

PowerCable xxx 101x

MANUAL


- PowerCable **Modbus** 101x
- PowerCable **MQTT** 101x
- PowerCable **REST** 101x

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Introduction

Thank you for purchasing this product of NETIO products a.s. Before using your product, please read this User Manual (MAN) and the included Quick Installation Guide (QIG) to avoid problems with incorrect installation or use.

 **Caution:**

The product works with mains voltage. Mishandling may damage it or result in injury or death.

1 Safety notices

1. The manufacturer is not liable for any damage caused by incorrect use of the device or by operating it in an unsuitable environment.
2. The device is not rated for outdoor use.
3. Do not expose the device to strong vibrations.
4. Unauthorized modifications may damage the device or cause a fire.
5. Protect the device from liquids and excessive temperatures.
6. Make sure the device does not fall.
7. Only electrical appliances approved for use in the electrical network may be connected to the device.
8. Do not connect multiple devices in series.
9. The cable plug must be easily accessible.
10. The device is completely switched off only when unplugged from the wall socket.
11. If the device malfunctions, disconnect it from the electrical power supply and contact your vendor.

2 General characteristics

- One metered and controlled 110/230V output
- WiFi interface: 802.11 b/g/n; 2.4GHz (secured / unsecured)
- WiFi encryption: WEP, WPA, WPA2
- AP mode for connecting the device to a local WiFi network (network selected from a list)
- Button to activate AP mode
- Output state can be toggled with the On/OFF button (press 3 times)
- Built-in web server for device configuration and control
- Password-protected login into device configuration
- Electricity consumption metering (6 parameters): [V, Hz, A, W, Wh, TPF]
- Measurement accuracy <1%

- ZCS (Zero Current Switching)
- IOC (Independent Output Control)
- PowerUp state - (ON / OFF / LAST)
- 1.2m cable
- Overvoltage protection
- Operating temperature range: -20°C to +65°C
- Supported protocols: DNS, NTP, DHCP, HTTP
- Supported M2M protocols:
 - PowerCable Modbus 101x: Modbus/TCP, Telnet, SNMP
 - PowerCable MQTT 101x: MQTT, Http(s) Push, SNMP
 - PowerCable REST 101x: XML API, JSON API, URL API, SNMP

3 PowerCable xxx



PowerCable Modbus 101x



PowerCable REST 101x



PowerCable MQTT 101x

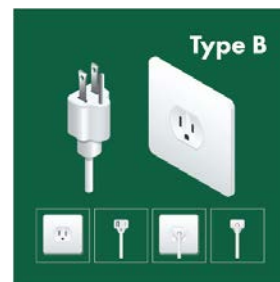
Overview of types according to the supported M2M protocols

Type / Protocol	PowerCable Modbus 101x	PowerCable REST 101x	PowerCable MQTT 101x
Web interface	Yes	Yes	Yes
Telnet	Yes	-	-
Modbus/TCP	Yes	-	-
URL API	-	Yes	-
XML API	-	Yes	-
JSON API	-	Yes	-
MQTT-flex	-	-	Yes
Netio Push JSON	-	-	Yes
Netio Push XML	-	-	Yes
SNMP v1	Yes	Yes	Yes

	PowerCable Modbus 101x	PowerCable REST 101x	PowerCable MQTT 101x
NETIO Cloud	Yes	Yes	Yes
NETIO Mobile2	Yes	Yes	Yes

Overview of models according to the electrical socket type

Model	Variant	Output socket	Input plug	Voltage	Max. current	Max. load
101F	DE	Type F	E/F (CEE 7/7)	230V ~	16A	3600W
101E	FR	Type E	E/F (CEE 7/7)	230V ~	16A	3600W
101J	CH	Type J	Type J	230V ~	10A	2300W
101S	IEC-320 C13/C14	IEC-320 C13	IEC-320 C14	110/230V ~	10A	2300W
101B	US	Type B	Type B	110V ~	15A	1600W
101G	UK	Type G	Type G	230V ~	13A	3000W



4 Specifications

Power	<p>101E, 101F: 230V~; 50Hz; 16A</p> <p>101J: 230V~; 50Hz; 10A</p> <p>101S: 110/230V~; 60/50Hz; 10A</p> <p>101G: 230V~; 50Hz; 13A</p> <p>101B: 110V~; 60Hz; 15A</p>
Switched outputs	<p>101E, 101F: 230V~; 50Hz; 16[8]A; max. 3600W</p> <p>101J: 230V~; 50Hz; 10[8]A; max. 2300W</p> <p>101S: 110/230V~; 60/50Hz; 10[8]A; max. 2300W</p> <p>101G: 230V~; 50Hz; 13[8]A; max. 3000W</p> <p>101B: 110V~; 60Hz; 15[8]A; max. 1600W</p>
Surge protection	Type 3 (CAT III)
Internal consumption	Max 1W
Output relay	<p>Micro-disconnection (μ) (resistive load)</p> <p>1E5 switching cycles, max. 1.5kV pulse voltage</p> <p>Switch heat and fire resistance class 1</p> <p>ZCS (Zero Current Switching)</p>
Electrical load	<ul style="list-style-type: none"> - Resistance load compatible - Capacitive load compatible - Inductive load compatible
Interfaces PowerCable xxx 101x	1x Wi-Fi 802.11b/g/n 2.4 GHz (internal antenna) with WEP/WPA/WPA2
Environment	<p>IP30, protection rating = class 1</p> <p>Operating temperature -20 .. 65°C (6A load = max. 63°C, 10A = max. 50°C, 16A = max. 30°C)</p> <p>Device rated for pollution degree 2.</p> <p>Designed for continuous operation in altitudes up to 2000m.</p> <p>No additional cooling required.</p> <p>The device is not designed to power appliances with a high inrush current.</p> <p>Do not connect several devices in series.</p>
Caution	<p>The device is safe only when completely disconnected from the electrical network. The cable plug serves as the disconnection means and must be easily accessible.</p> <p>The electrical socket must be earthed and protected with a circuit breaker rated at 16A or less.</p>

4.1 Specifications of different socket types

NETIO products a.s. supplies the PowerCable xxx 101x in several variants with different electrical plug/outlet types.



Figure 1 - PowerCable xxx 101F
(DE-schuko - Type F)

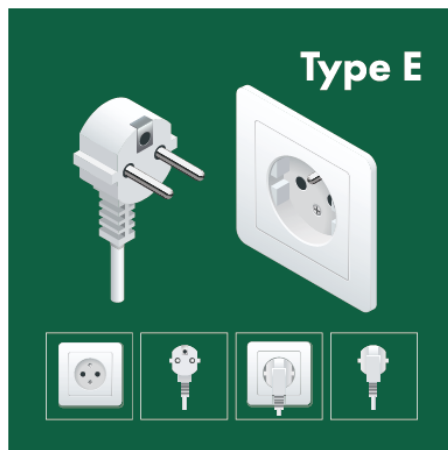


Figure 2 - PowerCable xxx 101E
(FR -Type E)



Figure 3 - PowerCable xxx 101J
(CH -Type J)



Figure 4 - PowerCable xxx 101S
(IEC-320 C13/C14)



Figure 5 - PowerCable xxx 101B
(US -Type B)

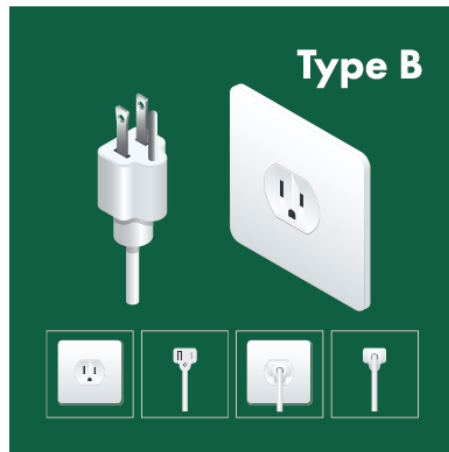
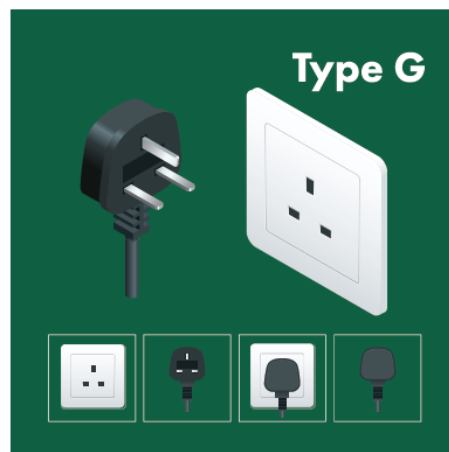


Figure 6 - PowerCable xxx 101G
(UK -Type G)



4.2 Features

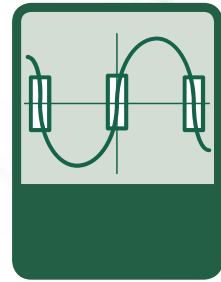
ZCS (Zero Current Switching)

ZCS (Zero Current Switching) function ensures that the relay contact is closed at the moment of zero voltage and opened at the moment when zero current flows through it.

Closing and opening at these exact moments has a number of advantages:

- The negative effects of inrush current on the lifetime of the relay in the NETIO device are significantly reduced.
- Reduced probability of a circuit breaker tripping in the circuit branch where the appliance with a high inrush current is connected.
- Significantly improved lifetime of switching supplies in appliances that are connected to the socket (especially in case of frequent switching on and off).
- Significantly reduced electromagnetic interference caused by repeated switching on and off.

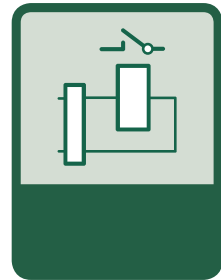
Zero current switching (ZCS) significantly improves the lifetime of the PowerCable and the connected end devices. This function is particularly important in case of frequent switching.



IOC (Independent Output Control)

Independent Output Control function of the PowerCable uses an independent system that ensures a stable operation of the output even if the main system is being restarted, updated, or is booting.

Thanks to IOC, the controlled output can power devices that, for technical reasons, must be powered without interruption (such as servers). The output control is completely independent from the WiFi or LAN communication subsystem.



PowerUp State

The PowerUp State parameter (sometimes also called **Cold start**) defines the behavior of the 110/230V power output during the first milliseconds to seconds after powering up the device, before the LAN/WiFi communication with a master system is established.

For some applications, it is important to set the correct state of a power output immediately after power is turned on (or restored). With servers in particular it is important to avoid undesired momentary switching.

Possible settings for PowerCable

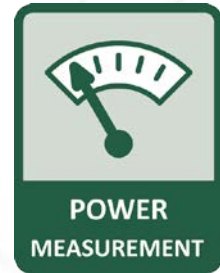
- On
- Off
- LAST state restores the last state before the power was disconnected



Electrical measurements

PowerCable measures relevant electrical parameters.

Parameter	Range	Units	Resolution	Accuracy
Voltage	90,0 - 250,0	V	0,1	<1%
Frequency	45,0 - 65,0	Hz	0,1	<1%
Current	0,005 - 16,000	A	0,001	<1%
TPF (True Power Factor)	0,00 - 1,00	-	0,01	<1%
Output power	0 - 3600	W	1	<1%
Consumption	0 - 4294967296	Wh	1	<1%



Quick WiFi connection setup (AP mode installation)

- NETIO PowerCable creates a WiFi network that you connect to with your PC or mobile phone.
- It then scans for WiFi networks in the vicinity, and lets you choose from a list and type the password.
- NETIO PowerCable then confirms the connection to the network and displays the assigned IP address.
- NETIO PowerCable devices can be discovered in the LAN using the [NETIO Discover](#) tool.



NFC Preconfig

PowerCable can be pre-configured using NFC even without being switched on. This requires a mobile phone with Android system, NFC function and mobile application „NETIO Mobile 2“.

The settings configured over NFC will be applied when the device is powered on.

In this way, it is possible to configure or show:

- Set SSID and password for connecting to WiFi
- Show assigned IP address in DHCP mode



For authentication, the existing password to the web administration “admin” account is used (default “admin” / “admin”).

4.3 Drawings

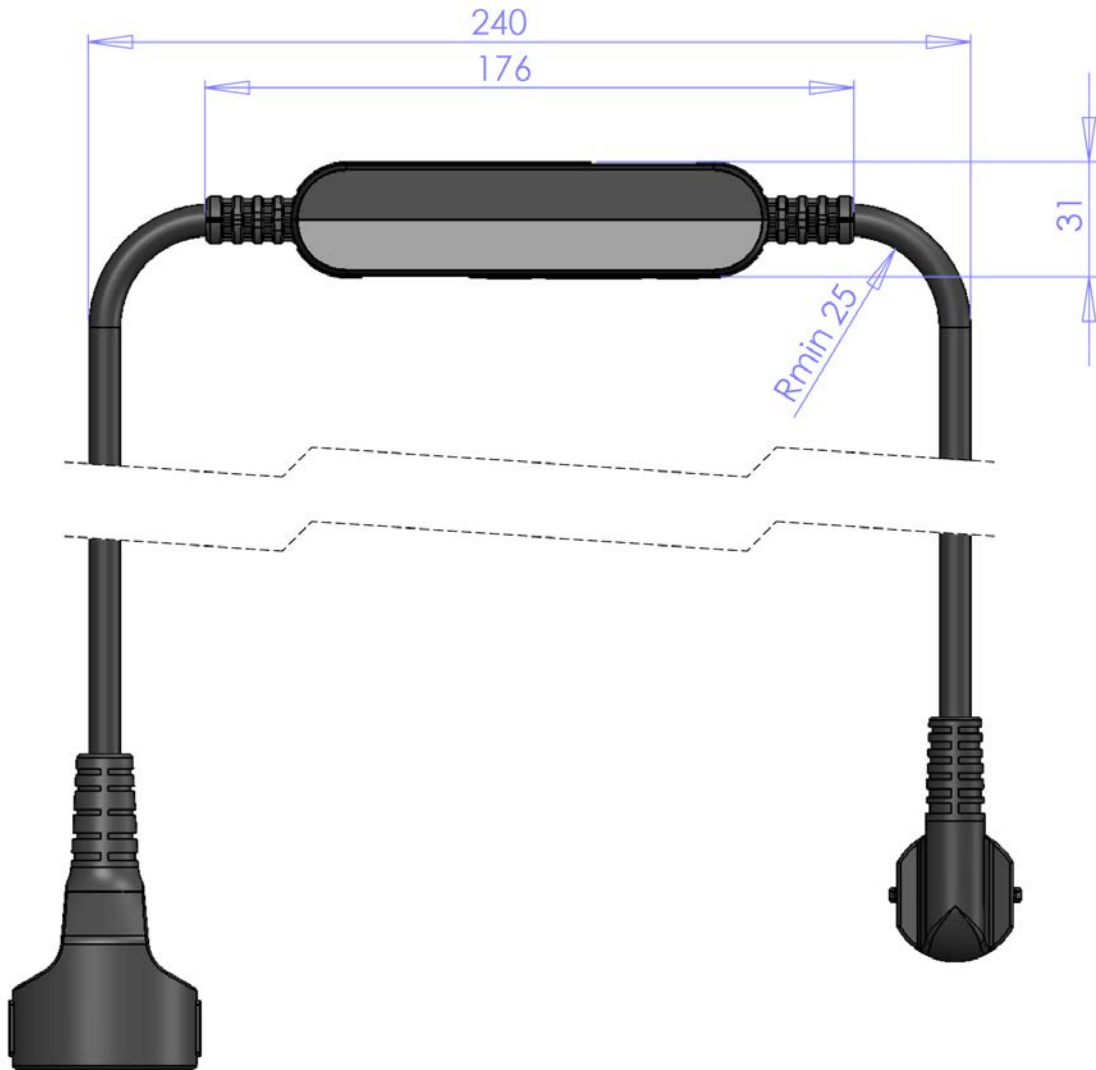


Figure 7 - PoweCable xxx 101x side view

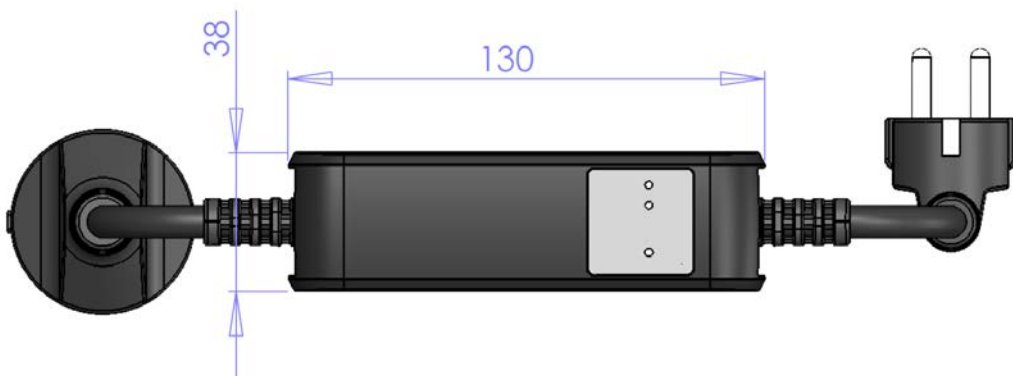





Figure 8 - PoweCable xxx 101x top view

4.4 Device description

1. Status LED (yellow) 
2. Output LED (green) 
3. Button – to press, a thin object is needed (may be conductive) 
4. Type plate – indicates the device model, electrical rating, maximum switching power and serial number (fig. 11)
5. Warning: Do not open the device – risk of electric shock!

Front view

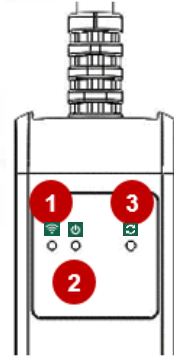


Figure 9 - PoweCable xxx 101x top view

Rear view

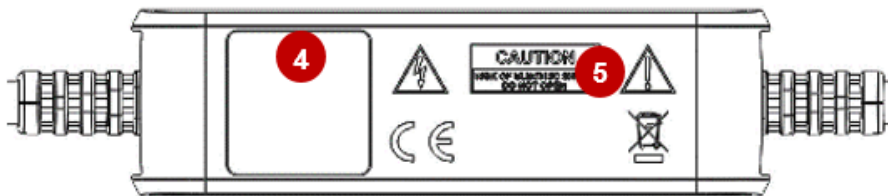


Figure 10 - PoweCable xxx 101x bottom view



SN on the type plate

-----xx

24A42C381234

WiFi network:

PowerCable-AP-xx

PowerCable-AP-34

Figure 11 - PoweCable xxx 101x type plate

4.5 LED and button functions

Button functions

Controlling the output	Press 3x within 1 to 5 seconds to switch the output.
AP mode activation	Press and hold for 10 seconds in the standard operating mode. Hold until the yellow LED (1) starts flashing rapidly. The AP mode is activated, making it possible to connect to the device and change the WiFi network to which it should connect.
Restoring factory defaults	Turn the device off, press and hold the button and turn the device on . Hold the button pressed for at least 10 seconds . The device is reset to factory defaults and the AP mode is activated (green LED flashes rapidly for 1 second, then yellow LED starts flashing rapidly).

LED indicators

Status LED (1)	Yellow	Off	No WiFi connection
		On	WiFi connected
		Rapidly flashing & red is off	AP mode
		Slowly flashing & red is off	Restoring WiFi connection/ Waiting for DHCP
	3 fast flashes every second & red is off	Locate function – for one minute after enabling in the web administration	
	Red	Flash	Activity (command received over M2M)
Output LED (2)	Green	Off	Output relay open
		On	Output relay closed
		Quick flashing for 1sec	“Load to defaults & AP mode” activated
All LEDs	Yellow, red, green	Shortly on	During system boot (e.g. after powering up or rebooting the device)

4.6 Minimum system requirements (for configuration)

A device with an Internet browser (Firefox, Chrome, Safari, Microsoft Internet Explorer, Opera, Mozilla etc.) that has JavaScript and cookies enabled.

