Reverse detection system

ACCURANCE R1002

Installation instructions
(Ver. draft 0.00)

To find out useful hints, tips and information about OPTEX products and services, please visit www.optex.net
Read carefully before use

- This product is designed to detect a person moving (passing) through reverse direction in the security areas or in the public areas. However, it is necessary to understand beforehand that it is not possible to detect all reverse motion. And it is also necessary to use under restrictions of the product according to this installation instructions.
- Install the product properly according to required local regulations or guidelines.
- Do not connect a fire alarm or a smoke detector to this product.
- The product is designed to detect targets only and therefore not to prevent property loss and casualty, or physical damage.
- Note that the manufacturer and distributors are not liable for any densification by any damages.

■ Pictorial indication
These installation instructions use symbols to represent special attention for proper use of the product in order to reduce the risk of any harm to other persons and property. Read carefully and understand the meaning of symbols as described below.

⚠️ Warning
Failure to follow the instructions provided with this indication and improper handling may cause death or serious injury.

⚠️ Caution
Failure to follow the instructions provided with this indication and improper handling may cause injury and/or property damage.

🚫 Indicates prohibition. Specific prohibited contents may be drawn in the figure, for example disassembly prohibition.

⚠️ Content to force or instruct actions.
Document disclaimer

Read carefully the following instructions for installation, wiring and setting.

⚠️ Warning

Follow the instructions below to reduce the risk of fire or electrical shock.

- Turn off the power during the installation.
- Connect wires into the terminal blocks firmly. Incomplete wiring or disconnection may cause a fire.
- Use this product within the specification, such as the correct power source and power consumption. When using this wrong and not within the environmental conditions, it may cause an electric shock, an injury or a fire.
- Stop using the product when smoke or a strange smell comes from the product, and when it is broken or damaged.
- Do not use the products beyond the specifications. Otherwise, it may cause a fire or an electric shock by a short circuit or heat.
- Do not wash or insert anything into the product.
- Do not put anything over the product in use. It may generate heat and burn the inside which can result to cause a fire or an electric shock.
- Do not ever open, modify or repair the product.

⚠️ Caution

To reduce the risk of injury

- Check periodically whether the products (especially the detection unit) are mounted firmly. If the mounting plate or screws rust, those may fall of and injure (a) person(s).

To reduce the risk of failure

- Do not use the product under environments with extreme humidity, oil, smoke, dust and any severe vibration.
- Do not stand on the product or put any heavy objects on the product.

To reduce the risk of injury

- Use the specified wires.
- Make sure there are no objects next to the product, which may interfere to the performance, such as an emergency light.
- The product is designed only for interior usage; inside a building, so do not use it outside.
- Do not install the product higher than mentioned in the specifications. This may decrease the performance.
- Do not touch the window of the detection unit, this may reduce the detection performance.
- Do not spray any chemical products on the product, such as thinner, benzine, air freshener or insect spray.
Reverse detection

As shown in the figure below, when a passerby crosses two lines of pink and light blue in opposite directions, a "Reverse" output will be activated.

Detection area

The width of the detection area (detectable range) varies depending on the mounting height of the detection unit. For each control box, up to 3 detection units can be installed.

<table>
<thead>
<tr>
<th>Mounting height</th>
<th>Maximum detection width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>x1 unit</td>
</tr>
<tr>
<td>2.5 m</td>
<td>1 500 mm</td>
</tr>
<tr>
<td>3.0 m</td>
<td>2 700 mm</td>
</tr>
<tr>
<td>3.5 m</td>
<td>3 300 mm</td>
</tr>
<tr>
<td>4.0 m</td>
<td>4 000 mm</td>
</tr>
</tbody>
</table>

- Calculation is based on a person with a maximum height of 2.0m as a target object.

Detection targets

In the following cases, it may not detect correctly.
- Reverse movement with low attitude such as crawling on the ground or crouching
- A person with an umbrella
- More than two persons, who have a gap in the height enter closely together
- Very short time of being in the detection area
- A person(s) stopping completely in the detection area
- When wearing a helmet
- A black, or nearly black floor in the detection area
- Dark lighting around the detection area
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1. Check before use

1-1. Features
This product is designed to detect a person moving (passing) through reverse direction in the security areas or in the public areas, by its own detection principle.

Reverse detection
When a movement in the direction opposite (reverse) to the specified direction (forward) occurs, it judges that "reverse" has occurred.

1-2. Confirmation of packing content and preparation
Make sure that all parts are available and without any damage before use.
Note: The detection unit and control box are separately available.

