Operating Instructions
BPS2000v2 Monitoring Power Distribution
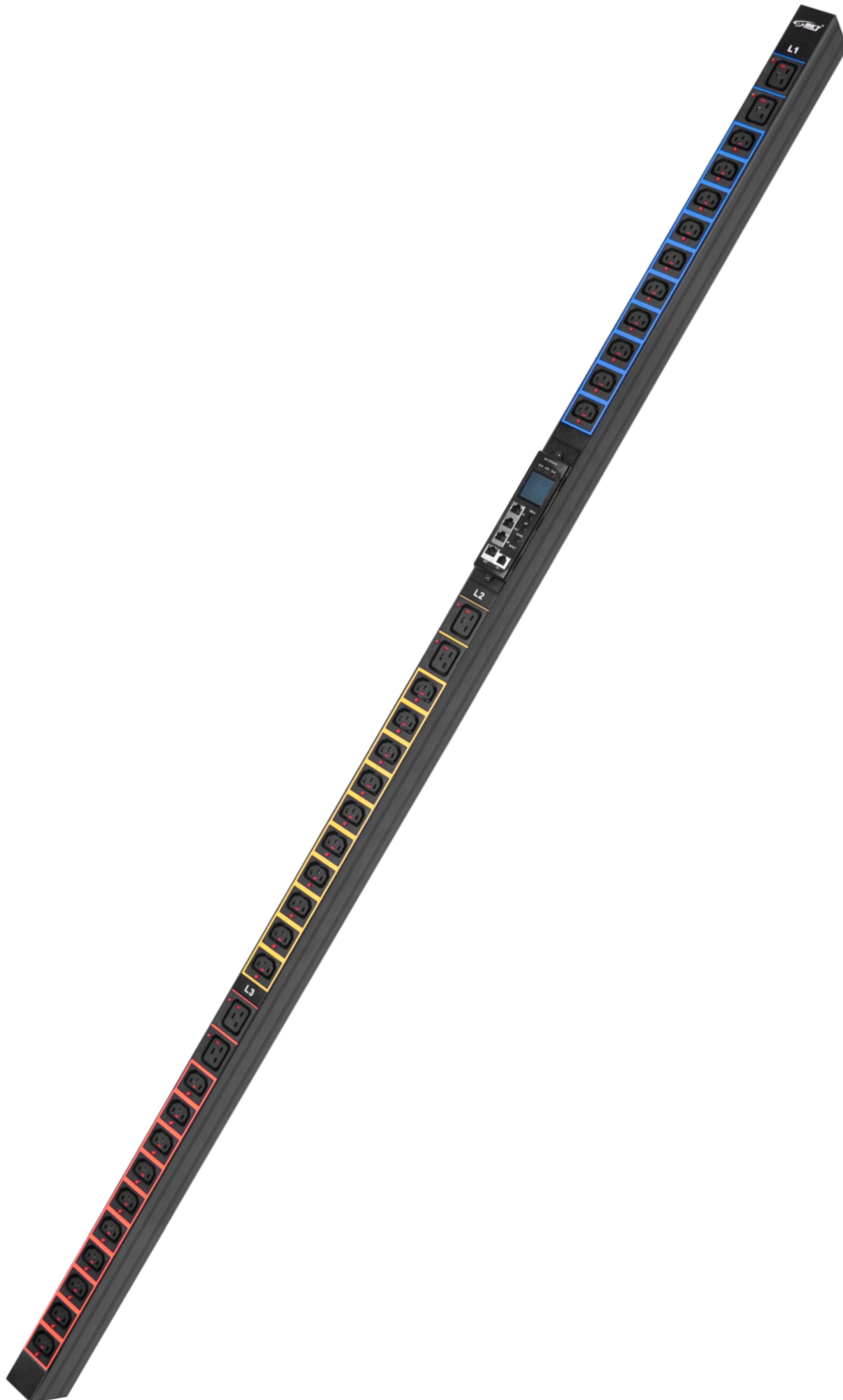
Ver.01.24

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1. Safety precautions

- The unit must only be installed by qualified personnel in accordance with the following installation and operating instructions.

