

PERFORMANCE
MADE
SMARTER

Product manual

4179B

Universal trip amplifier



TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

No. 4179BV100-EN
From serial no.: 241911000

PR
electronics

6 Product Pillars

to meet your every need

Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



Temperature

Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communications using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.



I.S. Interface

We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with SIL 2 Full Assessment that are both efficient and cost-effective. Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.



Communication

We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our Portable Plant Supervisor (PPS) application, available for iOS, Android.



Multifunction

Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.



Isolation

Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Display

Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

Table of Contents

| | |
|--|----|
| Warnings | 4 |
| Symbol identification | 5 |
| Safety instructions | 6 |
| Installation | 7 |
| Mounting / demounting of system 4000 | 7 |
| Product features | 8 |
| Functional highlights | 8 |
| Technical highlights | 8 |
| Programming | 8 |
| Mounting / installation | 8 |
| Applications | 9 |
| Connections | 10 |
| Block diagram | 11 |
| Specifications | 12 |
| Ordering information | 12 |
| Technical specifications | 12 |
| Common electrical specifications | 12 |
| Input and output specifications | 13 |
| Approvals & certificates | 14 |
| Programming | 15 |
| Configurable input error indication and input limits | 15 |
| Relay functions | 15 |
| Advanced settings menu | 19 |
| Routing diagram | 20 |
| Help text overview | 21 |
| Operation & troubleshooting | 22 |
| Document history | 24 |

Warnings



WARNING

This device is designed for connection to hazardous electric voltages. Ignoring this warning can result in severe personal injury or mechanical damage.

To avoid the risk of electric shock and fire, the safety instructions in this product manual must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following.

Prior to the commissioning of the device, this product manual must be examined carefully.

Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



HAZARDOUS VOLTAGE

Until the device is fixed, do not connect hazardous voltages to the device.

In applications where hazardous voltage is connected to in-/outputs of the device, sufficient spacing or isolation from wires, terminals, and enclosure to surroundings (incl. neighboring devices), must be ensured to maintain protection against electric shock.



HAZARDOUS VOLTAGE

To keep the safety distances, the relay contacts on the device must not be connected to both hazardous and non-hazardous voltages at the same time.



WARNING

Do not open the front plate of the device as this will cause damage to the connector for the PR 4500 display / communication interface.

This device contains no DIP switches or jumpers.

Symbol identification



Triangle with an exclamation mark: Warning / demand. Potentially lethal situations. Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.



The **CE mark** proves the compliance of the device with the essential requirements of the EU directives.



The **UKCA mark** proves the compliance of the device with the essential requirements of the UK regulations.



The **double insulation symbol** shows that the device is protected by double or reinforced insulation.

Safety instructions

Definitions

Hazardous voltages have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC.

Technicians are qualified persons educated or trained to mount, operate, and troubleshoot the device in accordance with safety regulations.

Operators are personnel familiar with the contents of this manual and capable of safe operation of the device.

Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until it has been permanently mounted.

Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.

The device must be installed in pollution degree 2 or better.

The device is designed to be safe up to an altitude of 2 000 m.

The device is designed for indoor use.

Mounting

Only technicians, who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these, should connect the device. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively, contact PR electronics at www.prelectronics.com.

Mounting and connection of the device should comply with national legislation for mounting of electric materials, e.g. wire cross section, protective fuse, and location.

Stranded wire should be installed with an insulation strip length of 5 mm or via a suitable insulated terminal such as a bootlace ferrule.

Descriptions of input / output and supply connections are shown in the block diagram and side label.

The following apply to fixed hazardous voltages-connected devices:

The max. size of the protective fuse is 10 A and, together with a power switch, it should be easily accessible and close to the device.

The power switch should be marked with a label indicating that it will switch off the voltage to the device.

SYSTEM 4000 must be mounted on a DIN rail according to DIN EN 60715.

Year of manufacture can be taken from the first two digits in the serial number.

Calibration and adjustment

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

Normal operation

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

Cleaning

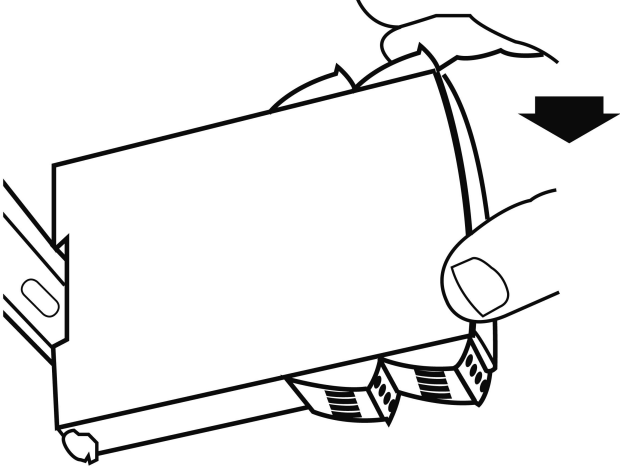
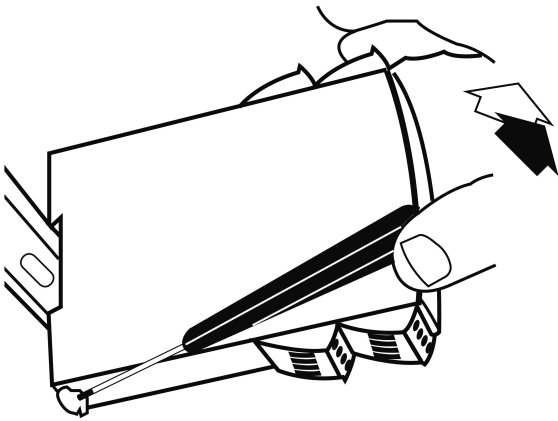
When disconnected, the device may be cleaned with a cloth moistened with distilled water.

Liability

To the extent the instructions in this manual are not strictly observed, the customer cannot advance a demand against PR electronics A/S that would otherwise exist according to the concluded sales agreement.

Installation

Mounting / demounting of system 4000

| Mounting on DIN rail (Fig.1) | Demounting from DIN rail (Fig.2) |
|--|--|
| Click the device onto the DIN rail. | The device is detached from the DIN rail by moving the bottom lock down. |
|  |  |
| Fig. 1 | Fig. 2 |

Mounting / demounting the PR 4500 communication interfaces

Mounting of the PR 4500 communication interfaces (Fig. 3)

- 1: Insert the tabs of the PR 4500 into the slots at the top of the device.
- 2: Hinge the PR 4500 down until it snaps into place.

