UPDU RN3000 family hardware user manual

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0.4. Document History

Date	Revision	Who	Comment
2020-06-03	0.1	FRIE	First draft user manual for firmware only
2020-09-15	1.1	FRIE	Draft user manual for firmware v1.1
2020-11-25	1.2	FRIE	Draft user manual for firmware v1.2
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2021-04-27	1.4	FRIE	Draft user manual for firmware v1.4
2021-06-18	2.0	FRIE	Draft user manual for firmware v2.0
2021-09-03	2.1	IGIA	First complete user manual draft updated for firmware v2.1
2022-05-23	2.5	IGIA	Updated and moved SW in separate document
2022-10-20	2.7	IGIA	Added OVP instructions and PoE diagrams

0.5. Glossary

AC	Alternating Current
API	Application Programming Interface
AUX	AUXiliary
CBM	Circuit Breakers Module
CLI	Command Line Interface
COM	COMmunication
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
ETH	ETHernet
FW	FirmWare
HTTP	HyperText Transfer Protocol
HTTPS	HyperText Transfer Protocol Secure
ICM	Interface and Control Module
IP	Internet Protocol
LED	Light Emitting Diode
MCB	Miniature Circuit Breaker
MIB	Management Information Base (SNMP)
OVP	OverVoltage Protection
PC	Personal Computer
PD	Powered Device
PDU	Power Distribution Unit
PE	Protection Earth
PIM	Power Inlet Module
PLC	Power-Line Communication
PoE	Power over Ethernet
POM	Power Outlet Module
PSE	Power Source Equipment
RCD	Residual Current Device
RCM	Residual Current Monitor
REST	REpresentational State Transfer
RNX	Riedo Networks Ltd.
RS232	Recommended Standard 232
RSTP	Rapid Spanning Tree Protocol
RTC	Real Time Clock
SNTP	Simple Network Time Protocol

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SNMP	Simple Network Management Protocol
SSH	Secure SHell
STP	Spanning Tree Protocol
TCP	Transfer Control Protocol
TFT	Thin Film Transistor
UPDU	Universal Power Distribution Unit
UPS	Uninterruptable Power Supply
USB	Universal Serial Bus

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1. Introduction

Thank you for purchasing an RNX Universal Power Distribution Unit of the RN3000 family. With its high precision measurements it is one of the most advanced PDUs available on the marked today.

2. Product overview

The new RN3000 family of universal PDUs stands out with their powerful controller and numerous interface and communication possibilities. The two Gigabit and the additional 100Mbit/s ports allow redundant Ethernet ring topology and optional PoE. Three auxiliary ports and two USB ports are ready for multiple sensor connections and other purposes. The controller is equipped with a large non-volatile memory capable of storing the load curves required by the actual Smart Meter norms.

The RN3000 come in a fully modular design allowing customized configuration from inlet metered PDUs to managed PDUs (outlet metered and outlet switched).

All modules (power inlet, controller and interface, power outlets, MCBs) are assembled from the front making it easy to adapt the PDU for future needs. A broad range of circuit breakers are available in order to comply for various national standards.

The modules are not user-serviceable or user-replaceable; they are not hot-swappable, neither.

By pressing the quick select button on any outlet module the relevant data is immediately shown on the large 2.4" graphic TFT display without any need for cumbersome menu navigation.

- Fully modular design, service-friendly assembly from front of PDU
- Full product range from inlet metered to managed (outlet metered and switched)
- 2x Gigabit with PoE for redundant and self-powered Ethernet ring topology and one additional 100Mbit/s Ethernet for local access
- 3x AUX ports for sensors, 2x USB ports
- Quick select button on each outlet module
- Billing-grade accuracy, factory calibrated
- Non-volatile memory stores all load curves for 60+ days
- Residual Current Monitoring (RCM) type B (optional)
- 2.4" graphic TFT display
- Slim and robust design (49.5 x 59.8mm), compact MCB allowing best air flow in the rack
- LSZH (low smoke zero halogen) cables and wires
- Multiple mounting options for time-saving and easy deployment in racks
- Locking IEC sockets compatible with TwyLock® power cables

2.1. Product structure

Each PDU is built in a solid extruded aluminum chassis. On one end of the chassis the Power Inlet Module (PIM) holds the inlet cable solidly to the PDU. The Interface and Control Module (ICM) is usually located in the middle of the PDU allows quick monitoring the power consumption,

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showing some useful parameters and provides the communication interfaces with the network and the external sensors. One or more Power Outlet Modules (POM) allows connecting the loads. 32A PDUs are equipped with MCBs to protect the loads against overcurrent.

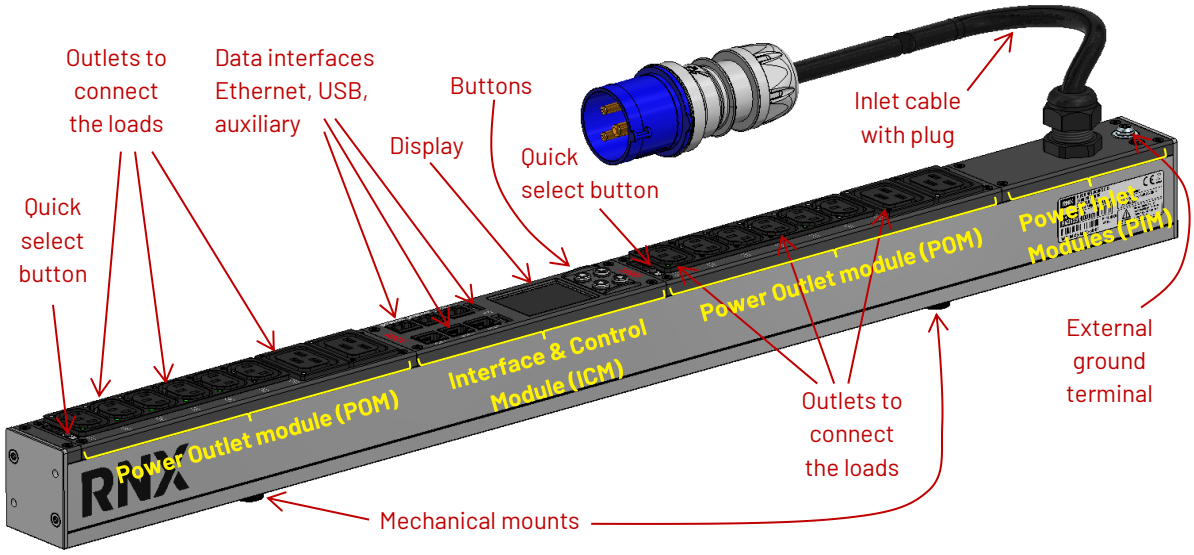

Figure 1: The UPDU and its interfaces (in this example a 3x16A model).

2.2.Intended use

This product is designed to power, monitor and control one or more AC loads, within the capacity of the selected model. It's intended to be used in an indoor room, such as an office or a data center. It must be securely fixed to a rack or a wall as explained in this document. It's intended to be used in an area where children are not likely to be present.

The mains supply must be compliant with the electrical rating reported on the product nameplate.

3. Physical installation and decommissioning

	Please read this manual carefully before installing or decommissioning this product. Failure to follow these instructions may result in hazardous situations.
	In addition to this operating manual the generally applicable legal regulations and other binding instructions concerning safety regulations, regulations for preventing accidents and regulations for the protection of the environment must be adhered to.

