

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

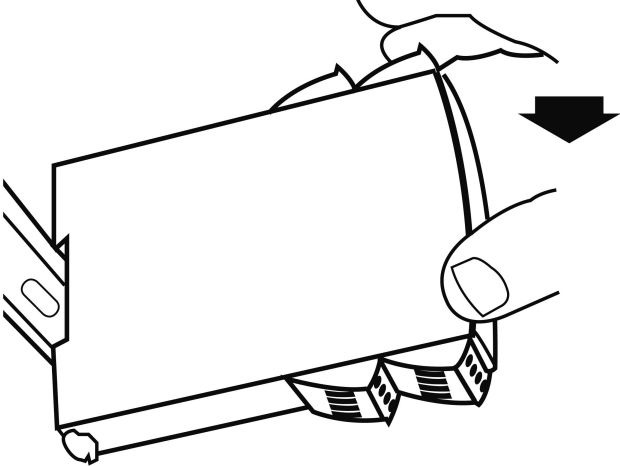
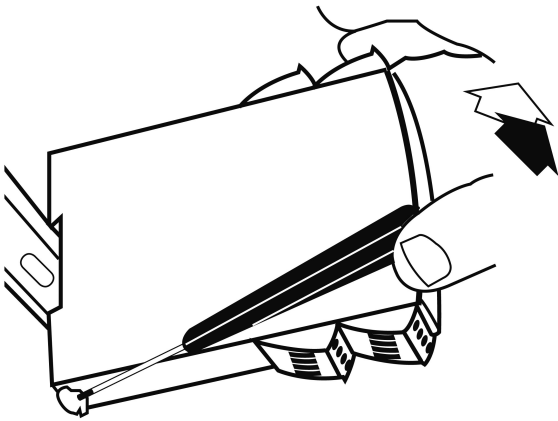
When disconnected, the device may be cleaned with a cloth moistened with distilled water.

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
 <p style="text-align: center;">Fig. 1</p>	 <p style="text-align: center;">Fig. 2</p>

Mounting / demounting the PR 4500 communication interfaces

Mounting of the PR 4500 communication interfaces (Fig.1)

- 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.2)

- 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.

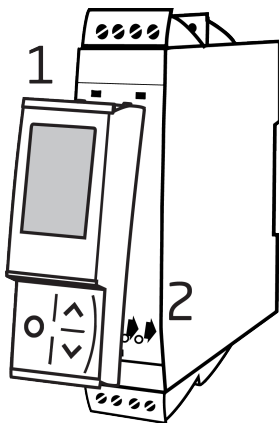


Fig. 1

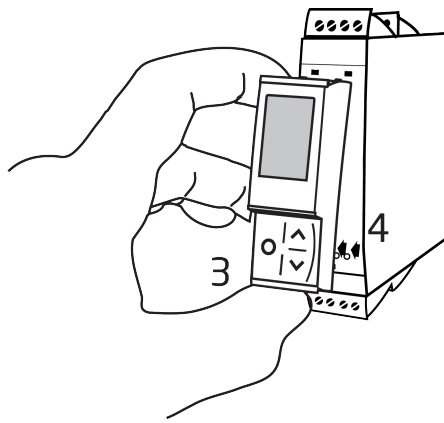


Fig. 2

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

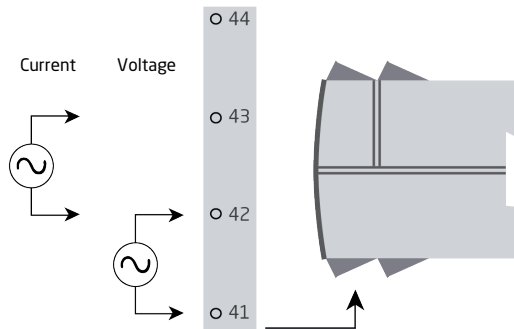
- Configuration, monitoring and diagnostics using PR 4500 detachable communication interfaces. Product-specific functionality includes communication via Modbus and Bluetooth using our PR Process Supervisor (PPS) application, available for iOS and Android.
- All programming can be password protected.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

