UPDU RN3000 family web user manual

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0.2. Confidentiality level

Public

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0.3. 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
2021-01-08	1.3	FRIE	Draft user manual for firmware v1.3
2021-04-27	1.4	FRIE	Draft user manual for firmware v1.4
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2021-09-03	2.1	IGIA	First complete user manual draft updated for firmware v2.1
2022-05-19	2.5	IGIA	Updated for firmware v2.5, web interface only
2022-10-27	2.7	IGIA	Updated for firmware v2.7

0.4. Glossary

AC	Alternating Current
API	Application Programming Interface
AUX	AUXiliary
CBM	Circuit Breakers Module
CLI	Command Line Interface
COM	COMmunication
DC	Direct Current
DCIM	Data Center Infrastructure Management
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)
NTP	Network Time Protocol
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

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SNTP	Simple Network Time Protocol
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
USB	Universal Serial Bus
UTC	Coordinated Universal Time

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1. Introduction

Each PDU of the RN3000 family can be accessed, read and configured via a simple web interface and this document describes how to use this interface. Please refer to "UPDU RN3000 family hardware user manual" for a more general description of the product.

	The web interface only contains the most common features of the product. More data and more options are available on the CLI. For more information on the CLI please refer to the "CLI reference manual".

2. Logging in

Connect the PDU to your Ethernet network by using any of the three ports ETH1, ETH2 or ETH3.

- By default, the UPDU is configured to get an IP address via DHCP.
- All Ethernet ports also support Auto-IP.

You can read the IP address of the corresponding port on the UPDU display by pressing the enter button ◙ several times to reach the information page and then scroll with the arrow buttons ◙ ◙ until the IP address is shown.

Figure 1: Finding the IP address on the PDU display.

To connect to the PDU via the web interface open a web browser and type "https://" followed by the IP address you just got (e.g. "https://192.168.1.57").

	The supported browsers are: - Chrome version 67 or newer - Edge version 80 or newer - Firefox version 58 or newer - Safari version 12.1 or newer

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A warning window like the following one appears, but this depends on your browser and on your settings. This is normal and is because the HTTPS certificate cannot be verified for a local IP address.

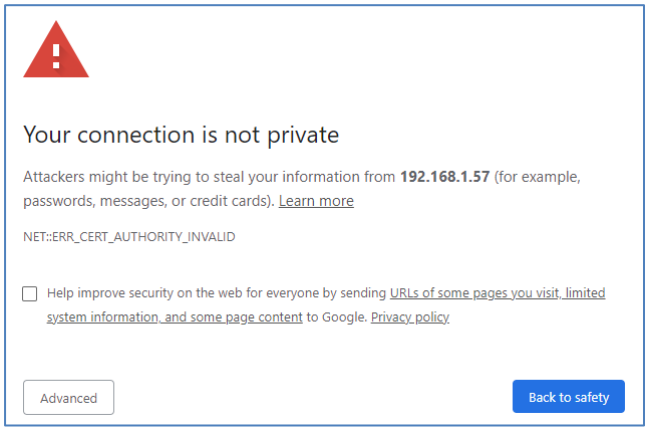

Figure 2: HTTPS connection warning message.

Simply click on "Advanced" and then on "Proceed to ..." (or something similar depending on your browser). You now have an HTTPS connection and a login screen appears:

Figure 3: Login dialog box.

	The default username is "**admin**" and the default password is "**admin**" as well.
	For safety reasons, please change the default password the first time you log in to a new PDU as described in section 3.1.

3. The home menu and logging out

Once logged in, on the left part of the screen you now have a menu showing all the available pages of the web interface.

In the homepage you can find the product model type, its serial number and its name.

To logout simply click on the "X" on the upper right corner of the page.

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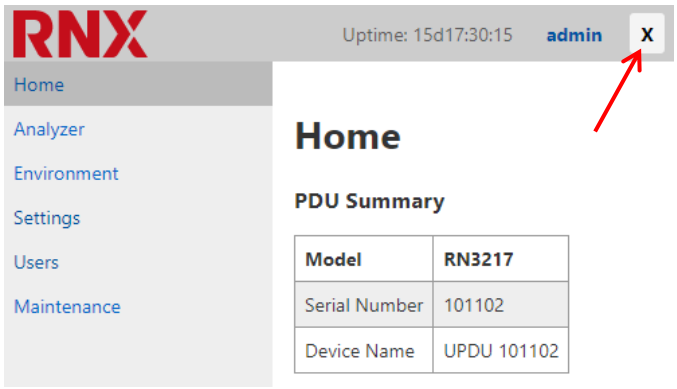

Figure 4: PDU summary in the web interface; use the "X" button to log out.

3.1. Changing your password

By clicking on your login name on the upper right corner (in this case "admin") you can visualize your user profile and change the password by pressing the "Change" button. A dialog box will pop up asking for the old and new password.