4.7 Package contents

- NETIO PowerCable product
- Quick Installation Guide (QIG)



Figure 11a - PoweCable xxx 101x package

5 Configuration and control

5.1 Connecting PowerCable to a local WiFi (AP Mode)

- Plug the NETIO PowerCable into the electrical network. When the device is powered up for the first time, it enters the “AP mode” that enables basic configuration - selection of a WiFi network to which the device will connect (yellow LED flashes rapidly).
- On a computer, tablet or smartphone, display available WiFi networks and connect to the unsecured “PowerCable-AP-xx” network (Figure 12).
- Device configuration page should open automatically. If not, open a web browser and enter <http://10.0.42.1> You will see NETIO PowerCable WiFi configuration page. (Figure 13).

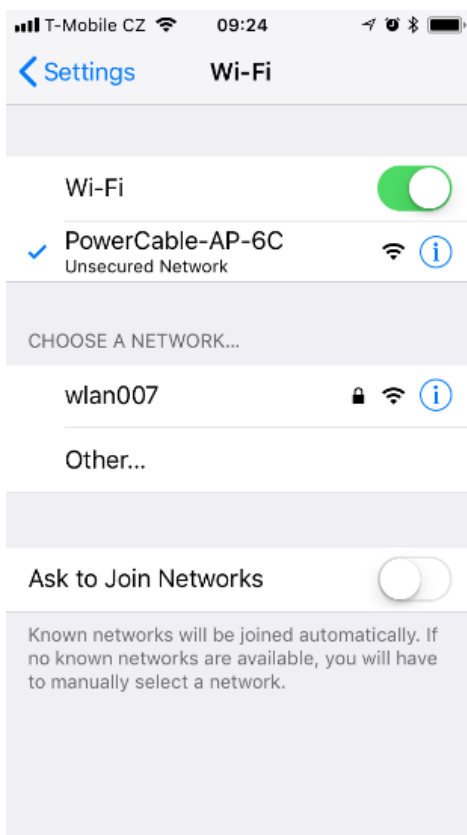


Figure 12 - Connecting to PowerCable AP

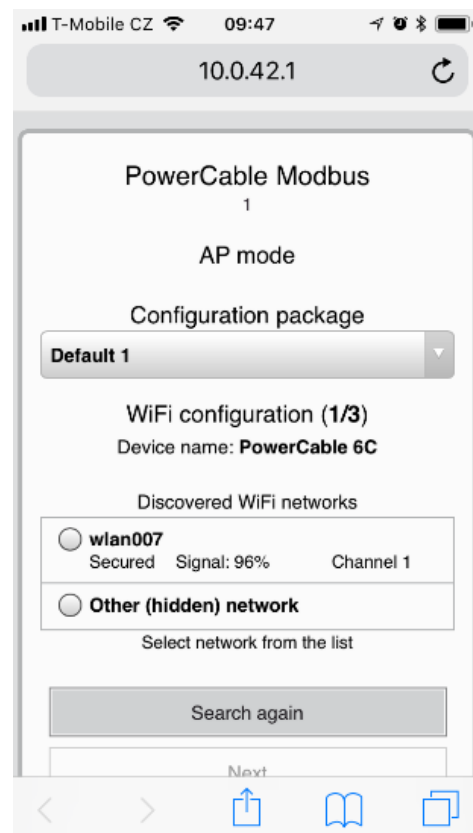


Figure 13 - Web Interface in AP mode

- Select your network in the list of detected networks and click “Next” (Figure 14).
- Enter the password for the selected WiFi network. You may also change the device name. If your network does not use DHCP, unselect this option and manually enter the IP address and other network parameters (Figure 16; for experts only). Click “Next” to confirm (Figure 15).

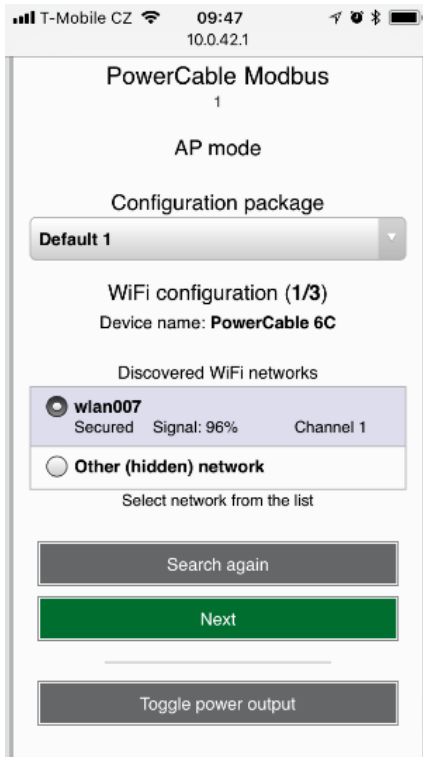


Figure 14 -Network selection in AP mode

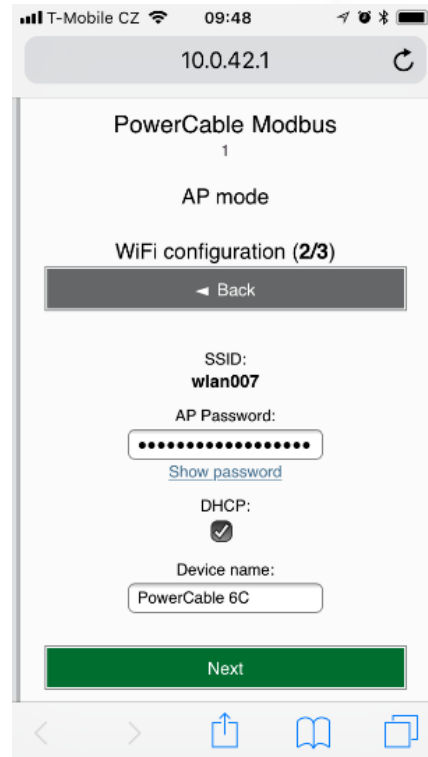


Figure 15 - Connecting to Wi-Fi in AP mode

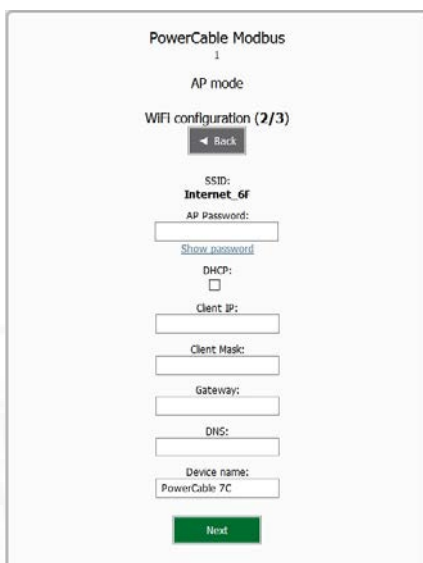


Figure 16 - Configuring the network IP parameters

If you do NOT use a DHCP server in your network, set the following parameters:

- AP Password - password for the network to which the PowerCable will be connected
- Client IP - IP address in your network address range
- Client mask - network mask for your network
- Gateway - gateway for your network
- DNS - DNS server for your network or a public DNS, e.g. 8.8.8.8
- Device name - specify a name under which the PowerCable will be visible in the local network

For more information, see chapter 5.6 Network Configuration

- A page with the connection result is displayed. If it shows "WiFi status: Connected", check the network parameters and then click "Save&Connect" to save the configuration (Figure 17). The device then exits the AP mode, connects to the selected WiFi network, and displays a network configuration summary page (Figure 18). WiFi connection is indicated with the yellow LED.

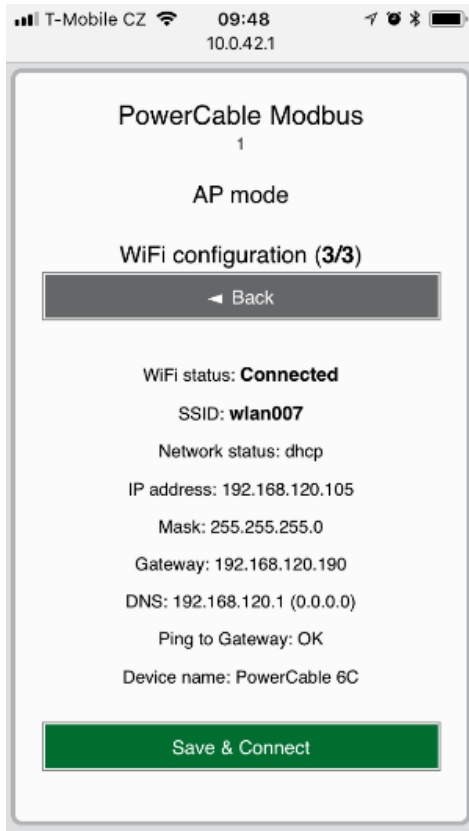


Figure 17 - Configured Wi-fi parameters

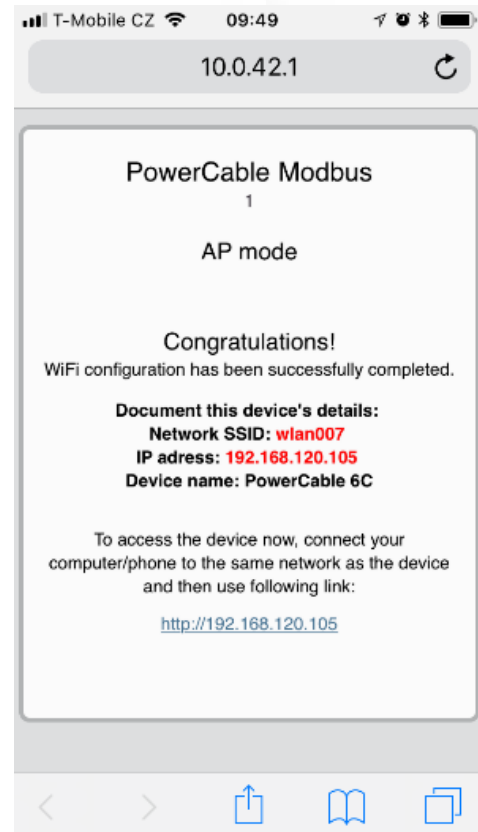


Figure 18 - Network connection info

5.2 NFC installation in 60 seconds

NFC (Near Field Communication) is a technology supported by some mobile phones (and tablets).

Using a mobile phone with NFC support and the NETIO Mobile 2 app, even a device that is powered off can be configured. The device will apply the new configuration as soon as it is powered on.

For example:

- NFC can be used to configure the WiFi connection parameters (network SSID + password) in the PowerCable MQTT 101x. When the PowerCable is powered on, it automatically connects to the specified WiFi network.
- NFC and the mobile app can be used to find out the IP address assigned to the installed WiFi device.

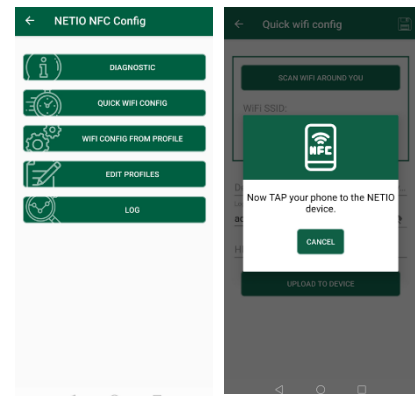
For authentication NFC config, the existing password to the web administration "admin" account is used (default "admin" / "admin").

5.2.1 NETIO Mobile2 for Android

NETIO Mobile2 application is for control NETIO devices produced after 2016.

Features:

- Install NFC enabled NETIO devices
- Switch On / Off each power socket on local network.
- Show power consumption on each power output (if supported).
- Searching NETIO devices in local network



<https://play.google.com/store/apps/details?id=cz.netio.netio>

5.3 Detecting and configuring the IP address

If you have followed the instructions in the previous chapter, you know the PowerCable's IP address, whether it was assigned by a DHCP server or configured manually. If you forgot the IP address, or if you have received a pre-configured device, you will need to find out its IP address.

Use Windows based NETIO Discover utility, available for download at <http://www.netio-products.com/en/software/netio-discover>.

Depending on your operating system, choose the .exe file (Windows) or the .jar file (Linux or Mac). To run the .jar file, JAVA RE is needed. It is available at: www.java.com

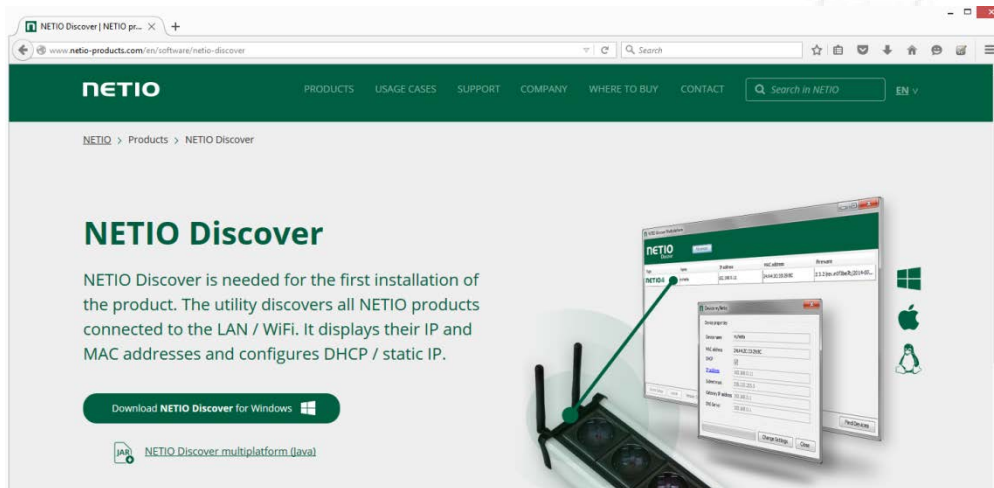


Figure 19 - NETIO Discover web interface

To successfully discover the IP address, the controlling system must be in the same LAN as the PowerCable xxx 101x.

If the discovered IP address belongs to a different address range than that of your WiFi network, we recommend resetting the device to factory defaults (see chapter 5.3) and then configuring it according to chapter 5.1.

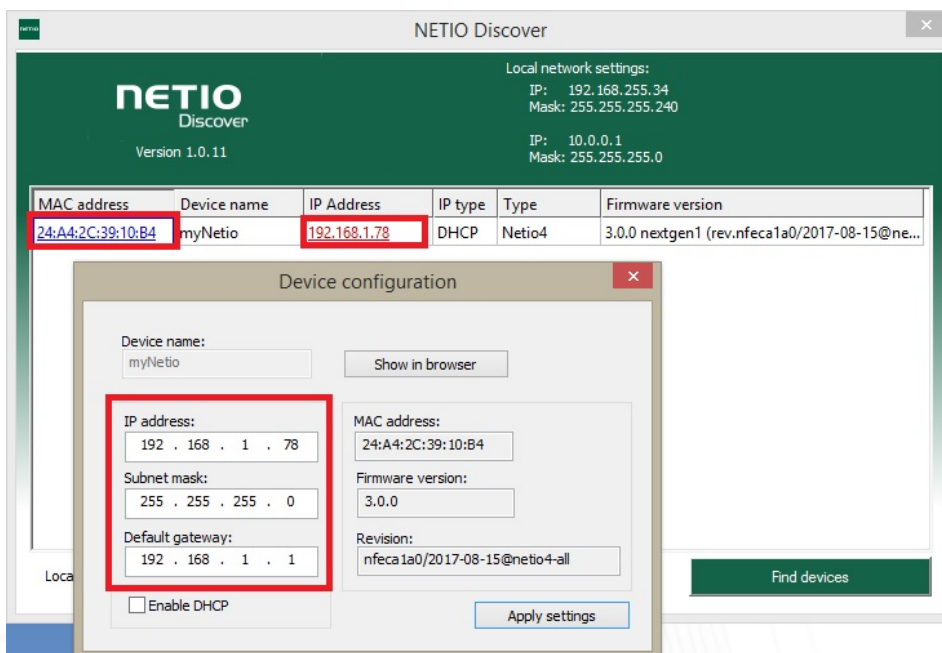


Figure 20 - Discovering and configuring network parameters using NETIO Discover

To change the IP address, click the value in the MAC address column, uncheck Enable DHCP and specify the IP address, Subnet mask and Default gateway. After applying the settings, PowerCable will be accessible at the specified address.

Enter the IP address into a web browser or the NETIO Mobile app and log in to the device.

Note: For MAC or Linux users use the NETIO Discover Multiplatform version.

5.4 Login to device web

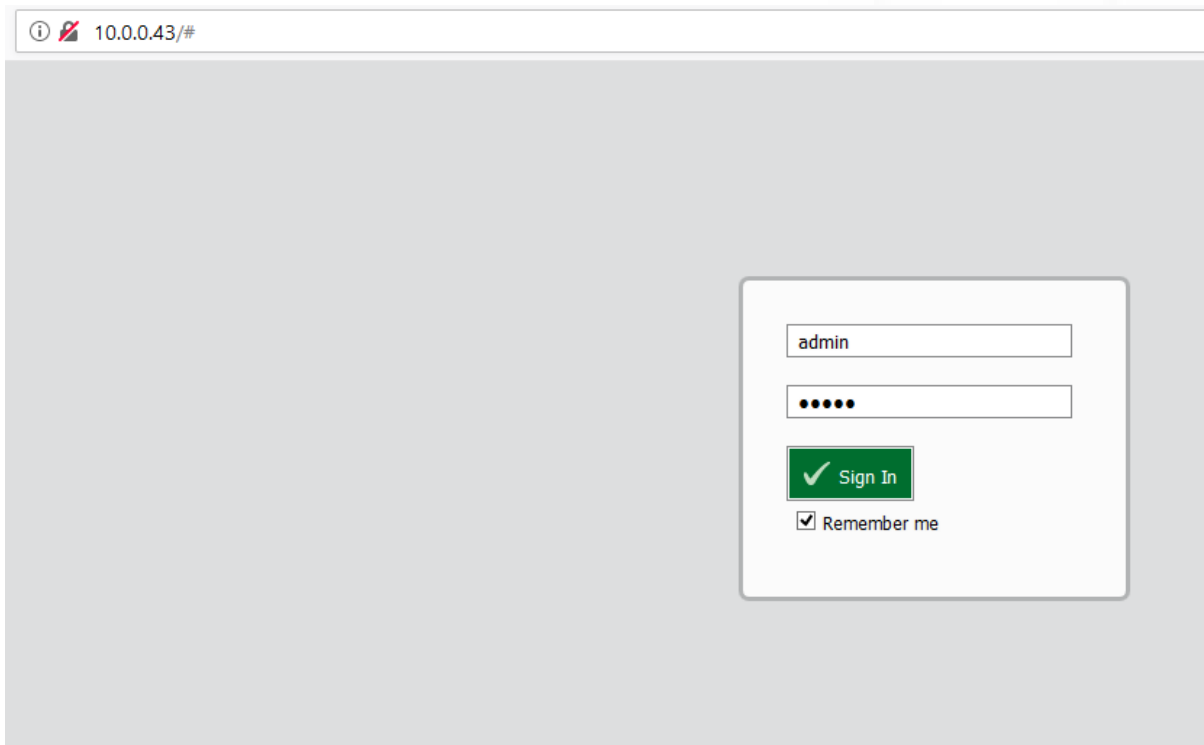


Figure 21 - PowerCable login dialog

To log in, use **admin** / **admin**
(default login username / password)

5.5 Restoring factory defaults

This operation deletes all user settings and restores the configuration to the factory defaults. It is useful when the device is in an unknown state or does not behave as described in this manual.

Procedure: Turn off the PowerCable.

Press and hold the button and power up the PowerCable.

Hold the button for about 10 seconds until the green LED flashes 3x, then release.