Mounting / installation

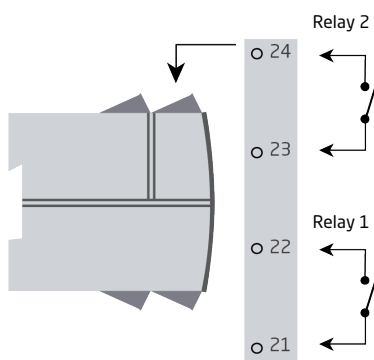
- Units can be mounted side by side, horizontally and vertically, without air gap on a standard DIN rail, even at 60°C ambient temperature.

Applications

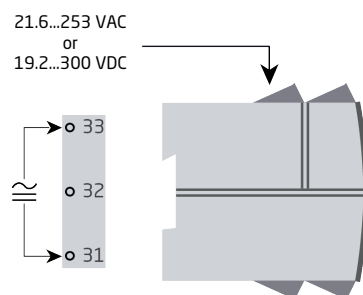
Input signals:



Output signals:

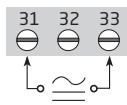


Power connection:

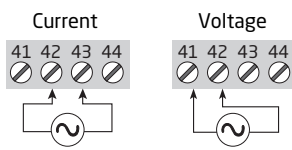


Connections

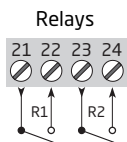
Supply



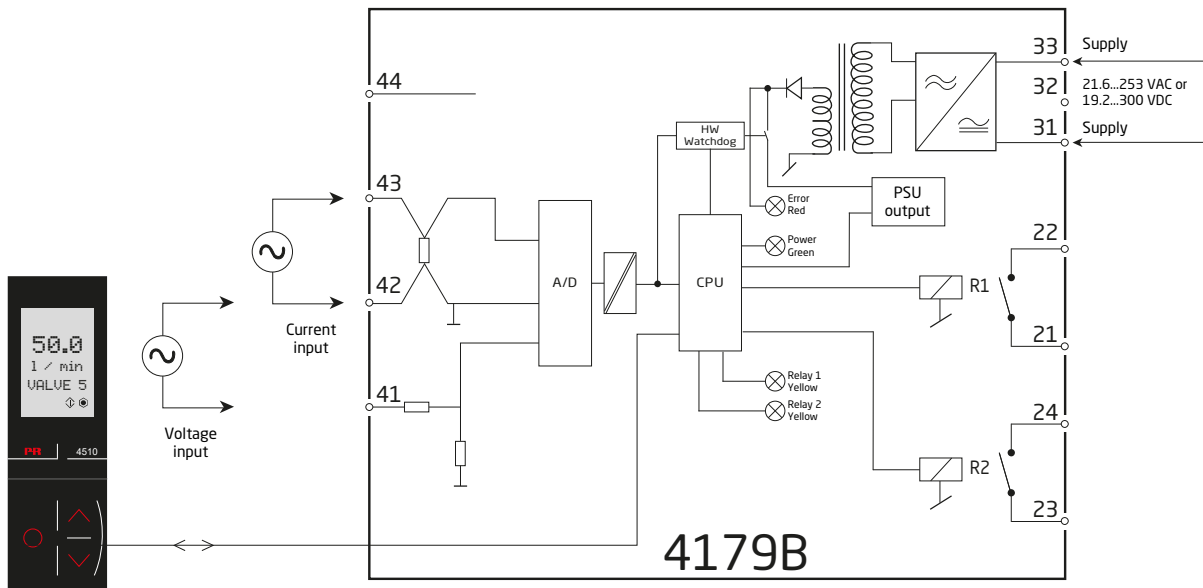
Input



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	1.4 W
Max. power dissipation	1.9 W

Max. required power is the maximum power needed at power supply terminals or rail connector.

