



Acquire - Graph data - Evaluate - Calculate




Version 5.6


intab^o


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1. Introduction

1.1 Thank You

Thank you for using INTAB loggers and software. We are proud that you have chosen EasyView. We are sure you will find it not only easy to use but also a very powerful evaluation tool for measurement data.

INTAB Interface-Teknik AB
SWEDEN

1.2 System requirements: Computer

1.2.1 *Minimum Computer Configuration*

These system requirements are a minimum. Don't expect "fast reactions".

Pentium compatible processor running Windows 2000, Windows XP, Windows 2003 or Windows Vista
64 MB RAM
5 MB free disk space
CD Disk drive
VGA monitor (640x480)
Graphic card >1MB
COM-port (for loggers)

1.2.2 *Recommended Computer Configuration*

In addition to the above we also recommend:

Processor speed >2GHz
256 MB RAM
Lots of free disk space
Graphics accelerator >4MB
20" monitor SXGA (1280x1024)

1.3 System requirements : Operator

A basic insight into the workings of Windows is highly recommended. A healthy curiosity and willingness to explore possibilities will help to increase operator skill. Further on in this manual there is a vocabulary for the beginner and, at the end, an INDEX.

It is too easy to get blinded by professional looking presentations of data and forgetting to connect and apply transducers correctly. So, don't forget to study the **hardware manual(s)**. The evaluation and analysis of collected data is never of any more value than the measurement method and accuracy permits.

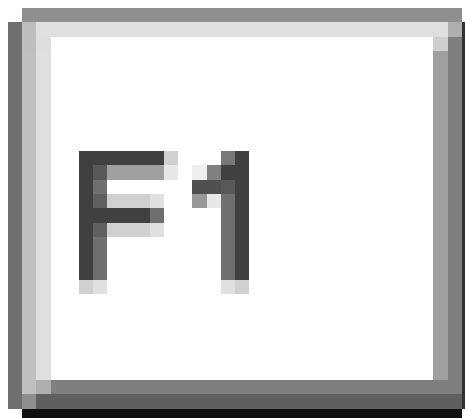
We would also like to take this opportunity to point to some facts that are self-evident but nevertheless give rise to questions:

National settings concerning numbers, decimal sign, list separator, time and date etc. are Windows settings. Use the Windows control panel.
Printers, their settings and drivers are programmed in Windows Settings/Printers.
Hot keys, Selections, Clicks etc. are Windows features. They are considered known by all and therefore not always described.
Modem Settings are also handled by Windows.

1.3.1 Operator's help

This manual is intended as a first help in getting started using EasyView. Once the EasyView is running, help will only be a keystroke away. The F1-key is the usual Window's entry point to help. This software is no exception.

HELP!! =



2. Using EasyView

2.1 General

EasyView is a very powerful tool for data acquisition and data evaluation. We will now start on a short Odyssey through the archipelago of EasyView features. This trip is intended to give you an insight into the basics of this software. Note that all features may not be present in your version of EasyView.

2.2 Analysing data – an odyssey

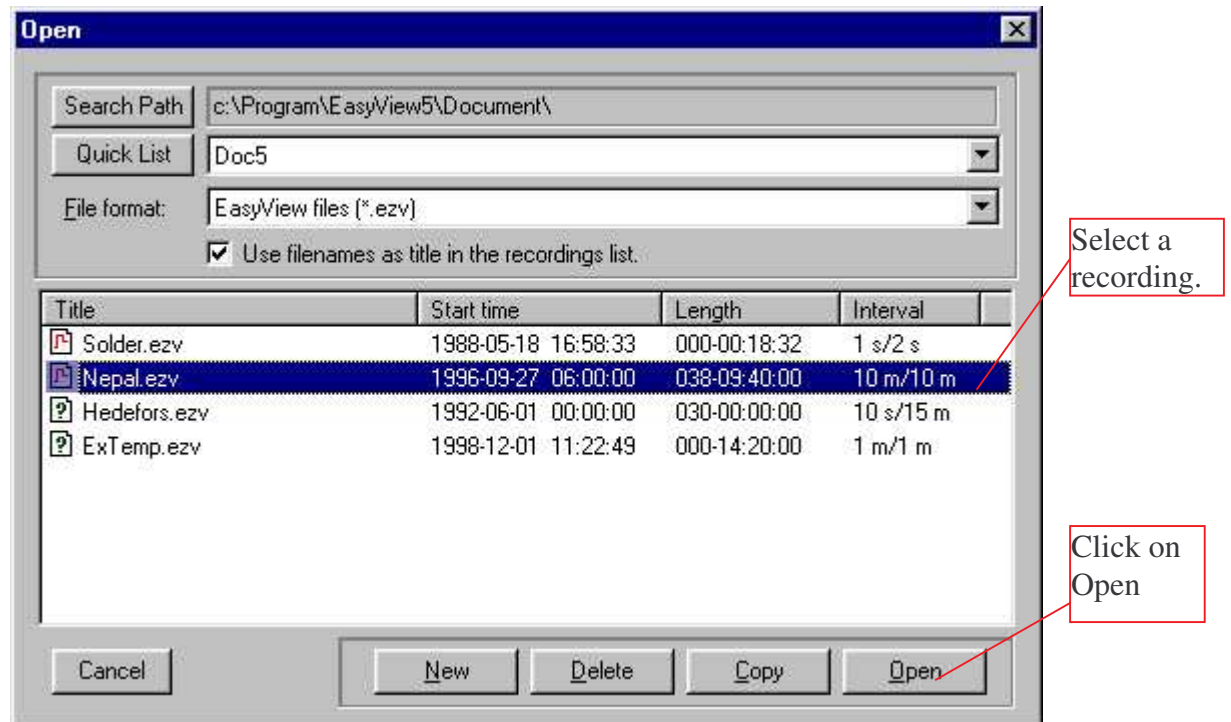
2.2.1 Open a recording

Let's assume that the EasyView is up and running. Let's be off!

We start by opening a recording. Click the Open button. 

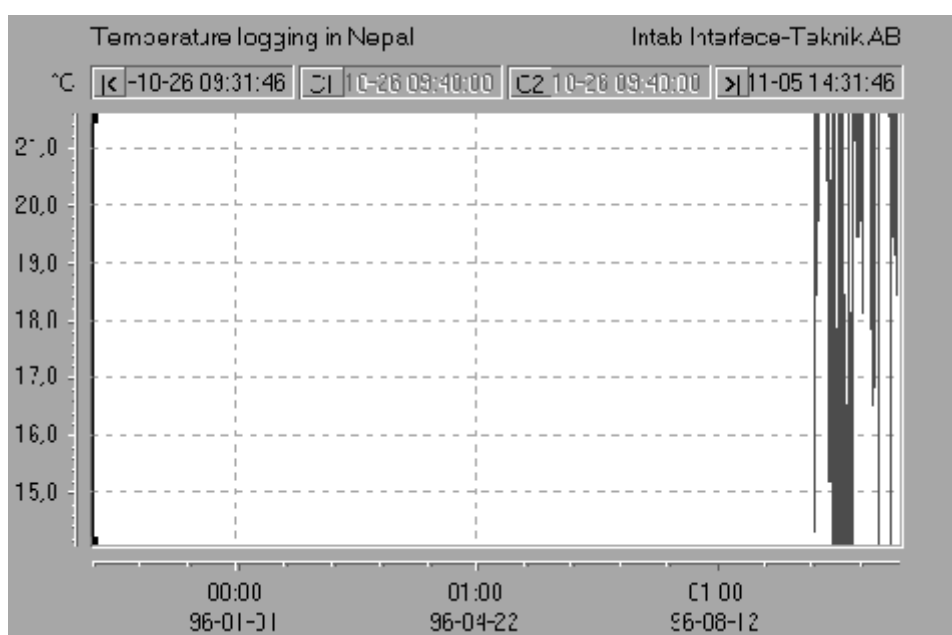
It will show a list of recordings that we include as demos.

This is what it looks like:



Let's take a look at a real recording that was acquired during a hike in Nepal. A miniature logger was tucked away in the rucksack. Select and open the indicated recording.


If you are unlucky it may look like this:

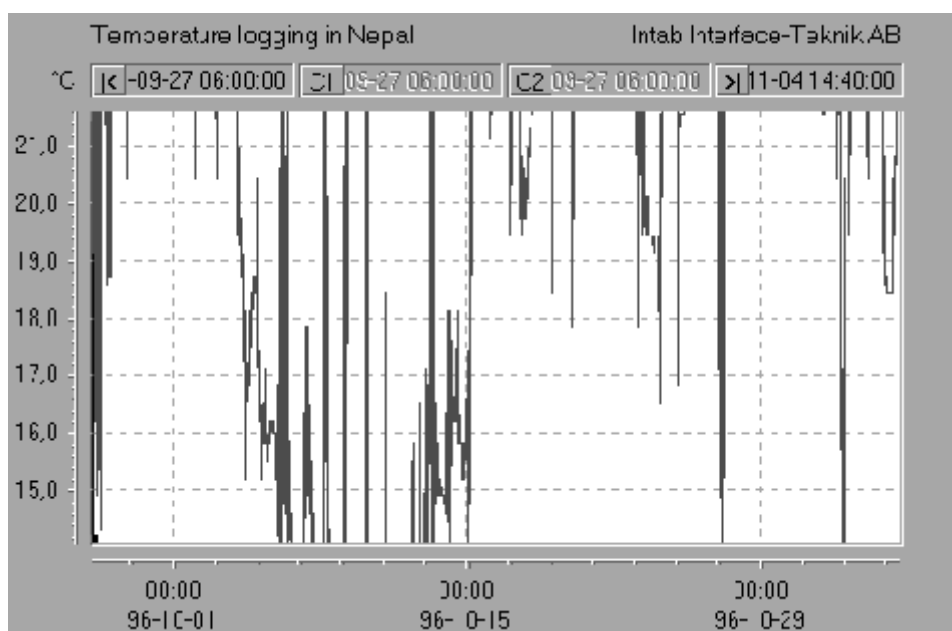


It doesn't look too good so we go straight to the next section.

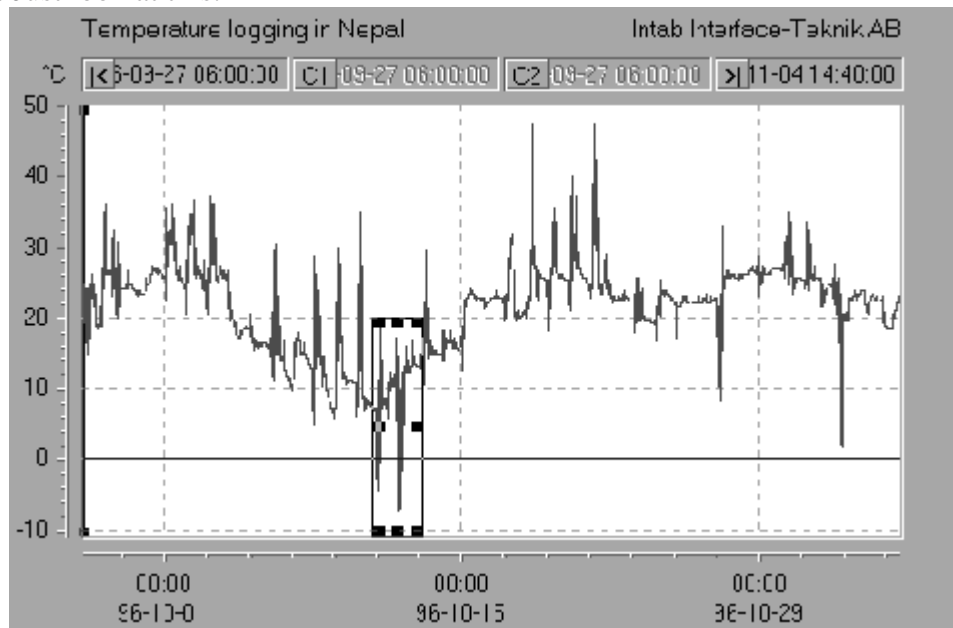
2.2.2 Autoscale

We have to do something to get meaningful information from the recording.

Click first on  to rescale the time axis to encompass the entire recording.



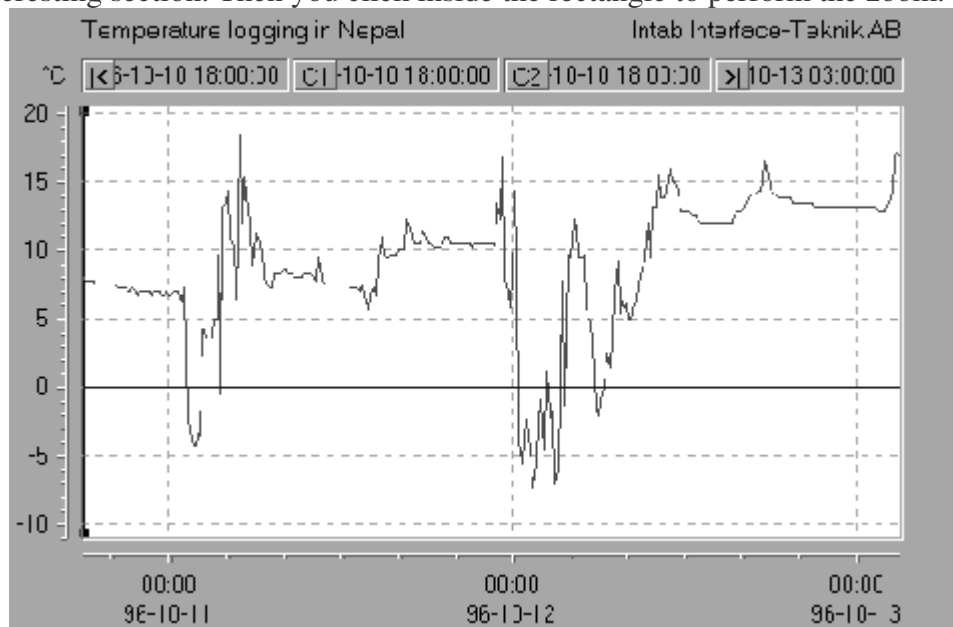
Then click on  so that the diagram is rescaled to show the full dynamic range of the signal. Just look at this:



Ugh! It was cold on top of the mountain (marked area). Let's make a closer study of the cold days. Let's see how we can zoom!

2.2.3 Zoom

By holding down the left mouse button and dragging, you will draw a rectangle around the interesting section. Then you click inside the rectangle to perform the zoom.



We are now able to see that the walk across the roof of the world took about two full days and that it was cold. The third dip in temperature occurred on the way down when the mountain shaded the sun.

This interesting and adventurous walk can be divided into "legs". The entire trip is seen in the diagram above after we had "Autoscaled".

We'll now go on to see how we can break the trip down into its constituent legs.

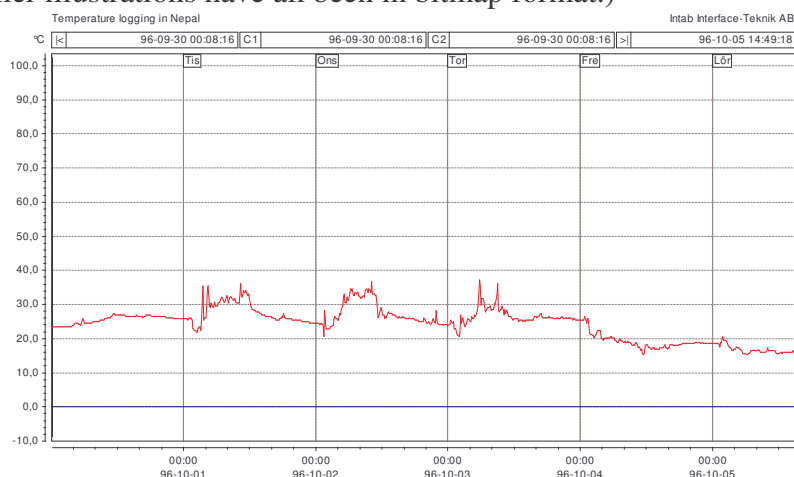
2.2.4 Views

The illustration below shows a number of tabs above the actual graph. They each have a descriptive comment or name on them to describe their contents. The x-axis has been scaled differently in each tab to cover different portions of the trip. The first tab shows the whole journey.

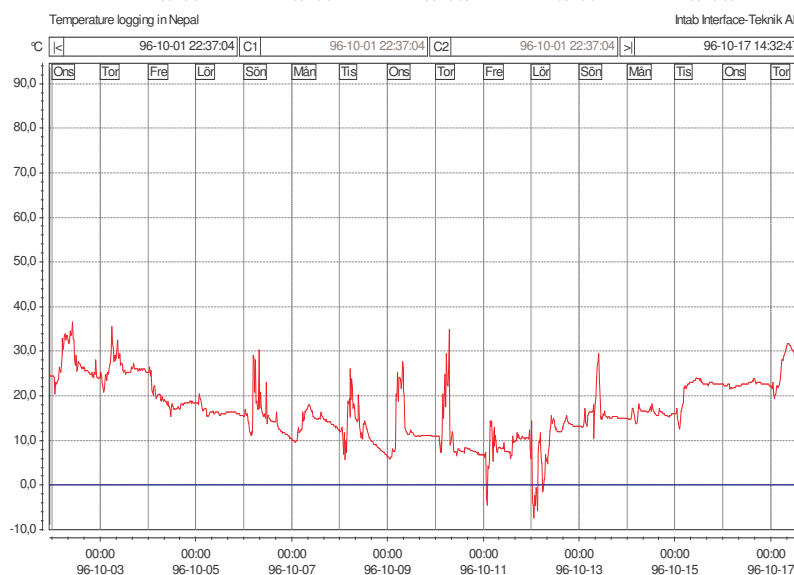


The following illustrations are “pasted” in wmf-format and each represents one of the tabs shown above. (Earlier illustrations have all been in bitmap format.)

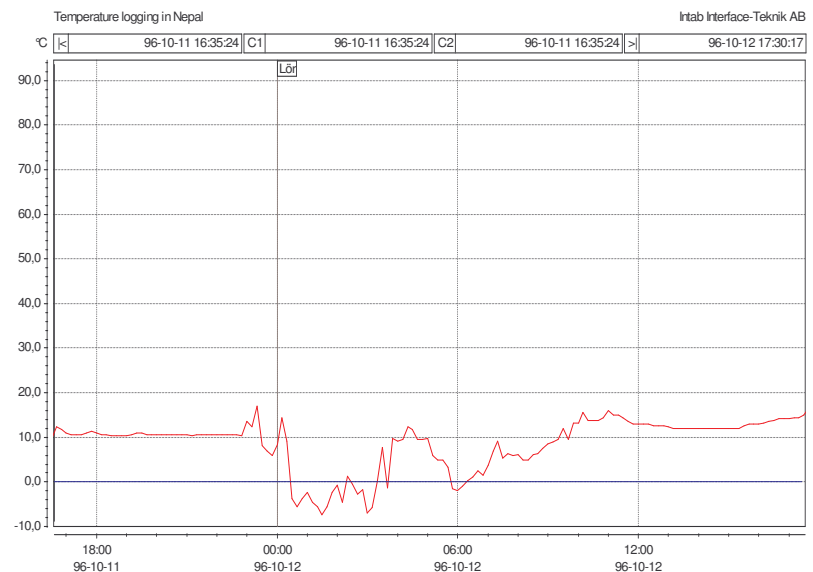
Flight to Nepal



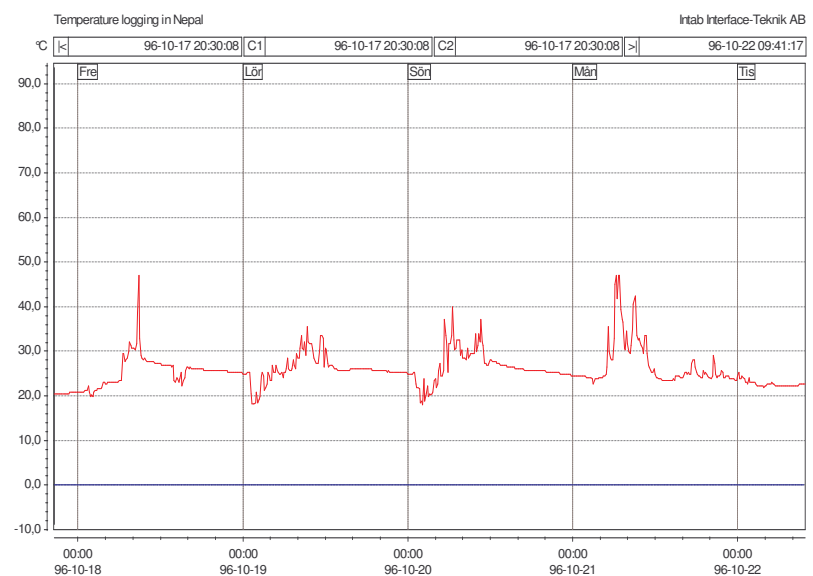
The hike



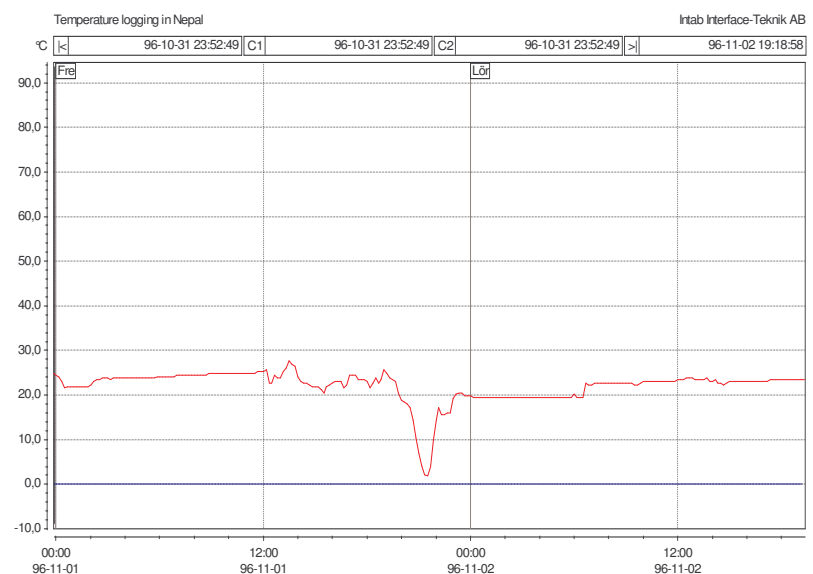
The Pass!
Special study of the
coldest moments of
the hike.



In the jungle! Nice
and warm.



Home again!
The weather was cold
coming off the plane.



We will now leave this interesting trip and take a look at another example.

2.2.5 Key values

After having recorded a process and drawn the graphs you are often able to judge whether the result was satisfactory or not by looking at their shapes.

You are many times able to, in your mind, “sum up” characteristic parameters.

Which are these characteristic parameters?

We believe that they often are the simple, perhaps statistical, values that give the most relevant information. The **Info table** supplies this type of information!

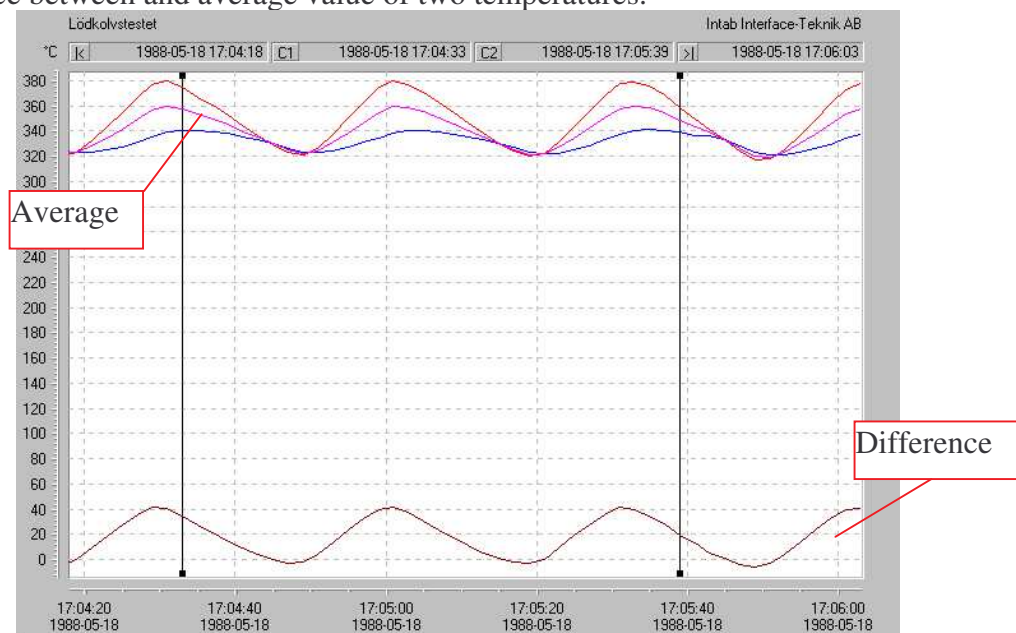
The following illustration is the result of a recording where flow has been measured over time.

Label	Unit	Ave	Min	Max	iDt (s)
Flow	l/s	1.13	0.38	1.90	97 767.00

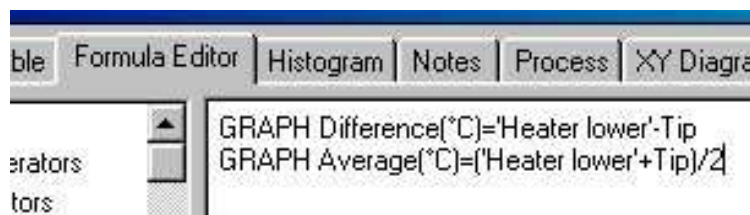
The flow rate has varied between shown min and max values. Average flow has been 1.13 litres per second. The integral, of course, shows total volume. This kind of information is often all that is needed.

2.2.6 Calculated values

EasyView has impressive calculating power. Just to whet your appetite we'll create the difference between and average value of two temperatures.



The formulas that produce these graphs look like this:



Simple as pie! Read more in the formula section of this manual.

2.2.7 Data Table

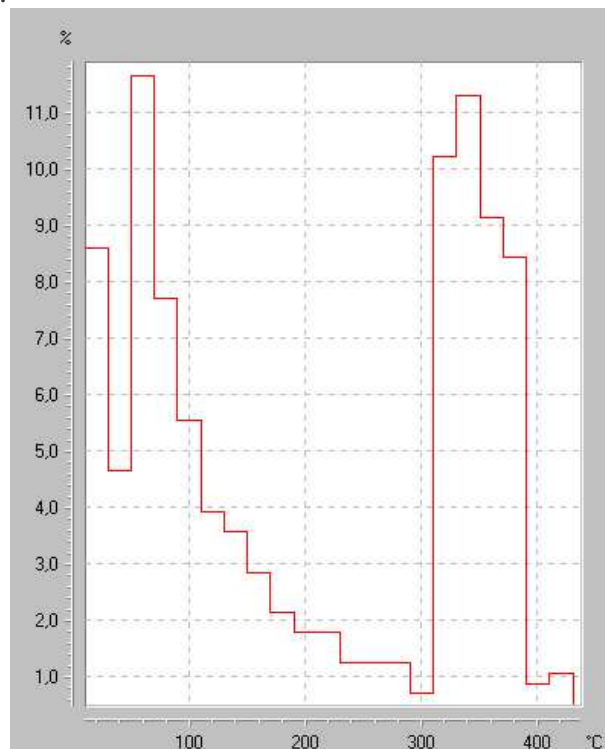
The data table shows data in ASCII-format. Data may be averaged and can be exported. The table will only contain data that is encompassed by the x-axis.

Data table	Formula Editor	Histogram	Notes	XY Diagram	Process
Time [1/1]	Heater upper	Heater lower	Tip		
106 s	20.40	157.00	60.80		
108 s	20.90	181.50	71.20		
110 s	21.40	205.10	81.80		
112 s	22.20	224.20	92.90		
114 s	23.00	242.20	105.00		
116 s	23.50	258.00	116.50		
118 s	24.60	273.20	128.40		
120 s	25.90	287.20	140.30		
122 s	27.20	300.50	151.90		
124 s	28.50	312.90	163.40		
126 s	29.90	324.30	173.20		
128 s	31.20	331.50	183.40		
130 s	32.20	339.20	194.10		
132 s	33.70	351.00	206.10		

INTAB PC-Logger on COM1

2.2.8 Histogram

A histogram is another way of looking at a set of acquired data. It shows the relative frequency of values.

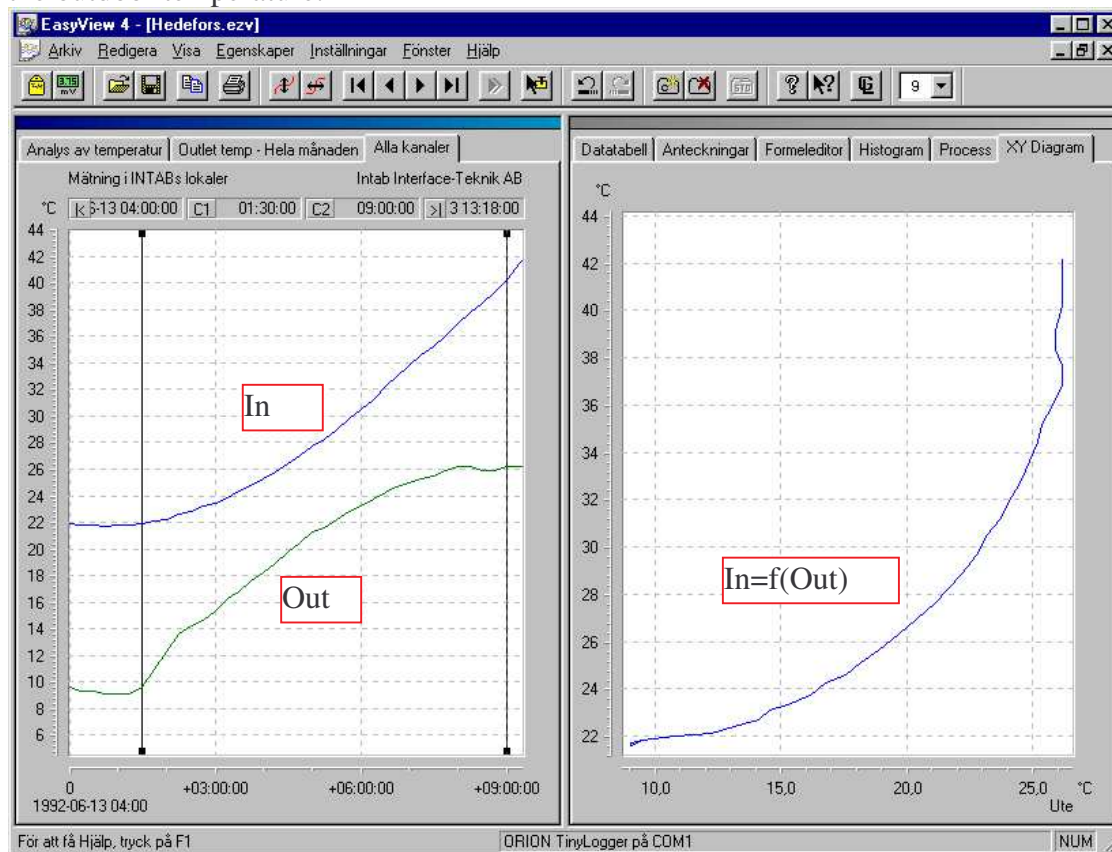


2.2.9 $Y(x)$

Show a channel as a function of another channel. Maybe distance as a function of force or temperature as a function of input energy.

Applications are numerous.

This is what it may look like. We are showing how an indoor temperature depends on the outdoor temperature.



2.2.10 Notes

Don't forget to make notes regarding the recordings you are making. Your memory may not be as "long" as you think. For every tab there is a new sheet to fill with information. Use it and you will be glad a year from now.

2.2.11 Templates

All settings for analysing data may be saved in templates. This will speed up repetitious analytical tasks enormously. Read more further on in this manual.

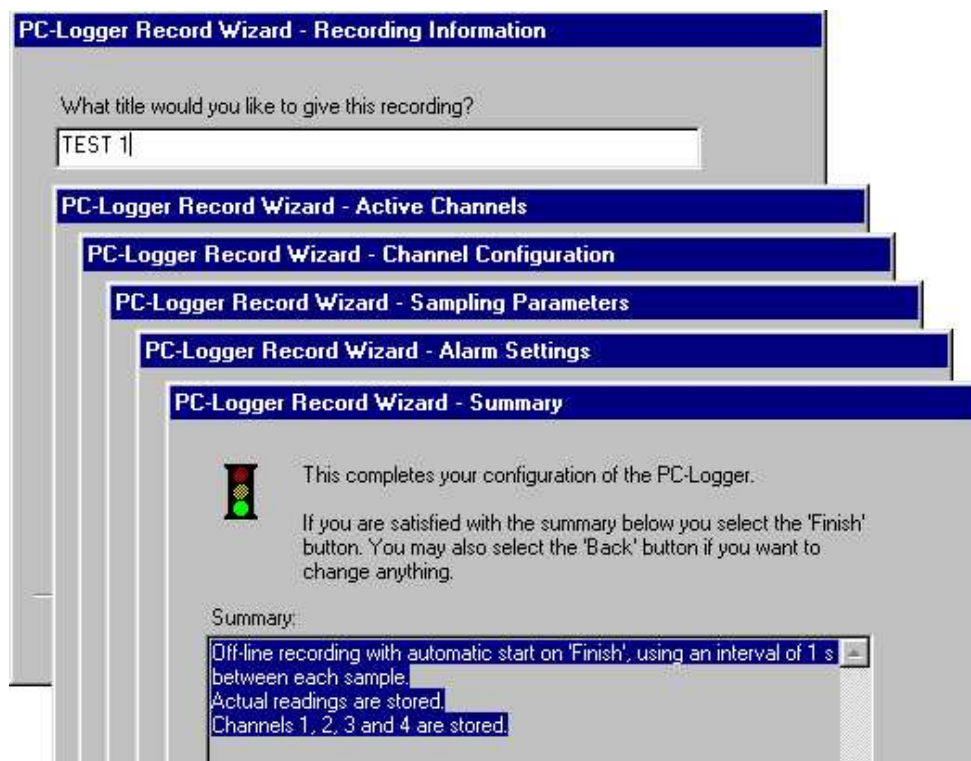
2.3 Collecting data

How data is collected is far more important than how it eventually looks on the screen. Unless you use the correct method it is of no importance what you do with it. It will be wrong anyway!

Plan your recordings with the end usage in mind. It will increase the usefulness of collected data.

2.3.1 PC-logger

The PC-logger Record Wizard will help you set up recording parameters without forgetting essentials. You simply step from page to page supplying parameters as prompted. The illustration below shows the different pages of the wizard.



A short explanation of menu titles:

- **Recording information** describes template parameters. Title entry field.
- **Active Channels** selects channels to record.
- **Channel Configuration** selects channel ranges, assigns channel “names” and performs linear transformation on recorded signal.
- **Sampling Parameters** programs sampling interval and data reduction.
- **Alarm Settings** to program alarm levels.
- **Summary** is the last chance to “go back” before starting.

”To measure is to know”, said one of our favourite customers. It is a nice thought, but wrong!

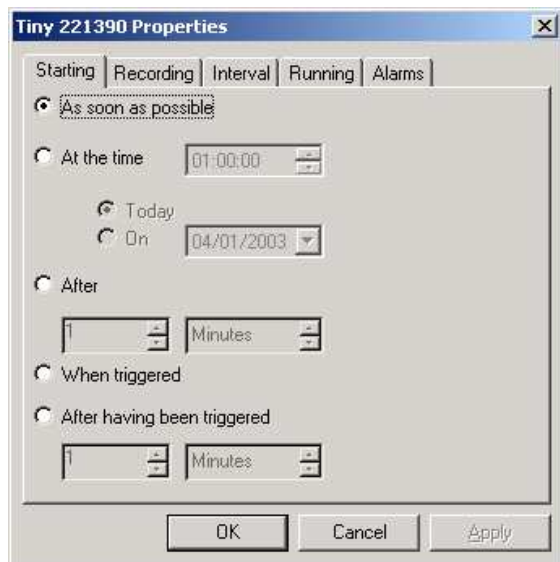
”To measure correctly and with insight is to know”, is better!

2.3.2 Tiny-Loggers

The Start/Offload menus for the very popular Tinyloggers are less complex than that for the PC-logger. The menus are in large self-explanatory. Let's take a look:



The Start menu main page has tools to start, stop and offload recordings. Any connected logger will work as a template as its settings may be used over and over again.



Setup is the entry to Properties where you define **Recording parameters** such as sampling interval and alarm levels.

2.4 Import

EasyView can process recordings made using other software. Operators who previously have used our products already know that we can import so-called AAC-files and Tinytag-files.

Data in tabulated ASCII format can also be imported. This opens up a wide field of usage. You may even use this software to analyse sociological data. You may also for the first time produce standardised reports from a host of data collecting equipment.

2.4.1 Tables

EasyView has a very powerful import facility. It can interpret data and detect column separators, column and channel names, measurement units etc..

Read more in chapter 10 and sections 4.3 and 7.6.3

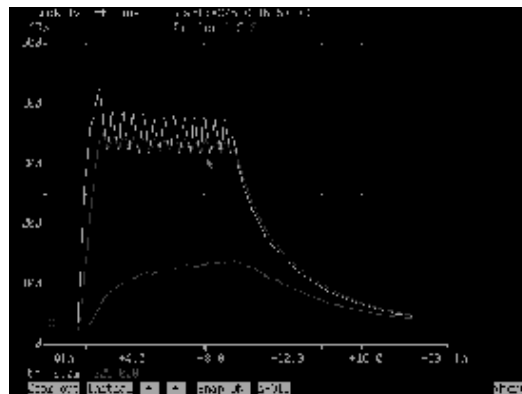
TEST 1	S/N 19824		
No.	Date	Time	2500 mV
1	97-05-13	08:59:08	1200
2	97-05-13	08:59:09	1000
3	97-05-13	08:59:10	980
4	97-05-13	08:59:11	980
5	97-05-13	08:59:12	990
6	97-05-13	08:59:13	1100
7	97-05-13	08:59:14	1000
8	97-05-13	08:59:15	970
9	97-05-13	08:59:16	970
10	97-05-13	08:59:17	970
11	97-05-13	08:59:18	960
12	97-05-13	08:59:19	960
13	97-05-13	08:59:20	980

2.4.2 Excel files

Excel files containing tabulated data may also be imported.

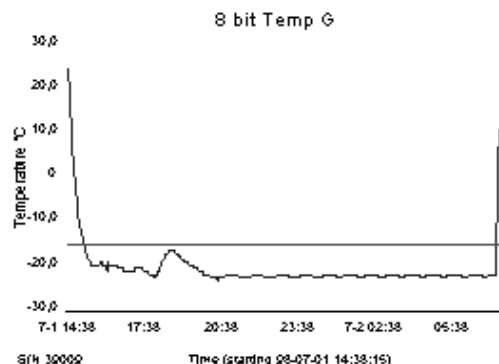
2.4.3 AAC-files

Measurement data acquired using the old DOS software "GL" are automatically converted into ezv-format.