- The manufacturer is not liable for incorrect use of the device, in particular use of the device that could lead to health injury or material damage.

- The device should not be opened or disassembled when it is live.

- The device may only be connected to a 230V AC power outlet (50Hz or 60Hz) for the single-phase version and 380-400V (50Hz/60Hz) for the three-phase version in star arrangement.

- Power cords, plugs and sockets should be in good technical condition. The device should always be connected to a properly earthed socket.

- The device is intended for indoor use only. Do not install the device in locations where excessive moisture or high temperatures may occur.

- For safety and official approval reasons, do not modify the device without prior authorization.

- Also, refer to the instructions for use and safety instructions for the connected devices.

- If after reading the manual, you have any questions regarding the installation, operation or use of the device, please contact the customer service department.

2. Foreword

The BPS2000v2 monitoring power distribution unit allows for power distribution and monitoring of power supply voltage, total current load, total active, reactive and apparent power consumption. In addition, the unit has integrated power consumption meters and enables measurement of power factor (cosϕ).

The units are equipped with a new generation replaceable control and measurement module with a built-in LCD display working in "hot swappable" technology, which displays information about power supply voltage, current load, active power consumption and energy consumption.

Thanks to the application of SNMP and ModBus RTU protocols, it is possible to fully integrate the BPS2000v2 unit with external management software.

3. Package contents

- BPS2000v2 series PDU

- Supply cord: 2M (RJ45/RJ45)

- Quick start instructions

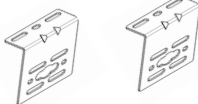- Mounting brackets (111SA200014.3)

4. Application of BPS2000v2

The BPS2000v2 units are used in IT, ICT, Data Center and power distribution environments. In addition, they allow monitoring of electrical parameters at the power input of the PDU along with monitoring of environmental conditions in the server rack.

5. Installation of BPS2000v2 unit

The BPS2000v2 units are designed for vertical installation as shown in the figure below.

As a standard, the units can be mounted with fixed brackets or brackets dedicated for 4DC and SRS/SSRS rack cabinets.

PDU brackets for BKT 4DC racks of width 600/800 mm (set) Index: 111SA200014.3	
PDU brackets for BKT SRS/SSRS racks (ordered separately) Index: 111SA200018.3	

