

UPDU RN3000 family web user manual

2022-10-27 / Revision: 2.7 / Author(s): IGIA / Public

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0.2. Confidentiality level

Public

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			
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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



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.

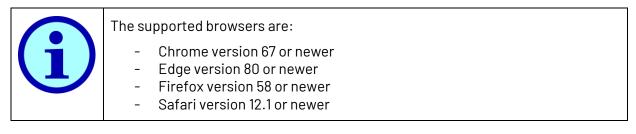
- By default, the UPDU is configured to get an IP address via DHCP.
- All Ethernet ports also support Auto-IP.

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").





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.

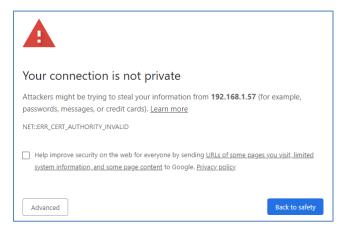
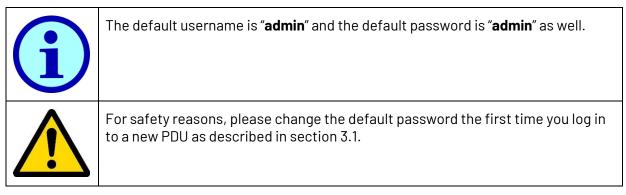


Figure 2: HTTPS connection warning message.

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:

RNX	Uptime: 0d00:08:35
Username Password Submit	

Figure 3: Login dialog box.



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.



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.

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.

SNX							Uptir	ne: 15d17:36:03	admin
me									
alyzer	Analyz	er							
ronment									
ttings	Power In	let Modu	le						
ers		P (W)	I (A)	RCM AC/DC (m	A) Energy (kWh)			
ntenance	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				
	Power O	utlet Mor	ules Over	view					
	i oner o						7		
	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			
	Power O	utlet Moo	dule 1 on L	.1					
	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
		n/a	0.0		0.0	236.1	0.000	1.00	0.000
	Outlet1.7								

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.

RNX

X								L	Iptime: 0d01:20:17	admin
	Analyz	er								
nent	Power In	lot Mod	ılo							
	Fower In	let wou								
		P (W)	I (A)	Energy (kWh)						
ance	Total	0.0	0.000	0.356						
	Power O	utlet Mo	dules Ove	rview						
	Module	P (W)	UN	I (A)	Energy (kWh)	1				
	POM 1	0.0	235.6	0.000	0.119					
	POM 2	0.0	235.7	0.000	0.118					
	POM 3	0.0	235.7	0.000	0.119					
	Power O	utlet Mo	dule 1							
	Power O	utlet Mo	dule 1	Q (var)	S (VA)	UM	I (A)	PF	Energy (kWh)	Switch
		Name		Q (var)	S (VA)	U (V)	1 (A)	PF	Energy (kWh) 0.024	Switch
	Object		P (W)							•K
	Object Outlet1.1	Name n/a	P (W)	-	-	-	-	-	0.024	Cycle
	Object Outlet1.1 Outlet1.2	Name n/a n/a	P (W) - 0.0	- 0.0	- 0.0	- 235.6	- 0.000	- 1.00	0.024	
	Object Outlet1.1 Outlet1.2 Outlet1.3	Name n/a n/a n/a	P (W) - 0.0 0.0	- 0.0 0.0	- 0.0 0.0	- 235.6 235.6	- 0.000 0.000	- 1.00 1.00	0.024 0.014 0.013	
	Object Outlet1.1 Outlet1.2 Outlet1.3 Outlet1.4	Name n/a n/a n/a n/a	P (W) - 0.0 0.0 0.0	- 0.0 0.0 0.0	- 0.0 0.0 0.0	- 235.6 235.6 235.6	- 0.000 0.000 0.000	- 1.00 1.00 1.00	0.024 0.014 0.013 0.014	
	Object Outlet1.1 Outlet1.2 Outlet1.3 Outlet1.4 Outlet1.5	Name n/a n/a n/a n/a n/a	P (W) - 0.0 0.0 0.0 0.0 0.0	- 0.0 0.0 0.0 0.0 0.0	- 0.0 0.0 0.0 0.0	- 235.6 235.6 235.6 235.6	- 0.000 0.000 0.000 0.000	- 1.00 1.00 1.00 1.00	0.024 0.014 0.013 0.014 0.014 0.014	Switch Cycle Cycle Cycle Cycle Cycle

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.