2.4.4 Tinytag-files

Tinytag-files in the ttd format may also be opened and converted by EasyView.



3. Installation

3.1 Installing in Windows 2000, 2003, XP and Vista

EasyView is intended to be run by a “User” in Windows. This increases system security since a User doesn’t have Administrator rights to install software and drivers.

Consequently, data such as Documents, Projects etc are saved in “\Documents and Settings\All Users\EasyView”.

The folder “\Documents and Settings\All Users\Intab” is used by the program to store its settings.

In Windows Vista these folders are found in “\Users\Public”

Installing EasyView will grant full privileges to all users in these two folders and their sub-folders.

It is therefore necessary to have administrator rights when installing.

Once installed, any logged-in user can run EasyView.

If the Administrator wants to exclude certain users from these rights it is up to him to grant and/or remove privileges as appropriate in the Security tab in these folders’ properties.

1. Make sure you have "Administrator rights".
2. **Close all started programs/applications.**
3. Insert the EasyView CD. The installation will start automatically.
4. See following sections. Read the information present in the different menus carefully.

3.1.1 Simple Installation procedure

Step 1

After the CD has been given time to pick up speed, you will be presented with the menu at right:

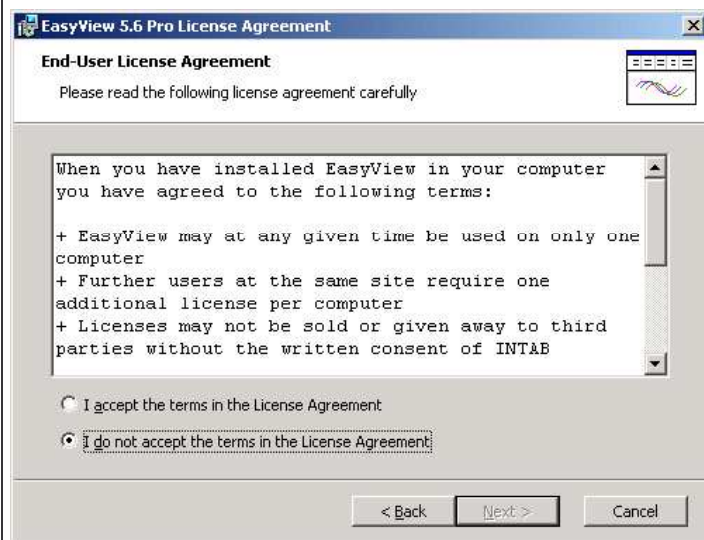
After entering the serial number supplied with the CD, the “**Next**” button will become active. Click on it to get to the next menu



Step 2

You will have to convince us that you accept the licence terms by clicking the “I accept...” before the **Next**-button becomes active.

It will take you to a menu where you enter user information



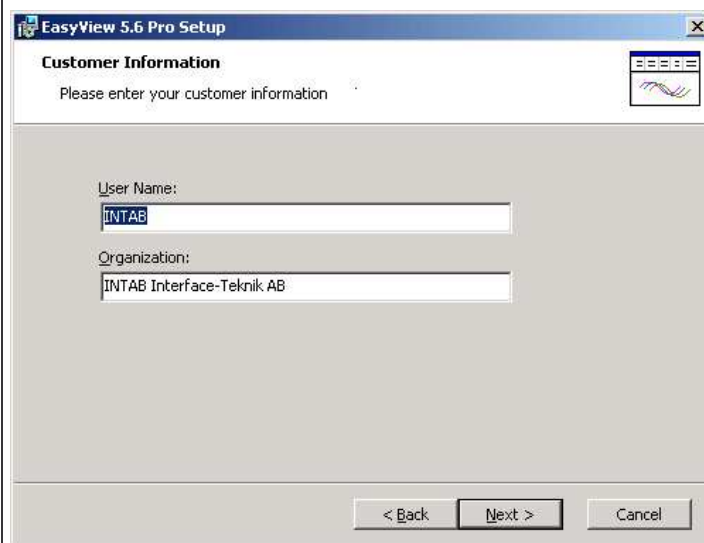
Step 3

Enter your user name. It serves only to remind you of who you are.

Then you enter Organisation name. This name will appear as a “logo” on your future EasyView documents.

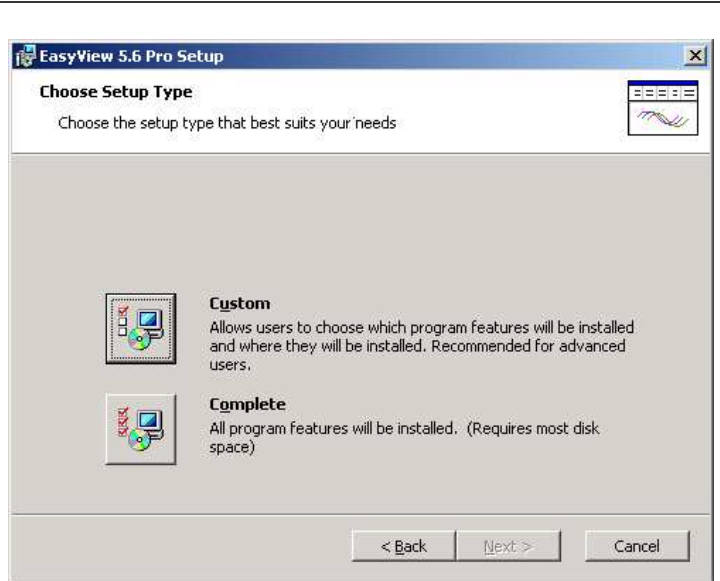
But fear not: it is possible and easy to modify at a later stage.

Click on **Next** to take you to a menu where you select type of setup.



Step 4

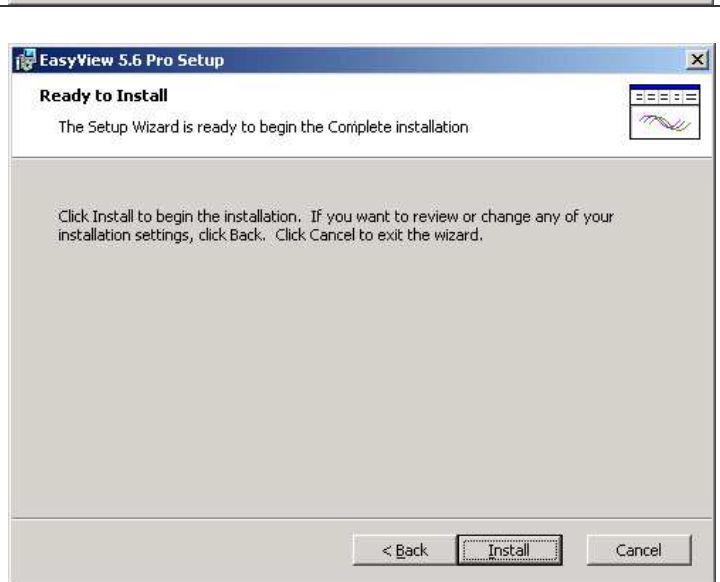
Click on “**Complete**”. It will, when all is ready and without any more “ado”, install the software and all its components into C:\Program files\Easyview\



Step 5

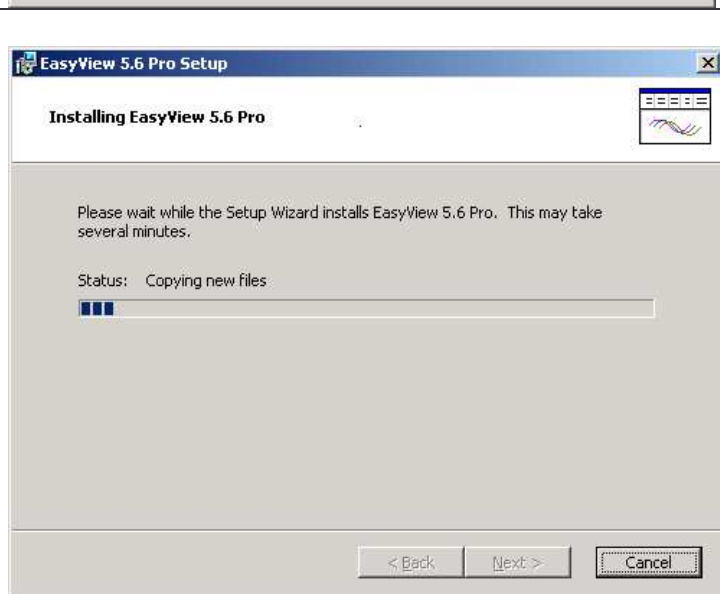
This is your last chance to revise your settings.

Click on **Install** to proceed.



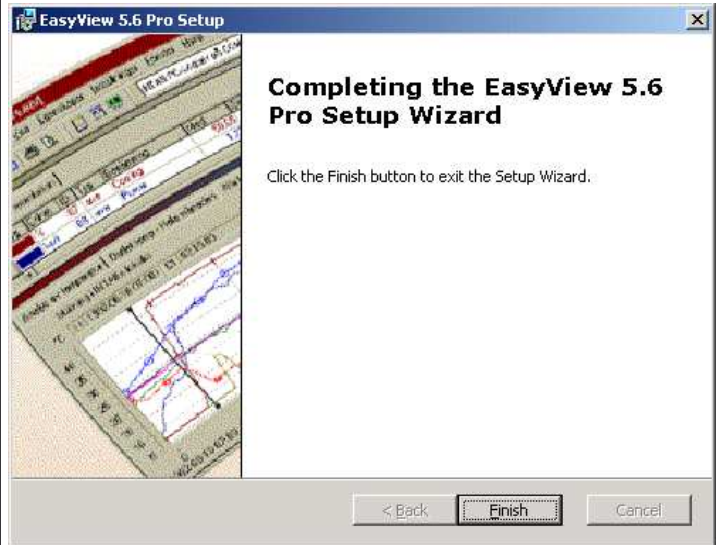
Step 6

This menu just keeps you informed of what is going on. It will, as it says, take some time to complete.



Step 7

This menu simply informs you that all has gone well and that the installation is completed. Click **Finish**.

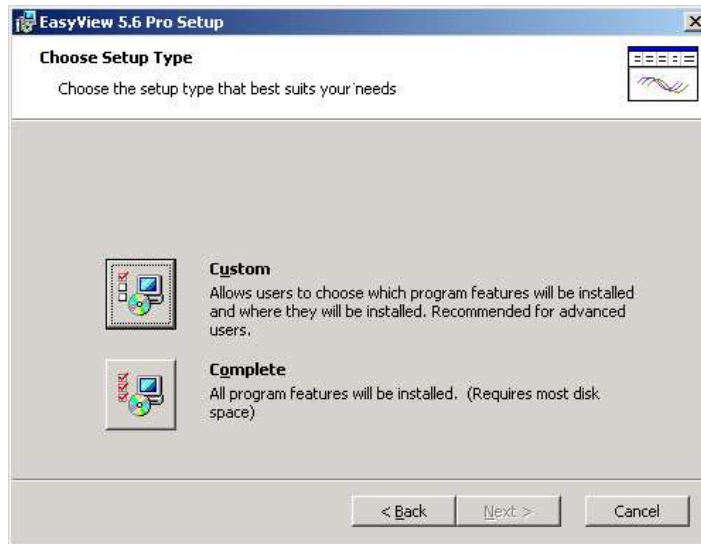


3.1.2 Custom Installation procedure

It may at times be wise to install no more than is absolutely needed. The Custom Installation lets you de-select the EasyView “components” that you have no need for and also direct the installation to a directory of your own choice. Simply start by following **Steps 1 to 3** as described in the previous section. Then go to step 4 below.

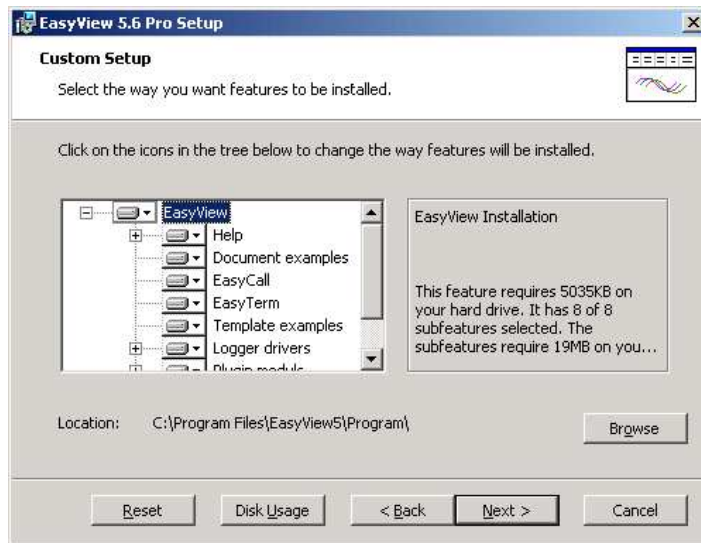
Step 4

When you get to this menu you click **Custom**.



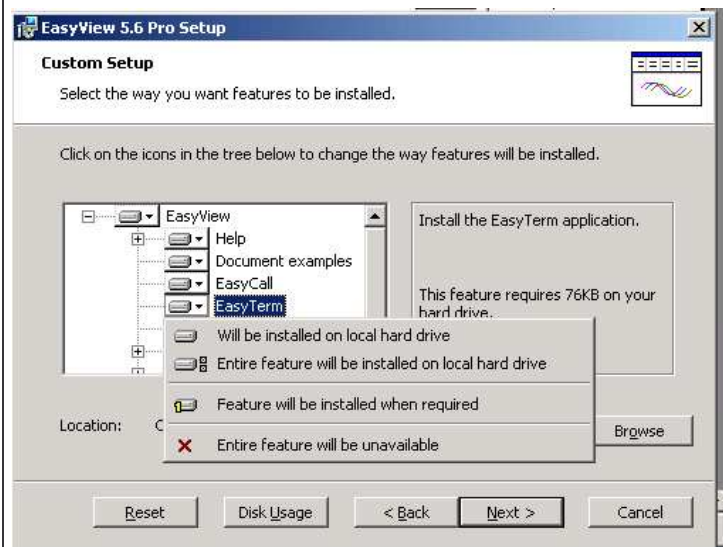
Step 5

This is where you are given the choice of features to deselect. Default setting will install all shown components.



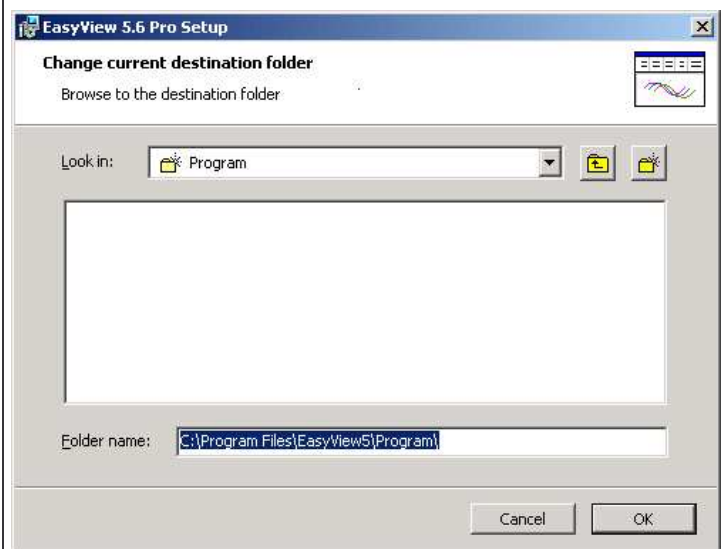
Step 6

As you can see, you have a choice of 4 different actions for each component. They are self-explanatory.



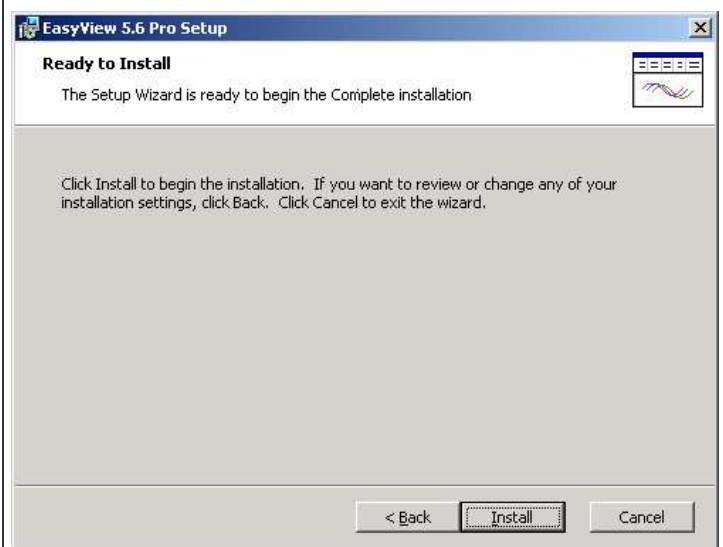
Step 7

Once you have deselected the unwanted components you may also decide where the EasyView files should be installed. Click on **Browse** and the menu at right will appear. It follows standard Windows functionality so we will not waste any more time on it. When ready, click **OK**.



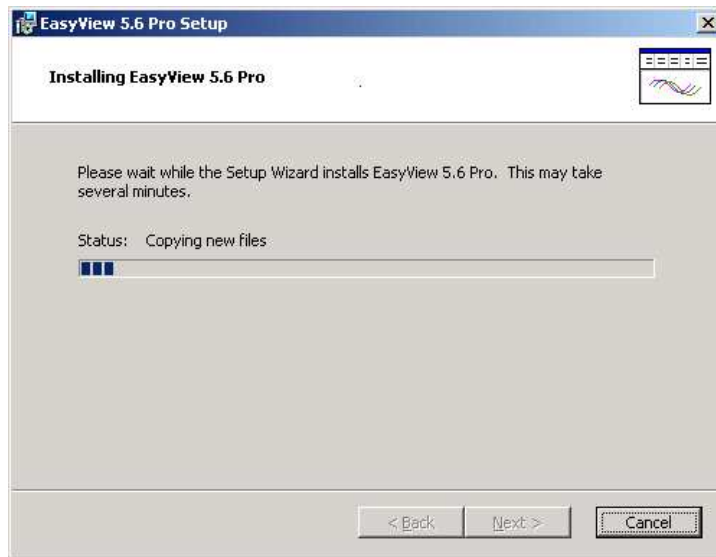
Step 8

Click **Install** to proceed.



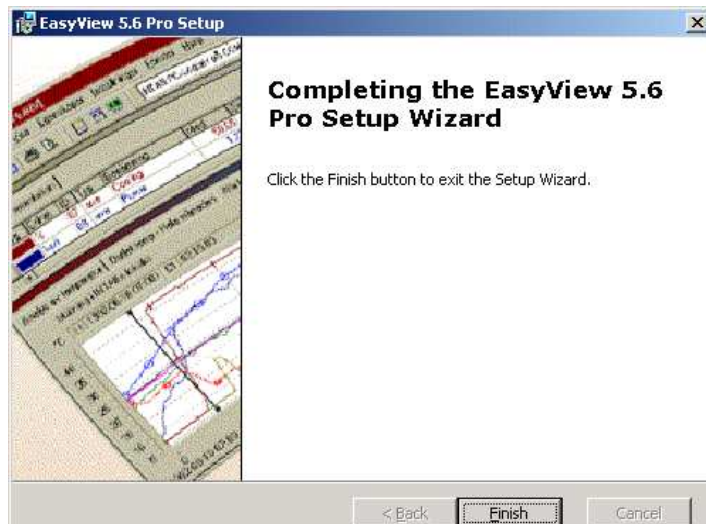
Step 9

The installation may take some time.



Step 10

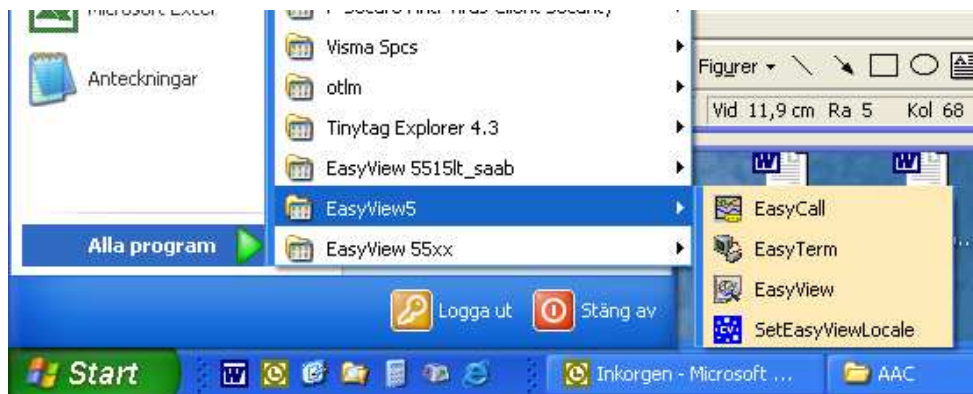
Click Finish and you will have installed one of the best softwares of its kind.





3.2 Change Language

EasyView has a very useful new language setting feature.

If you take a look in /Start/All Programs/EasyView5/ you will find “SetEasyViewLocale”



It will change your EasyView language at a click of the mouse:

	<p>Default language is the same as in your computer or, if yours isn't available, English.</p>
<p>The following languages are available:</p> <ul style="list-style-type: none">EnglishGermanDutchSwedish	

4. Open data files (recordings)

4.1 General

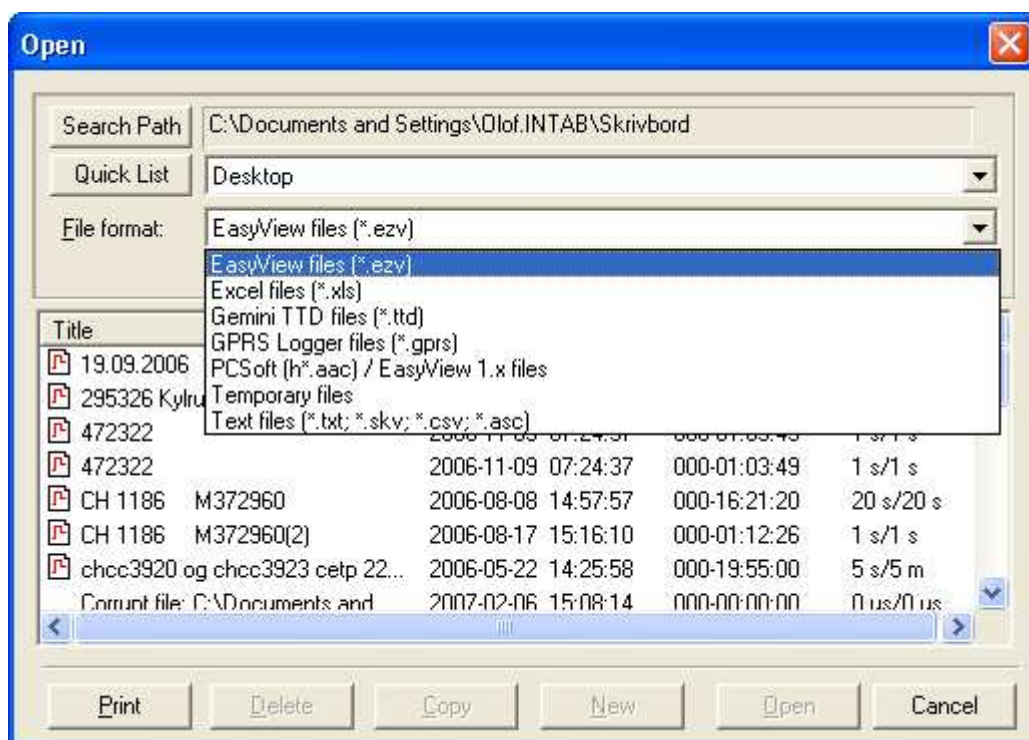
This section of the manual deals with opening measurement files (recordings) for analysis. It has been moved forward in the manual to make it easier to find for the first time user.

EasyView can, in reality, only show EasyView (*.ezv) files. All other formats have to be converted into ezv format. In order to simplify this procedure we have automated as much as possible. All conversions are performed by opening the appropriate file(s). Saving the document generates the EasyView file.

Click  to activate the **Open** menu.

The Open is used to find and open recordings.

Use the **File format** pull down menu to specify the format of the recording you are about to open.



Select desired file and click **Open**.

4.2 EasyView files (.ezv)

EasyView files are generated by saving a diagram document. When you open a Diagram document it will be displayed exactly as it was saved.

The Diagram Document holds, beside measurement data, information on

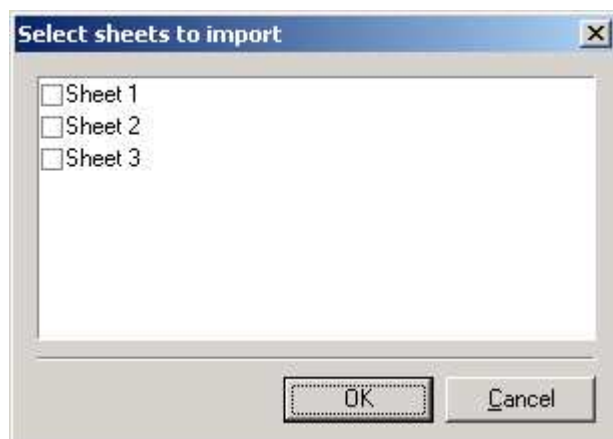
- Tab settings
- Shown channels/signals
- Axes' scalings
- Presentation properties
- Recording parameters
- Info table settings
- Plug ins' parameters
- Etc etc.

Read more in the following chapters. Try to grasp which parameters are logger specific and which are evaluation specific.

4.3 Excel files

Excel files that contain sheets with data in columns can be interpreted, converted and opened by EasyView Pro.

Should there be more than one sheet you will be asked to check the ones that contain data that you want to graph.

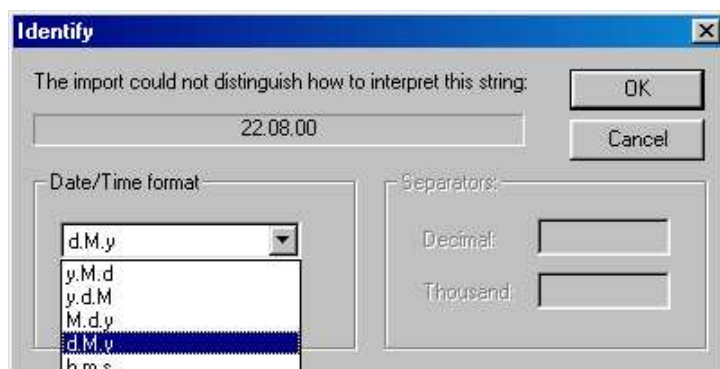


4.4 Data Tables - ASCII – Text

EasyView can open ASCII or text format data files. These files should be type txt, asc, csv or skv and have data in columns.

4.4.1 Open

Click on “Text files *.txt...” in **File format**. Select your file in the list and click **Open**. The import will analyse the contents. If there are any ambiguities you will be asked to help. It is usually time and date information that is a problem. The ambiguous string is shown in the menu below.

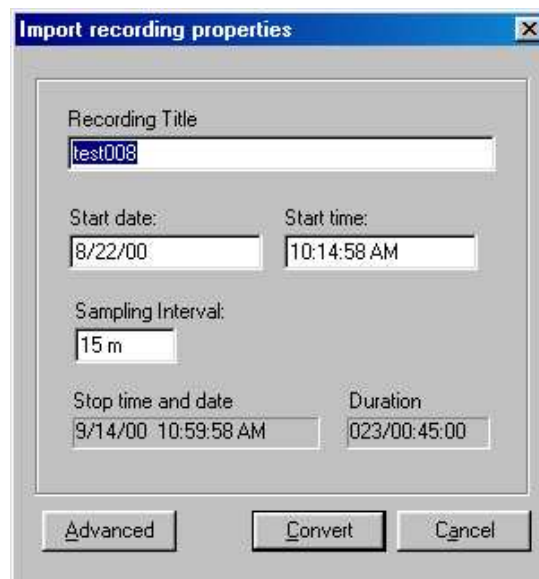


Please supply the necessary information.

y denotes year
M denotes Month
d denotes day
h denotes hour
m denotes minute
s denotes second

The “timing information” in this menu is derived from the time column of the table if it exists. The software will suggest timing information if it doesn’t. Alter it to make it correct. Don’t forget to enter a suitable recording title.

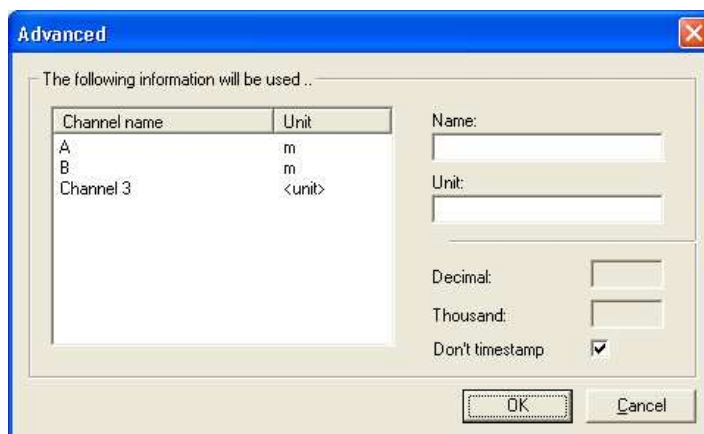
NB that EasyView uses the shortest common interval for all channels. You have to select an interval that accommodates all data. The suggested figure is almost always correct.



4.4.2 Advanced..

The advanced import menu lets you edit the information that is about to be imported. Rename signals and/or assign proper units. If the digit grouping symbol and decimal sign are wrong, you may have analysed too few lines. Increase the number of lines for analysis in *Settings/Import*.

Data with constant interval should have the “Don’t timestamp” checked.



4.5 AAC files (.aac)

Measurement files generated by AAC-2 PC-soft, popularly called the “GL” each consists of two files, a header file (Hx.aac) and a data file (Dx.aac). These are automatically converted into EasyView format.

Select PC-soft file format, open desired file and then save it. The saved file will be in evz format.

4.6 Tiny Logger files (.ttd)

Measurement files generated by GLM have the “ttd” format. These are readily converted using the same method as the AAC files. See above.

4.7 GPRS files (.gprs)

Our very popular logger that transmits data via GPRS to a database reachable by the operator, generates these files. They can be downloaded to a local computer and subsequently opened by EasyView.

4.8 Temporary files (~evxxxx.tmp)

EasyView works with temporary files. These are usually stored in \Documents and Settings\All Users\Easyview\Temp.

If a crash should occur while fetching data or recording on-line the data can be retrieved by opening the corresponding temp-file. See also section 7.2.

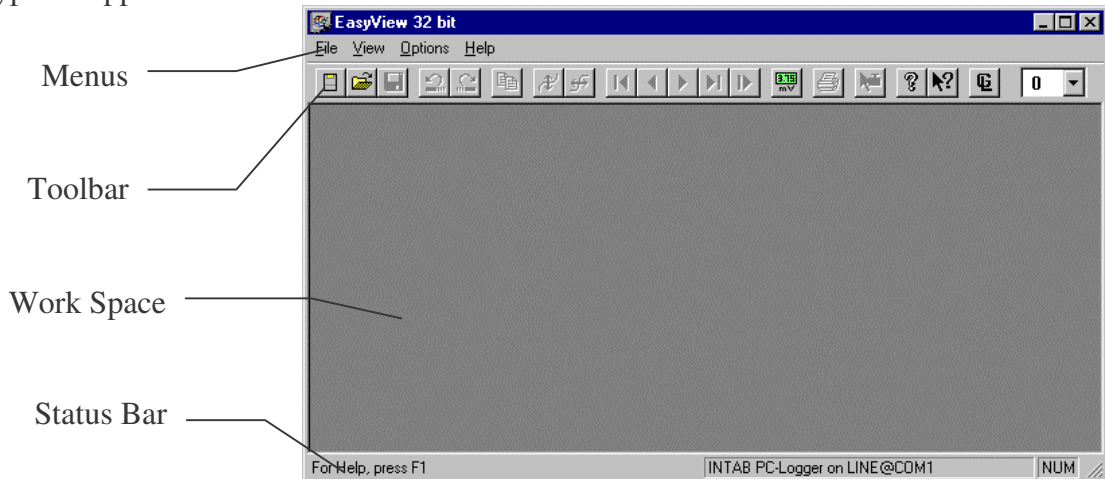
5. About EasyView

5.1 The Application Window

is very much like that of all other Windows applications. This window may contain one or more documents.

A document is in our case a recording.

Typical Application:



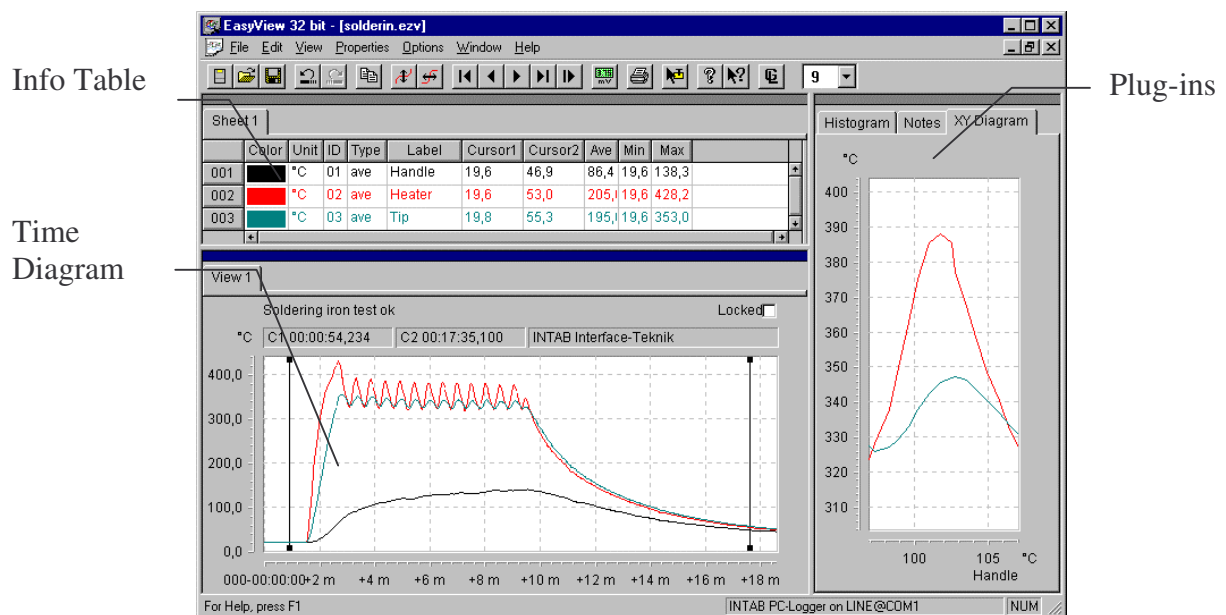
5.2 A Diagram Document Window

shows your recorded signals in the work space.

Switch between the two alternate views in Options\Extended features.

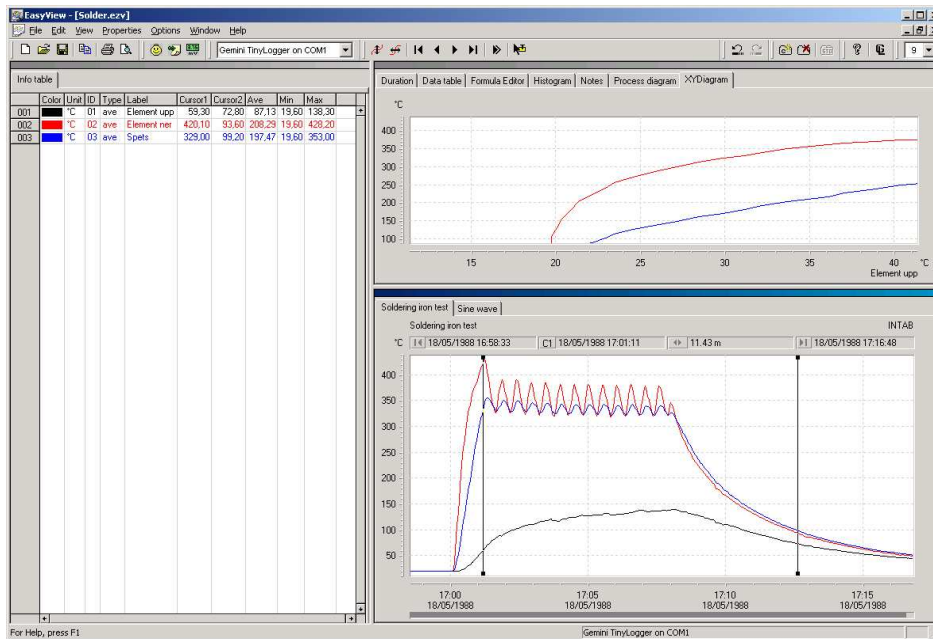
5.2.1 Standard layout

Info Table on top and plug-in to the right.



5.2.2 Alternative layout

Info Table to the left and plug-in on top.



5.3 The Info Table

The Info Table is usually found above the diagram. It contains, among other things, statistical characteristics of the shown graphs.

























5.4 The Plug ins' window

The number of available features in the plug in window varies depending on your version of the software and which ones you have activated. Note that your version of the software may not have all plug ins available. Some are only present in the Pro version, yet others are only sold separately. The following plug ins exist at present.

Data table	Numerical, tabular presentation of data. Exportable ASCII. See section 8.3
Formula Editor	Mathematics! Make calculations. (Pro) See section 8.4
Histogram	Histogram presentation of data. (Pro) See section 8.7
Lambda Tune	Regulator tuning tool. (Special) See separate manual
Notes	Text entry sheet to complement your own memory. See section 8.2
Process diagram	Shows process drawing with superimposed values in real time.(Pro) See section 8.6
X/Y diagram	Shows signals as functions of another signal. (Pro) See section 8.5
Duration	Shows how long a signal has been above a level. (Pro) See section 8.8
Publisher	Automatic transfer of diagrams to any URL. (Special) See separate manual
Alarm	On-line alarm. Activates sound, SMS/e-mail or relay in the optional relay box. (Special) See separate manual.
DDE server *)	Makes data available in real time for other users in network. (Special) See separate manual
OPC server *)	Makes data available in real time for other users in network. (Special) See separate manual

*) **OPC and DDE clients** are also available to record data from external servers. See separate manual.

