Table of Contents

1. About this manual................................................................. 8

2. General product information..................................................9
   2.1. Checking the consignment...............................................9
   2.2. Product identification ....................................................9
   2.3. Storage.......................................................................... 11
   2.4. Warranty......................................................................... 11
   2.5. Complaints...................................................................... 11

3. Operational safety................................................................... 12
   3.1. Electrical safety............................................................ 12
   3.2. Device handling............................................................ 12
   3.3. Electrostatic discharge.................................................. 12

4. Wiring.................................................................................... 13
   4.1. Installing connections................................................... 13
   4.2. Checking the wiring...................................................... 13

5. Energizing............................................................................... 14

6. Front panel............................................................................. 15
   6.1. Push-buttons............................................................... 15
   6.2. LED indicators............................................................ 16
   6.3. Controlling the alarm screen....................................... 17
   6.4. Accessing operating levels.......................................... 17
   6.5. Adjusting the LCD contrast......................................... 17
   6.6. Testing the LEDs and LCD screen.............................. 17
   6.7. Releasing latches.......................................................... 18
       6.7.1. Releasing latches using Easergy Pro...................... 18
       6.7.2. Releasing latches using buttons and local panel display 18
       6.7.3. Releasing latches using F1 or F2 buttons............... 18
   6.8. Controlling an object with selective control.................. 19
   6.9. Controlling an object with direct control...................... 20
   6.10. Menus.......................................................................... 20
        6.10.1. Moving in the menus...................................... 22
        6.10.2. Local panel messages.................................... 22

7. Easergy Pro setting and configuration tool............................ 23

8. Access to device configuration.............................................. 24
   8.1. Operating levels.......................................................... 24
   8.2. Logging in via the front panel...................................... 24
   8.3. HTTP and FTP login details....................................... 25
   8.4. Changing passwords.................................................. 25
   8.5. Restoring passwords.................................................. 26
9. Local port........................................................................................................ 27
10. Block diagrams.......................................................................................... 28
11. Mounting...................................................................................................... 36
12. Related documents..................................................................................... 40
Legal information

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Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.
Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it.

The following special messages may appear throughout this publication or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

⚠️ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠️ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠️ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠️ NOTICE

NOTICE is used to address practices not related to physical injury.

Please note

Electrical equipment must only be installed, operated, serviced, and maintained by qualified personnel. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Protective grounding

The user is responsible for compliance with all the existing international and national electrical codes concerning protective grounding of any device.
EU directive compliance

**EMC compliance**

![CE Mark] 2014/30/EU

Compliance with the European Commission's EMC Directive. Product Specific Standard was used to establish conformity:

- EN 60255-26 2013

**Product safety**

![CE Mark] 2014/35/EU

Compliance with the European Commission's Low Voltage Directive. Product Specific Safety Standard was used to establish conformity:

- EN 60255-27 2014
1. About this manual

This manual contains instructions for handling, mounting and wiring Easergy P3 protection relays.

Carefully read through the mounting instruction of this manual before undertaking any mounting or wiring work.
2. General product information

### DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Wear your personal protective equipment (PPE) and comply with the safe electrical work practices. For clothing, see applicable local standards.
- Only qualified personnel should install this equipment. Such work should be performed only after reading this entire set of instructions and checking the technical characteristics of the device.
- NEVER work alone.
- Turn off all power supplying this equipment before working on or inside it. Consider all sources of power, including the possibility of backfeeding.
- Always use a properly rated voltage sensing device to ensure that all power is off.
- Do not open the secondary circuit of a live current transformer.
- Always connect the polarity of the current transformer (CT) and the voltage transformer (VT) and their secondary ground wiring according to the connection diagrams presented in this document.
- Connect the relay’s protective ground to functional earth according to the connection diagrams presented in this document.