Example of mounting the unit in 4DC rack cabinet, mounting to the 19" profile front and side view
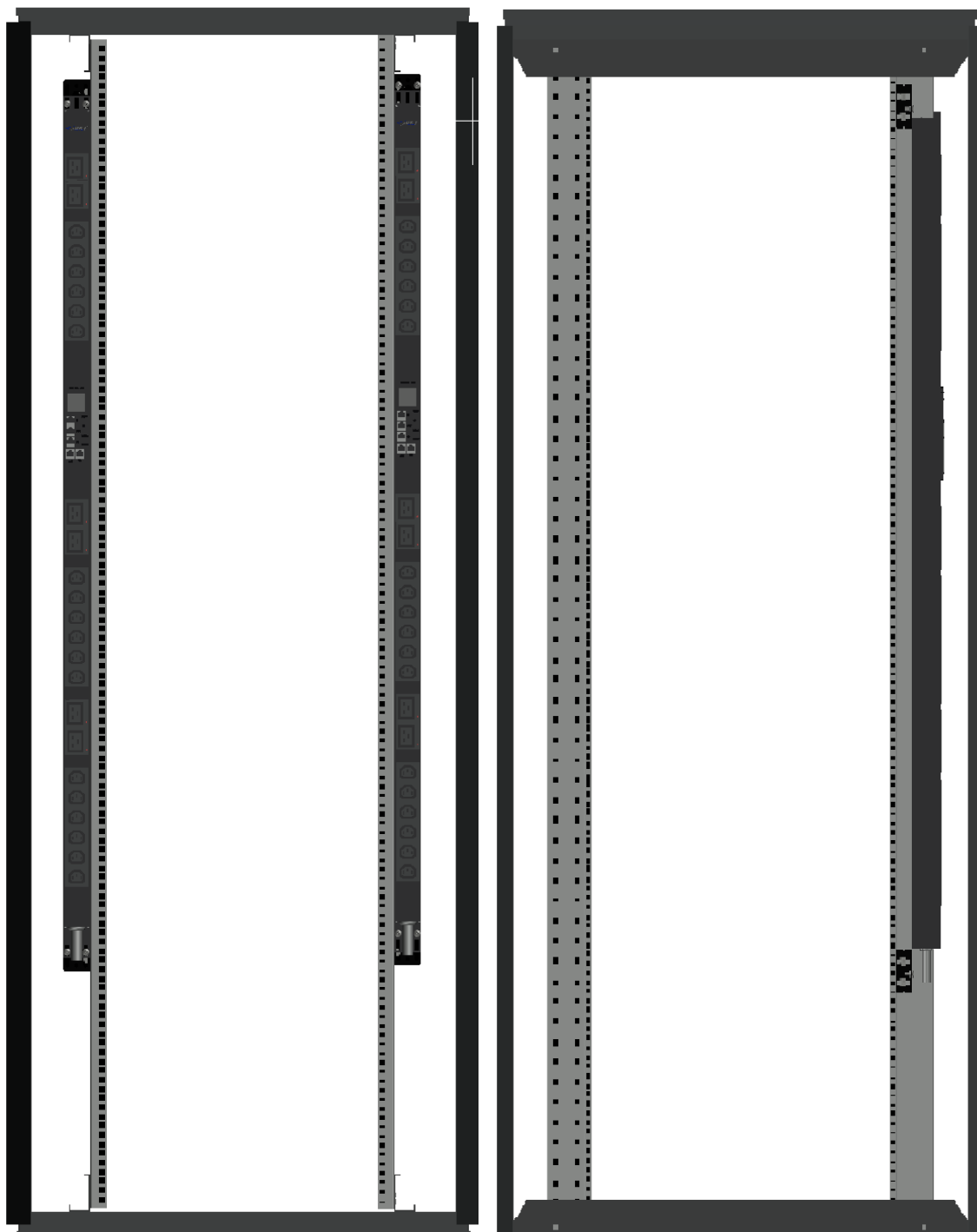
6. BPS2000v2 general characteristics

The BPS2000v2 monitoring device is a power distribution device that allows monitoring electrical parameters at the unit's input. It is equipped with a management module that allows supervision and control of electrical parameters with access via a web browser. Units are available in single-phase and three-phase designs with a load of 16A to 32A for each phase.
Units can be equipped with IEC320 C13, IEC 320 C19, NF C61-314 (st.PL/FR) or
DIN49440 (Schuko), also available with a disconnect lock for C13/C19 sockets.

Functionality:

Monitoring of electrical parameters at the PDU input:

- Unit power supply voltage [V]
- Total current load of the unit [A]
- Active Power, Apparent Power, Reactive Power [kW, kVA, kVAR]
- Energy consumption/counter of active energy, apparent energy [kWh, kVAh]
- Power factor [PF] (cosφ)
- Frequency [Hz]

Monitor environmental conditions with dedicated sensors:

- temperature and humidity
- door opening, flooding, smoke

The unit is equipped with an interchangeable management module made with technology
"Hot Swappable." Replacement of the module does not cause interruption of power supply to the receivers. The web interface is available from any web browser in Polish and English.

Communication is carried out using built-in network and communication protocols:

- SNMPv1/v2c/v3, Modbus RTU, Modbus TCP/IP
- HTTP, SMTP, Telnet
- IPv4/IPv6

6.1. View of the control module with description of the connectors
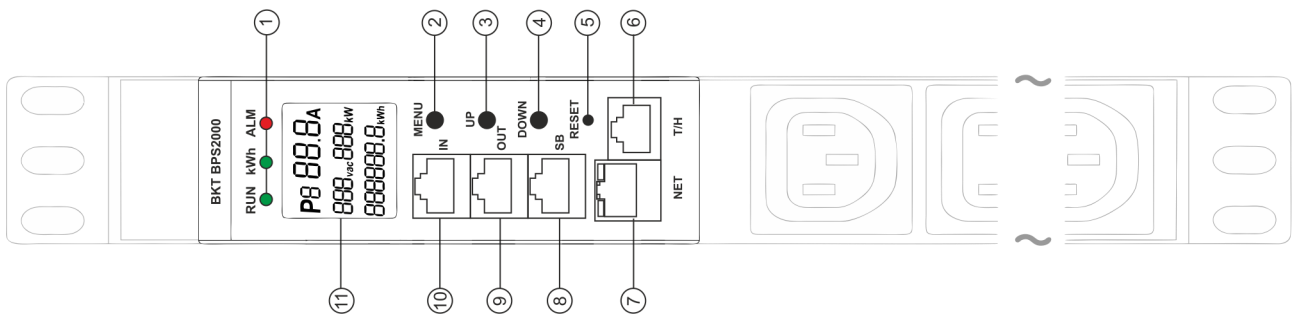
- **Description of connectors, controls and LED lights**

1. Led lights:

   RUN: operating status of the control module

   indicates correct status of the device - flashing green LED (1:1)

   kWh: energy count pulse signaling

   ALM: alarm status

         Normal state - LED off

         Fault - LED blinking red (1:1)

2. Menu - main menu of control module

3. Up - moves to the next LCD screen

4. Down - returns to the previous LCD screen

5. Reset - control module restart

6. T/H - port for connecting temperature/humidity sensor

7. NET(RJ45) - Network port

   Description of LED lights:

   yellow/status - ON: port is connected, OFF: port is disconnected, blinking: data is transmitted

   green/rate - ON: 100Mbps, OFF: 10Mbps

8. SB - Sensor Box environmental conditions module connection port

9. OUT - serial communication output port RS485 (Modbus RTU/SNMP)

10. IN - serial communication input port RS485 (Modbus RTU/SNMP)

11. LCD screen

6.2 LCD display interface for 250V single phase version

Screen 1
Read: Phase(L1) / Load(0.0A) / Voltage(237.6V) / Active power (0.0kW) / Energy(0.0kWh)

Screen 2
Read: Phase(L1) / Load(0.0A) / Voltage(237.6V) /Active power (0.0kW)/Power factor (0.00)

Screen 3
Read: the IP address of the BPS2000v2

Screen 4
Read/Write*: Master/Slave configuration for SNMP or ModBus RTU
Address: 00 indicates that the unit is in master mode
Address: 01 ÷04 indicates that the unit is working in Slave mode from 1 to 4

Screen 5
Read/Write*: Setting of threshold values, maximum for the following parameters
Load(32A)/ Voltage(250.0V)/ Temperature(44°C)/ Humidity(99%).

| Screen 1 | Screen 2 | Screen 3 | Screen 4 |

Screen 5

6.3 LCD display interface for 400V three phase version

Screen 1
Read: Phase(L1) / Load(0.0A) / Voltage(237.6V) / Active power(0.0kW)/ Energy(000000.kWh)

Screen 2
Read: Phase(L1) / Load(0.0A) / Voltage(237.6V) / Active power(0.0kW)/ Power factor(0.00)

Screen 3
Read: Phase(L2) / Load(0.0A) / Voltage(235.5V) / Active power(0.0kW)/ Energy(000000.0kWh)

Screen 4
Read: Phase(L2) / Load(0.0A) / Voltage(235.4V) / Active power(0.0kW)/ Power factor(0.00)

Screen 5
Read: Phase(L3) / Load(0.0A) / Voltage(234.9V) / Active power(0.0kW)/ Energy(000000.0kWh)

Screen 6
Read: Phase(L3) / Load(0.0A) / Voltage(235.0V) / Active power(0.0kW)/ Power factor(0.00)