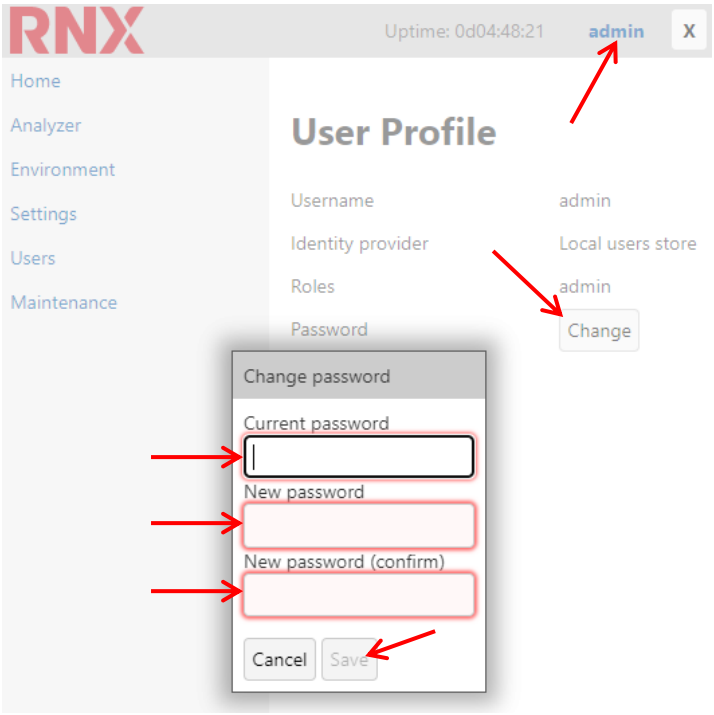

Figure 5: Click on your username to access the user profile page and change your password.

4. Analyzer

The analyzer page allows displaying real time measurements as taken by the PDU. The values are updated once a second.

The tables, their size and the values shown depend on the hardware configuration of the PDU.

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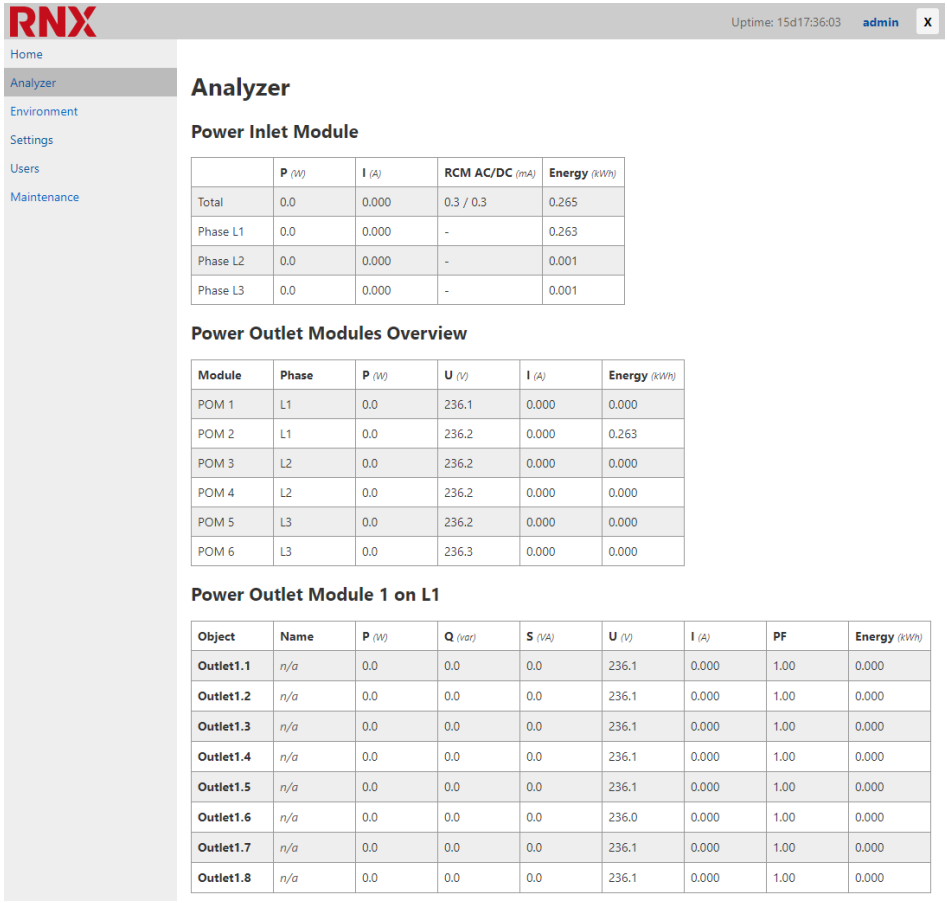
4.1. Reading physical values

The following measurements are shown:

- At the inlet (total and per phase)
- For each POM (Power Outlet Module)
- For every outlet (if equipped)
- Status of every outlet (if equipped with relay)

If the UPDU is equipped with an RCM module (Residual Current Monitoring), the RCM AC and DC values are displayed in the inlet section.



	P (W)	I (A)	RCM AC/DC (mA)	Energy (kWh)
Total	0.0	0.000	0.3 / 0.3	0.265
Phase L1	0.0	0.000	-	0.263
Phase L2	0.0	0.000	-	0.001
Phase L3	0.0	0.000	-	0.001

Module	Phase	P (W)	U (V)	I (A)	Energy (kWh)
POM 1	L1	0.0	236.1	0.000	0.000
POM 2	L1	0.0	236.2	0.000	0.263
POM 3	L2	0.0	236.2	0.000	0.000
POM 4	L2	0.0	236.2	0.000	0.000
POM 5	L3	0.0	236.2	0.000	0.000
POM 6	L3	0.0	236.3	0.000	0.000

Object	Name	P (W)	Q (var)	S (VA)	U (V)	I (A)	PF	Energy (kWh)
Outlet1.1	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.2	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.3	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.4	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.5	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.6	n/a	0.0	0.0	0.0	236.0	0.000	1.00	0.000
Outlet1.7	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000
Outlet1.8	n/a	0.0	0.0	0.0	236.1	0.000	1.00	0.000

Figure 6: The analyzer page (top part) of the web interface of 3x32A metered-only PDU equipped with RCM.