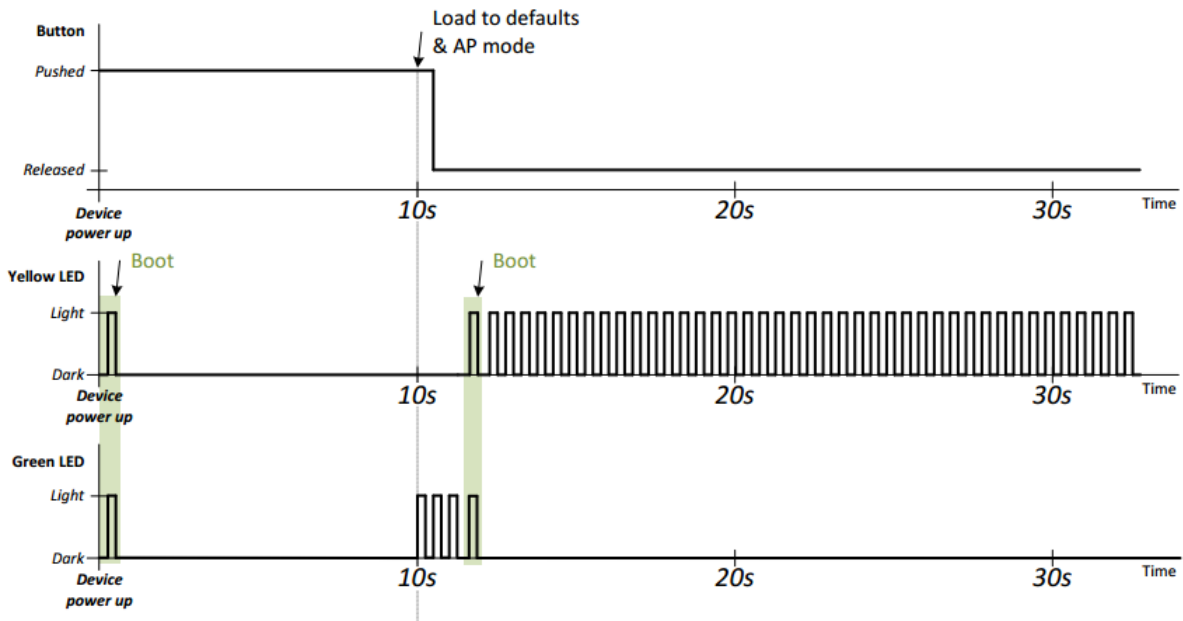


Figure 22 - LED indication when restoring factory defaults



Forgotten password

The reset to factory defaults is also used when the password has been forgotten. After restoring the factory defaults, the username and password to access the PowerCable will be "admin" / "admin".

5.6 Controlling the output manually

The output can be switched on/off (toggled) by pressing the button quickly 3 times in a row.

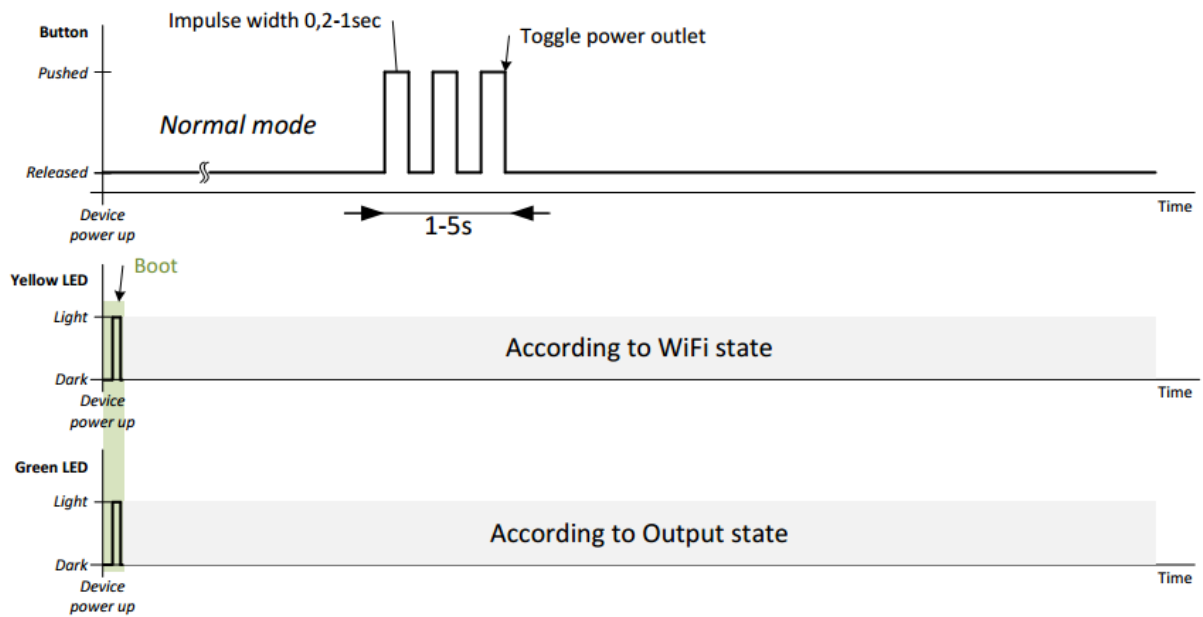



Figure 23 - LED indication for manual output control

6 Web interface

6.1 Outputs

In the left menu, click  **Outputs**. A screen showing the PowerCable output appears. The output can be controlled directly with two buttons:

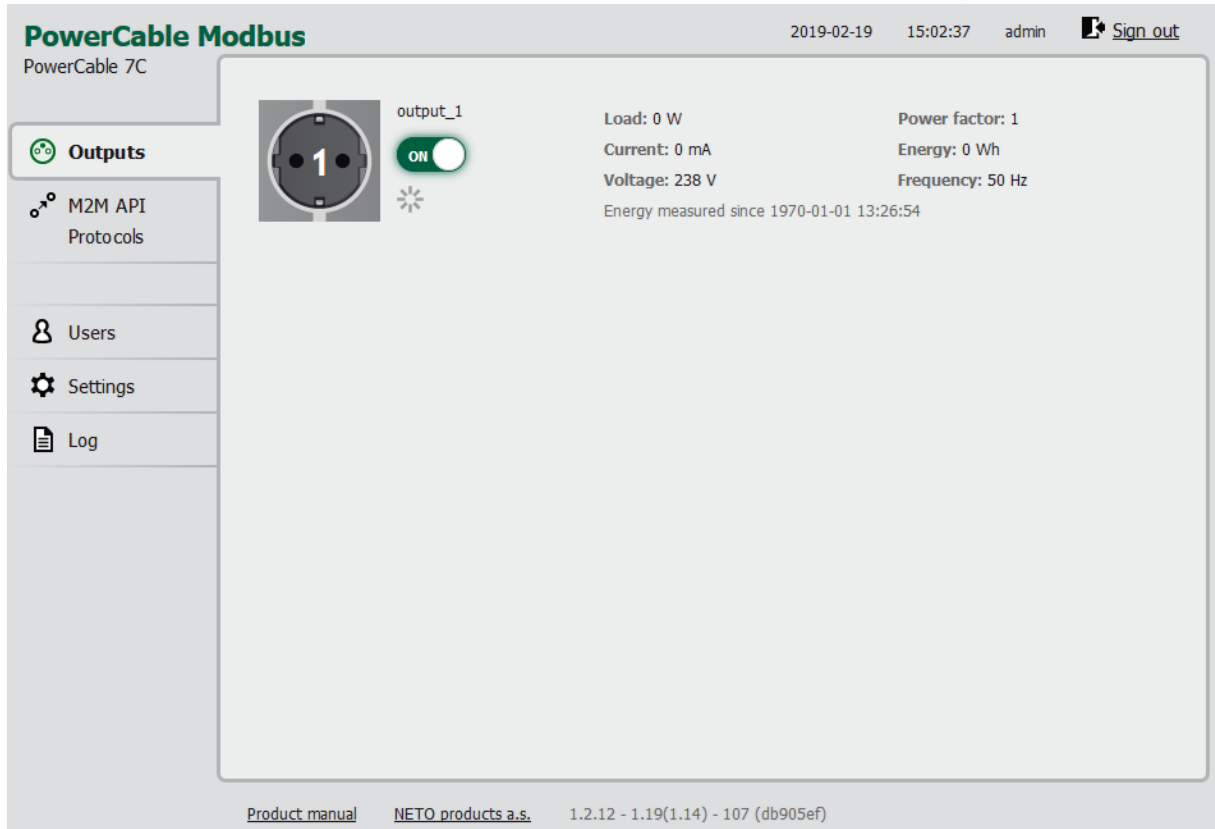




Figure 24 - Controlling the output

The  ON/OFF button controls the output directly. When the output is on, the button is green; when the output is off, the button is grey . When switching the output off, a confirmation dialog appears:

Do you really want to turn off output_1?


Turn Output Off

Cancel

Don't ask me again

Click **Turn Output Off** to confirm the switch-off or **Cancel** to keep the output switched on.

To suppress this dialog in the future, check **Don't ask me again**.

The  Reset button switches the output off and then back on. A confirmation is requested before the action is performed. The function is enabled only when the output is switched on. When the output is switched off, the Reset button is disabled.

Do you really want to reset output_1?

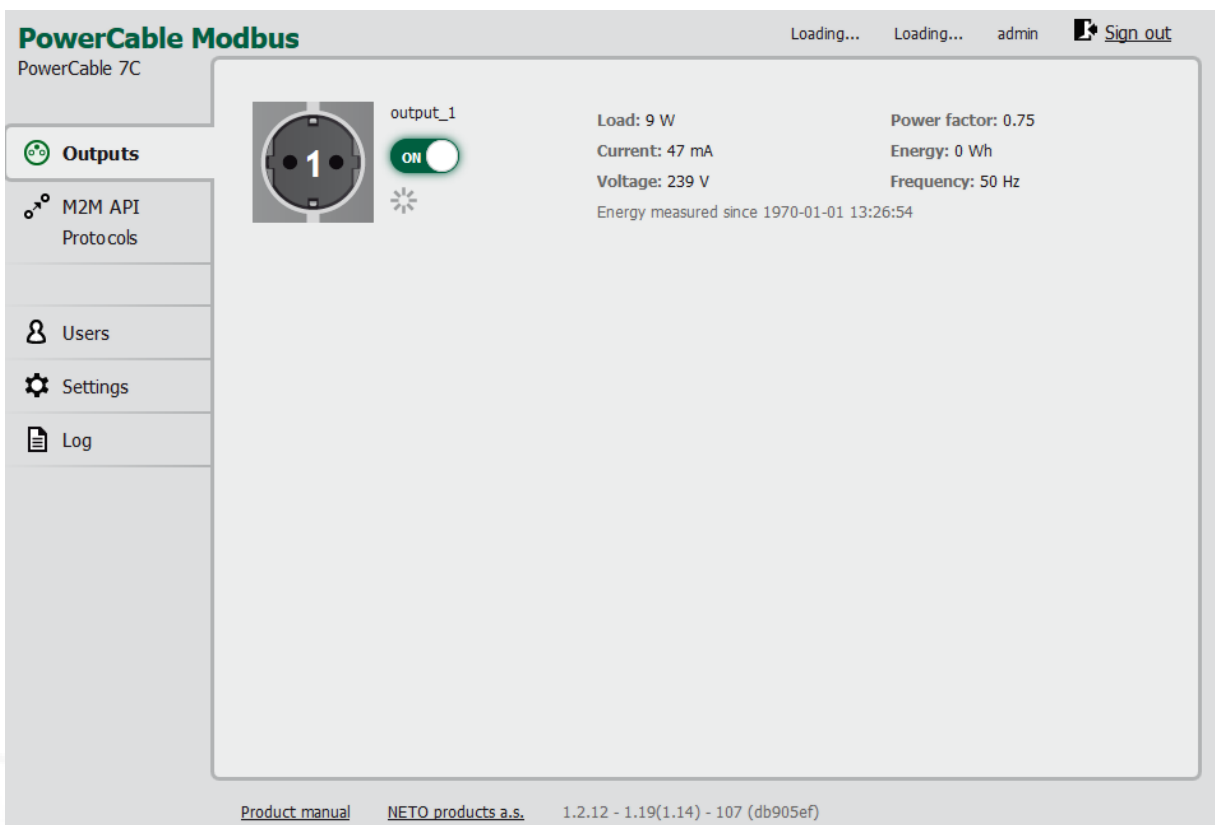


Don't ask me again

Click **Reset** to confirm the action or **Cancel** to cancel it.
To suppress this dialog in the future, check **Don't ask me again**.

6.1.1 Outputs - Energy measurements

PowerCable measures the following electrical parameters every 500ms. The display in the web interface is updated every 5 seconds.



The screenshot shows the 'PowerCable Modbus' web interface for 'PowerCable 7C'. The interface includes a sidebar with navigation options: Outputs, M2M API Protocols, Users, Settings, and Log. The main content area displays the status of 'output_1', which is currently 'ON'. A circular icon with the number '1' and a power symbol is shown next to the output name. To the right, the following measured values are displayed:

Load: 9 W	Power factor: 0.75
Current: 47 mA	Energy: 0 Wh
Voltage: 239 V	Frequency: 50 Hz
Energy measured since 1970-01-01 13:26:54	

At the bottom of the interface, there are links for 'Product manual', 'NETO products a.s.', and version information '1.2.12 - 1.19(1.14) - 107 (db905ef)'. The top right corner shows 'Loading...' indicators, the user 'admin', and a 'Sign out' button.

Figure 25 - Measured values

Load in watts [W] corresponds to the immediate current and voltage ($P = U * I * TPF$).

Current in amps [A] shows the immediate current flowing through the output.

TPF (True Power Factor) shows the ratio of active and apparent power, or the ratio of resistance and impedance. A value less than 1 means that there is a phase difference between the current and the voltage, i.e. higher energy losses compared to a purely resistive load.

Energy in watt-hours (**Wh / kWh**) is the cumulative energy consumed over a time interval. The value is the total consumption at the output since the last reset of the counter.


By default, the cumulative energy consumption is counted from the time the PowerCable was first powered on. To reset the counter, go to the **Settings > System** tab and click the **Reset Power consumption counter** button (see Figure 27). This restarts the measurements as of the current moment.

Voltage in volts [V].

Frequency in hertz [Hz].

6.1.2 Outputs - General

Click the picture of the output to open detailed settings.

The  **General** tab configures basic parameters for controlling the output.

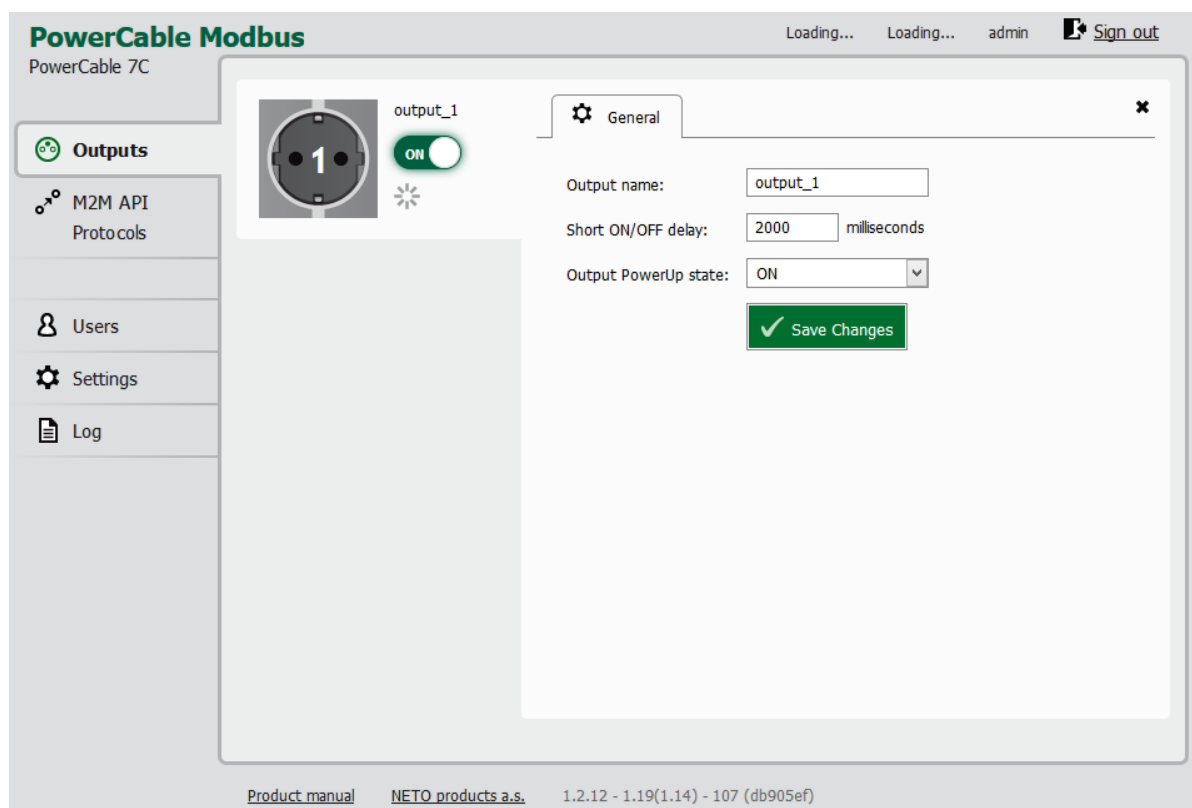


Figure 26 - General output configuration


Output name is shown above the two control buttons to improve clarity.

Short ON/OFF delay is an integer specifying, in milliseconds, the duration for the Short OFF (power cycling) and Short ON actions.

During this interval, any attempts to switch the output state via M2M API protocols are ignored.

Output PowerUp state defines the state of the output whenever the device is powered up or restarted. The output can be switched on (ON), switched off (OFF), or set to the last state before the restart (LAST).

Click **Save Changes** to save the settings.

To close the configuration dialog, click the  symbol in the top right corner.

PowerCable Modbus 1970-01-01 13:05:12 admin [Sign out](#)

PowerCable-70

- Outputs
- M2M API Protocols
- Users
- Settings**
- Log

- Wi-Fi
- Network Configuration
- Date / Time
- Firmware
- System**

Uptime: 0 hours 5 minutes 11 sec

Firmware version: 2.1.0 - 1.23(1.23) - 108 [Upgrade](#)

Device name:

HTTP port:

Enable Periodic device restart

Restart period: minutes, does not affect the Output state

Debug Log:

Global Outputs PowerUp interval: milliseconds

Blink with status LEDs for 1 minute.

Export and import device configuration

Configuration file: Soubor nevybrán.

[Product manual](#) [NETIO products a.s.](#) 2.1.0 - 1.23(1.23) - 108 (2593fed)

Figure 27 - Resetting the consumption counter

6.2 M2M API Protocol Actions

All M2M protocols use the same values for the *action* parameter to control the output. Allowed values are:

- 0 - turns the output off
- 1 - turns the output on
- 2 - short OFF - turns the output off for a short¹ time (if the output was off, it will be turned on)
- 3 - short ON - turns the output on for a short² time (if the output was on, it will be turned off)
- 4 - toggle - toggles the current output state
- 5 - no operation - leaves the output unchanged
- 6 - ignore - ignores the *action* attribute and only respects the *state* attribute - only for XML and JSON

The settings for individual M2M protocols supported by the respective PowerCable versions are described in detail at the end of this manual.

^{1,2} The short-off/short-on duration can be also specified in the command issued over the respective M2M protocol. If unspecified, the "Short ON/OFF delay" value is used.

6.3 Cloud

Netio Cloud is a service provided by NETIO Products a.s. and allow easy central remote control and monitoring of the NETIO devices. What can you do in NETIO Cloud?

Output control

- On/Off switch.
- Reset button (Short Off for defined time).
- Show power consumption [kWh] per output (metered device only)

Settings

- Output name can be modified.
- Outputs can be placed to any of groups.
- Short OFF (restart) interval for reset can be set up.

NETIO Cloud is a paid service, but the current customers will gain some free credits with each device added to their NETIO Cloud account.