5.5 Toolbar

Button	Description	Short Key	Menu	See
	Open New "empty" document	Ctrl + N	File/New	7.2.1
	Start/Stop/Offload	Ctrl + L	File/Logger ...	7.2.2
	Open/Copy	Ctrl + O	File/Open	7.2.3
	Save	Ctrl + S	File/Save	7.2.5
	Undo	Ctrl + Z	Edit/Undo	7.3.1
	Redo	Ctrl + A	Edit/Redo	7.3.2
	Copy	Ctrl + C	Edit/Copy	7.3.4
	Show entire recording		View/Page/All Pages	7.4.5
	AutoScale Y-axes			7.4.4
	Show first page	Home	View/Page/First	7.4.5
	Show previous page	Page Down	View/Page/Previous	7.4.5
	Show next page	Page Up	View/Page/Next	7.4.5
	Show last page	End	View/Page/Last	7.4.5
	Show graph in Real Time		View/RealTime	7.4.11
	Multimeter		View/Multimeter	7.4.2
	Print Document	Ctrl + P	File/Print	7.2.14
	Activate Comment Tag			6.5.8
	About EasyView		Help/About EasyView	
	Click for Help	F1		
	Extended Features		Options/Extended feat..	7.6.1
	Font Size		Properties/Font	7.6.2
	Add/Remove tab		Right button click on tab	6.3.1
	Use standard template		Right button click on tab	10
	File/Connections			7.2.10

5.6 Menus

File	Open this menu for document and printing functions.
Edit	Open this menu to Copy data.
View	Open this menu for toolbar and view settings.
Properties	Open this menu for graphs' settings.
Options	Open this menu for special application settings.
Window	Open this menu for document window settings.
Help	!

5.7 The Status Bar

The status bar is useful because it tells you the state of things. It may explain the usage of a key in the tool bar.

At its far right you may encounter something like : INTAB PC-logger on COM1. This tells you that COM1 is used for logger communication.

5.8 Use the right hand side mouse button

The right hand side mouse button plays a very important role in EasyView. By clicking the right (!) button, a pop-up menu will appear. By right clicking your mouse you can reach virtually every feature in the program. One of the most important is the "properties" of an object. This choice will always be located at the bottom of the pop-up menu. If you specifically want to activate the "properties" of an object you can also double-click on it.

The alternative is of course to open the applicable menu above the toolbar to click on the corresponding command.

Read more on the right hand mouse button further on in this manual or in the help file.

5.9 What is meant by...

If you are a newcomer in the PC-logger world you may need the vocabulary below. It will hopefully explain some technical terms and abbreviations that are used in the software.

In the table	
IMP	Imported Recording
N/A	Value or information Not Available or Not Applicable.
iDt	Time integral of shown graph. $\{(\Sigma \text{values}) * dt\}$
Skew	Time lateral displacement of graph.
ID1, ID2 etc.	Signal Identity number. Usually the same as Channel number
001, 002 etc.	Row identifier
In the diagram document	
Logotype	Text entry field. Usually company name.
Graph	Synonym for diagram. Often taken as meaning the line describing the signal.
C:\EasyView	Path to directory Easyview. Easyview is a sub-directory to the root directory of the C: drive.
In the formula dialog	
Functions	Examples: SIN, COS, SQRT, EXP...
Operators	Examples: ^, +, -, =, AND, OR...
Variables	Available channels. Examples: ID1.ave, Tip.ave...
Key words	Expression definers. Examples: GRAPH for formulas and FN for functions.
In Open	
030-01:18:32	Duration of a recording. This example shows a recording that is 30 days, 1 hour, 18 minutes and 32 seconds long
3s/21s	Sampling interval is 3 seconds. Reduction factor is 7, resulting in an averaged value every 21 seconds.
In Logger Setup	
T/C	T/C signifies thermocouple.
°C	No transformation of input signal.
(°C)	A "transformed" channel with resulting unit °C
off-line	Recording to logger data memory.
on-line	Recording to computer disk.
Rotating memory	Loop back "endless memory". Overwrites oldest data when memory is filled..
C01, C02 ...	Channel designators: Channel 1, Channel 2

5.10 Menu Overview

MAIN MENU	SUB-MENU	DESCRIPTION	See section
File	New	Creates empty document.	7.2.1
	Logger..	Start new recording/fetch data	7.2.2
	Open	Open documents	7.2.3
	Open view as new doc	To Save partial measurement files	7.2.4
	Save	Save active document	7.2.5
	Save As...	Save a copy of a document	7.2.5
	Close	Close active document	7.2.6
	Send mail	E-mailed ezv file.	7.2.7
	Templates	Create and apply templates	7.2.8
	Properties	Shows linking information	7.2.9
	Connections	Set up serial ports / Boot logger	7.2.10
	Project Manager	Plan your recordings	7.2.11
	Logger History	Automatic logger usage record	7.2.12
	EasyTerm	Terminal for direct logger comm.	7.2.13
	Print	Print active Diagram Document	7.2.14
	Print Preview	Look at the print-out before printing it	7.2.15
	Print Setup	Printer setup dialog.	7.2.16
	1 File1.ezv..	Fast open of previously opened files.	!
	Exit	Terminates EasyView	!
Edit	Undo	Undo Rescaling	7.3.1
	Redo	Undo the Undo	7.3.2
	Cut	..selected text to clipboard	7.3.3
	Copy	Export graph or values	7.3.4
	Paste	..text from clipboard	7.3.3
	Delete	Delete or Hide selection	7.3.5
	Up-date project	Modify "Project" settings	7.3.6
View	Toolbars	Show/Hide the Toolbars	7.4.1
	Multimeter	Activate the Multimeter	7.4.2
	Full screen	View a maximised pane	7.4.3
	Autoscale	Autoscale the amplitude	7.4.4
	Page First	Go to the first page of data.	7.4.5
	Last	Jump to the last page of data.	7.4.5
	Previous	Jump to the prev. page of data.	7.4.5
	Next	Jump to the next page of data.	7.4.5
	All	Show the entire recording.	7.4.5
	Graphs...	Diagram properties/Graphs	7.4.6
	Cursor time bar	Show/Hide cursor time bar	7.4.7
	Position Bar	Show/Hide position bar	
	Show time cursors	Show/Hide cursors	7.4.8
	Relative time cursors	Show time between cursors	7.4.10
	Header and Footer	Enter printout header/footer	
	Real Time graph	Start/Stop real time view of recording.	7.4.11
	Scrolling time	On-line recordings scroll the x-axis	7.4.13

Properties	Info table	Add and remove columns in the table	7.5.1
	Diagram	Dialog for graph settings. (Like X-form, formulas etc.)	7.5.2
	Active plug-in	Entry to Properties of active plug-in	7.5.3
Options	Extended features	Use this dialog to add or remove "plug-ins". Add or remove Transformation in the diagram properties dialog.	7.6.1
	Font	Dialog for selection of font and character size.	7.6.2
	Import.	Import settings	7.6.3
	Export	Set column separator, dec. point etc	
Window	New Window	Opens multiple window(s) containing the open Diagram Document	7.7.1
	Cascade	Arranges windows in an overlapping pattern so that the title bar of each window remains visible.	7.7.2
	Tile Vertical	Arranges windows side by side so that all windows are visible and don't overlap.	7.7.2
	Tile Horizontal	Arranges windows one above the other so that all windows are visible and don't overlap.	7.7.2
	Arrange Icons	Arrange Minimised windows in a tidy row at the bottom of the screen.	7.7.2
	1,2,3,4	EasyView lists the names of up to four open windows at the bottom of the Window menu. To make a window active, choose its name from the list.	7.7.3
Help	Tip of the Day	Read some tips about EasyView	NA
	Index	Show contents of EasyView Help.	NA
	Using Help	Get help on Help	NA
	System Information	Displays software and hardware version information.	NA
	INTAB on the net	Link to http://www.intab.se	NA
	About ..	Well!	NA

6. Diagram Document


6.1 General

A Diagram Document is a recording with "presentation parameters".

Besides data and recording information it therefore also contains "viewing parameters" such as axes' scalings. It consists of two or more sections or windows.

The upper part is the information or info table. The contents of the table are selectable.

You add columns so that it contains the information you need.

The lower section is the diagram itself. Numerous settings, rescalings and zooming facilities make it easy to evaluate the most complex graphs. You can also "split up" your document into different diagram tabs .

Plug-ins like tabulated data, Y(x) graph and notes sheets may also be present in the document.

6.2 Info Tables - contain only essential information

The Info table section of a diagram document can be user-tailored to contain only needed information. You can add info tabs that contain different selections of tabular information. Rows are activated for each signal or channel to be graphed. Columns are selected by user. There are columns for max. and min values, graph colour, draw style and many more. Multiple tables may each be scrolled to show different sections of information. Note that font size is programmable.



	Color	Unit	ID	Type	Label	Cursor1	Cursor2	Ave	Min	Max
.001		°C	01	ave	Heater upper	51,30	67,80	86,43	19,60	138,30
.002		°C	02	ave	Heater lower	399,50	85,00	205,70	19,60	428,20
.003		°C	03	ave	Tip	298,20	89,60	195,09	19,60	353,00

Identifying information is f. ex. colour, label, line style and width.

Key Values are columns like max, min and integral.

We believe that the usefulness of the software will increase if we can supply exactly the key values that are of interest to you.

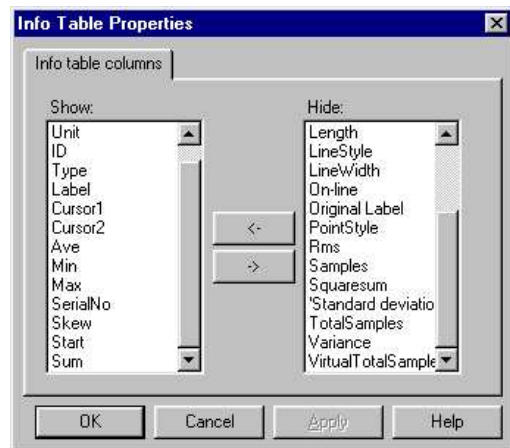
6.2.1 Columns of the Info Table

TYPE	NAME	FUNCTION
Identifying information	Colour Unit ID Type Label Draw Style Data Source Line Width Line Style Point Style Serial No Original Label Start End Transform	Show/modify graph colour Signal unit Channel no or equivalent Ave, min or max values of interval Channel "name" Step or interpolated graph Logger type, source Thick or thin? Dot – dash Ring, cross Logger serial number Channel name before combining Start date and time End date and time The pairs of numbers of “Transform”
Key values etc.	Ave Min Max iDt Sum Rms Squaresum Standard deviation Variance Samples Total samples Virtual total samples Interval Length On-line Cursor 1 Cursor 2 Cursor diff Skew	Average value of shown section Minimum value shown set maximum value of shown set Integral of shown values Arithmetic sum of shown values Root mean square Sum of the squares of shown values ! ! Number of shown samples Number of samples in recording Length/assigned interval Interval between samples Total recording length Last recorded value Value at cursor 1 Value at cursor 2 Cursor 1 – Cursor 2 Temporal displacement relative true time

6.2.2 Show/Hide Columns

Tables can be made to show only needed information. You can hide information/data columns by selecting the column(s) and then pressing **Del** or the **Edit/Delete** menu. Select columns by clicking the column header, or click and drag to select more than one. Remember that you are not actually deleting or taking anything away from your recording: you are only hiding it from view.

To **show additional columns** you click with your right mouse button on the column header and choose "properties" or double click the same area. The following dialog is self-explanatory.



6.2.3 Calculate key values – construct new columns

By using tools provided by the Formula plug-in it is possible to calculate key values in your own Info-table columns. Standard deviation and other goodies are within reach. Read more in the section dealing with **Key Values** in the Formula chapter of this manual.

6.2.4 Change order – Sort

The order in which the signals in the Info-Table are arranged may be altered. Select, by clicking once, the channel you wish to move. It will become highlighted. Keep the pointer on the channel and hold down the left mouse button and drag it into its new position.

Blocks of channels may be moved by dragging instead of just clicking when you do the selection. After dragging you get a new hold and keep the button down while moving the block.

When you have created so much chaos that you are completely lost, you have to right-click on the leftmost (channel number) column and select "**Sort**" and order will be restored.

6.2.5 Column width

Info-Table column widths may be adjusted to take up exactly the space needed to show all numbers. Right-click in the column header and select "**Adjust column width**". Life will be easier....

6.2.6 *Move signals to the same start point (origin)*

Recording start time and date are shown in the "**Start**" column of the Info-Table. This start time may be edited. This way you introduce a fictitious start time. By entering the same start time for several channels in a linked document where its constituent signals have been recorded at different times, you skew them to the same origin. See also "Skew".

By entering a skew of zero you can readjust signals to true time again.

6.2.7 *Move a Row or Column*

Rows (channels) and columns may be moved or grouped for better readability. Related pieces of information should perhaps be grouped together. The Min and the Max. columns should be next to each other for ease of comparison.

First just click on a column/row title. **Then** click and drag it to desired position.

6.2.8 Open multiple Info Tables to show more channels

There are two ways of increasing the number of channels that can be displayed in the Info tables window.

The obvious one is to enlarge the table area by holding down the mouse button and pulling the lower edge of the table downwards. You may even select a smaller font size. Doing this will increase the available area for the tables and in a corresponding degree decrease the area available for graphs. The readability of the graphs may therefore suffer.

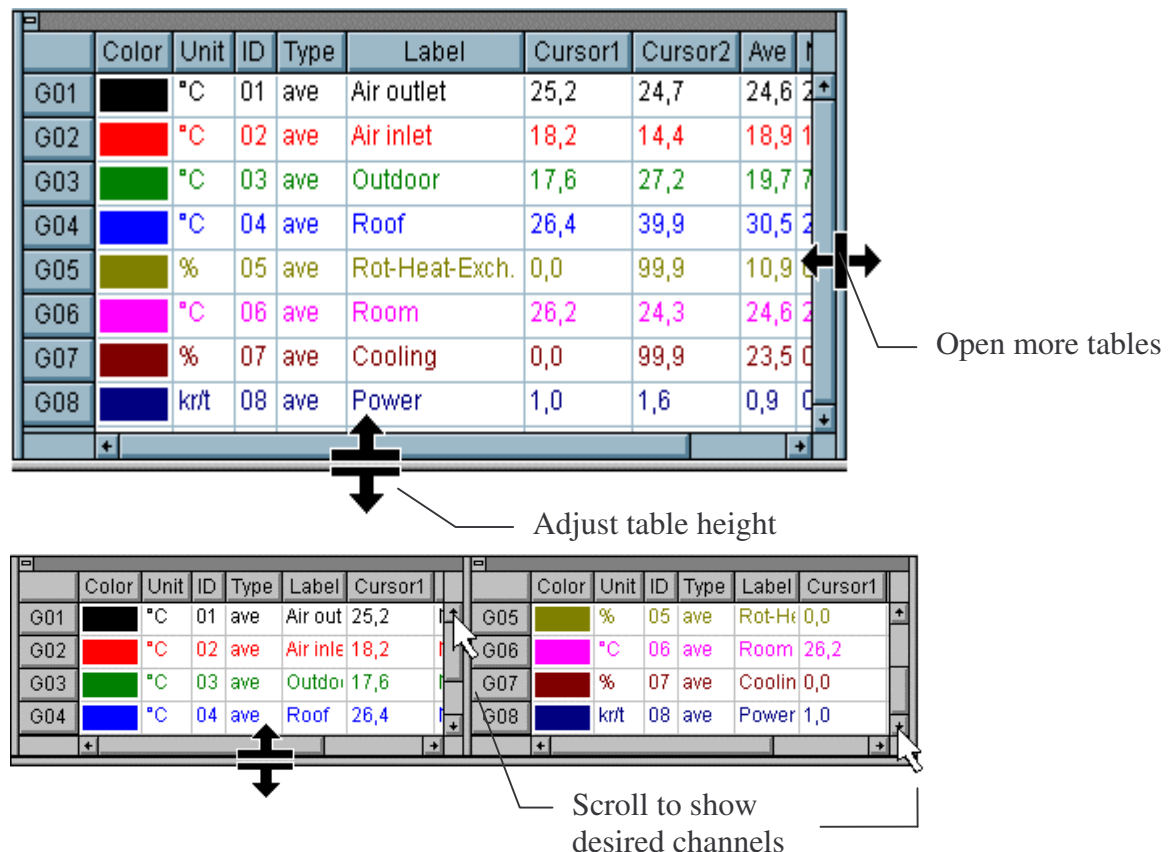
The second method is to open more tables.

This is achieved by pulling the right hand edge, using the mouse pointer, to the left.

A new table section is created in this way. Another way is to right-click in the middle of the table cell area and selecting "Add pane".

Channels will be evenly distributed between the panes.

Don't forget the possibility to use smaller characters if space gets cramped.



6.2.9 Swap Rows/Columns

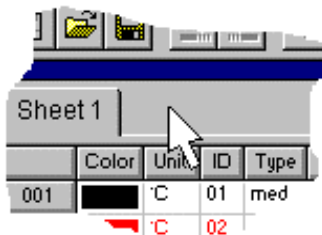
In some applications it is of advantage to present the columns as rows and vice versa. Right click on the Info-table headings' line and select Swap.....

6.3 Creating your own Diagram and Info tabs

An **Info table tab** is in this case a table with a number of rows and columns. The rows illustrate the channels used while the columns contain information about them. In a

recording you can add as many tabs with different column sets as you like. You can change the column set by using right-click in the columns title area. Mark one or more columns and press "Delete" on the keyboard to hide it/them.

A Diagram tab is a diagram area. In a Diagram tab you can have different channels presented and, of course, different scalings, both X and Y. All tabs are unique and are handled separately. If you add the "Plug-in" Notes, you can add commenting notes about the particular Diagram tab you are looking at. *Every diagram tab has its own Notes page.*



..This is the tabs' area..

6.3.1 Adding a Diagram tab or Info tab

- Right-button-click in the tabs area and choose "Add new copy".
- Write the title of the new tab and click on OK

6.3.2 Deleting or Renaming a Diagram tab or Info tab

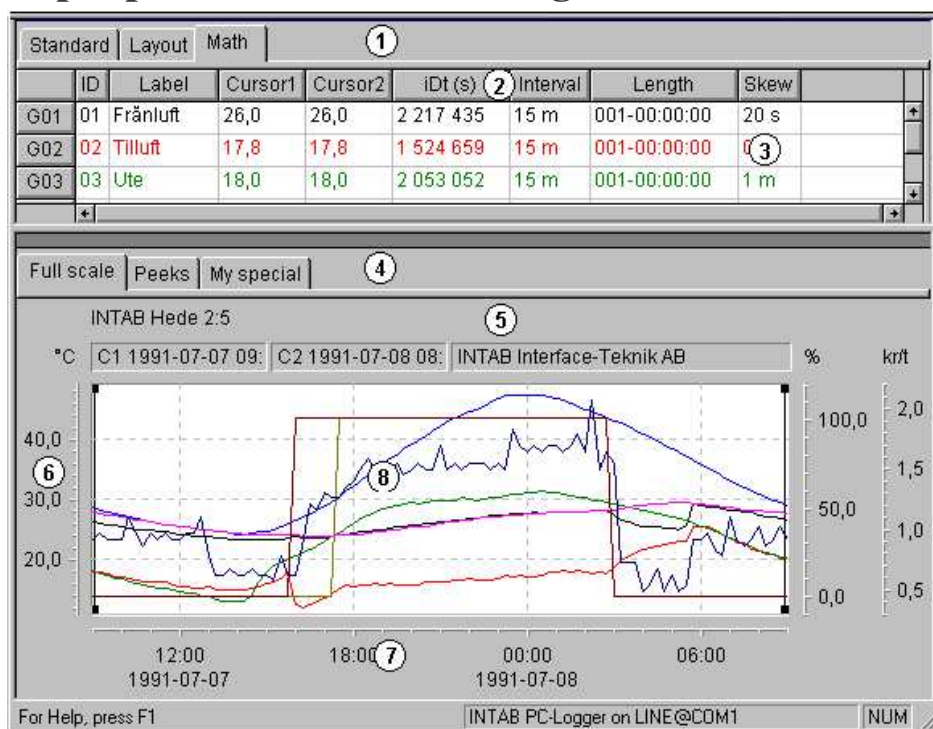
- Right-button-click in the Info tab or View tab area and choose "Delete ..." or "Rename ..."
- The action will take place on the active tab. Not the particular tab you right-clicked on!

6.3.3 Change name of a tab

- Activate the tab you want to change name on.
- Click the right hand mouse button and select "Change name.."

Read more in the Templates chapter.

6.4 Pop-Up Menus - Click The Right mouse button



See below for a description of the different "click areas". Note the numbering.

No	Action	Reaction
1	Click the right mouse button in the Info tabs area	Add, rename or remove an Info tab. Only the active tab will be affected. Save or load previously saved tabs' layouts.
2	Click the right mouse button on column header.	Add or remove columns of the Info tab.
3	Click the right mouse button in particular cells.	Some cells in the table can be edited. Start and LineWidth are two examples.
4	Click the right mouse button in the View tabs area	Add, rename or remove a Diagram tab. Only the active tab will be affected. Save or load a previously saved tab's layout.
5	Click the right mouse just above the diagram.	Leads you to the Information properties
6	Click the right mouse button on or beside an y-axis.	Lets you hide the axis or show all channels of a specific unit. Leads you to the Ranges' properties.
7	Click the right mouse button on or below the x-axis	Activate the time axis properties. Enable/Disable real time scroll.
8	Click the right mouse button in the middle of the graph area.	Hide/Show all channels of a specific unit. Select properties to open the Graph properties.

6.5 Right-click in plug ins

The easiest way to gain access to menus that are used for settings in the different windows of EasyView is to "right-click". The "properties" menu is very often the "door" to solving your problems.

Below is a summary of right-click menus in plug ins.

6.5.1 *Right-click in the Info-Table*

Adjust Column Width	Some headings or contents may not fit the present width
Hide Selection	Some columns or rows may not be needed
Sort Channels	It is easier to find signals (ID) if they are sorted
Swap Rows/Columns	Make columns into rows and vice versa
Properties	Select columns/rows to be shown

6.5.2 *Right-click in the Data table*

Save as..	Create ASCII file: *.txt
Copy	Copy numeric data to the clipboard
Full screen	No tools or menus shown
Operator channels	Enter data manually
Export Options	Select column separator, decimal mark etc.
Properties	Signals: column width. Time column: format, data reduction

6.5.3 *Right-click in the Formula editor*

Redraw now	Compiles formulas. Checks syntax and points to errors.
Redraw automatically	Each formula is checked on "Enter"
Load	Fetch previously saved set of formulae.
Save as	Save formula set.
Undo	Undo action.
Cut	Cut selection to clipboard.
Copy	Copy selection to clipboard.
Paste	Copy from clipboard.
Delete	Delete selected text.
Select all	Select all text.
Full screen	No tools or menus shown.

6.5.4 *Right-click in the Histogram*

Insert Comment	Add an explanatory comment
Copy	Copy graph to clipboard
Full screen	Switch off tools and menus
Autoscale	Rescale for best fit
View raster	Hide or show graticule
Save as	Save the picture as tif, gif or jpg
Properties	Set class base and width

6.5.5 *Right-click in the Notes*

Load	Fetch a txt-file
------	------------------

Save as	Save your notes as a txt-file
Undo	Clod!
Cut	Move selected text to clipboard
Copy	Copy selected text to the clipboard
Paste	Copy from the clipboard
Delete	Delete selected text
Select all	Select all text
Full screen	No tools or menus shown

6.5.6 *Right-click in the Process diagram*

New data field	Place new data field
Copy	Copy numeric data to the clipboard
Delete	Delete selected signal field
Full screen	No tools or menus shown
Font	Select font size
Properties	Fetch picture. Select value point(s)

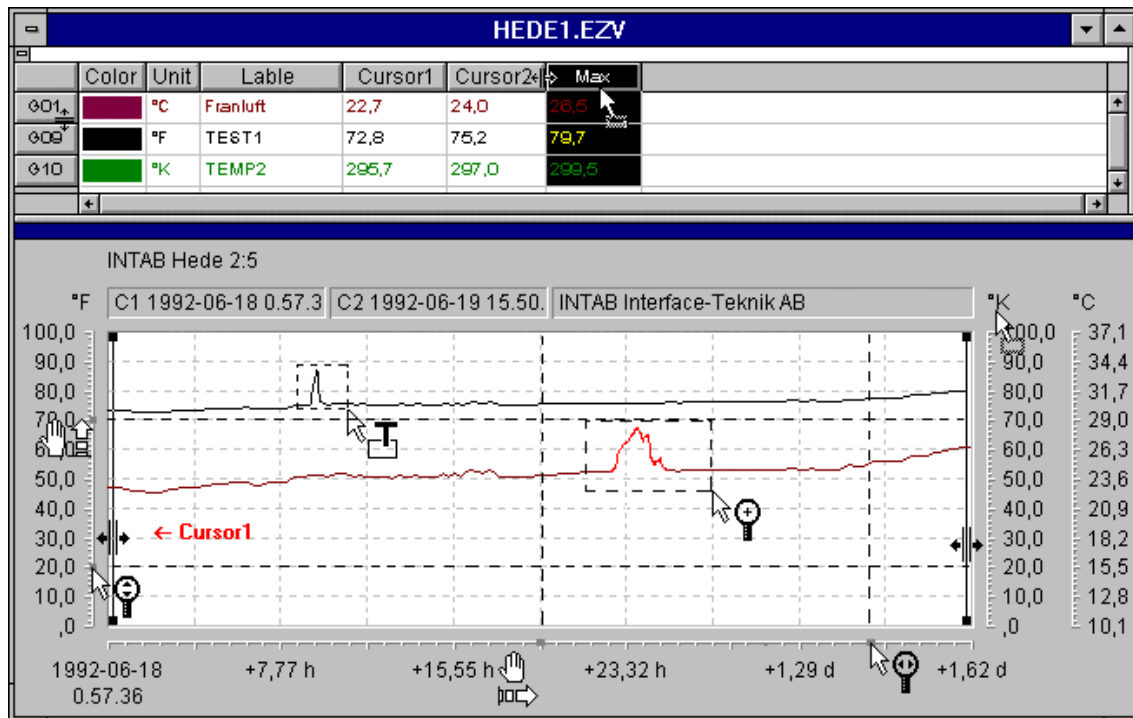
6.5.7 *Right-click in the X/Y-diagram*








Insert Comment	Add an explanatory comment
Copy	Copy graph to clipboard
Full screen	Switch off tools and menus
Autoscale	Rescale for best fit
View raster	Hide or show graticule
Connect Points	Some relations are better shown without connecting points
Save as	Save the graph as tif, gif or jpg.
Properties	Set class base and width





6.5.8 *Right-click in the Duration diagram*

Insert Comment	Add an explanatory comment
Copy	Copy graph to clipboard
Full screen	Switch off tools and menus
Autoscale	Rescale for best fit
View raster	Hide or show graticule
Save as	Save the diagram as a picture: tif, gif or jpg
Properties	Set axes' scalings

6.6 The Mouse Pointer : appearances and functions



Shape	Function
	Normal Pointer.
	You are pointing to a rescaling handle . Hold down the left mouse button to enlarge or diminish marked area.
	This is the Comment Tag Cursor and you are pointing in the Diagram Document area. Hold down the left mouse button and drag to open a text or comment insertion field. Click the right button to enter text.
	You are now pointing to a previously typed comment tag. Hold down the left mouse button and drag to move the comment . Click the right mouse button to edit comment text.
	The zoom pointer is active and is pointing somewhere in the Diagram area. Hold down the left mouse button to open a zoom area .
	Click and drag to rescale an axis in a rubber band fashion, the origin remains fixed. Shift is used as modifying key to hold the end point of the axis fixed. Ctrl will cause the axis to just slide along with no points fixed.
	The Y axis zoom pointer is used to zoom along a Y axis. Point to the axis along which you want to zoom (you have to point accurately so that the zoom pointer is shown) and hold down the left mouse button. Drag up or down to define zoom section. Only graphs representing the unit of the zoomed axis are affected.

	The Time axis zoom pointer is activated pointing the zoom pointer to the x-axis. Hold down the left mouse button to define zoom section by dragging.
	The move pointer can be used for two things: <ol style="list-style-type: none"> 1. Move a column or a row in the table. Click on row or column to be moved. Then click and drag holding down the left mouse button. 2. Change places of Y-axes. Click and drag on a Y-axis unit field. Move it to the one you want it to change places with.
	The adjust height/width pointer appears between columns or rows in the table window. Click and drag to adjust.
	This digital cursor pointer appears when pointing to one of the digital cursors in the graph area. It is used to move the cursor to points in the diagram to, in the table, numerically display values of interest. Click and drag to slide the cursor along the time axis.

6.7 Diagram Manipulation

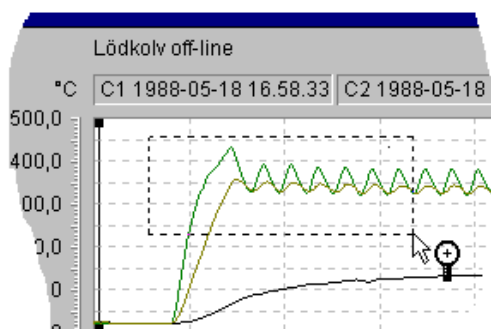
6.7.1 General

The amount of data collected is usually so great that the resolution or detail gets lost when it is all squeezed into one screen. To enable the operator to make close-up studies of interesting sections of the data, we have made available a host of axis rescaling tools. The different methods of zooming will enable you to selectively or collectively enlarge any portion of a recording.

6.7.2 Area Zoom

Zooms in on any selected graph section

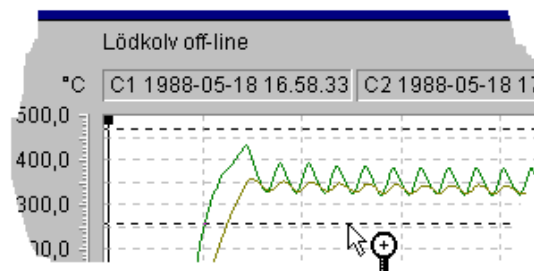
- By clicking and dragging with the left mouse button inside the graph area, you can perform a multi-graph zoom-in.
- All Y-axes as well as the time axis will be rescaled.



6.7.3 Multiple Y-axes Zoom

Zooms Y-axes over the entire X-axis.

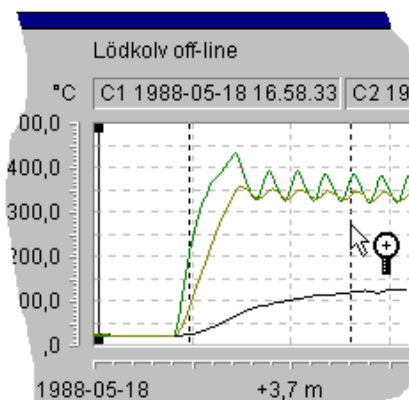
- Click and drag vertically.
- Zooms only Y-axes, leaving the X-axis span as is.



6.7.4 Time Axis Zoom

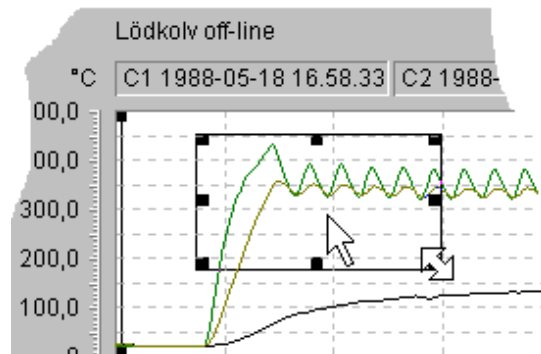
Zooms a section of the time axis.

- Click and drag horizontally.
- Zooms only the X-axis, leaving Y-axes as they are.



6.7.5 Perform the Zoom

1. If the zoom area became too small you enlarge it by pulling one of the "handles".
2. Hold down the mouse button inside the zoom area to move it.
3. Click once inside the zoom area to execute the zoom.



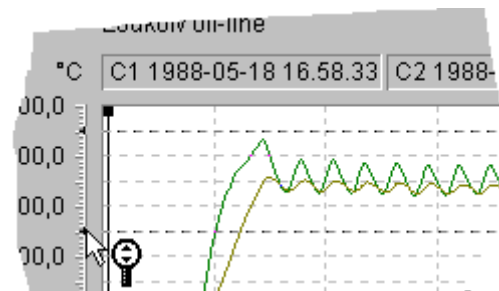
6.7.6 Abort Zoom

1. Abort a zoom by clicking the **right hand mouse** button or pressing **Esc** without letting go of the left-hand mouse button.
2. A defined zoom area is erased by clicking outside it.

6.7.7 Single Y-axis Zoom

Zooms selected interval of one Y-axis.

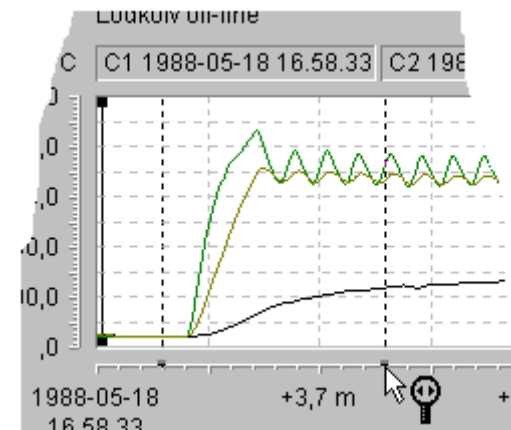
- By clicking and dragging along an Y-axis using the left mouse button, you zoom in on that particular axis. The other axes and the time axis will not be affected.
- Only one Y-axis is affected.
- All others remain unchanged.



6.7.8 Time Axis Zoom

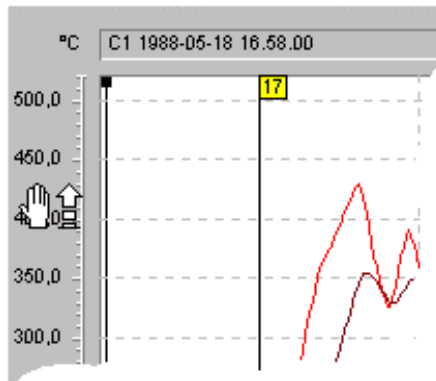
Zooms a selected section of the time axis.

- Click and drag with the left mouse button along the time axis in order to zoom in on a specific interval.
- The X-axis is rescaled.
- No Y-axes are affected.



6.7.9 Rubber Band Zooming

This is a novel, Intab first, zoom method. Axes indices are moved as if they are attached to a rubber band. Try it and discover a simpler way to rescale graphs for best readability.



All operations shown below are applicable to all y-axes as well as the time-axis!



Click the **left mouse button** only and drag up or down among the index values of an axis. The **origin** will be **fixed** and the end point will adjust accordingly.



Click the left **mouse button + shift** and drag up or down among the index values of an axis. The **end point** will be **fixed** and the origin will adjust accordingly.

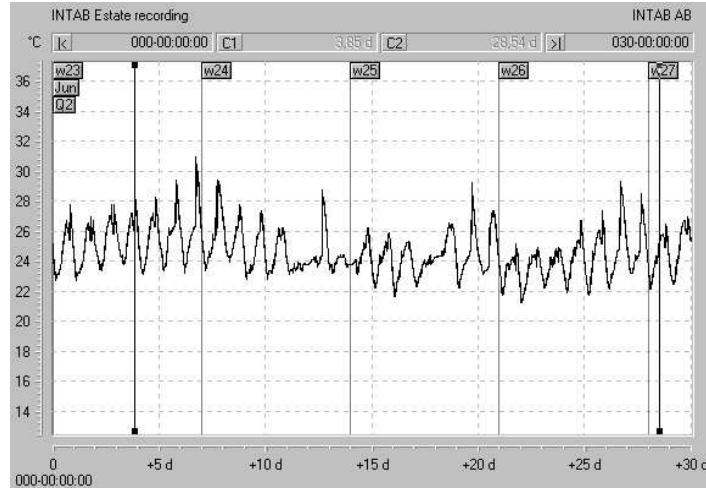


Click the left **mouse button + Ctrl** and drag up or down among the index values of an axis. The whole **axis will shift** longitudinally without changing its relative length.

6.7.10 Calendar Zoom

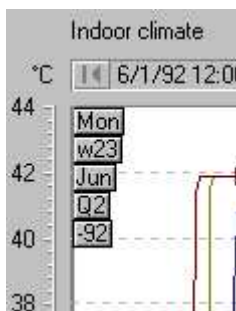
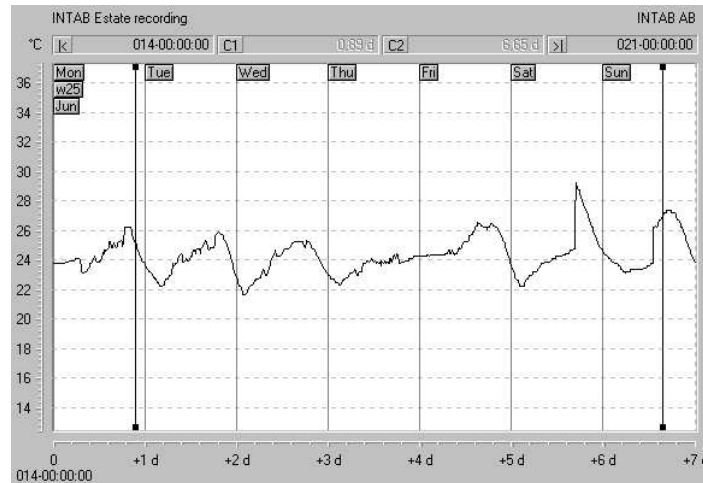
This zoom is extremely useful when studying data “calendar-wise” i.e. day by day or week by week etc.

Activating the appropriate flags in Properties/Diagram/Time enables this zoom method.



Clicking on one of the flags will zoom in on the period represented by it.

If enough flag types are activated you may also zoom out again by clicking on a flag with a higher “significance”. Zooming in on week 25 in the diagram above will have the following result.



Zoom out again by clicking the flag for the month of June.

Step between months or weeks by clicking the page arrows:



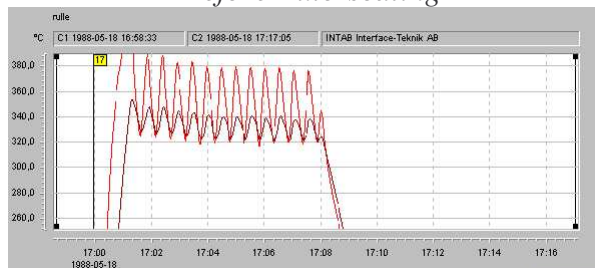
In case you get "lost" you simply click the "all pages" button


(see below) or the Undo button:

6.7.11 Auto Scale

The quickest way to scale a diagram to encompass all signals is to click the auto scale button.

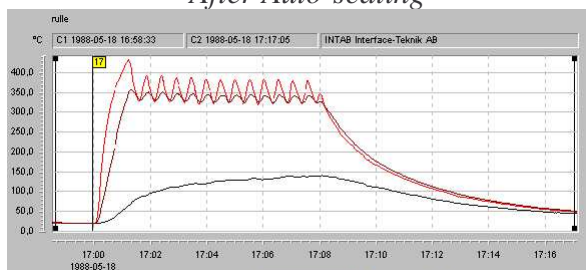
Before Auto-scaling



Click on  after you have waited a few seconds to let the graphs establish themselves.


All axes are rescaled to encompass all values of selected time scale. A small "overhead" is created, thereby increasing readability.