4.2. Controlling the relays

If the PDU is equipped with relays, control buttons are shown on the right of the corresponding outlets.

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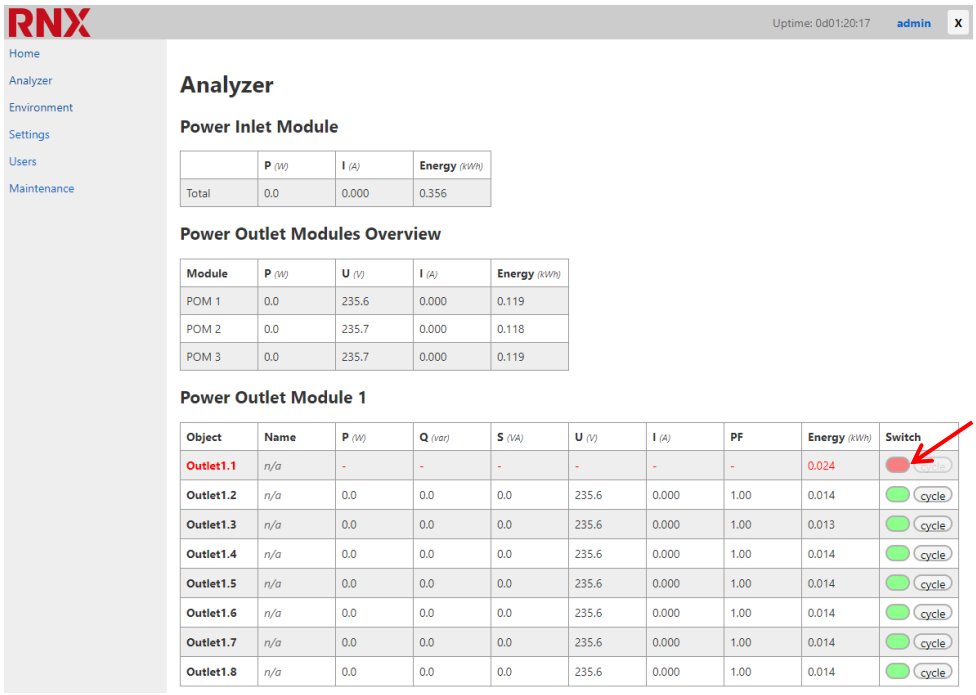


Figure 7: The analyzer page of the web interface of single phase switched PDU. Here outlet 1.1 is switched off.

The outlets of a POM with outlet switching function can be individually switched on and off by clicking on the red or green button, provided that the user has enough privileges. If the button is red the outlet is off; if it's green it's on. A pop-up window asks for confirmation before the outlet is switched.

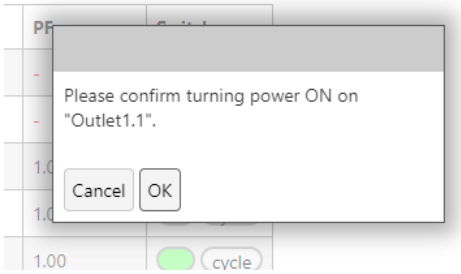


Figure 8: Relay toggle confirmation dialog box.

Outlet can also be automatically cycled off and back on again in a few seconds to restart a load but avoiding getting locked out if that load is powering the connection you're using to connect to the PDU. Simply click on the cycle button: a popup will ask for confirmation, than the load will be switched off and automatically on again a few seconds later.

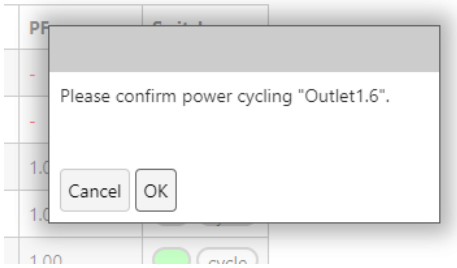


Figure 9: Relay cycle confirmation dialog box.

	When remotely switching a relay, make sure that the load connected to the outlet being remotely switched on will not generate a dangerous situation, such as starting a dangerous machine.

4.3. Object names and descriptions

By clicking on the name of an object it's possible to edit it and to add a description. If no name has been set "n/a" is displayed.