**Failure to follow this instruction will result in death or serious injury.**

2.1. Checking the consignment

- Check that the unit packaging and the seal are intact at the receipt of the delivery. Our products leave the factory in closed, sealed packaging. If the transport packaging is open or the seal is broken, the confidentiality and authenticity of the information contained in the products cannot be ensured.
- Check the device visually for possible external damage or loose parts inside the device. If you find the device to be damaged, see 2.5. Complaints on page 11.
- Check that the device complies with the order and the Calibration and Test Report. Check:
  - relay type, serial number
  - other possible order-related structural matters
  If found incomplete, see 2.5. Complaints on page 11.

2.2. Product identification

Each Easergy P3 relay is delivered in a separate package containing:

- Easergy P3 protection relay with the necessary terminal connectors
- Production testing certificate
- Quick Start manual

Optional accessories are delivered in separate packages.

To identify an Easergy P3 protection relay, see the labels on the package and on the side of the relay.
Universal Relays P3U10, P3U20 and P3U30

2. General product information

Serial number label

Figure 1 - P3U Serial number label

1. Rated voltage $U_n$
2. Rated frequency $f_n$
3. Rated phase current $I_n$
4. Rated earth fault current $I_{0n}$
5. Power consumption
6. Power supply operating range $U_{AUX}$
7. Order code
8. Serial number
9. Manufacturing date
10. MAC address for TCP/IP communication
11. Short order code
12. Production identification

Unit package label

Figure 2 - P3U Unit package label

1. Short order code
2. Serial number
3. Short order code
4. Internal product code
5. Order code
6. EAN13 bar code
2.3. Storage

Store the relay in its original packaging in a closed, sheltered location with the following ambient conditions:

- ambient temperature: -40 °C to +70 °C (or -40 °F to +158 °F)
- humidity < 90 %.

Check the ambient conditions and the packaging yearly.

2.4. Warranty

This product has a standard warranty of 2 years.

Ask your local Schneider Electric representative about our optional 10-year warranty. Local conditions and availability apply.

2.5. Complaints

Complaints for manufacturing faults are directed in writing to the relay manufacturer or the authorized dealer from which the product was acquired. Find more information from our customers care center (www.schneider-electric.com/ccc).

Complaints about transport damage must be sent to the accountable transport or insurance company.
3. Operational safety

## DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Wear your personal protective equipment (PPE) and comply with the safe electrical work practices. For clothing, see applicable local standards.
- Only qualified personnel should install this equipment. Such work should be performed only after reading this entire set of instructions and checking the technical characteristics of the device.
- NEVER work alone.
- Turn off all power supplying this equipment before working on or inside it. Consider all sources of power, including the possibility of backfeeding.
- Always use a properly rated voltage sensing device to ensure that all power is off.
- Do not open the secondary circuit of a live current transformer.
- Always connect the polarity of the current transformer (CT) and the voltage transformer (VT) and their secondary ground wiring according to the connection diagrams presented in this document.
- Connect the relay’s protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.

### 3.1. Electrical safety

National electrical safety regulations must be observed when work is carried out under live conditions. The relay manufacturer cannot be held responsible for accidents caused by incorrect working or protection practices.

### 3.2. Device handling

The correct handling of the relays under all mounting and operating conditions forms the foundation for their correct and safe use. Observe all safety notes and warnings.

### 3.3. Electrostatic discharge

The devices include components that are liable to be damaged by electrostatic discharge (ESD). Do not open the devices without permission from the manufacturer.
4. Wiring

Perform the wiring work according to national standards and possible requirements from the customer.

4.1. Installing connections

NOTE: Use only single-strand wire or stranded wire with insulated crimp terminals.

1. Check that the rated values of the relay comply with those of the intended application.
   - Check that the rated values of the voltage and current transformer secondaries comply with those of the device. The rated values can be found on the serial number label.
   - Check that the load ability of the outputs is adequate.

2. Earth the relay by connecting an earthing wire using a minimum 2.5 mm² cross-section (AWG 14) to the device's earthing terminal.