Demounting of the PR 4500 communication interfaces (Fig. 4)

- 3: Push the release button on the bottom of the PR 4500 and hinge the PR 4500 out and up.
- 4: With the PR 4500 hinged up, remove from holes at the top of the device.

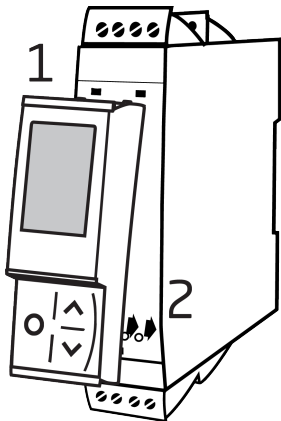


Fig. 3

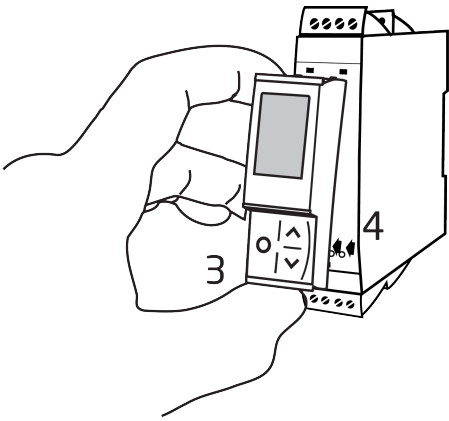


Fig. 4

Product features

- Measures AC current and voltage signals
- Output: 2 relays
- Programming, process monitoring and diagnostics via PR 4500
- Universal power supply 21.6...253 VAC / 19.2...300 VDC

Functional highlights

- The 0... 5 AAC RMS range makes it possible to accurately measure a typical current transformer.
- The 0...300 VAC RMS range allows accurate supply voltage monitoring.
- The device measures standard input ranges and can be freely configured to customer-defined input range.
- Process control with 2 pairs of potential-free relay contacts which can be configured to suit any application.
- Trip amplifier with window function allowing the relay to change state within a high and a low setpoint on the input span.
- Simulation of process value during commissioning / maintenance.
- All terminals are over-voltage protected, polarity protected and short-circuit protected.
- The 4179B provides the required failure data (SFF and PFD_{AVG}) for SIL 2 applications as per IEC 61508 / IEC 61511.
- Failure rates for 4179B correspond to Performance Level "d" according to ISO-13849.

Technical highlights

- Accuracy < 0.3% of span.
- Temperature coefficient 0.01% / °C.
- Response time < 0.75 s for measuring AC current / voltage signals.
- High galvanic isolation of 2.3 kVAC.
- Extended EMC immunity: NAMUR NE21, A criterion, burst.
- Functional safety: HW assessment, SFF > 90%.

Programming

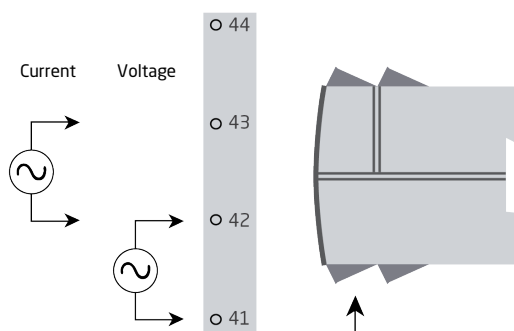
- Configuration, monitoring and diagnostics using PR 4500 detachable communication interfaces. Product-specific functionality includes communication via Modbus and Bluetooth using our PR Process Supervisor (PPS) application, available for iOS and Android.
- All programming can be password protected.
- Scrolling help text in 7 languages.

Mounting / installation

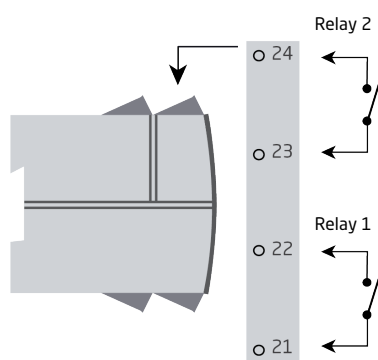
- Units can be mounted side by side, horizontally and vertically, without air gap on a standard DIN rail, even at 60°C ambient temperature.

Applications

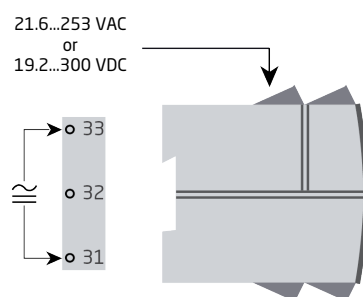
Input signals:



Output signals:

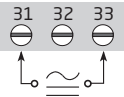


Power connection:

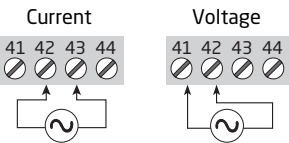


Connections

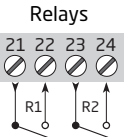
Supply



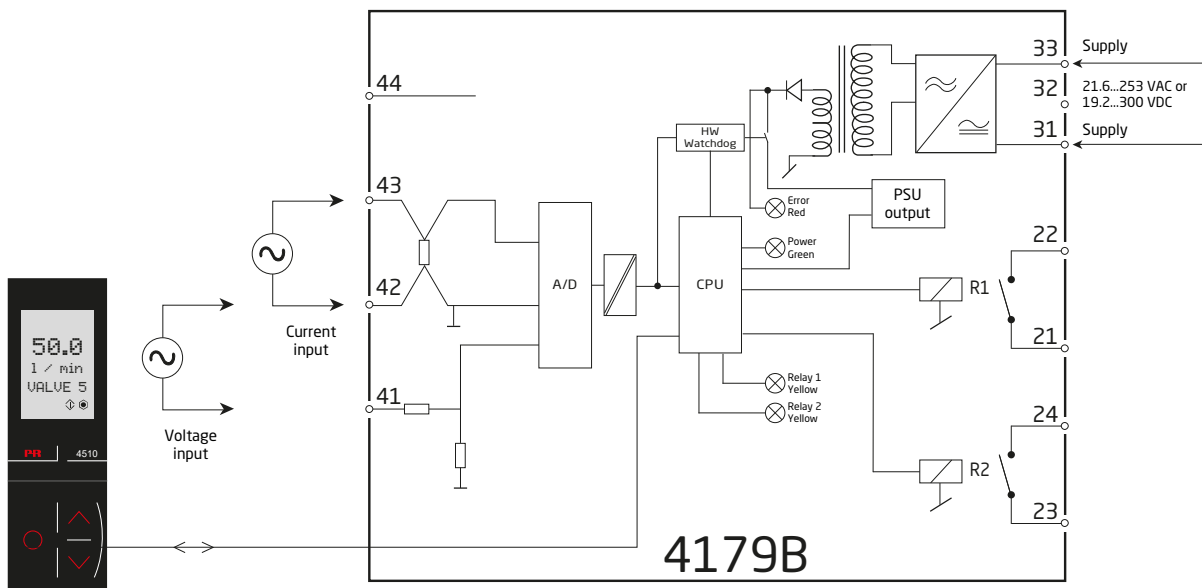
Input



Output



Block diagram



Specifications

Ordering information

Product variants

| Type | Name |
|-------|--------------------------|
| 4179B | Universal trip amplifier |