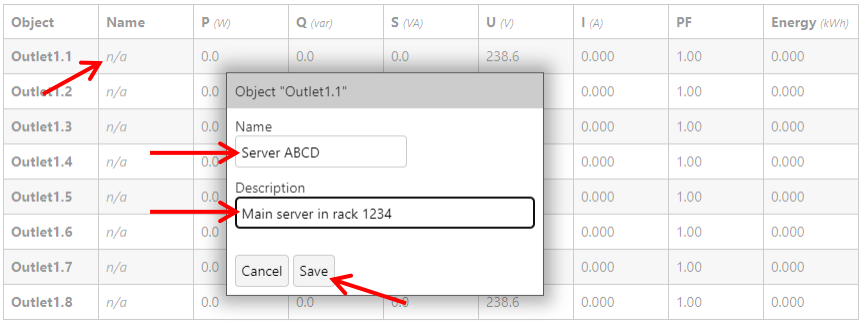
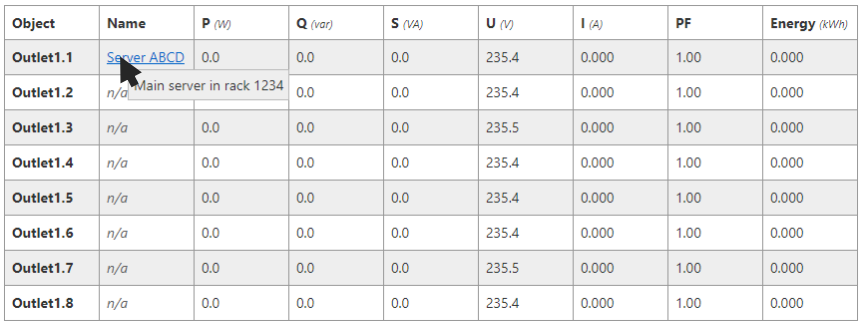


Figure 10: Changing the name and the description of an object.

Ba hovering the mouse over the name the description is shown.



Object	Name	P (W)	Q (var)	S (VA)	U (V)	I (A)	PF	Energy (kWh)
Outlet1.1	Server ABCD	0.0	0.0	0.0	235.4	0.000	1.00	0.000
Outlet1.2	n/a	0.0	0.0	0.0	235.4	0.000	1.00	0.000
Outlet1.3	n/a	0.0	0.0	0.0	235.5	0.000	1.00	0.000
Outlet1.4	n/a	0.0	0.0	0.0	235.4	0.000	1.00	0.000
Outlet1.5	n/a	0.0	0.0	0.0	235.4	0.000	1.00	0.000
Outlet1.6	n/a	0.0	0.0	0.0	235.4	0.000	1.00	0.000
Outlet1.7	n/a	0.0	0.0	0.0	235.5	0.000	1.00	0.000
Outlet1.8	n/a	0.0	0.0	0.0	235.4	0.000	1.00	0.000

Figure 11: The object Outlet1.1 has now a custom name.

5. Environment

In the environment page, the temperature and humidity values are displayed according to the type of sensors connected to the AUX1 to AUX3 ports of the ICM.

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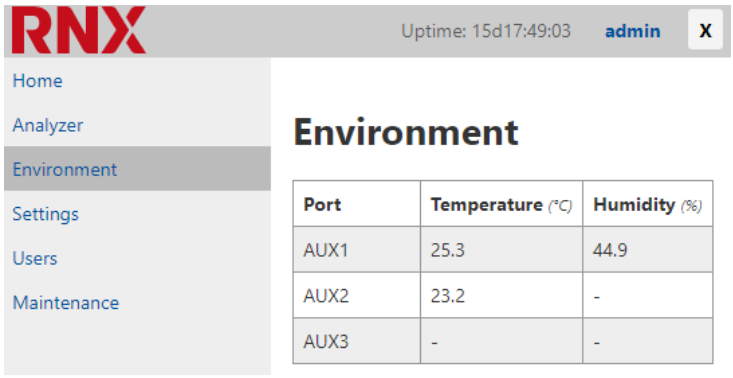

Figure 12: Environment data in the web interface: this PDU has a temperature and humidity sensor connected on AUX1 and another temperature sensor on AUX2.

6. Settings

Many settings can be directly configured in the "settings" page. These are the most common ones. More settings are available in the CLI.

6.1. General settings

On the general settings you can set the PDU device name and hostname.

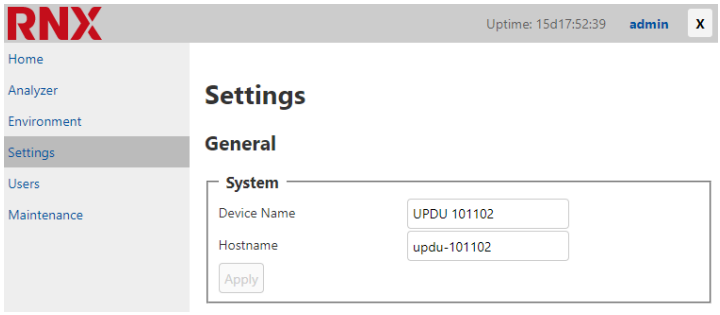

Figure 13: Overview of the general settings on the web interface.

The hostname also appears on the PDU display main page.

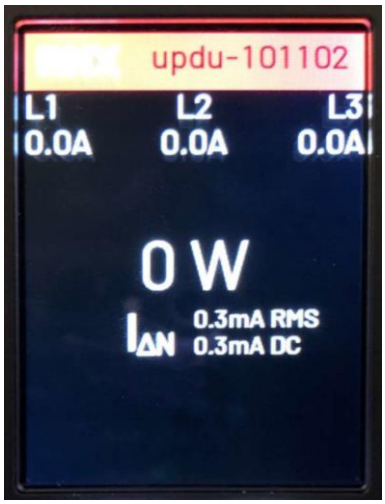

Figure 14: Hostname on the PDU display main page.