3. Wire the relay to the rest of the system according to the wiring diagrams of the application.

4. Connect the cable shields of shielded signal cables to the device's earthing terminal.

4.2. Checking the wiring

Check the secondary wiring by visual inspection and, when needed, by measuring to eliminate possible incorrect wiring that may cause malfunction of the relay or associated devices.

• Check the wiring visually:
  - Inspect the wiring visually. Especially check the wire bunches for adequate slack where needed over the hinges.
  - Check the screw terminals for correct tightness.
  - Check that no wire strands are protruding from the terminals.

• Check the wiring by measuring:
  - Check the connections between the relay and associated devices by using a circuit indicator lamp or buzzer.
  - Check other possible connections by using recognized and reliable working practices.
5. Energizing

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK

Before connecting the devices, disconnect the supply voltage to the unit.

Failure to follow these instructions will result in death or serious injury.

The external auxiliary voltage $U_{AUX} \text{ 48 (-20%) – 230 (+10%) V ac/dc or optionally 24 (-20% / +50%) V dc or 24-48 (±20%) V dc for the relay is connected to the pins X2: 3–4.}$

**NOTE:** Check the available power supply range from the device’s serial number label.

**NOTE:** When an optional 24 V dc or 24-48 V dc power module is used, the polarity is as follows: X2:3 positive (+), X2:4 negative (-).

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOSS OF PROTECTION OR RISK OF NUISANCE TRIPPING</td>
</tr>
</tbody>
</table>

- If the relay is no longer supplied with power or is in permanent fault state, the protection functions are no longer active and all the Easergy P3 digital outputs are dropped out.
- Check that the operating mode and SF relay wiring are compatible with the installation.

Failure to follow these instructions can result in equipment damage and unwanted shutdown of the electrical installation.

When the device is switched on, it performs the following initialization sequence that takes approximately 5 seconds:

- Power LED ON, “Starting ..” on the screen.
- Watchdog contact starts.

The first screen displayed at the end of the sequence is the **Mimic** view screen.
6. Front panel

Figure 3 - Easergy P3U10, P3U20 and P3U30 front panel

A. LCD  
B. Navigation push-buttons  
C. Object control buttons  
D. LED indicators  
E. Local port  
F. Function push-buttons and LEDs showing their status  
G. INFO push-button

6.1. Push-buttons

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>🏡</td>
<td>HOME/CANCEL push-button for returning to the previous menu. To return to the first menu item in the main menu, press the button for at least 3 seconds.</td>
</tr>
<tr>
<td>📡</td>
<td>INFO push-button for viewing additional information, for entering the password view and for adjusting the LCD contrast.</td>
</tr>
<tr>
<td>😳</td>
<td>Programmable function push-button.(^1)</td>
</tr>
</tbody>
</table>
Programmable function push-button.

ENTER push-button for activating or confirming a function.

UP navigation push-button for moving up in the menu or increasing a numerical value.

DOWN navigation push-button for moving down in the menu or decreasing a numerical value.

LEFT navigation push-button for moving backwards in a parallel menu or selecting a digit in a numerical value.

RIGHT navigation push-button for moving forwards in a parallel menu or selecting a digit in a numerical value.

Circuit breaker ON push-button

Circuit breaker OFF push-button

The default names of the function buttons are Function button 1 and 2. You can change the names of the buttons in the Inputs/outputs > Names for logic outputs setting view.

6.2. LED indicators

The relay has 12 LED indicators on the front panel:

- 2 LEDs for function buttons (F1 and F2)
- 2 LEDs represent the unit's general status (POWER and STATUS)
- 8 user-configurable LEDs (A-H)

When the relay is powered, the "POWER" LED is green. During normal use, the "STATUS" LED is not active, it activates only when an error occurs or the relay is not operating correctly. Should this happen, contact your local representative for further guidance. The "STATUS" LED and watchdog contact are assigned to work together. Hardwire the status output into the substation's automation system for alarm purposes.