- Control box and parts

- Detection units and parts

Note; This product requires PoE Network Switch (separately available) for the power source. Also it requires a PC for the installation.
1-3. System configuration

Refer to the following diagram as an example of the reverse detection system.

- Wires for the system installation are not provided and need to be obtained by an installer. Refer to “2-3. Wiring”.
- Limit to simultaneous connection to one PC (one session). Multi connections of PC (multi sessions) may cause an influence of operation delay, etc.
1-4. Name of parts

■ Control box

Reboot switch (IP address / password)

LED indicator
Power / reverse

Dipswitches

Input / output indicators

Input N.O./N.C. contact selector
Output N.O./N.C. contact selector


■ Detection unit

Reboot switch (IP address / password)
2. Settings and wiring

2-1. Mounting detection unit

**Suggested mounting position**
Before mounting, check the type of door and which way the door opens.

- Suggested mounting position may vary by the type of door and which way the door opens
- Suggested mounting position is only an indication to find the best position. Check its operation after area settings.
- It is necessary to install the sensor without obstructing the detection area with any obstacles. If the detection unit cannot be installed within the recommended installation position, please contact a dealer, an installer, a constructor or the manufacturer.

> For each control box, up to 3 detection units can be installed.

Overlap the detection areas at least 300 mm.

### Mounting height | Maximum detection width | Maximum mounting pitch
---|---|---
| x1 unit | x2 units | x3 units |  |
| 2.5 m | 1 500 mm | 2 700 mm | 3 900 mm | 1 200 mm |
| 3.0 m | 2 700 mm | 5 100 mm | 7 500 mm | 2 400 mm |
| 3.5 m | 3 300 mm | 6 300 mm | 9 300 mm | 3 000 mm |
| 4.0 m | 4 000 mm | 7 700 mm | 11 400 mm | 3 700 mm |
How to install the detection unit

Be sure to check the orientation of the detection unit before installing it. Install with the arrow of "REVERSE" facing in the reverse passing direction.

2-2. Mounting control box

Recommended range of installation for the control box

- The control box is recommended to be mounted in the secured area, and also inside the box secured by a lock (separately available).
- The control box is required to be connected to a PC through PoE Network Switch during the process of set up after installation and maintenance.

How to install

- Fix the control box by the fixing screws (x4 pieces) included, or other screws suitable to the material of the mounting place.
2-3. Wiring

■Wiring example

Control box R1002CB

PoE Network Switch
(separately available)

PoE

- Higher level control system
- Indicator
- Event recorder.
- etc.

■Applicable wires

<table>
<thead>
<tr>
<th>Application</th>
<th>Applicable wires</th>
</tr>
</thead>
<tbody>
<tr>
<td>PoE(LAN)</td>
<td>CAT5e or larger, maximum length: 100 m</td>
</tr>
<tr>
<td>In/out terminal</td>
<td>Single-wire: Φ0.65 mm (AWG 22) to Φ1.6 mm (AWG 14)</td>
</tr>
</tbody>
</table>
## Terminal description

<table>
<thead>
<tr>
<th>Number</th>
<th>Terminal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>n/a</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Output cancelling</td>
<td>Disable the output signals of Reverse [1] and [2]</td>
</tr>
<tr>
<td>8</td>
<td>Output reset</td>
<td>Reset the output signals of Reverse [1] and [2]</td>
</tr>
</tbody>
</table>

### Input

1. **Reverse [1]**
   - Reverse output signals.
   - Output holding time can be individually adjustable for Reverse [1] and [2] by a potentiometer.

2. **Reverse [2]**

3. **Detection unit [1]**

4. **Detection unit [2]**
   - Pulse outputs during the reverse detection by the unit [1], [2] or [3].

5. **Detection unit [3]**

6. **Number of Reverse detection**
   - Output signals for every reverse by pulse.

7. **n/a**

8. **Error**
   - Error output signals.
   - For example, communication error between the control box and detection unit(s), darkness in the detection area, etc.

- All output/input signals are No-Voltage type.
- Refer to “4-3. Input/output signals” for details.
2-4. Switch settings

Functions and settings are set with each switch.

■ Select output
Either N.O. (normally open) or N.C. (normally close) is selectable by input / output contact selectors.

Note; The contact output operation of the control box is as follows.

<table>
<thead>
<tr>
<th>Dipswitch settings</th>
<th>Power OFF</th>
<th>Power ON &amp; not activated</th>
<th>Power ON &amp; activated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normally open (N.O.)</td>
<td>OPEN</td>
<td>OPEN</td>
<td>CLOSE</td>
</tr>
<tr>
<td>Normally close (N.C.)</td>
<td>OPEN</td>
<td>CLOSE</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

- All contacts are set to N.O. as the factory default.
- All of the above settings of the dipswitches work in conjunction with the input / output terminals.