Screen 7
Read: the IP address of the BPS2000v2
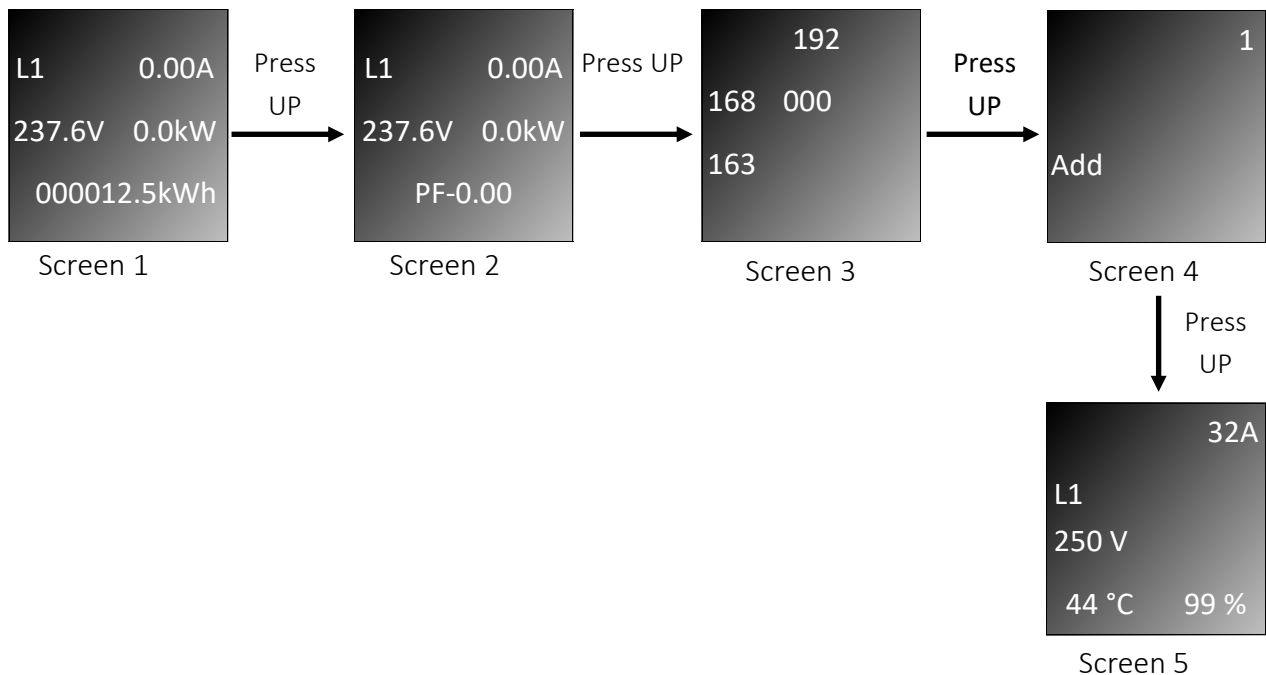
Screen 8
Read/write*: Master/Slave configuration
Address: 00 indicates that the unit is in master mode
Address: 01-04 indicates that the unit is working in Slave mode from 1 to 4

Screen 9
Read/write*: Setting of threshold values, maximum
Phase(L1) / Load(16A) / Voltage(276.0V) / Temperature(40°C) / Humidity(99%)

