

# E3METER<sup>®</sup> Smart PDU User Manual



Rev. 1.0, Firmware version 4.8

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Riedo Networks Ltd Route de la Fonderie 6 1700 Fribourg Switzerland

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# **Safety instructions**



Danger to life from electric current!

Contact with live parts poses an immediate risk of fatal injury from electric shock. Damage to the insulation or individual components can be fatal.

- The PDU is only to be installed and manipulated by trained IT personnel or electricians.
- The PDU is used to supply power and measure the energy consumption of electronic devices in a rack (e.g. in server rooms). The rated power of the PDU must not be exceeded.
- Only connect the PDU to an adequately secured power socket.
- Only use the PDU in a dry environment.



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# **Document History**

Date	Revision	Who	Comment
2023-06-13	1.0	FRIE	V4.8

# 1. Introduction

Thank you for purchasing the Riedo Networks E3METER Smart PDU. Whether used together with other products from Riedo Networks or individually, the E3METER forms the basis of an intelligent energy management system.

Please read these operating instructions carefully and follow the usage and safety instructions to ensure optimal and safe use.

# 2. Operation via Display

# 2.1. Front Panel



- a) Ethernet interface
- b) Sensor interfaces (RJ12)
- c) Display
- d) Control buttons

# 2.2. Wake up the display from sleep mode

- 1. After 15 minutes, the display will go into sleep mode. To wake up the display, press one of the two buttons.
- 2. The display will light up and show the Main Screen or the last selected mode.

# 2.3. Turn Displays

- 1. To rotate the display, press and hold the mode button in the main menu.
- 2. When "Rotate Display" appears, press the Turn button to rotate the display.
- 3. Press the exit button to leave the menu

Settings	Exit
Rotate Display	
	Turn

# 2.4. Menu Overview

The built-in TFT display with the buttons next to it offers the most direct method of operating the E3METER Smart PDU. The different modes are selected by pressing the mode button. This is shown schematically below (for a 1-phase PDU).



You can scroll through all pages in a particular mode by pressing the Page button.

# 2.5. Main Screen

In the main menu, the active power currently consumed is displayed in watts.

Above it appears:

- 1. The voltage in Volt
- 2. The frequency in Hertz
- 3. The current in Ampère
- 4. The power factor



Note: In the case of the 3-phase PDU, the active powers of the 3 phases L1, L2 and L3 are displayed on the main screen in addition to the total active power.

# **Differential function (Delta)**

Pressing the delta button displays the change in power. This allows one differential measurement to be carried out.

#### Fix the base:

- 1. Press Delta button
- 2. The difference value appears on the bottom line.

#### **Reset difference value:**

- 1. Press the Clear button
- 2. The difference value is reset.

# 2.6. Analyzer mode

Pressing the mode button once takes you to analyzer mode. The values are displayed on the first page:

- 1. Active power (P) in Watt
- 2. Reactive power(Q) in Var
- 3. Apparent power (S) in Voltampère

Analyzer	1/2	Mode
Power		
Р	0 W	
Q	0 var	
S	0 V A	
		Page

Pressing the Page button takes you to the second page of the analyzer. Here are listed:

- 1. Voltage in Volt
- 2. Frequency in Hertz
- 3. Current in Ampère
- 4. Power factor

Analyzer	2/2	Mode
Various		
U	235.7 V	
1	0.00 A	
f	50.00 Hz	
PF	0.000	
		Page

Note: In the case of the 3-phase PDU, the following measurements for the 3 phases and the total are displayed on 8 pages in the analyzer mode:

- 1. Active power (P) in Watt
- 2. Reactive power (Q) in Var
- 3. Apparent power (S) in VA
- 4. Voltage in V

- 5. current in A
- 6. Frequency in Hz
- 7. Power Factor
- 8. Neutral current in A

# 2.7. Meter mode

Another press of the mode button displays the non-resettable energy meter for active and reactive energy.

Meter	Mode
Active Energy	
0.027 kWh	
Reactive Energy (L)	
0.000 kvarh	
Reactive Energy (C)	
-0.004 kvarh	

Note: In case of the 3-phase PDU, these values are displayed on 3 pages.