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)

Specifications

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	Nom. 0.02 Ω

Voltage input

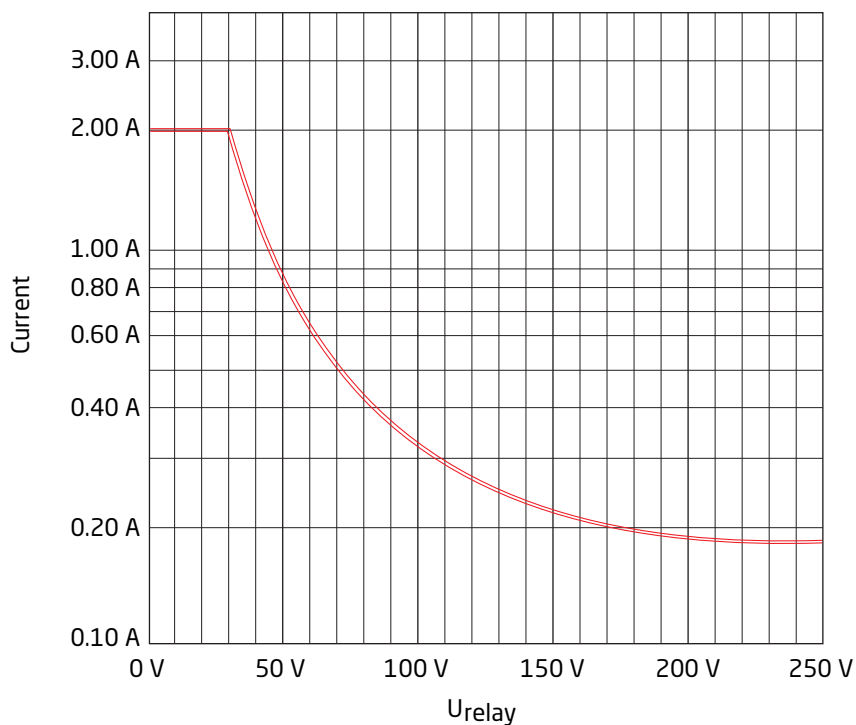
Signal range.	0...300 VAC / 40...400 Hz
Maximum input limit	300 VAC
Programmable measurement ranges	0...0.5, 0...1, 0...2.83, 0...5, 0...120, 0...230 & 0...300 VAC
Custom configurable measurement range.	0...300 VAC / 40...400 Hz
Min. span	0.5 VAC
Input resistance.	Nom. 3 M Ω 100 pF

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 @ U _{relay} ≤ 30 VDC	2 ADC
Max. DC current, resistive load @ U _{relay} > 30 VDC	[1380 x U _{relay} ⁻² x 1.0085 ^{U_{relay}}] ADC

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



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.

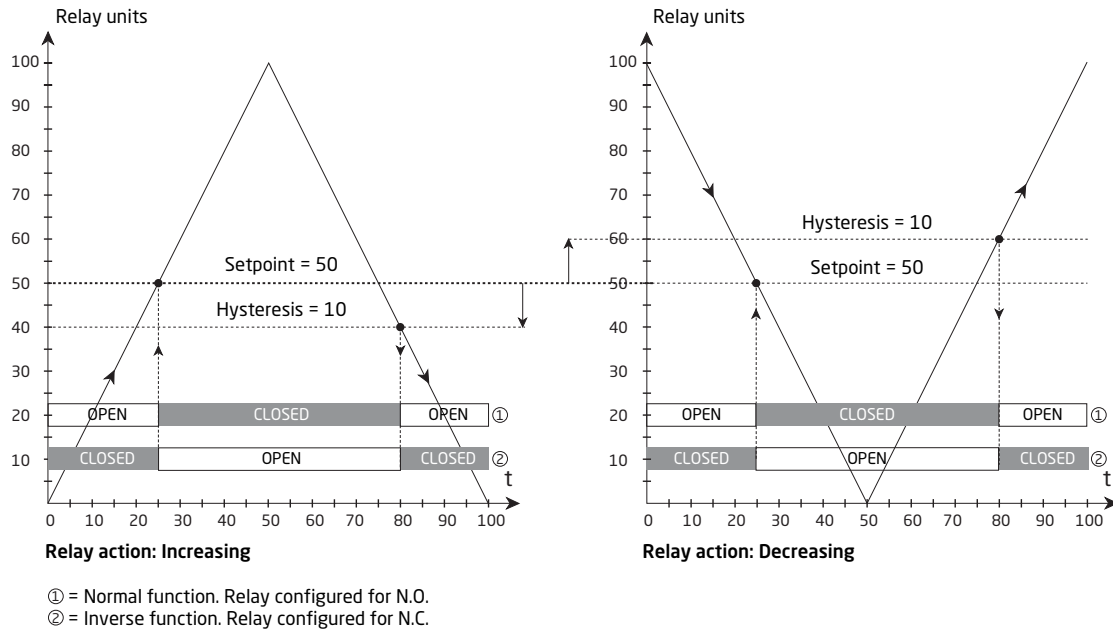
Hysteresis: 0.0...100.0%.