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3.1. Mounting

This product must be secured to a wall or a rack by its mounting bolts to ensure its mechanical stability. The thick inlet cables and the numerous cables connected to the POMs represent a significant weight and can cause the product to fall or tip over.

	To avoid potential injuries, make sure the product is secured to a wall or a rack with its mounting bolts.
	This product is intended for indoor use only. Humidity or water may result in electrical or fire hazard.

Two captive M4 nuts slide in a longitudinal slot on the back of the product. Dedicated knurled bolts are supplied with the product and allow hanging it on special brackets. Several models are available or dedicated brackets can be fabricated according to the drawing in figure 3.

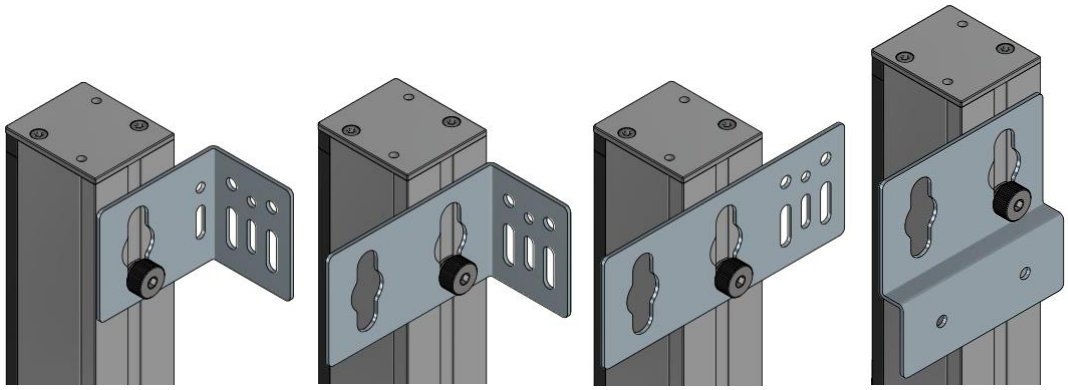

Figure 2: Various mounting bracket examples. From left to right we have models RN1016, RN1017, RN1018 and RN1030.

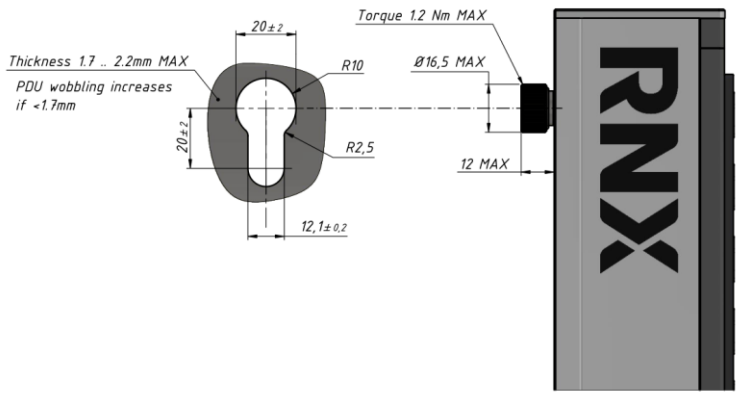

Figure 3: Mounting bolts and slot panel cutout.

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Two brackets are required for each PDU. Start by bolting the two brackets to a wall or to a rack. Make sure they are solid. Measure the distance between the axes of the two slots.

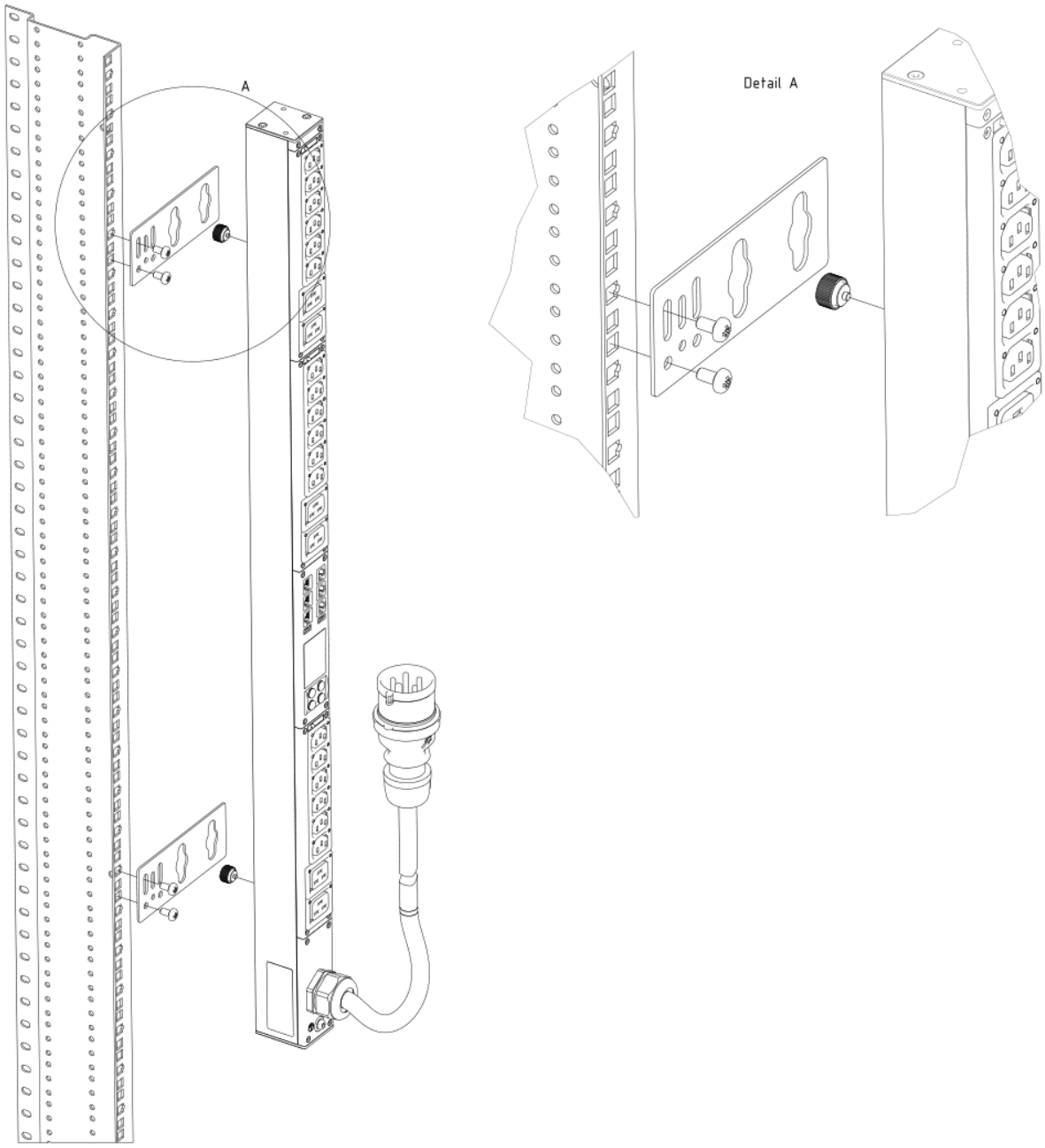

Figure 4: Mounting the RNxxxx on a rack.

Now fix the two knurled bolts on the back of the PDU at the desired location such that their position matches the position of the brackets, i.e. they are at the same distance you measured just before. In spite of their specific shape, there are truly M4 bolts and can be adjusted by untightening them, sliding them along the PDU and tightening back as any regular bolt. They accept a 5mm hex key.