After Auto-scaling



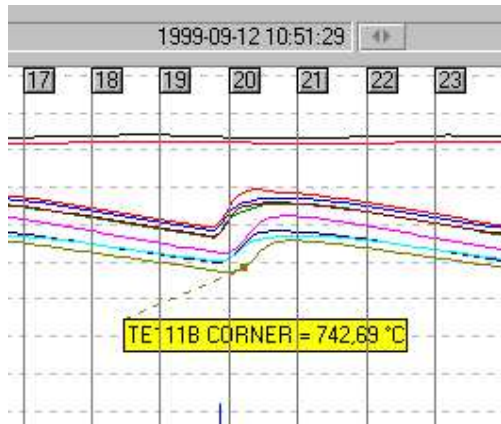
NOTE that if two windows are opened (like the above) it is necessary to make sure that the correct window is the active window before performing any operations.

(A further example of this is the **Copy** command that has to be directed to the correct window to do the correct operation on the correct set of data. It may take data from the wrong set and it may also take ASCII tabulated data if the tables section is active when you actually intended to move a picture of your graphs into the report you were writing using MS-Word.

You may also want to try the  button. It is the **All Pages** button and works analogous to the Auto Rescale button but **rescales the time axis** instead. It rescales the time axis to encompass the entire recording.

6.7.12 Comment Tags

Comment tags are used to point out specific points or sections on a graph. There are two methods available to attach them.



The first is to move the cursor to the vicinity of a graph. A yellow rectangle, showing channel label, value and unit, will appear. Hold down the left mouse button and the cursor will change into Comment Tag

appearance:

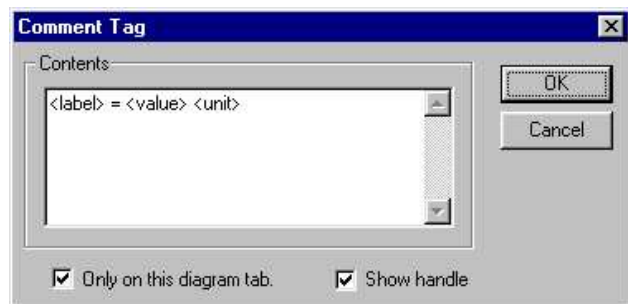
Drag the tag into a suitable position. Let go of the mouse button and the tag will "stick". The tag is "anchored" via a dotted line from the closest corner to a point on the graph. See the illustration on the left.

The yellow comment tag shows the channel label, unit and value of the point to which it is anchored. The anchor point may also be moved by clicking and dragging.

Change Comment Tag text

Right click on the comment tag and select "Properties". The menu shown at right will appear. It has a text entry field where you can write your own comments.

Default contents are shown at right. The <label> command fetches automatically the "name" of the channel.



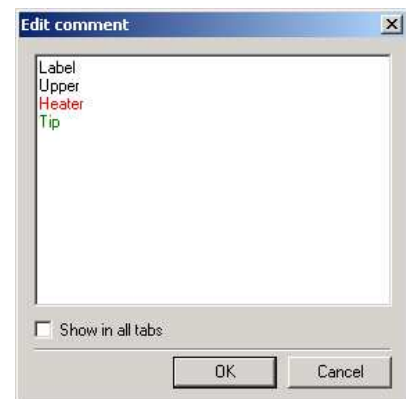
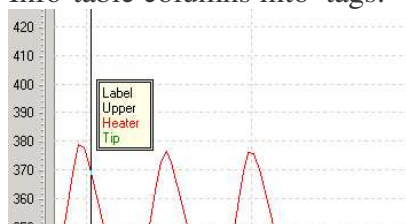
Similarly <value> and <unit> fetches the measured value and unit of the anchor point. You may either replace this information or add text of your own.

Check "**Show handle**" if you want to see the dotted line between the tag and its anchor point. Without this line, the tag is more "universal".

Check "**Only on this diagram tab**" if you want to limit the presence of the tag to this particular tab.

The second is to activate the comment tag cursor in the tool bar. This will open a text entry menu. Type or paste in your comments.

It is often a good idea to copy and paste informative Info-table columns into tags.



7. The Menu bar : commands and dialogs

7.1 General

Some commands need settings before they can be executed. Dialog boxes are used to input this additional information to EasyView.

This chapter will deal with menus and their sub-menus, commands and dialog boxes in the order (from left to right) they appear on the menu bar.

7.2 File

It may surprise you to, among other things, find functions that have to do with files in this menu: Open, Save and New. Recorder and Printer set-ups are also performed in this menu.

7.2.1 New

This opens an empty document. Data may be added by either or all of the following:

- Drag-and-drop a tabular file
- Paste tabular data from the clip board

Thus imported tables must fulfil the criteria stated in the chapter dealing with imports.



7.2.2 Logger..

File / Logger - Start/Stop/Offload

Ctrl + L



This dialog is for starting new recordings or fetching off-line data from loggers.

See "PC-logger recording" or "Tiny Logger recording"

These sections contain information on how to set up and start recordings and how to fetch recorded data.

7.2.3 Open

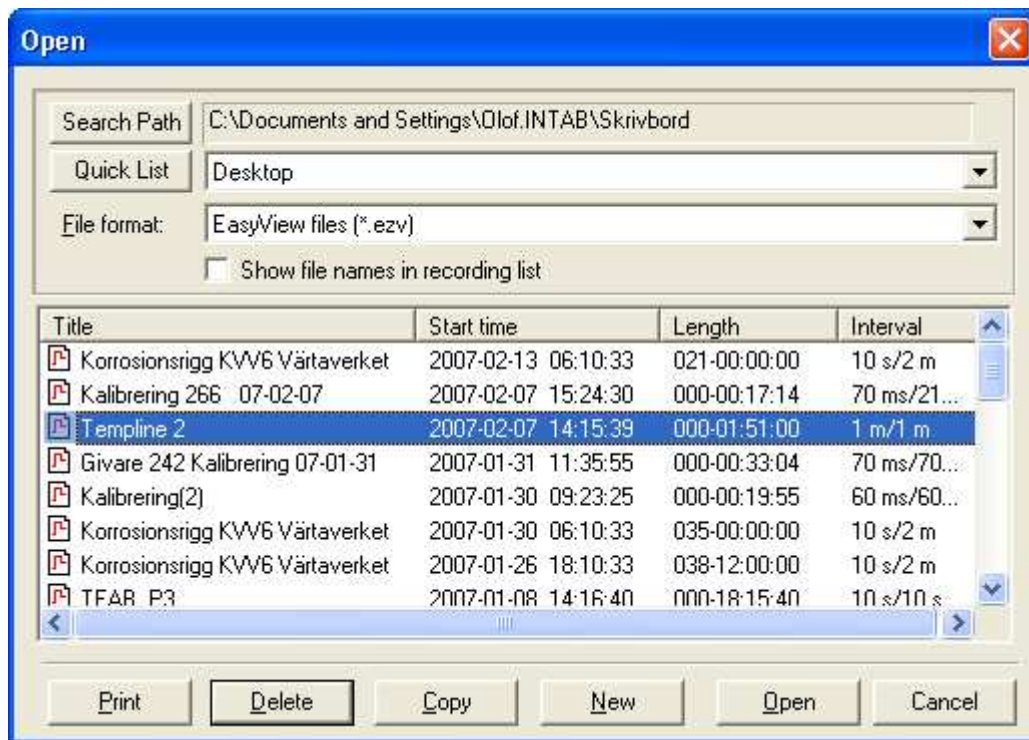
File/Open

Ctrl + O



This dialog involves many functions. The most obvious one is to open recordings for graphing and analysis.

The **Quick List** simplifies switching between recording directories.



7.2.3.1 Search Path

Shows the path to the presently active recordings' directory. Click on **Search Path** and then double click your way to alternate directories in the usual Windows manner.

7.2.3.2 Quick List

Quick List **Quick List** lets you, in your own words, give a short description of your recordings' directories. Don't underestimate the efficiency this tool can provide. Let's say that you are using a directory in the file server with the search path: "H:\COMPANY\USER\JOHN\AAC2\DOC", and you are also editing files on you local hard-drive on the path "C:\COMPANY\AAC2". Instead of changing the Search Path every time, you could for instance just call them "Net" and "Local" in the Quick List.

7.2.3.3 Sort

Your saved recordings may be sorted by any of the displayed criteria. You can sort the recordings by Start time, Title, Duration or sampling Interval. Just click on the grey column header that corresponds to you sort criteria. Reverse sorting order by clicking again.

7.2.3.4 Select recordings

- Select a recording by clicking on it.
- Select multiple adjacent recordings by holding down the left mouse button and dragging across them or alternatively, click on the first, hold down the Shift key and click on the last..
- Select multiple non-adjacent recordings by holding down the Ctrl key and clicking on desired recordings.

7.2.3.5 Open a recording

Click on the recording you want to see and click on Open.
Double clicking on a recording will also open it.

See also the section below on Open Multiple Recordings.

7.2.3.6 File format - Open

In the **File format** box you can choose which kind of file to open. There are six (Pro) alternatives:

- EasyView files (.ezv)
- PC-soft files (Hx.aac + Dx.aac) (Pro only)
- Orion GLM files (.ttd)
- Text files (.txt, .skv, .csv, .asc) (Pro only)
- Excel files (Pro only)
- Temporary files (~evxxxx.tmp)

EasyView files are directly opened with the settings previously programmed. Other formats are converted into ezv format in the opening process. Save the thus converted file and you will have a new EasyView file.

7.2.3.7 Temporary files

In spite of very reliable mains supply, computers, operating systems and improved programs you will eventually experience a computer "crash". Losing valuable data because of a crash is not amusing!

Our programmers have foreseen these problems and made EasyView work with a temporary file that is updated with incoming data at regular intervals.

Temporary files are named in this format: **~ev1234.TMP**. They are automatically erased when EasyView is closed properly. After a crash it will be accessible and so save valuable data.

In "**File format**" there is a pull-down combo-box where you select file type to be shown and opened.

- Click on "Temporary files" and select the file.
- Click "Open"
- Go immediately to File/Save as... so that you don't loose it again.

NOTE that a temporary file is automatically erased when EasyView is closed. Unless you have saved it with a proper name it will be permanently lost.

7.2.3.8 Copy recordings

Recordings may be copied to other directories or drives.

- Select recording(s) to be copied.
- Click on Copy.
- Select destination drive and directory in the Select Directory dialog.

7.2.3.9 Delete Recordings

by first selecting recordings that are no longer wanted and then clicking on **Delete**.

7.2.3.10 New – old recordings serve as templates for new

Select the recording you know to have parameters that are suitable for the task ahead and click New.

You will be taken straight into the "Start wizard"

7.2.3.11 Print

Click this button to print a list of all recordings.

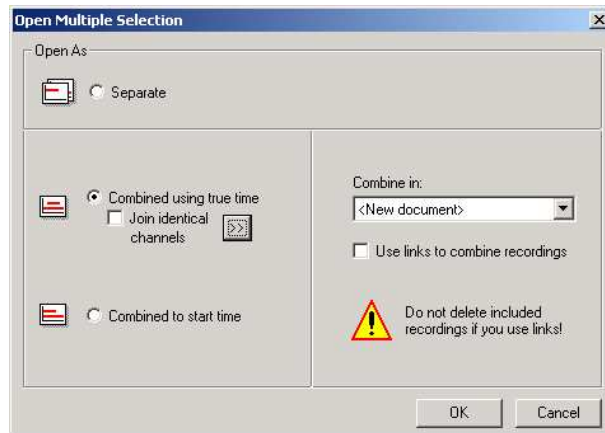
7.2.3.12 Open Multiple Recordings

Combining Diagram Documents can be very useful to compare differences in two or more recordings in the same diagram document.


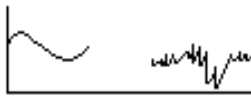
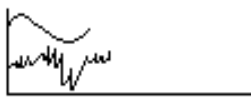
1. Use extended selection to select the files you want to combine. (More than one..)
2. Then press the Open button. The dialog to the right will appear.

To save space you may link to the recordings instead of copying them into one large file. Check the “Use links” box and

make a special note of the displayed warning!



This dialog gives you three alternative methods of presenting the Diagram Document(s)

<ul style="list-style-type: none"> • Separate 	Recordings are opened each in its own window.	
<ul style="list-style-type: none"> • Combined using true time 	Recordings are combined in the same diagram with each signal placed in the correct "time slot". Mark the checkbox called "Join identical channels" to merge all of the channels that have the same Label into one single channel.	
<ul style="list-style-type: none"> • Combined to start time 	Recordings are combined in the same window with their start times at time zero. The first recording selected in the open-dialog will act as a reference. The lateral time shift some signals undergo with this method is shown in one table-column as Skew .	

Define identical channels by clicking the double arrow and checking appropriate boxes.



7.2.4 Open view as new document

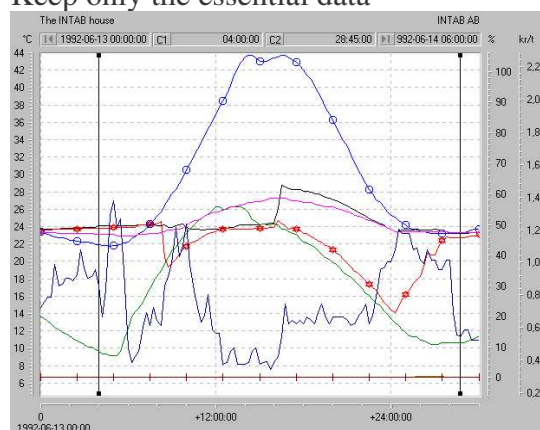
It is not unusual to have recordings that are aeons long and only having use for a very short period of this. We have made it possible to save zoomed views as new documents. Having separately saved the essentials you may as well delete the superfluous initial, all too long, recording.

This is how you do it:

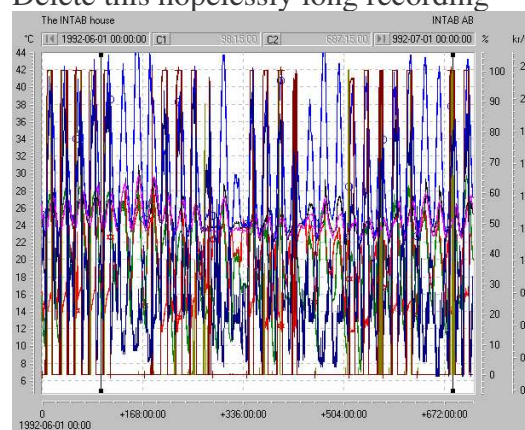
- Create, if you like, a new tab.
- Select the channels you want to see.
- Zoom in on the section of interest.
- Click on File/Open view as new document.
- Click on File/Save as ... to save this view in its own document.

Only this one view will be saved in the new document. If this view contains all the interesting data of the recording you may as well delete the original. **Just make sure that you got it all right before you loose valuable data.**

Keep only the essential data



Delete this hopelessly long recording



7.2.5 Save or Save as..



7.2.5.1 Save your Diagram Document

Normally you click the save button (shown above) or select File/Save to save your document with all its settings. EasyView has also the command File/Save as which allows you to save a copy of the opened file to any storage medium you feel appropriate. I.e. files opened from the net server may be stored locally on your own hard disk.

7.2.5.2 Temporary files

You don't really have to know this but....

To minimise the risk of damaging valuable recordings we have adopted a scheme that uses a temporary file for all work. This temporary file (extension tmp) is an exact copy of its original and is created every time you open a Diagram Document (extension ezv), start a new on-line recording or transfer data from an off-line recording. It is automatically erased when you close the Document in a correct fashion.

7.2.5.3 EasyView in Networks

The Temporary files bring the following advantages in LANs:

Documents that are saved on a shared drive, can be opened on any local computer.

1. Opened temporary copies may be saved by the "Save as.." command on any suitable drive and directory.
2. On-line, recordings to a shared drive may be monitored by local computers. The limitation being that no real time updating is performed. Close and re-open the document for updated views. The master computer updates the on-line document every 2 minutes **on condition that the on-line recording has been saved after start!**

7.2.6 Close

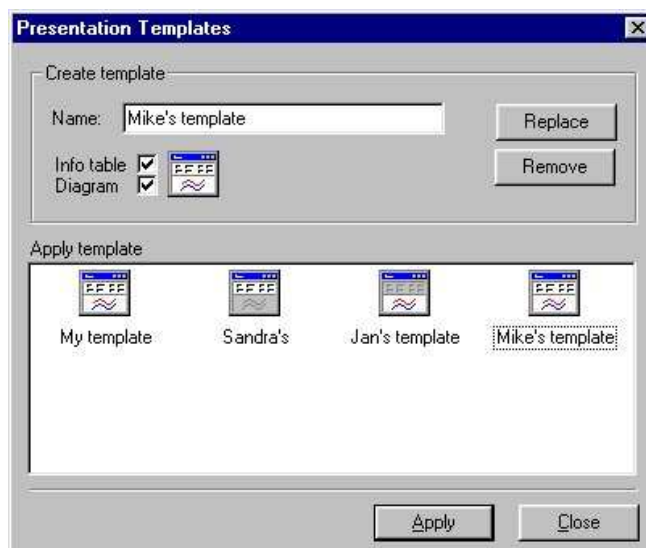
For those of you who still not have found the upper right hand corner cross, we have included this command.

7.2.7 Send mail

This will help you send the document via your e-mail.

7.2.8 Templates

This is where you save your settings as templates to speed up future analysis.



Read more in the chapter dealing with templates.

7.2.9 Properties

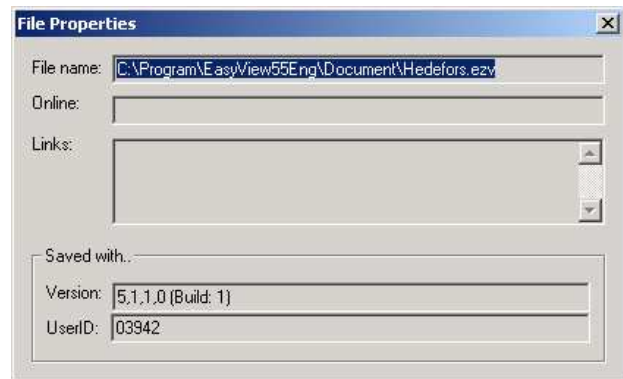
File/Properties

File name – shows the path and the file name of the recording

On-line – shows the data source (port) for on-line recordings

Links – shows links to constituent files of linked recordings

Saved with – program version and issue number of the licence number

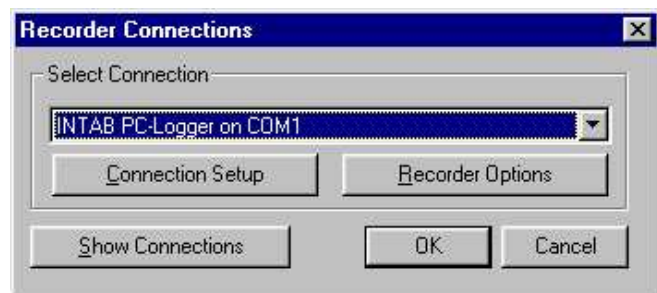


7.2.10 Connections

File/Recorder Connections

Choose your COM-port here.
The “Show Connections” is only available if there are more than four “lines” available.

Recorder Options is entry point to the **Boot** facility.

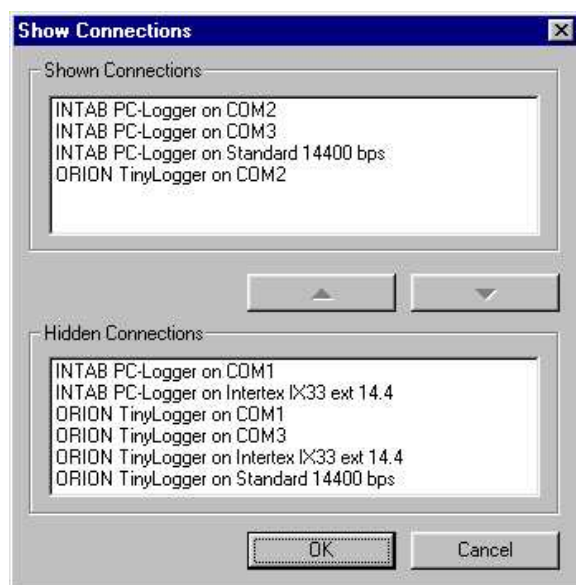


7.2.10.1 Show Connections

File/Recorder Connections/Show Connections

In this dialog you select logger (type) and serial port.

It exists only if there are more than four “lines” available.

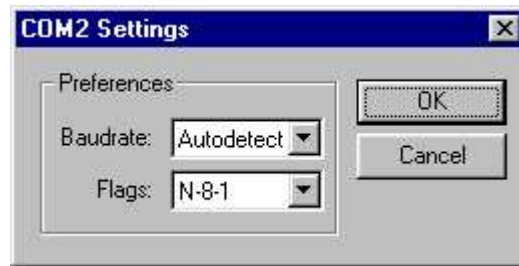


7.2.10.2 Connection Setup

File/Recorder Connections/Connection Setup

Do not alter these settings unless you know what you are doing and why.

Normal operation does not require any modifications of these settings



7.2.11 Project manager

(This is an EasyView Pro feature.)

Today EasyView supports a lot of different data acquisition devices or services. Some of the properties are common to all of them: *data acquisition*, *presentation* and *storing*. A **project** is a “canister” that holds information about all of these parts to simplify **repetitive recordings**. A project can be *started*, *stopped* and *offloaded* within or outside EasyView via shortcuts.

To create a project you have to connect to your recording device. After that, you can modify the project in any way without having the recorder connected.

A project consists of four parts:



- Appearance in the EasyView document.
- Recorder settings.
- Communication interface such as COM port etc.
- Save recordings automatically to a specified location?

Read more in the Project manager chapter.

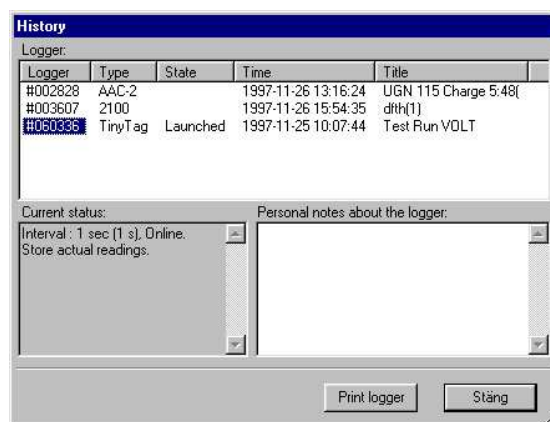
7.2.12 Logger History

File/History..

This unique feature will be of invaluable help in “keeping tabs” on your loggers. Parameters and type of “procedure” will be noted every time you contact your logger.

Loggers are identified by serial number and logger type.

Your “personal” notes on each logger may also be entered. There is a notes’ page available for each logger.



7.2.13 EasyTerm (PC-logger only)

File/EasyTerm

This is a test program. It can be compared to a terminal program. Its use is to communicate directly, in ASCII format, with the logger.

EasyTerm may be used by advanced operators to, for example, fetch settings' information from the logger.

Please refer to the command manual for more information on available commands.

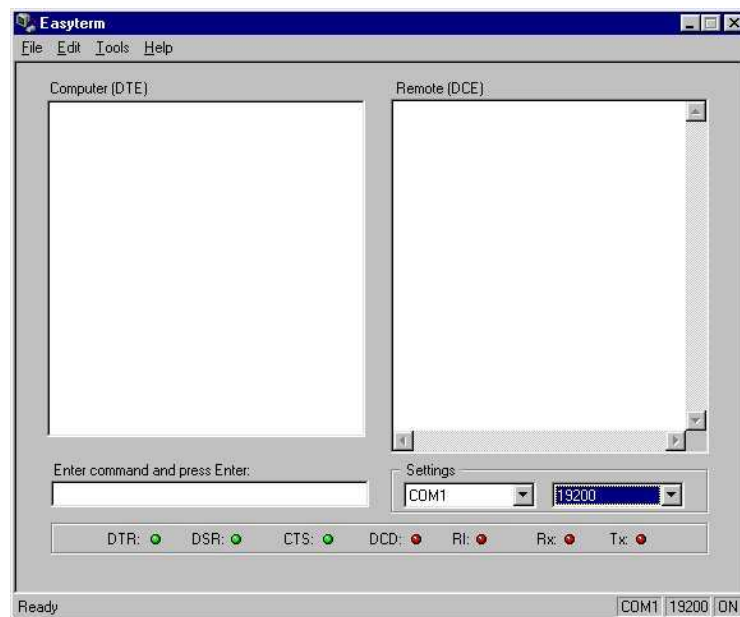
(The command manual is really only useful for those who intend to write software of their own.)

Settings :

- Select Baud rate and COM port.
- Activate port in Tools/Open port

Commands:

- Type your commands in the input field. Terminate with an **Enter**. Commands will be shown in DTE input field. Logger responses are shown in the DCE field.



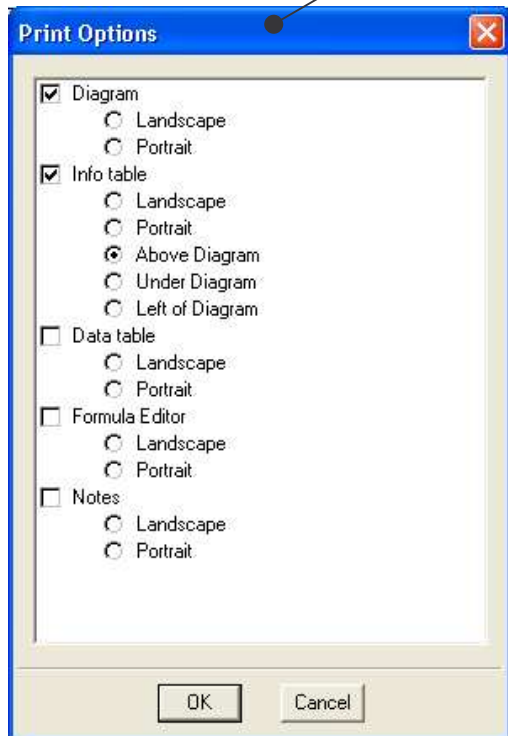
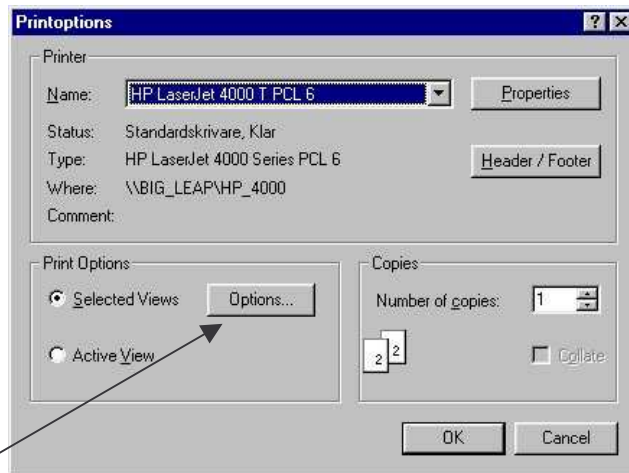
7.2.14 Print

File/Print

This dialog is used to print a Diagram Document.

“**Properties**” is used for printer settings. See your printer manual.

“**Options..**” is to select views for printing. See below.




Check the section of the Diagram Document you wish to print. Printable sections are the

- Diagram
- Info Table
- Data Table
- Formulas
- Notes
- Y(x) diagram
- Duration
- Process diagram
- Histogram

For each of these you also select “Landscape” or “Portrait” orientation.

7.2.14.1 How to distinguish graphs in black and white printouts

Graphs of different colours will automatically be presented in differing grey tones. This may not always suffice to distinguish one from the other. Do one of the following to improve readability:

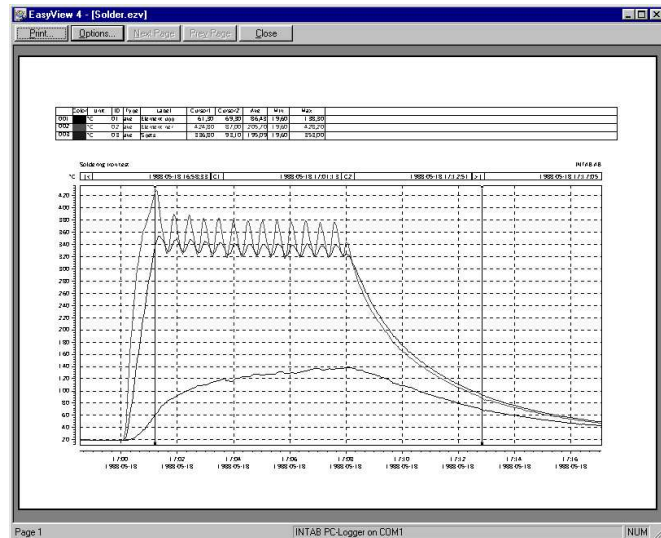
- Click the right mouse button in the diagram area. Select Properties/Presentation and try different settings of Styles: Draw, Point, Line and Width.
- Add a text comment field next to any curve that isn't easily identifiable: click on , position the pointer and drag a rectangle. Click the right mouse button to enter your own text.

7.2.15 Print Preview

File / Print Preview

The print Preview will present the Diagram Document the way it will look on paper.

Step between selected pages using "Next page" and "Previous Page"

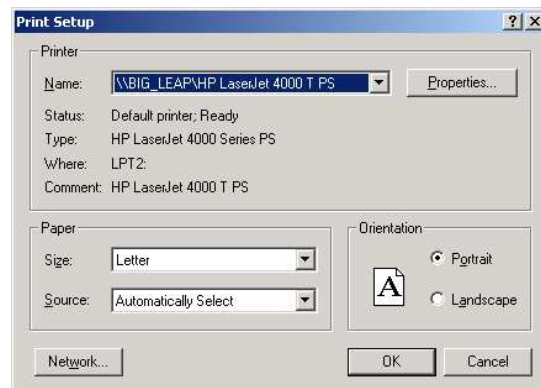


7.2.16 Printer Setup

File / Printer Setup

This Dialog selects printer and page format.

- Select **printer**. Choose between default and specific printer(s).
- **Orientation** is only applicable to the "History"



Consult your Windows manual for more information on printers and printouts.

7.3 Edit



This menu follows the general Windows look. It has two main functions. The first is to **Undo** or **Redo** changes to the graph. The second is to **Copy** numeric or graphical information to the Clipboard.

7.3.1 Undo

Edit/Undo



Ctrl + Z

Undo re-scalings of diagrams. Click on undo if you get lost or just want to see the previous view. The undo and redo buffer is separate for the standard diagram and the "plug-ins" as for example the X/Y-diagram.

7.3.2 Redo

Edit/Redo



Ctrl + A

Redo is really an undo of an undo! Switch back and forth between views by alternately Undoing and "Redo"

7.3.3 Cut, Copy, Paste

Edit/Cut etc.

These menus work exactly the way you would expect when dealing with text in Notes and Formulas.

Copy has also a more specialised function. See below.

7.3.4 Edit/Copy

Edit/Copy



Ctrl + C

7.3.4.1 General

It has become more and more popular to create nice looking digital reports instead of printing them out on paper. EasyView has therefore been equipped with extensive export capabilities. Almost every part of EasyView can be exported in a suitable format.

7.3.4.2 Copy the Info table:

Activate the Info table area (above the graph area).

Click on the copy button to copy the entire table. If you want to, you may instead select a certain group of cells to be copied.

You will benefit from pasting the information into an application that handles RTF-format, since the channels' colours will be copied as well.

ID	Label	Unit	Cursor1	Ave
01	Heater upper	°C	19,60	86,42
02	Heater lower	°C	19,60	205,69
03	Tip	°C	19,80	195,09

7.3.4.3 Copy the Data table:

The Data table is an extended feature that can be activated and deactivated in the "Options/Extended features" menu.

1. Click somewhere in the data table to activate the pane.
2. Click on the copy button or Edit / Copy.

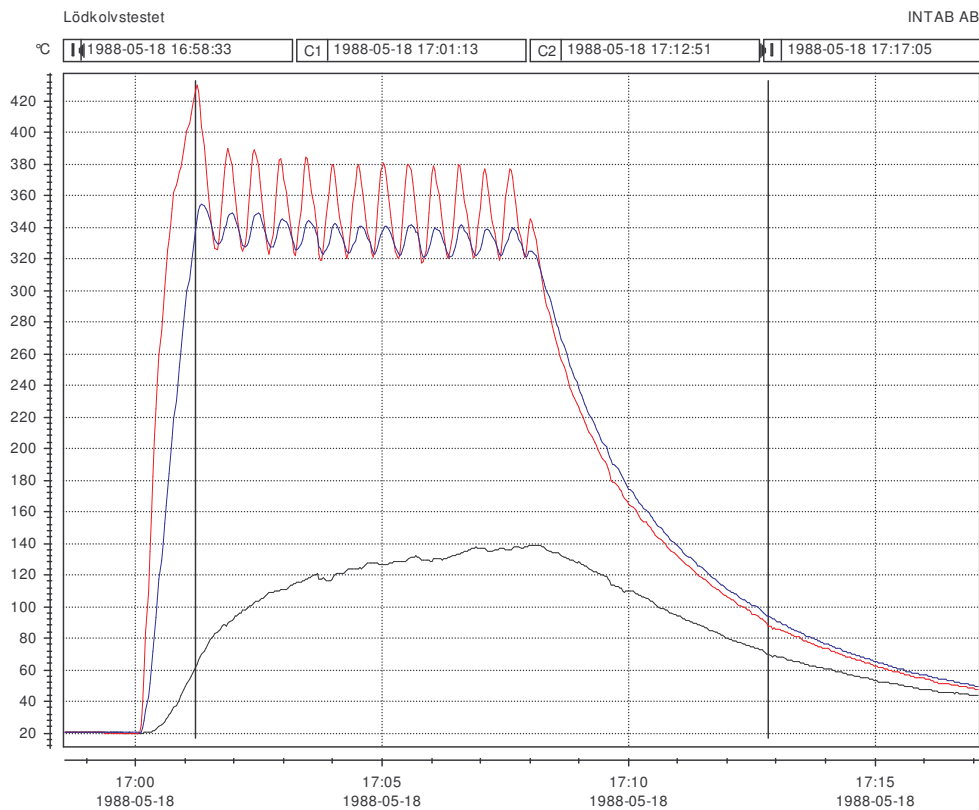
<i>EasyView [1/50]</i>	<i>Heater upper</i>	<i>Heater lower</i>	<i>Tip</i>
1988-05-18 17:00:11	19,852	21,02	20,138
1988-05-18 17:01:51	51,734	331,73	248,35
1988-05-18 17:03:31	105,51	355,04	336,58
1988-05-18 17:05:11	122,32	349,21	332,06
1988-05-18 17:06:51	130,38	346,2	330,33
1988-05-18 17:08:31	136,13	332,46	321,5
1988-05-18 17:10:11	120,14	202,98	214,39
1988-05-18 17:11:51	93,762	131,1	137,77
1988-05-18 17:13:31	71,868	92,2	97,002

7.3.4.4 Copy the Graph:

- Activate the ordinary diagram or the X/Y-diagram.
- Click on the copy button or Edit/Copy

A picture in a metafile format has been copied to the clipboard. Use Edit/Paste of the destination software.

If you want to, you can instead use Edit/Paste Special to paste a bit map picture if the word processor you are using supports this feature.



7.3.5 Delete (Hide)

Edit/Delete

Apart from the obvious task of deleting text in the Notes and Formulas, this menu helps in **hiding columns** from view. It is active when the tables are in use and **does not delete any information**. It only hides information (columns) in the tables. You have to select one or more columns before hiding them.

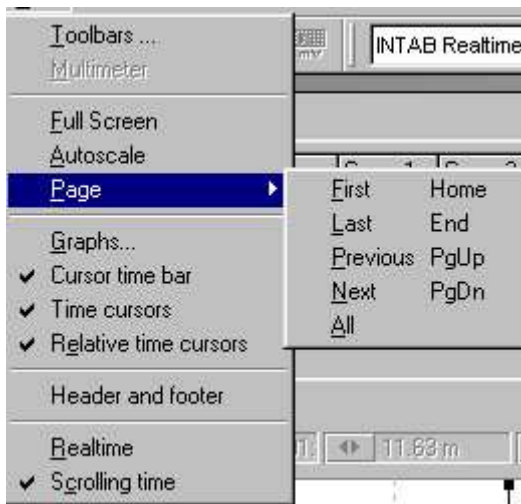
7.3.6 Up-date Project

Project settings (see section 9) may be modified during analysis.

The way you programmed the project settings may need improvement. The simplest way to do this is to modify the document you are working on so that it shows exactly what you want it to.

Then click on Edit/Up-date Project to override your old settings with the new ones.

7.4 View (menu)



The View menu is used to activate or deactivate some of the screen features. Examples are the toolbar, the status bar and Multimeter.

Diagram Autoscale and Page selection are also important features of this menu.

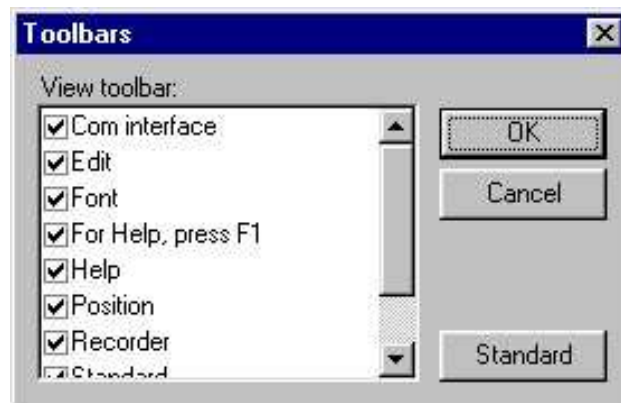
7.4.1 Toolbars

View/Toolbars



These bars provide information and facilitate the use of many features. Hiding them will increase the area available for the Diagram Document.

Select "View/toolbars.." in the menu to hide or show toolbar components. The control buttons are split into small toolbar groups so that you can arrange them as you se fit.



To **move** a toolbar section from its current position, place the mouse on the toolbar but not on a button as the picture illustrates. Then drag the field to a new location.

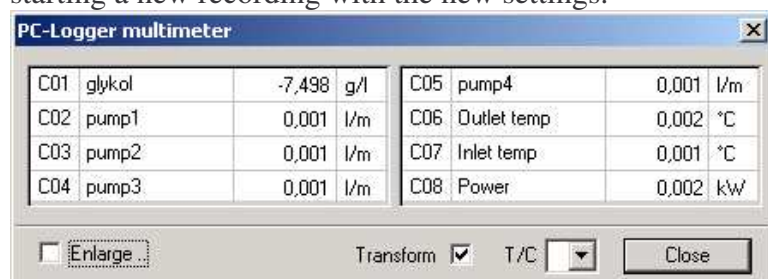


7.4.2 Multimeter

View/Multimeter

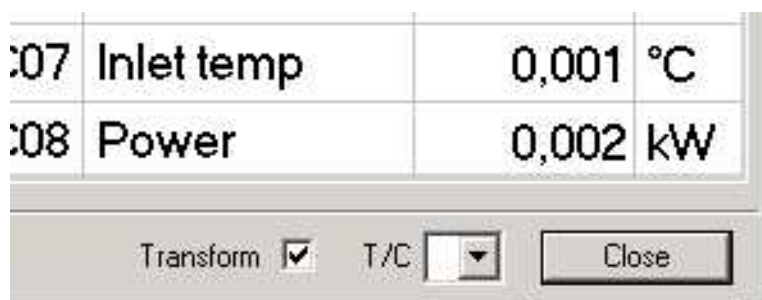


The Multimeter is a very useful tool while installing sensors. It will show you the "just now" output values of connected sensors. It works much like an ordinary multimeter, the difference being the number of channels shown. The values shown are, of course, measured by the logger with the settings that it has stored. Settings are only changed by starting a new recording with the new settings.