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

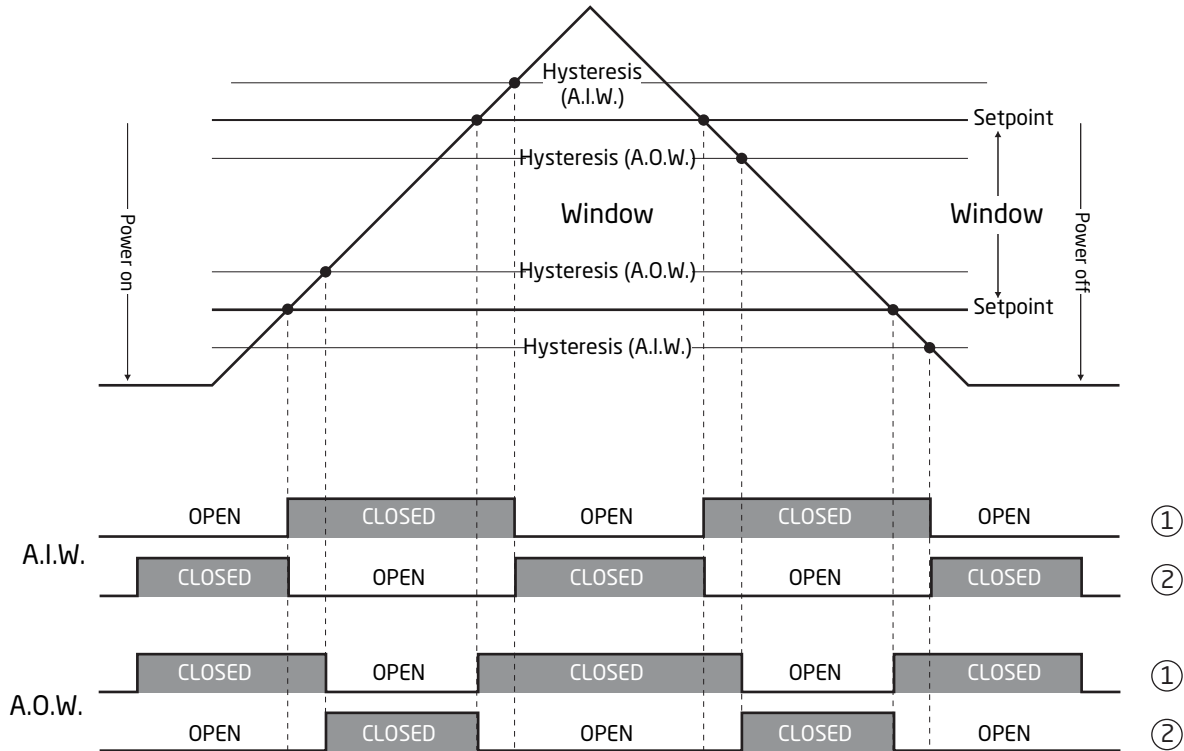
The device works as a single limit switch when selecting 'setpoint' in the menu and entering the desired limit. For setpoint the relays can be set to activate on increasing or decreasing input signal.