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Figure 5: Fix the two knurled bolts at the desired location.

	When installing many identical PDU, the use of a template such as a piece of cardboard showing the exact location of the bolts will considerably speed up this operation.

Lift the PDU and hang it on the brackets by pushing the bolts in the dedicated slots and gently let the PDU slide down along the slots until it reaches the bottom. Now try pulling the product to make sure it's secured in place; both brackets must hold the PDU.

	The PDU can be installed in any position: vertical, horizontal or upside down. The display will automatically rotate to be always readable.

If desired, the external ground terminal can be connected to the rack metal frame with a wire. This is not a protection ground and is just intended to minimize electrical noise. The protection ground is always connected through the inlet cable.

The inlet cable can now be connected to a mains power supply outlet. If desired, the cable can be attached or routed through a suitable cable tray.

	The building mains outlet where the PDU is connected to must be protected by fuses or MCBs in the building distribution box of the same current rating of the PDU. E.g. a 16A PDU must be protected by 16A MCBs and a 32A PDU must be protected by 32A MCBs.
	The inlet plug can be used as a disconnect device: it must be easily accessible at all times.

The 19" model is much shorter than the other PDUs and is fitted with side brackets to be installed in a standard 19" rack. Please note that the PDU has a width of 50mm that is slightly more than the standard 44mm of 1U.

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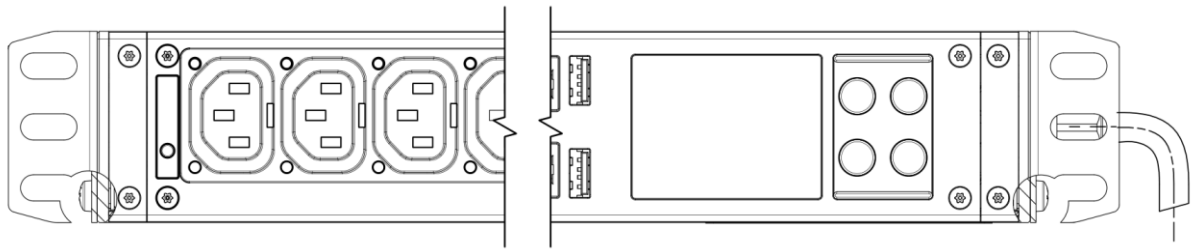

Figure 6: A 19" PDU with its mounting brackets.

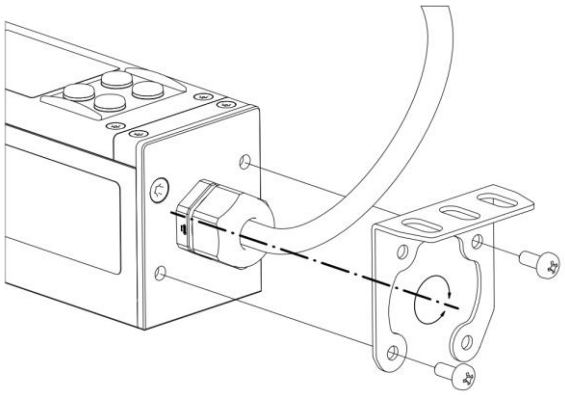

Figure 7: Detail view of the 19" mounting bracket.

3.2. Connecting and disconnecting loads

This product supports standard IEC 60320 C13 and C19 female connectors that accept any IEC 60320 C14 and C20 male plugs.

Moreover, all outlets are compatible with TwyLock® snap-in cable retention. To connect a TwyLock® cable simply push the connector in until it clicks. To disconnect it, squeeze the two side buttons on the plug while pulling it out.

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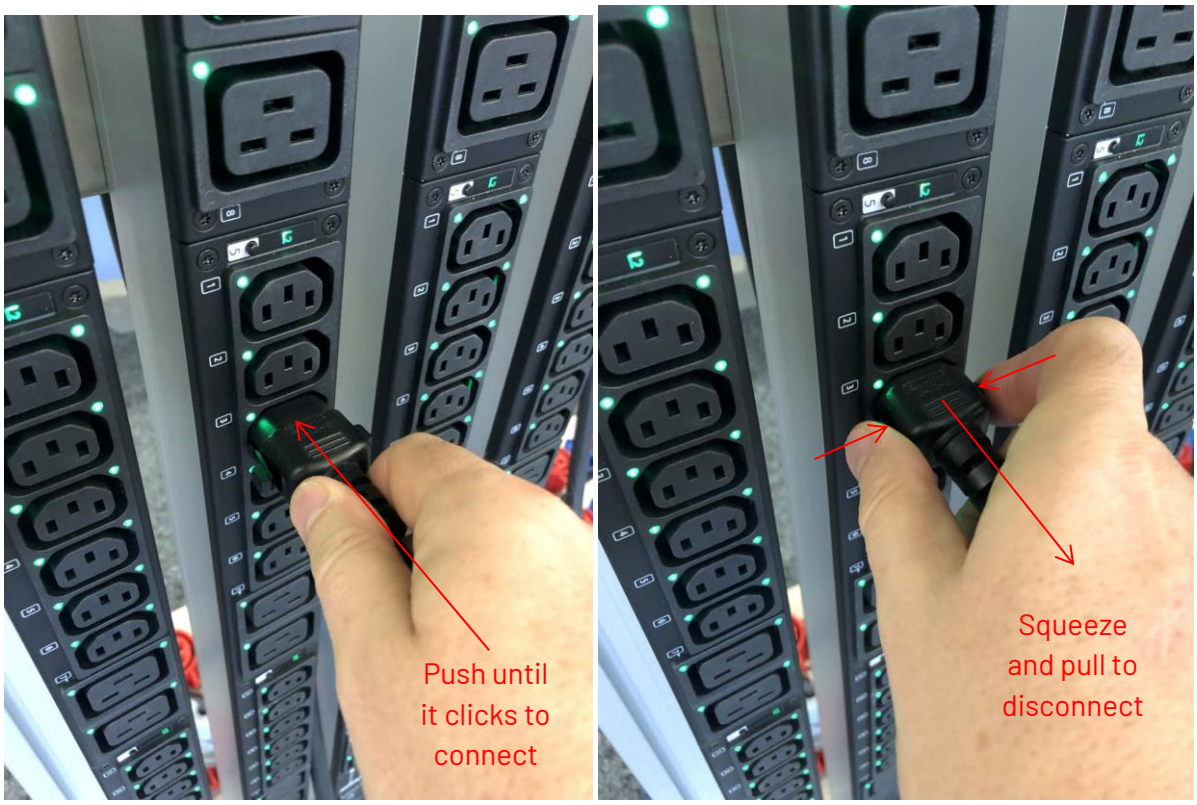

Figure 8: Connecting (left) and disconnecting (right) a TwyLock® cable to and from the UPDU.

	This product is intended to be used only with IT devices. The user must make sure that any load connected to a C13 outlet has a rated current of 10A or less.

3.3. Using the MCBs

32A PDUs are equipped with 16A MCBs to protect the loads and their cables. Standard O/I symbols indicate the status of the MCB.

The black number(s) on white background indicate which branch each MCB controls. This number matches the one of the corresponding POM.

Hydraulic-magnetic MCBs are flush when on and the rocker lever protrudes when off. To switch them on one just has to push the lever in. To switch them off a sharp tool such as a screwdriver is needed to push the lever out. This prevents accidentally switching off a load.