To customize the LED texts on the front panel, the text may be created using a template and then printed. The printed text may be placed in the pockets beside the LEDs.

You can also customize the LED texts that are shown on the screen for active LEDs via Easergy Pro.

Table 1 - LED indicators and their information

<table>
<thead>
<tr>
<th>LED indicator</th>
<th>Meaning</th>
<th>Measure/ Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power LED lit</td>
<td>The auxiliary power has been switched on</td>
<td>Normal operation state</td>
</tr>
<tr>
<td>Status LED lit</td>
<td>Internal fault, operates in parallel with the self supervision output</td>
<td>The relay attempts to reboot [REBOOT]. If the status LED remains lit, call for maintenance.</td>
</tr>
</tbody>
</table>
### 6.3. Controlling the alarm screen

You can enable or disable the alarm screen either via the relay's local display or using Easergy Pro:

- On the local display, go to **Events > Alarms**.
- In Easergy Pro, go to **General > Local panel conf**.

### 6.4. Accessing operating levels

1. On the front panel, press [ ] and [ ].
2. Enter the password, and press [OK].

### 6.5. Adjusting the LCD contrast

**Prerequisite:** You have entered the correct password.

1. Press [ ], and adjust the contrast.
   - To increase the contrast, press [△].
   - To decrease the contrast, press [▼].
2. To return to the main menu, press [ ],

**NOTE:** By nature, the LCD display changes its contrast depending on the ambient temperature. The display may become dark or unreadable at low temperatures. However, this condition does not affect the proper operation of the protection or other functions.

### 6.6. Testing the LEDs and LCD screen

You can start the test sequence in any main menu window.

To start the LED and LCD test:

1. Press [ ].
2. Press [ ].

The relay tests the LCD screen and the functionality of all LEDs.
6.7. Releasing latches

You can release latches using:

- Easergy Pro
- buttons and local panel display
- F1 or F2 buttons

6.7.1. Releasing latches using Easergy Pro

1. Connect Easergy Pro to the device.
2. From the Easergy Pro toolbar, select R > Release all latches.

Alternatively, go to General>Release latches and from the drop-down menu, select Release.

6.7.2. Releasing latches using buttons and local panel display

Prerequisite: You have entered the correct password

1. Press 0.
2. Press 1.
3. Select Release, and press OK. All latches are released.

6.7.3. Releasing latches using F1 or F2 buttons

You can use the function buttons F1 or F2 to release all latches after configuring this function in Easergy Pro.

- To configure F1 to release latches:
  a. In Easergy Pro, go to INPUTS/OUTPUT >FUNCTION BUTTONS.
  b. For F1, select F1 from the Selected control drop-down menu.
c. Go to **GENERAL > RELEASE LATCHES**.
d. Select F1 from the **DI to release latches** drop-down menu.
e. Set 1 s delay for **Latch release signal pulse**.

After this, pressing the F1 button on the relay’s front panel releases all latches.

**NOTE:** The latch release signal can be activated only if the latched output is active.

### 6.8. Controlling an object with selective control

**Prerequisite:** You have entered the correct password and enabled selective control in the **Objects** setting view.

When selective control is enabled, the control operation needs confirmation (select before operate).

1. Press ![button](image) to close an object.
   - Press ![button](image) again to confirm.
   - Press ![button](image) to cancel.

2. Press ![button](image) to open an object.
   - Press ![button](image) again to confirm.
   - Press ![button](image) to cancel.
6.9. Controlling an object with direct control

Prerequisite: You have entered the correct password and enabled selective control in the Objects setting view.

When direct control is enabled, the control operation is done without confirmation.

1. Log into the system.

2. Press 1 to close an object.

3. Press 2 to open an object.

6.10. Menus

This section gives an overview of the menus that you can access via the device's front panel.

The main menu

Press the right arrow to access more measurements in the main menu.