Check "**Enlarge**" to increase legibility at distances.

T/C selects thermocouple type. This is only possible when no recording is in progress.



It is also possible to apply a straight-line equation to, for example, process signals. This is called transformation.

Check Transform. One for each channel may be programmed in the start wizard.

7.4.3 Full Screen






Normally there are three windows visible in a document: Graph, Info table and plug-in. In addition to these, the toolbar is shown. All these features may take up valuable screen area. The "full screen" will show the active document section over the entire workspace.

7.4.4 Autoscale

This has the same function as the Autoscale button:



7.4.5 Page

View/Page/	First		Home
	Last		End
	Previous		PgUp
	Next		PgDwn
	All		All Pages

These menus or their corresponding buttons or short cut keys are used to step or scroll through a recording.

The term **Page** signifies one X-axis length of data. An example: with a one day long X-axis you can go "Next Page" seven times if your recording is a week long.

All Pages rescales the X-axis to encompass the entire recording.

7.4.6 Graphs

This is a back-door to Properties/Graphs.

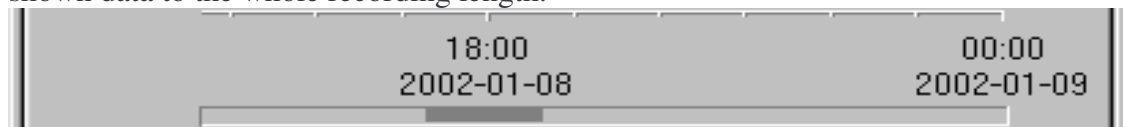
7.4.7 Cursor Time Bar

The time bar above the diagram gives the time at x-axis end-points. At the same time the cursors' temporal positions are reported.



7.4.8 Position Bar

The shaded section of the position bar shows the relative position in the recording the x-axis covers. The relative length of the shaded section is a measure of the ratio of shown data to the whole recording length.



In the example above you can see that we are showing a section that is about 15% of the whole recording length and starting about one quarter in, in the complete recording.

7.4.9 Show Time Cursors

Show or hide the Time Cursors.

It may be a good thing to hide them before a printout to a report that has no use for them.

7.4.10 Relative time cursors

The cursor time bar will either show absolute times or difference in time between them.

7.4.11 Header - Footer

The Print Dialog in File/Print has a button so that you can define headers and/or footnotes for your printouts



Please note that headers and footers are "global". They are ALSO saved in the document IF they were modified while the document was open. This means that documents with thus previously saved headers and/or footers will "override" differing global setting.



This ingenious dialog has one entry field for the header and one for the footer. You'll have to guess which is which...

Text alignment is selected by clicking on one of the radio buttons:

"**Left**" places the text on the left-hand side of the sheet.

"**Centre**" places text centrally and

"**Right**" places text to the right of the paper.

Check "**Differing first page**" if you want this feature. It will result in two tabs with header and footer information entries.

Maybe it's only the first page that needs header and footer? In that case you leave "**All pages**" blank.

The buttons in the middle of the dialog may need explaining. They supply "variable information" like date and time.



This button will enter a code that fetches the computer date at the time of printing.



The computer's time will be printed using this button.



The printed pages are numbered if this button is allowed to enter page information.



The Document is really a file. This button will print the file name and path.



This button enters the most important information of all: RECORDING TITLE !



In case you are printing only a selected section of all data you can include the tab name too.

LOGO

A picture will be displayed in all upper left hand corners if you place a logo.bmp in the ..EasyView\Program directory

7.4.12 Real Time - on-line

View/Real Time



Real Time Display of on-line recordings.

This mode will show signals as they happen. Their progress will (hopefully) reflect reality with its real time scale. Hence the term "Real Time".

This mode is active by default for on-line recordings. Its usefulness is obvious.

Note that it is possible to open multiple windows with different time scales all showing different aspects of the same recording. All in Real Time.

Real Time display may be suspended by clicking on the button illustrated above.

It will toggle, so just click on it again to resume Real Time Display.

The recording itself is not affected at all by this.

7.4.13 Scrolling time

There are two ways to show incoming data in real time.

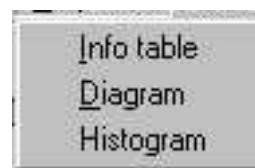
Scrolling time will enter data at the right end and "push the graph" leftwards. When the far left end is reached, the x-axis will roll right with the data.

Non-scrolling time will enter data at the left end, fill out the x-axis length and the step the x-axis one entire length.

7.5 Properties

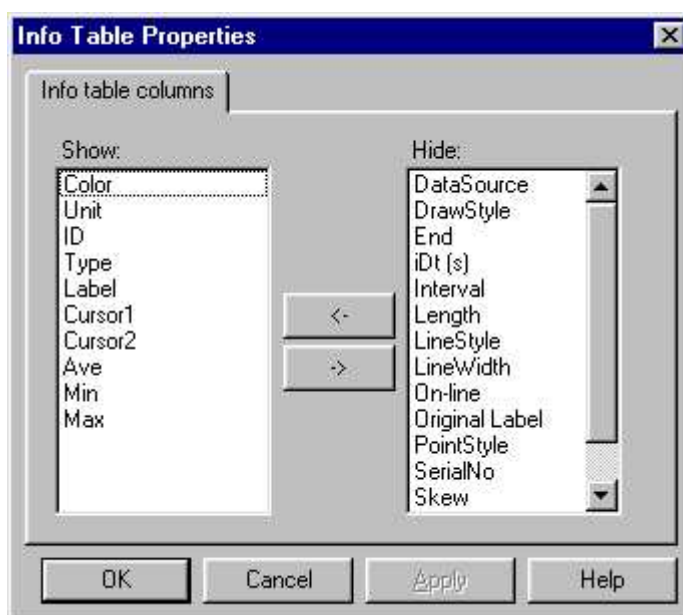
The Properties menu has tools to tailor the diagram document the way you want it.

Info table, Diagram and active plug-in properties are featured here.



7.5.1 Info table properties

The Info table properties dialog is used to add or remove information displayed in the table, above the graph. As default, the table will not show all of the columns available for readability reasons.




Select the information columns in one of the list boxes that you want to hide or display. Then press one of the => buttons to execute the action.

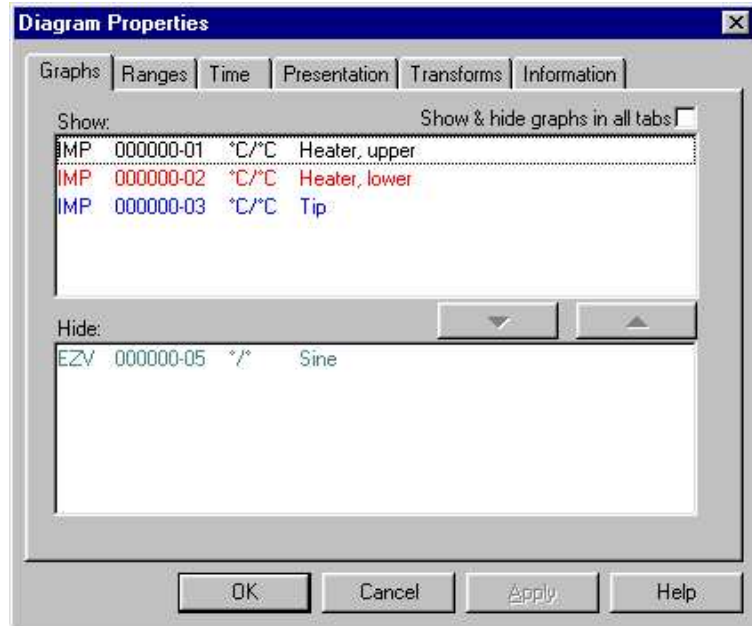
7.5.2 Diagram Properties

7.5.2.1 Diagram Properties – Graphs

Select Channels

The two list boxes **Show** and **Hide** will tell what channels will be shown as graphs and which will not be shown at all.

- Select channels to be shown from the Hide box and click the  to move them to the Show box. Alternatively you may of course double click to move them.
- Hold down Ctrl and click to select multiple channels.

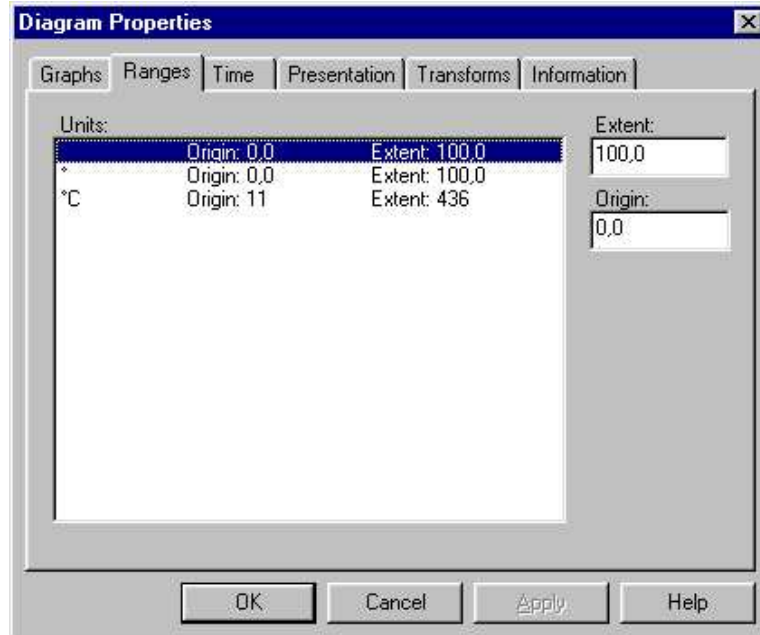


Read about alternative methods in the section dealing with tables, Diagram Properties – Ranges

7.5.2.2 Diagram Properties – Ranges

Changing the Origin and Extent values of a y-axis

When double clicking, or right-clicking and choosing properties, on the index values of a vertical axis, you will land in this dialog. Change the values as you see fit.



7.5.2.3 Diagram Properties - Time

Time axis settings and format are programmed in this menu.

The screenshot shows the 'Diagram Properties' dialog box with the 'Time' tab selected. The 'From' field is set to 'Date: 1988-05-18' and 'Time: 16:58:33'. The 'To' field is set to 'Date: 1988-05-18' and 'Time: 17:17:05'. Under 'Origin', 'Calendar time' is selected. Under 'Other labels shows', 'Calendar time' is also selected. The 'Show flags at' section has checkboxes for 'Auto', 'Year', 'Quarter', 'Month', 'Week', 'Day', 'Hour', and 'Trig or event'. The 'Example' section displays a time axis with labels '17:00 1988-05-18' and '17:10 1988-05-18'. The bottom buttons are 'OK', 'Cancel', 'Apply', and 'Help'.

From – To.

What you write in these boxes depends on which format you have chosen in the label definitions. The standard format is "Calendar time". If you for instance select to show "Time from start", the origin, or starting point of your recording, will be shown as time zero e.g. 000-00:00:00. In other words, the amount of time that has passed since the beginning of the recording.

The table below presents a summary of the four different alternatives for the time axis:

<u>First label shows</u>	<u>Other label shows</u>	<u>Result</u>
Calendar time	Calendar time	All indexes of the time axis will show the actual time and date.
Calendar time	Time from origin	This modifies the time information on the time axis to show a time span or extent in selected unit (h, m or s). The origin is still an absolute date.
Time from start	Time from start	Use this format when you want to compare different time spans and are not interested in the absolute date and time. This is a format that takes a lot of space on the time axis. Experiment with a smaller font size
Time from start	Time from origin	The origin is displayed as 000-00:00:00 while the extent is a time span (or +time from the origin), e.g. +20m +30m and so on.

Show flags at..

Check appropriate square to show "flagged" indicator lines at selected period.

Possible choices are:

Every new..

Year

Quarter

Month

Week

Day

Hour

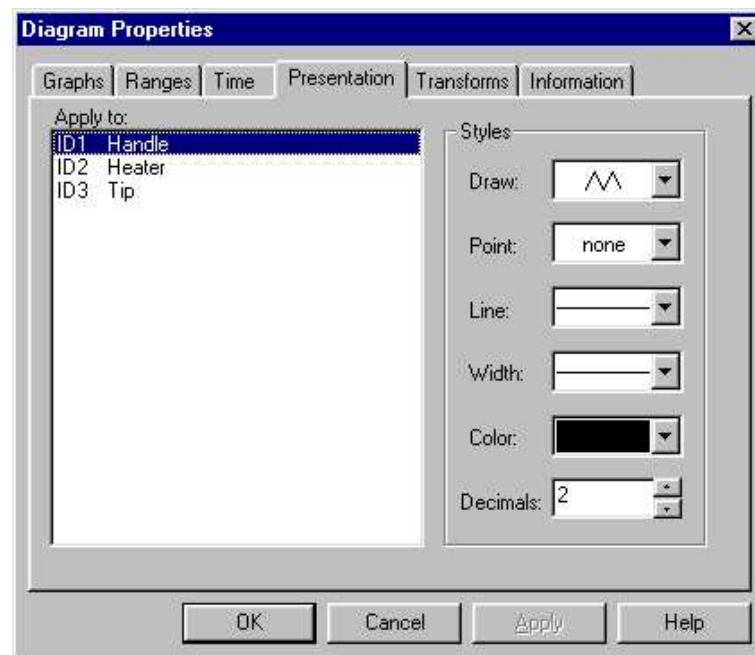
Trig

The flags also serve as zooming tools. Read more in the zoom chapter.



7.5.2.4 Diagram Properties - Presentation

Double-click or right-click in the graph area to invoke the diagram properties. Then choose Presentation.



Use extended selection or single selection of channels to change the appearance.

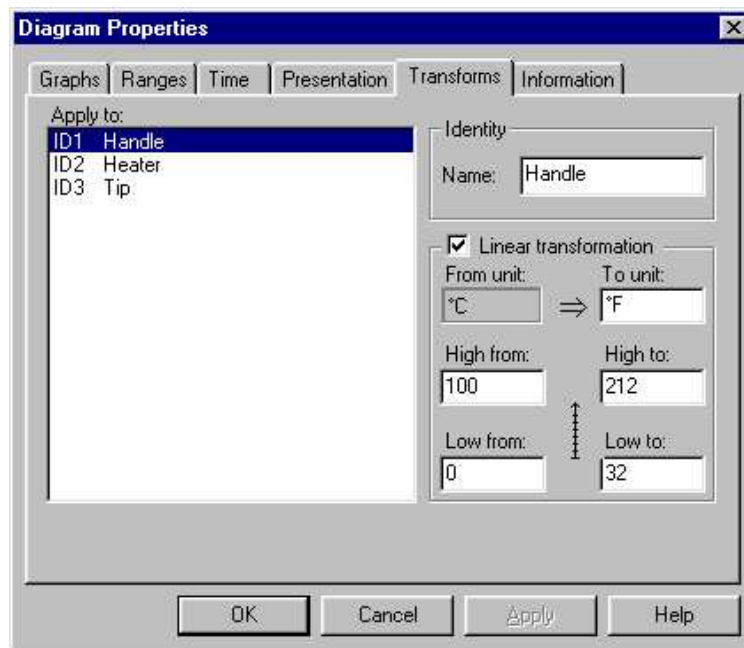
Draw: Choose between point-to-point line draw and step between values.

Point: Put markers on the graph so it is easily distinguished from other channels.

Decimals Sets number of decimals shown in the Info and Data tables.

The others are, we believe, self-explanatory.

7.5.2.5 Diagram Properties - Transformation



Linear Transformation

Add Linearly Transformed signals to your Diagram Document

Transformation of "raw" logger data may be programmed in this menu. Transformation here includes not only linear transformation of data but also freely programmable engineering unit. The linear transformation is actually an application of a straight-line equation defined by two pairs of numbers.

If many of the channels are to be configured in the same way, you can mark multiple channels by holding down the mouse and drag. Ctrl and Shift-click works as well.

Linear transformation is disabled or enabled by un-checking or checking the "Linear transformation" box.

An example:

The relationship between centigrade and degrees Fahrenheit is **linear**. Centigrade can therefore be easily and correctly transformed into °F.

Input signal is °C which should be converted in-"to unit" °F.

You know (?) that 0°C corresponds to 32°F and 100°C corresponds to 212°F. Enter these values as shown in the illustration above.

One more example:

Using a constant current source of 500µA to measure temperature with a Pt100 can usually be linearly transformed without errors becoming too large.

At 0°C the Pt100 is 100Ω and at 266.4°C it is 200Ω.

Since Ohm's law applies ($U=R \cdot I$) it easy to realise that 50mV corresponds to 0°C and 100mV corresponds to 266.4°C.

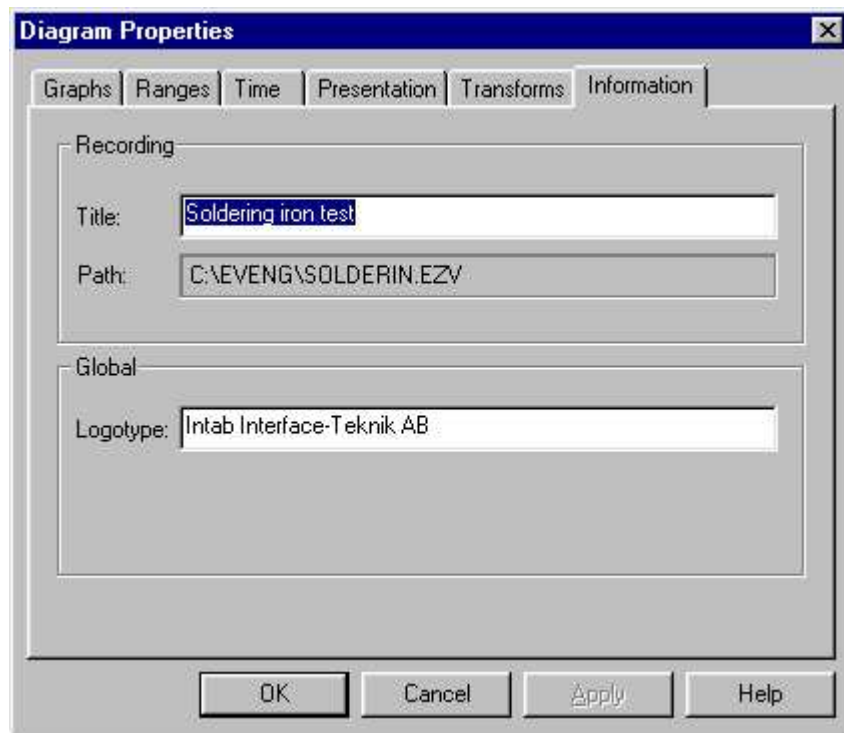
So, enter 100 in "High from" and 266.4 in "High to". Go down to "Low from" and enter 50 and finish it all by entering a zero in "Low to".

Check "Linear transformation" to activate the transformation.

7.5.2.6 Diagram Properties - Information

You can change the title of the recording in the upper edit field. This is the same title you will see in the browser when opening a recording.

The lower edit field contains the company name that you typed in when you installed this software. If you want to change the logotype you can do so here. This information will be saved and used for all recordings.



7.5.3 Plug-in

The third row in "Properties" changes with active plug-in:

- Data table
- Histogram
- X/Y-diagram
- Process diagram
- Duration

7.6 Options

There are three dialogs in this menu.

7.6.1 Extended features..

Extended features are enabled in Options/Extended features. Keep the features you have no need for disabled. It makes life easier and saves valuable processing time.

Alternative entry point is the  key.

Add Plug-ins

Active plug-ins are accessed under its respective tab in the data table area of the Diagram Document. The plug in window size is adjustable. Try it!

Alternate view layout will make the Info-table appear on the left hand side of the working space instead of at the top.



Active plug-ins are in this case data table, Formulas, Notes and Y(x) diagram. All of these are not present in all versions of EasyView. Here is a table showing presently possible combinations:

EasyView - Light	EasyView - Pro	Optional Plug-ins
<ul style="list-style-type: none"> Notes Data Table 	<ul style="list-style-type: none"> Notes Data Table Formulas X/Y Diagram Histogram Process diagram Duration diagram 	<ul style="list-style-type: none"> OPC Server DDE Server Publisher Alarm Lambda-Tune

Please note the information written at the bottom of the “Extended Features” menu.

7.6.2 Font

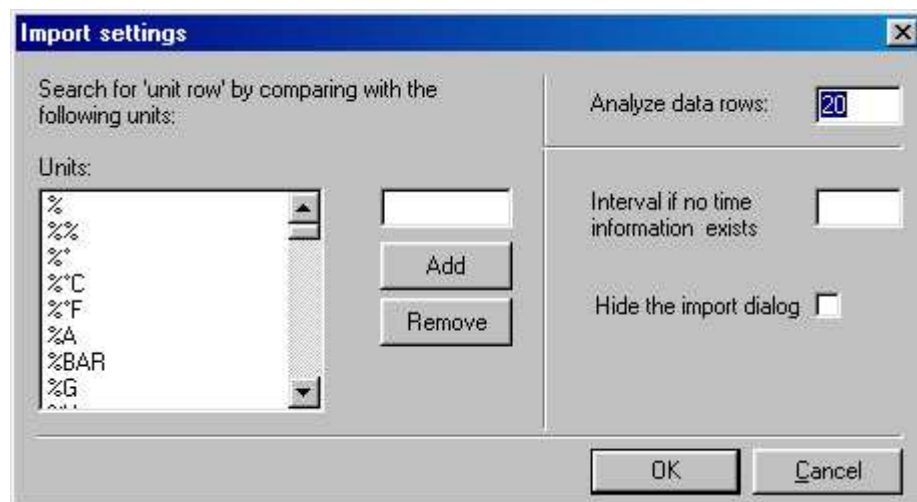
Options/Font

This dialog is the standard Windows menu where you select font. Read windows help if you need assistance.

7.6.3 Import

Options/Import

Import will show the following menu:



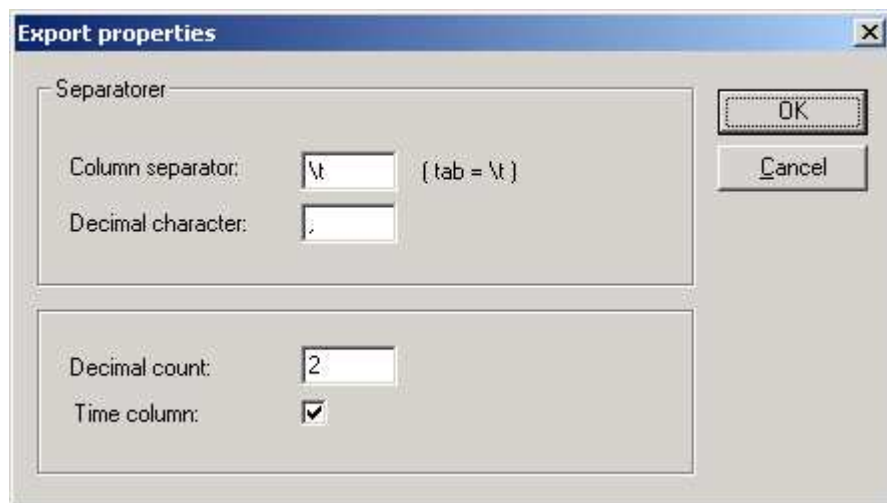
To help the program to find the units of signals we have constructed a small database with common **units**. You will make it easier if you add the missing units of your signals. Just enter your unit and click on "Add". Since the search will be case-insensitive, it will appear as upper case letters even if you wrote lower case ones.

To speed up analysis the number of rows in "**Analyse data rows**" should be as small as possible. Just remember to give the program a fair chance to find all relevant information like channel names, channel units, timing and date information.

Please supply **interval** information if you know that timing information is missing in your file.

7.6.4 Export

These settings are used to program some parameters to make import into the destination application easier.



Column separator is by default a “tab”. Any other printable character is acceptable. The **Decimal character** (mark) is a point in the English speaking countries and a comma in all (?) other countries.

Decimal count limits the amount of decimal places to export. Be sure to set this to the number required by your application.

The **Time Column** is not always needed. Uncheck this box if the destination doesn’t require the time information.

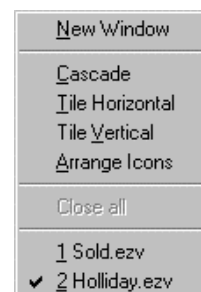
7.7 Window

7.7.1 New window

Window/New window

"New Window" opens a new (=another) copy of the active window. These two (or more) windows will show data from the same recording but can be individually scaled to show different aspects of the collected data. **Templates will not be applied to these new windows.**

Saving a Diagram Document will save the settings of all windows representing the opened document.



Example.1 Show two windows with the same recording. One shows the entire recording and the other an enlarged detail of the first.

Example.2 Split up recordings with many channels into several windows each containing a selection of channels. A 24 channel recording split up into two windows of 12 channels each will increase readability, especially if several signals have comparable magnitudes.

A maximum of eight windows may be open at any one time.

7.7.2 Cascade, Tile Horizontal, Tile Vertical, Arrange icons

Window/ Cascade
Tile Horizontal
Tile Vertical

Arrange windows and icons

Multiple open windows may be arranged several ways. Use one of the following alternatives:

Cascade

Tile Horizontal

Tile Vertical

Minimised windows are shown as icons at the bottom of the screen. Select "Arrange icons" to arrange them in a tidy row if several recordings have been minimised.


7.7.3 1, 2, 3Open Window

Window/ 1 Recording1.EZV
2 Recording2.EZV...

This is a list of open Diagram Documents. Click on one to make it the active Document. The active document is checked. You may also use Ctrl + F6 to step between documents.

8. Plug-ins : Extended features in EasyView

8.1 General

To open this dialog you can either use the  button on the toolbar or Extended features in the Options menu.

The purpose of this option is to make your application fit your needs. If you for example have no need for an X/Y Diagram you can deselect it here to avoid confusion later.



Add Plug-ins

The upper listbox is at present containing **Formula Editor**, **Histogram**, **Notes**, **Process diagram** and **X/Y Diagram**. These are so called "Plug-ins" which means that they may be added as needed. There is no limit to how many or few plug-ins there are in your case or eventually may be.

Please note the instruction in the illustration regarding adding plug-ins.

Standard features

Linear Transformation Transform your process signal into engineering unit.

You can enable this features any time you want. It can be loaded dynamically. Just like the Plug-ins, it may be inactive the first time you start EasyView.

Alternate view layout Move the Info-table to the left of the diagram

This view is very useful when you are displaying a large number of signals and want to be able to see all the key values of the info-table.

8.2 Notes

“Notes” is a simple text editor. It is much like the well-known Windows Note pad. All editing keys work here too: arrows, Del., Home, End etc.

For every diagram tab there is a new notes sheet available to enter your remarks. Use the notes sheet to write down particulars about the recording you are analysing. You will appreciate this feature when you return after one year and find your notes describing the signals present on your screen and reminding you of why you scaled this particular view to show these particular features.

8.3 Data table

The Data table is a Plug-in. All plug-ins will appear in the window to the right in EasyView. Plug-ins are activated or deactivated in the extended features dialog.

The Data table presents the graphs in text (ASCII) format. Only data of the selected time span will be presented.

[1]	Heater upper [°C]	Heater lower [°C]	Tip [°C]
05-18 17:16:35	45,20	50,00	52,30
05-18 17:16:37	44,80	49,90	52,00
05-18 17:16:39	45,20	49,80	51,80
05-18 17:16:41	44,90	49,80	51,80
05-18 17:16:43	44,60	49,40	51,50
05-18 17:16:45	44,60	49,20	51,20
05-18 17:16:47	44,30	48,90	51,00
05-18 17:16:49	44,30	48,90	50,70
05-18 17:16:51	44,00	48,70	50,70
05-18 17:16:53	44,00	48,40	50,50

8.3.1 What does the Data table contain?

The channels shown in the diagram area will be presented in the data table. If you want to hide a channel in the data table, just hide it in the diagram and it will be hidden in the data table as well.

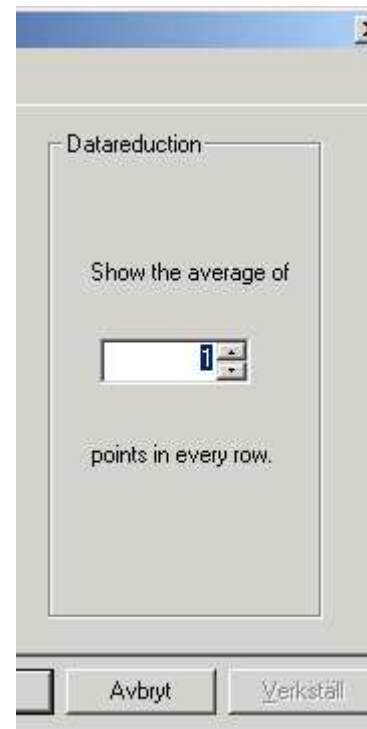
The same goes for the time span shown in the data table. If you want to look at a different time zone you have to rescale the time axis to a new position.

8.3.2 Data reduction

Even the best of operators oversample from time to time. The result is unmanageable amounts of data in which the interesting portions are drowned. So **data reduction**, a feature that many have been waiting for, has been implemented in the data table. The function does not alter the existing data, but it presents a reduced amount of points by averaging values. The reduction factor is set by the operator and can be anything between 1 (no reduction) and n (n=total amount of shown samples).

Follow these steps below to reduce the amount of data:

- Double click in the leftmost column of the data table.
 - Choose a reduction factor between 1 and n and OK
- Averaged values are now presented in the data table.



8.3.3 Export/Copy the data table information

When the data table contains the data you want to export just activate the data table by clicking in it and choose "Edit/Copy" in the menu. Large amounts of data may take some time to copy. A progress bar will indicate time left.

When the data is successfully copied you may paste it into any application you like.

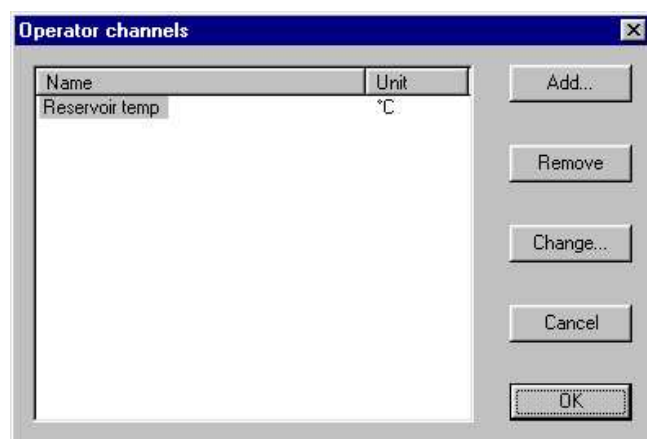
8.3.4 Operator channels

During recording sessions it may at times be desirable to record measurements from instruments that don't have electrical outputs. They have to be read on a scale, bar graph or numeric display.

These measurements may be important for the validity of the other parameters.

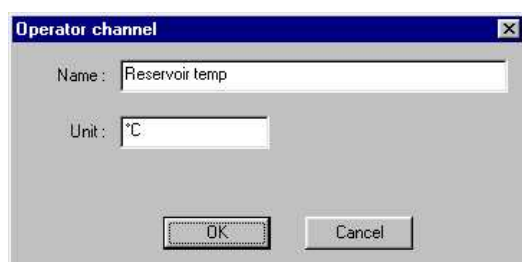
We have therefore opened up the possibility to manually enter "observed" data. These artificial channels are called "**Operator channels**".

Operator channels are columns in the data table.



Right-click in the data table to open the dialog at left. It shows existing operator channels and is your tool to add, change or remove them. The buttons don't need further explanations. Do they?

Add... and Change... will take you to the following dialog:



Name and **Unit** have the same significance as in ordinary channels.

When you have established your operator channels in the dialogs shown above, a new empty, column will have appeared in the data table. Place the mouse pointer in a cell corresponding to the time where you took a reading and click. Enter the value. When you have taken the next reading you type it too into a cell having the correct time.

Behold! All empty cells between the two values will automatically be filled by interpolated values and a "rudimentary" graph will have seen the light of day. Continue adding "observations" for as long as is needed in the recording.

The screenshot shows the INTAB PC-Logger software interface. At the top, there are tabs for 'Data table', 'Formula Editor', 'Histogram', 'Notes', 'Process', and 'XY Diagram'. The 'Data table' tab is active, displaying a table with three columns: 'Time [1/1]', 'Flow [l/m]', and 'Reservoir temp...'. The table contains 18 rows of data. The 'Flow' column shows values that are interpolated between observed points. For example, between 16:41:13 and 16:41:15, the flow values are 24.00, 24.00, and 23.90. The 'Reservoir temp...' column shows values that are also interpolated, such as 8.00, 7.96, 7.72, 7.58, 7.45, 7.31, 7.17, 7.03, 6.89, 6.75, 6.62, 6.48, 6.34, and 6.20. The status bar at the bottom indicates 'ss F1' and 'INTAB PC-Logger on COM'.

Time [1/1]	Flow [l/m]	Reservoir temp...
1999-10-21 16:41:13	24,00	
1999-10-21 16:41:14	24,00	
1999-10-21 16:41:15	23,90	
1999-10-21 16:41:16	24,00	8,00
1999-10-21 16:41:17	24,00	7,96
1999-10-21 16:41:18	24,00	7,72
1999-10-21 16:41:19	23,90	7,58
1999-10-21 16:41:20	24,00	7,45
1999-10-21 16:41:21	23,90	7,31
1999-10-21 16:41:22	24,00	7,17
1999-10-21 16:41:23	23,90	7,03
1999-10-21 16:41:24	24,00	6,89
1999-10-21 16:41:25	24,00	6,75
1999-10-21 16:41:26	24,00	6,62
1999-10-21 16:41:27	23,90	6,48
1999-10-21 16:41:28	24,00	6,34
1999-10-21 16:41:29	24,00	6,20
1999-10-21 16:41:30	24,00	

8.4 Formulas

The EasyView application is designed on the principle that it should be the only application needed to manage and analyse collected data. There should be no need to export data to other programs!

The possibility to apply formulas to collected data is therefore a must.

EasyView features advanced mathematical tools. Formulas or polynomials containing constants, channels as variables and employing all thinkable operators are easily constructed and presented as graphs and tables.

The versatility is way beyond what most of the famous spreadsheet programs can offer. The limitation is usually the imagination of the operator.

NOTE!

The following sections describe how to write formulas: format and syntax. All available operators and functions are also explained.

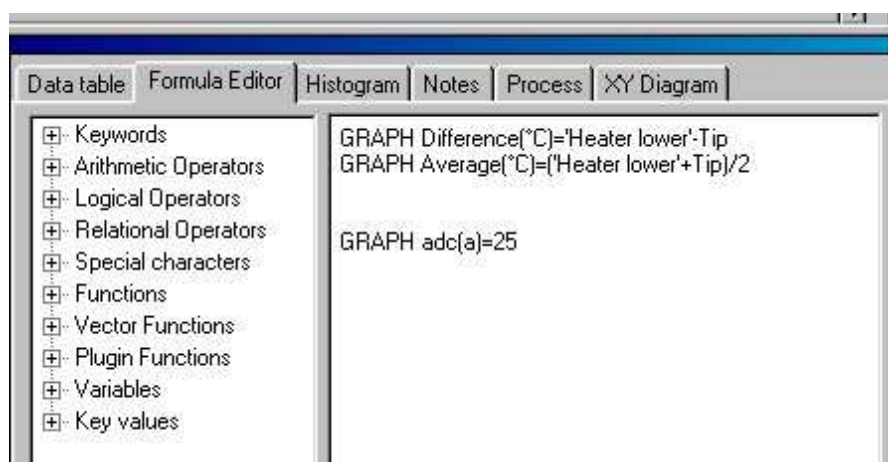
This information is complete and adequate for anyone who wishes to use the mathematical powers of this software.

How mathematics can be applied to your particular task is your problem (!). To start your thinking and whet your appetite for formulas there is a collection of examples at the end of the formula section.

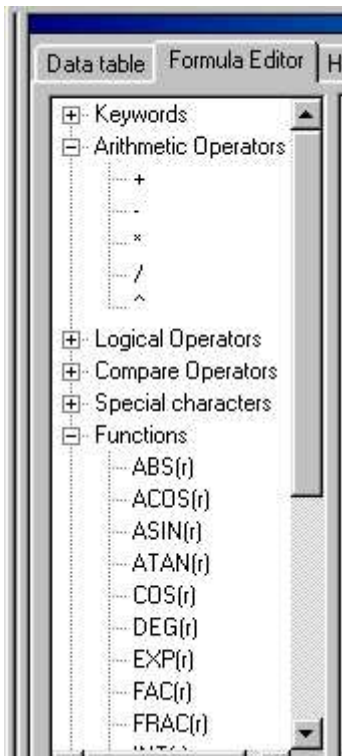
NOTE also that the list separator and decimal point character specified in the Windows control panels “National Settings” must be used when writing formulas. **Decimal point** is a dot (.) in the Anglo-Saxon world and a comma (,) in other parts of the world. **The list separator** is usually a comma (,) or a semicolon (;).

8.4.1 Where do I find the formula Editor?

- Open the plug-in section by dragging the right hand side edge inward.
- Click on the **Formulas** tab to open the dialog illustrated below.



The tools: **Functions, Operators, Variables, Keywords** etc. are shown at left. They can be expanded by clicking on the “+”.



This activates lists from which you can "click to pick and place" the indicated factors.

This feature greatly reduces time spent and simplifies "assembly" of correctly syntaxed formulas.

The **Functions** will do for you what the operators aren't able to.

If you are unsure of what signals you have to play with, you may consult the **Variables**.

All the above are explained in detail further on in this manual.

8.4.2 Procedure

A formula has always one of the structures or syntaxes illustrated below:

GRAPH "formula descriptor" (unit) = formula (generates visual graph)
GRAPH "formula descriptor" = formula (no visual graph generated)

You can type in all factors "by hand" if you like, but we recommend that you use the "pick lists". The chance of errors will be greatly reduced.

Below is a step by step instruction of how to create the example formula below (Current and Voltage are recorded signals):

GRAPH "Power" (kW)=Current*Voltage

Operation

1. Click on GRAPH in the Keyword list
2. Type "Power"
3. Type (
4. Type kW
5. Type)
6. Type =
7. Click on **Current** in the variables list
8. Click on * in the operators list
9. Click on **Voltage** in the variables list

Result

GRAPH
 GRAPH "Power"
 GRAPH "Power"(
 GRAPH "Power"(kW
 GRAPH "Power"(kW)
 GRAPH "Power"(kW)=
 GRAPH "Power"(kW)=Current
 GRAPH "Power"(kW)=Current*
 GRAPH "Power"(kW)=Current*Voltage

It wasn't difficult, was it?

