some unacknowledged navigation warnings are changed to alarm priority after a limited time period, the escalation time.

This time can be set by the user in the Settings -> Escalation menu between 0:30 and 5:00 min.

The setting is password protected on level 1. The factory default value is 60 sec. The last setting is stored.

-> Navigation warnings only are escalated, automation warnings are not affected!

A typical escalation sequence is shown in the table below:

<table>
<thead>
<tr>
<th>Step</th>
<th>Event</th>
<th>The Display Changes to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SI088 - Redundant Position Lost</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The warning has not been acknowledged by the operator within the escalation time period and has been escalated to an alarm</td>
<td>!</td>
</tr>
<tr>
<td>3</td>
<td>The horn has been stopped by the operator</td>
<td>!</td>
</tr>
<tr>
<td>4</td>
<td>The warning, now with alarm priority, has been acknowledged by the operator but the redundant position is still lost.</td>
<td>!</td>
</tr>
<tr>
<td>5</td>
<td>The redundant position is valid again and the alarm status is set to normal, no symbol is shown</td>
<td>!</td>
</tr>
</tbody>
</table>

Table XIV / 2 Alert Sequence for Escalated Warning

1.12 Transfer of Escalated Warnings to BNWAS (optional)

Depending on the ship specific configuration an escalated warning can be reported via relay contact to a third party Bridge Navigational Watch Alarm System. This is a one way reporting. Acknowledgment from BNWAS back to the ECDISPILOT Platinum STM system is not available with existing BNWAS.

1) Level 1 has a factory default setting of 11 which can be changed during system commissioning.
1.13 Aggregated Alerts

A number of related alerts are aggregated by the ECDISPILOT Platinum STM system to one alert which is then marked with a "+" sign.

A typical example is the Target Auto-Acquired warning. If a second target is acquired, instead of a new warning, a plus sign is added to the existing warning.

In addition, if the warning is not acknowledged within a pre-set escalation time, the warning is changed into an alarm.

The escalation time can be set by the user in the Alarms-> Settings menu between 0:30 and 5:00 min.

A typical alert sequence is shown in the table below:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>The Display Changes to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A target has been auto-acquired</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A second or further target has been auto-acquired</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The horn has been stopped by the operator</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The warning has not been acknowledged by the operator within the escalation time period and has been escalated to an alarm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The alarm has been acknowledged, and because the event has been rectified (acquired targets are tracked now) the alarm status is set to normal, no symbol is shown</td>
<td></td>
</tr>
</tbody>
</table>

Table XIV / 3 Alert Sequence for Auto-Acquired Target

-> An aggregated alarm will become unacknowledged, every time a new alarm is aggregated again to the existing alarm entry.
### 1.14 Priority Reduction of Alerts

Larger navigation systems with several MFDs (workstations) are typically fitted with a number of redundant sensors.

Imagine the situation that GPS1 1) is selected as the actual position sensor. GPS 2 and 3 are configured for use, but actually not required for navigation.

If now GPS 2 or 3 are failing, and without any further measures, an acoustic warning would be given distracting the OOW from his primary nautical task.

In order to avoid this situation a function for priority reduction of alerts has been included into the ECDISPILOT Platinum STM system. If a sensor is failing, which is not in use, instead of a warning a silent caution is given.

-> If sensor integrity monitoring is active the secondary sensor used for monitoring is considered to be in use, priority reduction does not take place for this sensor.

-> If sensor selection is in auto mode, and the actual sensor in use is failing, the automatic switch-over process to another sensor is indicated by a warning, which has to be acknowledged by the user.

If sensors with full alert communication 2) according to the new INS standard IEC 61924 Ed2 are used, the processing of alerts from these sensors is as follows:

- If a warning from a sensor not in use is received, this warning is indicated in the alarm list and has to be acknowledged by the user.
- The ECDISPILOT Platinum STM system is transmitting an ACM message with “responsibility transfer” command to the sensor.
- The sensor will stop the acoustic alert, change status, and confirm with an ALF message.

---

1) GPS (Global Positioning System) used here as short form for a GPS navigation sensor
2) Sensors supporting responsibility transfer of alerts with ALF, ACM communication
1.15 History of Alerts

The history of alerts can be traced with the event log.
Each time, an alert has been raised, acknowledged, or rectified, an entry is added to this event list.
The event log is available under the Alarms-> List menu, just select Lists instead of Nav. Alarms and Events to open the event log.

Select Lists and Events here
1.16 Test of Alerts

The internal alert functions can be tested for training and maintenance purposes:

Go back to the Super Home page.

Select the entry Infrastructure under Maintenance.

Open the Tools bar and select Alert Test.

Select an Alert Priority (ALARM, WARNING, CAUTION) and an Alert Category (A, B, C) and activate the test alert by checking the corresponding box.
2 Navigation Sensor Alerts

This chapter describes the navigation sensor alerts available in the system. The main navigation sensors used for the heading, speed and position are monitored depending on the configuration. Those sensors which are redundant can be supported by an automatic selection mode.

⚠️ CAUTION

The automatic selection mode is the default setting after start or restart of the system.

- If the selection mode is AUTO the switching over to another sensor of the same type is done without any alarm or warning.
- If an individual sensor is chosen the switching over to the backup sensor must be done manually after the respective alarm or warning has been given.
- In the meantime (until a new sensor has been selected) the system is using the latest valid values of the disturbed or faulty sensor which produced the alarm.
- Switch over to the new sensor as soon as possible, but not before its data have been checked for plausibility and correctness. Just move the cursor to the new sensor in the selection list to see a small information window with the actual sensor data.

Legend:

In front of each entry in the alarm list the priority is shown with the respective symbol 🔴 or 📊. Cautions are marked by the symbol ! .

Further-on the source is indicated by the alert number, SI... is an alert from the sensor interface, RA... is from radar, EI... is from ECDIS, and AI... from AIS.

All navigation sensor alerts listed below are category B alerts, they are distributed over the entire navigation system and can be acknowledged from any workstation.
## 2.1 Heading Sensor Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI001 Heading Valid</td>
<td>B</td>
<td>WARNING</td>
<td>The compass system is again sending valid data.</td>
</tr>
<tr>
<td>SI</td>
<td>SI002 Heading Invalid 1)</td>
<td>B</td>
<td>WARNING</td>
<td>The heading sensor system has failed, or is reporting incorrect data, -or- the sensor interface connected to the system has failed.</td>
</tr>
<tr>
<td>SI</td>
<td>SI003 Heading Timeout 1)</td>
<td>B</td>
<td>WARNING</td>
<td>Data are no longer received from the selected heading sensor or from the sensor interface. Another heading sensor will have to be selected by the operator if available.</td>
</tr>
<tr>
<td>SI</td>
<td>SI004 New HDG Sensor Selected 2)</td>
<td>B</td>
<td>WARNING</td>
<td>The sensor selection for the connected position sensors is operating in AUTO mode and the previously used sensor is invalid or data are no longer received via the sensor interface. The new selected sensor is indicated with its data, status and mode in the position instrument display. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI019 ROT Limit Exceeded</td>
<td>B</td>
<td>WARNING</td>
<td>The preset limit for rate-of-turn data from gyro has been exceeded. This warning is escalated to an alarm after the user set time period!</td>
</tr>
</tbody>
</table>

1) All display objects and operating possibilities for which the heading information is required are no longer shown or are inactive, tracked targets are deleted.