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.

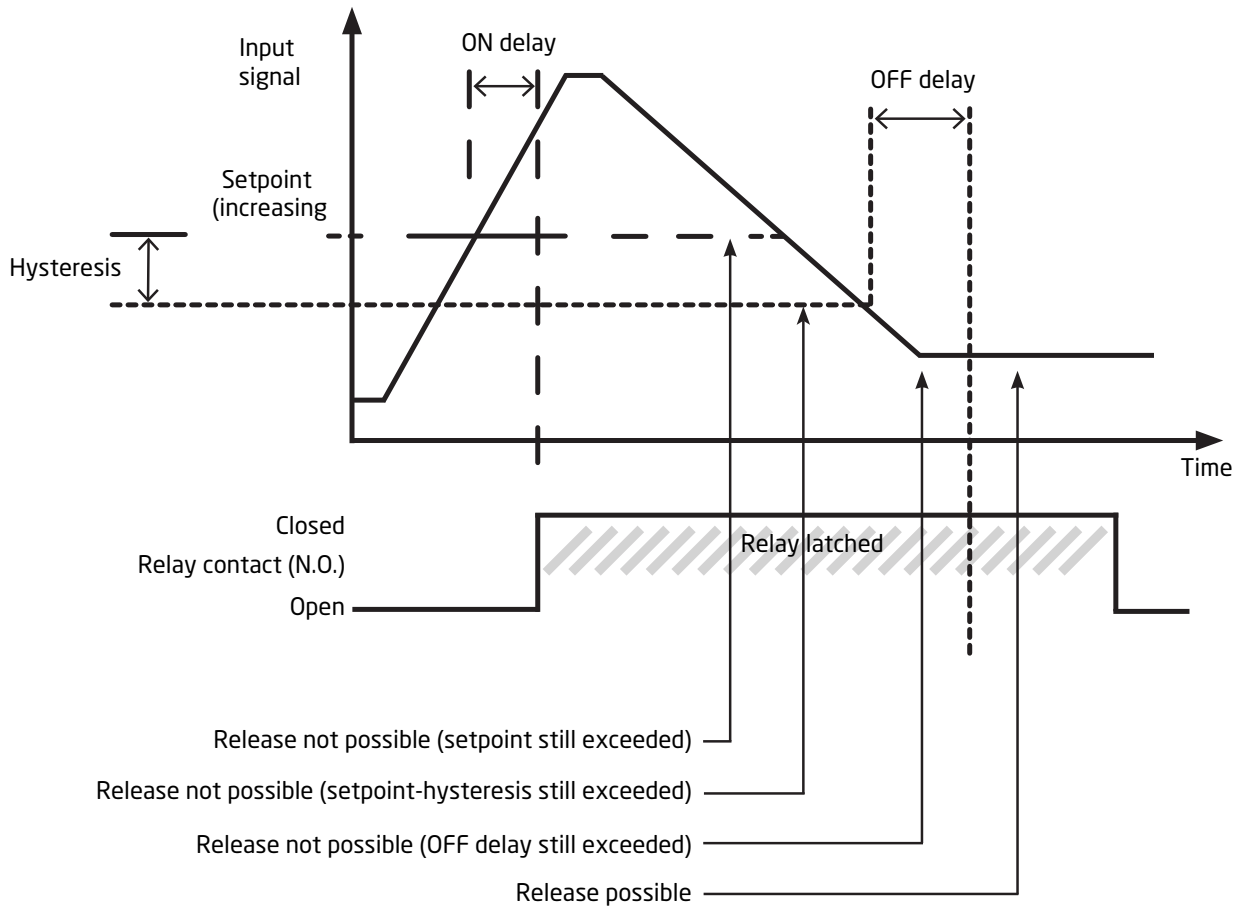
Graphic depiction of relay action setpoint