If you prefer to type in formulas by hand, please remember the following:

- All functions and operators must be typed using capital letters
- All formula descriptors must be enclosed by inverted commas if they contain a space.
- All variables must be typed **exactly** as defined in the variables' list.

Special case:

Formulas may be written without "unit". These formulas will be calculated and the result made available for "later" formulas but they will not be drawn as graphs.

In the following sections, describing syntax and function of the mathematical tools, the following notations are used:	
r	- Real value, floating point number. Measured value or constant.
n	- Integer. Argument.
ID	- Variable: channel, signal.
t	- Time in seconds.

8.4.2.1 Practical features

Errors are in red	When typing, formulas are continually checked for syntax. Incomplete or incorrect syntax is in red letters and ignored.
Correct syntax will turn black	As soon as a formula line is correct it will turn black. Concurrently the new graph will be drawn.
Errors are described	The status bar will inform you of the type of error you have made.
Suppress plotting	Continual re-plots may be irritating when typing. Click right and deactivate "Redraw automatically".
Redraw when you are done	Right click and select "Redraw now" to see how your newly constructed formulas look as graphs.

8.4.3 Functions

Function	Description
ABS(r)	Returns absolute value <i>Example: ABS(-10) returns 10</i>
ACOS(r)	Returns the angle the Cosine of which is (r) <i>Example: ACOS(1) returns 0 (0°)</i>
ASIN(r)	Returns the angle the Sine of which is (r) <i>Example: ASIN(1) returns 1.57 (90°)</i>
ATAN(r)	Returns the angle the Tangent of which is (r) <i>Example: ATAN(1) returns 0.785 (45°)</i>
COS(r)	Returns the Cosine of r <i>Example: COS(3.14) returns -1</i>
DEG(r)	Transforms radians into degrees. <i>Example: DEG(3.14) returns 180°</i>
EXP(r)	Exponent of e <i>Example: EXP(4) calculates e^4 (=54.6)</i>
FAC(r)	Evaluates the faculty ! <i>Example: FAC(4) returns 1*2*3*4=24</i>
FRAC(r)	Returns decimal fraction of value. <i>Example: FRAC(31.232) returns 0.232</i>
INT (r)	Returns the integer portion of value <i>Example: INT(31.232) returns 31</i>
LN(r)	Returns e logarithm of values>0 <i>Example: LN(10) returns 2.30...</i>
LOG(r)	Returns base 10 logarithm of values>0 <i>Example: LOG(10) returns 1</i>
PWR(x;y)	Returns y raised to x <i>Example: PWR(2;ID1) returns the square of ID1</i>
RAD(r)	Transforms degrees into radians <i>Example: RAD(180) returns 3.141592653589793238462..</i>
RND(r)	Returns a random number within the range of the power of the signal value. <i>Example: RND(30) returns a number between 0 and 99</i>
SGN(r)	Returns +1 if positive and -1 if negative
SIN(r)	Returns Sine of r in radians. <i>Example: SIN(3.14) returns 0 (almost)</i>
SQRT(r)	Returns square root of value <i>Example: SQRT(144) returns 12</i>
TABLE(ID;r)	Returns a transformed value by interpolating in the two-column Tabler.txt file (r is a sequential number).
TAN(r)	Returns Tan of r. <i>Example: TAN(Pi/4) returns 1.548..</i>

8.4.4 Vector functions

Functions that begin with a "V" are so called vector functions. These are used in formulas that need calculated values that take several samples into account. The argument separator (if applicable) is the one selected in the windows' control panel.

Function	Description
VAVEL(ID;n)	Returns, for every data point, the average value over $2n + 1$ samples. I.e. $\left(\sum_{-n}^{+n} S \right) / (2n + 1)$ <i>Ex: VAVEL(ID1.ave;5) returns an average of 5 samples back in time, the current value and 5 samples ahead.</i>
VDER(ID)	Returns, for every data point, the Derivative calculated by $(f(t-2dt)-8*f(t-dt)+8*f(t+dt)-f(t+2dt))/12$ <i>Ex: VDER(ID1.ave)</i>
VDER2(ID)	Returns, for every data point, the Second Derivative calculated on one sample ahead and one backwards from the actual value. I.e. $X_2 - X_1 = 2\Delta t$ <i>Ex: VDER2(ID1.ave)</i>
VMEDL(ID;n)	Returns, for every data point, the median value of $2n+1$ values <i>Ex: VMEDL(ID1;7) returns the median of 7 values from channel 1</i>
VPOS (ID)	Returns, for every data point, time from recording start as days. <i>Ex: VPOS(ID1.ave) may return 2.1323 which translates as 2 days, 3 hrs, 10 mins and 31 secs</i>
VREV(ID)	Returns sampled values in reverse order, i.e. Last value first and first value last.
VSIZE(ID)	Returns a decimal value for the recording length (or duration) expressed in days.
VSKEWL(ID;n)	Creates a skewed (or time laterally displaced) graph. Skew is given as "n" samples. <i>Ex: VSKEWL(ID1.ave;5)</i>
VSKEWT (ID;t)	Creates a skewed graph. Skew is given as "X" in units of "t" which represents s, m or h for seconds, minutes or hours. Do not mistake this function for the Info table's skew. They are not identical.

8.4.5 Operators

Most mathematical operators are familiar to all of us. Some may need explaining. The well known arithmetic operators include +, - and =. Operators like GT, LT are briefly explained below. ^ is used to exponentiate: X^Y means X raised to Y. Parentheses change the order of precedence. **AND (&), BIT, OR (|), XOR, >** and **<** are **logical operators**. (The characters in parentheses may be used in place of the operator they signify.)

	Arithmetic Operators
+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation
	Logical (Boolean) Operators
AND &	The Boolean AND operates on binary whole numbers representing values. It returns the result of the operation! <i>Example : GRAPH mask (Din)= ID31 AND 4</i> <i>Returns a 4 if bit 2 of channel 31 is a one</i>
OR 	Performs logic OR. <i>Example : GRAPH both (on)= ID31 OR 4</i> <i>Returns 4+ID31</i>
BIT	The BIT operator tests bits of whole numbers. <i>Example: GRAPH mask (Din)= ID31 BIT 2</i> <i>Returns a one if the result is true, i.e. bit 2 of Ch 31 is a 1.</i>
XOR	The best way to describe a so called half adder is to illustrate with a truth table: It is valid for every position in a binary number. <div style="text-align: center;"> 0+0=0 1+0=1 0+1=1 1+1=0 </div> <i>Example: GRAPH add (bin)= 5 XOR 3 (Returns 6)</i>
~	The "tilde" will invert any value such that a Zero will become a one, and anything different from zero will become a zero.
	Relational Operators
>, <	Compare variables. They return a 1 if true, else zero. <i>Example : GRAPH "greater than"(bit) = ID1 > 5</i> <i>Returns a 1 for all points where the signal is above 5</i>
=	A one is returned if equality exists. Else zero.
>=	Greater or equal to. A one is returned if true. Else zero.
<=	Less or equal to. A one is returned if true. Else zero.
GT	Returns the greater of ... and ...
LT	Returns the lesser of ... and ...

Finally we make available a number of "odd" characters that are handy to have close by.

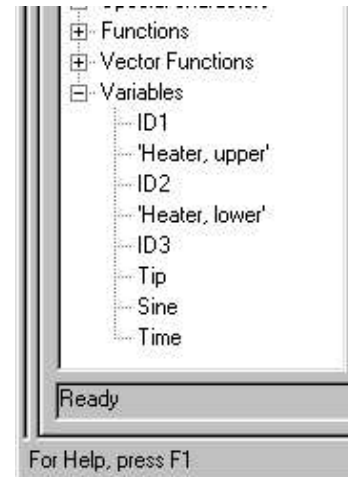
°	Degree sign
μ	Mu, micro-
²	Square, raised to 2
[]	Square brackets to "index" values. See 8.4.7

8.4.6 Variables

Available variables are the channels that have been recorded and the formulas previously compiled. All active channels are represented in two ways. The first is the channel id like ID.ave. The second is the channel descriptor or name that you yourself assigned to each channel before starting the recording. These two are completely interchangeable. Pick the one that is least likely to confuse the operator.

Example : ID1 may well signify the same channel as Heater upper.

Formulas may also be used as variables. Just make sure that they are previously defined on a row above. Especially formulas without unit are meant to be used this way.



8.4.7 Previous value - Integrate

The mathematical power of EasyView has increased considerably by the introduction of yet another, very useful, operator. It allows expressions that point backwards or forwards in time in relation to the value being processed "just now".

The uses are innumerable and the syntax simple. You just have to supply an index to the signal: ID1[-1]. Note that square brackets are used. A minus points backwards in time and a plus or no sign point forward.

An example:

GRAPH difference (°C) = ID1 – ID[-1]

This formula will generate a graph showing the difference between the "present" value and the "previous". The difference is of course an increase or a decrease. If you at all remember your high school maths you will see the similarity with derivatives.

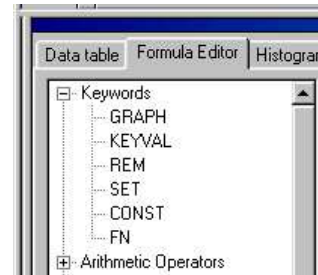
Now we'll integrate to calculate total volume from a flow:

GRAPH integral (l) = integral[-1] + ID2 * interval

This formula will create a graph that will increase until its end value which is total volume. Be sure to get your units right before you get mixed up.

8.4.8 Keywords

There are at present six keywords.
They always lead off any expression in the formula editor.
You are already familiar with **GRAPH**, but it will anyway be explained below with the other four.



GRAPH (or FML)	Defines a formula. <i>Example : GRAPH "My Graph"(Sinα) = SIN(ID1)</i>
KEYVAL	Declares an expression that generates key values I.e. an Info table column <i>Example : KEYVAL test = SUM/N</i>
REM	Precede remarks that should not be processed as formulas or functions. Besides starting comment strings to remind you of what the formulas are put together for, it can be used to temporarily disable a formula. <i>Example : REM GRAPH test($^{\circ}$C) = Temp1.max - Temp2.min</i>
SET	Is used to simplify formula composition by assigning shorter "names" to variables. <i>Example : SET U2 = 'Voltage R2' SET I1 = 'Current R1' CONST R1 = 50000 GRAPH test(V) = U2 - R1 * I1</i>
CONST	This keyword simply declares a constant that can be used in later formulas. <i>Example : CONST PI=3.1415926535</i>
FN	Defines a function. The algorithm is up to you! Functions may have more than one operand: y(z;x) or f(a;b:c) . <i>Example: define the function f1 as FN f1(x;y) = (5*x) - y define operands as GRAPH functest(r/min) = f1(ID1.ave; ID2.ave)</i>

8.4.9 What happens next to the formula?

If the formula you have constructed is accepted as you press Enter or F2 to compile, it will automatically transfer to the shown section of **Graph Properties** and be drawn along with the other selected signals. (formulas with a declared unit that is ..)

Formulas may be employed in Real Time graphing. Formula graphs will progress in pace with the data coming in from the logger.

Calculated data is never saved thus avoiding taking up disk space that may be put to

better use. Calculated formula data is instead recreated every time the document or recording is opened.

You only have to remember to save the "changes" before closing the document.

ASCII tabulated values, that are the result of a formula, are transported to the clipboard exactly as if they were ordinary channel data.

Just select the Data table plug-in and click on Edit/Copy. The data will now be present on the clipboard.

8.4.10 Examples

A simple Formula Example

Suppose you have tank where the temperature difference between top and bottom may not differ by more than 10°C. Preferably there shouldn't be any difference at all.

You wish to monitor the temperature difference and compare it to a set of reference lines.

The following set of formulas may be used:

Formula	Why?
SET top = ID1	Defines a designator for channel 1 as the top temperature
SET bottom = ID2	Defines a designator for channel 2 as the temperature at the bottom
GRAPH "High level"(°C) = 10	Draws a 10 degrees reference line
GRAPH "Low level"(°C) = -10	Draws a -10 degrees reference line
GRAPH "Temp Diff."(°C) = bottom - top	Creates a graph of the temp. difference.

One more Formula Example

Integrate flow to calculate volume. ID1 is a signal representing l/min

First calculate sampling interval (days) and convert to minutes to agree with the flow unit:

GRAPH prev=ID1[-1]

GRAPH interval=(VPOS(ID1) – VPOS(prev)) * 24 * 60

Then we integrate

GRAPH volume(l)=volume[-1] + ID1*interval

8.4.11 A potpourri of formulas

These are examples of formulas. They are shown to spur your imagination and whet your mathematical and logical thinking.

Study them carefully if you think that the previous information hasn't helped you.

You should also be aware of the fact that your mathematical problem is unique and cannot possibly have a ready solution in this manual.

- **Draw a temp reference line at 30°C**
GRAPH "ref line"(°C)=30
- **Linearly convert 4-20mA to 0-100%**
GRAPH "ratio"(%)=6.25*ID1 - 25
- **Add 0.5°C correction constant above 100°C**
GRAPH "corrected"(°C)=ID1 + (ID1 > 100)*0.5
- **Create average of two temps**
GRAPH "ave"(°C)=(ID1 + ID2)/2
- **Show the difference between two temps**
GRAPH "diff"(°C)=ID1 - ID2
- **Smooth "noisy" pressure graph**
GRAPH "smooth"(kPa)=VAVEL(ID1;5)
- **Calculate flow from volume**
GRAPH "flow"(l/m)=VDER(ID1)
- **Replace out of range points with constant maximal value.**
GRAPH "process"(mA)=ID1 LT 20
- **Replace singular points with previous point. "skew" is ID2 skewed by -dt**
GRAPH "no spikes"(°C)=((ID2 - skew) < 10)* ID2 +(1 -((ID2 - skew) < 10))*skew
- **"Good" (1) or "Bad" (0) indication.**
GRAPH "Good"(Yes)=ID1 > 30
- **Draw ID1 when over 30; ID2 when below. Use "Good" above to simplify.**
GRAPH "Best"(°C)=Good*ID1 + (1-Good)*ID2
- **Remove noise spikes using median filter.**
GRAPH "Harmony"(MPa)=VMEDL(ID1;5)

8.4.12 Key Values

Available Key Values that can be used to create new columns in the Info-table are:

AVE	Average Signal value during shown time.
MIN	Minimum Signal value during shown time.
MAX	Maximum Signal value during shown time.
IDT	Signal integral of shown time. Δt is in seconds.
SUM	The Arithmetic sum of all shown values. Σx
SQRSUM	Sum of the squares of all shown values. Σx^2
N	Number of shown values.
CURSOR1	Graph value at position of cursor 1.
CURSOR2	Graph value at position of cursor 2.
ONLINE	Most recent value of on-line recording. Last value in all other cases.

The **Syntax** of Key Values is shown by this formula that calculates **variance**:

KEYVAL Variance = $(\text{SQRSUM} - 2 * \text{SUM} * \text{AVE} + (\text{AVE}^2) * \text{N}) / \text{N}$

Standard deviation is then a "piece of cake":

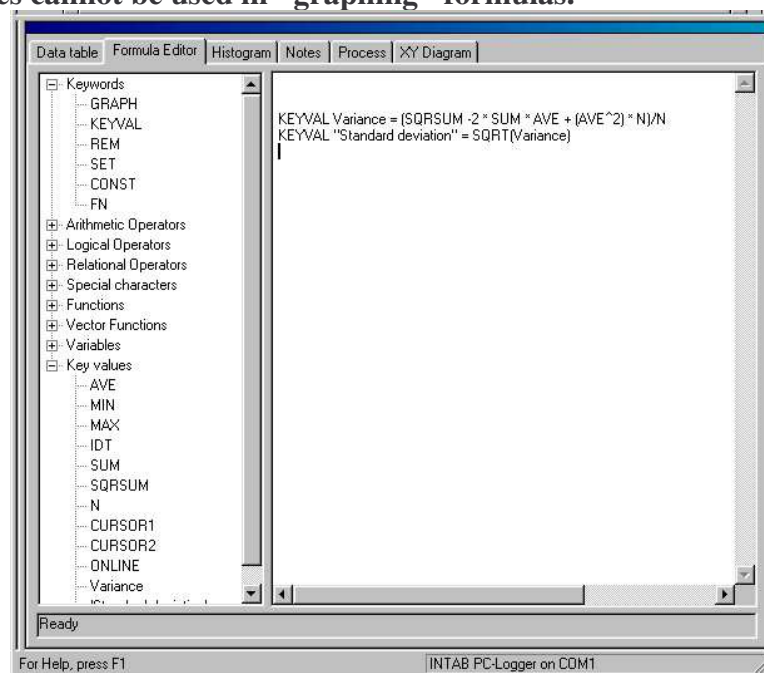
KEYVAL "Standard deviation" = $\text{SQRT}(\text{Variance})$

As you can see, all these expressions have to begin with the Key Word KEYVAL. It helps the program to decide what to do with the string that follows. To sum it up, this is the "formal" syntax: **KEYVAL name=expression**

Allowed operators in "expression" are the arithmetic and functions.

NOTE

- **signals (=variables, channels) and vector functions cannot be used to create Key values.**
- **Key values cannot be used in "graphing" formulas.**



8.5 X/Y Diagram

The normal diagram view is a signal plotted against time. You see for example how a temperature has varied with time. These graphs are termed Y(t) graphs.

On many occasions it is valuable to be able to plot and see how one signal varies as a result of another signal. Examples of this would be temperature vs. power; distance vs. force etc.

Graphs of this kind are Y(x) or X/Y graphs.

Y(x) graphs are drawn from the data displayed in the Y(t) diagram. Select data to be graphed by rescaling the x-axis. Make sure that data to be displayed as Y(x) is monotonous. If it isn't, you may get results that are difficult to interpret.

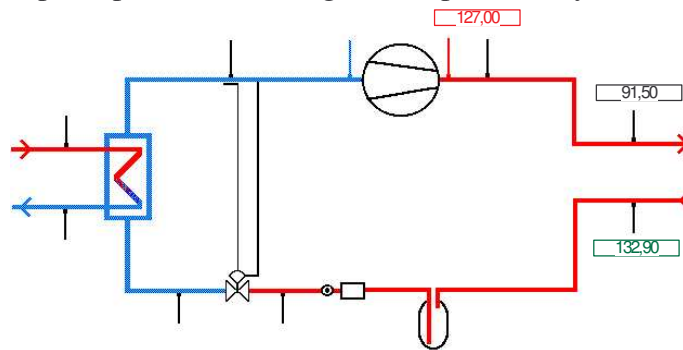
X/Y graphs are rescaled exactly as the time diagram. See relevant sections.

The X/Y x-axis signal is selected among the shown signals by clicking the right mouse button in the diagram and then selecting "Properties".

8.6 Process diagram

It is often of great advantage to be able to relate signals and their values to visual locations. This is where the process diagram has its given place.

The diagram should show a schematic layout of machinery or process equipment with sensor placements clearly marked. Numeric presentation of values can then be superimposed on the diagram (or picture, if you like).



The picture shows a typical cooling system. Three sensor signals have been placed on the "warm side" to make sure it works.

8.6.1 The diagram

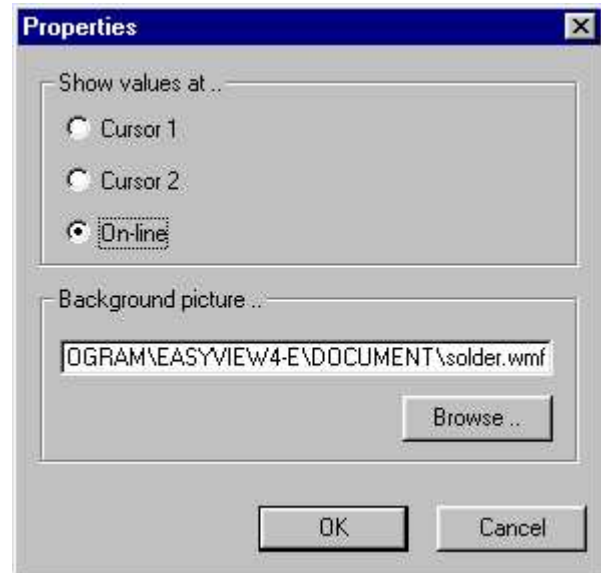
The picture or diagram has to be in one of the following formats, wmf, emf, jpg, gif, bmp or tif. Most drawing programs support at least one of these formats.

Background picture..

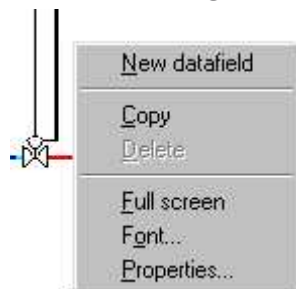
Double click in the process plug-in.
Use the Browse to find the picture you have created in a drawing program.
Should you remember where it is, you can type its path and name instead.

Show values at..

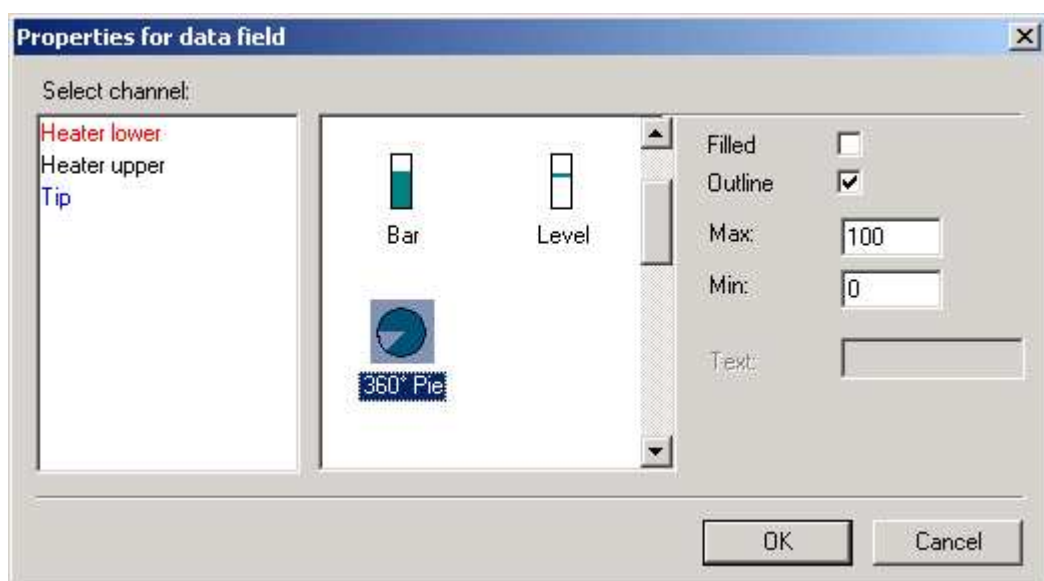
Select on-line for real time recordings.
Select one of the cursors to evaluate “old” recordings.



8.6.2 Place signals

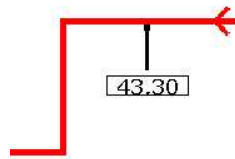


The signals that are to be shown superimposed on the picture must be activated and put in the right place.
Click the right mouse button to activate the menu shown at left.
“New datafield” is entry into “Data field properties” shown below.



“Data field properties” shows a list of available signals. First select one of the signals

you want displayed in the diagram. Then you select the type of representation or value field you want to see: Numerical value, Pie, bar or Gauge.



The value field will be placed where you had the pointer when you clicked. Click and drag if you want to move it.

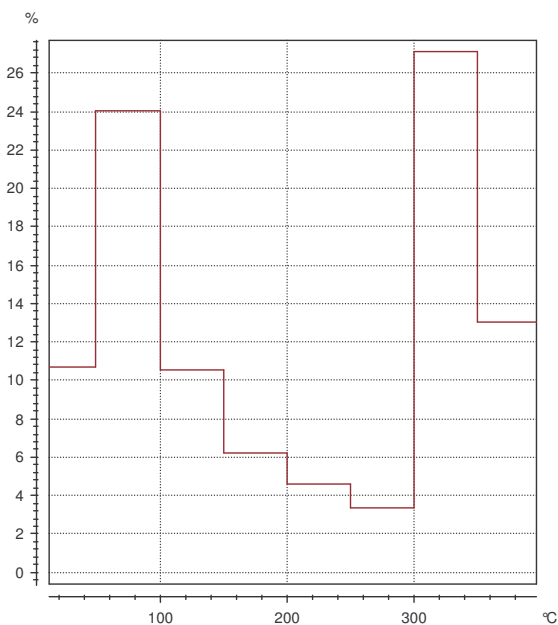


The corresponding pie representation could look like this.
Be sure to program the correct min and max “boundaries” for this figure.

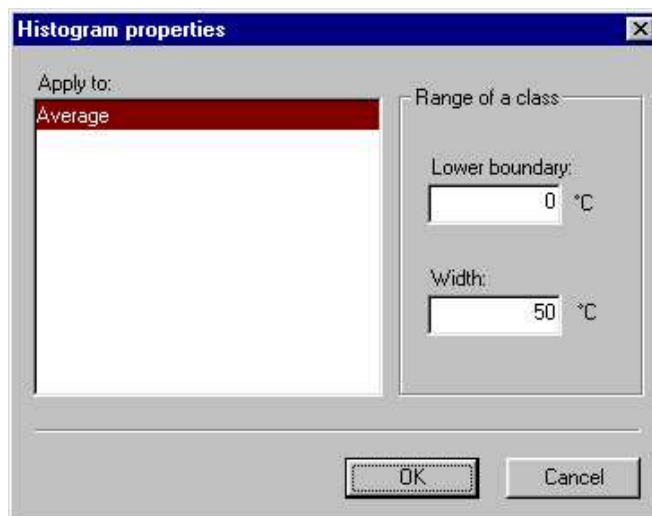
8.7 Histogram

A histogram illustrates the relative frequency of measurements. The measurements are divided into classes of equal width (or range). The number of measurements that fall within a class is expressed as a percentage of the total number of measurements.

NOTE that only measurements shown above the x-axis are included.



8.7.1 Histogram settings



The Histogram settings are programmed in Properties.

Enter a value for **Lower boundary** to specify where one of the classes should start.

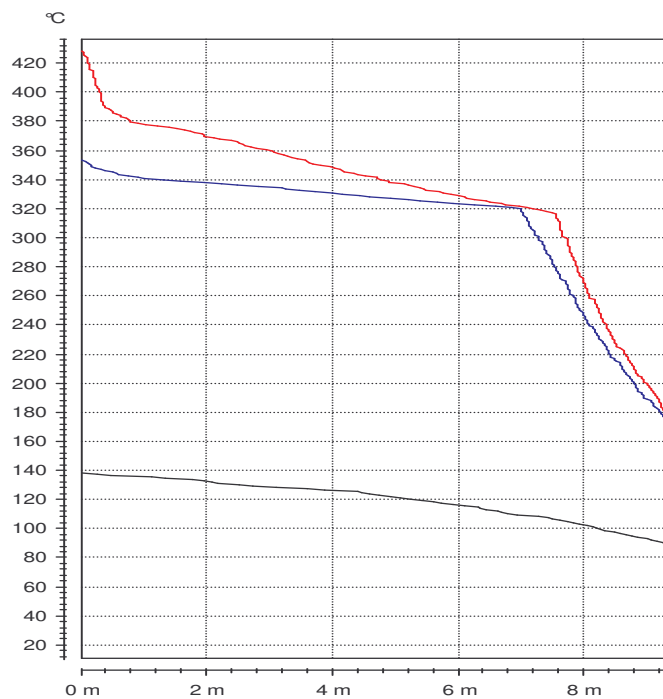
Specify required class **Width**.

The illustrated settings are in effect in the diagram above.

8.8 Duration

Each point on the duration curve shows how long the signal has been above that certain level. By "long" we mean the sum total of all times above that level.

In the example at right, the "lowest" signal has been above 120 °C for about 5 minutes. The "middle" has been above 320°C for about 7 minutes and the "highest" above 360°C for about 3 minutes.



9. Project Manager

This is an EasyView Pro feature.

9.1 What is a project?

Today EasyView supports a lot of different data acquisition devices or services. Some of the properties are common to all of them: *data acquisition*, *presentation* and *storing*. A **project** is a “canister” that holds information about all of these parts to simplify **repetitive recordings**. A project can be *started*, *stopped* and *offloaded* within or outside EasyView via shortcuts.

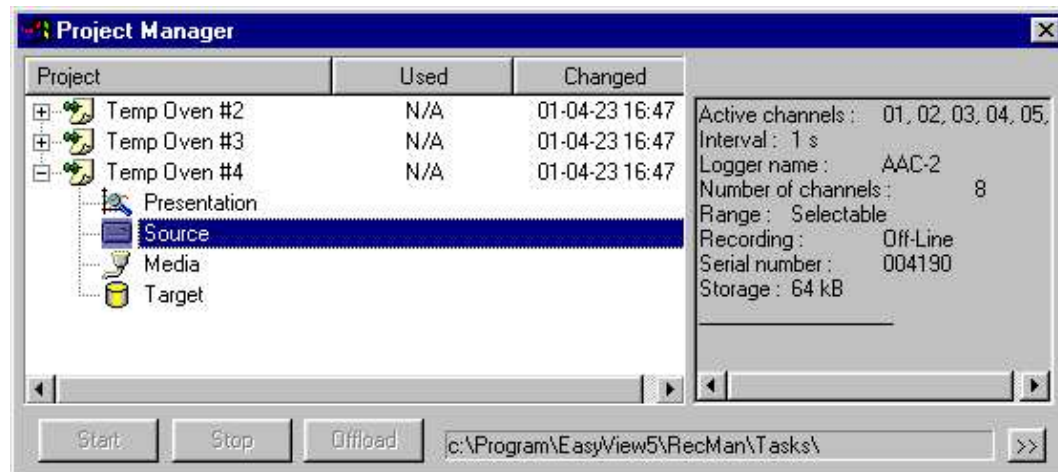
To create a project you have to connect to your recording device. After that, you can modify the project in any way without having the recorder connected.

A project consists of four parts:




- Appearance in the EasyView document.
- Recorder settings.
- Communication interface such as COM port etc.
- Save recordings automatically to a specified location?

To the right in the Project Manager you will find a short summary of the settings for the selected project item.



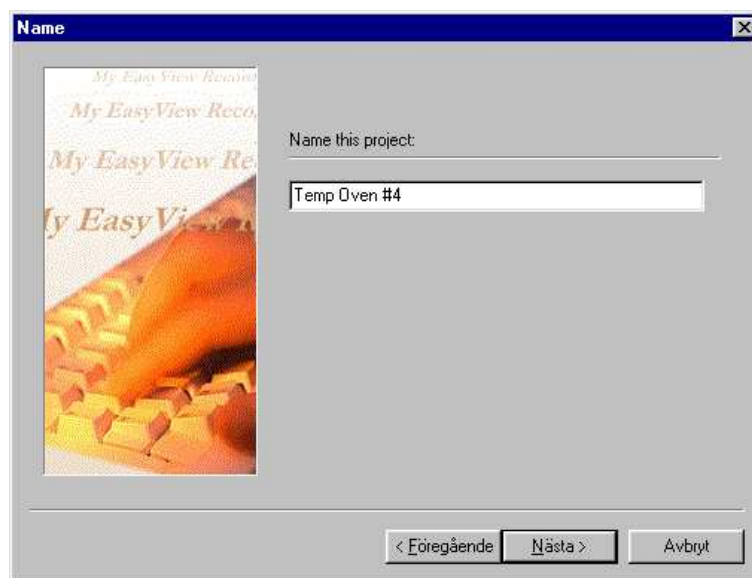
9.2 Create a project

To create a project you first connect to your data source (logger or OPC/DDE). Then click on  or select File/Project Manager.



- **Right click** and select **New folder** if you wish to organise your projects into sub-groups.
- **Right click** the folder in which you want to create the new project and select **New project**.

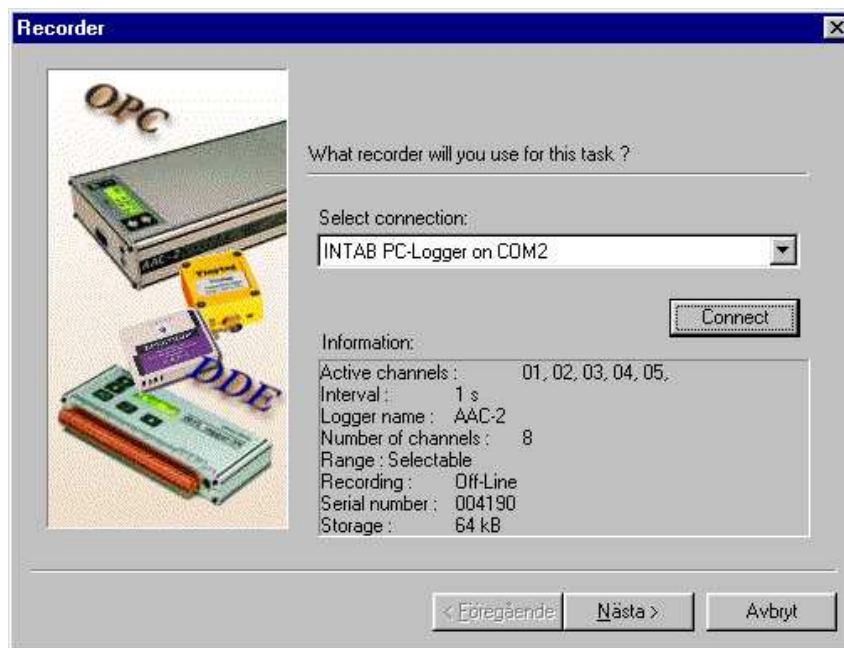
9.2.1 Name a project



The first step in creating a project is to give it a name. This name will be used as a file-name and must only contain acceptable characters. Do not use question marks (?) or asterisks (*).

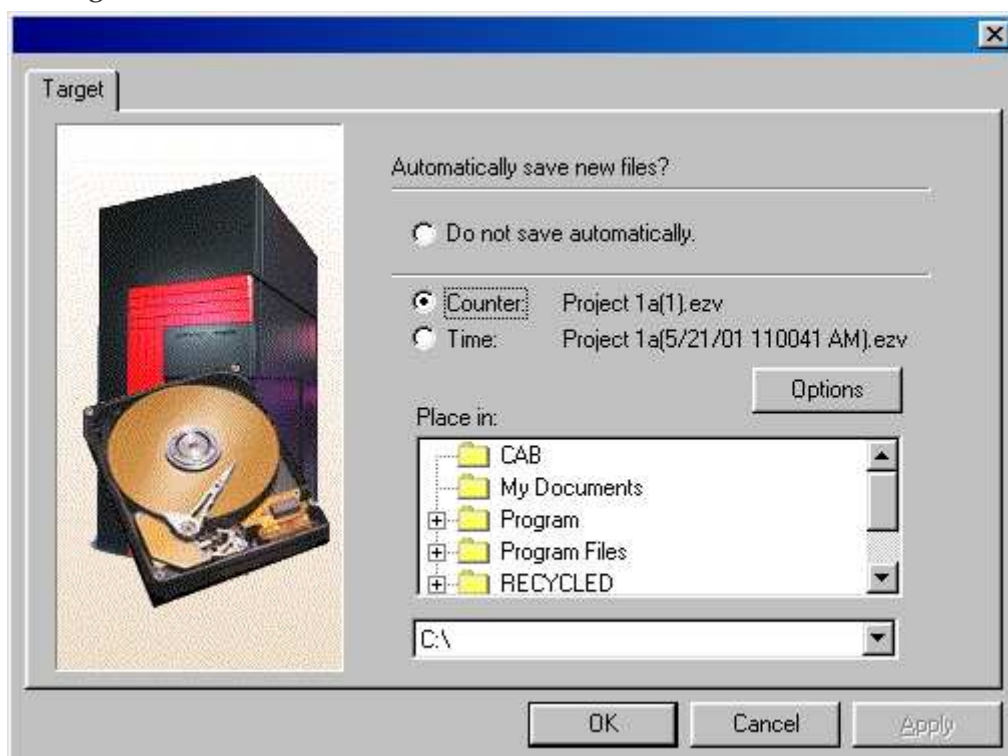
- Enter a name and click *Next*.

9.2.2 Data source



Select connection in the combo box and click *Connect*. A template containing logger properties and settings will be compiled. Click Next.

9.2.3 Target



If you want to have influence over file-names you select "Do not....." and you will be prompted for a name.

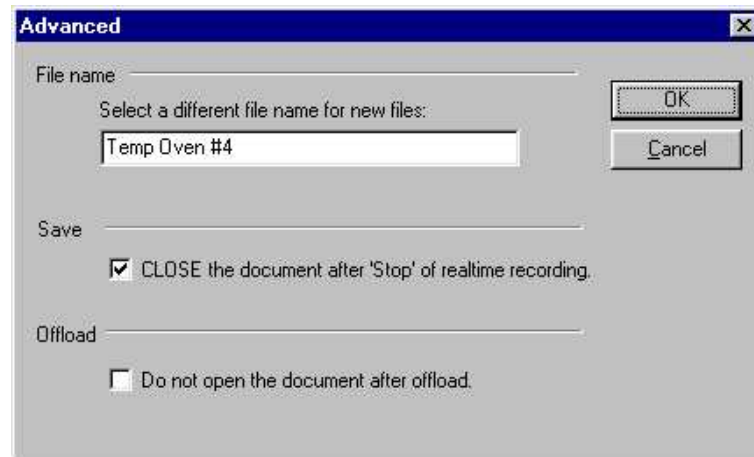
Recordings may be saved automatically at off-loading or on-line.

Automatically saved recordings have your project name as a base.

Counter will simply index your files as they are created. Index numbers are in parentheses: (1), (2) etc.

Time will instead add time and date of the first sample to the name.

Options



Should you wish to use a filename that is different from your project name, this is the place to enter it.

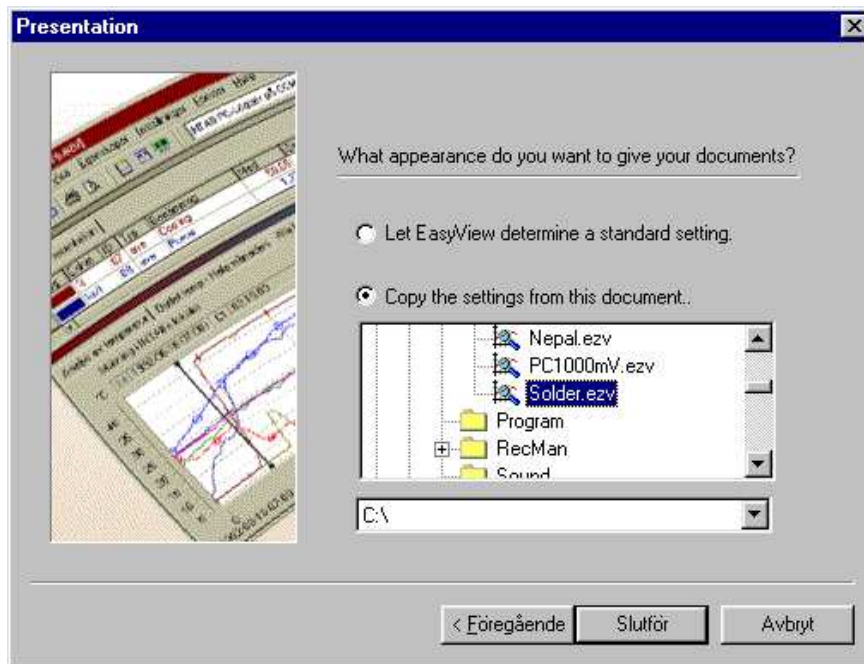
Save

Check CLOSE to automate your project control. Projects may be started and stopped by clicking shortcuts to the project file (.ezt). Place the shortcut in StartUp in case there is a power failure.