<table>
<thead>
<tr>
<th>Menu name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active LEDs</td>
<td>User-configurable texts for active LEDs</td>
</tr>
<tr>
<td>Measurements</td>
<td>User-configurable measurements</td>
</tr>
<tr>
<td>Single line</td>
<td>Single line or Single line mimic, measurements and control view. This is a default start view. To return to this view from any location, press the HOME/CANCEL button for at least 3 seconds.</td>
</tr>
<tr>
<td>Info</td>
<td>Information about the relay: relay's name, order code, date, time and firmware version</td>
</tr>
<tr>
<td>P</td>
<td>Power: power factor and frequency values calculated by the relay. Press the right arrow to view more energy measurements.</td>
</tr>
<tr>
<td>E</td>
<td>Energy: the amount of energy that has passed through the protected line, calculated by the relay from the currents and voltages. Press the right arrow to view more energy measurements.</td>
</tr>
<tr>
<td>I</td>
<td>Current: phase currents and demand values of phase currents. Press the right arrow to view more current measurements.</td>
</tr>
<tr>
<td>U</td>
<td>Line-to-line voltages. Press the right arrow to view other voltage measurements.</td>
</tr>
<tr>
<td>Dema</td>
<td>Minimum and maximum phase current and power demand values</td>
</tr>
<tr>
<td>Umax</td>
<td>Minimum and maximum values of voltage and frequency</td>
</tr>
<tr>
<td>Imax</td>
<td>Minimum and maximum voltage values</td>
</tr>
<tr>
<td>Pmax</td>
<td>Minimum and maximum power values</td>
</tr>
<tr>
<td>Menu name</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Month</td>
<td>Monthly maximum current and power values</td>
</tr>
<tr>
<td>FL</td>
<td>Short-circuit locator applied to incomer or feeder</td>
</tr>
<tr>
<td>Evnt</td>
<td>Event log: event codes and time stamps</td>
</tr>
<tr>
<td>DR</td>
<td>Disturbance recorder configuration settings</td>
</tr>
<tr>
<td>Runh</td>
<td>Running hour counter</td>
</tr>
<tr>
<td>TIMR</td>
<td>Timers: programmable timers that you can use to preset functions</td>
</tr>
<tr>
<td>DI</td>
<td>Digital input statuses and settings</td>
</tr>
<tr>
<td>DO</td>
<td>Digital output statuses and settings</td>
</tr>
<tr>
<td>Prot</td>
<td>Protection: settings and statuses for various protection functions</td>
</tr>
<tr>
<td>I&gt;, I&gt;&gt;, etc.</td>
<td>Protection stage settings and statuses. The availability of the menus are depends on the activated protection stages.</td>
</tr>
<tr>
<td>AR</td>
<td>Auto-reclosure settings, statuses and registers</td>
</tr>
<tr>
<td>OBJ</td>
<td>Objects: settings related to object status data and object control (open/closed)</td>
</tr>
<tr>
<td>Lgic</td>
<td>Logic events and counters</td>
</tr>
<tr>
<td>CONF</td>
<td>General device setup: CT and VT scalings, frequency adaptation, units, device info, date, time, clock, etc.</td>
</tr>
<tr>
<td>Bus</td>
<td>Communication port settings</td>
</tr>
<tr>
<td>OPT</td>
<td>Slot info: card ID (CID) that is the name of the card used by the relay firmware</td>
</tr>
<tr>
<td>Diag</td>
<td>Diagnosis: various diagnostic information</td>
</tr>
</tbody>
</table>
6.10.1. Moving in the menus

Figure 8 - Moving in menus using the front panel

- To move in the main menu, press ▲ or ◀.
- To move in the submenus, press ▶ or ◀.
- While in the submenu, press ▲ or ◀ to jump to the root.
- To enter a submenu, press OK and use ◀ or ▲ for moving down or up in the menu.
- To edit a parameter value, press OK and ▲.
- Enter the password, and press OK.
- To go back to the previous menu, press ◀.
- To go back to the first menu item in the main menu, press ◀ for at least three seconds.