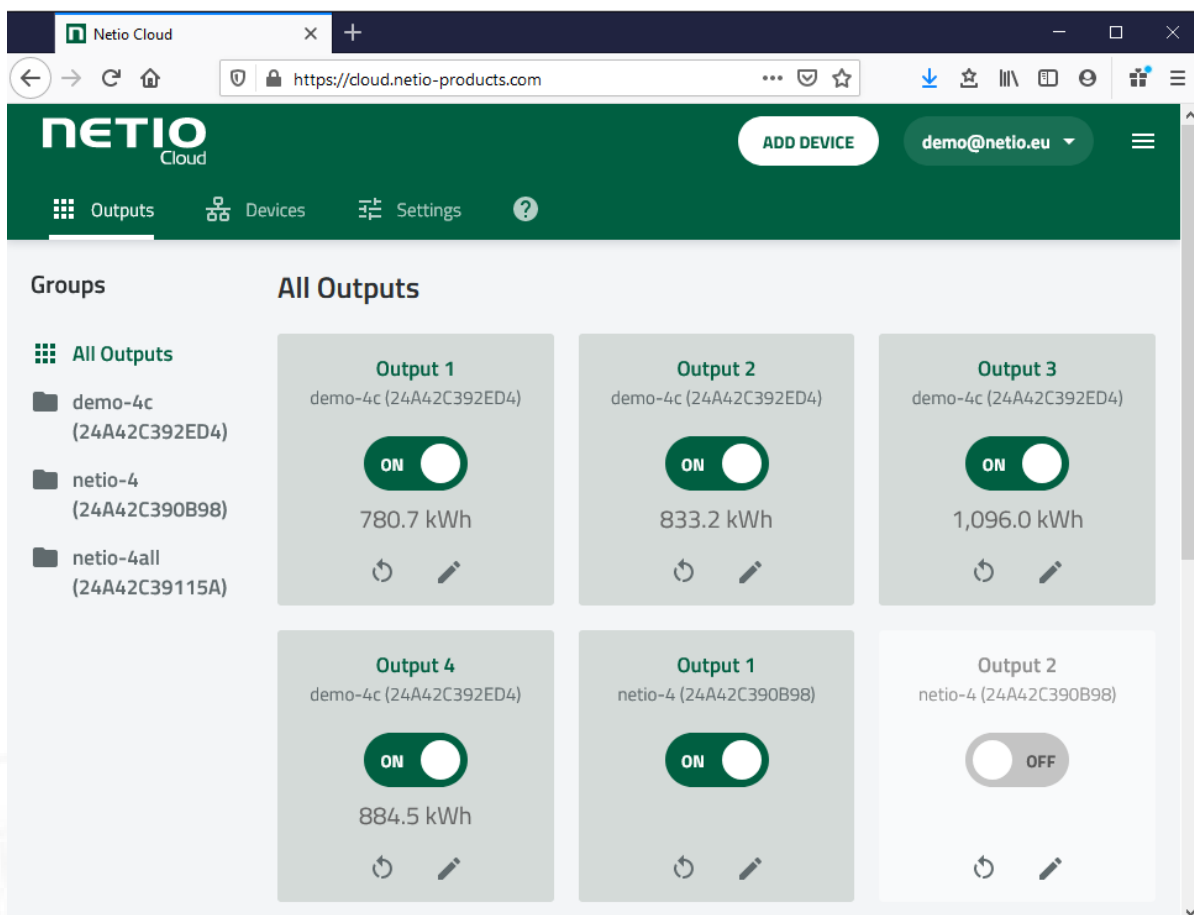


Figure 27a - NETIO Cloud

Note: Cloud is available only in Firmware 2.5.0 and newer!

Connection to NETIO Cloud can be configured on Cloud tab.

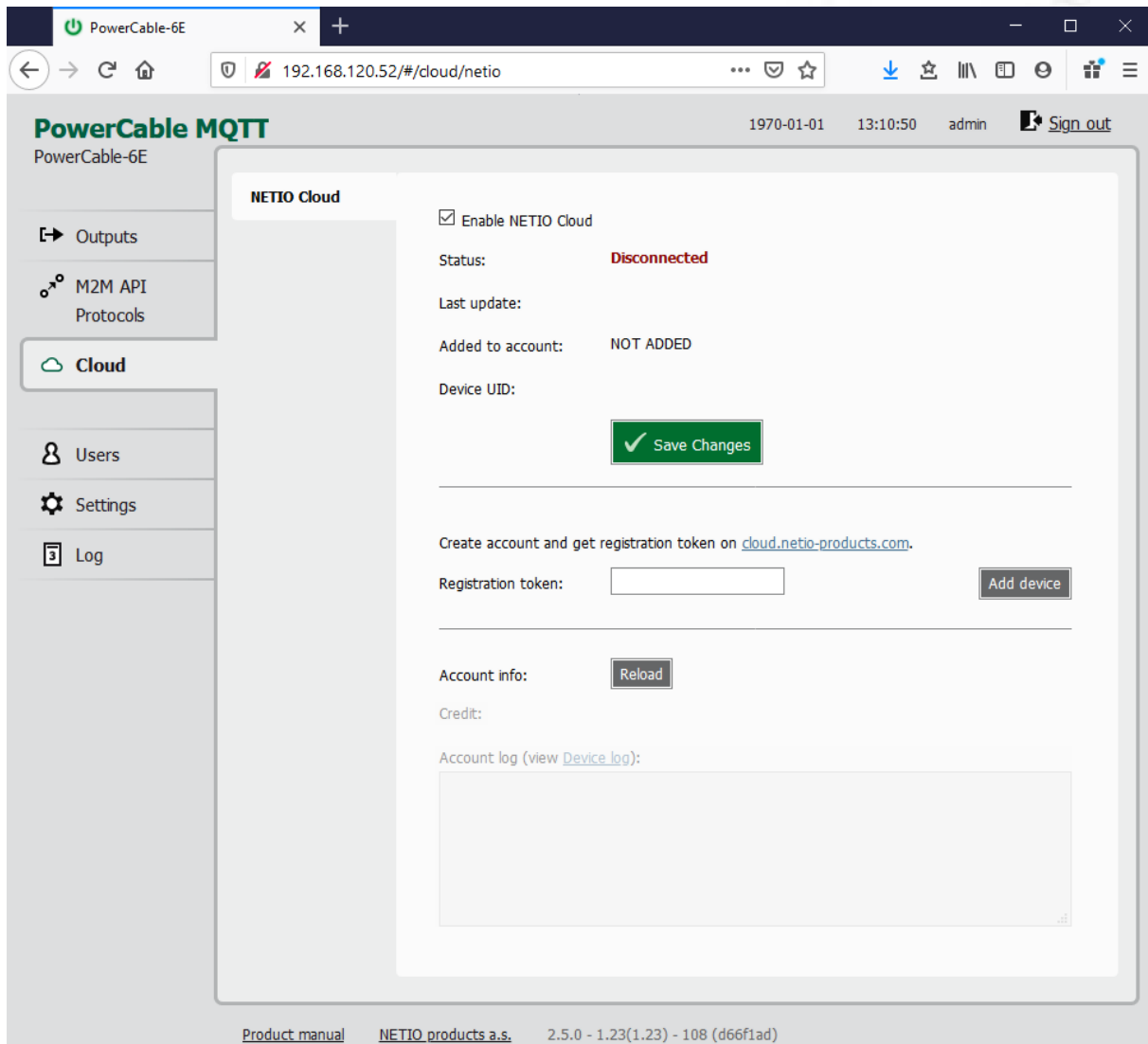


Figure 27b - Cloud configuration

Enable NETIO Cloud	Check to enable NETIO Cloud.
Status	<p>Disconnected: Device not connected to Cloud</p> <p>Cloud connect failed...reconnecting: Device it trying to connect to Cloud.</p> <p>Connected: Device connected to NETIO Cloud.</p> <p>Connected and sychronised: Device connected to NETIO Cloud and account information synchronized.</p>
Last update	Date and time of the last update.
Added to account	Account name to what this device is assign.
Device UID	Unique device ID.

<i>Save Changes</i>	Saves the changes.
<i>Registration token</i>	Enter the registration token from NETIO Cloud web - shown when "ADD DEVICE" button used. Then press "Add device" button.
<i>Remove device</i>	If this device is connected to NETIO Cloud use this button to remove/disconnect it from NETIO Cloud.
<i>Account info</i>	Use "Reload" button tu refresh account information.
<i>Credit</i>	Value of the available credit for Cloud account.
<i>Account log</i>	Log of the Cloud account events.

6.4 Users

When several users use the PowerCable, it is advisable to assign them different accounts with the necessary privileges. In the left menu, select **Users**.

The screenshot shows the 'PowerCable Modbus' web interface. The left sidebar contains navigation options: Outputs, M2M API Protocols, **Users** (selected), Settings, and Log. The main content area is titled 'admin' and features a 'Create User' button. The form fields are as follows:

- Username:
- Current password:
- Password:
- Confirm password:
- Privileges [more]:
 - administrator (full access)
 - user (may only control outputs)
 - guest (may only observe status)

A green 'Save Changes' button is located at the bottom right of the form. The footer of the interface includes links for 'Product manual', 'NETO products a.s.', and version information '1.2.12 - 1.19(1.14) - 107 (db905ef)'.

Figure 28 - Adding and managing users

Username	The username. The PowerCable must always have an “admin” account with administrator privileges; this account cannot be deleted or disabled. The device supports up to 5 user accounts. The username must start with a letter and may only contain numbers and letters without accents.
Current password	When changing the password, the current (old) password must be entered.
Password	New password for the given account. The password can be up to 15 characters long and may consist of alphanumeric characters and the following special characters: <code>_ , ; ! * () {} [] # \$ % @ ^ + - ~</code>
Confirm password	Enter the password again.
Privileges	<p>administrator (full access): User with full privileges.</p> <p>user (may only control outputs): User that can control the outputs but cannot change system settings.</p> <p>guest (may only observe status): User that cannot change any settings, may only monitor the current output state.</p>


Click "more/less" to display detailed privileges.

<i>Create User</i>	Opens a dialog to enter the parameters of a new user account.
<i>Save changes or Create User</i>	Saves the changes.

Only an administrator or a user with the "manage users" privilege may change the passwords of other users.

Note: User based account can be used for access to NETIO Mobile2 App.

6.5 Settings

To ensure correct operation as intended, the device settings need to be properly configured. Select  Settings in the left menu to display a sub-menu with product settings.

6.5.1 Wi-Fi

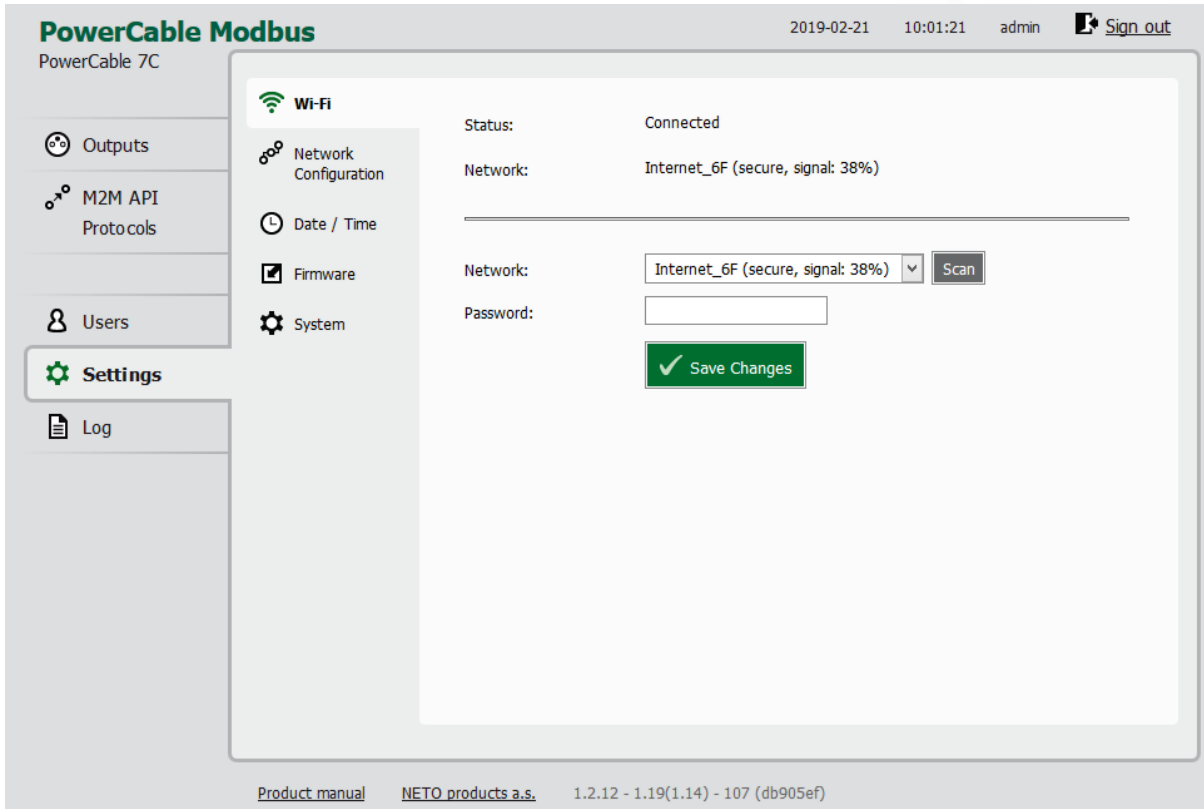


Figure 29 - Wi-Fi settings

PowerCable uses Wi-Fi to connect to the local network.

Status	Indicates whether the device is connected to (“Connected”) or disconnected from (“Disconnected”) the local network.
Network	Name of the Wi-Fi network to which the device is connected. In parentheses, there is an indication of whether or not the communication is encrypted (“secure”) and of signal strength.
Network [Scan]	From the menu, select a network to connect to. Press Scan to have PowerCable search for Wi-Fi networks in range.
Password	Password for connecting to the Wi-Fi network.
Save Changes	Saves the changes.

6.5.2 Network Configuration

This section allows configuring the IP parameters of the PowerCable network interface which are essential for correct network operation.

PowerCable Modbus 1970-01-01 13:01:45 admin [Sign out](#)

PowerCable-70

Wi-Fi Wi-Fi

Network Configuration

MAC address: 24:A4:2C:38:D1:70

Status: Connected

Use DHCP

Set static IP address

IP address: 192.168.120.57

Net mask: 255.255.255.0

Default gateway: 192.168.120.190

DNS server: 192.168.120.1

Hostname: PowerCable-70

[Save Changes](#)

Warning: Changes to network settings may result in device becoming unavailable at the current address. See the device User Manual for ways to find the device at its new address.

[Product manual](#) [NETIO products a.s.](#) 2.3.9 - 1.27(1.23) - 108 (a53c7d7)

Figure 30 - Network configuration

MAC address	Ethernet address of the network adapter. Unique for each device. Also corresponds to the PowerCable serial number.
Status	Connection status
Use DHCP	When selected, the device attempts to obtain network configuration from a DHCP server. If your network does not use DHCP, set the parameters statically.
Set static IP address	Manual configuration of network parameters. Select this option if your network does not have a DHCP server.
IP address	Choose an unused IP address in your network's address range.
Net mask	Set the network mask according to your network's address range.
Default gateway	Address of the network gateway. Corresponds to the address of your router's LAN interface.
DNS server	IP address of the domain name server. It is usually the same as the gateway address, as long as the DNS function is enabled on the router. If

unsure, enter a public DNS server, such as: 8.8.8.8

<i>Hostname</i>	Name of the device in the local network. It is generated from the Device name (unsupported characters are replaced).
-----------------	--

<i>Save Changes</i>	Saves the changes.
---------------------	--------------------



Caution

After changing the network configuration, it may be necessary to re-discover the PowerCable at its new address. The discovery procedure is described in section [3.2 Detecting and configuring the IP address](#).

6.5.3 Date / Time


In the Settings menu on the left, select  Date/Time.

Figure 31 - Date / time settings

Use NTP server When selected, the device's clock is periodically synchronized with a NTP server. If you do not have your own NTP server in your network, use e.g. tik.cesnet.cz

Set time manually Select if you do not wish to use a NTP server.

Date Current date and time on the PowerCable's clock. Can be modified if necessary.

Synchronize with this computer Check this box to copy the current date and time from your computer to PowerCable's internal clock.

Timezone Set the time zone to govern the time settings.

Save Changes Saves the changes.

6.5.4 Firmware

The **Firmware** section allows updating the firmware of your device. The current firmware version is shown in the footer of each page.

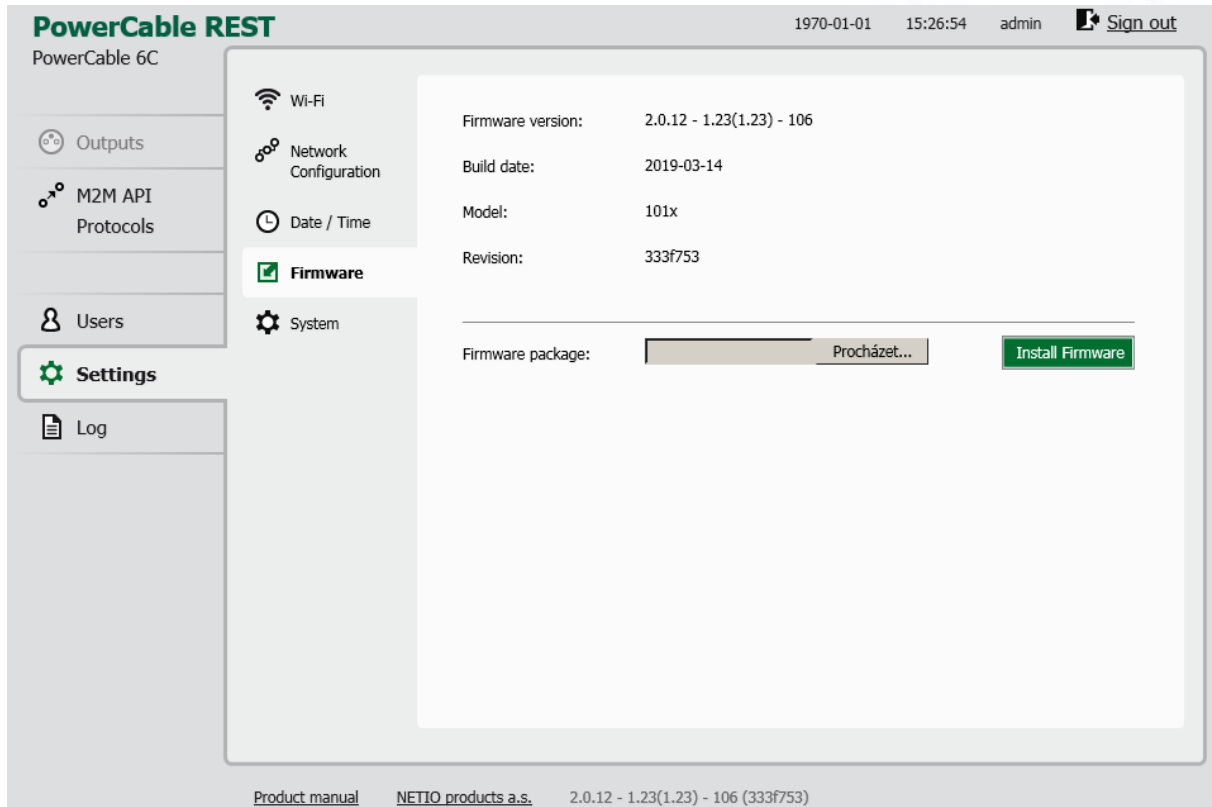


Figure 32 - Details about the installed firmware

Firmware version	Installed firmware version.
Build date	Creation date of the installed firmware version.
Model	Model designation.
Revision	Revision number.
Firmware Package	Click Browse to select a firmware file to install. Then click Install Firmware to start the installation.

Firmware files are available at: <https://www.netio-products.com/en/powercable-xxx-firmware>

Where to find right fw?

Go to the product page on our website (link below), select your product and scrool down the page.