Figure 9: Six hydraulic-magnetic MCBs on a 3x32A PDU.

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Thermal-magnetic MCBs can be turned on or off by hand and have a protective hood to prevent accidentally switching off a load.

Figure 10: Six thermal-magnetic MCBs on a 3x32A PDU.

3.4. Servicing the OVP

Some models are equipped with an overvoltage protection (OVP) that has replaceable cartridges. OVP cartridges wear out over time and with absorbed surges; when they fail they "blow" like a fuse and (if equipped) an alarm is sent to the ICM. A failed cartridge won't protect against surges any longer but the PDU still operates normally without overvoltage protection. When a cartridge fails, one or more red tabs appear in its control window indicating that it should be replaced.

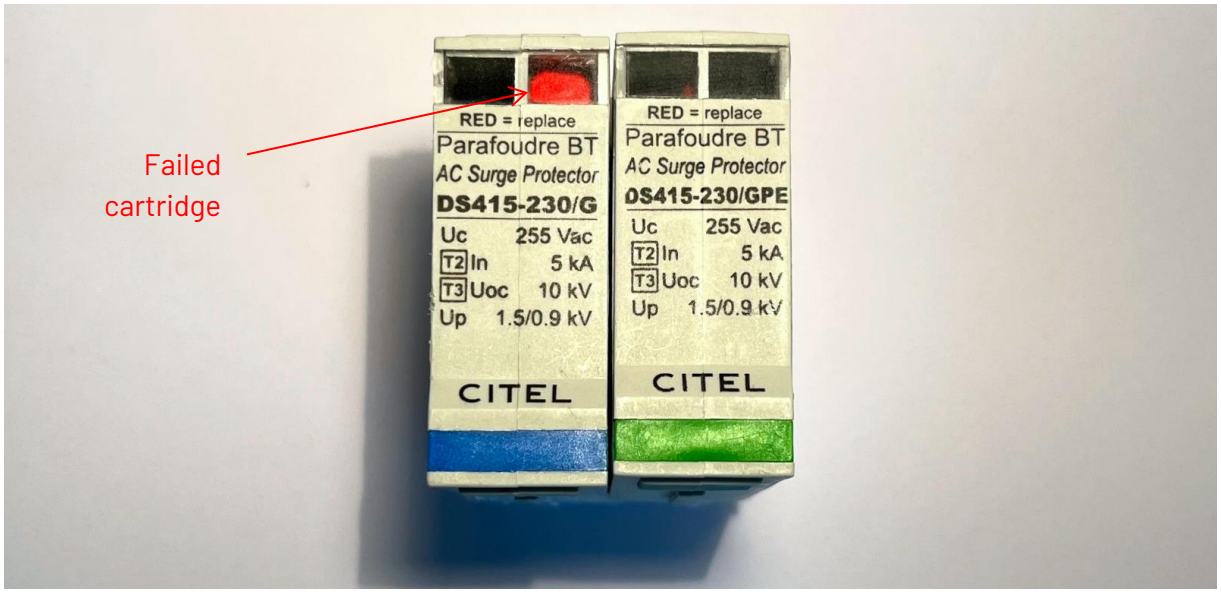

Figure 11: Two OVP cartridges. The one on the left has failed.

	Replacing OVP cartridges must only be done by a trained electrician.

To replace a cartridge follow these steps:

1. Cut off the power of the PDU
2. Unscrew the two TX10P screws and remove the cover over the OVP cartridges
3. Firmly grab the failed cartridge and pull it strongly out of its socket
4. Insert a new cartridge in the socket and push it all the way in
5. Reinstall the cover and tighten the two screws to 0.4Nm

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6. Switch the power of the PDU back on

	Don't remove both cartridges at the same time as the socket may move inside the PDU frame and it could be difficult to realign it again without taking the PDU apart.
	A 3-phase PDU has two different cartridges that are not interchangeable: one has a blue stripe and the other one has a green stripe. The correct cartridge only fits in the correct slot. The green stripe is on the bottom right, the blue stripe on the bottom left.

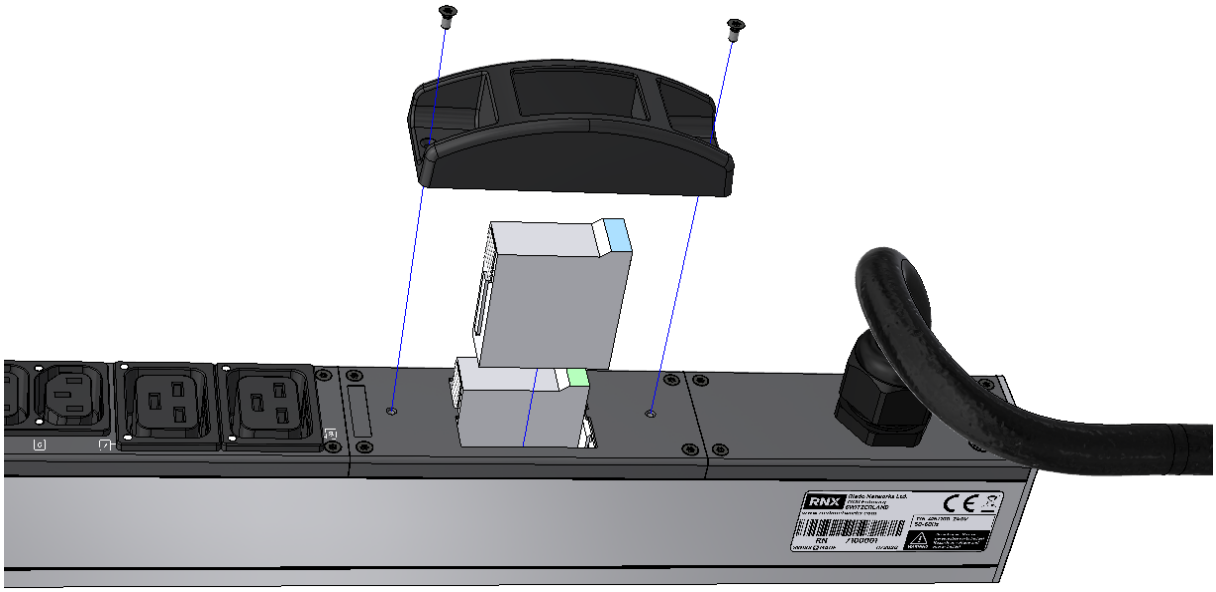

Figure 12: Replacing an OVP cartridge.

3.5. Decommissioning

To decommission the product please follow the following steps in this precise order.

1. Disconnect the inlet cable from the mains supply by unplugging it from the wall outlet.
2. Disconnect all the C14 and C20 connectors from the PDU POMs.
3. Disconnect all network, USB and auxiliary cables from the ICM.
4. If connected, unscrew and remove the external ground terminal on the PIM.
5. Free the inlet cable from any support or cable tray.
6. Detach the PDU from its supports by lifting it and pulling it forward.
7. The product can now be packaged and sent back for repair or maintenance.
8. If the PDU is being scrapped, the RTC battery inside the ICM must be removed and safely recycled. This operation can only be done by an electrician.
9. If the PDU is being scrapped, it must be recycled as electronic waste according to local regulations.

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	There is a CR2032 lithium battery in the ICM. It's not user serviceable but must be removed by trained personnel (i.e. an electrician) and recycled according to the local regulations before disposing of the product.