2) If you want to use another sensor than the automatically selected one, you must go to manual selection mode by a click on the required sensor in the position sensor menu. A reactivation of AUTO mode can only be done by the operator (Click on AUTO in the menu).
## 2.2 Speed Sensor Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI020</td>
<td>B</td>
<td>WARNING</td>
<td>The speed sensor which had given the <strong>Ground Speed Invalid</strong> or <strong>Ground Speed Timeout</strong> alarm is again sending valid data. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI021</td>
<td>B</td>
<td>WARNING</td>
<td>The selected COG/SOG speed sensor is sending invalid data. Another speed sensor will have to be selected by the operator. At present, the speed that was last sent as the valid speed is being used. Dashes are shown in the speed display field.</td>
</tr>
<tr>
<td>SI</td>
<td>SI022</td>
<td>B</td>
<td>WARNING</td>
<td>Data are no longer being received from the selected COG/SOG speed sensor. Another speed sensor will have to be selected by the operator. At present, the speed that was last sent as the valid speed is being used, or the sensor interface connected to the system has failed.</td>
</tr>
<tr>
<td>SI</td>
<td>SI023</td>
<td>B</td>
<td>WARNING</td>
<td>The speed sensor not in use changed its status, i.e. from operation to not available. <strong>Escalation:</strong> This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI024</td>
<td>B</td>
<td>WARNING</td>
<td>See SIO004 - New HDG Sensor selected!</td>
</tr>
<tr>
<td>SI</td>
<td>SI026</td>
<td>B</td>
<td>WARNING</td>
<td>The selected STW sensor is sending invalid data. Another water speed sensor will have to be selected by the operator. At present, the speed that was last sent as the valid speed is being used. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI027</td>
<td>B</td>
<td>WARNING</td>
<td>Data are no longer received from the selected water speed sensor. Manual water speed input has to be selected by the operator. At present, the speed that was latest sent as the valid speed is being used. <strong>Escalation:</strong> This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI029</td>
<td>B</td>
<td>WARNING</td>
<td>See SIO004 - New HDG Sensor selected! <strong>Escalation:</strong> This warning is escalated to an alarm after the user set time period!</td>
</tr>
</tbody>
</table>
### 2.3 Position Sensor Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI030 Position Valid</td>
<td>B</td>
<td>WARNING</td>
<td>The position sensor which has given the <strong>Position Invalid</strong> or <strong>Position Timeout</strong> alarm is sending valid data again. Check data of the main sensor! This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI031 Position Invalid</td>
<td>B</td>
<td>WARNING</td>
<td>The selected position sensor is sending invalid position data. Another position sensor will have to be selected by the operator. During the transition period, the system determines the position by dead reckoning (i.e. is internally switched to Estimated Position).</td>
</tr>
<tr>
<td>SI</td>
<td>SI032 Low Position Quality 1)</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected position sensor has reported a greater position-deviation than is usual for this type of sensor.</td>
</tr>
<tr>
<td>SI</td>
<td>SI033 Position Timeout</td>
<td>B</td>
<td>WARNING</td>
<td>Data are no longer received from the selected position sensor, -or- the sensor interface connected to the system has failed. Another position sensor will have to be selected by the operator. During the transition period, the system determines the position by dead reckoning.</td>
</tr>
<tr>
<td>SI</td>
<td>SI034 Position Status Changed to Lower Accuracy</td>
<td>B</td>
<td>WARNING</td>
<td>The position status changed i.e. from DGPS to GPS. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI035 Position Status Changed to Higher Accuracy</td>
<td>B</td>
<td>CAUTION</td>
<td>The position status changed i.e. from GPS to DGPS.</td>
</tr>
<tr>
<td>SI</td>
<td>SI036 No Valid Position Sensor</td>
<td>B</td>
<td>WARNING</td>
<td>In AUTO mode the system has switched temporarily to dead reckoning (DR). Acknowledgment is possible on any indicator. As soon as possible the system will automatically switch to a valid position sensor and deactivate this warning.</td>
</tr>
<tr>
<td>SI</td>
<td>SI037 No WGS84 Position in Use</td>
<td>B</td>
<td>WARNING</td>
<td>The selected position sensor is reporting another position datum than WGS84. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>SI</td>
<td>SI038 Latitude exceeded</td>
<td>B</td>
<td>CAUTION</td>
<td>The own ship has reached polar regions beyond 85 degree north or south, due to incorrect Mercator projection any electronic charts must not be used, paper charts have to be used</td>
</tr>
<tr>
<td>SI</td>
<td>SI039 New POSN Sensor Selected</td>
<td>B</td>
<td>WARNING</td>
<td>In AUTO mode the previously used sensor is invalid or data are no longer received. The new sensor selected is indicated with its data, status and mode in the position instrument display. If you want to use another sensor than the automatically selected one, you must go to manual selection mode by a click on the required sensor in the position sensor menu. A reactivation of AUTO mode can only be done by the operator (Click on AUTO in the menu). This warning is escalated to an alarm after the user set time period!</td>
</tr>
</tbody>
</table>

1) Option for DNV NAUT-AW ships
## 2.4 Depth and Weather Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI051 Depth Invalid</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is sending invalid data. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI052 Depth Timeout</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is no longer available. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI053 Depth Limit Exceeded</td>
<td>B</td>
<td>WARNING</td>
<td>The user set depth limit has been reached, check navigational situation.</td>
</tr>
<tr>
<td>SI</td>
<td>SI054 UKC Limit Exceeded</td>
<td>B</td>
<td>WARNING</td>
<td>The user set Under Keel Clearance has been reached, check navigational situation.</td>
</tr>
<tr>
<td>SI</td>
<td>SI061 Wind Invalid</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is sending invalid data. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI062 Wind Timeout</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is no longer available. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI066 Weather Invalid</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is sending invalid data. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI067 Weather Timeout</td>
<td>B</td>
<td>WARNING</td>
<td>The selected sensor is no longer available. Another sensor has to be selected by the operator.</td>
</tr>
<tr>
<td>SI</td>
<td>SI069 Wave Height Warning</td>
<td>B</td>
<td>WARNING</td>
<td>The user set wave height limit has been reached, check navigational situation.</td>
</tr>
</tbody>
</table>
2.5 Backup Sensors and Redundant Input

If two or more sensors of the same type are available in your NACOS system, each second or further sensor, which is currently not in use as main or secondary sensor, is considered as a backup sensor and monitored.

If a backup sensor is lost, a caution (yellow square, silent) with ... Backup Lost is generated to inform the user.