<https://www.netio-products.com/en/products/all-products>

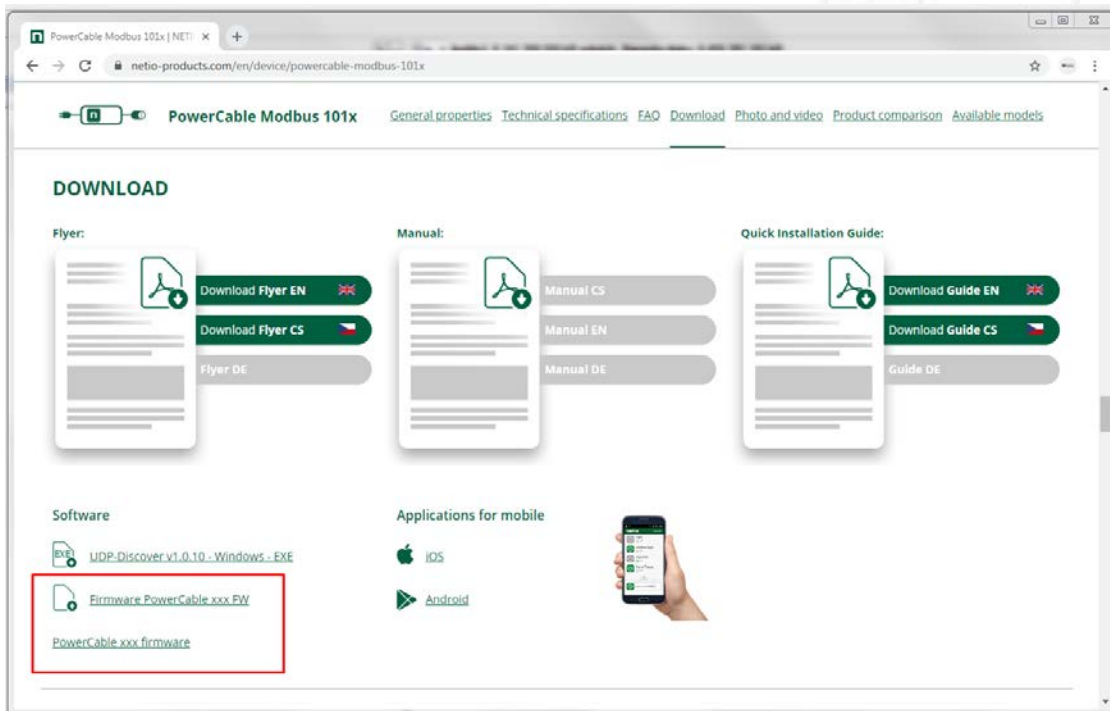


Figure 32b - WEB of NETIO products - Link to Firmware download

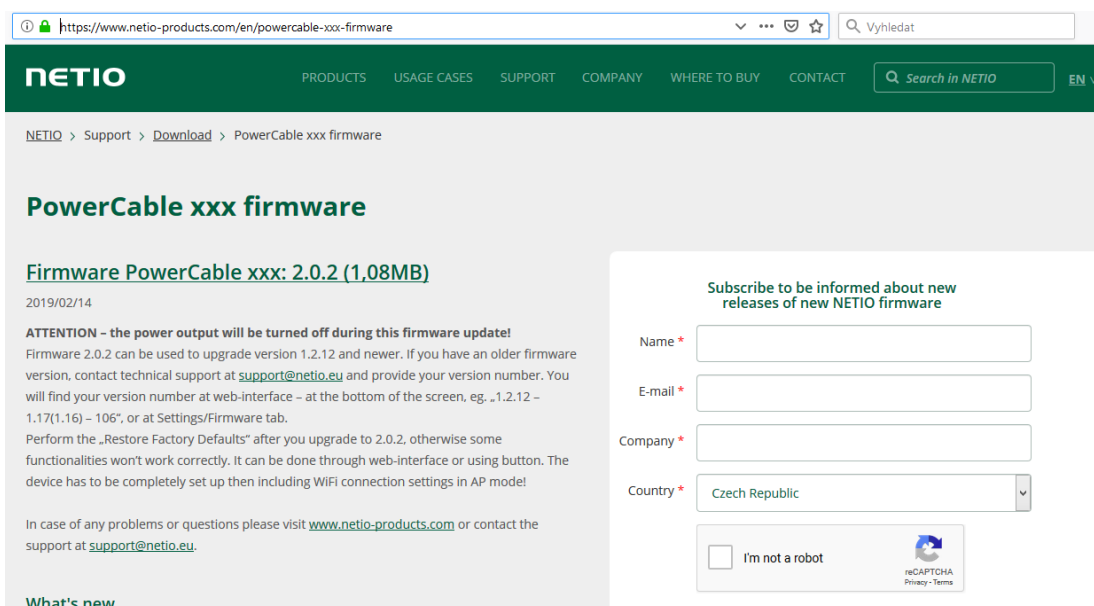


Figure 33 - Firmware download link at the netio-products.com website



Caution

Before installing firmware, read carefully the instructions at our website, make sure that you are upgrading from the correct version, and follow the prescribed procedure.

Downgrade to a lower firmware version may cause the device to reset to factory defaults. This will disconnect the device from your WiFi network. For this reason, we strongly discourage from downgrading the firmware remotely, without physical access to the device. Before downgrading the firmware, always consider if it is really necessary, and if needed, contact technical support: support@netio.eu

6.5.5 System

This section allows performing basic settings and viewing basic parameters.

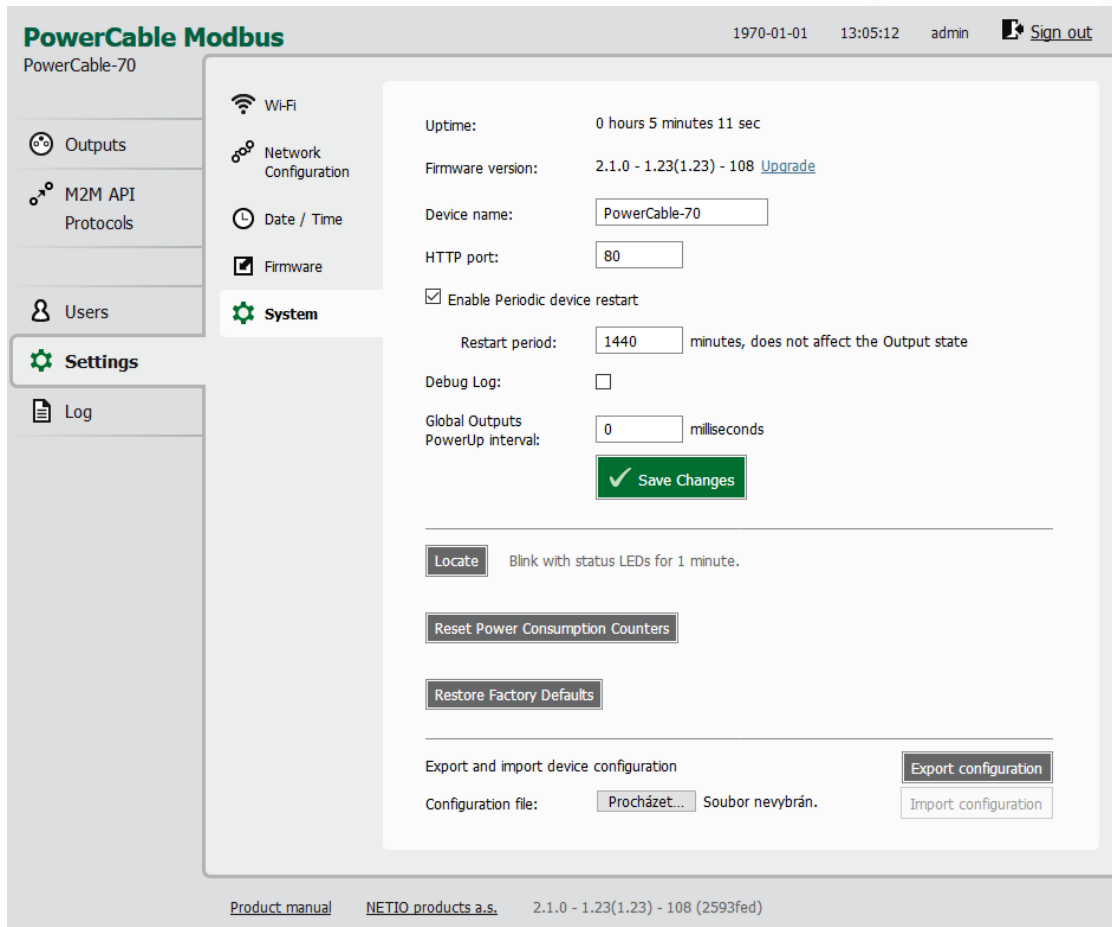



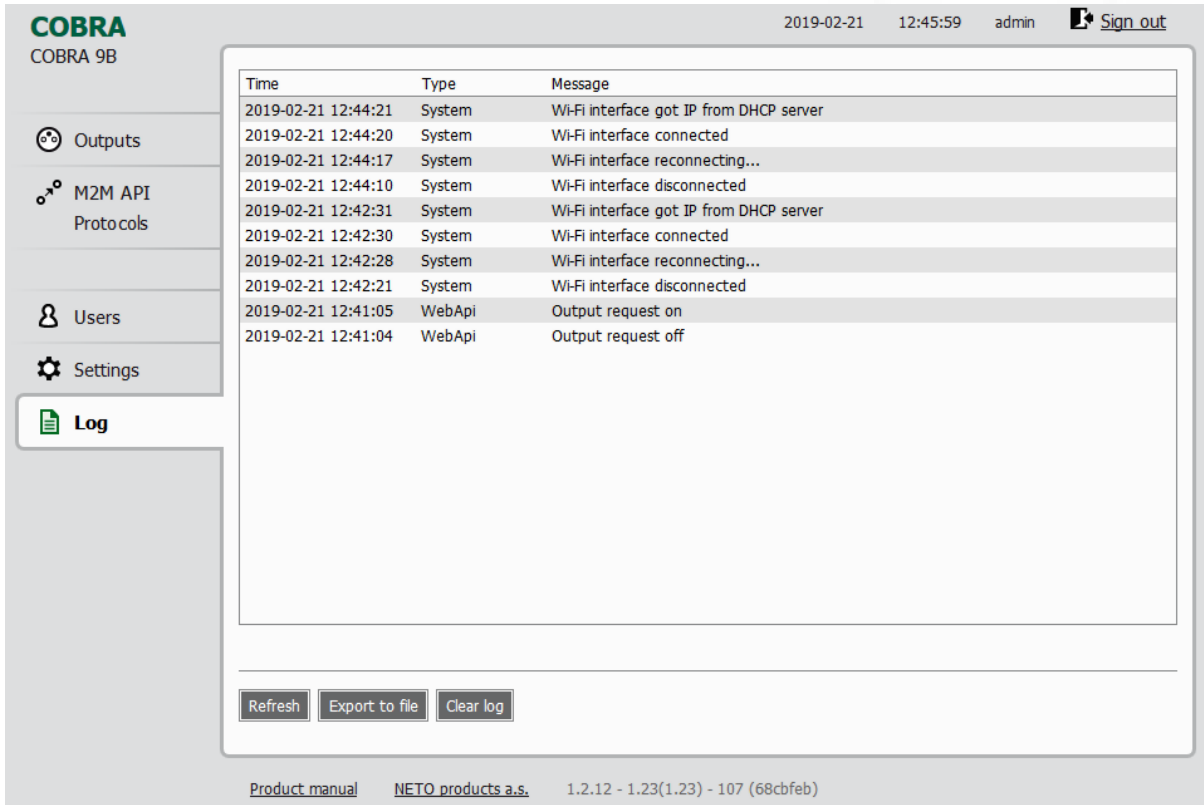
Figure 34 - System settings

Uptime	Time since the last restart of the device.
Firmware version	Currently installed firmware version and a link to the firmware download page.
Device name	Shown in NETIO Discover and under the device logo in the web administration (in the figure above: <i>PowerCable-70</i> under the PowerCable Modbus logo in the top left corner) CAUTION: This value is NOT propagated into the <i>hostname</i> parameter in the <i>Network Configuration</i> section.
HTTP port	Current http port. If the port number is different from 80, it has to be specified in the web browser after the PowerCable IP address, e.g.: 192.168.0.99:888
Enable Periodic device restart	Enables automatic restarting of the device.
Restart period	Specifies the interval for automatic device restarts. The restart does not affect the state of the output.


<i>Debug Log</i>	Adds a DebugLog section with diagnostic values to XML and JSON M2M API.
<i>Global Outputs PowerUp interval</i>	Delay in seconds between powering up the device and switching on the output.
<i>Save Changes</i>	Saves the changes.
<i>Locate</i>	Identifies a particular device. When clicked, the yellow LED no. 1 starts flashing with pauses.
<i>Reset Power Consumption Counter</i>	Resets the electricity consumption counters.
<i>Factory Reset Defaults</i>	Resets PowerCable to factory defaults. Follow section 3.1 to make the device operational again.
<i>Export and import device configuration</i>	<p>Can be used to back-up and restore device configuration. Do not modify the exported file!</p> <p>“Export configuration” - shows a confirmation dialog for exporting the device configuration and downloading it to your computer.</p> <p>“Browse” - opens a dialog to select a configuration file for import into the device.</p> <p>“Import configuration” - shows a confirmation dialog for importing the device configuration. After the import, the device restarts and the imported configuration takes effect.</p>

6.6 Log

In the left menu, select  **Log**.



COBRA
COBRA 9B

2019-02-21 12:45:59 admin  Sign out

Time	Type	Message
2019-02-21 12:44:21	System	Wi-Fi interface got IP from DHCP server
2019-02-21 12:44:20	System	Wi-Fi interface connected
2019-02-21 12:44:17	System	Wi-Fi interface reconnecting...
2019-02-21 12:44:10	System	Wi-Fi interface disconnected
2019-02-21 12:42:31	System	Wi-Fi interface got IP from DHCP server
2019-02-21 12:42:30	System	Wi-Fi interface connected
2019-02-21 12:42:28	System	Wi-Fi interface reconnecting...
2019-02-21 12:42:21	System	Wi-Fi interface disconnected
2019-02-21 12:41:05	WebApi	Output request on
2019-02-21 12:41:04	WebApi	Output request off

Refresh Export to file Clear log

Product manual NETO products a.s. 1.2.12 - 1.23(1.23) - 107 (68cbfeb)

Figure 35 - Event log

Refresh Reloads the log to show the most recent entries.

Export to file Exports the log in the html format.

Clear log Clears the log records.

The log contains 40 most recent events only and is cleared when the device is restarted.

Sources (types) of log entries:

System	Event generated by the system itself, e.g. WiFi reconnect
WebApi	Event related to a request from the web interface, e.g. User logged in
XML	M2M XML protocol
JSON	M2M JSON protocol
M2M URL	M2M URL API protocol
Modbus	M2M Modbus/TCP protocol
MQTT	M2M MQTT protocol
SNMP	M2M SNMP protocol
Web server	Web server, e.g. Client disconnected

7 PowerCable REST 101x

7.1 Overview

PowerCable REST WiFi controlled power socket by NETIO products
 Energy metering (kWh, A, W, V, Hz, TPF)
REST XML/JSON & URL API
 WiFi reconnect

Wi-Fi
 AP mode Installation
 POWER measurement
 XML REST HTTP
 JSON REST HTTP
 URL API HTTP
 WEB Access
 NFC pre-config
 ZCS Zero Current
 IOC Independent IO
 PowerUp state
 Industrial

UK Type G
 S: IEC-320 C13/C14
 CH Type J
 FR Type E
 DE (Type F) SCHUKO

Only one protocol can be active!

7.2 M2M API Protocol - XML (REST M2M API)

Available only in PowerCable REST 101x

PowerCable REST
PowerCable-20

1970-01-01 13:58:37 admin [Sign out](#)

XML API

Enable XML API

Port:

Enable READ-ONLY

Username:

Password:

Enable READ-WRITE

Username:

Password:

Test XML API:

Open XML API file (read password required)
<http://192.168.120.56/netio.xml>

Download example XML API file:

- [Set output 1 to ON](#)
- [Set output 1 to OFF](#)
- [Toggle output 1](#)

[Product manual](#) [NETIO products a.s.](#) 2.5.0 - 1.27(1.23) - 108 (0684819)

Figure 36 - XML API protocol configuration

Enable XML API	Enables M2M XML API functions in the system kernel.
Port	Read-only value. Indicates the port where the device currently listens for M2M XML API commands.
Enable READ-ONLY	Enables Read-Only access via M2M XML API for monitoring. You may also fill in the username and password for this mode.
Enable READ-WRITE	Enables Read/Write access for monitoring (reading values) and writing (output control). You may also fill in the username and password for this mode.
Username	Username for the respective access mode (Read-Only/ReadWrite). Note - this is unrelated to the username for accessing the NETIO 4x web administration interface. When left empty, the protocol will not require any authentication.
Password	Password for the corresponding username (Read-Only/ReadWrite).
Save Changes	Saves the changes.

When the XML API is enabled, other M2M protocols are disabled. After clicking **Save changes**, you will be asked to confirm the deactivation of the other protocols.

Enabling XML API will disable all other protocols. Continue?



Click **Confirm** to confirm the action or **Cancel** to return to the XML API protocol configuration.

For an example of reading the output state using XML API, click the "Test XML API - Open XML API file (read password required)" link.

After entering the username and password, you will receive an xml file with the PowerCable current state.

URL for downloading/uploading the netio.xml file: <http://<PowerCableIP>/netio.xml>
e.g. <http://192.168.120.75/netio.xml>

Example of the netio.xml file

```
<?xml version="1.0" encoding="utf-8"?>
<set:Root xmlns:set="http://www.netio-
products.com/XMLSchema/NETIO.xsd">
  <Agent>
    <Model>101x</Model>
    <DeviceName>PowerCable 6C</DeviceName>
    <OemID>5</OemID>
    <VendorID>0</VendorID>
    <Version>2.0.12</Version>
    <XmlVer>2.0</XmlVer>
    <SerialNumber>24:A4:2C:38:D4:6C</SerialNumber>
    <Uptime>6879</Uptime>
    <Time>1970-01-01T14:54:39+01:00</Time>
    <NumOutputs>1</NumOutputs>
  </Agent>
  <GlobalMeasure>
    <Voltage>240</Voltage>
    <Frequency>50.00</Frequency>
    <TotalCurrent>0</TotalCurrent>
    <TotalLoad>0</TotalLoad>
    <TotalEnergy>0</TotalEnergy>
    <OverallPowerFactor>1.00</OverallPowerFactor>
  </GlobalMeasure>
  <Outputs>
    <Output>
      <ID>1</ID>
      <Name>Power output 1</Name>
      <State>1</State>
      <Action>6</Action>
```

```

<Delay>2000</Delay>
<PowerFactor>1.00</PowerFactor>
<Load>0</Load>
<Current>0</Current>
<Energy>0</Energy>
</Output>
</Outputs>
</set:Root>

```

The following example XML files for controlling the device can be downloaded directly from the web administration:

- Set output 1 to ON
- Set output 1 to OFF
- Toggle output 1

Click **Download XML Schema (XSD)** to download the .xsd schema file.

The **Upload XML file to the device** button opens the following dialog for testing:

HTTP(s) file upload

Host:

Port: Method: **HTTP POST**

Username: Password:

Request #1 (e.g. set-output1-to-1.xml)
 No file selected

Request #2 (e.g. set-output1-to-0.xml)
 No file selected

Request #3 (e.g. toggle-output1.xml)
 No file selected

Response

Host - URL of the .xml file.

Port - port number used by the XML API protocol.

Username and Password - Username and password configured for the XML API protocol in the READ-WRITE section.

Request #1,2,3 – select .xml file(s) with commands to perform.

Send file - send the selected file(s).