# 2.8. User Meter mode

By pressing the mode button again, the resettable energy meter and its running time are displayed.

Meter (User)	Mode
Timer: 1:51:55	
0.000 kWh	
	Clear

#### Reset energy counter:

- 1. Press the Clear button
- 2. The values are reset and start again at 0.

Note: The 3-phase PDU shows the values for the 3 phases on this page.

# 2.9. Environment mode

By pressing the mode button again, the values of the internal and external temperature sensors are displayed. If no external sensors are connected, "n/a" is displayed instead.

Environmer	nt	Mode
Int:	31.5 C	
Ext1:	n/a	
Ext2:	n/a	

# **2.10.** Maintenance mode

Pressing the mode button again displays the settings of the PDU. You can scroll between the subpages by pressing the Page button.

Maintenance	1/3	Mode
P/N (Model)		
1212		
S/N		
005189		
Version		
2.1(2642)		
		Derre
		Page
Maintenance	2/3	Mode
IP Address		
192.168.1.82		
Mac Address		
D466.A8xx.xx	XX	
		Dama
		Page

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Maintenance	1/3	Mode
PLC		
Searching		
Frequency Band		
FCC		
Signal Quality		
13% (TM)		
		Page

# 2.11. Restart the electronics

- 1. The electronics is restarted (reset) by pressing and holding both buttons on the main screen.
- 2. If you remain on the buttons until the LEDs are off (visible in the sensor sockets), the electronics remain switched off. To switch the electronics back on, keep both buttons pressed until the LEDs light up again.

# 2.12. Factory reset

- 1. To reset the PDU to factory settings, press and hold the Delta button in the main menu.
- 2. As soon as the "Factory Reset" display appears, you can reset to the factory settings by pressing the reset button or exit the menu with the exit button.



# 2.13. Change frequency band

- 1. To change the frequency band, press and hold the Mode button in Maintenance/PLC.
- 2. As soon as "Change PLC Band" appears, the PLC band can be selected with the Swap button. FCC, CENELEC B, ENET or PLC-off appears under "New Band".
- 3. Press the Save button to save the frequency band setting



#### Attention:

Communication via PLC can only be used in combination with the E3METER Data Concentrator (RN1401). Instead of PLC communication, the IPS can also be connected to the data concentrator via Ethernet Layer 2. To do this, the IPS and the data concentrator must be in the same VLAN. No IP address or other configuration is required on the IPS. Parallel access to the IPS via IP, e.g. g. http, SNMP, Syslog, Telnet, is still possible, but not required for operation with Data Concentrator. PLC is disabled when the IPS is working in ENET mode.

# 3. Operation via web browser

# 3.1. Ethernet Access (TCP/IP)

After installing and connecting the PDU, you can access the user interface using a web browser.

Note: By default, the PDU obtains an IP address from a DHCP server. If no DHCP server is available, the PDU switches to Auto IP.

- 1. Read the IP address on the PDU display under Maintenance page 2
- 2. Enter this IP address in the address line of the browser (http://IP-address')
- 3. The following overview page appears:

Example of a 1-phase PDU:

Ë3METER IPS 12	20				
Home Analyzer Login About	Channels	Active Energy (kWh) 83193.037	Active Power (W)	Current (A) 0.00	
	Environment	Temperature (°C) 28.0			

#### Example of a 3-phase PDU:

lome	Channels			
ogin		Active Energy (kWh)	Active Power (W)	Current (A)
out	CH1 L1	2.966	0	0.00
	CH2 L2	0.000	0	0.00
	CH3 L3	0.000	0	0.00
	CH4 N			0.00
	-Groups			
	Pre-defined	Active Energy (kWh)	Active Power (W)	Current (A)
	Total CH1-3	2.966	0	0.00
	Environment			
		Temperature (°C)	Rel. Humidity (%)	
	Internal Sensor	21.6		
	External Sensor 1	24.4		
	Esternal Concerce	01.0	110	

The active energy (kWh), the active power (W) and the current (A) per phase and in total are displayed. The temperature of the internal sensor as well as the temperature and humidity of any connected external sensors are displayed as well.