Further-on if any sensor is connected redundant to your NACOS system, which means the data are fed in parallel into two inputs i.e. into two navigation sensor interfaces DCU 2010 or DPU 2020, a loss of data on any redundant input will generate again a caution (yellow square, silent) with ... Redundant Input.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI055 Depth Redundant Input</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the redundant input is lost. The primary or main sensor is still working. No further action is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI056 Depth Backup Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the backup sensor is lost. The primary or main sensor is still working. No further actions is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI070 Heading Redundant Input</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the redundant input is lost. The primary or main sensor is still working. No further action is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI071 Heading Backup Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the backup sensor is lost. The primary or main sensor is still working. No further actions is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI076 Position Redundant Input</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the redundant input is lost. The primary or main sensor is still working. No further action is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI077 Position Backup Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the backup sensor is lost. The primary or main sensor is still working. No further actions is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI078 Speed Redundant Input</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the redundant input is lost. The primary or main sensor is still working. No further action is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
<tr>
<td>SI</td>
<td>SI079 Speed Backup Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The sensor signal from the backup sensor is lost. The primary or main sensor is still working. No further actions is actually required. The backup sensor should be checked as soon as possible.</td>
</tr>
</tbody>
</table>
### 2.6 Sensor Monitoring - Secondary Sensor Lost

If sensor monitoring is activated and the secondary sensor which is used for monitoring the main sensor, is lost, a caution (yellow square, silent) with **Monitoring Lost** is generated.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI080 Heading Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
<tr>
<td>SI</td>
<td>SI082 STW Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
<tr>
<td>SI</td>
<td>SI083 SOG Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
<tr>
<td>SI</td>
<td>SI084 Depth Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
<tr>
<td>SI</td>
<td>SI087 DR Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
<tr>
<td>SI</td>
<td>SI088 Position Monitoring Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The selected secondary sensor for monitoring is no longer available and no further sensor of the same type can be used for monitoring.</td>
</tr>
</tbody>
</table>
2.7 Sensor Monitoring - Deviation between Main and Secondary Sensor

If sensor monitoring is activated and the secondary sensor which is used for monitoring the main sensor, is differing more than a user set limit, a warning (orange circle and horn) with "Monitoring" is generated.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SI</td>
<td>SI089 Heading Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
<tr>
<td>SI</td>
<td>SI091 STW Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
<tr>
<td>SI</td>
<td>SI092 SOG Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
<tr>
<td>SI</td>
<td>SI093 Depth Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
<tr>
<td>SI</td>
<td>SI096 DR Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
<tr>
<td>SI</td>
<td>SI097 Position Monitoring</td>
<td>B</td>
<td>WARNING</td>
<td>The deviation of sensor data between the main sensor and the secondary sensor selected for monitoring is greater than the limit set by the user.</td>
</tr>
</tbody>
</table>
### 3 ECDIS Alerts (if ECDIS is installed)

Most ECDIS Alerts listed below are category A alerts and handled from the workstation where they appear. Some alerts are marked with (B) which means, that they are distributed navigation system wide and handled from any workstation.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI</td>
<td>EI000 Malfunction of ECDIS</td>
<td>A</td>
<td>ALARM</td>
<td>ECDIS not available for route monitoring and display of charts.</td>
</tr>
<tr>
<td>EI</td>
<td>EI001 Crossing Safety Contour</td>
<td>A</td>
<td>ALARM</td>
<td>The ship will cross a depth limit for which this alarm has been activated in the Alarms &gt; ECDIS Alerts menu.</td>
</tr>
<tr>
<td>EI</td>
<td>EI002 Crossing Special Area</td>
<td>A</td>
<td>WARNING</td>
<td>The chart monitoring detected an area with special condition (for example a user made Danger Highlight Area) ahead of the own ship’s position. This alert can be set by the user to a CAUTION (see EI015).</td>
</tr>
<tr>
<td>EI</td>
<td>EI003 Deviation from Route</td>
<td>A</td>
<td>ALARM</td>
<td>The current position of the ship deviates from the planned position. The limits of the cross track deviation can be altered in the XTD LIM column of the waypoint list. This alarm is equivalent to &quot;Off Track Limit Exceeded&quot; in TP mode.</td>
</tr>
<tr>
<td>EI</td>
<td>EI005 Approach to Waypoint</td>
<td>A</td>
<td>WARNING</td>
<td>The ship is approaching a WOP (wheel over point), it is indicating the approach to the next course change maneuver on the pre-planned route. This alarm is equivalent to &quot;TP Waypoint Approaching&quot; in TP mode. This alarm can be activated or suppressed in the Alarms expander under ECDIS Alerts with the selection of Critical point on route alert.</td>
</tr>
<tr>
<td>EI</td>
<td>EI006 Approach Critical Point</td>
<td>A</td>
<td>WARNING</td>
<td>The ship is approaching a critical point on the route. Check the chart for any obstacles!</td>
</tr>
<tr>
<td>EI</td>
<td>EI010 Navigation Hazard Ahead</td>
<td>B</td>
<td>CAUTION</td>
<td>An obstruction, a wreck, a rock with depth below the user selected safety depth or Aids to Navigation or a user made Safety Line will be crossed soon.</td>
</tr>
<tr>
<td>EI</td>
<td>EI015 Crossing Special Area</td>
<td>B</td>
<td>CAUTION</td>
<td>The chart monitoring detected an area with special condition, this caution is distributed to all workstations and it can be handled at any workstation. This alert can be set by the user to a WARNING (see EI002).</td>
</tr>
</tbody>
</table>
## Target Alerts

Target Alerts listed below are category A alerts and handled from the workstation where they appear.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA</td>
<td>RA001 Lost Target 1)</td>
<td>A</td>
<td>WARNING</td>
<td>The tracked target situated at the displayed lost target symbol has got lost. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>RA</td>
<td>RA002 Dangerous Target</td>
<td>A</td>
<td>ALARM</td>
<td>The target which is flashing in red has become a dangerous target, because the CPA and TCPA values are smaller than the set limits.</td>
</tr>
<tr>
<td>RA</td>
<td>RA003 Target AUTO-Acquired</td>
<td>A</td>
<td>WARNING</td>
<td>A target which is not yet being tracked has been acquired automatically in the acquisition/guard zone. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>RA</td>
<td>RA004 ACQ Zone Overflow</td>
<td>B</td>
<td>CAUTION</td>
<td>A target has been acquired automatically in the guard zone. It cannot be tracked, because the maximum number of targets 2) are already being tracked. Check the acquisition/guard zone; delete targets.</td>
</tr>
<tr>
<td>RA</td>
<td>RA005 TGT Entered Guard Zone</td>
<td>A</td>
<td>WARNING</td>
<td>A target which is already being tracked has entered the acquisition/guard zone. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>RA</td>
<td>RA008 Check ARPA Target Capacity</td>
<td>A</td>
<td>WARNING</td>
<td>95% of the maximum number of ARPA targets are being tracked. Delete at least one unimportant target. This warning is escalated to an alarm after the user set time period!</td>
</tr>
<tr>
<td>RA</td>
<td>RA009 ARPA TGT Capacity Limit</td>
<td>A</td>
<td>WARNING</td>
<td>100% of the maximum number of ARPA targets are being tracked. Delete at least one unimportant target.</td>
</tr>
</tbody>
</table>

1) For AIS targets the Lost Target warning can be disabled in the Settings - Target menu.
2) ARPA targets and AIS targets together
## 5 AIS Alerts

Depending on the type of AIS connected to the system, not all alerts listed below may be supported. If no AIS is connected, none of the alerts will appear.

**Escalation:** All warnings are escalated to alarms after the user set time period!

All AIS alerts listed below are category B alerts (navigation system wide) unless otherwise marked with (A) which means, that the alert is handled from the workstation where it appears.