Off-load

Check "Do not..." to save off-loaded documents without looking at them. This is essential if you intend to off-load a large number of recordings since EasyView will only accept 4 open documents at any one time.

9.2.4 Presentation



If you already have a Diagram Document containing data from the same channels of the same logger as the one connected, it will save time to copy its appearance.

Select the template file and click Finish.

All settings may, of course, be modified later on.

9.3 Modify Properties

9.3.1 General

Double click the section you want to modify or right-click and select Properties.

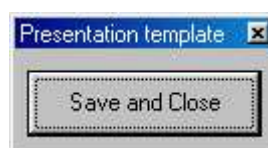


9.3.2 Presentation

Double-click Presentation to edit the way the document will look. A template document based on the active channels etc. of the Source's settings, will be created.

The sine curve is shown as an illustration only. Proper values will become available when the project has been applied.

Make sure that all settings are as you want them: axes, tabs, active plug-ins etc. Click the button shown at right when everything is OK.



9.3.3 Source

Double-click Source. The settings here are the same as the ones in the logger set-up menus (wizard). Select channels, specify sampling interval etc. Read more in the logger sections of this manual.

9.3.4 Media

Media specifies measurement source and its connection to your computer.

Example. INTAB PC-Logger on COM1 or INTAB Real-time Client on OPC1.



You may change the connection but not the type of logger/source.

9.3.5 Target

See *Target* in "Create a project".

9.4 Employing a Project

9.4.1 Start recording

Select a project and click the *Start* button to start a recording. (The alternative method of right-clicking and selecting Start is, of course, also available.)

A real-time recording (on-line) or off-line, depending on the source settings, will then start.

The Project may also be started by double-clicking the project file. See *Automated project control*.

9.4.2 Stop recording

Stopping a recording is done the same way as you start it.

Select a project and click the *Stop* button to stop a recording. (The alternative method of right-clicking and selecting Stop is, of course, also available.)

The Project may also be stopped by double-clicking the project file. See *Automated project control*.

9.4.3 Off-load logger

Loggers, such as PC-loggers and Tinyloggers; equipped with memory, may be off-loaded.

Click the Off-load button or right click and select Off-load.

The Project may also fetch data by double clicking the project file. See *Automated project control*.

9.4.4 "Automated" project control

The Project is stored in a file with the extension *.EZT* . This extension is associated with EasyView in such a way that if you double click the file or a short-cut to it, the project will start even if EasyView is not started.

Should you wish to stop the recording you should click a shortcut that has the switch *"/stop"* .

Example: "C:\Program\EasyView5\RecMan\Tasks\Oven4.ezt" /stop

You may also Off-load by clicking a short-cut. Just add the switch *"/offload"* .

Example: "C:\Program\EasyView5\RecMan\Tasks\Oven4.ezt" /offload

Combined with the Target setting for on-line recordings "CLOSE after stop...." or, for off-line recordings, "Do not open..." the system will become "automatic". The operator has only three icons to click: one to start, one to stop and one to off-load.

9.4.5 Concurrent projects

This new feature will let you run several projects at the same time – in the same diagram. All values are stored in the same document. It is quite possible to run four PC-Loggers, two Real-time Clients and a Tinylogger in real-time and in the same diagram!

Projects that are to be run concurrently may not use the same connection. It is for obvious reasons impossible to have two loggers connected to the same COM port.

Do like this:

1. Select the projects you wish to run (use Ctrl + Click if necessary).
2. Right click and select *Start*, *Stop all* or *Off-load*
3. Select combined or separate.



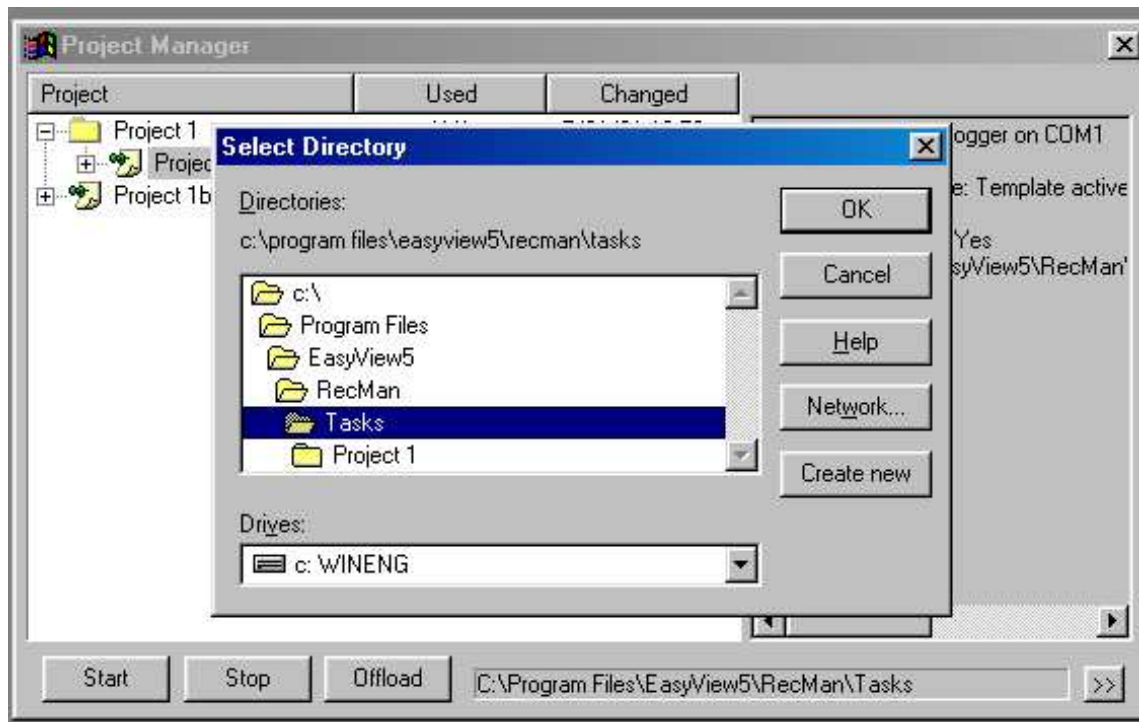
Large "constellations" with hundreds of channels may be visually very congested before you have created tabs, hidden less important channels etc. For this reason it may be wise to create a **Project group** and then assign *Presentation properties* to it

In these cases you select *Create group ...* after you have right clicked. A Project group also has the extension *.EZT* and may be started as if it were a single project.

9.5 Organise your Projects

Select project root directory

It is wise to have the project manager point a directory that is accessible by all authorised users. Change the default project directory by clicking the double arrow (>>) in the lower right corner.



10. Templates

10.1 The Tabs in the Info Table and Diagram

First some general information on Tabs. They should be looked on as templates. Templates that will speed up analysis of the data you collect.

Info Table Tabs each contain a set of columns and rows. Rows represent channels or signals and columns show specific signal information. Every tab can contain a different set of channels and different column information. Columns are added by double clicking in the column header area and selecting desired “topic”. Remove columns by selecting and then pressing delete. The rows reflect the channels activated in the active “Diagram tab”.

Diagram Tabs each shows a set of graphs. Each tab can have its own selection of channels. They can also be individually scaled both in time and amplitude. Presentation parameters are also individually programmable.

Save all your Tab settings in a template. It will speed up future analysis.

10.2 Using Templates

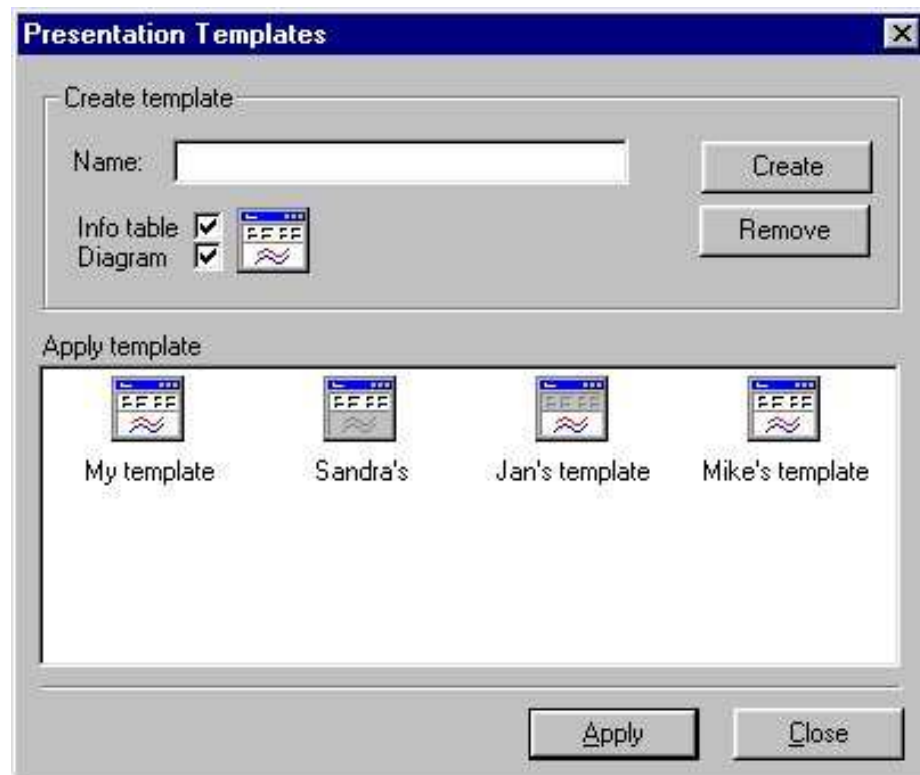
EasyView employs several templates to speed up your daily work with collected data. Below is a classification of the different template set-ups.

There are two main types of templates available in EasyView:

Type	Represented by	Description
Presentation templates (Tabs templates)	Info tabs	Info Table tabs containing column selections.
	Diagram tabs	Diagram tabs containing X and Y-axis scaling set-ups as well as selected channels.
Recording templates <i>for PC-logger</i>	Diagram Document	Saved recordings are used as templates to set up new recordings with the same parameters.
<i>for Tiny logger</i>	Start templates A and B	Two separate start templates can be set up without connecting a logger.

10.3 Tabs templates

You reach the following menu by clicking the right mouse button among the tabs and selecting “Templates..” or selecting File/Templates..



10.3.1 Create a template

Create a template by first entering a name for it. Invent a name that is descriptive of what you are doing, it may well be the jog your memory needs a year from now. Click “Create” (or "Replace") and a new template with the exact settings of your open document will be created.

Note that you can choose between Diagram template, Info table template or both.

The astute has already understood that you have to set up the document as it should be prior to naming a new template.

10.3.2 Active template

The last handled template – select and click Apply – is the active template.

When you have changed all settings and feel lost, all you have to do is click the  and the template will again be asserted.

11. Import tabulated (ASCII) data

EasyView can open tabulated data in ASCII format. The files may have any of the following extensions txt, asc, skv or csv. The file content will be analysed the same way regardless of the file extension.

Tabulated data files (text files) should, to give best results, have

- one line containing measurement unit(s)
- one line containing channel descriptor(s) or name(s)
- a single time format

Here is a simple example:

TEST 1	S/N 19824	
Date	Time	Pressure mBar
97-05-13	08:59:08	1200
97-05-13	08:59:09	1000
97-05-13	08:59:10	980
97-05-13	08:59:11	980
97-05-13	08:59:12	990
97-05-13	08:59:13	1100
97-05-13	08:59:14	1000
97-05-13	08:59:15	970
97-05-13	08:59:16	970
97-05-13	08:59:17	970
97-05-13	08:59:18	960
97-05-13	08:59:19	960
97-05-13	08:59:20	980

If it would make things easier for you, you could always use some kind of editor to modify your files if they deviate too much from the norm.

11.1 Some "theory"

Analysis of a "text" file

A text file, containing data arranged in columns, may be constructed in very many ways. To simplify matters for you, the operator, we have constructed a very powerful analytical tool. All you have to do is select the file and click "Open". The following parameters are searched for:

1) Separators

EasyView no longer consults the control panel's regional settings to define separators like the decimal mark, list separator etc. Instead it tests all common combinations of separators until it finds the proper combination. Below is a list of separators used by EasyView.

List separator

<i>Separator</i>	<i>Denomination</i>
,	Comma
;	Semicolon
tab	One tabulator character (tab)
space	Two or more tabs or spaces

Decimal mark

<i>Separator</i>	<i>Denomination</i>
.	Point
,	Comma

Number grouping symbol

<i>Separator</i>	<i>Denomination</i>
	Space
.	Dot
,	Comma

Date and time separators

<i>Separator</i>	<i>Denomination</i>
-	Hyphen
.	Dot
,	Comma (only for milliseconds)
:	Colon
/	Slash

2) Date and time

One of the main problems is the number of ways date and time can be written. EasyView will try every combination possible until a pattern emerges. Ambiguities will sometimes be found. Just look at this: 01.02.03. Is it a time or a date? There is no way to find out what it means unless there is a header saying something like YY.DD.MM, in which case all will be solved. Otherwise you will be prompted for an interpretation.

The file you import may have its timing information in one or two columns: a date and time column or one date and one time column or just a time column. These may be placed anywhere among the columns.

Below is a list of timing formats supported by EasyView. The separators may be any of the above listed characters but we show Swedish settings as an example.

<i>Format</i>	<i>Example</i>
Time	
h:m	20:15
h:m:s	20:15:10
h:m:s,x	20:15:10,123
h:m A	8:15 PM
h:m:s A	8:15:10 PM
h:m:s,x A	8:15:10,123 PM
Date	
y-M-d	2001-02-05
y-d-M	01-05-02
M-d-y	2-5-1
d-M-y	05-02-2001
Relative time	
S	10 h
D-h:m:s	101-20:15:10
D-h:m:s,x	101-20:15:10,123
H-m:s	101-15:10
H-m:s,x	101-15:10,123

Date and time may be combined separated by a space.

Ex: 01-09-19 01:10:20

All imported data will be time stamped. Data that is missing in stated interval will be interpolated.

3) Channel names and units

EasyView also searches for headings that contain channel names. A row containing headings must have the same number of columns as the following data. The heading texts will also be analysed to find measurement units. Text strings are compared to entries in a units' database, containing common units like Bar, A, V, W etc. EasyView will do its utmost to find this information if it at all exists.

If the file contains units that are unknown to the software, you may add these manually in *Options/Import*.

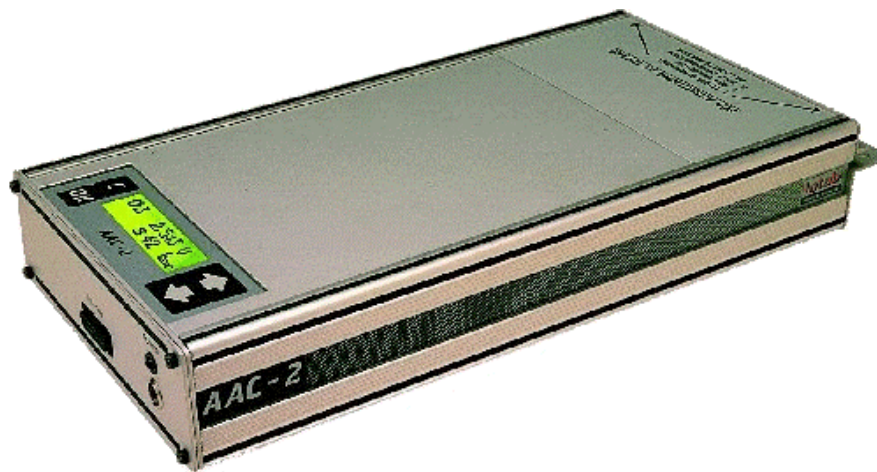
A row containing text strings that don't qualify as units but otherwise seems correct, is a good candidate for being tested for channel names.

If no channel names and/or units are found they are set to "default". This default information may be modified after import or just prior to import in *Advanced* in the import dialog.

11.2 How to do it?

How to import is described in sections 4.3 and 7.6.3.

PC-Logger



PC-Logger - Driver For EasyView Pro™

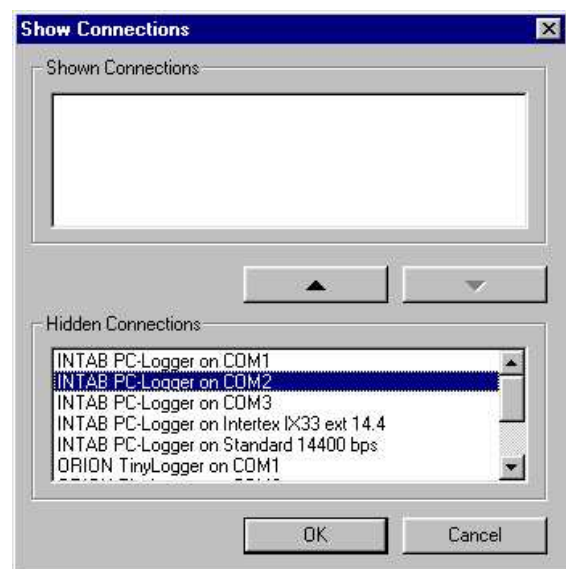
© Intab Interface-Teknik AB

12. PC-logger handling

12.1 Connect a PC-logger

12.1.1 Select and install a COM-port

1. Click "Show connections" in File/Connections.
2. This takes you to Show Connections. Select INTAB PC-logger at appropriate COM port move it to the "Shown connections" and click OK.



3. Click on OK



12.1.2 Recorder Options – BOOT

In case your logger is in need of booting, this is the place to go. Follow the instructions.

Don't forget to read the hardware manual. It is usually better than booting.

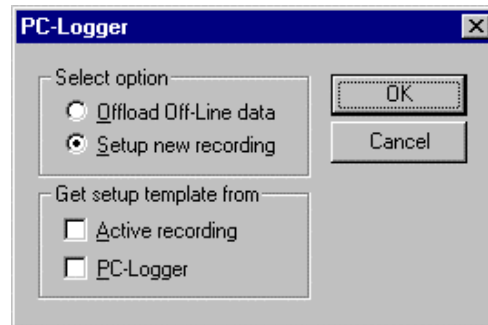
12.2 PC-logger: Start or upload a recording

12.2.1 Logger (Start/Stop/Offload)

File / Logger

Ctrl + N

This dialog is for starting new recordings or fetching off-line data from loggers.



12.2.2 Offload Off-line data

Select **Offload Off-line data** to transfer an off-line recording to the computer and click on OK.

Only AAC-2f recordings have to be stopped before offloading. All others are able to transfer data "on the run". Click **Abort** to terminate offloading.

Chapter 11 has more information on Offloading.

12.2.3 Setup New Recording

by selecting this option. Read below on templates before you click on OK.

Read up on setting up recordings in Chapter 7, 9 and 11.

12.2.4 Get setup template from

- An opened and active Diagram Document will normally serve as template for New Recordings.
Check the **Active recording** box to achieve this.
- Failing to have an opened DD you may instead fetch recording parameters from connected logger. Check **PC-Logger** in this case.

Failing to check any of these boxes will mean starting from scratch or from the "Standard" template if you have a previously saved "Standard" Tabs template. Just remember that chances are that the new recording will be very much like the previous and that a template saves time.

12.3 PC-Logger Start

12.3.1 PC-logger Setup Dialog

Every recording is performed according to programmed parameters. These parameters are divided into different "classes". They appear in the pages of the start wizard.

All pages are not active for all loggers. The software adapts this menu to each connected logger and shows applicable pages.

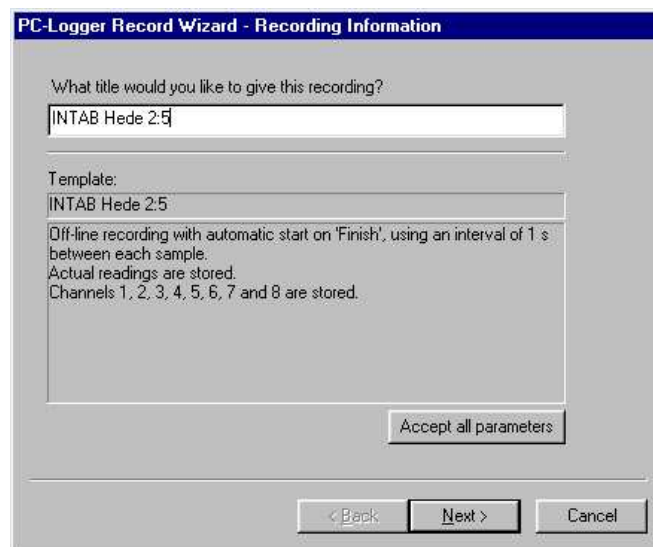
All possible pages are explained below.

12.3.2 New recording using a template



When you are about to start a new recording you might want to think twice about how you would proceed. What I'm referring to is the use of recording templates. An "old" recording that you have made in an earlier stage or parameters contained in the connected logger can be used as templates for a new recording. The advantage is that all or most of the parameters set in the recording used as a template, will be automatically transferred to the Start Wizard.

12.3.3 Information: Title



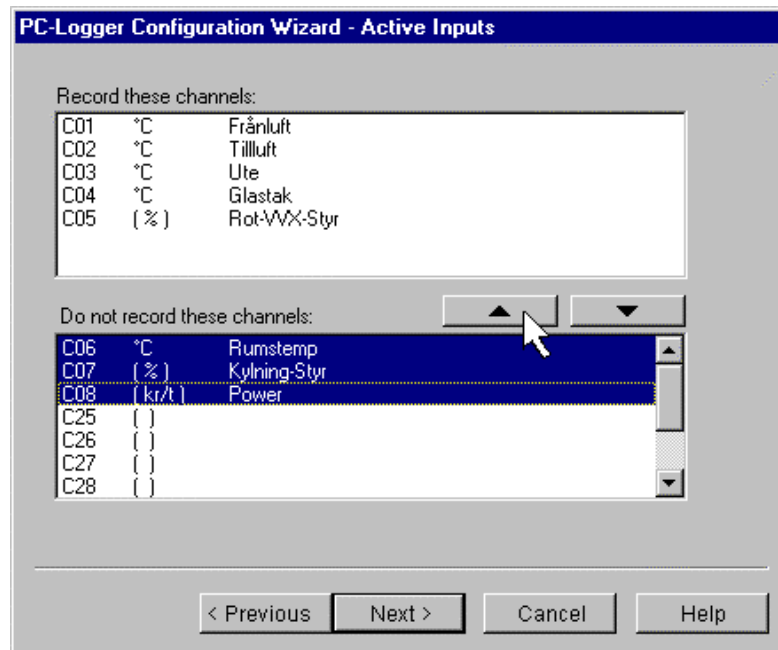
The information page has an entry field for a recording **Title**. The title is for your own use and should serve to remind you of the whats and whys of this particular recording. Make the title as descriptive as possible. This title does not necessarily have to be the same as the file name of the diagram document. You can save your recording at any time after on-line start or after offloading a logger.

Templates

If you have chosen to use a template in the previous step, you will get an additional button called "Accept all parameters" in the lower right-hand corner. Pushing this button makes the Configuration Wizard go to the Summary Page and use the settings from the Template to finish the start procedure. The information page also has a field that contains a summary of recording parameters:

- whether the recording will be on-line or off-line.
- number of channels and channel numbers active in recording
- sampling interval
- reduction factor

12.3.4 Active Channels (Inputs)



The dialog box is titled "PC-Logger Configuration Wizard - Active Inputs". It contains two lists of channels. The first list, "Record these channels:", contains C01 (°C) Frånluft, C02 (°C) Tilluft, C03 (°C) Ute, C04 (°C) Glastak, and C05 (‰) Rot-VX-Styr. The second list, "Do not record these channels:", contains C06 (°C) Rumstemp, C07 (‰) Kylning-Styr, C08 (kr/t) Power, C25 (), C26 (), C27 (), and C28 (). There are up and down arrow buttons between the two lists. At the bottom are buttons for "< Previous", "Next >", "Cancel", and "Help".

Record these channels:		
C01	°C	Frånluft
C02	°C	Tilluft
C03	°C	Ute
C04	°C	Glastak
C05	(‰)	Rot-VX-Styr

Do not record these channels:		
C06	°C	Rumstemp
C07	(‰)	Kylning-Styr
C08	(kr/t)	Power
C25	()	
C26	()	
C27	()	
C28	()	

Record/Do not record



This pane is used to activate and deactivate channels for recording.

One field lists active channels: **Record these channels.**

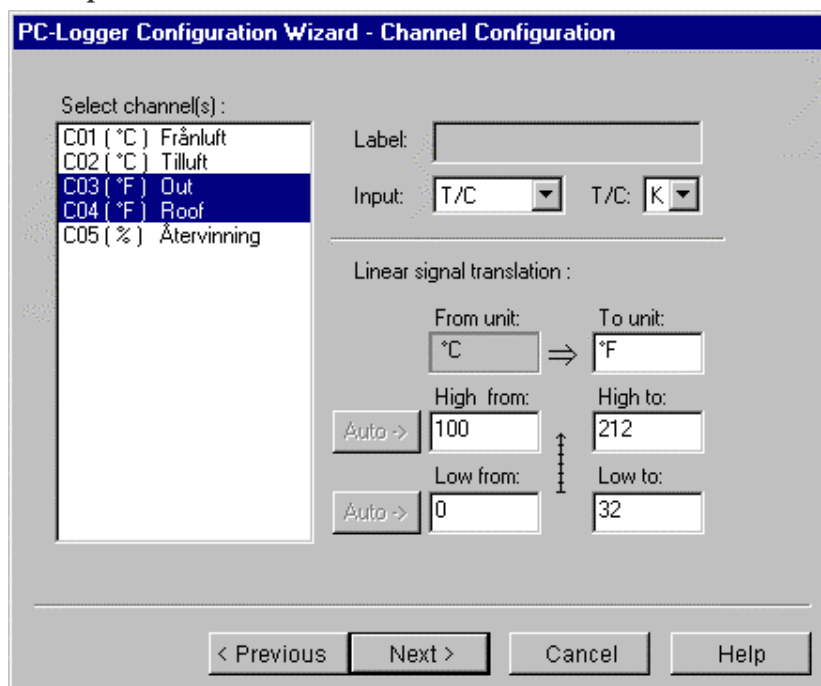
The other field lists inactive channels: **Do not record these channels.**

They both work exactly the same when moving a channel from one to the other:

Double click on a channel to move it or

Select several by holding down the mouse button and dragging. Then click on  or  to activate or deactivate channels by moving them from one field to the other.

12.3.5 Input Setup



The dialog box is titled "PC-Logger Configuration Wizard - Channel Configuration". It has a list of channels on the left: C01 (°C) Frånluft, C02 (°C) Tilluft, C03 (°F) Out, C04 (°F) Roof, and C05 (‰) Återvinning. C03 is selected. To the right, there are fields for "Label:", "Input:" (T/C), and "T/C:" (K). Below these are "Linear signal translation" settings: "From unit:" (°C) and "To unit:" (°F), with "High from:" (100) and "High to:" (212), and "Low from:" (0) and "Low to:" (32). There are "Auto ->" buttons for the high and low values. At the bottom are buttons for "< Previous", "Next >", "Cancel", and "Help".

Select channel(s):

C01 (°C)	Frånluft
C02 (°C)	Tilluft
C03 (°F)	Out
C04 (°F)	Roof
C05 (‰)	Återvinning

Label:

Input: T/C:

Linear signal translation:

From unit:	°C	⇒	To unit:	°F
High from:	100		High to:	212
Low from:	0		Low to:	32

Select channel(s)

Select channel(s) to setup.

Label

This is a text-input field. Its main purpose is to give a "name" or descriptor to a channel. This label is editable should you change your mind after completing the recording. It is, in any case, good practise to name your channels so that you remember what was done.

Input

Available ranges are (unless your logger has factory pre-set ranges):

T/C 50mV

T/C 100mV

+/- 10V

+/- 1000mV

+/- 100mV

+/- 50mV

+/- 20mA

The 50mV range is almost without exception the best range when employing thermocouples.

To Unit

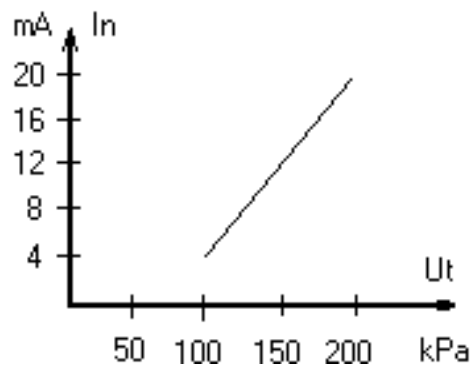
Your process signal will probably represent some other unit than the mA or V actually measured by your PC-logger.

This input field will let you assign your own unit to what is being measured. Type for example kW or ppm or

The text has no influence on the numerical value of your measurements. It will just attach the correct engineering units to them.

X-form: Linear Transformation

As you may already have deduced, incoming process signals may be transformed into the engineering unit and magnitude it actually represents. This is done by applying a straight line transformation. This straight line is defined by two points represented by two pairs of values.



You don't really have to know how this works mathematically. You only have to apply the two pairs of numbers.

An example is in place:

A transmitter puts out a signal between 4mA and 20mA.

This signal represents pressure so that 4mA corresponds to 100kPa and 20mA corresponds to 200kPa.

Simply enter 4 and 20 on the Input side and then 100 and 200 on the Output side.

From unit:	mA	⇒	To unit:	kPa
High from:	20		High to:	200
Low from:	4		Low to:	100

One more example:

The four wire resistance measurement method is often used measuring temperature with **Pt-100** sensors. At a constant current of 0.5mA the following applies:

At zero (0°C) the resistor is 100Ω and so generates 50mV. ($U=R \times I$)

At 100mV the resistor is 200Ω which corresponds to 266°C

From unit:	mV	⇒	To unit:	°C
High from:	100		High to:	266
Low from:	50		Low to:	0

Such a linear transformations do not affect the input or its range in any way. It simply helps you to interpret the incoming signals. You still have to make sure that the input is correctly set.

Calibrate

This "autotransform" feature is mainly used to "calibrate" transducers. By clicking on one of the **Auto**-keys next to the **from** fields you will automatically enter the present output value from the transducer.

A pressure transducer will serve as an example. They seldom present zero at zero pressure. By clicking the lower **Auto**, the zero value result of no applied pressure will automatically be entered in the **Low from** field.

To calibrate full scale you first apply a pressure corresponding to full scale. Then click on the **Auto** next to the **High from** field.

Enter your pressure units on the right hand side: the **High to/Low to** side.

12.3.6 Parameters

The screenshot shows the 'PC-Logger Record Wizard - Sampling Parameters' dialog box. It is divided into several sections: 'Record' with radio buttons for 'on-line, store samples on the PC's hard disk' and 'off-line, store samples in the logger's memory'; 'Store' with checkboxes for 'Maximum value', 'Average value' (checked), and 'Minimum value', and a dropdown for 'over 6 sample(s)'; 'Sample' with a dropdown for '10 s' and the text 'between each sample.'; 'Memory' with a checkbox for 'Go on and write over oldest samples when the memory is filled.'; and 'Duration' with a text box showing '007-14:02:40'. At the bottom are buttons for '< Back', 'Next >', and 'Cancel'.

Mode.. on-line or off-line

Select recording mode:

On-line Recordings are made with the logger connected to the computer. Data are continuously transferred to disk and can be studied in real time on screen.

Off-line Measurements are in this mode stored in logger memory. Once recording parameters have been transferred to the logger it may be disconnected from the computer and started "in the field" using the keys next to the LCD.

Upload and restart after stop

When using the AAC-2F (fast) you can check this box to make the AAC off-load itself to the computer when stop trig has been invoked. The logger then positions in a "ready to start" mode again. Used in conjunction with trig levels.

Interval

This is where you specify the time between samplings. The inverse of the interval is the sampling frequency.

Reduction

This term may just mean that you want to acquire averaged values.

The input field accepts figures between 1 and 255. The figure defines how many samples that are to be taken before the average is calculated. A figure of 1 results in no averaging. If the figure is larger than one, you have a choice of storing, not only the average value, but also (or instead) the min and/or max. value of the averaging period. You may also want to reduce the amount of data by saving only the max. or min of the averaging/reduction period.

Note that by saving ave, max and min values you have almost the same informational value as if no averaging had been performed.

Why is this?

If you observe the relative value of the ave graph compared to the max and min graphs, you can determine whether the values have been close to the max with an occasional down peak, or close to the min with an occasional up peak, or placed nicely in between the min and the max.

The width of the min-max. band also carries information about the quality of the signal. With this in mind you can save time and storage space by reducing the amount of data you have to analyse. Hence the term "Reduction Factor".

Store

Check boxes to store min, max and/or ave values.

If the reduction factor is 1, you may only check the ave box. In this case it is not an average value that will be stored. It is a momentary value. These values don't need an extension in the signals' table.

Duration

This box shows how long the memory will last with the present settings. This is of course the possible length of your recording.

On-line recordings are stored on your disk and may become extremely long.

Factors affecting storage capacity of any given storage media space are sampling capacity, reduction factor and number of stored channels.

Try not to collect more data than necessary. It will just make analysis more time consuming.

Memory : Wrap when full

Off-line recordings may either stop when memory is full or "wrap around" to overwrite oldest data. Check this box to "wrap around" making memory appear endless.

Note that this feature is at present not available for on-line recordings.

12.3.7 Alarm Levels

Loggers equipped with digital I/O may be programmed to give an alarm signal. The alarm is given as a contact closure as a pre-programmed level is crossed.

This output may in turn be connected to alarm systems or sirens.

The menu for programming alarms (see below) will only appear if the connected logger is equipped with digital I/O:s.

Alarms may be programmed both in off-line and in on-line recording modes.

The screenshot shows a Windows-style dialog box titled "PC-Logger Record Wizard - Alarm Settings". It contains the following elements:

- Select channel(s):** A list box with three entries: "C01 °C Air Outlet", "C02 °C Air Inlet", and "C03 (°F) Room temp". The third entry is selected and highlighted in blue.
- Notify when signal is:** A group box containing three checkboxes:
 - ☐ above high level.
 - ☒ between high & low levels.
 - ☐ below low level.
- Test these signal levels:** A group box containing two input fields with vertical arrows on the left:
 - High:** 110,0
 - Low:** 32,0
- Configuration:** A group box containing a label "Notify through:" followed by a dropdown menu showing "Relay 1".
- Buttons:** At the bottom are three buttons: "< Back", "Next >", and "Cancel".

Alarm Level Programming

Any channel may have an alarm associated with it. Several channels may influence the same alarm output. Just remember that a contact closure has a higher priority than, or wins over, a contact break. There are two input fields for alarm levels: the High Level and the Low Level.

The Close Relay section has three check boxes. These are used to define where contact closures should take place with reference to programmed levels. Possible checks are:

- Above high level
- Between high & low levels
- Below low level

Alarm levels are programmed in the unit defined by the transform function. Consequently you don't have to do any calculations to arrive at proper levels.

Example:

The figure above (previous page) shows settings to close relay no 1 for temperatures above 32°F but below 110°F. The relay will be open for temperatures outside these levels. See illustration above.

12.3.8 Trig programming of the AAC-2F

The AAC-2F may be programmed to start recording when certain conditions are fulfilled. These are exceeded level or logical trig (TTL) signal.

Recordings may also be programmed to stop on these trig conditions.

The screenshot shows the 'PC-Logger Configuration Wizard - Trig Settings' dialog box. It has a title bar with the text 'PC-Logger Configuration Wizard - Trig Settings'. The main area is divided into two columns. The left column is titled 'Start recording when' and contains two checkboxes: 'Start condition on signal level is detected.' (checked) and 'External trig is applied.' (unchecked). The right column is titled 'Stop recording when' and contains two checkboxes: 'Stop condition on signal level is detected.' (unchecked) and 'External trig is removed.' (checked). Below these columns is a section titled 'Record using a window' with a checked checkbox. This section contains two text boxes: the first is labeled 'Remember' and contains '120 ms', followed by the text 'prior to stop, and continue to record for'; the second is labeled '230ms' and followed by the text 'after stop, resulting in a window size of 350 ms'. At the bottom of the dialog are four buttons: '< Previous', 'Next >', 'Cancel', and 'Help'.

Trig Modes

There are three alternate trig settings for both start and stop.

Level trig

Recordings may be programmed to start when the signal on a channel exceeds one or falls below another level.

Stops may be programmed in the same way.

Check the **Start on** and/or **Stop on level** trig box to select this method.

Levels are then programmed in the Trig Levels page.

External trig

The External Trig input accepts a digital level (TTL) to start or stop recordings.

Check the Start on and/or Stop on External trig box to select this method.

Note that the trig signal must remain high for the duration of the recording if the stop box is checked.

Level and external trig

Checking both level and external trig boxes combines these methods.

- Start condition occurs when Level Trig **AND** External Trig are "true".
- Stop condition occurs when either Level Trig **OR** External Trig is "true".

Trig Window

The very useful "Trig Window" is used to catch and present transient events by showing a programmable time before an event occurred and another programmable period after the same.

To do this we employ the stop trig and define a Pre-trig period to be shown in conjunction with the trig event.

The Post-Trig period is the time that the recording progresses beyond the trig event itself.

Define the Pre and Post trig times to avoid having to transfer all memory and to see just the period before and after a fault (?) condition occurred.

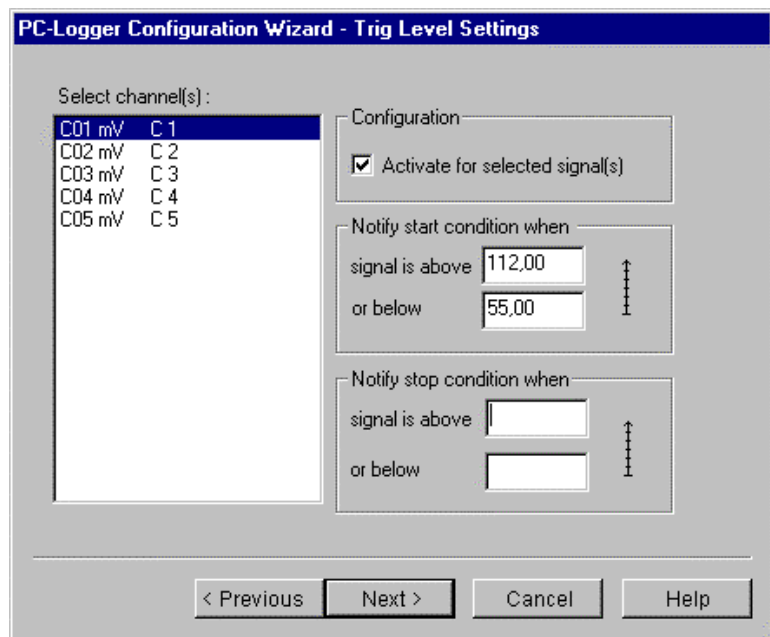
Trig Levels

When you have decided to employ level trigs you also have to define the levels at which trigs will occur.