Accessories for programming

4510 = Display / programming front

4511 = Modbus communication enabler*

4512 = Bluetooth communication enabler*

4590 = ConfigMate

*Note: The PR 4500 communication interfaces are approved and certified as an add-on component to the 4000 series of devices. All technical characteristics are valid with the PR 4500 communication interface attached.

Technical specifications

Environmental conditions

| | |
|-----------------------------------|--|
| Operating temperature | -20°C to +60°C |
| Storage temperature | -20°C to +85°C |
| Calibration temperature | 20...28°C |
| Relative humidity | < 95% RH (non-cond.) |
| Protection degree. | IP20 |
| Installation in | Pollution degree 2 & measurement / overvoltage category II |

Mechanical specifications

| | |
|---|---|
| Dimensions (HxWxD) | 109 x 23.5 x 104 mm |
| Dimensions (HxWxD) w/ PR 4500 | 109 x 23.5 x 131 mm |
| Weight approx. | 155 g |
| DIN rail type. | DIN EN 60715 - 35 mm |
| Wire size. | 0.13...2.08 mm ² / AWG 26...14 stranded wire |
| Screw terminal torque | 0.5 Nm |
| Vibration, IEC 60068-2-6. | 2...13.2 Hz ± 1 mm, 13.2...100 Hz = ± 0.7 g |

Common electrical specifications

| | |
|--|--|
| Supply voltage, universal. | 21.6...253 VAC, 50...60 Hz or 19.2...300 VDC |
| Internal fusible resistor. | < 80 s, 2.4 A |
| Max. required power | 1.2 W |
| Max. power dissipation – current measurement | 2.2 W |
| Max. power dissipation – voltage measurement. | 1.2 W |

Max. required power is the maximum power needed at power supply terminals, **excluding** the power required for the PR 4500 communication interface.

Max. power dissipation is the maximum power dissipated at nominal operating values.

| | |
|--|----------------------|
| Isolation voltage - test | 2.3 kVAC |
| Isolation voltage - working | |
| Supply to any & Input to any | 250 VAC (reinforced) |

| | |
|---|----------------------------------|
| Relay to relay | 125 VAC (reinforced) |
| Signal dynamics, input | 20 bit |
| Bandwidth. | 40...400 Hz |
| Response time (0...90%, 100...10%) | < 0.75 s |
| Programming | PR 4500 communication interfaces |
| Input limiter response time. | 2.5 s |
| Long term stability, of span, current, 1yr / 5yr @ 25°C | $\leq 0.071\%$ / $\leq 0.121\%$ |
| Long term stability, of span, voltage, 1yr / 5yr @ 25°C | $\leq 0.073\%$ / $\leq 0.124\%$ |

Accuracy, the greater of general and basic values:

Input accuracy

| General values | | |
|----------------|---------------------------|---------------------------------|
| Input type | Absolute accuracy | Temperature coefficient |
| All | $\leq \pm 0.3\%$ of span* | $\leq \pm 0.01\%$ of span* / °C |

| Basic values | | |
|--------------|----------------|-------------------------|
| Input type | Basic accuracy | Temperature coefficient |
| Current | 1.5 mA | 50 μ A / °C |
| Voltage | 1.5 mVAC | 50 μ VAC / °C |

Note: Accuracy and temperature coefficient for digital interfaces (e.g. HART, PROFIBUS, MODBUS) follow the accuracy of the configured input (above table).

| | |
|---|-----------------------|
| EMC - immunity influence. | < $\pm 0.5\%$ of span |
| Extended EMC immunity: NAMUR NE 21, A criterion, burst | < $\pm 1\%$ of span |

*of span = of selected standard range or for custom range: span = IN.HI value

Input and output specifications

Current input

| | |
|--|-------------------------------------|
| Signal range. | 0...5. AAC / 40...400 Hz |
| Maximum input limit | 6.00 AAC @ 40°C |
| Programmable measurement ranges | 0...0.5, 0...1, 0...2.5 & 0...5 AAC |
| Custom configurable measurement range. | 0...5 AAC / 40...400 Hz |
| Min. span | 0.5 AAC |
| Input resistance | < 0.042 Ω (incl. terminals) |

Voltage input

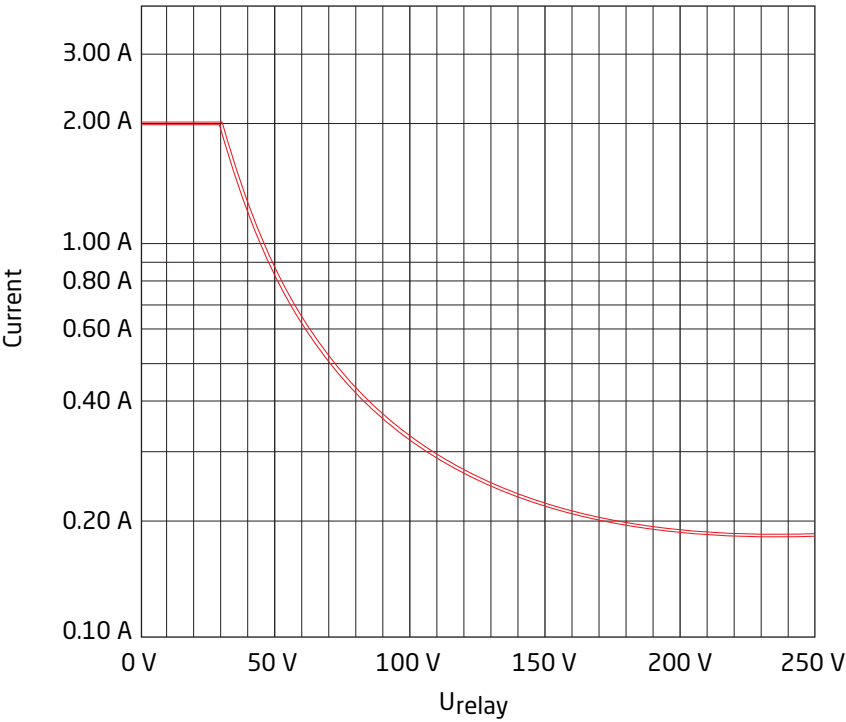
| | |
|--|---|
| Signal range. | 0...300 VAC / 40...400 Hz |
| Maximum input limit | 300 VAC |
| Programmable measurement ranges | 0...0.5, 0...1, 0...2.83, 0...5, 0...120, 0...230 & 0...300 VAC |
| Custom configurable measurement range. | 0...300 VAC / 40...400 Hz |
| Min. span | 0.5 VAC |
| Input resistance. | Nom. 3 M Ω 100 pF |