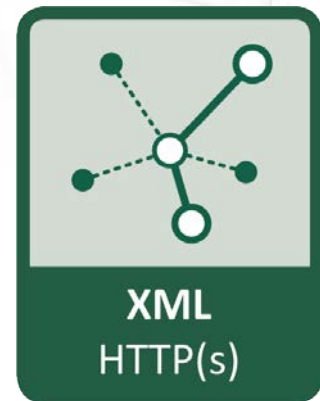
Response - response to the submitted command.

Close - closes the dialog window.

Figure 37 - Upload XML file dialog

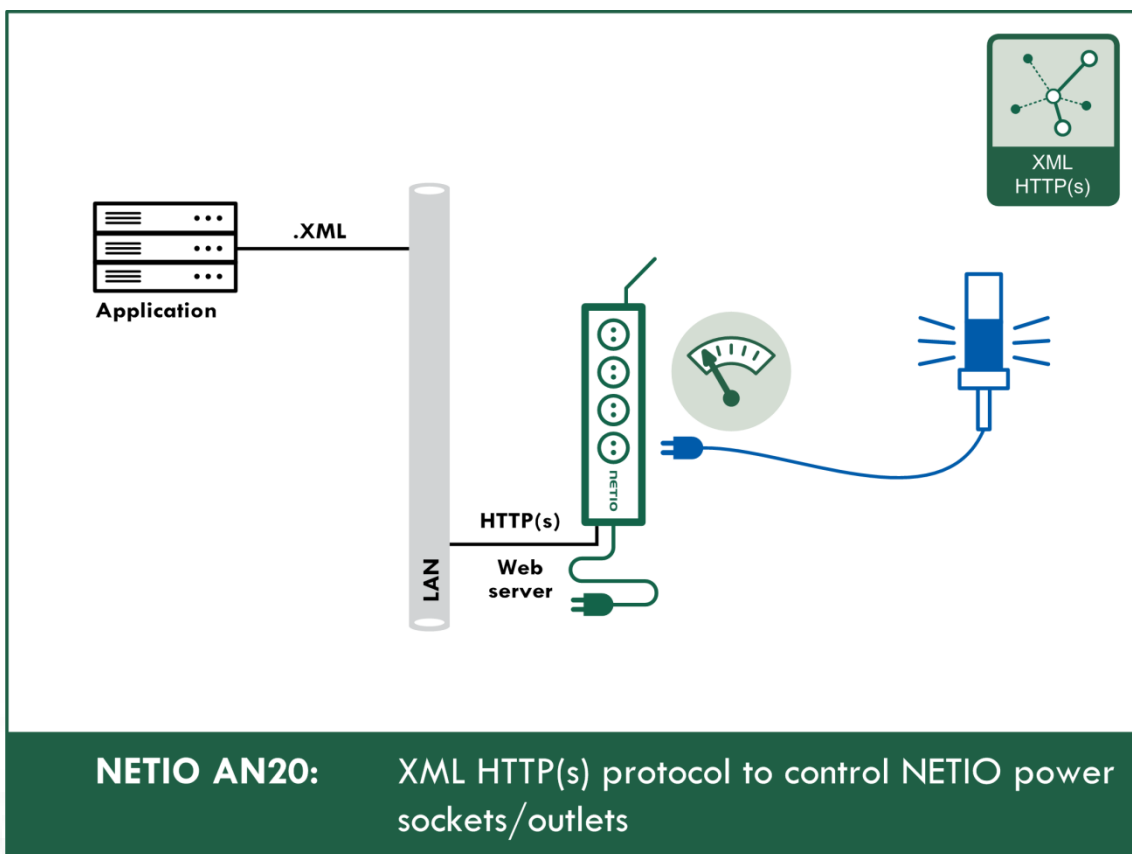
For the specifications of the M2M XML API protocol, visit the **Support > Download** section of our website and see the following document:

[XML - description of NETIO M2M API interface - PDF](#)



For more information and a practical demonstration of using the XML protocol with PowerCable smart sockets, see the following Application Note:

[AN20 XML HTTP\(s\) protocol to control NETIO smart power sockets 110/230V](#)



7.3 M2M API Protocol - JSON (REST M2M API)

Available only in PowerCable REST 101x

PowerCable REST 1970-01-01 14:00:33 admin [Sign out](#)

PowerCable-20

XML API

• **JSON API**

URL API

SNMP

Enable JSON API

Port:

Enable READ-ONLY

Username:

Password:

Enable READ-WRITE

Username:

Password:

Test JSON API:

Open JSON API file (read password required)
<http://192.168.120.56/netio.json>

Download example JSON API file:

- [Set output 1 to ON](#)
- [Set output 1 to OFF](#)
- [Toggle output 1](#)

[Product manual](#) [NETIO products a.s.](#) 2.5.0 - 1.27(1.23) - 108 (0684819)

Figure 38 - JSON API protocol configuration

Enable JSON API	Enables M2M JSON API functions in the system kernel.
Port	Read-only value. Indicates the port where the device currently listens for M2M JSON API commands.
Enable READ-ONLY	Enables Read-Only access via M2M JSON API for monitoring. You may also fill in the username and password for this mode.
Enable READ-WRITE	Enables Read/Write access for monitoring and output control. You may also fill in the username and password for this mode.
Username	Username for the respective access mode (Read-Only/ReadWrite). Note - this is unrelated to the username for accessing the PowerCable web administration. When left empty, the protocol will not require any authentication.
Password	Password for the corresponding username (Read-Only/ReadWrite).
Save Changes	Saves the changes.

When the JSON API protocol is enabled, other M2M protocols are disabled. After clicking **Save changes**, you will be asked to confirm the deactivation of the other protocols.

Enabling JSON API will disable all other protocols. Continue?



Click **Confirm** to confirm the action or **Cancel** to return to the JSON API protocol configuration.

For an example of reading the output state using JSON API, click the "Test JSON API: Open JSON API file (read password required)" link.

After entering the username and password, you will receive a json file with the PowerCable current state.

URL for downloading/uploading the netio.json file: <http://<PowerCableIP>/netio.json>
e.g. <http://192.168.120.75/netio.json>

Example of the netio.json file

```
{
  "Agent": {"Model": "101x", "DeviceName": "PowerCable
6C", "MAC": "24:A4:2C:38:D4:6C", "JSONVer": "2.0", "Time": "1970-01-
01T14:42:06+01:00", "Uptime": 6126, "Version": "2.0.12", "OemID": "5", "
VendorID": "0", "NumOutputs": 1},
  "GlobalMeasure": {"Voltage": 238, "TotalLoad": 0, "TotalEnergy": 0, "Ove
rallPowerFactor": 1.00, "Frequency": 50.0, "EnergyStart": "2018-05-
31T14:21:54+01:00"},
  "Outputs": [
    {"ID": 1, "Name": "Power output
1", "State": 1, "Action": 6, "Delay": 2000, "Current": 0, "PowerFactor": 1.
00, "Energy": 0, "Load": 0}
  ]
}
```

The following example json files for controlling the device can be downloaded directly from the web administration:

- Set output 1 to ON
- Set output 1 to OFF
- Toggle output 1

The Upload JSON file to the device button opens the following dialog for testing:

Host - URL of the .json file.

Port - port number used by the JSON protocol.

Username and Password - username and password configured for the JSON protocol in the READ-WRITE section.

Request #1,2,3 – select .json file(s) with commands to perform.

Send file - send the selected file(s).

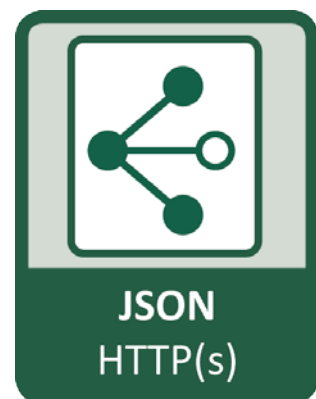
Response - response to the submitted command.

Close - closes the dialog window.

Figure 39 - Upload JSON file dialog

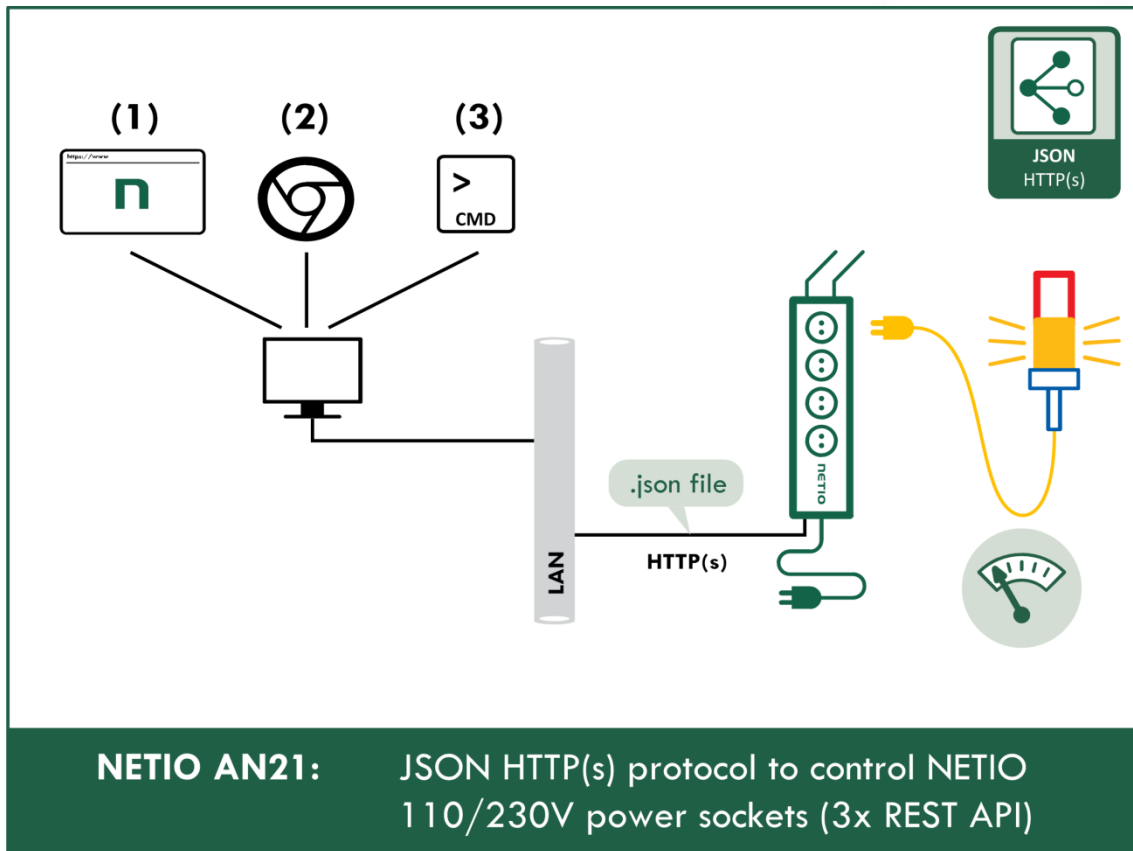
For more information about the M2M JSON API, visit the **Support > Download** section of our website and see the following document:

[JSON - description of NETIO M2M API interface - PDF](#)



For more information and a practical demonstration of using the JSON protocol with PowerCable smart sockets, see the following Application Note:

[AN21 JSON HTTP\(S\) protocol to control NETIO 110/230V power sockets \(3x REST API\)](#)



7.4 M2M API Protocol - URL-API (REST M2M API)

Available only in PowerCable REST 101x

Figure 40 -URL API protocol configuration

Enable URL API	Enables M2M URL API functions in the system kernel.
Port	Read-only value. Indicates the port where the device currently listens for M2M URL API commands.
Enable READ-WRITE	Enables READ-WRITE access.
Password	Password to authenticate HTTP GET communication (pass attribute in the request).
Save Changes	Saves the changes.

When the URL API is enabled, other M2M protocols are disabled. After clicking **Save changes**, you will be asked to confirm the deactivation of the other protocols.

Enabling URL API will disable all other protocols. Continue?

Click **Confirm** to confirm the action or **Cancel** to return to the URL API protocol configuration.

For an example of toggling output no. 1 using the M2M URL API, click the link under **Test URL API**.

This opens a new browser tab and invokes the following HTTP GET request:

`http://<PowerCableIP>/netio.cgi?pass=<Password>&output1=4`

e.g. `http://192.168.120.75/netio.cgi?pass=netio&output1=4`

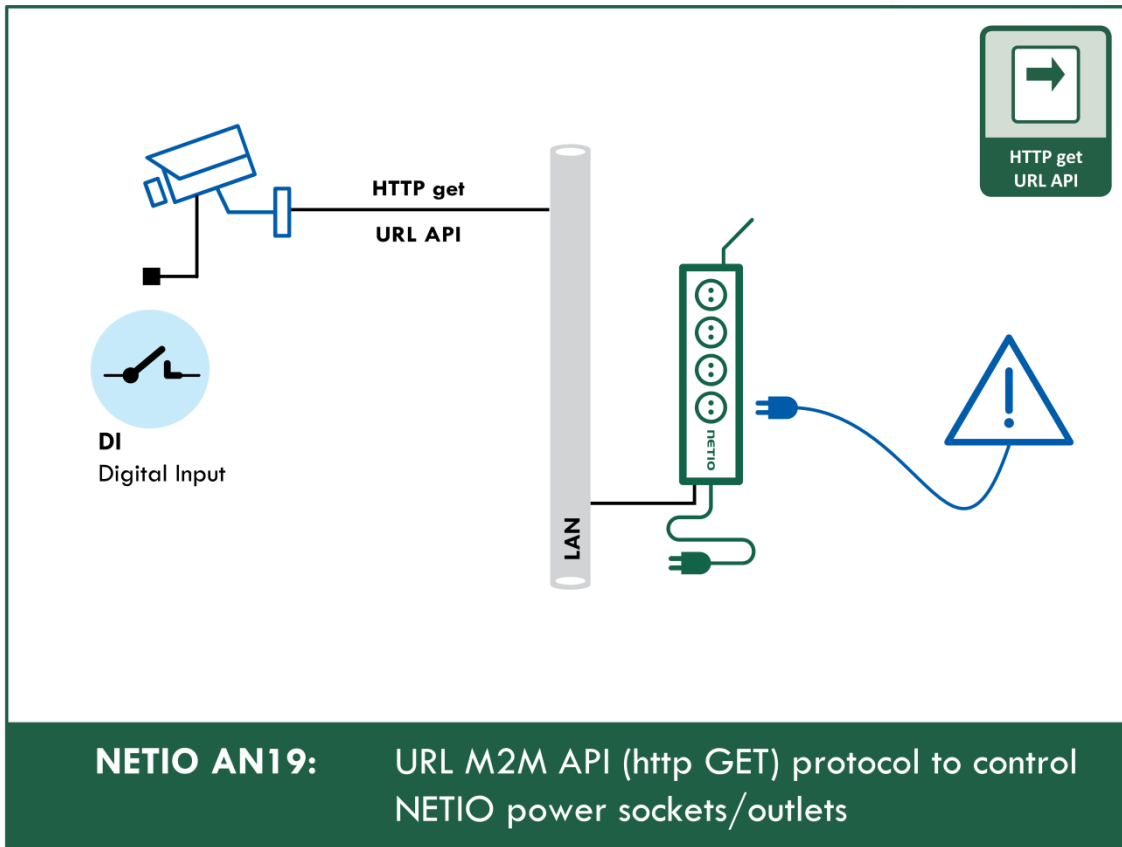
For more information about the M2M URL API, visit the **Support > Download** section of our website and see the following document:

[URL API - description of NETIO M2M API interface - PDF](#)



For more information and a practical demonstration of using the URL-API protocol with PowerCable smart sockets, see the following Application Note:

[AN19 URL API \(http GET\) protocol to control NETIO 4x power sockets/outlets 110 / 230V](#)



7.5 M2M API Protocol - SNMP

SNMP is available from FW version 2.6.0 in these devices as one of M2M protocols:

- PowerCable REST 101x
- PowerCable Modbus 101x
- PowerCable MQTT 101x.

PowerCable REST
PowerCable-20

1970-01-01 14:04:56 admin Sign out

XML API
JSON API
URL API
• SNMP

Enable SNMP

SNMP version: 1,2c

Location: Unknown

Community READ: public

Community WRITE: private

Save Changes

Download MIB file

Product manual NETIO products a.s. 2.5.0 - 1.27(1.23) - 108 (0684819)

Figure 40a - SNMP API protocol configuration

Enable SNMP	Enables M2M SNMP API functions in the system kernel. The port is 161.
SNMP version	1,2c - unsecured, unencrypted.
Location	Define system location (sysLocation).
Community READ	Also called the “community string” in SNMP. Similar to a username/password combination. Needed for reading information from PowerCable over SNMP. We recommend to use “pure” ASCII characters (that is, to avoid accented and special characters, such as @, & and so on, if possible).
Community WRITE	Also called the “community string” in SNMP. Similar to a username/password combination. Needed for writing commands to PowerCable over SNMP. We recommend to use “pure” ASCII characters (that is, to avoid accented and special characters, such as @, & and so on, if possible).

Save Changes

Saves the changes.

Download MIB file

Use this button tu download MIB.

When the SNMP API is enabled, other M2M protocols are disabled. After clicking **Save changes**, you will be asked to confirm the deactivation of the other protocols.

Enabling URL API will disable all other protocols. Continue?



Click **Confirm** to confirm the action or **Cancel** to return to the SNMP API protocol configuration.

The MIB can be downloade from a device web administrator as described above.