■ Output hold time
Output hold time is independently adjustable for each output, Reverse [1] and Reverse [2].

Output hold times can be set as follows.

<table>
<thead>
<tr>
<th>Rotary switch position</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output hold time (sec.)</td>
<td>∞</td>
<td>0.2</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rotary switch position</th>
<th>8</th>
<th>9</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output hold time (sec.)</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>30</td>
<td>45</td>
</tr>
</tbody>
</table>

- Factory default is 4 sec.
■ Dipswitches

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Dipswitch settings

■ Buzzer ON/OFF (dipswitch setting [2])
Set whether to sound the buzzer (ON) or not (OFF) during the reverse output hold time.

<table>
<thead>
<tr>
<th>Buzzer ON/OFF (dipswitch setting [2])</th>
<th>OFF</th>
<th>Disable Buzzer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON</td>
<td>Enable Buzzer</td>
</tr>
</tbody>
</table>

- The duration time of the buzzer is the same as “Output hold time for Reverse detection [1]”.

2-5. LED indication

■ Operation indicator

Power | Reverse
---|---
○ | ○

Operation indicator works as below.

<table>
<thead>
<tr>
<th>Operation indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power indicator</td>
<td>Stay on when the power is ON.</td>
</tr>
<tr>
<td>Reverse indicator</td>
<td>Stay on during reverse detection. *1</td>
</tr>
<tr>
<td>Input indicator</td>
<td>Stay on during input continuing.</td>
</tr>
<tr>
<td>Output indicator</td>
<td>Stay on during output continuing.</td>
</tr>
</tbody>
</table>

*1; The duration time of the Reverse indicator is the same as “Output hold time for Reverse detection [1]”.
3. Area settings

Connect to a PC for area settings after installation of each item.

3-1. Before setting

Use PoE Network Switch and LAN cable for the connection. Factory default settings are shown as follows. Change the network settings if needed according to the installation site.

<table>
<thead>
<tr>
<th>Control box</th>
<th>Detection unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>192.168.0.1</td>
</tr>
<tr>
<td>Subnet mask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Default gateway</td>
<td>-</td>
</tr>
<tr>
<td>Initial password</td>
<td>accuracy</td>
</tr>
</tbody>
</table>

- Harmonize the settings of the network between a PC and each item so that all of them belong to the same network segment. Consult a network administrator (system administrator) if you need to.
- Manage strictly the IP address of each device, this is important information of the system and should not to be leaked to a third party.
- Also manage strictly the password, and immediately change is recommended.

Operating environment

This product can check the operation status of the system and set the equipment from the web browser of PC. Recommended Browser: Chrome 54, Internet Explorer 11 or later
Confirmation environment: Chrome 54, Internet Explorer 11 (Windows 7 PC)

Network setting for PC

< Windows7 >

3-1-1. Click “Network status and task indicator” at “Control panel” in the “Start” menu.

3-1-2. Click “Adopter setting”
3-1-3. Right click "Local area connection" in "Network connection", and click "Properties".

3-1-4. Select "TCP/IPv4", and click "Properties".

3-1-5. Set "IP address" as follows.

Set the end number of the PC's IP address to a value different from that of the control box or detection unit on the same network.

- Example of connecting only one control box and detection unit on the same network
  - PC: Change to 192.168.0.99
  - Control box: 192.168.0.1 (Default)
  - Detection unit: 192.168.0.2 (Default)

Change the IP address from the default value when connecting multiple combinations of control boxes and detection units on the same network. Refer to the following pages for details.
■ Log-in
Access each device using an IP address through the browser on the PC.
Input a password according to the instruction on the screen. Initial password is “accurance”.

Input an IP address of each device here.
Control box: 192.168.0.1 (Default)
Detection unit: 192.168.0.2 (Default)

■ LAN settings
Change the LAN settings according to the situation of the installation site
・ Example for the control box.

Set the end number of the IP address to a value different from that of the other devices on the same network.

・ Example for the detection unit
Note; Set the different IP address for each unit when multiple detection units are used in the same system.

Set the end number of the IP address to a value different from that of the other devices on the same network.

■ Password change
Change the password from the initial setting.
3-2. Mounting and confirmation

Set and confirm (monitor) the operation of the system through the control box. Access the control box using an IP address from the PC. The default setting is "192.168.0.1".