Relay outputs

| | |
|---------------------------|--|
| Relay functions | Setpoint, Window, Error indication, Latch, Power and Off |
|---------------------------|--|

| | |
|---|---|
| Hysteresis | 0...100% |
| On and Off delay | 0...3600 s |
| Power on delay | 0...9999 s |
| Max. voltage. | 250 VAC / VDC |
| Max. AC current | 2 A |
| Max. AC power | 500 VA |
| Max. DC current, resistive load @ Urelay ≤ 30 VDC | 2 ADC |
| Max. DC current, resistive load @ Urelay > 30 VDC | [1380 x Urelay ⁻² x 1.0085 ^{Urelay}] ADC |

Graphic depiction of [1380 x Urelay⁻² x 1.0085^{Urelay}]:



Approvals & certificates

Observed authority requirements

| | |
|---------------|------------------------------|
| EMC | 2014/30/EU & UK SI 2016/1091 |
| LVD | 2014/35/EU & UK SI 2016/1101 |
| RoHS. | 2011/65/EU & UK SI 2012/3032 |

Approvals

| | |
|---------------------------|---------|
| c UL us, UL 508 | E248256 |
|---------------------------|---------|

Functional Safety

Hardware assessed for use in SIL applications FMEDA report - www.prelectronics.com

Programming

The PR 4500 communication interfaces provide complete module programming and access to a wide range of operational features that help you when using the device. For further information on how to navigate and operate the 4500 communication interfaces, please refer to www.prelectronics.com/products/communication

This chapter deals with the advanced features of the product. The complete menu structure and programming options can be found in the Routing diagram section.

Configurable input error indication and input limits

To increase system safety and integrity, users can program a high and low input error detection level. Input signals outside the low and high limits will cause the output of the device to go to the programmed error state.

The error is indicated in display line 1 as IN.ER and at the same time the backlight flashes. The two configurable input error detection levels can be set and enabled individually, just as it is possible to individually set the output error indication for each of the two detection levels.

This allows users to differentiate process faults, broken input wires, etc. Available output error states for each of the two detection levels are: NONE, OPEN, CLOSE, HOLD.

Relay functions

5 different settings of relay function can be selected.

Setpoint: The device works as a single limit switch.

Window: The relay has a window that is defined by a low and high setpoint. On both sides of the window the relay has the same status.

Power: The relay is activated if power is on.

Off: The relay is deactivated.

Latch: The relay is latched. Valid for Setpoint, Window and Error function (advanced settings).

Setpoint and window configuration

Common parameters:

Delay: An ON and an OFF delay can be set on both relays in the range 0...3600 s.

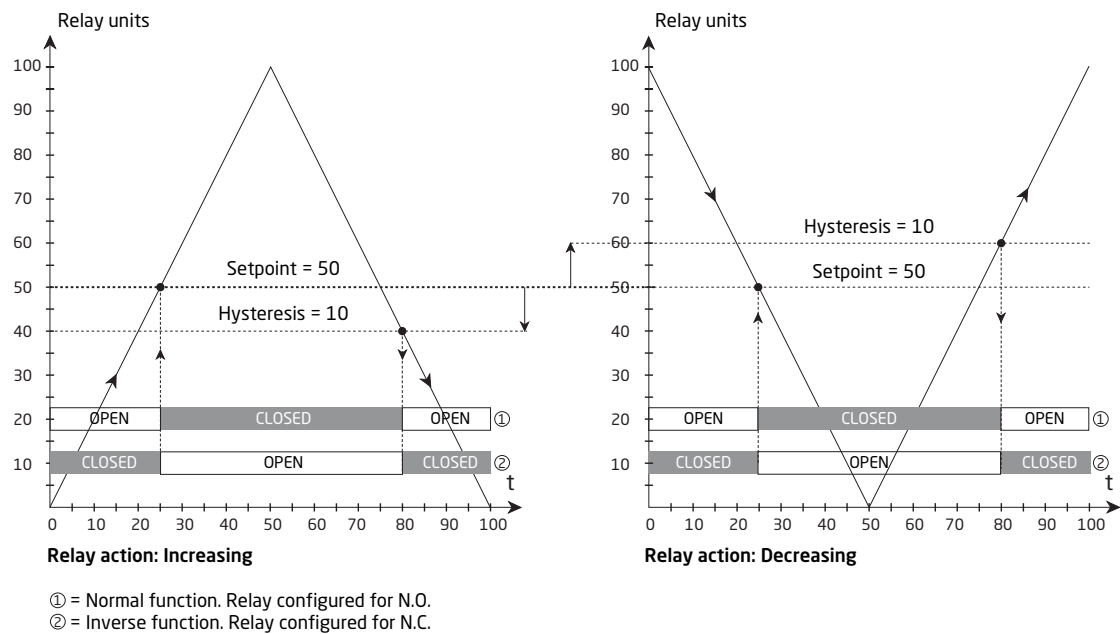
Hysteresis: 0.0...100.0%.

An active relay can be set as either normally open or normally closed.