The target related alarms and warnings are documented in the chapter target alarms.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>AI001 AIS TX Malfunction</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS system stopped transmission. Check the AIS system. Check the antenna and the antenna cabling (short circuit or missing contact at the connectors). Call the service at the next possible harbor, be aware that your ship might not be visible for other ships as an AIS target.</td>
</tr>
<tr>
<td>AI</td>
<td>AI002 AIS VSWR Limit Exceeded</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS system continues operation: The VSWR (voltage standing wave ratio) checked by the AIS is out of range. The distance from where your own ship is visible for other ships as an AIS target is significantly reduced to a very few miles only. Check the AIS system. Check of the AIS UHF antenna, antenna cabling and connectors.</td>
</tr>
<tr>
<td>AI</td>
<td>AI003 AIS RX Ch. A Malfunction</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS stopped the transmission on the channel A. The AIS system must be exchanged.</td>
</tr>
<tr>
<td>AI</td>
<td>AI004 AIS RX Ch. B Malfunction</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS stopped the transmission on the channel B. The AIS system must be exchanged.</td>
</tr>
<tr>
<td>AI</td>
<td>AI005 AIS RX DSC Malfunction</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS stopped the transmission on the DSC channel 70 but continues to transmit own ship AIS data. The AIS system must be exchanged.</td>
</tr>
<tr>
<td>AI</td>
<td>AI006 AIS General Failure</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS has stopped the transmission caused by an internal fault. Call service as soon as possible.</td>
</tr>
<tr>
<td>AI</td>
<td>AI007 AIS UTC Sync. Invalid</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operation using indirect or semaphore synchronization. The AIS has lost time synchronization from internal GNSS receiver (GPS) and switches over to indirect synchronization. Call service as soon as possible.</td>
</tr>
<tr>
<td>AI</td>
<td>AI008 AIS Oper. Unit Offline</td>
<td>B</td>
<td>CAUTION</td>
<td>The indicator electronic (MKD) does not communicate with the AIS electronics unit. The AIS continues operating. Check the cabling and connection between RADAR and AIS system:</td>
</tr>
<tr>
<td>AI</td>
<td>AI009 AIS Position Mismatch</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate. The AIS internal position from the AIS own GNSS receiver differs more than 100m for more than one hour from the external position (system position used at the bridge). Check the system position, the AIS internal position, the AIS GNSS antenna and cabling, call service.</td>
</tr>
<tr>
<td>AI</td>
<td>AI010 AIS NavStatus Incorrect</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate: It has been set to an incorrect navigation status, e.g. &quot;at anchor&quot; while ship is sailing with more than 3 kn or to &quot;under way&quot; while ship has SOG of 0 kn for more than 2 hours. Correct the status in the AIS settings.</td>
</tr>
<tr>
<td>AI</td>
<td>AI011 AIS Heading Sensor Offset</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate but has received COG and HDT from navigation system with a difference of more than 45 deg for 5 min while SOG is &gt; 5 kn. Check navigation system and heading sensors.</td>
</tr>
</tbody>
</table>
### ALARMS, WARNINGS, AND CAUTIONS

#### 5 AIS Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>AI014 AIS Active SART</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate. It has received a message from an active AIS-SART (Search and Rescue Transponder) which is carried by vessels and planes. Check the target list for the nearest SART ACTIVE target. Start any rescue activities if required.</td>
</tr>
<tr>
<td>AI</td>
<td>AI025 AIS External POSN Lost</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate. The AIS system does not receive a valid position sensor information and falls back to its internal position sensor. Check the sensor and the cabling.</td>
</tr>
<tr>
<td>AI</td>
<td>AI026 AIS No Valid Position</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate but has no valid position information from internal position sensor. Check the cabling and the antenna of the GPS sensor which is integrated into the AIS system.</td>
</tr>
<tr>
<td>AI</td>
<td>AI029 AIS No Valid SOG</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate using default data, it has no valid speed over ground information. Check selected speed sensor. (Typically the SOG information from an integrated bridge system which is derived from a GPS sensor, the AIS will continue to work with its own sensor, but the speed, which is sent out to other ships might not be as accurate as before.)</td>
</tr>
<tr>
<td>AI</td>
<td>AI030 AIS No Valid COG</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate using default data. It has no valid course over ground information. Check the connected sensor and cabling. (The COG information is computed by an integrated bridge system using GPS sensor data, the AIS will continue to work but will transmit less information to other ships.)</td>
</tr>
<tr>
<td>AI</td>
<td>AI032 AIS No Valid Heading</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate using default data. It has no valid heading information from the sensor. Check the heading sensor. (Typically the heading information from an integrated bridge system which is derived from the gyro, the AIS will continue to work but will transmit less information to other ships.)</td>
</tr>
<tr>
<td>AI</td>
<td>AI035 AIS No Valid ROT</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate using default data. It has no valid rate of turn information from the sensor. Check the sensor and the cabling. (Typically the rate of turn information from an integrated bridge system which is derived from the gyro, the AIS will continue to work but will transmit less information to other ships.)</td>
</tr>
<tr>
<td>AI</td>
<td>AI051 AIS Ch.Man. Not Accepted</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate but the settings made for the channel management have not been accepted by the system. Check the settings.</td>
</tr>
<tr>
<td>AI</td>
<td>AI052 AIS Receiver Fault</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to transmit but the receiver of the AIS has detected an internal malfunction. Call service at the next possible harbor. The transmitter is still operable, your vessel will still be visible for other ships, but you might not see other AIS targets.</td>
</tr>
<tr>
<td>AI</td>
<td>AI053 AIS GPS Antenna Failure</td>
<td>B</td>
<td>WARNING</td>
<td>The AIS continues to operate using the system position but the GPS antenna of the AIS does not work correctly. Check the GPS antenna and the antenna cabling (short circuit or missing contact at the connectors). No immediate action is required, AIS is normally fed by an external GPS receiver from the integrated bridge system.</td>
</tr>
<tr>
<td>AI</td>
<td>AI054 AIS GPS ANT Short Circ.</td>
<td>B</td>
<td>WARNING</td>
<td>The internal check of the GPS receiver has detected a short circuit in the coax wire between the antenna and the receiver. Check the GPS antenna cable.</td>
</tr>
<tr>
<td>AI</td>
<td>AI060 AIS Offline</td>
<td>A</td>
<td>WARNING</td>
<td>The AIS is not operating. Check the AIS system. It might be possible to eliminate the fault by switching the voltage supply to the AIS electronics unit off and then on again at the ship's mains.</td>
</tr>
<tr>
<td>AI</td>
<td>AI061 AIS New Safety Message</td>
<td>B</td>
<td>CAUTION</td>
<td>The AIS continues to operate. It has received a safety message. The safety messages can be read under &gt; Tools &gt; Target &gt; RX Msg (earlier SW versions are generating a warning with audible alarm and distract the crew from the nautical task).</td>
</tr>
</tbody>
</table>
### ALARMS, WARNINGS, AND CAUTIONS

#### 5 AIS Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>AI062</td>
<td>B</td>
<td>WARNING</td>
<td>The transmitter of AIS system has been switched off. Check the AIS settings.</td>
</tr>
<tr>
<td></td>
<td>AIS Not Transmitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI</td>
<td>AI068</td>
<td>A</td>
<td>WARNING</td>
<td>The AIS continues to operate, but 95% of the maximum number of AIS targets are being tracked. Delete at least one unimportant AIS target.</td>
</tr>
<tr>
<td></td>
<td>AIS Check TGT Capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI</td>
<td>AI069</td>
<td>A</td>
<td>WARNING</td>
<td>The AIS continues to operate, but 100% of the maximum number of acquired AIS targets are being tracked. Delete at least one unimportant AIS target.</td>
</tr>
<tr>
<td></td>
<td>AIS TGT Capacity Limit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6 NAVTEX Alerts

If a NAVTEX system is connected the following alerts could appear:

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>CR005 NAVTEX Offline</td>
<td>B</td>
<td>WARNING</td>
<td>The NAVTEX system is offline due to switched off mode, no power, or no connection. Check settings, power supply and cabling.</td>
</tr>
<tr>
<td>CR</td>
<td>CR006 NAVTEX New Message</td>
<td>B</td>
<td>WARNING</td>
<td>A new NAVTEX message has been received, check message and consider for your voyage.</td>
</tr>
<tr>
<td>CR</td>
<td>CR008 NAVTEX NAV Warning</td>
<td>B</td>
<td>WARNING</td>
<td>A new NAVTEX navigational message has been received, check message and consider for your voyage.</td>
</tr>
<tr>
<td>CR</td>
<td>CR009 NAVTEX MET Warning</td>
<td>B</td>
<td>WARNING</td>
<td>A new NAVTEX meteorological message has been received, check message and consider for your voyage.</td>
</tr>
<tr>
<td>CR</td>
<td>CR010 NAVTEX SAR Information</td>
<td>B</td>
<td>WARNING</td>
<td>A new NAVTEX search and rescue message has been received, check message and consider for your voyage.</td>
</tr>
<tr>
<td>CR</td>
<td>CR011 NAVTEX RX Malfunction</td>
<td>B</td>
<td>WARNING</td>
<td>The NAVTEX receiver is not working, check system and call service.</td>
</tr>
<tr>
<td>CR</td>
<td>CR012 NAVTEX BIST Failure</td>
<td>B</td>
<td>WARNING</td>
<td>The NAVTEX receiver has not passed the internal Built-in-Self-Test, it is not working, check system and call service.</td>
</tr>
<tr>
<td>CR</td>
<td>CR013 NAVTEX General Failure</td>
<td>B</td>
<td>WARNING</td>
<td>The NAVTEX receiver is not working in general, check system and call service.</td>
</tr>
</tbody>
</table>
7 Anchor Watch Alerts

If the anchor watch option is activated the following alerts could appear:

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI</td>
<td>EI020 Exiting Anchor Area</td>
<td>A</td>
<td>WARNING</td>
<td>The vessel is exiting the anchor watch area, which means is touching the contour of the sector at one of the two sides or at the back.</td>
</tr>
<tr>
<td>EI</td>
<td>EI021 Out of Anchor Area</td>
<td>A</td>
<td>WARNING</td>
<td>The vessel is out of the anchor watch area.</td>
</tr>
<tr>
<td>EI</td>
<td>EI022 Anchor Dragging</td>
<td>A</td>
<td>WARNING</td>
<td>The anchor is dragging, which means the vessel is touching the contour of the sector at the back.</td>
</tr>
<tr>
<td>EI</td>
<td>EI023 Anchor Watch Speed Limit</td>
<td>A</td>
<td>WARNING</td>
<td>The remaining speed during anchoring exceeds the set speed limit.</td>
</tr>
</tbody>
</table>
# Extended Route Management Alerts

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALARM TEXT</th>
<th>CAT</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI</td>
<td>EI025 1) No FOC Route Signature</td>
<td>B</td>
<td>WARNING</td>
<td>Before use the selected route has to be signed again by the FOC due to any changes.</td>
</tr>
<tr>
<td>EI</td>
<td>EI026 2) No Master Route Signature</td>
<td>B</td>
<td>WARNING</td>
<td>Before use the selected route has to be signed again by the master due to any changes.</td>
</tr>
<tr>
<td>EI</td>
<td>EI027 3) Route Signature Required</td>
<td>B</td>
<td>WARNING</td>
<td>Before use the selected route has to be initially signed by the FOC and the master.</td>
</tr>
<tr>
<td>EI</td>
<td>EI028 Out of Route Corridor</td>
<td>B</td>
<td>WARNING</td>
<td>While sailing on an active route track monitoring switched on, either manually controlled by the helmsman or automatically by the Trackpilot the vessel has left the route corridor. Extend the corridor or steer the vessel back to the corridor.</td>
</tr>
<tr>
<td>EI</td>
<td>EI029 Leaving Route Corridor</td>
<td>B</td>
<td>WARNING</td>
<td>During sailing on a track, either manually controlled by the helmsman or automatically by the Trackpilot the vessel is leaving the route corridor. Extend the corridor or steer the vessel back to the centre of the corridor.</td>
</tr>
</tbody>
</table>

1) Only if FOC option is installed.  
2) Only if FOC option is installed.  
3) Only if FOC option is installed.
9 VDR Alerts

The following alerts are only available in the NACOS Platinum system, if a VDR DEBEG 4300, VDR 4350, or VDR 4360 is connected via its LAN interface.

<table>
<thead>
<tr>
<th>SYS</th>
<th>ALERT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDR</td>
<td>VR000</td>
<td>B CAUTION</td>
</tr>
<tr>
<td>VDR</td>
<td>VR001</td>
<td>B WARNING</td>
</tr>
<tr>
<td>VDR</td>
<td>VR002</td>
<td>B CAUTION</td>
</tr>
<tr>
<td>VDR</td>
<td>VR003</td>
<td>B CAUTION</td>
</tr>
<tr>
<td>VDR</td>
<td>VR004</td>
<td>B CAUTION</td>
</tr>
<tr>
<td>VDR</td>
<td>VR005</td>
<td>B CAUTION</td>
</tr>
<tr>
<td>VDR</td>
<td>VR006</td>
<td>B CAUTION</td>
</tr>
</tbody>
</table>
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**Abbreviations**