**NOTE:** To enter the parameter edit mode, enter the password. When the value is in edit mode, its background is dark.

6.10.2. Local panel messages

<table>
<thead>
<tr>
<th>Table 3 - Local panel messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value is not editable:</td>
</tr>
<tr>
<td>Control disabled:</td>
</tr>
<tr>
<td>Change causes autoboot:</td>
</tr>
</tbody>
</table>
Easergy Pro is a software tool for configuring Easergy P3 relays. It has a graphical interface where the relay settings and parameters are grouped under seven tabs:

- General
- Measurements
- Inputs/outputs
- Protection
- Matrix
- Logs
- Communication

The contents of the tabs depend on the relay type and the selected application mode.

Easergy Pro stores the relay configuration in a setting file. The configuration of one physical relay is saved in one setting file. The configurations can be printed out and saved for later use.

For more information, see the Easergy Pro user manual.


**NOTICE**

**RISK OF SYSTEM SHUTDOWN**

After writing new settings or configurations to a relay, perform a test to verify that the relay operates correctly with the new settings.

Failure to follow these instructions can result in unwanted shutdown of the electrical installation.
8. Access to device configuration

You can access the device configuration via:

- Easergy Pro setting tool
- the device’s local panel

Related tasks

Changing passwords on page 25

8.1. Operating levels

The relay has three operating levels: user, operator and configurator. The purpose of the access levels is to prevent accidental or unwanted change of relay configurations, parameters or settings.

Table 4 - User level

<table>
<thead>
<tr>
<th>Use:</th>
<th>Possible to read for example parameter values, measurements and events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening:</td>
<td>Level permanently open</td>
</tr>
<tr>
<td>Closing:</td>
<td>Closing not possible</td>
</tr>
</tbody>
</table>

Table 5 - Operator level

<table>
<thead>
<tr>
<th>Use:</th>
<th>Possible to control objects and to change for example the settings of the protection stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening:</td>
<td>The default password is 1.</td>
</tr>
<tr>
<td>Closing:</td>
<td>The level is automatically closed after 10 minutes idle time. Giving the password 9999 also closes the level.</td>
</tr>
</tbody>
</table>

Table 6 - Configurator level

<table>
<thead>
<tr>
<th>Use:</th>
<th>The configurator level is needed during the commissioning of the relay. For example the scaling of the voltage and current transformers can be set.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening:</td>
<td>The default password is 2.</td>
</tr>
<tr>
<td>Closing:</td>
<td>The level is automatically closed after 10 minutes idle time. Giving the password 9999 also closes the level.</td>
</tr>
</tbody>
</table>

8.2. Logging in via the front panel

1. Push and on the front panel. The Enter password view opens.

Figure 9 - Opening the access level
2. Enter the password for the desired access level.

Select the desired digit value using [△], and if the password is longer than one digit, move to the next digit position using [►].

**NOTE:** There are 16 digit positions in the Enter password view. Enter the password starting from the first digit position.

Example: If the password is 2, you may enter 2*** or **2* or ***2 to log in. Do not type number 0 if it is not part of the password.

3. Push [OK] to confirm the password.

### 8.3. HTTP and FTP login details

You can login to the HTTP server and FTP using these user names and passwords.

Table 7 - HTTP and FTP login details

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Login name</th>
<th>Login password</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>conf</td>
<td>2</td>
</tr>
<tr>
<td>FTP</td>
<td>easergy</td>
<td>config</td>
</tr>
</tbody>
</table>

### 8.4. Changing passwords

**NOTICE**

**CYBERSECURITY HAZARD**

To improve cybersecurity:

- Change all passwords from their default values when taking the protection device into use.
- Change all passwords regularly.