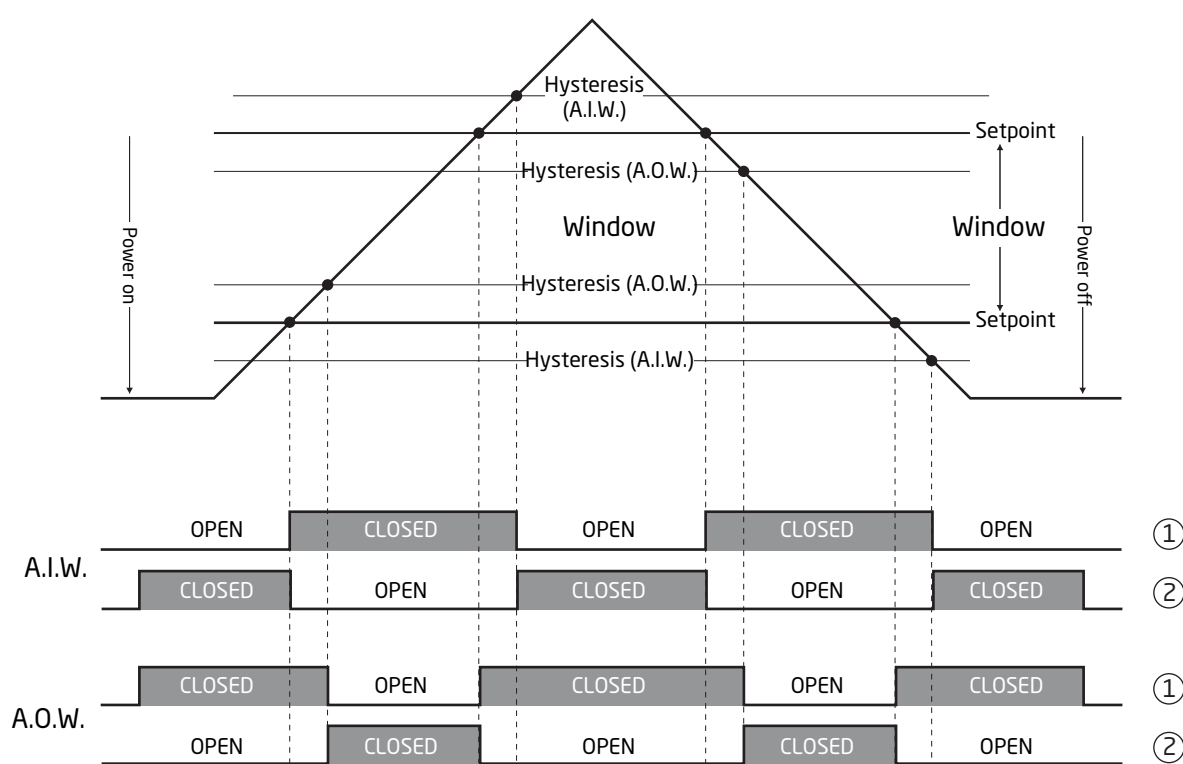
The device works as a single limit switch when selecting 'setpoint' in the menu and entering the desired limit. For setpoint the relays can be set to activate on increasing or decreasing input signal.

The window function is selected by choosing 'window' in the menu and defining a high and a low setpoint. The relay can be configured as active inside the window or outside the window.

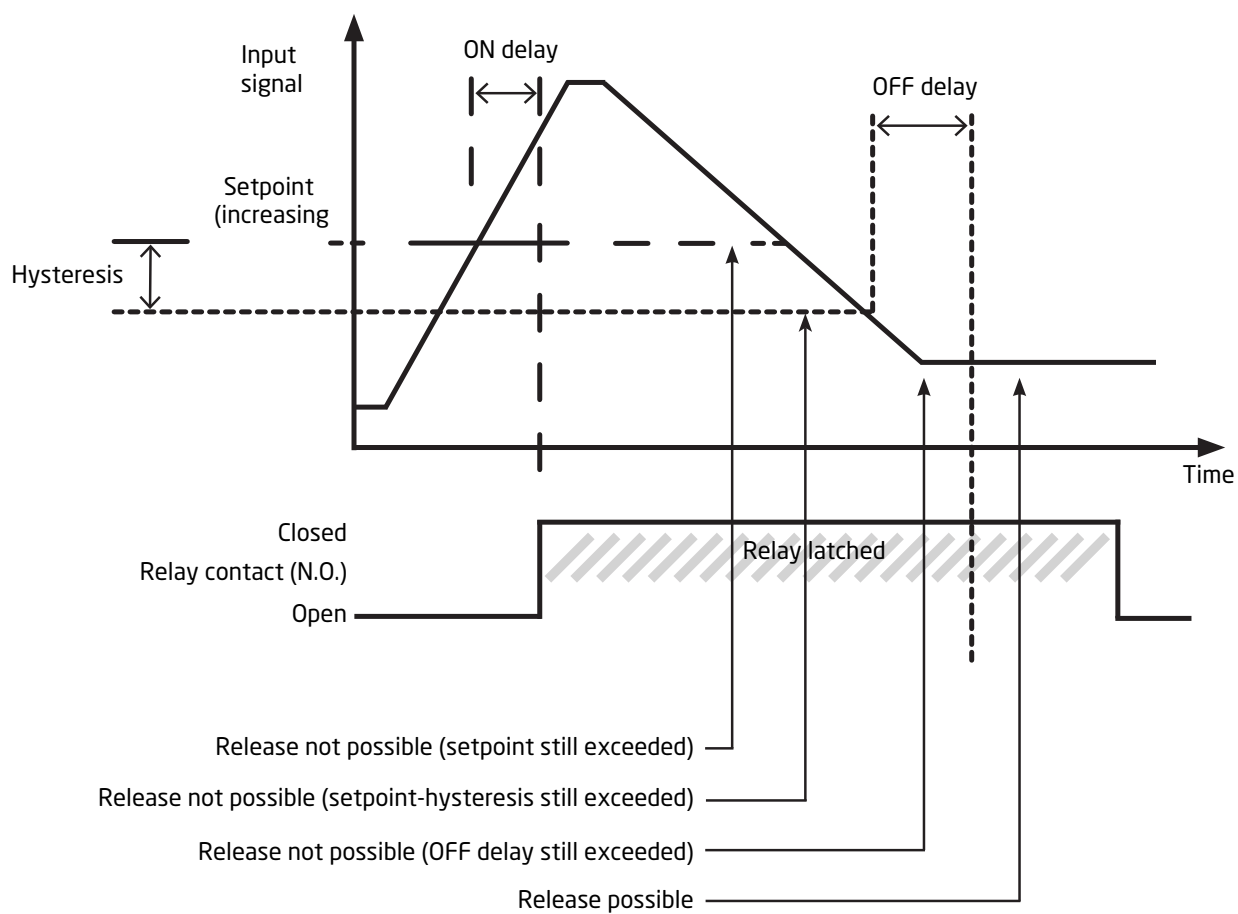
Graphic depiction of relay action setpoint