A  
ARCS  Admiralty Raster Chart Service  
B  
BCR  Bow Crossing Range  
BCT  Bow Crossing Time  
BIOS  Basic Input/Output System  
C  
CCRS  Consistent Common Reference System  
CPA  Closest Point of Approach  
CTW  Course Through Water  
D  
DPU  Data Processing Unit  
DR  Dead Reckoning  
E  
EBL  Electronic Bearing Line  
ECDIS  Electronic Chart Information System  
ETA  Estimated Time of Arrival  
G  
GPS  Global Positioning System  
H  
HDG  Heading  
I  
IHO  International Hydrographic Organisation  
INS  Integrated Navigation System  
ISO  International Standardisation Organisation  
L  
LAT  Geographical Latitude (from 0 to 90 degree North or South)  
LED  Light Emitting Diode  
LON  Geographical Longitude (from 0 to 180 degree East or West)  
LOP  Lines of Position  
M  
MFD  Multi-Function-Display (workstation)  
MOB  Man-over-Board  
P  
PI  Parallel Index Lines  
PPI  Plan Position Indicator  
PRT  Port Side  
R  
REF TGT  Reference Target  
REL  Relative Bearing  
RM  Relative Motion  
ROT  Rate of Turn  
S  
SAR  Search and Rescue  
SDME  Speed and Distance Measuring Equipment
SOG  Speed Over Ground
STB  Starboard
STW  Speed Through Water
T  True Bearing
TCPA  Time to Closest Point of Approach
TFT  Thin Film Transistor, a kind of Monitor
TTM  True Target Message
U  User Interface
UID  User Identification
UTC  Coordinated Universal Time
UTM  Universal Transverse Mercator
V  Variable Range Marker
W  World Geographic System 1984
WP  Waypoint
Z  Central Date and Time Telegram
# Document History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Author</th>
<th>Changed Part</th>
<th>Changes</th>
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<tr>
<td>09 (2013-07)</td>
<td>Ehrke</td>
<td>All</td>
<td><strong>For SW version 1.0.14:</strong> Generation of complete update including anchor monitoring, user symbol input with UTM, old and new WP list format, ENC S-63 1.1 certificates, system printer, and remote dimming</td>
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<td>10 (2014-02)</td>
<td>Ehrke</td>
<td>GENERAL FUNCTIONS</td>
<td><strong>For SW version 1.0.15:</strong> (text in American English now) Chapter 3.1.1 updated with head stab mode Chapter 3.5 updated with selection Navigate for AIS sleeping targets Chapter 3.6 updated with list for 3 simulated critical targets</td>
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<tr>
<td></td>
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<td>ROUTE PLANNING AND MON</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>AIS, NAVTEX, Printer, other</td>
<td></td>
</tr>
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<td>DATA MAINTENANCE</td>
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<td>Chapter 3.2 &amp; 3.3 about Time Schedule Monitor added</td>
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<td>Chapter 2.1 updated with AIS status check and NAVTEX alarm handling</td>
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<td>CHART MAINTENANCE is now DATA MAINTENANCE, Chapter 2.7 about remote update added</td>
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<td>11 (2014-05)</td>
<td>Ehrke</td>
<td>ALARMS, WARNINGS, ...</td>
<td><strong>For SW version 1.1:</strong> Complete update according to new IEC 62388 Ed2 Alert symbols updated acc. to IEC 62388 Ed.2</td>
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<td></td>
<td></td>
<td>All</td>
<td>Chapter 2 with weblink reference extended, Chapter 11 about HSC added</td>
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<tr>
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<td>RADAR FUNCTIONS</td>
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<td>12 (2014-07)</td>
<td>Ehrke</td>
<td>ALL</td>
<td>Small changes resulting from initial delivery of SW 1.1</td>
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<td></td>
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<td>DATA MAINTENANCE</td>
<td>C-Map ENC added</td>
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<td>Author</td>
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<td>Changes</td>
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<td>13 (2014-10)</td>
<td>Ehrke</td>
<td>ALL</td>
<td><strong>For SW version 2.0:</strong> Update of screenshots and operating, DISPLAY FUNCTIONS AND TOOLS is now divided into SETTINGS and NAVIGATION TOOLS</td>
</tr>
<tr>
<td>14 (2015-01)</td>
<td>Ehrke</td>
<td>SYS DESCR AIS, VDR, NAVTEX...</td>
<td>SYS DESCR for INS functions added</td>
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<td>15 (2015-06)</td>
<td>Ehrke</td>
<td>ALARMS...</td>
<td>List of Alarms updated with INS related alarms</td>
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<td>16 (2015-08)</td>
<td>Ehrke</td>
<td>All ALARMS, WARNINGS, AND CAUTIONS</td>
<td>Company logo and name changed, now Wärtsilä, document number changed, separate number for SW 2.0, ED... number skipped, Alert list now in table format, description of various TP/SP alerts updated</td>
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<td>17 (2016-01)</td>
<td>Ehrke</td>
<td>TARGET HANDLING CHART FUNCTIONS</td>
<td>Number of sleeping targets updated 200 -&gt; 240, Description of category groups and advanced chart settings for IEC 61174 Ed.4 updated</td>
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<tr>
<td>18 (2016-02)</td>
<td>Ehrke</td>
<td>NAVIGATION TOOLS SETTINGS CHART FUNCTIONS CONNING</td>
<td><strong>For SW version 2.1:</strong> Optional HELO function added, Rulers added, Default or S-mode settings shifted from QUICK START to SETTINGS and extended for ECDIS IEC 61174 Ed.4, now 70 parameters are set by default, Update for new IEC 61174 added, Description of status line in raster charts updated, Chapter 2.1 updated with more details about drift angle calculation</td>
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<tr>
<td>19 (2016-04)</td>
<td>Ehrke</td>
<td>SYS DESCR SETTINGS ROUTE MONITORING</td>
<td>Chapter 10 with approved system layouts added, Chapter 2.3 updated, dangerous target alarm is ON in S-mode, Chapter 2.3 with settings for ECDIS hazards added</td>
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<tr>
<td>20 (2016-07)</td>
<td>Ehrke</td>
<td>LAYOUT AIS, VDR, ... ROUTE MON.</td>
<td>New Wärtsilä title page, Chapter Safety Messages moved from TARGET HANDLING to AIS; RX messages updated, now generating caution and not a warning; chapter about AIS Hot Standby added, ECDIS hazard list added</td>
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<tr>
<td>21 (2016-09)</td>
<td>Ehrke</td>
<td>ROUTE MON.</td>
<td>Chapter about Edit Leg to WP added</td>
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<td>22 (2016-12)</td>
<td>Ehrke</td>
<td>SETTINGS NAVTEX</td>
<td>Depth Limits is now Alert Limits, Wind limits added, NAVTEX Alerts added</td>
</tr>
<tr>
<td>Revision</td>
<td>Author</td>
<td>Changed Part</td>
<td>Changes</td>
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| 23 (2017-01) | Ehrke  | NAVTEX CHARTS TARGET HANDLING | NAVTEX section shifted to NAVIGATION TOOLS  
Section about Chart1 updated with description of IHO PresLib4 Check  
Presentation of AIS targets updated |
| 24 (2017-05) | Ehrke  | GENERAL FUNCTIONS | Chapter about time server added  
Chapter about dimming updated |
| 25 (2017-10) | Ehrke  | STM FUNCTIONS | New chapter about Sea Traffic Management added |
| 26 (2017-11) | Ehrke  | STM FUNCTIONS | Port Call Message and Definitions added |
Wärtsilä SAM is a global leader in complete life-cycle power solutions for the marine and energy markets. By emphasizing technological innovation and total efficiency, Wärtsilä SAM maximizes the environmental and economic performance of the vessels and power plants of its customers. Wärtsilä SAM is listed on the NASDAQ OMX Helsinki, Finland.

See also www.wartsila.com

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Wärtsilä SAM Electronics GmbH, Germany
Service
Customer Support Center
Phone: +49 (0) 18 03 00 85 53
Fax: +49 (0) 18 03 00 85 54
E-mail: shipservice.sam@wartsila.com
Appendix:

Furuno Voyage Information Service Service

- Service instance description
- System Description
- User manual
Title: Service instance description for SHIP MadameButterfly IMO7917551 Voyage Information Service
## Document status

### Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMA</td>
<td>Swedish Maritime Administration</td>
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<tr>
<td>Furuno</td>
<td>Furuno Finland</td>
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## Document History

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<td>0.4</td>
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## Review

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1 Introduction

1.1 Purpose of the Document
The purpose of this service instance description document is to provide an operational description of the specific service instance.

1.2 Intended Readership
This service instance description document is intended to be read by service consumers in charge of selecting the service instance to consume.
2 Service Instance Identification

The purpose of this chapter is to provide a unique identification of the service instance and describe where the service is in terms of the engineering lifecycle.