Following standard MIBs are also required:

- SNMPv2-SMI
- SNMPv2-TC

Monitoring (read)

Object OID	Type	Value example	Note
netioOutputID.1.0 1.3.6.1.4.1.47952.1.1.1.1.1.0	INTEGER	1	
netioOutputName.1.0 1.3.6.1.4.1.47952.1.1.1.2.1.0	STRING	output_1	Based on user defined name
netioOutputState.1.0 1.3.6.1.4.1.47952.1.1.1.3.1.0	INTEGER	off(0), on(1)	
netioOutputStateString.1.0 1.3.6.1.4.1.47952.1.1.1.4.1.0	STRING	"off", "on"	
netioOutputLoad.1.0 1.3.6.1.4.1.47952.1.1.1.25.1.0	INTEGER	24	[W]
netioOutputEnergy.1.0 1.3.6.1.4.1.47952.1.1.1.26.1.0	INTEGER	13	[Wh]
netioOutputEnergyStart.1.0 1.3.6.1.4.1.47952.1.1.1.27.1.0	DateAndT ime	2017-6- 23,5:47:3.0,+0: 0	Initial date and time. UTC based *1
netioOutputCurrent.1.0 1.3.6.1.4.1.47952.1.1.1.28.1.0	INTEGER	195	[mA]
netioOutputPowerFactor.1.0 1.3.6.1.4.1.47952.1.1.1.29.1.0	INTEGER	534	Current power factor * 1000
netioVoltage.0 1.3.6.1.4.1.47952.1.2.1.0	INTEGER	239100	Voltage in the power grid [mV]
netioFrequency.0 1.3.6.1.4.1.47952.1.2.2.0	INTEGER	49900	Frequency in the power grid [mHz]

netioTotalCurrent.0 1.3.6.1.4.1.47952.1.2.3.0	INTEGER	195	[mA]
netioOverallPowerFactor.0 1.3.6.1.4.1.47952.1.2.4.0	INTEGER	534	Current power factor * 1000
netioTotalLoad.0 1.3.6.1.4.1.47952.1.2.5.0	INTEGER	24	[W]
netioTotalEnergy.0 1.3.6.1.4.1.47952.1.2.6.0	INTEGER	13	[Wh]
netioEnergyStart.0 1.3.6.1.4.1.47952.1.2.7.0	DateAndTime	2017-6-23,5:47:3.0,+0:0	Initial date and time. UTC based

Control (write)

Object OID	Type	Value	Action
netioOutputAction.1.0 1.3.6.1.4.1.47952.1.1.1.5.1.0	INTEGER (i)	0 1 2 3 4 5	Turn OFF Turn ON Short OFF delay (restart) Short ON delay Toggle (invert the state) No change

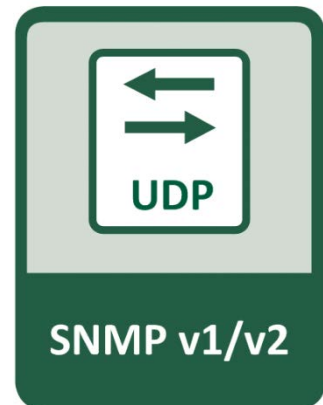
For more information about the M2M SNMP API, visit the [Support > Download](#) section of our website and see the following document:

[SNMP API - description of NETIO M2M API interface - PDF](#)

Note: There are differences compare to description in PDF:

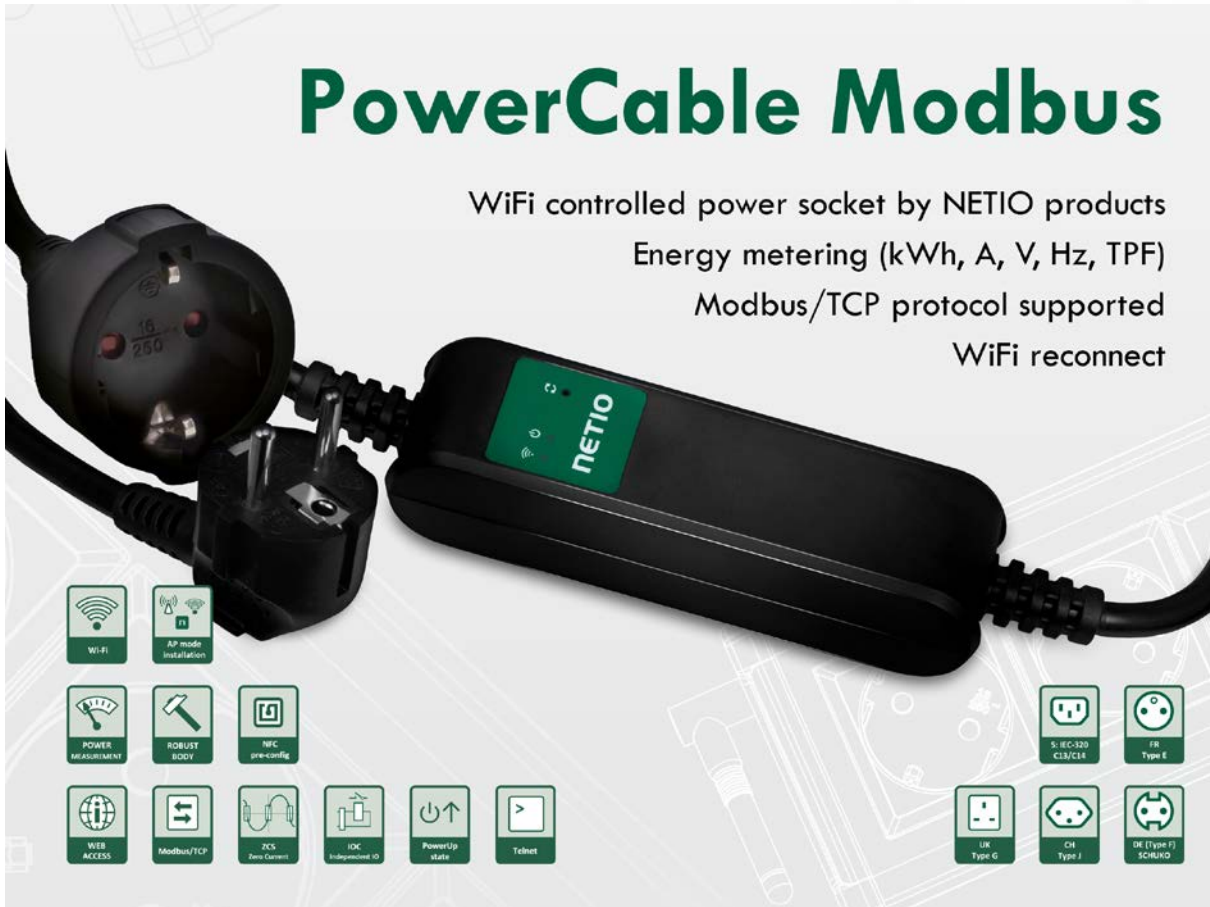
- PowerCable can be controlled over SNMP v1/2c
- All Objects/OIDs have added ".0" at the end (the tables on this and previous page contain correct/full Objects/OIDs).

Please contact NETIO support in case of questions.



8 PowerCable Modbus 101x

8.1 Overview



PowerCable Modbus

WiFi controlled power socket by NETIO products
 Energy metering (kWh, A, V, Hz, TPF)
 Modbus/TCP protocol supported
 WiFi reconnect

WiFi
 AP mode installation
 POWER MEASUREMENT
 ROBUST BODY
 NFC pre-config
 WEB ACCESS
 Modbus/TCP
 ZCS Zero Current
 IOC Independent ID
 PowerUp state
 Tcbnet
 UK Type G
 S: IEC-320 C13/C14
 FR Type E
 CH Type J
 DE (Type F) SCHUKO

Only one protocol can be active!

8.2 M2M API Protocol - Modbus/TCP

Available only in PowerCable MODBUS 101x

The screenshot shows the 'PowerCable Modbus' configuration interface for device 'PowerCable-70'. The user is logged in as 'admin' at '1970-01-01 13:05:14'. The 'M2M API Protocols' section is active, showing the 'Modbus/TCP' configuration page. The configuration includes:

- Enable Modbus/TCP
- Port: 502
- Last access IP: 0.0.0.0 (with a Refresh button)
- Enable IP filter
- IP from: 0.0.0.0
- IP to: 0.0.0.0
-

 At the bottom, there are links for 'Product manual', 'NETIO products a.s.', and version information '2.1.0 - 1.23(1.23) - 108 (2593fed)'.

Figure 41 -Modbus/TCP protocol configuration

Enable Modbus/TCP	Enables M2M Modbus/TCP functions in the system kernel.
Port	Specific port for Modbus/TCP only, range 1 - 65535. The device alerts you if you specify a port number that is already occupied. However, to be sure, we recommend using port numbers above 1024.
Last access IP	Read-only value indicating the IP address from which the last Modbus/TCP command was received. The "Refresh" button updates this value.
Enable IP filter	To improve security, the IP filter can be used to specify a range of IP addresses from which Modbus/TCP commands are accepted. Commands from addresses outside of this range will be ignored.
Save Changes	Saves the changes.

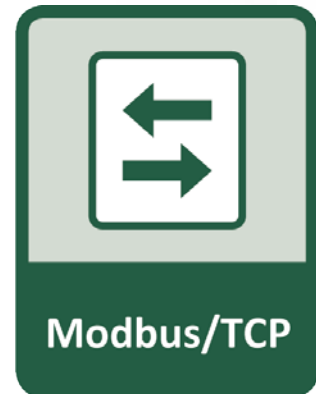
Function	Register	Value	Description
0x01	101	0/1	1st output state

0x01	102	0/1	2nd output state
0x01	103	0/1	3rd output state
0x01	104	0/1	4th output state
0x03	0	uInt16	Number of digital inputs
0x03	1	uInt16	Number of digital outputs
0x03	2	uInt16	Number of measured digital outputs
0x03	101	uInt16	1st output state
0x03	102	uInt16	2nd output state
0x03	103	uInt16	3rd output state
0x03	104	uInt16	4th output state
0x03	201	uInt16	"Short" delay of 1st output [s*10]
0x03	202	uInt16	"Short" delay of 2nd output [s*10]
0x03	203	uInt16	"Short" delay of 3rd output [s*10]
0x03	204	uInt16	"Short" delay of 4th output [s*10]
0x05	101	0/1	Turn On/Off 1st output
0x05	102	0/1	Turn On/Off 2nd output
0x05	103	0/1	Turn On/Off 3rd output
0x05	104	0/1	Turn On/Off 4th output
0x06	101	uInt16	Set action to 1st output
0x06	102	uInt16	Set action to 2nd output
0x06	103	uInt16	Set action to 3rd output
0x06	104	uInt16	Set action to 4th output
0x06	201	uInt16	Set "Short" delay of 1st output [s*10]
0x06	202	uInt16	Set "Short" delay of 2nd output [s*10]
0x06	203	uInt16	Set "Short" delay of 3rd output [s*10]
0x06	204	uInt16	Set "Short" delay of 4th output [s*10]
0x04	0	uInt16	Power grid frequency [Hz*100]
0x04	1	uInt16	Voltage [V*10] - RMS
0x04	2	uInt16	TruePowerFactor * 1000
0x04	100	uInt16	All outputs current [mA]
0x04	101	uInt16	1st output current [mA]
0x04	102	uInt16	2nd output current [mA]
0x04	103	uInt16	3rd output current [mA]
0x04	104	uInt16	4th output current [mA]
0x04	200	uInt16	All outputs power [W]
0x04	201	uInt16	1st output power [W]
0x04	202	uInt16	2nd output power [W]
0x04	203	uInt16	3rd output power [W]
0x04	204	uInt16	4th output power [W]
0x04	300	uInt16	All outputs energy counter - 2 upper bytes[Wh]
0x04	301	uInt16	All outputs energy counter - 2 lower bytes[Wh]
0x04	302	uInt16	1st output energy counter - 2 upper bytes [Wh]
0x04	303	uInt16	1st output energy counter - 2 lower bytes [Wh]
0x04	304	uInt16	2nd output energy counter - 2 upper bytes [Wh]

0x04	305	uInt16	2nd output energy counter - 2 lower bytes [Wh]
0x04	306	uInt16	3rd output energy counter - 2 upper bytes [Wh]
0x04	307	uInt16	3rd output energy counter - 2 lower bytes [Wh]
0x04	308	uInt16	4th output energy counter - 2 upper bytes [Wh]
0x04	309	uInt16	4th output energy counter - 2 lower bytes [Wh]

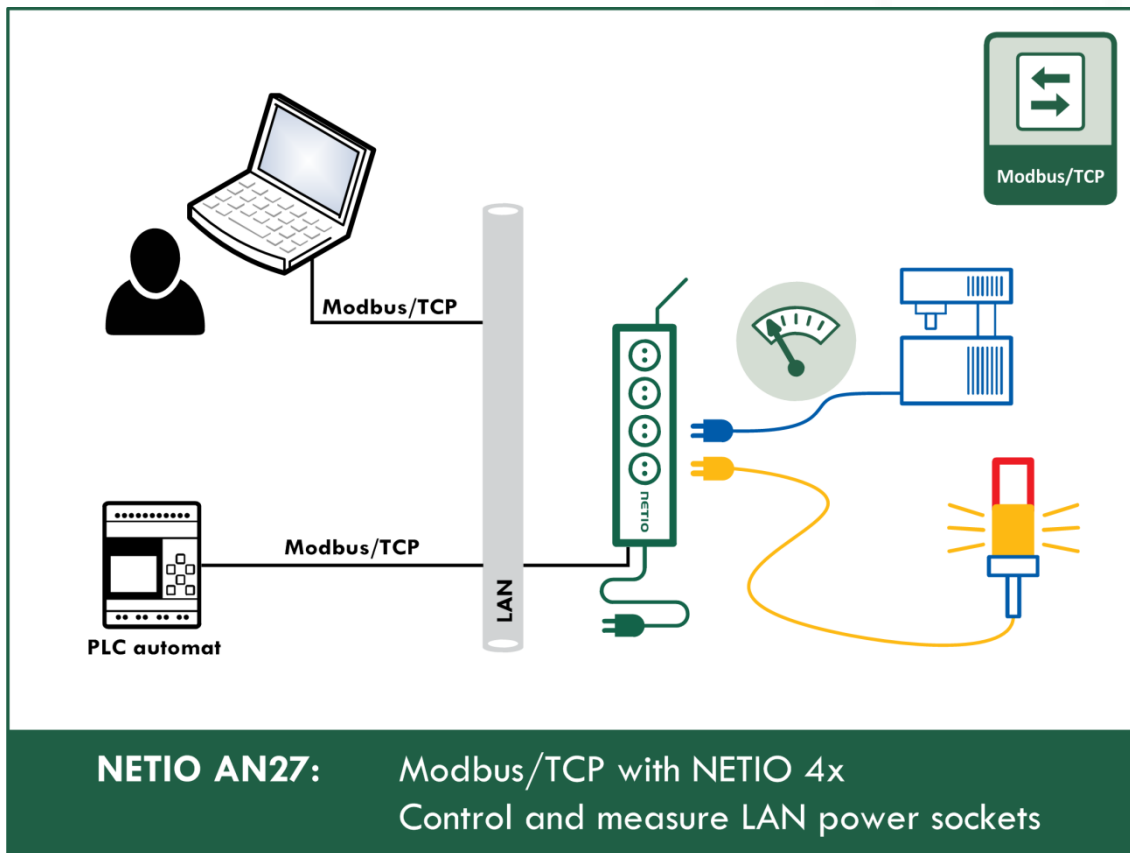
For more information about the M2M Modbus/TCP protocol, visit the **Support > Download** section of our website and see the following document:

[Modbus / TCP - description of NETIO M2M API interface - PDF](#)



For more information and a practical demonstration of using the Modbus/TCP protocol with PowerCable smart sockets, see the following Application Note:

[AN27: Modbus/TCP with NETIO 4x - Control and measure LAN power sockets](#)



8.3 M2M API Protocol - Telnet

Available only in PowerCable MODBUS 101x

Figure 42 -Telnet protocol configuration

Enable Telnet	Enables M2M Telnet functions in the system kernel.
Port	Specific port for Telnet only, range 1 - 65535. Be aware, that you should enter value, which is not already occupied by another M2M protocol or web interface.
Enable READ-ONLY	Enables Read-Only access via M2M Telnet API for monitoring. You may also fill in the username and password for this mode.
Enable READ-WRITE	Enables Read/Write access for monitoring and output control. You may also fill in the username and password for this mode.
Username	Username for the respective access mode (Read-Only/ReadWrite). Note - this is unrelated to the username for accessing the PowerCable web administration. When left empty, the protocol will not require any authentication.
Password	Password for the corresponding username (Read-Only/ReadWrite).
Save Changes	Saves the changes.

Telnet connection to a PowerCable device IP address and its Telnet port

When the connection is established, the PowerCable device returns the following response and is ready to receive commands.

Telnet welcome message

```
100 HELLO B166A626 - KSHHELL V2.0
```

Note: The Telnet connection is automatically terminated after 60 seconds of inactivity. It is possible to use the *noop* command to keep the connection alive for the next 60 seconds.

Command set

Command	Description
login <username> <password>	Log in a user. Replace <username> and <password> by the equivalent attributes defined in the Telnet protocol configuration (Figure 42) <password> Example - log in with username <i>netio</i> and password <i>passwd</i>: login netio passwd
quit	Log out and terminate Telnet connection.
noop	Keep the Telnet connection alive for the next 60 seconds. No-operation
port list	Returns state of output. port list 250 1 (output is ON)
port <output> <action>	Control the output. <output> is replaced by the output number (1) <action> is replaced by a parameter described below If no <action> is provided, the state of the output is returned.

Each command must be followed by CR and LF characters (hexadecimal 0D and 0A). Typically, you can use Enter in the terminal.

Parameters <action> for *port* command

Parameter	Action
0	Turn OFF
1	Turn OFF
2	Short OFF delay (restart)
3	Short ON delay
4	Toggle (invert the state)
5	No change

Command examples

Switch power output 1 to ON:

```
port 1 1
```

Switch power output 1 to OFF:

```
port 1 0
```

Toggle power output 1:

```
port 1 4
```

Status codes

Status code	Description
130 CONNECTION TIMEOUT	No command submitted for longer than 60 seconds. The Telnet connection is terminated.
250 OK	The command is accepted.
500 INVALID VALUE	The command parameter is not valid.
501 INVALID PARAMETR	The command parameter is not valid.
502 UNKNOWN COMMAND	The command is not valid.
505 FORBIDDEN	An attempt to make an action with not sufficient permission (i.e.: control output with read only user, try to monitor output state with non-logged user, where ReadOnly user is password protected etc.)
510 OUT OF RANGE	Specified value is not valid (i.e. trying to control port 4 on device, which has only 1 socket)

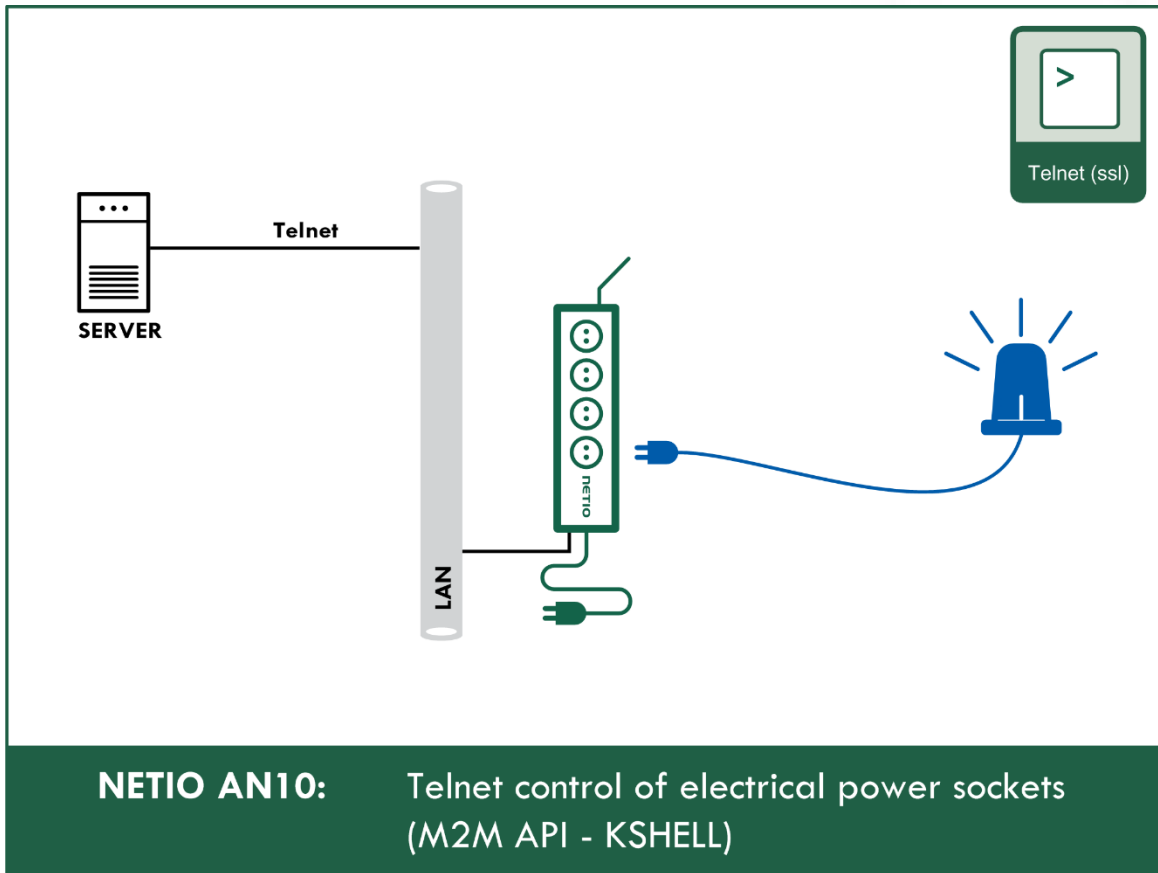
For more information about the Telnet protocol, visit the **Support > Download** section of our website and see the following document:

[Telnet - description of NETIO M2M API interface - PDF](#)



For more information and a practical demonstration of using the Modbus/TCP protocol with PowerCable smart sockets, see the following Application Note:

[AN10 Telnet control of electrical power sockets \(M2M API - KSHELL\)](#)



8.4 M2M API Protocol - SNMP

See the description in section [7.5](#)

9 PowerCable MQTT 101x

9.1 Overview

PowerCable MQTT WiFi controlled power socket by NETIO products
 Energy metering (kWh, A, W, V, Hz, TPF)
MQTT with user definable structure
 WiFi reconnect

Features and capabilities shown in the image:

- Wi-Fi
- AP mode Installation
- POWER measurement
- MQTT
- WEB Access
- NFC pre-config
- ZCS Zero Current
- IOC Independent IO
- PowerUp state
- Industrial
- UK Type G
- S: IEC-320 C13/C14
- CH Type J
- FR Type E
- DE (Type F) SCHUKO

Only one protocol can be active!