**Failure to follow these instructions can increase the risk of unauthorized access.**

You can change a password:

- in the **General > Device info** setting view in Easergy Pro connected to the USB port in the relay's front panel
- via Ethernet using Easergy Pro or the web server

**NOTE:** The password can contain 1-16 digits (no alphabets).

**Related concepts**

*Access to device configuration* on page 24
8.5. Restoring passwords

If a password is lost or forgotten, you can restore it. To restore a password, a relay program is needed. The virtual serial port settings are 38400 bps, 8 data bits, no parity and 1 stop bit. You can configure the bit rate via the front panel.

1. To get the break code and the relay’s serial number, enter these commands in the relay program:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>get pwd_break</td>
<td>Get the break code (Example: 6569403)</td>
</tr>
<tr>
<td>get serno</td>
<td>Get the serial number of the relay (Example: 12345)</td>
</tr>
</tbody>
</table>

2. Send both numbers to your nearest Schneider Electric Customer Care Centre and ask for a password break.

A relay-specific break code is sent back to you. That code is valid for the next two weeks.

3. To restore the factory default passwords, enter this command including the relay-specific password break code.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>set pwd_break=xxxxxxx</td>
<td>Restore the factory default passwords (&quot;xxxxxxx&quot;= the relay-specific password break code received from the Schneider Electric Customer Care Centre.)</td>
</tr>
</tbody>
</table>
9. Local port

The relay has a USB port in the front panel.

Protocol for the USB port

The front panel USB type B port is always using the command line protocol for Easergy Pro.

The speed of the interface is defined in the CONF/DEVICE SETUP menu via the front panel. The default settings for the relay are 38400/8N1.

Connecting a cable between the PC and the relay creates a virtual com-port. The default settings for the relay are 38400/8N1. The communication parameter display on the local display shows the active parameter values for the local port.

It is possible to change the front USB port's bit rate. This setting is visible only on the relay's local display. The bit rate can be set between 1200 and 187500. This changes the bit rate of the relay, and the Easergy Pro bit rate has to be set separately. If the bit rate in the setting tool is incorrect, it takes a longer time to establish the communication.

**NOTE:** Use the same bit rate in the relay and the Easergy Pro setting tool.
10. Block diagrams

The status of the output contacts is shown when the relay is energized but none of the protection, controlling or self-supervision elements are activated.

Figure 10 - P3U10 5AA A1AAA block diagram

NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay’s protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️ ⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

**DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️ ⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
Figure 14 - P3U20 5AA A1AGAA block diagram

NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
Figure 15 - P3U30 5 AA A2 BBA block diagram

NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
Figure 16 - P3U30 5AA A1BCA block diagram

NOTE: Connect only one (5 A, 1 A or 0.2 A) earth fault overcurrent input.

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Connect the relay’s protective ground to functional earth according to the connection diagrams presented in this document.

Failure to follow this instruction will result in death or serious injury.
<table>
<thead>
<tr>
<th>Terminal characteristics</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>X5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pluggable clamp connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire cross section, mm² (AWG)</td>
<td>6 (10)</td>
<td>2.5 (13 - 14)</td>
<td>2.5 (13 - 14)</td>
<td>2.5 (13 - 14)</td>
<td>2.5 (13 - 14)</td>
</tr>
<tr>
<td>Maximum wiring screw tightening torque Nm (lb-in)</td>
<td>0.8 (7)</td>
<td>0.5–0.6 (4.4–5.3)</td>
<td>0.5–0.6 (4.4–5.3)</td>
<td>0.5 - 0.6 (4.4 – 5.3)</td>
<td>0.5 - 0.6 (4.4 – 5.3)</td>
</tr>
<tr>
<td>Maximum connector retention tightening torque Nm (lb-in)</td>
<td>1 (8.5)</td>
<td>0.34 (3)</td>
<td>0.34 (3)</td>
<td>0.34 (3)</td>
<td>0.34 (3)</td>
</tr>
<tr>
<td>Wire type</td>
<td>Single strand or stranded with insulated crimp terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pluggable ring lug connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ring lug width (mm) and screw size</td>
<td>10.0, M4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum wire cross section if directly mounted under screw, mm² (AWG)</td>
<td>2.5 (14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum wiring screw tightening torque Nm (lb-in)</td>
<td>1.5 Nm (13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum connector retention screw tightening torque Nm (lb-in)</td>
<td>1.4 (12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire type</td>
<td>Single strand or stranded with insulated crimp terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# 11. Mounting