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<thead>
<tr>
<th>Name</th>
<th>MadameButterfly IMO7917551 Voyage Information Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>urn:mrn:stm:service:instance:furuno:imo:7917551</td>
</tr>
<tr>
<td>Version</td>
<td>1.0</td>
</tr>
<tr>
<td>Service Specification ID</td>
<td>urn:mrn:stm:service:specification:sma:vis</td>
</tr>
<tr>
<td>Service Specification Version</td>
<td>2.2</td>
</tr>
<tr>
<td>Service Design ID</td>
<td>urn:mrn:smt:service:design:sma:vis-rest-2.2</td>
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<tr>
<td>Service Design Version</td>
<td>2.2</td>
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<tr>
<td>Description</td>
<td>The service shares voyage plans from the ship to interested parties. The service accepts incoming proposed updates on voyage plan (RTZ), text messages and area (S124) messages. The service accepts subscription requests and requests for voyage plans.</td>
</tr>
<tr>
<td>Keywords</td>
<td>Ship, VIS, TXT, S124, Voyage Information Service</td>
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<tr>
<td>Provider</td>
<td>Full name for the organisation that provides the information, acronym urn:mrn:stm:org:furuno</td>
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<tr>
<td>Status</td>
<td>released</td>
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<td></td>
<td>Released for staging</td>
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<tr>
<td>IMO</td>
<td>7917551</td>
</tr>
<tr>
<td>MMSI</td>
<td>563892000</td>
</tr>
</tbody>
</table>

Table 1 - Service Instance Identification
3 Service Instance Details

3.1 Overall description
The Ship Voyage Information Service provides interested parties with the ships voyage plan in RTZ format. The normal procedure is that the owner of the voyage plan nominates a set of interested parties. Nomination includes in this context both giving an interested party authorization to read the voyage plan and also adding the interested party to a subscription list, which gives the interested party an initial voyage plan and after that continuously all updates on the voyage plan. An interest party can also request to subscribe to voyage plans from the ship. Both the ship and the interested party can remove subscription.

An interested party can also ask for all or specific voyage plans from the ship.

The service accepts incoming (uploaded) voyage plans in RTZ format, text messages in STM format and area message in S124 format.

3.2 Service coverage
The service covers the whole world.

3.3 Required input
Incoming voyage plans must be an RTZ version 1.1 with STM Extension according to the VIS Design 2.2.
Incoming text messages must be in STM TXT v1.3 format.
Incoming area message must be in S124 v0.0.7 format.

3.4 Output from the service
Outgoing voyage plans are in RTZ v1.1 STM format
Outgoing text messages are in STM TXT v1.3 format

3.5 Functional description
The service instance is online all the time. The vessel makes contact with the instance at regular intervals.
3.6 Interaction diagram

3.6.1 Normal flow – ship share voyage plans

The normal procedure is that the ship or ship representative identifies all interested parties to the voyage and nominates them. Nomination in this context includes both giving access to the voyage plan and adding the interested party as subscriber on the voyage plan. A voyage plan is sent to the interested party when it is added as subscriber, and all the updates are sent to the interested party.

![Interaction diagram](image)

*Figure 2 - Normal flow – ship share voyage plans*
3.6.2 Alternative flow – consumer requests voyage plan

The alternative procedure is that the ship has for some reason not nominated the interested party, and the interested party then requests to subscribe to voyage plans for the ship.

The interested party sends a text message to the vessel. The vessel adds the interested party to the list of subscribers.
### 3.7 Allowed methods

The Ship Voyage Information Service is based on the Voyage Information Service design version 2.2 and handles all operations.

PRS handles interaction on the following methods:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Allowance/handling</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive voyage plan in RTZ</td>
<td>uploadVoyagePlans incl ACK</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Receive STM text messages</td>
<td>uploadTextMessage incl ACK</td>
<td>Yes</td>
<td>STM TXT v1.3</td>
</tr>
<tr>
<td>Receive area (S124) messages</td>
<td>uploadArea incl ACK</td>
<td>Yes</td>
<td>S124 v0.0.7</td>
</tr>
<tr>
<td>Return list of voyage plans on request</td>
<td>getVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td>Accepts subscription request</td>
<td>subscribeToVoyagePlans</td>
<td>Yes</td>
<td>RTZ v1.1STM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>As the subscription is also the access list this method does nothing if you are not already subscribed to the voyage.</td>
</tr>
<tr>
<td>Accepts removal of subscriptions</td>
<td>removeSubscriptionToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Accepts request for list of subscribed voyages</td>
<td>findSubscriptionsToVoyagePlans</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Allowed methods

### 3.8 Constraints

The service has the following constraints.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Method</th>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access list management is handled by asking for access using a text message</td>
<td>voyage plan access</td>
<td></td>
</tr>
<tr>
<td>S124 messages time of validity</td>
<td>S124 start/end/cancel times</td>
<td>We only work with whole days – not time of day</td>
</tr>
</tbody>
</table>

Table 3 - Constraints
4 Release Notes

<table>
<thead>
<tr>
<th>Version</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>The service is release in its first version.</td>
</tr>
</tbody>
</table>

*Table 4 - Release Notes*
5 References

This chapter shall include all references used in the service instance description. Specifically, the service specification document as well as the applicable service design description shall be listed.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Version</th>
<th>Reference</th>
</tr>
</thead>
</table>

Table 5 - References
6 Acronyms and Terminology

6.1 Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIS</td>
<td>Voyage Information Service</td>
</tr>
</tbody>
</table>

Table 6 - Acronyms

6.2 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>The provision of something (a non-physical object), by one, for the use of one or more others, regulated by formal definitions and mutual agreements. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.</td>
</tr>
<tr>
<td>Service Consumer</td>
<td>A service consumer uses service instances provided by service providers. All users within the maritime domain can be service customers, e.g., ships and their crew, authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
<tr>
<td>Service Instance</td>
<td>One service implementation may be deployed at several places by same or different service providers; each such deployment represents a different service instance, being accessible via different URLs.</td>
</tr>
<tr>
<td>Service Instance Description</td>
<td>Documents the details of a service implementation (most likely documented by the service implementer) and deployment (most likely documented by the service provider). The service instance description includes (but is not limited to) service technical design reference, service provider reference, service access information, service coverage information, etc.</td>
</tr>
<tr>
<td>Service Interface</td>
<td>The communication mechanism of the service, i.e., interaction mechanism between service provider and service consumer. A service interface is characterised by a message exchange pattern and consists of service operations that are either allocated to the provider or the consumer of the service.</td>
</tr>
<tr>
<td>Service Operation</td>
<td>Functions or procedure which enables programmatic communication with a service via a service interface.</td>
</tr>
<tr>
<td>Service Provider</td>
<td>A service provider provides instances of services according to a service specification and service instance description. All users within the maritime domain can be service providers, e.g., authorities, VTS stations, organizations (e.g., meteorological), commercial service providers, etc.</td>
</tr>
</tbody>
</table>

Table 7 - Terminology
**Scope of supply**

- Existing ship system
  1. FMD-3100/3200 ECDIS (software to be upgraded)
  2. AIS transponder
  3. VSAT satellite communication equipment
- Additional equipment
  1. STM module mini-PC
     - STM functions
     - firewall
Description of Furuno STM system
The roles of different parts of the system are shown in Table 1.

1 ECDIS functionality
- Voyage planning
- Route monitoring
- Display of area messages
- Display of other ships’ routes (AIS)
- Transmission of own route by AIS
- Access to STM user interfaces (by connecting to mini-PC)

2 STM mini-PC
- Text messages: sending and display
- User interfaces:
  - Browsing of STM services
  - Management of access rights
  - Port call messages
  - Logs
- Other functions:
  - Firewall
  - Communication gateway between ECDIS and VIS/SPIS Service instance

3 VIS/SPIS Service instance
The shore based service will include an online presence of every Furuno vessel participating in the test bed. The VIS+SSC and SPIS interfaces towards the vessel use secure tunnels. The interface towards other STM services based on REST and secured with SSL and client side TLS authentication.

3.1 Server structure
The front server is nginx that requires client side TLS to succeed before accepting the connection.

The back server is a Swagger generated Python flask server running connexion that interprets the VIS.2.2 Swagger yaml file at runtime. This allows rapid adaptation to any changes in the specification during the lifetime of the project.