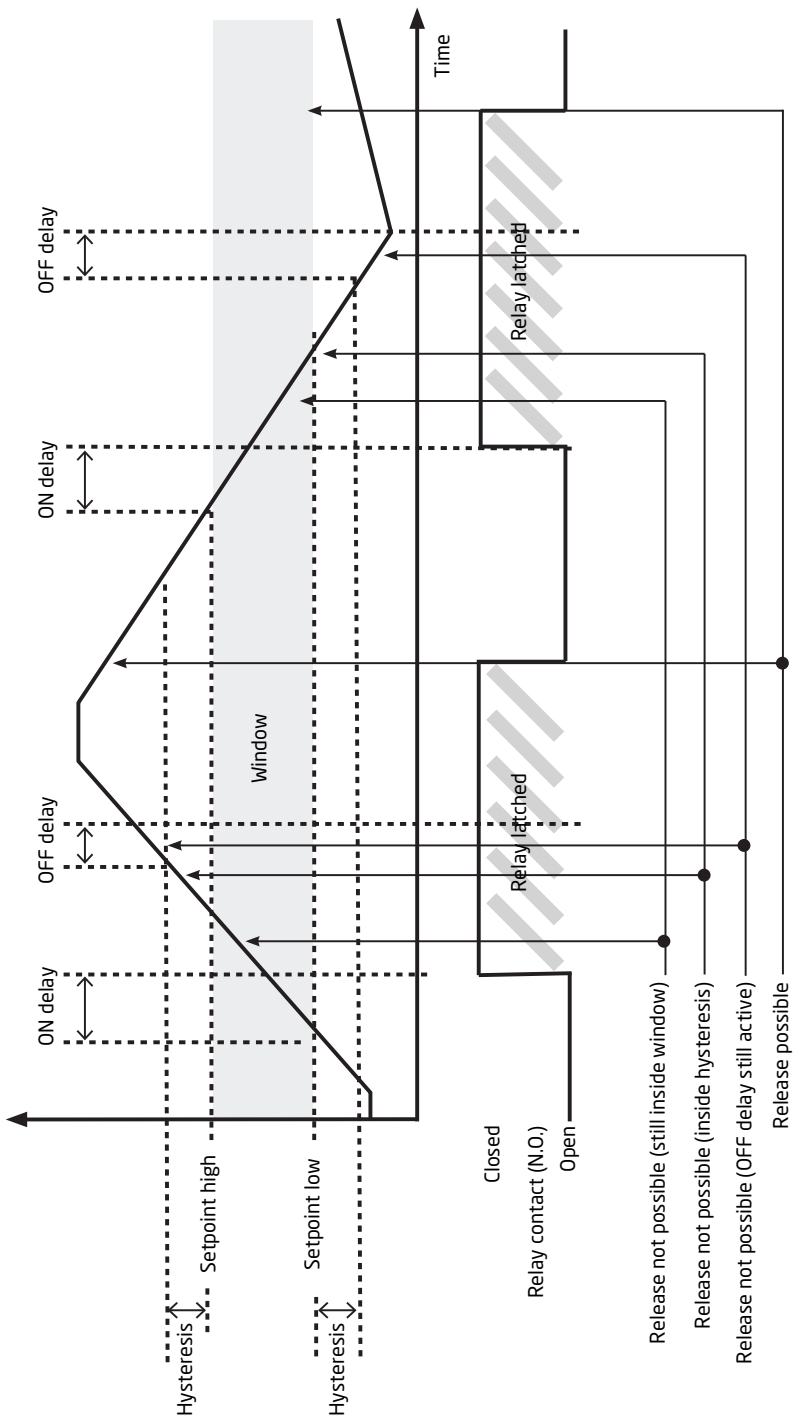
Graphic depiction of relay action window



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 alphanumeric.

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.