PF	e
	e confirm turning power ON on let1.1".
1.0 Can	cel OK
1.00	Cycle

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.

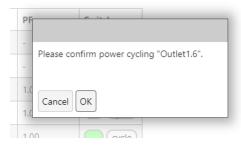


Figure 9: Relay cycle confirmation dialog box.



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.

Object	Name	P (W)	Q (var)	S (VA)	U (V)	1 (A)	PF	Energy (kWh)
Outlet1.1	n/a	0.0	0.0	0.0	238.6	0.000	1.00	0.000
Outlet1.2	n/a	0.0 Object	"Outlet1.1"			0.000	1.00	0.000
Outlet1.3	n/a	0.0 Name				0.000	1.00	0.000
Outlet1.4	n/a	0.0 Serve	r ABCD			0.000	1.00	0.000
Outlet1.5	n/a	0.0 Descri	ption server in rack	4004		0.000	1.00	0.000
Outlet1.6	n/a	0.0 Main	server in rack	1234		0.000	1.00	0.000
Outlet1.7	n/a	0.0 Cance	el Save			0.000	1.00	0.000
Outlet1.8	n/a	0.0	0.0	0.0	238.6	0.000	1.00	0.000

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 Main serv	er in rack 1234	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.

RNX		Uptime: 15d17:49:03	admin X
Home			
Analyzer	Enviro	onment	
Environment			I
Settings	Port	Temperature (°C)	Humidity (%)
Users	AUX1	25.3	44.9
Maintenance	AUX2	23.2	-
	AUX3	-	-

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.

RNX		Uptime: 15d17:52:39	admin X
Home			
Analyzer	Settings		
Environment	5		
Settings	General		
Users	System		
Maintenance	Device Name	UPDU 101102	
	Hostname	updu-101102	
	Apply		

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

The hostname also appears on the PDU display main page.

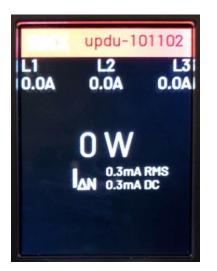


Figure 14: Hostname on the PDU display main page.

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.

Local Time	
Local Time	
Mode	● UTC ○ Custom offset ○ Timezone
Apply	

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".

Local Time	
Mode	🔿 UTC 🖲 Custom offset 🔿 Timezone
Offset	+7:00
Apply	

Figure 16: Entering a custom time zone offset.

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

Local Time ——	
Mode	○ UTC ○ Custom offset
Timezone	Europe/Berlin 🗸
Apply	

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,...

Networking

General		
Outgoing Interface	ETH 1/2 🗸	
Apply		

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.

- ETH1	
Enabled	
MAC Address	d4:66:a8:10:0d:6e
Link state	UP
IPv4	
Configuration	DHCP 🗸
Address	10.1.51.54
Netmask	255.255.255.0
Gateway	10.1.51.1
DNS Config Mode	Automatic (DHCP) 🗸
DNS Server 1	8.8.8.8
DNS Server 2	8.8.4.4
ΙΡν6	
Configuration	SLAAC 🗸
Link-local address	fe80::d666:a8ff:fe10:d6e
Addresses	n/a
Gateway	n/a
DNS Config Mode	Automatic 🗸
DNS Server 1	n/a
DNS Server 2	n/a
Apply	

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





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.