6.2. Time settings

By default the PDU is configured to use UTC time. But it's possible to select a local time zone either by entering a custom offset or by selecting a time zone from a list.

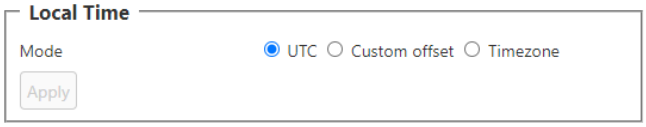

Figure 15: By default the PDU uses UTC time.

By selection a custom offset it's possible to directly enter the offset in hours and minutes. Make sure you enter both hours and minutes separated by a colon, e.g. "+7:00".

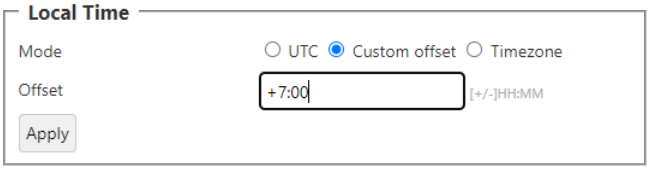

Figure 16: Entering a custom time zone offset.

Or the time zone can also be selected from a list of common time zones.

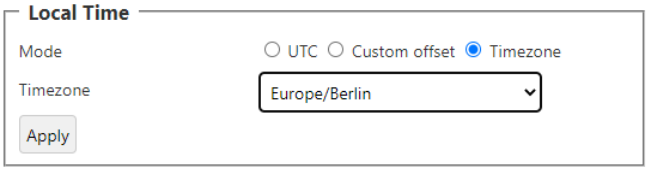

Figure 17: The time zone can also be selected from a list of common time zones.

6.3. Networking settings

6.3.1. ETH1 and ETH2

The default outgoing interface is the interface used by the PDU to transmit data, e.g. for Syslog events, NTP requests,...

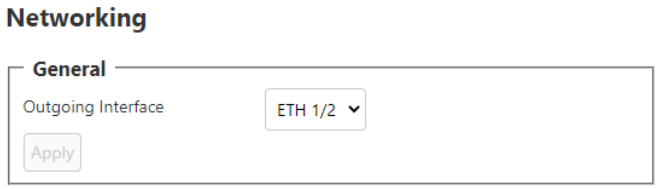

Figure 18: Setting the default outgoing interface.

In the ETH1 section you'll find all the settings for enabling or disabling this port and setting its IP address for both IPv4 and IPv6. By default it uses DHCP. If no IP address is received the Auto-IP function will automatically assign an IP address.

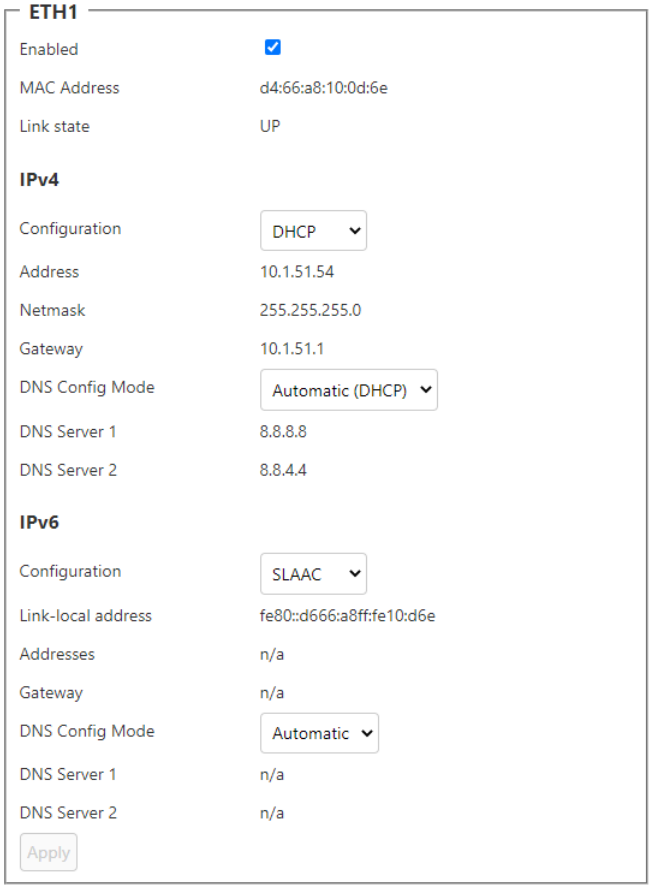

Figure 19: Overview of the networking settings for the ETH1 port.

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	ETH1 and ETH2 are internally connected to a Gigabit switch: when ETH2 is enabled it's always bridged to ETH1 and they both share the same IP address. ETH3 is a totally independent port and has a different IP address than ETH1/2. ETH3 cannot be bridged to ETH1/2

Because ETH2 is connected to ETH1 via an internal switch, ETH2 can only be enabled or disabled but shares the same settings of ETH1.

Figure 20: Overview of the networking settings for the ETH2 port.

6.3.2. ETH3

ETH3 is an independent port o n a different network interface and has very similar settings as ETH1. ETH3 cannot be bridged to ETH1/2.