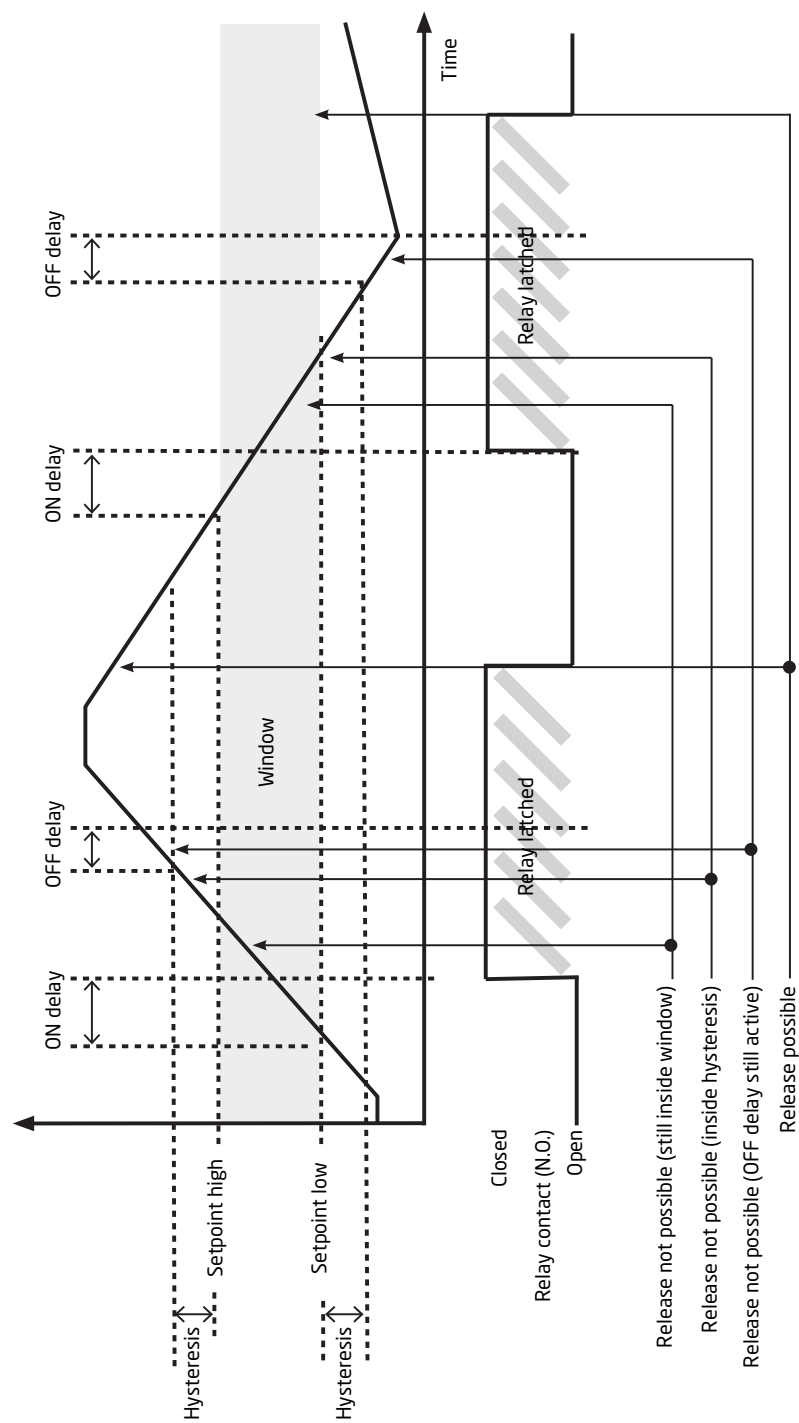
Graphic depiction of relay action window



Graphic depiction of latch function setpoint



Graphic depiction of latch function window



Advanced settings menu

Language (LANG): In the menu "LANG" you can choose between 7 different language versions of help texts that will appear in the menu. You can choose between UK, DE, FR, IT, ES, SE and DK.

Password protection (PASS): Programming access can be blocked by assigning a password. The password is saved in the device in order to ensure a high degree of protection against unauthorized modifications to the configuration. If the configured password is not known, please contact PR electronics support - www.prelectronics.com/contact.

Memory (MEM): In the memory menu you can save the configuration of the device in the PR 4500 communication interface, and then move the PR 4500 communication interface onto another device of the same type and download the configuration in the new device. Calibration parameters and relay latch status (where applicable) are device-specific and will not be included in the saved configuration.

Display setup (DISP): Here you can adjust the brightness contrast and the backlight. Setup of TAG numbers with 6 alphanumerics.

Two-point process calibration (CAL): The device can be process-calibrated in 2 points to fit a given input signal. A low input signal (not necessarily 0%) is applied and the actual value is entered via the PR 4500 communication interface. Then a high signal (not necessarily 100%) is applied and the actual value is entered via the PR 4500 communication interface. If you accept to use the calibration, the device will work according to this new adjustment. If you later reject this menu point or choose another type of input signal the device will return to factory calibration. Process-calibration is cleared if you edit either of the parameters: input type, input low, input high, display low or display high. Process calibration data are not saved to the configuration repository of the PR 4500 communication interface.

Process simulation function (SIM): Simulation of process value is possible via the up and down arrows, thus controlling the output signal. The point REL.SIM allows you to activate relay/-s by means of the arrow-keys up/down. You must exit the menu by pressing <OK> (no time-out). The simulation function exits automatically if the PR 4500 communication interface is detached.

Orientation setup (ORIEN): When the device is mounted upside down the display orientation of the PR 4500 communication interfaces can be programmed to be rotated 180 degrees and reverse the up/down button functions.