4. User interface

The PDU is equipped with a 2.4" TFT display and four buttons allowing a simple user interface. This interface is intended to show the most important measurements and configuration parameters of the product for an easy installation or troubleshooting. It's only a subset of what is available on the web interface, the CLI, the SNMP or other protocols.

	The buttons on the PDUs only allow reading information. For safety reasons, it's not possible to modify anything directly on the PDU. To change the configuration or to change the status of a relay one must use the provided network interfaces (CLI, web, SNMP,...) and successfully log in to the PDU.

4.1. ICM user interface description

Figure 13: The ICM and its interface.

The UPDU has an auto-orienting 2.4" graphic full-color TFT display and is equipped with 4 buttons:

	Home/cancel button
	Menu/enter button
	Up/down buttons

4.2. ICM operation with display and buttons

Wake up the display with the menu/enter button  .

You can switch between the following views with the same button  :

- **Overview**
- **Module** - showing the data of each module in a separate page

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- **Environment**
- **Info** - showing general data and network ports configuration

With the up/down buttons you can scroll through the pages in views with more than 1 page.

Pressing the home button returns to the overview page.

4.3. POM user interface description

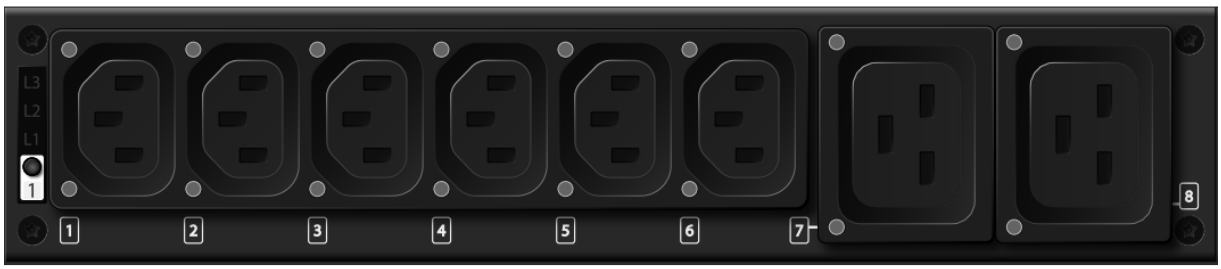

Figure 14: The POM and its interface.

Each Power Outlet Module (POM) is equipped with one or more C13 or C19 outlets.

4.3.1. Outlet numbering

Each POM has a number between 1 and the maximum number of POMs of the PDU. It's indicated by a black number on white background close to the quick select button.

The outlets of each POM are numbered between 1 and the maximum number of outlets of that particular POM. This number is printed in white over the color of the PDU (usually black, red or blue).

4.3.2. Phase indication

All the outlets of a POM are connected to the same phase. The phase LED is close to the quick select button and lights up to show L1, L2 or L3. The phase is visible only when the PDU is powered.

Moreover, this LED also indicates the status of the POM as follows:

- Green: POM is OK
- Orange: temporary error (the most common error is losing the communication with the neighbor POM when rebooting or upgrading the firmware). This situation should resolve itself in a few minutes.
- Red: permanent error (e.g. no calibration, ADCs not found, problem with POM hardware,...). This situation needs the user attention. If rebooting the PDU doesn't fix this problem, the PDU should be sent back for maintenance.

4.3.3. Outlet status indication

Each outlet is equipped with one or two LEDs

- One LED for outlet metered POMs
- Two LEDs for POM equipped with the outlet switching function

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In the latter case, both LEDs glow of the same color.

The indication depends on the voltage and is as follows:

- Green: voltage is within its nominal value ±10%
- Red: no voltage (the voltage is below 50V)
- **Blinking red:** voltage outside its nominal value ±10%

4.3.4. Quick select button

By pressing this button the UPDU shows immediately the values of the corresponding POM on the display.

The module number (in black on white background) close to the quick select button lights up in white to indicate that that particular module is being displayed on the ICM. This happens when the quick select button is pressed or when the corresponding page is selected on the ICM.

5. Software, firmware and connecting to the PDU

Because these features strongly depend on the actual version of the firmware running in the PDU, their description has been moved to several different documents.

Please refer to the following documents:

- "UPDU RN3000 family software user manual" for e general description of the software features
- "UPDU RN3000 family web user manual" for a detail description of the web interface.
- "CLI Reference Manual" for a complete and up to date description of the commands available in the CLI

6. Power over Ethernet and powering the PDU logic

The PDU is composed by two separate sections: the high power section providing AC power to the loads and the logic section ensuring metering, analysis and communication.

While the PDU has only one mains power inlet that will power both sections, in case of a mains power outage, the logic can be kept alive via power over Ethernet (PoE). This maintains communication with the PDU and avoids any missing data in the logs. This also makes sure that the alarms are sent correctly during such an event. For outlet switched models, it's also possible to switch relays on or off even when the mains power is lost.

	The PoE feature only keeps the logic alive; the loads will of course lose power as the mains supply is lost.

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To keep the loads powered even in the case of a power outage, we suggest the use of two PDUs connected on two independent mains power supply feeds and the use of loads with redundant power inputs.

6.1. Normal power of the PDU logic

During normal operation, the PDU controller (ICM) is powered by an internal AC-DC power supply unit connected on the L1-N conductors of the AC mains supply. This supply unit is capable of delivering a maximum of 30W: this is enough power to feed its own PDU plus an additional PDU, as the internal power consumption of a PDU is always below 15W.

6.2. PoE PSE port (ETH2)

The ICM will provide up to 15W of power on connector ETH2 (PSE). This can be used to provide redundant auxiliary power another PDU or to power any PoE compatible device. The PSE feature (Power Supply Equipment) can be turned on or off with the CLI. By default it's turned on.

6.3. PoE PD port (ETH1)

The ICM will negotiate 15W of PoE supply on connector ETH1 (PD) if it finds a suitable PoE PSE enabled device connected in this port. During normal operation, no power is used from the PoE as the internal mains power supply always has priority. Should the mains power be suddenly lost, the ICM will immediately switch to PoE without any interruption.

Power on this connector can come from the ETH2 (PSE) port of another UPDU or from any PoE injector or PoE switch capable of delivering 15W or more.

The PD function cannot be turned on or off in the PDU. If it's not desired, just connect ETH2 to a non-PoE equipment or turn it off in the equipment providing the power.

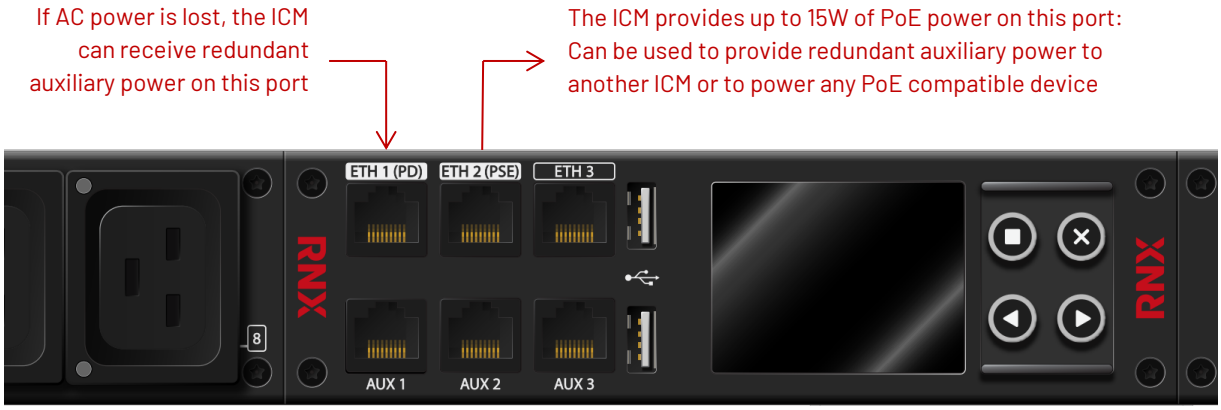

Figure 15: ICM PoE connections.