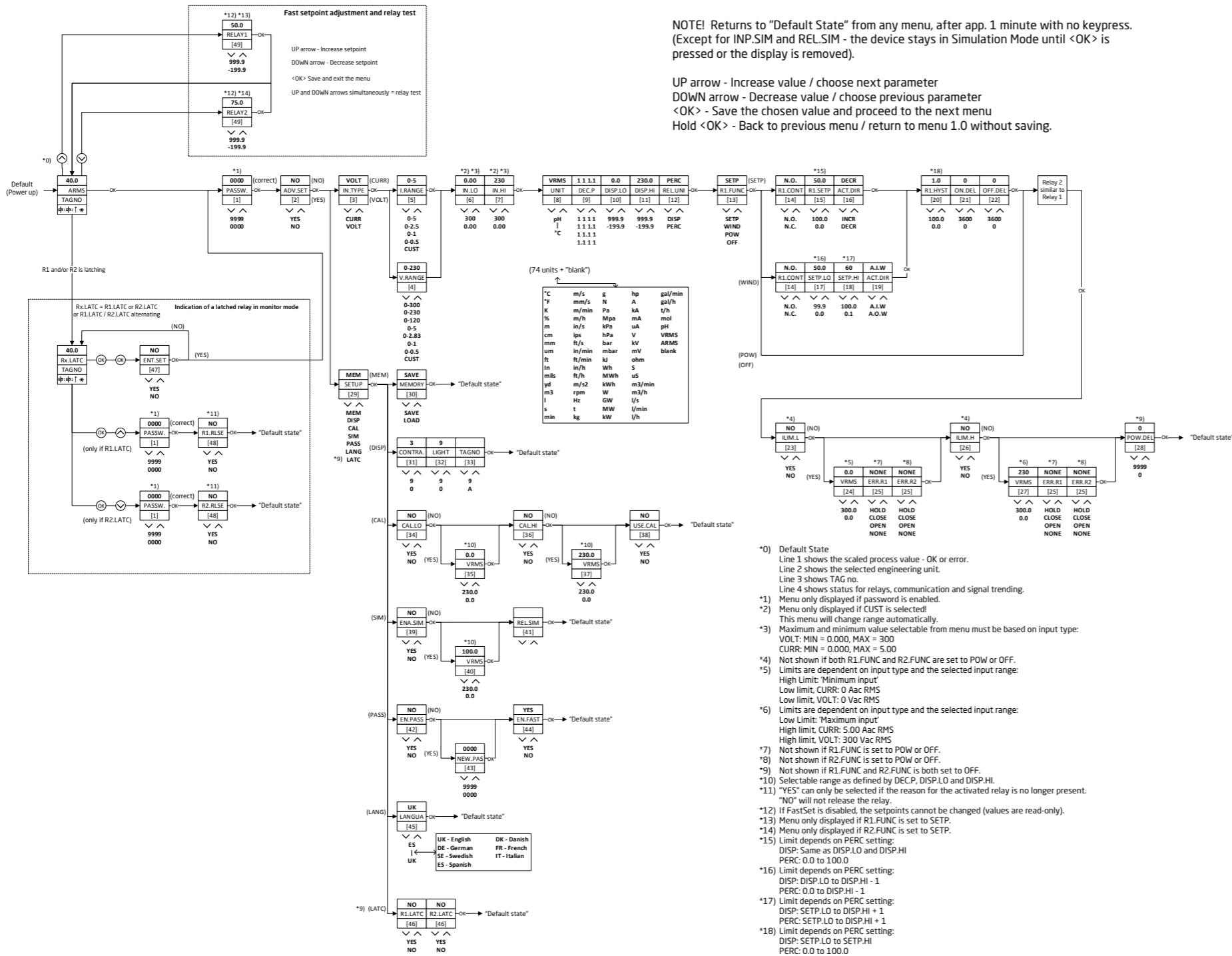
Bluetooth communication (BLUE): (available for 4512 Bluetooth communication enabler). User-configurable Bluetooth communication with the option to enable two-factor authentication. You can use Bluetooth communication with PR Process Supervisor app.

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



NOTE! Returns to "Default State" from any menu, after app. 1 minute with no keypress. (Except for INP.SIM and REL.SIM - the device stays in Simulation Mode until <OK> is pressed or the display is removed).