ETH2		
Enabled	✓ (bridged to ETH1)	
Link state	DOWN	
Apply		

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

6.3.2. ETH3

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

- ETH3	
Enabled	
MAC Address	d4:66:a8:10:0d:6d
Link state	DOWN
IPv4	
Configuration	DHCP V
Address	n/a
Netmask	n/a
Gateway	n/a
DNS Config Mode	Automatic (DHCP) 🗸
DNS Server 1	n/a
DNS Server 2	n/a
IPv6	
Configuration	SLAAC 🗸
Link-local address	n/a
Addresses	n/a
Gateway	n/a
DNS Config Mode	Automatic 🖌
DNS Server 1	n/a
DNS Server 2	n/a
Apply	

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

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.

STP	
Enabled	
Version	○ STP (Classic)
Priority	32768 (0 - 61440, multiples of 4096)
Hello Time	2 sec (1 - 10)
Forward Delay	15 sec (6 - 40)
Max Age	20 sec (4 - 30)
Apply	

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.

- SNMP	
Enabled	
Read Community	public
Write Community	wr1te-p4s5w0rd
Location	Rack 123
Contact	John Smith 1234
Apply	
Download MIB file: RNX-U	IPDU.mib

Figure 23: SNMP settings.





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.

- NTP		
Server Address	pool.nt	p.org
Server Port	123	
Interval	60	minutes
Apply		

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.

☐ Telnet	
Temet	
Enabled	
Apply	

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.

Syslog — Syslog	
Enabled	
Server Address	
Server Port	514
Apply	

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.

RNX		Uptime: 0d04:19:47	admin X
Home			
Analyzer	Users		
Environment			
Settings	Username	Roles	
Users	admin	admin	
Maintenance	john	guest	edit delete
	dcim-user	guest, snmp-read	edit delete
	Create user		·

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".

dcim-user	quest_snmn-read
Create User	
Username	new-user
Roles	🗆 admin
	✓ guest
	snmp-read
	□ snmp-write
Password	new-secure-password
SNMPv3	
Access Enabled	
Cancel 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".

Ise	rnamo	Polos	
dr	Create User		
bh	Username		snmp-user
	Roles		admin
cii			🗆 guest
ev		\rightarrow	✓ snmp-read
rea		\rightarrow	□ snmp-write
	Password		strong-password
	SNMPv3		
	Access Enabled		
	Auth Protocol		MD5 🗸
	Auth Password		good-auth-password
	Privacy Protocol		AES 🗸
	Privacy Password		good-privacy-password
	Cancel 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.





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".

RNX		Uptime: 0d04:29:19	admin X
Home			
Analyzer	Users		
Environment			
Settings	1		
Users	Really delete user	"new-user"?	
Maintenance	j Cancel OK	_	edit delete
	dcim-user	guest, snmp-read	edit delete
	new-user	guest	edit delete
	Create user		

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.

	Mai	nten	ance				
ient	PDU Summary						
	Model		RN3217				
	Serial N	lumber	101102				
	Device	Name	UPDU 101102	2			
	PDU O	verview					
	Phase	Module	# Outlets	Part Number	Revision	Firmware	Firmware Standby
	L1	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
	L2	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
	L3	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
	-	ICM	-	100-0141	1	2.7.0-5741e7a3	2.7.0-DEV-1fac7e1
	L1	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
	L2	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
	L3	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6

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.

Phase	Module	# Outlets	Part Number	Revision	Firmware	Firmware Standby
L1					3.3.0-2a77ebc1	2.1.2-8bddefc6
L2	Firmwar	e update suc	ceeded.		3.3.0-2a77ebc1	2.1.2-8bddefc6
L3	Installed version: 2.7.0-5741e7a3				3.3.0-2a77ebc1	2.1.2-8bddefc6
-	ОК				2.7.0-5741e7a3	2.7.0-5741e7a3
L1	LOW	0	100-0250	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
L2	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
L3	POM	8	100-0290	2	3.3.0-2a77ebc1	2.1.2-8bddefc6
Firmware update Select file (or drag & drop here) Selected: updu-fw-2.7.0-5741e7a3.bin Update						

Figure 32: Successful upgrade operation.



i	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.
i	To revert back to the backup image firmware please use the CLI.
i	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.
i	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.