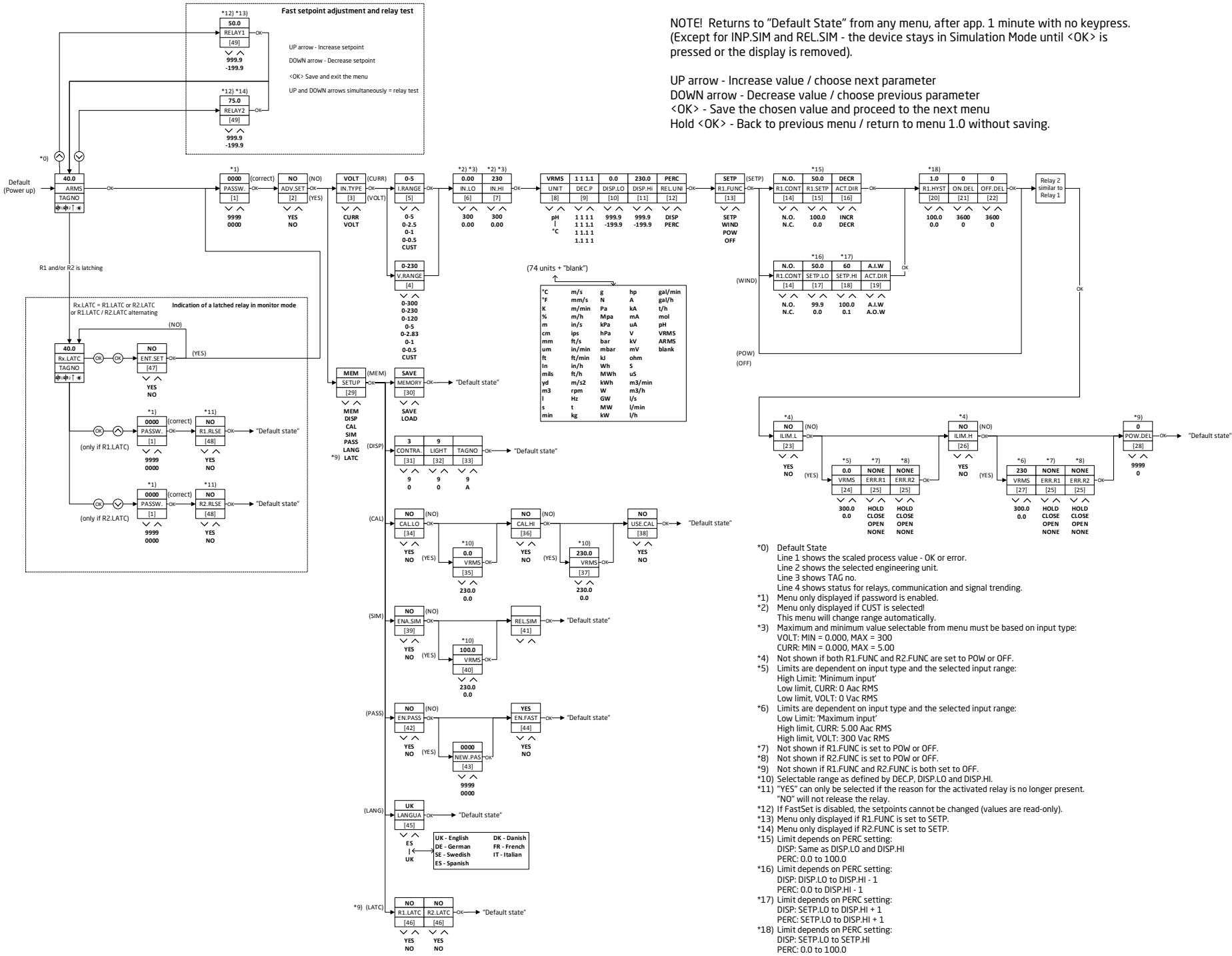
Bluetooth communication (BLUE): (available for 4512 Bluetooth communication enabler). User-configurable Bluetooth communication with the option to enable two-factor authentication. You can use Bluetooth communication with PR Process Supervisor app.

Modbus setup (MODB): (available for 4511 Modbus communication enabler). With the Modbus RTU interface you can set Modbus address, parity, stop bit, response delay and baud rate.

Latch function (LATC): The latch function can be applied for a relay when combined with the setpoint, windows or error function. The latch function will hold the relay in its active/alarm state until latch is released via the PR 4500 display. If the setpoint, window or error function demands an active relay you cannot release the latch.

If the configuration is copied from one device to another by way of the PR 4500 communication interface, the latch function must be reconfigured.