9.2 M2M API Protocol - MQTT-flex

Available only in PowerCable MQTT 101x

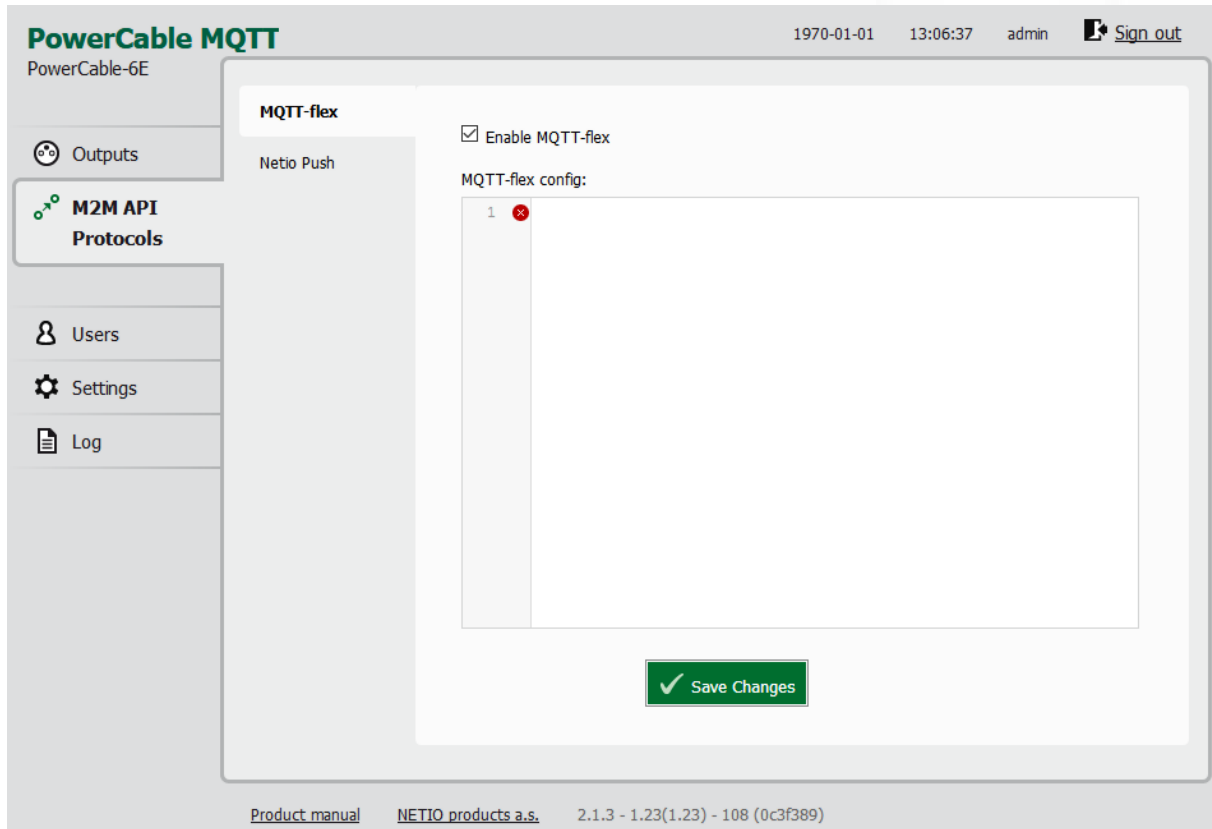


Figure 43 - MQTT-flex protocol configuration

Enable MQTT-flex	Enables MQTT-flex functions in the system kernel.
MQTT-flex Config:	Text area for entering the MQTT-flex configuration.
Save Changes	Saves the changes.

PowerCable MQTT 101x uses json to define the MQTT-flex structure (MQTT-flex Config). Both subscribe and publish topics can be defined. Publish topics may include actions that initiate a transmission.

MQTT-flex configuration example:

```
{
  "config":{
    "broker":{
      "type":"generic",
      "protocol":"mqtt",
      "ssl":"false",
      "url":"broker.hivemq.com",
      "port":1883,
      "username":"","",
      "password":""
    },
    "subscribe":[
      {
        "topic":"netio/${DEVICE_NAME}/output/1/action",
        "qos":0,
        "target":"OUTPUTS/1/ACTION",
        "action":"${payload}"
      },
      {
        "topic":"netio/${DEVICE_NAME}/output/1/delay",
        "qos":0,
        "target":"OUTPUTS/1/DELAY",
        "action":"${payload}"
      }
    ],
    "publish":[
      {
        "topic":"netio/${DEVICE_NAME}/output/1/voltage",
        "qos":0,
        "retain":false,
        "payload":"${OUTPUTS/1/VOLTAGE} V",
        "events":[
          {
            "type":"delta",
            "source":"OUTPUTS/1/VOLTAGE",
            "delta":40
          },
          {
            "type":"timer",
            "period":3600
          }
        ]
      },
      {
        "topic":"netio/${DEVICE_NAME}/output/1/state",
        "qos":0,
        "retain":true,
        "payload":"${OUTPUTS/1/STATE}",
        "events":[
          {
            "type":"change",
            "source":"OUTPUTS/1/STATE"
          }
        ]
      }
    ]
  }
}
```

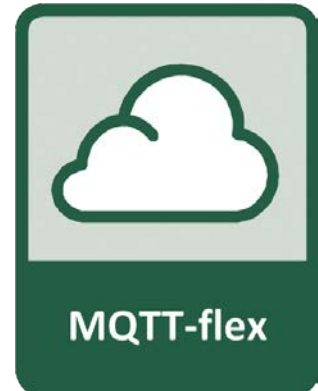


For more information about the M2M MQTT-flex API, visit the **Support > Download** section of our website and see the following document:

[MQTT-flex - description of NETIO M2M API interface - PDF](#)

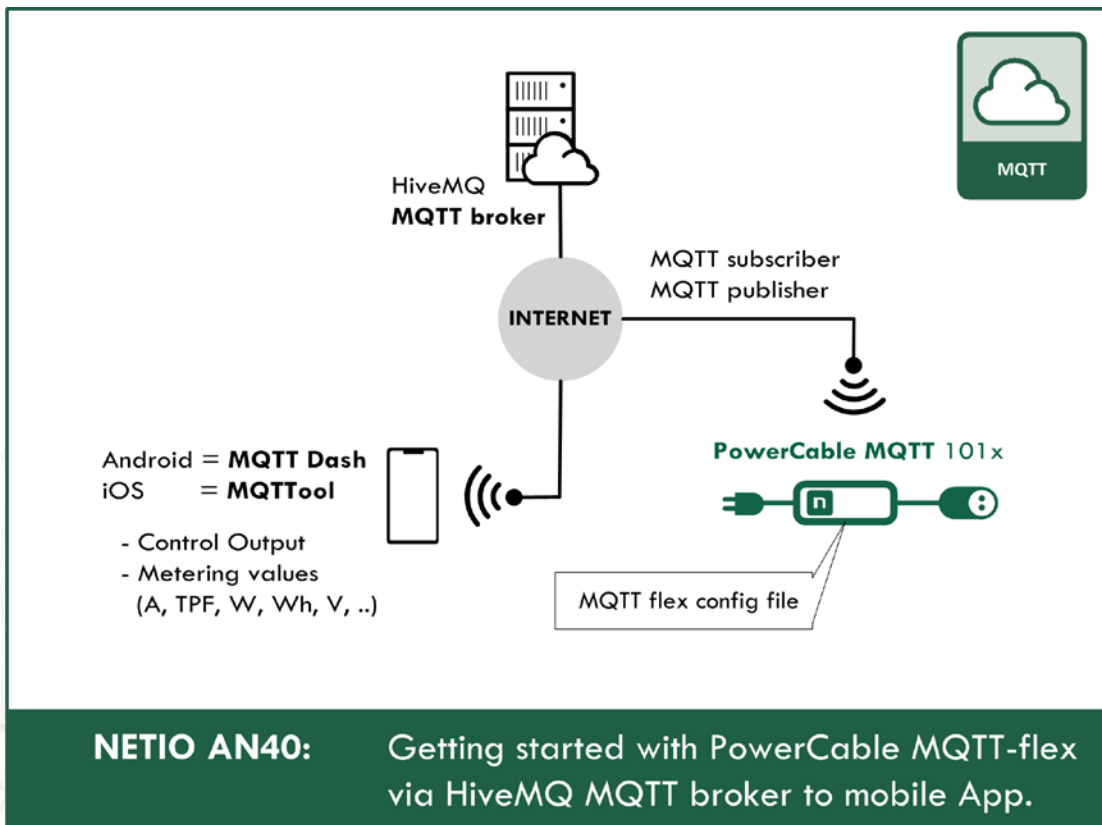
There are wide options for subscribe and publish sections and its possibilities expand over the time.

You will find details and examples at our online resource center: <https://wiki.netio-products.com/index.php?title=MQTT-flex>



For more information and a practical demonstration of using the MQTT protocol with PowerCable smart sockets, see the following Application Note:

[AN40 Getting started with PowerCable MQTT-flex via HiveMQ MQTT broker to mobile App](#)



9.3 M2M API Protocol - Netio Push

Available only in PowerCable MQTT 101x

The screenshot shows the 'Netio Push' configuration page in the PowerCable MQTT interface. The page is titled 'MQTT' and 'Netio Push'. It includes a sidebar with navigation options: Outputs, M2M API Protocols, Users, Settings, and Log. The main content area contains the following configuration options:

- Enable Netio Push
- Target host HTTP server:
- Push Period: 0 hrs, 1 min, 0 sec
- Auto Push (delta): mA
- Protocol:
-
-

At the bottom of the page, there are links for 'Product manual', 'NETIO products a.s.', and version information '2.1.0 - 1.23(1.23) - 108 (2593fed)'.

Figure 44 -Netio Push protocol configuration

Enable Netio Push

Enables Netio Push functions in the system kernel.

Target host HTTP server:

Defines the parameters of the target:

- http / https to specify the protocol
- Target URL
- Port
- Username
- Password

Example: `https://username:password@test.example.com:80/push`

Push Period

Period for the automatic sending of data (Push), in seconds.

Auto Push (delta)

Data will be immediately sent (Push) if a measured value exceeds this limit.

Parameter - at this time, only Current

Value - limit value for the selected parameter

Protocol

Selects the payload format.

- JSON

- XML

Save Changes

Saves the changes.

Data (payload - JSON/XML) are automatically periodically sent to the target address using HTTP(s), depending on the configured push period.

For more information about the M2M HTTP(s) Push API, visit the **Support** > **Download** section of our website and see the following document:

[HTTP\(s\) Push XML/JSON - description of NETIO M2M API interface - PDF](#)



9.4 M2M API Protocol - SNMP

See the description in section [7.5](#)

10 PowerCable OEM DevKit 101x

10.1 Overview

PowerCable OEM

WiFi controlled power socket for by NETIO products
Energy metering (kWh, A, W, V, Hz, TPF)
Product for your OEM projects

Supported protocols and features:

- Wi-Fi
- Modbus/TCP
- ZCS Zero Current
- WEB ACCESS
- POWER MEASUREMENT
- AP mode Installation
- PowerUp state
- NFC pre-config
- HTTps
- JSON HTTP
- MQTT
- Push JSON
- Push XML
- Telnet
- XML HTTP
- IOC Independent IO
- SI IEC 320 C13/C14
- CH Type J
- UK Type G
- FR Type E
- US (Type B) NEMA 5-15
- DE (Type F) SCHUKO

PowerCable OEM DevKit is ideal for use by developers to test functionalities of selected M2M protocols with own system.

It supports all available M2M protocols according to previous chapters.

Only one protocol can be active!

10.2 OEM - custom modifications (customizations)

For more information about OEM use, please contact us.

We can offer several options of customizations to support your specific needs.

- a) **Gray customization** In most of the M2M protocols is the Vendor ID tag. Default value is 0 or empty tag. We can provide you unique number for this tag and deliver you products with your number inside this tag. No other changes from standard PowerCable xxx 101x products.
 - 1) You can define Vendor ID tag and use one of defined M2M protocols.

- b) **Green OEM customization** Simple customization with your own device name and device web configuration. Defined product name will be listed on the website, bottom green label and on the paper box.
 - 1) You can define Vendor ID tag and use one of defined M2M protocols.
 - 2) Defined product name on the device website - left top corner.
 - 3) Defined links on the website, AP mode device name.
 - 4) Customer product name can be listed on the predefined bottom green label.
 - 5) If you will be interested in using our single paper-box, there can be your logo and device name on the sticker and EAN.
 - 6) You can define all Pxx parameters of the device web configuration. You can also predefine WiFi credentials for the first connection to the WiFi network.
 - 7) You can define your own printed manual inserted to the package or use / modify our standard printed QIG.
 - 8) NETIO products a.s. as manufacture will provide you CE declaration of conformity. You can also declare it by your own based on our measurement protocols.

- c) **Black customization** Similar to Green customization, but NETIO products a.s. will be hidden as device manufacture from the device label. Defined product name will be listed on the website, bottom black label without NETIO as manufacture and on the paper box. All CE certification items stay as predefined. You can use our measurements protocols to declare CE declaration of conformity by your own under your name.
 - 1) You can define Vendor ID tag and use one of defined M2M protocols.
 - 2) Defined product name on the device website - left top corner.
 - 3) Defined links on the website, AP mode device name.
 - 4) Customer product name can be listed on the predefined bottom green label.
 - 5) If you will be interested in using our single paper-box, there can be your logo and device name on the sticker and EAN.
 - 6) You can define all Pxx parameters of the device web configuration. You can also predefine WiFi credentials for the first connection to the WiFi network.
 - 7) You can define your own printed manual inserted to the package or use / modify our standard printed QIG.
 - 8) Customer is declared as manufacture. Customer issue CE declaration of conformity. NETIO products a.s. will provide you the measurement protocols as real device manufacture. There are no changes in mandatory items, the model name 101x will stay there, so Customer can also declare CE based on NETIO's measurement protocols.

- d) **Full customization** We can provide you any development, labels customization or another M2M protocols. Contact us for more details.

11 DECLARATION OF CONFORMITY (RED CE)

Manufacturer: NETIO products a.s.
Address: U Pily 3/103
 143 00 Praha 4, Czech Republic
Product / type: 101x - where "x" define a socket/plug variant:
 E FR
 F DE
 J Swiss
 S IEC320 C13/C14
 L Italy
 G UK
 H Israel
 T IEC320 C19/C20

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object of the declaration: "Extension socket NETIO PowerCable 101x controlled and monitored over the WiFi / LAN network".

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

- NV 426/2016 Sb. including amendments
- RED CE (Radio Equipment Directive) - 2014/53/EU - including amendments
 - ETSI EN 300 328 V2.1.1, EN 62311:2008, ETSI EN 301 489-1 V2.2.0
 - EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013

References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:

- Article 3.1 a) Health and safety
- Article 3.1 b) Electromagnetic compatibility
- Article 3.2 Effective use of radio spectrum

Additional information:

- Test Report No.: EZÚ 700026-01/06 of 31.1.2018
- Test Report No.: EZÚ 700026-01/09 of 31.1.2018

RoHS:

The product mentioned above to which this declaration relates is in conformity with the essential requirements and other relevant requirements of the Directive 2011/65/EU (restriction of the use of certain hazardous substances in electrical and electronic equipment).

The product mentioned above is in conformity with the following standards and/or other normative documents: EN 50581:2012

Czech Republic, Prague, 11.6.2018

Jan Řehák, Chief of the board



12 NETIO products overview

	LAN (RJ45)	WiFi / Antenna	IQRF 868MHz	Output Type	Switched outputs	Metered outputs	DI Inputs	Power	Button(s) / LED	NFC	Industrial features	Power-Up state
PowerPDU 4C	2x	-	-	C13	4	4	-	110/230V / 10A	4 / 4	-	ZCS, RS232	Yes
PowerPDU 4PS	1	-	-	C13	4	-	-	110/230V / 10A	1 / 4	-	ZVS	Yes
PowerDIN 4PZ	1	Int.	-	Terminal block	4	2	2x (SO)	110/230V / 16A	1 / 4	Yes	ZCS	Yes
PowerBOX 3PE	1	-	-	FR	3	-	-	230V / 16A	1 / 0	-	ZVS	Yes
PowerBOX 3PF	1	-	-	DE	3	-	-	230V / 16A	1 / 0	-	ZVS	Yes
PowerBOX 3PG	1	-	-	UK	3	-	-	230V / 16A	1 / 0	-	ZVS	Yes
PowerCable Modbus 101E	-	Int.	-	FR	1	1	-	230V / 16A	1 / 1	Yes	ZCS	Yes
PowerCable Modbus 101F	-	Int.	-	DE	1	1	-	230V / 16A	1 / 1	Yes	ZCS	Yes
PowerCable Modbus 101J	-	Int.	-	CH	1	1	-	230V / 10A	1 / 1	Yes	ZCS	Yes
PowerCable Modbus 101G	-	Int.	-	UK	1	1	-	230V / 13A	1 / 1	Yes	ZCS	Yes
PowerCable Modbus 101S	-	Int.	-	C13	1	1	-	110/230V / 10A	1 / 1	Yes	ZCS	Yes
PowerCable IQRF 901E	-	-	Yes	FR	1	1	-	230V / 16A	1 / 1	-	ZCS	-
PowerCable IQRF 901F	-	-	Yes	DE	1	1	-	230V / 16A	1 / 1	-	ZCS	-
NETIO 4 DE	1	Fixed	-	DE	4	-	-	230V/15A	4 / 4	-	-	-
NETIO 4 FR	1	Fixed	-	FR	4	-	-	230V/15A	4 / 4	-	-	-
NETIO 4AII DE	1	Ext.	-	DE	4	4	-	230V/15A	4 / 4	-	-	-
NETIO 4AII FR	1	Ext.	-	FR	4	4	-	230V/15A	4 / 4	-	-	-

NETIO products – features

	Web	HTTPS	Scheduler function	IP Watadog function	Lua scripting	Telnet	Modbus/TCP	XML	JSON	URL-API	SNMP	Http(s) push XML / JSON	MQTT	MQTT-flex
PowerPDU 4C	✓	✓	Yes	Yes	Yes	✓	✓	✓	✓	✓	v1/v3	-	✓	-
PowerPDU 4PS	✓	-	planned	-	-	✓	✓	✓	✓	✓	v1	-	-	✓
PowerDIN 4PZ	✓	-	planned	-	-	✓	✓	✓	✓	✓	v1	✓	-	✓
PowerBox 3Px (E,F,G)	✓	-	planned	-	-	✓	✓	✓	✓	✓	v1	-	-	✓
PowerCable Modbus 101x	✓	-	planned	-	-	✓	✓	-	-	-	v1	-	-	-
PowerCable REST 101x	✓	-	planned	-	-	-	-	✓	✓	✓	v1	-	-	-
PowerCable MQTT 101x	✓	-	planned	-	-	-	-	-	-	-	v1	✓	-	✓
PowerCable IQRF 901x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NETIO 4 DE	✓	✓	Yes	Yes	Yes	✓	✓	✓	✓	✓	v1/v3	-	✓	-
NETIO 4 FR	✓	✓	Yes	Yes	Yes	✓	✓	✓	✓	✓	v1/v3	-	✓	-
NETIO 4AII DE	✓	✓	Yes	Yes	Yes	✓	✓	✓	✓	✓	v1/v3	-	✓	-
NETIO 4AII FR	✓	✓	Yes	Yes	Yes	✓	✓	✓	✓	✓	v1/v3	-	✓	-