6.4. PoE network topology

To provide redundant power to and from two or more PDUs, network loops are very common. Because this PDU supports the RSTP protocol and it's enabled by default, this is not a problem.

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It's possible to create loops without the need of manually disabling Ethernet ports or creating any communication problem. RSTP will automatically and dynamically detect and open a loop.

6.5. Ethernet and PoE connection examples

If PoE is not used, any connection configuration of the three Ethernet ports will work. ETH1 and ETH2 are internally connected to a Gigabit switch while ETH3 is on a different network. Therefore ETH1 and ETH2 are always part of the same network interface and ETH3 is always on a different one. ETH3 cannot be bridged to ETH1/ETH2.

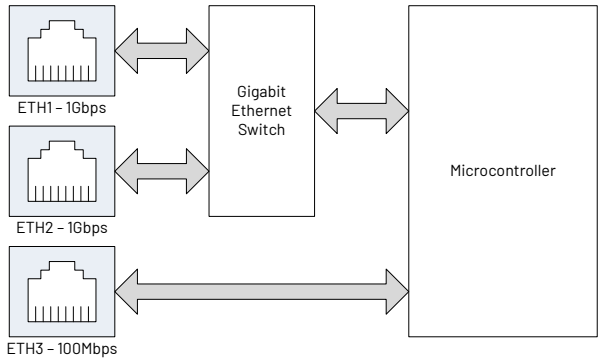

Figure 16: ICM Ethernet internal block diagram.

Here are a few examples of network topology:

6.5.1. Star topology

In a star topology each PDU is directly connected to an Ethernet switch. This is how normal network devices are usually connected, but has the disadvantage of requiring many long cables and of occupying many switch ports (one per PDU). The advantage is that if a network cable fails, only one PDU loses connection.

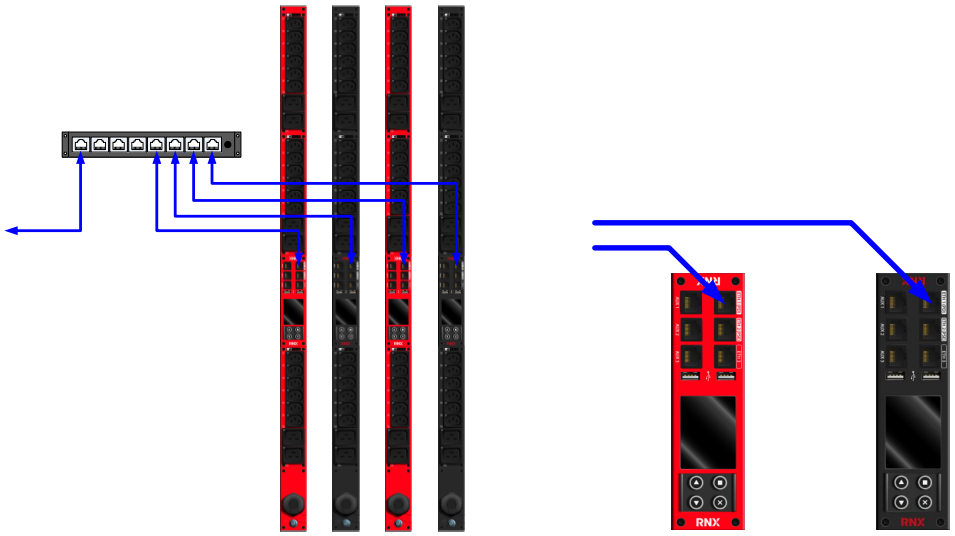

Figure 17: Ethernet star topology.

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If the Ethernet switch is capable of providing PoE PSE (and is powered by an UPS) it can provide auxiliary power to the PDUs in case of AC power failure. In this case, all the PDUs must be connected via the ETH1 (PD) port. If PoE is not used, any PDU ETH port will work.

6.5.2. Chain topology

Because each PDU has an internal Ethernet switch, it's possible to connect them in a daisy chain. This has the advantage of requiring much shorter cables and only uses one port on the switch. But it has the disadvantage that if a network cable fails all the PDUs after the failure loose connectivity. This only works with ports ETH1 and ETH2 because only these two ports are connected to the internal switch.

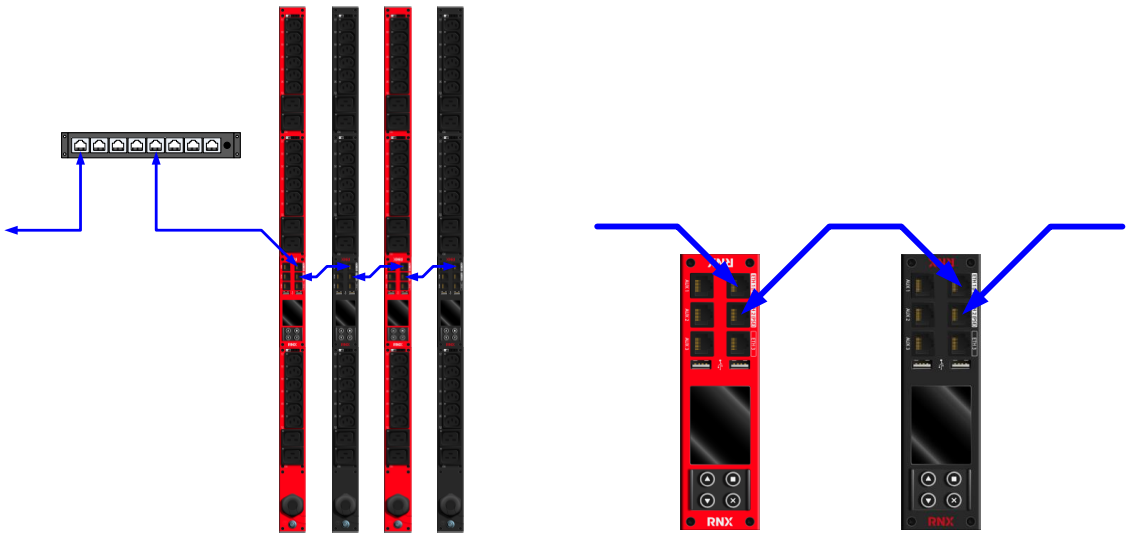

Figure 18: Ethernet chain topology.

In terms of auxiliary power, if the PDUs are connected alternatively to two (or more) AC mains feeds, if one feed fails every PDU that still has AC power will power the next PDU of the chain and all PDUs can still communicate. In this example the two AC feeds are represented by the red and the black PDUs. For this to work, the Ethernet switch must be able to supply PoE power to the first PDU of the chain, and each PSE (ETH2) port of PDU number "N" must be connected to the PD (ETH1) port of PDU "N+1".