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# 3.2. Analyzer

Home Analyzer	Analyzer							
Login		P (W)	Q (var)	S (VA)	U (V)	I (A)	PF	f (Hz)
About	CH1 L1	0	0	0	240.9	0.00	0.000	50.05
	CH2 L2	0	0	0	240.9	0.00	0.000	50.00
	CH3 L3	0	0	0	240.9	0.00	0.000	50.05
	CH4 N					0.00		
	Groups							
	Pre-defined	P (W)	Q (var)	S (VA)		I (A)		
	Total CH1-3	0	0	0		0.00		

The following is displayed here: active power (W), reactive power (var), apparent power (VA), voltage (U), current (A), power factor, frequency (Hz).

# 3.3. About

E3METER IPS	1256		
Home Analyzer	About-		
Settings	Manufacturer	Riedo Networks Ltd	
Jsers Aaintonanco	Product	E3METER IPS 1256	
Password	Serial Number	018557	
bout	Hardware Version	4	
	Firmware Version	4.8 (Build e73d936)	
	Bootloader Version	4	
		Powered by E3METER®.	
	Logal Natica	Electronics Copyright © 2008-2020 Riedo Networks Ltd.	
	Legal Notice	Firmware Copyright © 2008-2020 net-track GmbH.	
		The firmware is built on the FreeRTOS system.	

In addition to the manufacturer information, you will also find the product type, the serial number and the firmware version here.

# **3.4.** Login for advanced features

After logging in, the advanced functions can be accessed.

Authentication Required				
http://192.168.1.67 requires a username and password.				
Your connection to this site is not private.				
User Name:	admin			
Password:	****			
		_		
	Log In Cancel			

When logging in for the first time, please enter the following:

- User name: admin
- Password: admin

Please change the password after the first login (click on 'Password').

### 3.5. Settings

Under Settings you can edit the system settings.

E3METER IPS 12	12	
Home Analyzer	- General	
Settings Alarms	Device label	Frank
Users Maintenance	Hostname	e3meter-012435
About	-Network configuration-	
	Method	DHCP V
	IP address	
	Netmask	
	Gateway	
	Current IP	192.168.1.37
	MAC address	D466.A800.3093
	SNMP Server	
	Enable	
	Community	public
	Location	
	Contact	
	Receiver 1 IP	10 1 20 14
	Receiver 2 IP	10.1.20.14
	Version	
	version	V2C V
	-Miscellaneous	
	Web server	open 🗸
	Telnet enable	
	SNTP server	
	Timezone offset	0
	Display orientation	Min. 270° 🗸
	-Syslog	
	Receiver IP	
	Facility	local0 V
	Reports Report Interval	Z Analyzer D Meter
	Report Interval	

Save values

General:

- Device label: This name is displayed on the PDU. The name can be queried via SNMP.
- Hostname: description of the DNS hostname of the PDU

#### Network Configuration:

- **Method**: Here you can switch between static IP address and dynamic (DHCP).
- **IP address**: The static IP address is entered here.
- **Netmask**: The subnet mask is entered here.
- **Gateway**: The default gateway is entered here.
- **Current IP**: Your current IP address is displayed here.
- **MAC address** : Your current MAC address is displayed here.

#### SNMP Server

- **Enable**: SNMP can be enabled or disabled here.
- **Community**: The SNMP read community can be configured here.
- **Location**: he PDU location can be entered here.
- **Contact**: he responsible contact person can be entered here.

#### SNMP Traps

- Receiver 1 IP: IP address of a traps receiver
- Receiver 2 IP: IP address of another traps receiver
- Trap community:
- **Version**: choice between V1 and V2c

#### Miscellaneous

- Web server: The operating mode of the web server can be configured here. The following operating modes are available:
  - **open**: Allows access to the Home and Analyzer pages without prior login.
  - **restricted**: Requires a prior login to the web server for all pages.
  - **off**: Disables the web server.



- Attention: In order to reactivate the web server of the PDU, access via the serial interface is required.
- **Telnet enable**: This can be used to disable Telnet access.
- **SNTP Server**: An SNTP time server can be specified here.
- **Timezone offset**: Specifies the offset to GMT in minutes.
- Display orientation: Orientation of the display. Depending on how the PDU is installed, the display can be rotated for better legibility in 90° steps.