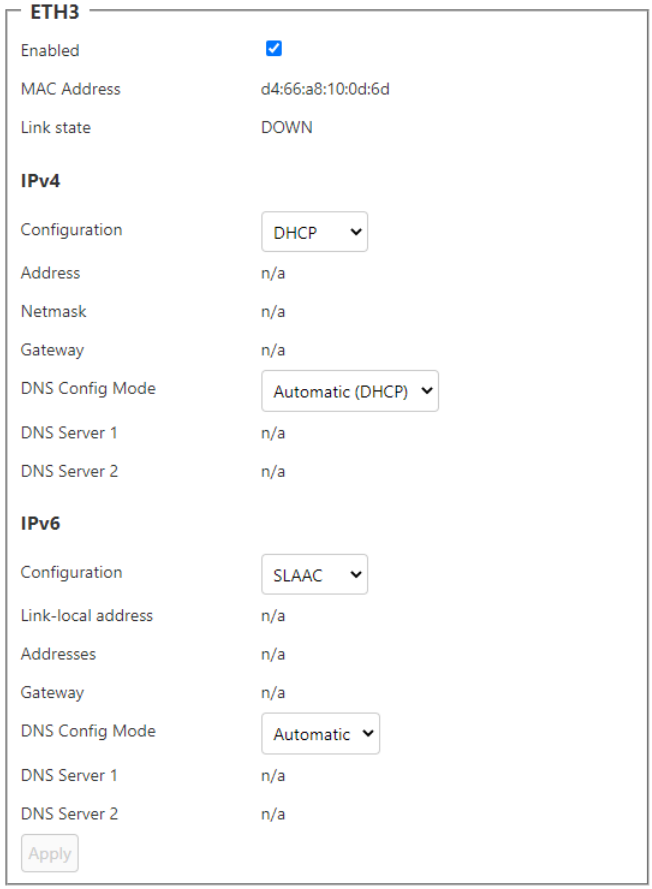

Figure 21: Overview of the networking settings for the ETH3 port.

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6.3.3. STP/RSTP

The STP/RSTP protocol allows connecting PDUs in a closed network loop to create a redundant connection in case one cable fails. It takes care of automatically breaking the loop at a convenient location and reconnects it in case of a fault. RSTP is enabled by default.

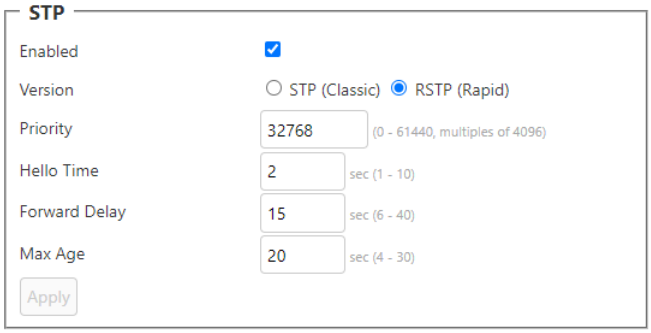

Figure 22: STP/RSTP settings.

6.4. Services settings

In the services settings the most important services/protocols can be enabled and configured.

6.4.1. SNMP

The SNMP protocol is used by DCIM software to collect data from PDUs and to remotely manage them.

The MIB file describing the data structure of the PDU is required for SNMP control and can be directly downloaded here.

The "Enabled" check box will enable SNMP, both v2 and v3.

To allow SNMP v2 access, enter a password for "Read Community" and/or "Write Community" according to the desired read/write permissions. If no password is given, that access is disabled.

The "Location" and "Contact" information are optional descriptions.

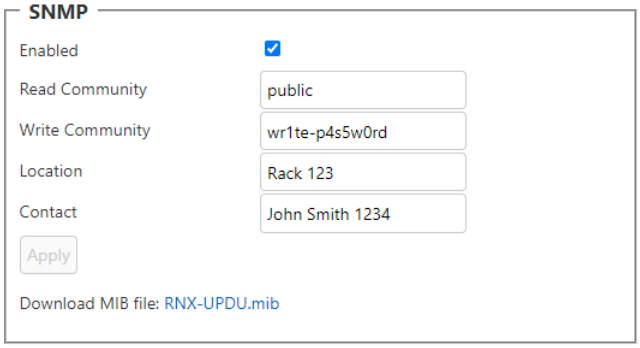

Figure 23: SNMP settings.

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	SNMP v3 access rights are defined per user in the user management section. See section 7. If only SNMP v3 is desired, leave both fields “Read Community” and “Write Community” empty to disable SNMP v2 but let the “Enabled” checkbox ticked to still have SNMP active.

6.4.2. NTP

To synchronize the internal clock of the PDU the NTP protocol is used. By default it polls pool.ntp.org once every hour.

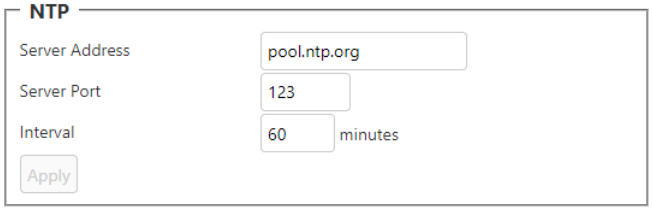

Figure 24: NTP settings.

6.4.3. Telnet

The Telent protocol can be used to connect to the command line interface of the PDU, but it’s not an encrypted protocol and therefore it’s not secure. It’s disabled by default as an equivalent secure connection is possible via SSH.