6.5.3. Loop topology

By adding one extra cable to the switch to close the loop, the chain topology can be significantly improved. The STP/RSTP protocol will automatically take care of dynamically opening the loop and automatically restoring it should one cable fail making this configuration resistant to a single cable failure.

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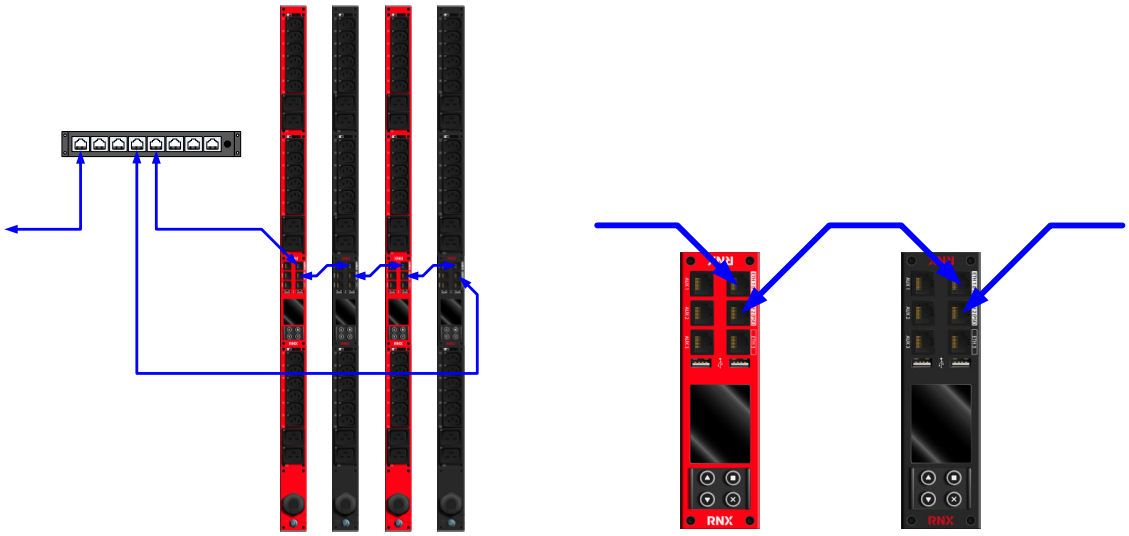

Figure 19: Ethernet loop topology.

In terms of auxiliary power, this configuration allows the same redundant supply as in the chain configuration and requires the ports to be connected in the same way.

6.5.4. The third port

Each PDU is equipped with three Ethernet ports. The first two ports and the internal Gigabit switch allow constructing daisy chains and rings without additional equipment. This is enough to collect all the data from all the PDUs.

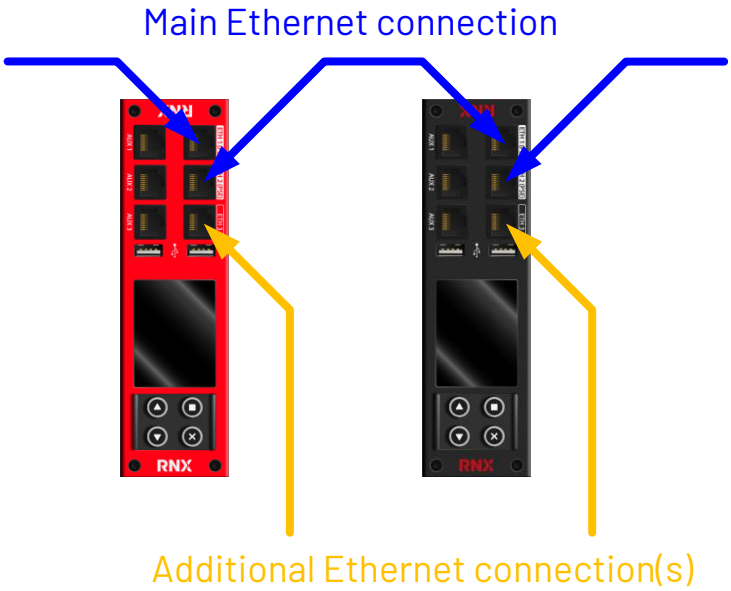

Figure 20: Using the three Ethernet ports.

But sometimes it's desirable to let a device (e.g. a server) have access to just the PDU it's getting its power from without giving him access to all the other PDUs. This is particularly useful when the server belongs to a third party, e.g. a rented server in a data-center. By using ETH3 it's possible to do just that: a short jumper cable allows a server to talk to its PDU on its own

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network without needing extra ports on the switch and without a connection to the network where all other PDUs are connected, thus saving on wiring and on switches.

7. Technical support

7.1. PDU reset

In some cases, mainly for troubleshooting, it's desirable to do a hardware reboot or to reset the PDU. A software reset can be done with the CLI ("reboot" command) or the web interface (in the "maintenance" section there is a "reboot" button).

7.1.1. Hardware PDU reset

To reset the microcontroller and reboot the PDU, press and hold the home/cancel and the menu/enter button for about 7 seconds. This will not reset the Ethernet switch that can only be reset by cycling the power of the PDU.

Figure 21: Buttons to hold down for a microcontroller reboot.

7.1.2. Factory reset

To reset all settings to the factory default values, press and hold the home/cancel and the down button for about 3 seconds, then confirm the factory reset. This will erase all the configuration data, including users and passwords.

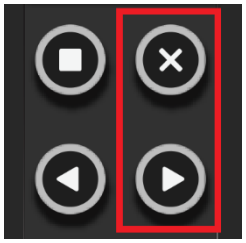

Figure 22: Buttons to hold down for a factory reset.

7.1.3. Bootloader mode

Pressing and holding all 4 buttons for about 7 seconds puts the controller in bootloader mode. In this mode the screen stays dark and the ICM behaves as if it was permanently switched off. This mode is only used in the factory to flash a new firmware and it's not supposed to be used by the customer.

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Should you enter this mode my accident, press and hold the home/cancel and the menu/enter buttons for about 7 seconds to exit this mode and resume normal operation of the ICM.

7.2. Service and maintenance

No service or maintenance is required and there are no serviceable parts inside the product. Opening the product may void the warranty.

	Assembly and maintenance can only be done by trained personnel (i.e. an electrician).
	Modules are not hot-swappable. The product must always be disconnected from the mains when disassembled or serviced by trained personnel (i.e. an electrician).

7.3. More technical support

https://www.riedonetworks.com

Riedo Networks Ltd.
Rte. de la Fonderie, 6
CH-1700 Fribourg
Switzerland

support@riedonetworks.com

Tel: +41 26 505 50 00

Or contact your local distributor.

8. Product specifications

8.1. Environmental

Environment	Operating parameters	Storage parameters
Temperature	0..60°C	–15..70°C
Humidity	10..90%RH (non-condensing)	5..95%RH (non-condensing)
Elevation	0..3'000m	0..15'000m

Table 1: Environmental ratings.

8.2. Electrical

See nameplate for exact unit ratings.

Product type	Ratings
Single phase, 16A, 3.7kW	100-240V~ 50-60Hz 16A
Single phase, 32A, 7.4kW	100-240V~ 50-60Hz 32A
Three phase, 16A, 11kW	175-415/100-240V 3N~ 50-60Hz 16A
Three phase, 32A, 22kW	175-415/100-240V 3N~ 50-60Hz 32A

Table 2: Electrical ratings.