#### Syslog

- Settings for receiving syslog messages:

- Receiver IP:
- Facility:
- Reports:
- Report interval:

All changes are saved on the PDU with 'Save values'.

# 3.6. Alarms

Warn High	Critical High					
Warn High	Critical High					
Warn High	Critical High					
Warn High	Critical High					
Warn High	Critical High					
Warn High	Critical High					
Warn High	Critical High					
	Ondearnan					
Relative Humidity						
Warn High	Critical High					
	Warn High					

In this menu you can configure the threshold values for warnings and alarms. 2 threshold values (low and high) for a warning and 2 threshold values (low and high) for an alarm can be defined for the following measurements:

- Power (1-phase PDU: CH1. 3-phase PDU: all 3 phases and neutral)
- Temperature for the internal sensor and, if present, for the external sensors
- Humidity if external sensors are present

If a threshold value is exceeded or not reached, a message is sent via SNMP traps.

# 3.7. Users

Home Analyzer Settings Alarms Users Maintenance Password About	Create new user Username Type Password	Choose type  Create user
	Modify user User Username Type Password	Choose user ▼ Choose type ▼ Modify user
	- Delete user	Choose user ▼ Delete user

Create new user  $\rightarrow$  Create a new user

- **Username**: Enter new username
- **Type**: Select user type:
  - Administrator: Full access rights to the entire system
  - User: Access to Home and Analyzer (useful in connection with the system setting: Web server > Restricted).
- Password: Enter the password for the new user

Create the new user with 'Create user'

#### Modify user $\rightarrow$ Edit existing user

- User: Select user
- **Username**: Enter existing or new username
- **Type**: Select user type
- **Password**: If desired, enter a new password

Save the user changes with 'Modify user'

#### Delete user $\rightarrow$ Delete an user

- User: elect the user to delete

Delete the user with 'Delete user'

## **3.8.** Maintenance

E3METER IPS 1231				
Home Analyzer Settings Alarms Users Maintenance Password	Firmware upgrade — Current versions: Firmware file	Board revision E, Firmware 3.4 (Build 3028), Bootloader 4 Choose File No file chosen Upload		
About	Reboot Reboot device			

In Maintenance, firmware upgrades can be carried out and the PDU restarted (reboot).

Firmware upgrade

- **Current versions**: The currently installed firmware version is displayed here.
- Firmware file: Here you can upload a new firmware image. Please visit <u>https://www.rnx.ch/support</u> or contact us (<u>info@riedonetworks.com</u>) so that we can send you the download link: Click on 'Upload' to start the update process. After a successful update, the bar will restart with the new firmware.

Bemerkung: Falls Sie Ihre PDUs mit einem Data Concentrator verwalten, können diese automatisch auf die jeweils letzte Firmware aktualisieren werden (Meters Upgrade in der CTR Monitoring Software dazu auf Auto setzen Note: If you manage your PDUs with a data concentrator, they can be automatically updated to the latest firmware (set Meters Upgrade to Auto in the CTR Monitoring Software).

Reboot

 Reboot device: The PDU is restarted by clicking on 'Reboot device'. This does not affect the power supply of the connected devices.

# 4. Serial interface

Without a network connection, the PDU can be connected to a serial USB port using the USB adapter RN1080. To do this, connect the USB adapter to the left RJ12 sensor socket.



- Start Tera Term, PuTTy (or similar)
- Check in the Device Manager which USB port is being used
- elect the correct port and set the baud rate to 115200

Tera Term: Serial port set	tup	x			
Port:	COM3 -	ОК			
Baud rate:	115200 🔻				
Data:	8 bit 🔹	Cancel			
Parity:	none 🔻				
Stop:	1 bit 💌	Help			
Flow control:	none 💌				
Transmit delay 0 msec/char 0 msec/line					

The cli Commands List (E3METER Smart PDU Console and Telnet Command List) can be downloaded here:

https://www.rnx.ch/support

Entering 'help' gives the list of commands.

# 5. Technical support

- <u>https://www.rnx.ch/support</u>
- <u>support@riedonetworks.com</u>
- +41265055000

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