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</strong></td>
</tr>
<tr>
<td>• Wear your personal protective equipment (PPE) and comply with the safe electrical work practices. For clothing refer applicable local standards.</td>
</tr>
<tr>
<td>• Only qualified personnel should install this equipment. Such work should be performed only after reading this entire set of instructions and checking the technical characteristics of the relay.</td>
</tr>
<tr>
<td>• NEVER work alone.</td>
</tr>
<tr>
<td>• Turn off all power supplying this equipment before working on or inside it. Consider all sources of power, including the possibility of backfeeding.</td>
</tr>
<tr>
<td>• Always use a properly rated voltage sensing relay to ensure that all power is off.</td>
</tr>
<tr>
<td>• Do not open the secondary circuit of a live current transformer.</td>
</tr>
<tr>
<td>• Connect the relay's protective ground to functional earth according to the connection diagrams presented in this document.</td>
</tr>
</tbody>
</table>

**Failure to follow this instruction will result in death or serious injury.**
11. Mounting

Universal Relays P3U10, P3U20 and P3U30

Figure 17 - Panel mounting

PANEL MOUNTING P3Uxx

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>P3Uxx-5</td>
<td>214mm / 8.4&quot;</td>
<td>192mm / 7.6&quot;</td>
</tr>
<tr>
<td>P3Uxx-6</td>
<td>226mm / 8.9&quot;</td>
<td>224mm / 8.8&quot;</td>
</tr>
</tbody>
</table>

X1 (P3Uxx-5)  
T max. 1.40Nm  12lb in  
0.8 x 4.0  3/32in x 0.030in

X1 (P3Uxx-6)  
T max. 1.40Nm  12lb in  
0.8 x 4.0  3/32in x 0.030in

X2, X3, X4, X5  
T max. 0.80Nm  7lb.in  
0.4 x 2.5  3/32in x 0.015in

Nut M4  
1.5Nm  13.3Ib in  
min. 2.5mm²  Ø 4.6mms

7mm  9/32in
1.5Nm  13.3Ib in

0.8 x 4.0  5/32in x 0.030in

0.8 x 4.0  5/32in x 0.030in

0.4 x 2.5  3/32in x 0.015in

0.4 x 2.5  3/32in x 0.015in

0.8 x 4.0  5/32in x 0.030in
Figure 18 - Panel mounting with the raising frame REL52834

CAUTION

HAZARD OF CUTS

Trim the edges of the cut-out plates to remove any jagged edges.

Failure to follow these instructions can result in injury.
Figure 19 - Example of the P3U alarm facial label insertion

See "P3 Standard Series facial label instruction" document for more information.

Protective film

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK OF DESTRUCTION OF THE RELAY</td>
</tr>
<tr>
<td>The protective film on the relay's display is plastic and can melt if exposed to high temperatures intensive sunlight. Remove the protective film after mounting the relay.</td>
</tr>
<tr>
<td>Failure to follow these instructions can result in equipment damage.</td>
</tr>
</tbody>
</table>
## 12. Related documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easergy P3 Universal Relays P3U10, P3U20 and P3U30 User Manual</td>
<td>P3U/EN M/xxxx</td>
</tr>
<tr>
<td>Easergy Pro Setting and Configuration Tool User Manual</td>
<td>P3eSetup/EN M/xxxx</td>
</tr>
<tr>
<td>P3 Standard Series facia label instruction</td>
<td>P3TDS17011EN</td>
</tr>
<tr>
<td>Principles of numerical protection techniques</td>
<td>P3INS17019EN</td>
</tr>
</tbody>
</table>

* xxx = revision number