Outlet type	Ratings
IEC 60320 C13	250Vac, 10A (UL & CSA 15A, 250Vac)
IEC 60320 C19	250Vac, 16A (UL & CSA 20A, 250Vac)

Table 3: Receptacle ratings.

PDU type	Inlet connector
1x16A	CEE plug (IEC 60309), 1x16A, 230V, 3 poles, 6h or T23 plug (SN 441011), 1x16A, 230V, 3 poles
1x32A	CEE plug (IEC 60309), 1x32A, 230V, 3 poles, 6h
3x16A	CEE plug (IEC 60309), 3 x 16A, 400V, 5 poles, 6h
3x32A	CEE plug (IEC 60309), 3 x 32A, 400V, 5 poles, 6h

Table 4: Inlet plug types.

MCB type	Tripping current	MCB part number	Tripping curve	Breaking capacity
Hydraulic-magnetic	16A	Carling Technologies N41-B0-26-616-122-FG	Long delay	10kA
Thermal-magnetic	16A	ABB S201M-C16	C	10kA

Table 5: MCB ratings.

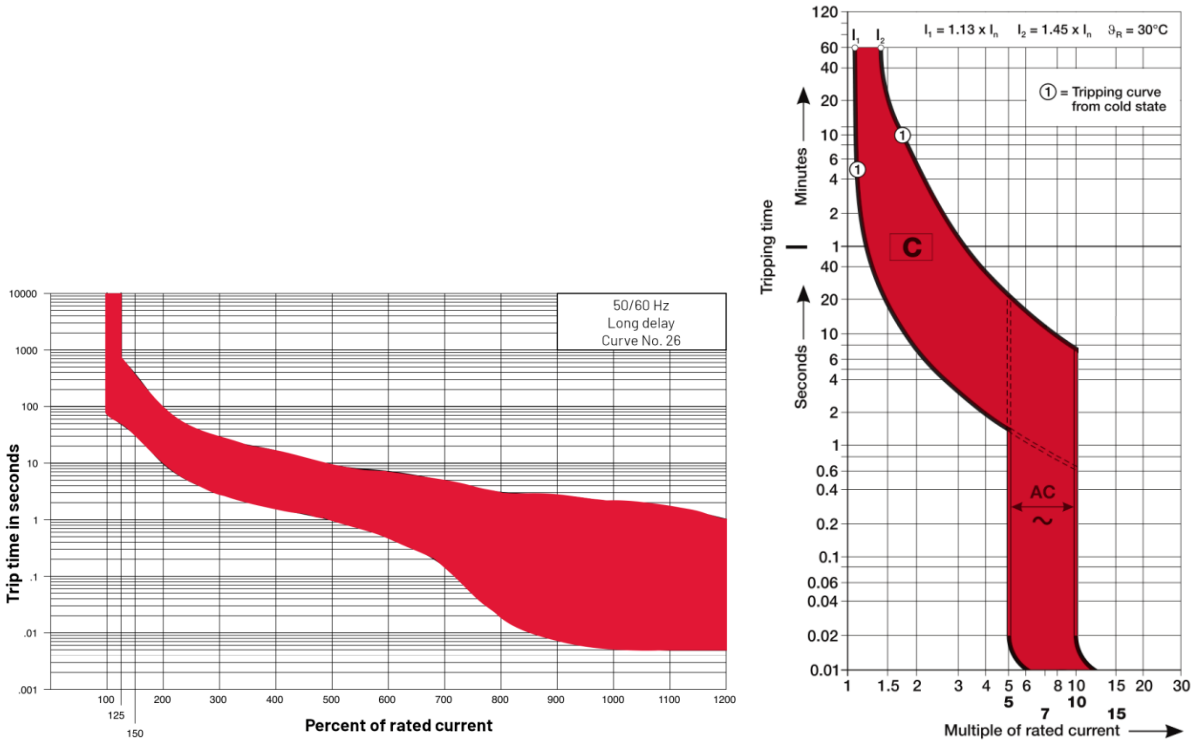

Figure 23: Carling Technologies N41-B0-26-616-122-FG tripping curve (left) and ABB S201M-C16 tripping curve (right).

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Temperature	Tripping current
−40 °C	21.3 A
−30 °C	20.7 A
−20 °C	20.0 A
−10 °C	19.2 A
0 °C	18.5 A
10 °C	17.7 A
20 °C	16.9 A
30 °C	16.0 A
40 °C	15.1 A
50 °C	14.1 A
60 °C	13.1 A
70 °C	11.9 A

Table 6: ABB thermal-magnetic S201-C16 MCB temperature dependence.

8.3. Outlet switching (if equipped)

Parameter	Ratings
Switch type	Bi-stable relay
Rated current	16A nominal, 20A maximum
Maximum load	4'000VA
Operating life	10'000 commutations

Table 7: Relay ratings.

8.4. Networking

Ethernet port	Speed	PoE	Switch
ETH1	1 Gbit/s	Yes, PD	Internal Gigabit switch
ETH2	1 Gbit/s	Yes, PSE	Internal Gigabit switch
ETH3	100 Mbit/s	No	No

Table 8: Network interfaces.

8.4.1. Remote management, protocols

Implemented protocols
Console (serial)
Telnet
SSH
DHCP
SNMP v2 & v3
NTP
HTTP
HTTPS
IPv4 & IPv6
REST API
STP/RSTP
RADIUS
SYSLOG

Table 9: Supported protocols.

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8.5. Other interfaces

Interface	Purpose
AUX1	External temperature and humidity sensors
AUX2	External temperature and humidity sensors
AUX3	External temperature and humidity sensors & console connection
USB1	Reserved for development
USB2	Reserved for development

Table 10: Additional interfaces.

8.6. Metering

Parameter	Ratings
Metering type	Per outlet (if equipped) Per module Per branch Per phase Inlet (if equipped) or total
Measured parameters	Voltage (V) Current (A) Active Power (W) Apparent Power (VA) Reactive Power (var) Active Energy (kWh) Reactive Energy (kvarh, capacitive and inductive) Frequency (Hz) Power Factor
Metering accuracy	Billing-grade accuracy, <0.5%

Table 11: Metering specifications.

Load curve type	Sample rate	Storage length	Memory type
Normal resolution	1 per second	>60 days	Non-volatile
High resolution	1 per minute	>2 hours	Standard

Table 12: Load curves storage.

RCM parameter	Ratings
Measuring range	AC/DC ±300 mA
Characteristics (IEC 60755)	AC/DC, type B
Resolution	< 0.2 mA
Frequency range	DC…2 kHz
Measuring time	180 ms
Operating uncertainty DC…500 Hz	±(5% + 0.5 mA)
Operating uncertainty 500…1'000 Hz	±(15% + 0.5 mA)
Operating uncertainty 1…2 kHz	–(50% ± 0.5 mA)

Table 13: RCM specifications (if equipped).

OVP parameter	Rating
Part number	Citel DS415S-230/G
Type	2
Technology	MOV
AC system	TT-TN
In	5kA
Imax	15kA
Failsafe mode	Disconnection

Table 14: OVP specifications (if equipped).

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9. Accessories and spare parts

Please contact RNX for a complete and updated list of mounting accessories and spare parts.

Part number	Description
RN1016	UPDU Mounting Bracket single
RN1017	UPDU Mounting Bracket double
RN1018	UPDU Mounting Bracket flat
RN1030	UPDU Mounting Bracket double, z-style
RN1031	UPDU Mounting Bracket 19" or top/bottom (set of 2pcs)

Table 15: Accessories and spare parts.

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