Figure 25: Telnet settings.

6.4.4. Syslog

If syslog is enabled, the PDU will send its log events to the specified server. This can be used for monitoring and alarming.

Figure 26: Syslog settings.

7. User management

Administrators have access to the user management menu. From there they can see all the users in the PDU, edit them, delete them and create new users.

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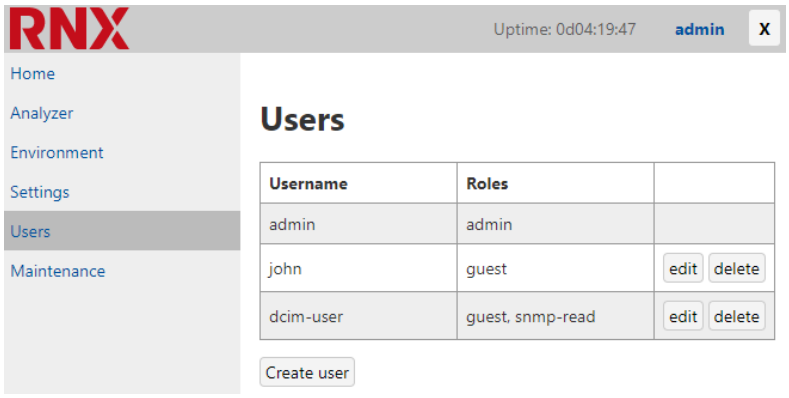

Figure 27: User management menu.

	Only administrators have the “Users” menu.

7.1. Creating a new user

To create a new user, simply click “Create user”. Type in the username, select its role(s), set a new password and click “Save”.

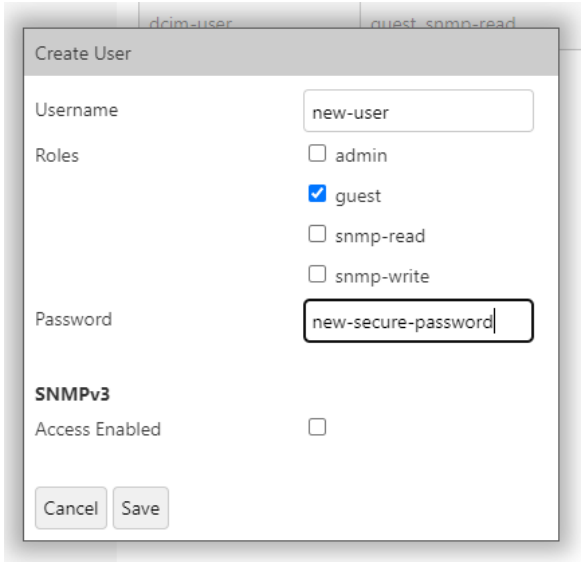

Figure 28: Creating a new user.

	Only guests and administrators can log in to the web interface.

	The password must be at least 5 characters long.

7.2. Creating users for SNMP v3

To use SNMP v3 you need at least one user with an SNMP role. Simply create a new user and tick "snmp-read" and/or "snmp-write" as desired for read and/or write access.

Make sure the "Access Enabled" checkbox is also checked to select the encryption algorithms and passwords. Then click "Save".

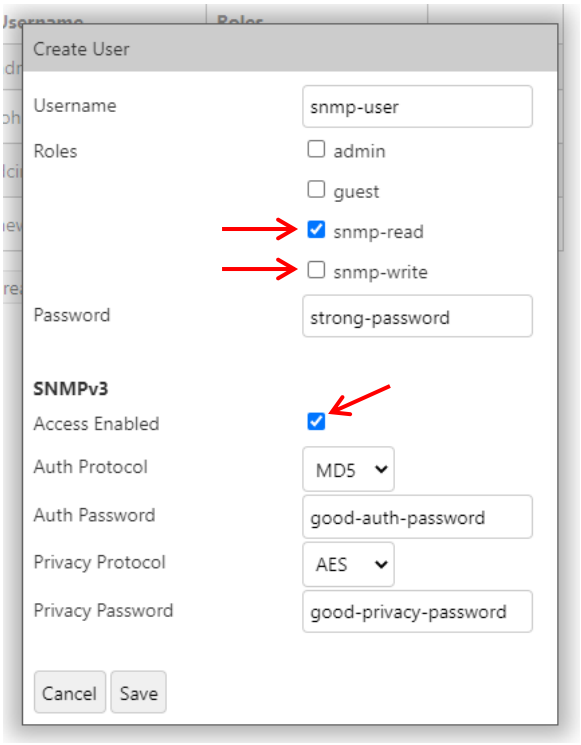

Figure 29: Creating a user for SNMP v3.

SNMP v3 will only work if SNMP is enabled in the SNMP settings (see section 6.4.1).

7.3. Editing an existing user

Editing a user allows changing its role(s) and its password in pretty much the same way the user was created.

	Once created, the username cannot be edited. But that username can be deleted and a new user with the correct username can be created.

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	A user cannot edit himself. To change your own password please follow the instructions in section 3.1.

7.4. Deleting a user

To delete a user simply click the corresponding “delete” button and confirm with “Ok”.