Register the combination of the control box and the detection unit
Register the detection unit corresponding to the control box. Maximum three detection units can be registered in one control box. Find connected detection unit(s) clicking "Search" button in the "Search/Register detection unit" menu. Select and click "Register" button according to the displaying connected detection unit(s).

Repeat the procedure “Search” and “Register” when multiple detection units (3 units max.) are to be registered.

Confirm that the required number of detection unit(s) is(are) displayed in "Registered detection unit" and click "Go to next setting".

The maximum number of searches by the search button is up to ten. When 11 or more detection units are connected on the same network, register directly by specifying the IP address directly.

Register to specify the IP address
3-3. Area settings

Make settings corresponding to the number on the screen below.

3-3-1. Input “Site name”, “Entrance name” and “Mounting height” of the detection unit

<table>
<thead>
<tr>
<th>Site name</th>
<th>Site [4 char]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location name</td>
<td>Location [8 char]</td>
</tr>
<tr>
<td>Installation height</td>
<td>2700 mm (2300-5000)</td>
</tr>
</tbody>
</table>
3-3-2. Detection area settings

Check “Four point settings”, then adjust the four ends of the detection area to the width of the passage.

When one of the numbers through [1] to [4] is clicked, it turns red to show it is movable. They can be fine-tuned with the up/down and right/left arrow buttons on the PC keyboard.

After completing the area setting up to 3-3-2., proceed to “3-4 Transfer setting” and “3-5 operation check”. If fine adjustment is necessary after checking the operation, proceed to 3-3-3. and 3-3-4. below.

3-3-3. Sensitivity and detectable size

Adjust the slide switch on the display, if necessary.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Lower (toward &quot;-&quot;&quot;)</th>
<th>Higher (toward &quot;+&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>Detection sensitivity decreases. When detecting the shadow or door opening or closing cycle by mistake, set the detection sensitivity low. However, note that it may be difficult to detect persons.</td>
<td>Detection sensitivity increases. Note that if it is made too high, the risk of the detection error to detect the shadow or door opening or closing cycle may increase too.</td>
</tr>
<tr>
<td>Detectable size</td>
<td>The size of the object recognized as one person increases. It makes the detector easier to detect large people, and more difficult to detect small people.</td>
<td>The size of the object recognized as one person decreases. It makes the detector easier to detect small people, and also easier to recognize large ones as two people.</td>
</tr>
</tbody>
</table>
3-3-4. Area masking
Set the masking sector by clicking the marking on the display. For example, masking prevents detection through the glass.

3-4. Transfer setting configuration
Transfer the setting configuration to the devices after the area setting. Specify the storage location and enter the file name to save as the backup in PC.

- Changes will not be transferred to the devices unless "Overwrite save" is clicked. Be sure to click "Overwrite save" after changes in settings. If the "Change the target detection unit" or "End" button is pushed before saving, changed parameter will be cleared.
- Keep the saved setting data carefully.
  - When "Overwrite save" is completed, select "Setup completed" and proceed to "3-5 operation check".
3-5. Operation check

Check the operation on the screen after transferring the setting configuration.

When two or more detection units are registered (up to 3 units), it is possible to switch the monitor display of detection units 1 to 3, and "All" with the display changeover button.

**Operation check**

Check the operation for the reverse detection, with the following movements.

- Walking in normal and reverse direction by one person
- Walking in reverse direction by multiple persons
- Trot in reverse direction
- Walking in reverse direction on both ends of the passage
- Cross movement

When any problems are found during “Operation check” process, go to “4-4 Trouble shooting”, or adjust the sensitivity.

Refer to "3-3-3. Sensitivity and detectable size" and “3-3-4. Area masking".
3-6. Other settings

■ Load the setting
It loads the saved setting parameters in a PC at the “Detection area setting” menu. Click “Download” button to start.

Select the desired setting data. Confirm the reflected settings and click “Overwrite save”.

■ Print report
Print the setting report to enter the request on the screen. Click “Print report”, then the report is displayed on the other screen. Input the “Site name” if necessary. Print the report through the function of the browser.