Routing diagram



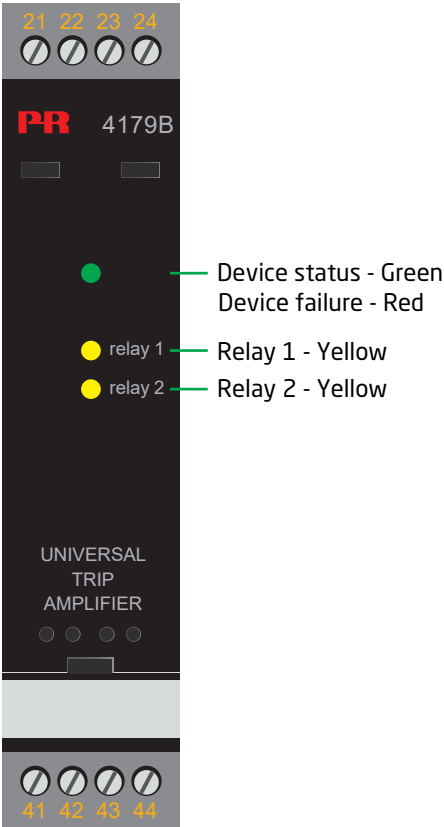
Help text overview

| | | | |
|------|--|------|---|
| [01] | Set correct password | [21] | Set relay ON delay [seconds] |
| [02] | Enter advanced setup menu? | [22] | Set relay OFF delay [seconds] |
| [03] | Select current input | [23] | Enable configurable input limit, low |
| | Select voltage input | [24] | Set configurable input limit, low |
| [04] | Select 0..300 V RMS input range | [25] | Select no error action - undefined relay state - at limit error |
| | Select 0..230 V RMS input range | | Open relay contact at limit error |
| | Select 0..120 V RMS input range | | Close relay contact at limit error |
| | Select 0.5 V RMS input range | | Hold relay status at limit error |
| | Select 0..2.83 V RMS input range | [26] | Enable configurable input limit, high |
| | Select 0.1 V RMS input range | [27] | Set configurable input limit, high |
| | Select 0..0.5 V RMS input range | [28] | Set relay power-on delay [seconds] |
| | Select custom voltage input range | [29] | Enter Relay Latch setup |
| [05] | Select 0..0.5 A RMS input range | | Enter Language setup |
| | Select 0.1 A RMS input range | | Enter Password setup |
| | Select 0..2.5 A RMS input range | | Enter Simulation mode |
| | Select 0.5 A RMS input range | | Perform Process calibration |
| | Select custom current input range | | Enter Display setup |
| [06] | Set input range low | | Perform Memory operations |
| [07] | Set input range high | [30] | Load saved configuration into module |
| [08] | Select display unit | | Save configuration in display front |
| [09] | Select decimal point position | [31] | Adjust LCD contrast |
| [10] | Set display range low | [32] | Adjust LCD backlight |
| [11] | Set display range high | [33] | Write a 6-character device TAG |
| [12] | Set up relay in % of input range | [34] | Calibrate Input low to process value? |
| | Set up relay in display units | [35] | Set value for low calibration point |
| [13] | Select SETPOINT function - relay is controlled by 1 setpoint | [36] | Calibrate Input high to process value? |
| | Select WINDOW function - relay is controlled by 2 setpoints | [37] | Set value for high calibration point |
| | Select POWER function - relay indicates power status OK | [38] | Use process calibration values? |
| | Select OFF function - relay is permanently off | [39] | Enable simulation mode? |
| [14] | Select Normally Closed contact | [40] | Set the input simulation value |
| | Select Normally Open contact | [41] | Relay simulation - use UP and DOWN arrows to toggle relay 1 and 2 |
| [15] | Set relay setpoint | [42] | Enable password protection? |
| [16] | Activate relay on decreasing signal | [43] | Set new password |
| | Activate relay on increasing signal | [44] | Enable Fastset functionality? |
| [17] | Set relay window setpoint, low | [45] | Select language |
| [18] | Set relay window setpoint, high | [46] | Enable Relay Latch function? |
| [19] | Select relay to be Active Outside Window | [47] | Enter setup menu? (Latched relays may release!) |
| | Select relay to be Active Inside Window | [48] | Release relay? (if conditions allow) |
| [20] | Set relay hysteresis | [49] | Relay setpoint - press OK to save |
| | | | Relay setpoint - read only |

Operation & troubleshooting

The 4000 series devices provide multiple features for easy user-operation, and to perform efficient troubleshooting. Monitoring the operational status is easy from either the front LEDs or the PR 4500 communication interface.

Status indicator front LED



Status indicators without PR 4500 communication interface

| Indicator | Indicator pattern | Condition |
|---------------------------|-------------------|--|
| Device status - Green LED | 13 Hz, 250 ms | Normal operation |
| | 1 Hz, 2 ms | Device OK, Sensor or Input limit error |
| | Solid | Internal error |
| Device status - Red LED | Solid | Device failure |
| Relay - Yellow LED | Solid | Relay energized |

Status, error detection and signal 'out-of-range' with PR 4500 communication interface

| SCROLLING ERROR MESSAGE | INDICATION Text | CONDITION | ACTION |
|---|--------------------------|---|--|
| Process and application errors | | | |
| Input range limit error - Input outside configurable input range limit | IN.ER - flashing display | Input out of configured input limits | Check input signal value and configured input limits |
| Input overrange | IN.HI | Input above measurement range | Check input signal source |
| Input underrange | IN.LO | Input below measurement range | Check input signal source |
| Display out of range | -1999 or 9999 | Display saturation | Check configuration and input values |
| Device errors | | | |
| No communication between device and the PR 4500 communication interface | NO.CO | No communication (PR 4500 <-> device) | Reattach the PR 4500 communication interface to the product. If attached, disconnect and reattach |
| Invalid configuration | CO.ER | Invalid configuration downloaded to module | Step through menu to create valid configuration ** |
| Invalid configuration type or version | TY.ER | Configuration read from the PR 4500 has invalid type or rev. no | Save correct device type and revision configuration to the PR 4500 communication interface ** |
| Output supply error | OU.SU | Output supply error | Verify output configuration and output connection * |
| Output supply voltage reference error | VR.ER | Output supply voltage reference error | Verify output configuration and output connection * |
| Output supply MCU error | VD.ER | Output supply MCU error | Verify output configuration and output connection * |
| RAM memory error | RA.ER | Internal RAM error | Contact PR electronics * |
| A/D converter error | AD.ER | Internal A/D converter error | Verify input signal value and signal range match.* |
| Internal flash error | IF.ER | Internal flash error | Contact PR electronics * |
| External flash error | EF.ER | External flash error | Contact PR electronics * |
| Storing of configuration failed - previous configuration used | WARN | Writing configuration to internal device memory failed | Device configuration reverts to last known valid configuration. Cycle through menu to retry writing new configuration. |
| Hardware error | R1.ER | Relay readback indicates hardware error for Relay 1 | Power cycle unit to reset error.* |
| Hardware error | R2.ER | Relay readback indicates hardware error for Relay 2 | Power cycle unit to reset error.* |

| | |
|----|---|
| ! | All error indications in the display flash once per second. The help text explains the error. If the error is an input loop error, the display backlight flashes as well - this is acknowledged (stopped) by pushing the <OK> button. |
| * | Error is acknowledged by either stepping through the basic setup, or by resetting the device power. Some types of errors can only be acknowledged by resetting the device power. If error persists contact PR electronics. |
| ** | Error is acknowledged by stepping through the basic setup. |

The following list provides notes concerning revisions of this document.

| Rev. ID | Date | Notes |
|---------|------|---------------------------------|
| 100 | 2503 | Initial release of the product. |

We are near you, *all over the world*

Our trusted red boxes are supported wherever you are

All our devices are backed by expert service and a 5-year warranty. With each product you purchase, you receive personal technical support and guidance, day-to-day delivery, repair without charge within the warranty period and easily accessible documentation.

We are headquartered in Denmark, and have offices and authorized partners the world over. We are a local

business with a global reach. This means that we are always nearby and know your local markets well. We are committed to your satisfaction and provide PERFORMANCE MADE SMARTER all around the world.

For more information on our warranty program, or to meet with a sales representative in your region, visit prelectronics.com.

Benefit today from ***PERFORMANCE MADE SMARTER***

PR electronics is the leading technology company specialized in making industrial process control safer, more reliable and more efficient. Since 1974, we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. This dedication continues to set new standards for products communicating, monitoring and connecting our customers' process measurement points to their process control systems.

Our innovative, patented technologies are derived from our extensive R&D facilities and from having a great understanding of our customers' needs and processes. We are guided by principles of simplicity, focus, courage and excellence, enabling some of the world's greatest companies to achieve PERFORMANCE MADE SMARTER.