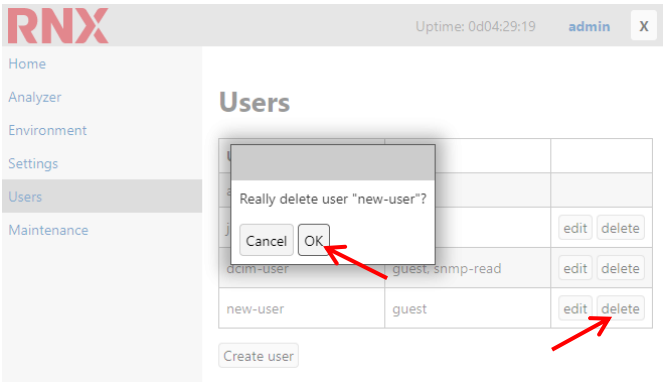

Figure 30: Deleting a user.

	A user cannot delete himself.

8. Maintenance

The maintenance page allows upgrading the firmware and rebooting the UPDU. The relevant data is shown per module.

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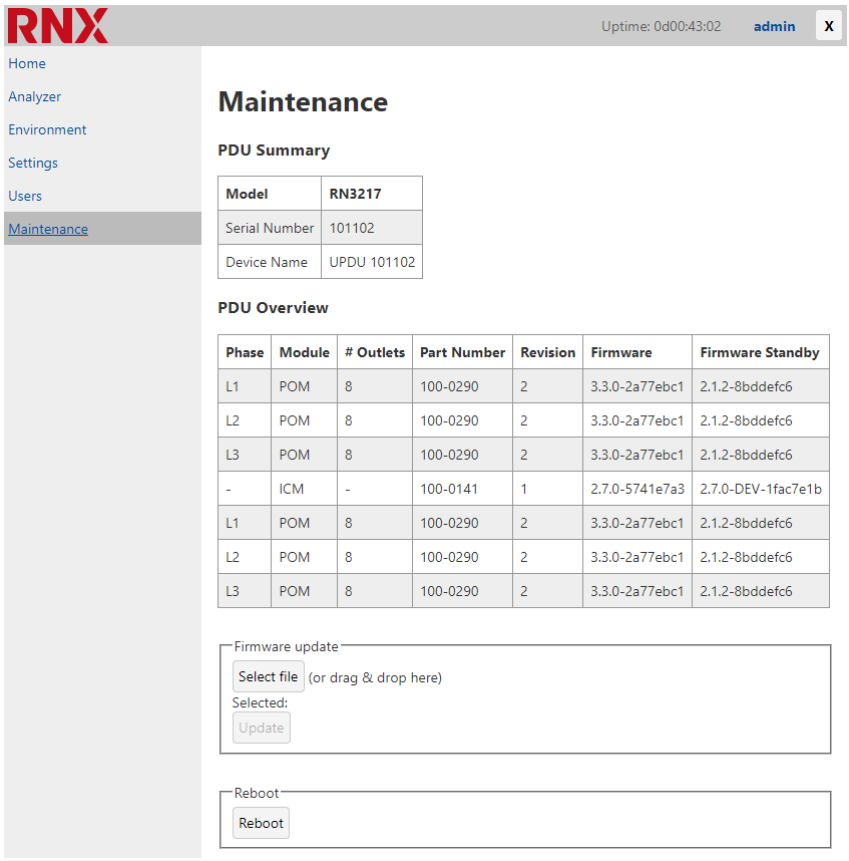

Figure 31: Maintenance page of the web interface.

8.1. Upgrading the firmware

To update the firmware click on the "Select File" button, point to the desired .bin file and click update. This takes less than a minute. When the upgrade is done a notification will pop up, then you'll have to log in to the PDU again.

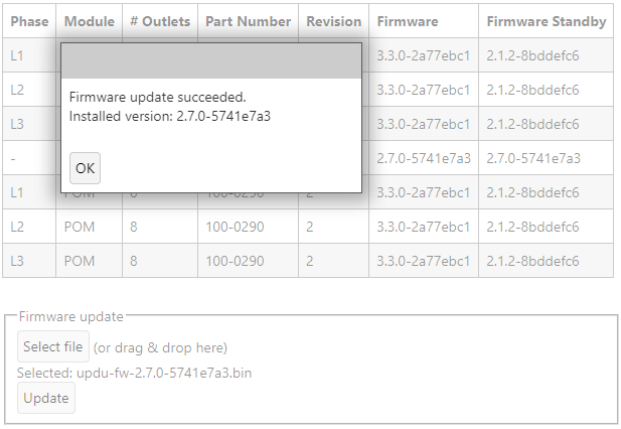

Figure 32: Successful upgrade operation.

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	Because all modules use a dual-image firmware technology, the firmware update is fail safe. If the upgrade fails, the modules simply keep the last working firmware.
	To revert back to the backup image firmware please use the CLI.
	With the upgrade operation the user only upgrades the firmware in the ICM. The firmware image however also contains the firmware of all the other modules of the PDU. The ICM will automatically take care of upgrading all the modules when the PDU reboots.
	When upgrading from old firmware revisions (2.5.x or earlier), the confirmation message may not display the new revision correctly.

8.2. Rebooting the PDU

The "Reboot" button will simply ask for confirmation and reboot the PDU. As soon as the PDU boots up you'll have to log in again.

	Rebooting the PDU will not reset the internal Ethernet switch on ETH1 and ETH2 that will continue to operate normally, i.e. rebooting a PDU will not break the network chain one may have built with these ports.

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