3-7. Log out
Log out by clicking the button on the right side of the screen after settings are completed, or cancelled.
4. Appendixes

4-1. Dimensions

■ Detection unit

■ Control box

Unit: mm
## 4-2. Specifications

### Detection unit / Control box

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection Method</td>
<td>Vector Focusing Method</td>
<td></td>
</tr>
<tr>
<td>Detection Accuracy</td>
<td>&gt; 95% (by own criteria)</td>
<td></td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>Power over Ethernet IEEE 802.3 af</td>
<td></td>
</tr>
<tr>
<td>Warm-up time</td>
<td>Approx. 45 sec.</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Control box 10 W max.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detection unit 10 W max.</td>
<td></td>
</tr>
<tr>
<td>Indicator</td>
<td>Control box</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green Power (lit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red Reverse detection (lit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green / Red Warm-up (lit) / Trouble (blinking)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication trouble (alternative blinking)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detection unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green Power (lit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red Reverse detection (lit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orange Warm-up (lit) / Trouble (blinking)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication trouble (alternative blinking)</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>Control box 265 × 135 × 31 mm (W × H × D)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detection unit 193 × 85 × 34 mm (W × H × D)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Control box 800 g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detection unit 220 g</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>0 to 50°C</td>
<td></td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>&lt; 80% RH</td>
<td>only under no condensation</td>
</tr>
<tr>
<td>Operating Illuminance</td>
<td>100 to 20,000 lux *1</td>
<td>only the outline of an object is shown</td>
</tr>
<tr>
<td>Install location</td>
<td>Control box Wall / stationary</td>
<td>Interior only</td>
</tr>
<tr>
<td></td>
<td>Detection unit Ceiling</td>
<td>Interior only</td>
</tr>
<tr>
<td>Mounting Height</td>
<td>Detection unit 2.5 to 4.0 m</td>
<td>It may be limited by environmental conditions.</td>
</tr>
<tr>
<td>LAN wiring</td>
<td>CAT5e or larger</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 m max. in length</td>
<td></td>
</tr>
<tr>
<td>Ethernet</td>
<td>100Base-T(X)</td>
<td>Protocol : TCP/UDP(IPv4), ARP, ICMP or HTTP</td>
</tr>
<tr>
<td>Input terminal *2</td>
<td>Disable output</td>
<td>Disable reverse detection [1] and [2]</td>
</tr>
<tr>
<td></td>
<td>Output reset</td>
<td>Stop the outputs of reverse detection [1] and [2]</td>
</tr>
<tr>
<td></td>
<td>N.O./N.C. no voltage</td>
<td></td>
</tr>
<tr>
<td>Output terminal *2</td>
<td>Reverse detection [1]</td>
<td>Variable timer 0.2 to infinity</td>
</tr>
<tr>
<td></td>
<td>Reverse detection [2]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit [1] detects</td>
<td>Pulse output for reverse detection by unit [1]</td>
</tr>
<tr>
<td></td>
<td>Unit [2] detects</td>
<td>Pulse output for reverse detection by unit [2]</td>
</tr>
<tr>
<td></td>
<td>Unit [3] detects</td>
<td>Pulse output for reverse detection by unit [3]</td>
</tr>
<tr>
<td></td>
<td>Number of reverse detections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MOS FET relay N.O./N.C. no voltage 30 V DC 0.2 A or less (Resistibility load)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pulse output for the number of reverse detection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Output when disable to detect</td>
<td></td>
</tr>
</tbody>
</table>

*1 R1002 always requires 100 lux or more.

*2 Input/output relays can be selected N.O./N.C. by the dipswitch.

- Specification and design are subject to change without prior notice.
4-3. Input/output signals

Reverse detection / Number of reverse detection
The difference between 2 outputs is shown below. All the examples apply N.O. contact type. The outputs of the “Reverse detection [1] and [2]” are held for the duration time set by event timer. Each output of the “Detection unit [1] to [3] detects”, and the “Number of reverse detections” are activated for predetermined duration time at the “Reverse detection”.
(Pulse width = 0.5 sec. Interval = 0.5 sec. min.)

![Diagram of input/output signals]

4-4. Troubleshooting

<table>
<thead>
<tr>
<th>Status</th>
<th>Check point</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>No work (No LED indication)</td>
<td>LAN cable connection.</td>
<td>Rewire LAN cable. Use CAT5e or larger. Maximum length should not exceed 100 m.</td>
</tr>
<tr>
<td></td>
<td>PoE Network Switch connection and operation.</td>
<td>Use PoE Network Switch complying IEEE 802.3af as the power source, and check the connection. Check also its capacity should be minimum 20 W.</td>
</tr>
<tr>
<td>Do not detect the reverse detection</td>
<td>Installation of the detection unit was correct but removed after installation.</td>
<td>Adjust again the detection area.</td>
</tr>
<tr>
<td></td>
<td>Obstacle object (equipment) in the detection area.</td>
<td>Take away the obstacle (equipment), or consider about relocation the detection unit.</td>
</tr>
</tbody>
</table>