3.2 Access
Accessing Voyage plans requires that the vessel give access to the requested Voyage plan. The access lists are managed on-board in the STM module and pushed to the VIS+SSC instance on shore whenever they change. Incoming messages, including navigational warnings, text messages and port call messages, are always allowed.

3.3 Vessel data on shore
In our implementation every vessel has two intermediate storage areas of data.

Incoming data to the vessel:
- Voyage plans, messages, areas, Port call messages, Services, Identities

Outgoing data from the vessel:
- Voyage plans, messages, acknowledgements, access lists, requests
3.4 Quality of Service
Whenever the vessel initiates the communication, the message is sent out immediately. Incoming requests from shore are polled once per 10 minutes.

3.5 Multiple vessels - one service
Our service instances are run on different ports on a single server.

- https://stm.furuno.fi:8000 – Vessel 1

The service point is always on-line and it runs TLSv1.2 authentication and encryption for its communication with the other STM services.

The URI for communicating with a vessel can be retrieved from the Service Registry. Keywords that may be used to find the service instance are name, id, MMSI or IMO.
Table 1: Relation of requirements to system components

<table>
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<tr>
<th>Requirement</th>
<th>ECDIS</th>
<th>STM module</th>
<th>Communication link</th>
<th>VIS/SPIS Service instance</th>
<th>Comments</th>
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<td>R-3.2.3</td>
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<td>R-3.2.4</td>
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<td>VP exchange</td>
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<td>Message indication</td>
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<td>SPIS</td>
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Project timetable

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<td>April 2017</td>
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<tr>
<td>Development to be completed</td>
<td>June 2017</td>
</tr>
<tr>
<td>Internal testing</td>
<td>July-August 2017</td>
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<tr>
<td>FAT</td>
<td>August-November 2017</td>
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<tr>
<td>SAT</td>
<td>March 2018</td>
</tr>
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1. Sea Traffic Management System, STM

1.1 General

Figure 1. Block diagram of STM system

Equipment onboard a ship:

- FMD-3200/3300 ECDIS
- AIS transponder
- VSAT satellite communication equipment

Additional equipment:

- STM PC: firewall and access to STM functionality
2. FUNCTIONS

2.1 Introduction

There are several functions which can be done by Sea Traffic Management system.
- Route share ship to ship using AIS messages (1+7 WPT)
  o Other vessels’ monitored route can be displayed on ECDIS (current leg and 6 following legs)
  o Calculation of route CPA and TCPA based on route exchange information
- Sharing of monitored route (Voyage Plan) to port authorizes and service providers
  o It can be selected by user with whom monitored route is shared (route is transmit/received in .rtz format)
- Sharing of other route to shore
  o You can export any route from ECDIS (route is transmit/received in .rtz format)
- Communication ship<-> shore in Port Call Message Format (PortCDM)
  o Estimated Time of Arrival (ETA)
  o Recommend Time of Arrival (RTA)
- Communication in free text message
  o VIS textMessage
3. SETTINGS

3.1 How to change settings of STM

Click STM button and then select SETTING.

A STM dialog in General tab you can define Shipping Company and RTZ version (1.1 STM). Check Pop-up ETA if you want to get RTA shown on display whenever received from the port.
3.2 How to activate STM function

User can activate STM function in ECDIS. Use NAVI or PLAN mode, then STM button appears to left side of display where you can select FUNCTION and then select ON.

Color of STM button turns green after switching STM function ON.
4 STM PC

4.1 General

You can operate STM PC on ECDIS display. Click STM button and then select STM PC.

There are several tabs available in STM PC.

- In Inbox tab it is available messages which can be as text message, S124 area message or rtz route message.
- Port tab is to send ETA (Estimated Time of Arrival) to destination port and receive RTA (Recommended Time of Arrival) from the Port.
- In VTS tab a list of VTS available is displayed. You can select to which VTS monitored route and/or exported route is sent.
- In Services tab it is listed all available services in STM for the vessel.
- In Vessels tab it is listed all available vessels in STM
- In Log tab all events of the vessel is listed (stored in Furuno cloud service).
- In Local Log events on STM PC is listed.
4.1.1 Inbox Messages

In Inbox tab you can find messages received by STM PC. If you are interested to see what is content of message you can click **Send to ECDIS** button.

![Image of Inbox tab with messages]

Area Message (S124)

Area message is shown in list of AREA MSG:

![Image of Area Message list]

Click AREA MSG button

Double click message you want see. Area will be displayed in middle of ECDIS display. Additional information is available by Cursor Pick.
**Text message (txt)**

Text message is shown in list of TEXT MSG:

Click TEXT MSG button

If there is listed geographical area in message it is displayed middle of ECDIS display. Otherwise it is displayed in Chat.
**Route message (rtz)**

If you want to use received route in ECDIS, click send to ECDIS button.

In ECDIS following dialogue appears:

You can view received route and do the following things:

- Check route
- Save for Later use. Then it is available on ECDIS as normal route.
- Reject if it is not needed.
- Switch to monitor mode if it is checked first.
4.1.2 Ports

You can send Planned Time of Arrival (PTA) to destination port of Voyage Plan.

4.1.3 VTS

You can select if Monitored route or Exported route is sent to one or more VTS.
4.1.4 Services

You can select if Monitored route or Exported route is sent to one or more Service providers.
4.1.5 Vessels

You can select if Monitored route or Exported route is sent to one or more Service providers.
4.1.6 Log and Local Log

In Log tab you can view what has happen in Furuno cloud server.

In Local log tab you can view what has happen in STM PC.
4.1.7 Statistics

In Statistics tab you can view various tables of connections between ship and shore.
5. ROUTE SHARING BY AIS

5.1 Settings of AIS Route Sharing

You can set:
- Route sharing ON/OFF
- Color of shared route
- Display Active Target
- Set Deviation parameters for indication of shared AIS route

5.1.1 How to activate route sharing by AIS

You can select STM->SETTING

Open AIS Route Sharing tab.

Check Route Sharing by AIS
If you want route to be displayed automatically, you can select “Active target”. Then route of AIS target is displayed when AIS target is active.

5.1.2 How to Set Deviation indication
You can set deviation indication for shared AIS route. You can set XTD limit [NM] and Speed difference limit [kn]. Displaying of deviation indication is based on information received by AIS.
5.2 AIS symbol of vessel using STM function
If AIS message contains route information it is shown [STM] before vessel name.

5.3 How to get AIS target’s route displayed

You can select STM->SETTING

In Option Auto Display you can select AIS target’s route to be displayed:
- for Active AIS targets
- by set value of Route CPA and Route TCPA.
5.4 Route Trial Maneuver

You can make a route trial maneuver to check Route CPA and Route TCPA of AIS target.

You can select STM→SETTING

When you choose option Planned then calculation of RCPA and RTCPA is done using planned speed set in monitor route both own ship and AIS target.

When you choose option Manual then calculation of RCPA and RTCPA is done using manual speed for own ship and planned speed set in monitor route for AIS target.
6. Route Planning

6.1 Voyage ID

Route Planning is done in normal way, see Operator’s Manual of Furuno ECDIS FMD-3200 for more information about route planning. In STM version a new tab “STM” is for defining a few things for route used by STM system.

- Voyage ID is unique identification for voyage plan which is used to identify route used by the vessel. This voyage id is used with route plan in this name. If necessary you can create new Voyage ID by clicking Generate New ID.
- Route Status can be changed in Route Status field.
- Departure Port
- Arrival Port
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