No change in recording status will occur as long as the signal is between the two defined levels.

In the **start** case no start will occur as long as the signal remains between the two levels.

In the **stop** case it means that the recording will proceed until levels are crossed.



The image shows a screenshot of the "PC-Logger Configuration Wizard - Trig Level Settings" dialog box. It features a list of channels on the left and configuration options on the right. The channels listed are C01 mV, C02 mV, C03 mV, C04 mV, and C05 mV, each with a corresponding channel number (C 1 to C 5). The "C01 mV C 1" entry is selected. On the right, under the "Configuration" section, there is a checked box labeled "Activate for selected signal(s)". Below this, there are two sections for setting trigger levels. The "Notify start condition when" section has two input fields: "signal is above" with the value "112,00" and "or below" with the value "55,00". The "Notify stop condition when" section has two empty input fields for "signal is above" and "or below". At the bottom of the dialog, there are four buttons: "< Previous", "Next >", "Cancel", and "Help".

Select channel(s) :	
C01 mV	C 1
C02 mV	C 2
C03 mV	C 3
C04 mV	C 4
C05 mV	C 5

Configuration

☒ Activate for selected signal(s)

Notify start condition when

signal is above

or below

Notify stop condition when

signal is above

or below

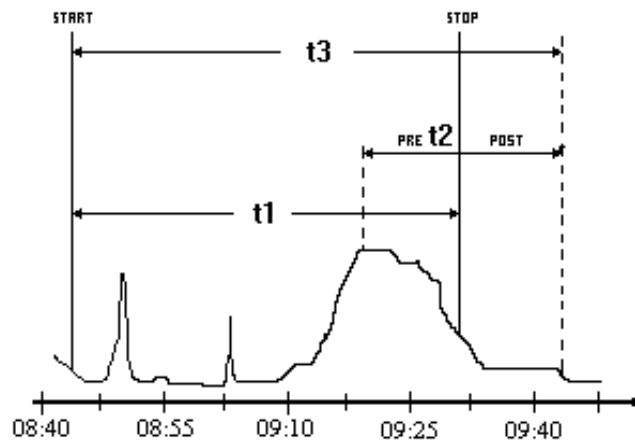
< Previous Next > Cancel Help

Don't forget to check the **Activate..** box before leaving this menu!

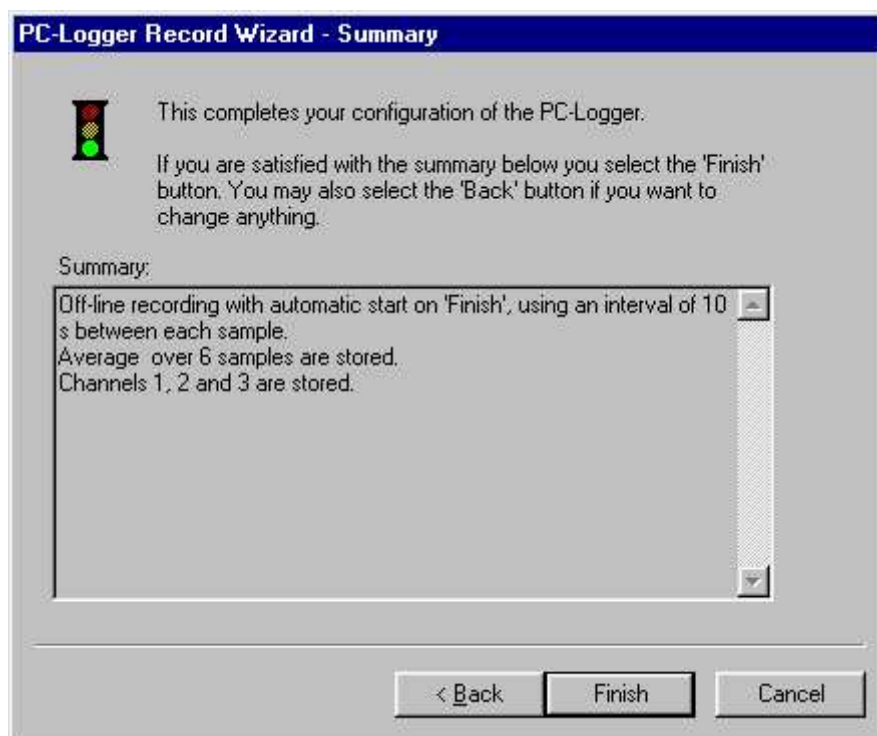
Trigs: what is actually stored?

The illustration at right may explain it all:

- Without a trig-window, data from START to STOP will be stored. Memory contents will encompass the time corresponding to **t3**.
- Using a trig-window, recorded data will correspond to time **t1**. You may then choose to offload either the entire recording (**t3**) or just the window represented by **t1**. The window consists of a pre-trig and a post-trig period.



12.3.9 Finish!



12.4 PC-logger Start/Offload: Step-by-step

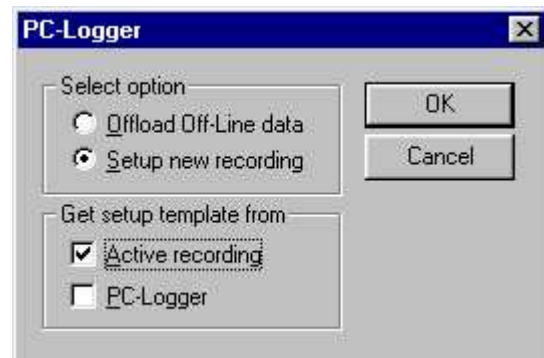
12.4.1 Step 1: Start

Select **File / Logger** or

Select **Setup new recording**.

We want to start recording from scratch. There is no Document available that would be suitable as a template so we leave the template check boxes un-checked.

Click on **OK**



A Wizard will now help you set up all recording parameters.

12.4.2 Step 2: Information

Enter a **Title** for your recording. It may later on remind you of what you were doing.



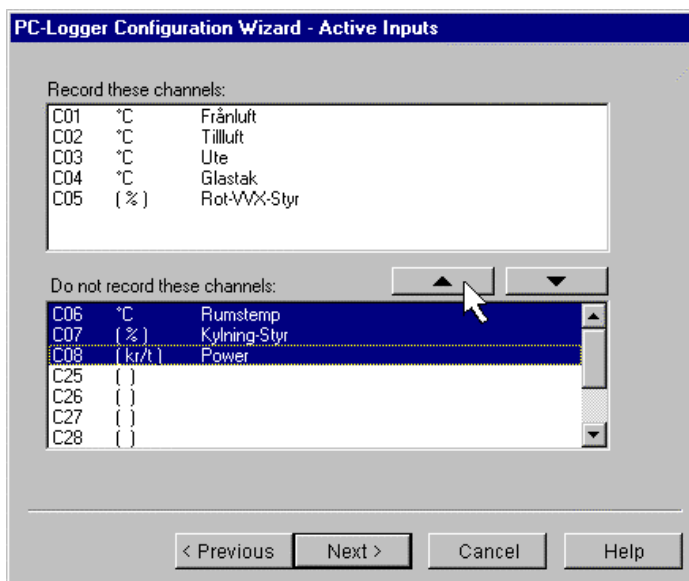
12.4.3 Step 3: Activate channels

Select channels that are to be recorded. The activated channels appear in **"Record these channels"**.

Channels are activated by first selecting them in the **"Do not record these channels"** field and then clicking on

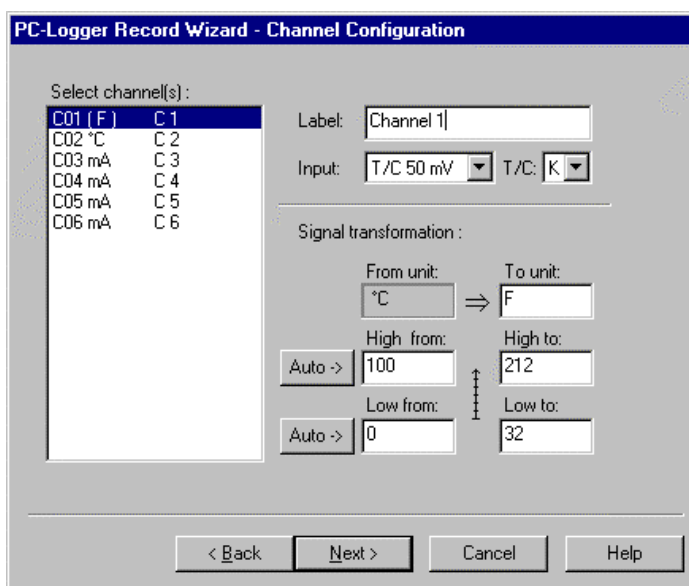


De-activate channels by moving them from the "Record" to the "Do not record" area.

A screenshot of the 'PC-Logger Configuration Wizard - Active Inputs' dialog box. It has two list boxes. The top list box, titled 'Record these channels:', contains five entries: C01 °C Frånluft, C02 °C Tilluft, C03 °C Ute, C04 °C Glastak, and C05 (%) Rot-VVX-Styr. The bottom list box, titled 'Do not record these channels:', contains five entries: C06 °C Råmstemp, C07 (%) Kylning-Styr, C08 (kr/t) Power, C25 (), C26 (), C27 (), and C28 (). A mouse cursor is pointing at the upward arrow button between the two list boxes. At the bottom are buttons for '< Previous', 'Next >', 'Cancel', and 'Help'.

12.4.4 Step 4: Input setup

This is the channel setup Property Page. Follow the directions below for each active channel.

A screenshot of the 'PC-Logger Record Wizard - Channel Configuration' dialog box. On the left is a list box titled 'Select channel(s):' with entries C01 (F) C 1, C02 °C C 2, C03 mA C 3, C04 mA C 4, C05 mA C 5, and C06 mA C 6. To the right of the list box are fields for 'Label:' (containing 'Channel 1'), 'Input:' (a dropdown menu showing 'T/C 50 mV'), and 'T/C:' (a dropdown menu showing 'K'). Below these is a 'Signal transformation:' section with 'From unit:' (°C) and 'To unit:' (F) fields, and 'High from:' (100) and 'High to:' (212) fields, and 'Low from:' (0) and 'Low to:' (32) fields. There are 'Auto ->' buttons for the 'High from' and 'Low from' fields. At the bottom are buttons for '< Back', 'Next >', 'Cancel', and 'Help'.

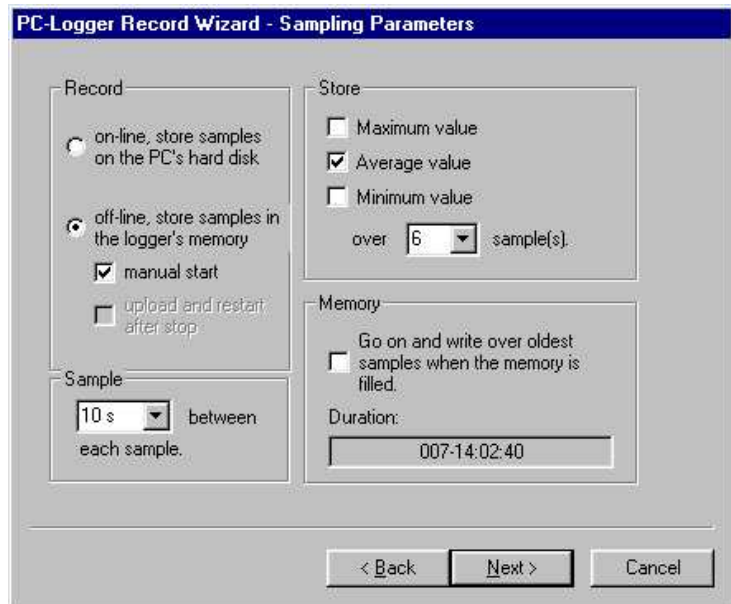
1. **Select channel.**
2. Enter a **"Label"** (or name) describing your signal.
3. Select **input range**.
4. Select **T/C** (type) if you are using thermocouples.
5. Enter proper engineering unit in **"To Unit"**.
6. Enter transformation values (if applicable) in **"Linear Transformation"**.
7. Repeat points 1 to 5 for all channels.

12.4.5 Step 5: Parameters

Select **Off-line** or **On-line**.

Enter a suitable **Interval**.

Remember that slowly changing signals may be sampled with longer intervals than faster. Try not to collect more data than needed. Huge amounts of data get cumbersome to analyse.



The dialog box is titled "PC-Logger Record Wizard - Sampling Parameters". It contains three main sections: "Record", "Store", and "Memory". In the "Record" section, the "off-line, store samples in the logger's memory" radio button is selected, and the "manual start" checkbox is checked. In the "Store" section, the "Average value" checkbox is checked, and the "over" dropdown is set to "6". In the "Memory" section, the "Go on and write over oldest samples when the memory is filled." checkbox is unchecked. The "Sample" section shows a dropdown set to "10 s" with the text "between each sample." The "Duration" field shows "007-14:02:40". At the bottom are buttons for "< Back", "Next >", and "Cancel".

Reduction factors > 1 will enable averaging. Averaging will reduce the amount of data and still keep most of the "informational value" of the recording.

Check the Max. and/or Min boxes if you also want to store these values of the averaging period.

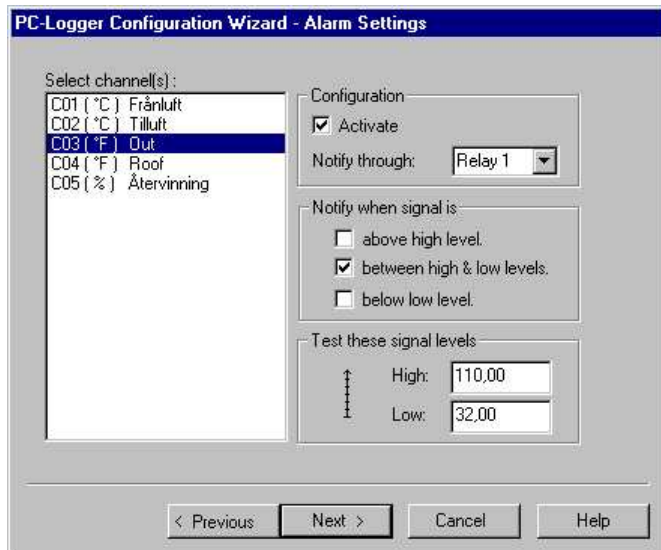
Note that by saving ave, max. and min values you have almost the same informational value as if no averaging had been performed.

12.4.6 Step 6: Alarm levels (N/A to all loggers)

Alarm outputs are available on logger units, except the "F", with digital I/O:s.

Alarms can be assigned to all active channels.

Follow the procedure below to program alarms.



The dialog box is titled "PC-Logger Configuration Wizard - Alarm Settings". It contains a list of channels on the left: "C01 (°C) Frånluft", "C02 (°C) Tilluft", "C03 (°F) Out", "C04 (°F) Roof", and "C05 (%) Återvinning". The "C03 (°F) Out" channel is selected. On the right, the "Configuration" section has the "Activate" checkbox checked and "Notify through:" set to "Relay 1". The "Notify when signal is:" section has the "between high & low levels." checkbox checked. The "Test these signal levels:" section shows "High:" set to "110,00" and "Low:" set to "32,00". At the bottom are buttons for "< Previous", "Next >", "Cancel", and "Help".

1. **Select channel** to assign alarm to.
2. Select a relay in "**Notify through**".
3. Enter **High level** and **Low level**.
4. Check appropriate box(es) in **Notify when....**
5. Repeat points 1 to 4 for all channels that are to have alarms assigned.


12.4.7 Step 7: OK to Send parameters/Start recording

This is the end of the journey. Check in **"Summary"** that all is exactly the way you want it and finish off by clicking : **"Finish"**



12.4.8 Offload and Analyse Data

After an off-line recording is completed, data has to be transferred to the computer.

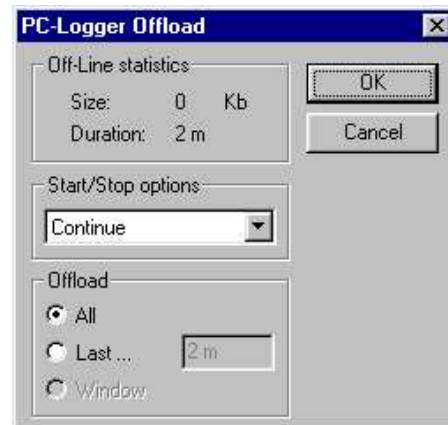
Connect the logger to the selected serial port and click on  or, alternatively, select **File, Logger**.

Step 1 : Select Offload

Select **Offload** and click **OK**.



Step 2 : Offload data



Before offloading data you:

1. Select **Start/Stop options**:


Continue	Offload takes place without stopping the recording which proceeds undisturbed.
Stop, Offload	Stops the recording then Offloads data.
Stop, Offload, Restart	Stops recording then Offloads data and afterwards starts a new recording.
Offload, Stop	First Offloads data then stops the recording.
Offload, Stop, Restart	First Offloads data then stops the recording and finally restarts recording.
2. Select **amount of data** to fetch:

All	Fetches all data.
Last...	Define amount from end of recording.
3. Finish off by clicking **OK**

Step 3: After Offload

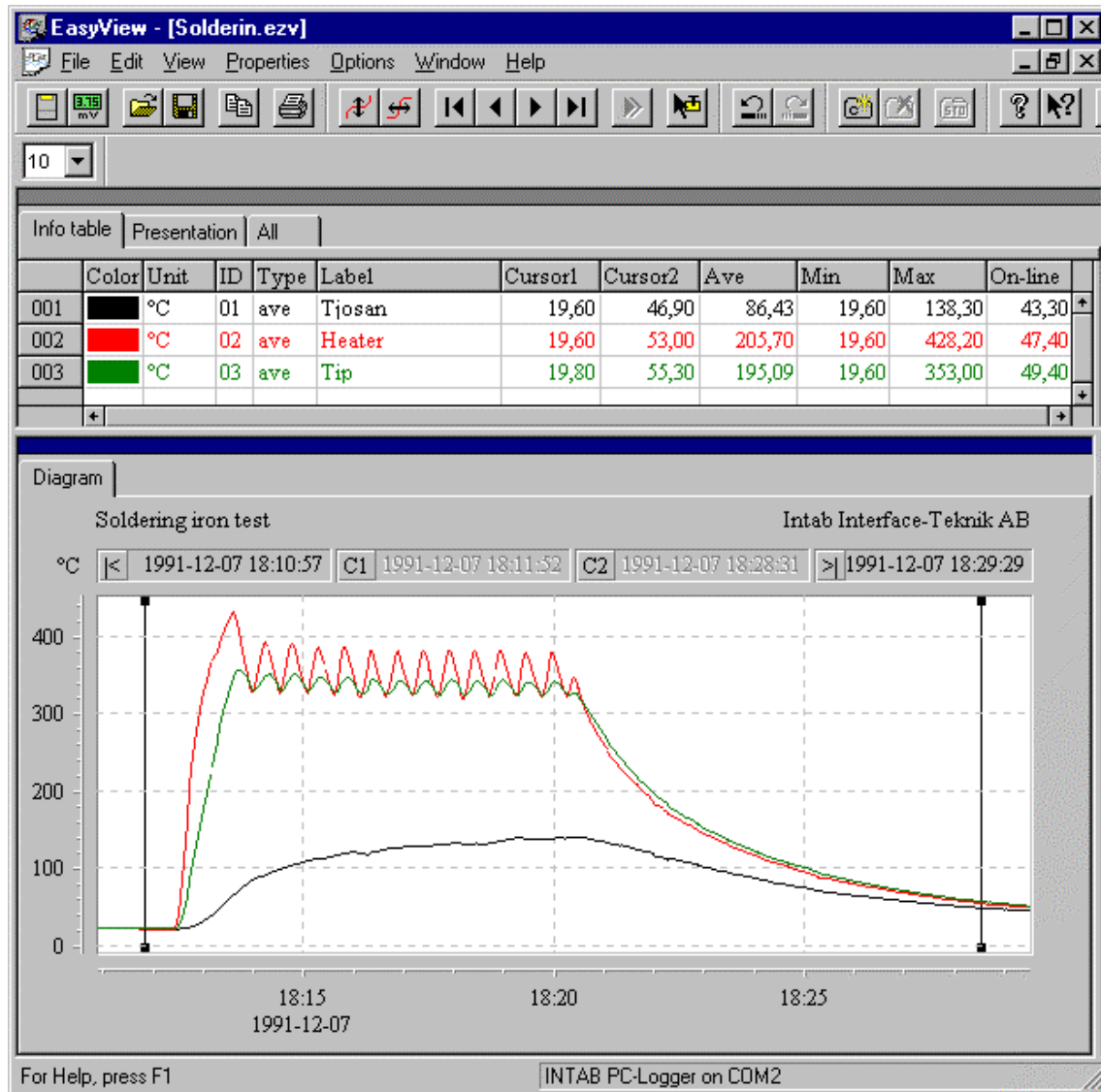
- The recorded data is now transferred to a temporary file on disk.

Click  to show the entire recorded time.

- Click on the autoscale  to see the full range of the recorded signal.

Step 4: Analyse data

Use all the tools you need to get the required results. Read further on in this manual to realise the full potential of this software.



TinyLogger



TinyLogger : Driver

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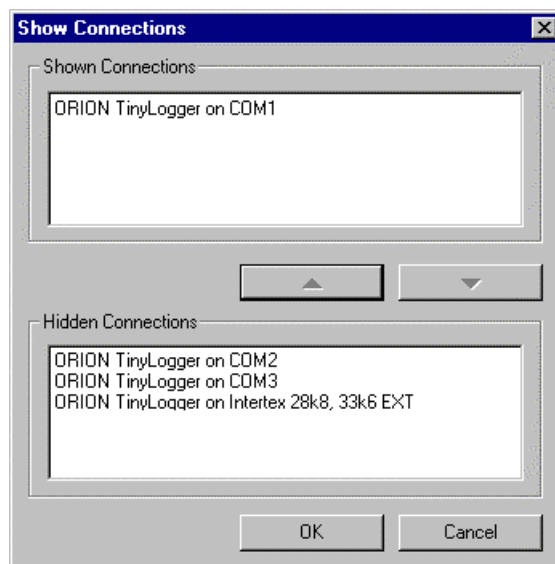
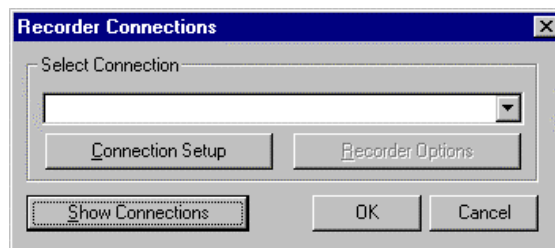
13. TinyLogger Handling


13.1 Connecting TinyLogger to Computer

13.1.1 Select and install a COM-port

Before you start communicating with your logger the COM-port must be configured. The section below will demonstrate how this is done.

1. Choose File/Recorder setup in the EasyView menu. The dialog shown to the right will appear.
2. Click "Show Connections".
3. This takes you to the Show Connections dialog.
Select one or more of the available TinyLogger drivers and click the Up-arrow button.
4. Click OK to continue.




5. In "Recorder Connection" the COM-port has been added to the list of communication lines.
6. Click on OK to finish off. The COM-port is now ready to use.
7. Check to see if everything works by clicking the  button. This will activate the Digital MultiMeter.



13.2 TinyLogger - Start and Offload

13.2.1 Connecting the TinyLogger

- Connect the logger to one of the serial ports available on your computer.
- Click "File / Recorder Setup" in the menu. Select the COM-port you are using. If this COM-port is not in the drop-down listbox, see the previous chapter on how to add one.
- Click the logger button  to commence the connection process.
- During this process the logger will be asked for its serial number and whether or not the logger is recording etc. After a few seconds the dialog below is shown.



The information in this dialog will differ depending on which state the logger is in. If the logger is recording, the information presented will be minimised.

When the logger is connected, you are allowed to start, stop and offload it. The dialog above will not close until you close it manually. This means that you can start or offload a number of TinyLoggers in sequence.

The TinyLogger dialog is divided into two parts:

- **Start** to the right and..
- **Offload** to the left

To start a recording

- If there is no recording in progress, the logger's present settings will be displayed in the right part of the dialog on the previous page.

If you want to modify any of these settings before starting the new recording, please do so by clicking the Offline or Online Setup button. Sampling Interval and alarm levels are some of the parameters that can be changed.

See **Setup** for more information.

- When you are satisfied with the setup of your logger, click the "Start" button to begin the recording process.

Offload a recording

To the left in the TinyLogger start up dialog, you will find controls that handle the Off-loading procedure.

Choose how to proceed after data is offloaded. There are two alternatives.

- Open recording (Option to analyse the recording immediately..)
- Save recording (Option to offload many loggers in sequence..)

First of all, if the off-load button is not activated, your logger is recording in a "second interval mode". In this case you will have to stop the logger prior to offloading.

Push the "**Offload**" button to get data from the TinyLogger.

If you choose to save the file after offload a Save as.. dialog will appear. Here you give the file a name.

If you selected the other alternative, to open the recording, you will not be prompted to save the file until you close the window. You can of course always, at any time, save it manually.

When the TinyLogger is offloaded its recording parameters will be present in the "Start-frame" to the right. This helps you if you want to use this setup for several TinyLoggers.

13.2.2 Setup

This menu will help you make the correct setup for your logger. The contents of the tabs will differ depending on the logger model.

In "Recording parameters" you program the following parameters:

- Set alarm levels
- Select recording method
- Define sampling interval (The duration is presented in **days-hours:mins:secs**)
- Set start and stop conditions

The following sections will describe these procedures.

Start & Stop settings

When to Start

As you can see in the illustration at right, you may select to start recording

- **Immediately** means exactly what it says: start is "now" at the click on the start bar.
- **After** (a set period) lets you specify the length of time that has to elapse before recording starts.
- At a certain **date** and **time**.
- **When triggered** by placing a magnet at the indicated spot on the logger.
- **After having been triggered** adds a delay time to the trigger time.



How to Stop

Again you have to make up your mind about recording parameters: when do you want the recording to stop? You have three possible settings. They are:

- Stop when **full**. (Need we say more?)
- **Run indefinitely**. Memory is "endless" in the sense that it never stops. It will always contain the most recent readings. Oldest data will "spill over".
- **Stop after (a number of) readings**. There is no need to collect more data than necessary. Enter 100 readings if that is what you need!



Recording

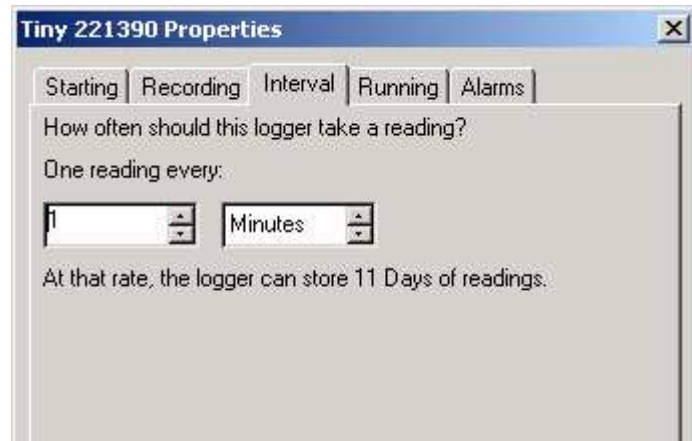
Using minute intervals it is possible to choose between saving the instantaneous value each interval's end or the largest (Max) or the smallest (Min) of noted values during the interval.



Interval

Enter a suitable number of time units.

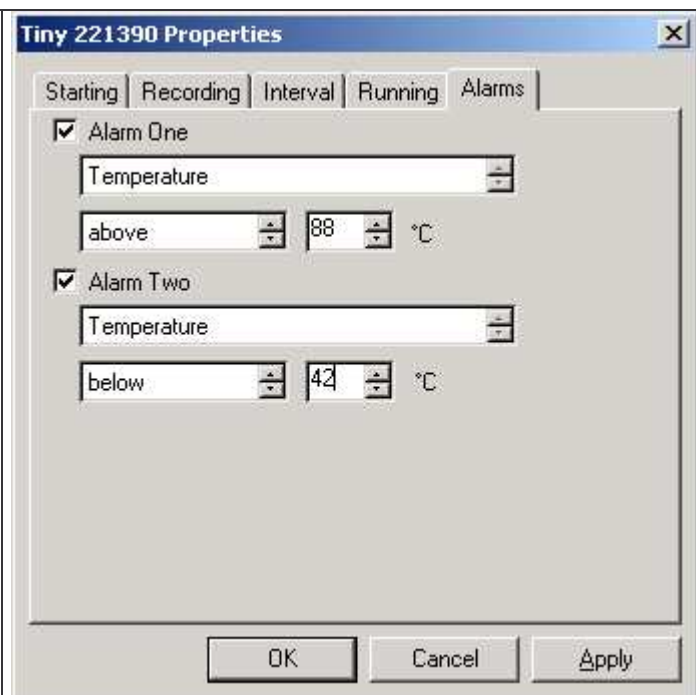
Also select time unit: Seconds, Minutes or Hours.



Set alarm levels

Some Tinyloggers are equipped with alarm functions. Alarm conditions are displayed by a flashing LED.

Alarm indications are useful in determining fault conditions without off-loading acquired data. You may simply want to leave the logger recording as long as nothing abnormal happens. An excessive temperature may trigger the alarm and call your attention so that you can off-load and analyse the data and maybe trace the fault..



- Two possible alarms are distinguished from each other by their flashing pattern: single or double flash.
Activate or deactivate alarms as required by clicking the appropriate "check": LED flashes once and/or LED flashes twice
- Enter the level(s) and indicate whether it is above, below, above (latched) or below (latched) these that the alarm should "sound"

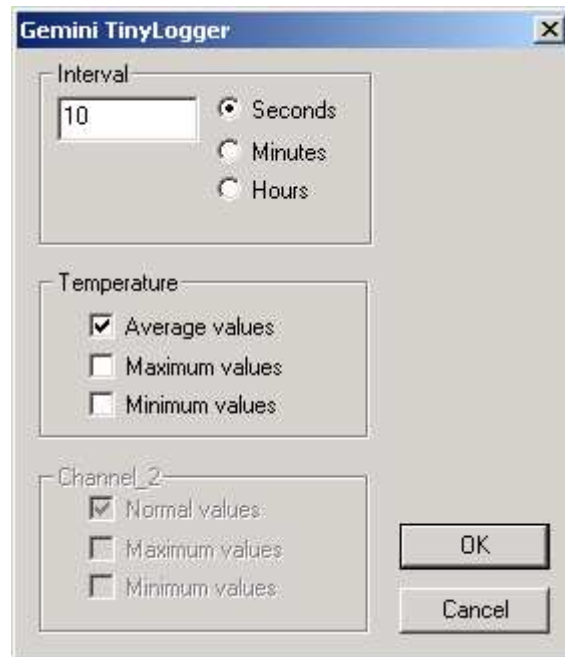
Diagrammatic representation of alarms

The programmed alarm levels will be shown as horizontal lines in the diagram **if** the corresponding alarm has occurred during the recording.

Online Recording

EasyView has made it possible to monitor signals via Tinyloggers on-screen in real time.

We term this On-line recording. You can see the graph "grow" in front of your eyes!



Since the alarm and start-and-stop parameters are not applicable in this case, checking the On-line box will make the "Next>" button change to "Finish".

Interval and data reduction

Sampling interval while recording On-line is always once a second. Avoid cumbersome amounts of data by specifying an interval larger than one. This will reduce data by producing the average, max or min value of the number of seconds specified.

Just click on the appropriate radio button.

Example: **Seconds** active and **Interval** specified at 30 together with **Average** value active will produce and store the average of 30 values every ½ minute.

Example: **Minutes** active and **Interval** specified at 2 together with **Max value** active will store the max of 120 values every 2:nd minute.

Click "Finish" to return to main logger menu. Click the start bar.

Note that some rescaling functions are not active during real time display.



Stop the real time display by clicking the . Rescale axes and then restart the display by clicking again on the double arrow.

14. COMET Transmitter/Logger

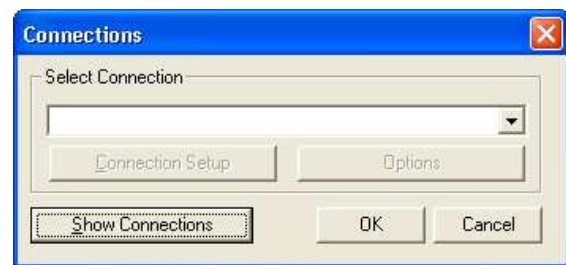
The Comet line of transmitters/loggers can be used as sensors for direct real-time input to EasyView.

They are accessed through LAN or via Internet. In either case they must be given and programmed with a relevant IP address. See the hardware manual.

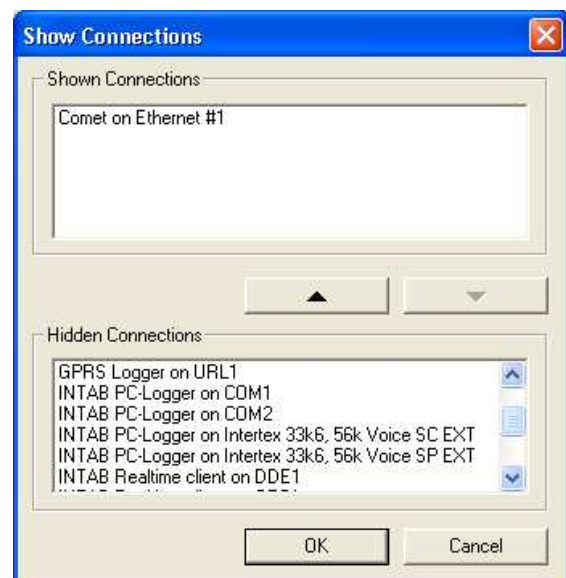
14.1 Connecting to a Comet

8. Choose File/Recorder setup in the EasyView menu. The dialog shown to the right will appear.

9. Click "Show Connections".

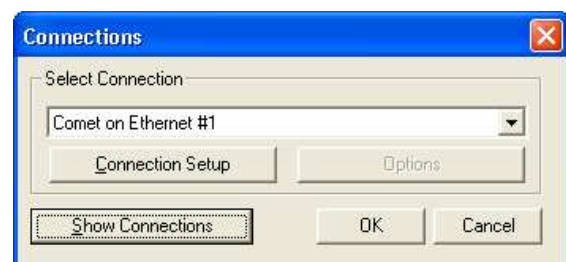


10. This takes you to the Show Connections dialog. Select Comet and click the Up-arrow button.




12. In "Shown Connection" the Comet has been added to the list of communication lines.

13. Click on OK to finish off. The transmitter can now be contacted.



14.2 Comet Recording Start

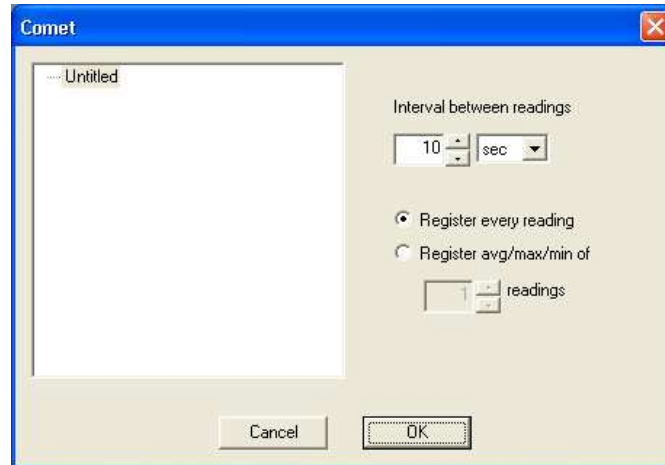
After the Connection menu has been set to Comet you can access the start menu via File/Logger or by clicking the  button.

NOTE below which “component” has been selected for the shown menu to appear.

The Comet start menu looks like this:

Right-click on “Untitled” to edit recording title and add transmitter(s).

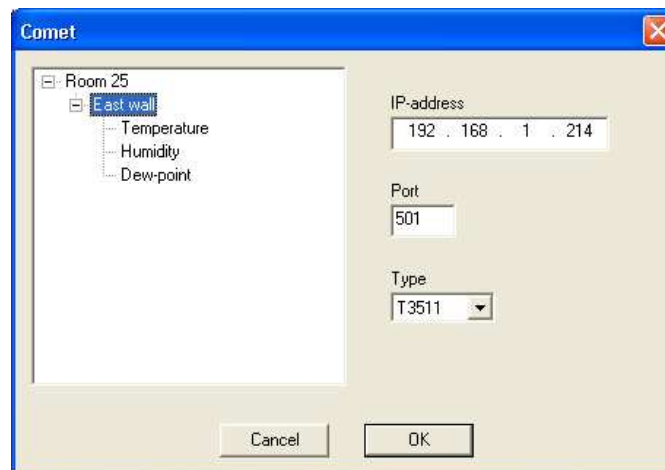
Click Register avg/max/min if you want to employ data reduction. Type in or increase no of “readings” to be averaged.



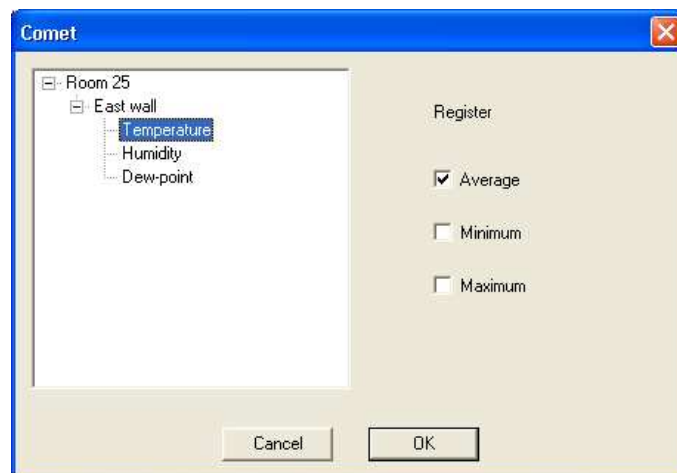
It is a good idea to name the transmitter with something that describes its location. Then you:

- ✓ Select type of transmitter.
- ✓ Enter port no
- ✓ Enter IP address

Please see hardware manual for info on these parameters.
Selected port must be open.
Consult your IT technician for details regarding IP addresses etc.



If you have decided to employ data reduction you here have a choice of storing either or all of averaged values, min values and max values.



Return to the topmost menu and click OK to start recording!

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