UP arrow - Increase value / choose next parameter
DOWN arrow - Decrease value / choose previous parameter
<OK> - Save the chosen value and proceed to the next menu
Hold <OK> - Back to previous menu / return to menu 1.0 without saving.

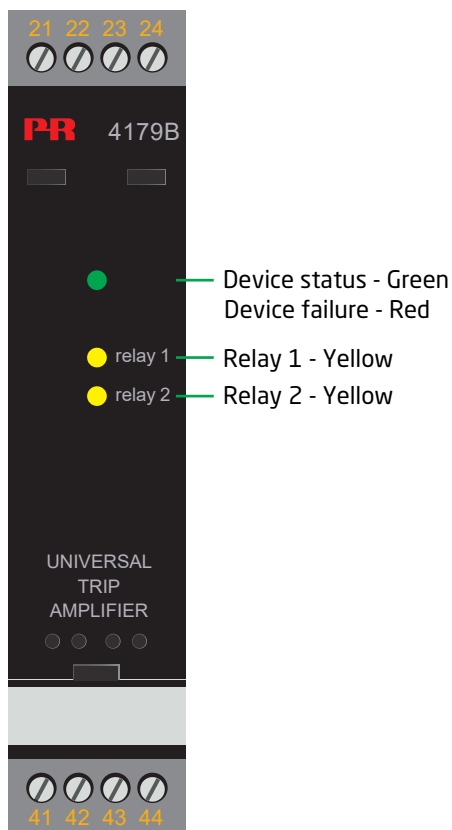
Help text overview

[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 Select voltage input	[23]	Enable configurable input limit, low
[04]	Select 0..300 V RMS input range Select 0..230 V RMS input range Select 0..120 V RMS input range Select 0..5 V RMS input range Select 0..2.83 V RMS input range Select 0..1 V RMS input range Select 0..0.5 V RMS input range Select custom voltage input range	[24]	Set configurable input limit, low
[05]	Select 0..0.5 A RMS input range Select 0..1 A RMS input range Select 0..2.5 A RMS input range Select 0..5 A RMS input range Select custom current input range	[25]	Select no error action - undefined relay state - at limit error Open relay contact at limit error Close relay contact at limit error Hold relay status at limit error
[06]	Set input range low	[26]	Enable configurable input limit, high
[07]	Set input range high	[27]	Set configurable input limit, high
[08]	Select display unit	[28]	Set relay power-on delay [seconds]
[09]	Select decimal point position	[29]	Enter Relay Latch setup Enter Language setup Enter Password setup Enter Simulation mode Perform Process calibration Enter Display setup Perform Memory operations
[10]	Set display range low	[30]	Load saved configuration into module Save configuration in display front
[11]	Set display range high	[31]	Adjust LCD contrast
[12]	Set up relay in % of input range Set up relay in display units	[32]	Adjust LCD backlight
[13]	Select SETPOINT function - relay is controlled by 1 setpoint Select WINDOW function - relay is controlled by 2 setpoints Select POWER function - relay indicates power status OK Select OFF function - relay is permanently off	[33]	Write a 6-character device TAG
[14]	Select Normally Closed contact Select Normally Open contact	[34]	Calibrate Input low to process value?
[15]	Set relay setpoint	[35]	Set value for low calibration point
[16]	Activate relay on decreasing signal Activate relay on increasing signal	[36]	Calibrate Input high to process value?
[17]	Set relay window setpoint, low	[37]	Set value for high calibration point
[18]	Set relay window setpoint, high	[38]	Use process calibration values?
[19]	Select relay to be Active Outside Window Select relay to be Active Inside Window	[39]	Enable simulation mode?
[20]	Set relay hysteresis	[40]	Set the input simulation value
		[41]	Relay simulation - use UP and DOWN arrows to toggle relay 1 and 2
		[42]	Enable password protection?
		[43]	Set new password
		[44]	Enable Fastset functionality?
		[45]	Select language
		[46]	Enable Relay Latch function?
		[47]	Enter setup menu? (Latched relays may release!)
		[48]	Release relay? (if conditions allow)
		[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.

Document history

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.