Screen 10
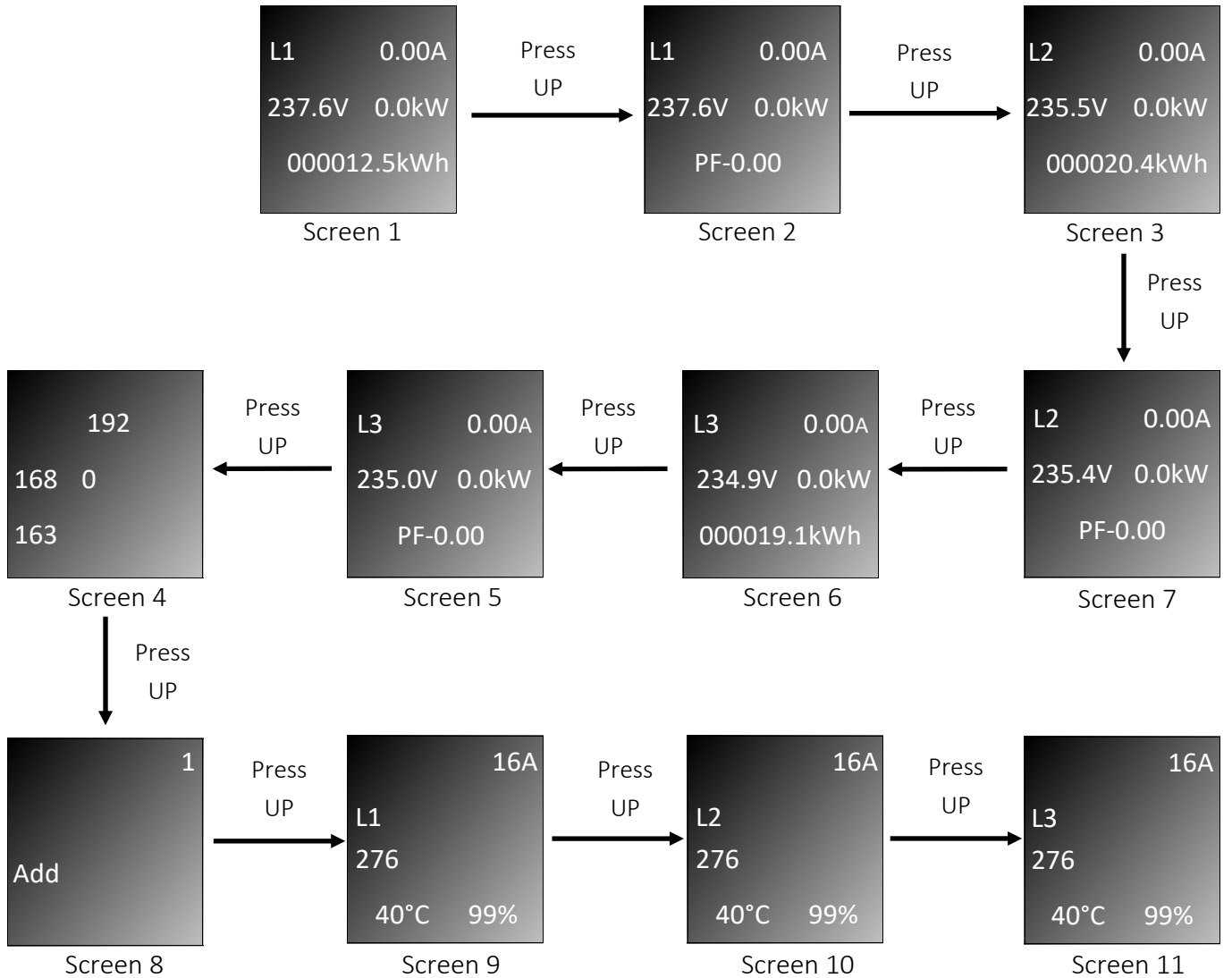Read/write*: Setting of threshold values, maximum
Phase(L2) / Load(16A) / Voltage(276.0V) / Temperature(40°C) / Humidity(99%)

Screen 11
Read/write*: Setting of threshold values, maximum
Phase(L3) / Load(16A) / Voltage(276.0V) / Temperature(40°C) / Humidity(99%)

6.3 LCD display interface for 400V three phase version

Screen 1
```
L1          0.00A
237.6V   0.0kW
    000012.5kWh
```

Press UP →

Screen 2
```
L1          0.00A
237.6V   0.0kW
    PF-0.00
```

Press UP →

Screen 3
```
L2          0.00A
235.5V   0.0kW
    000020.4kWh
```

Press UP ↓

Screen 7
```
L2          0.00A
235.4V   0.0kW
    PF-0.00
```

← Press UP

Screen 6
```
L3          0.00A
234.9V   0.0kW
    000019.1kWh
```

← Press UP

Screen 5
```
L3          0.00A
235.0V   0.0kW
    PF-0.00
```

← Press UP

Screen 4
```
        192
168   0
163
```

Press UP ↓

Screen 8
```
              1


Add
```

Press UP →

Screen 9
```
              16A
L1
276
    40°C    99%
```

Press UP →

Screen 10
```
              16A
L2
276
    40°C    99%
```

Press UP →

Screen 11
```
              16A
L3
276
    40°C    99%
```
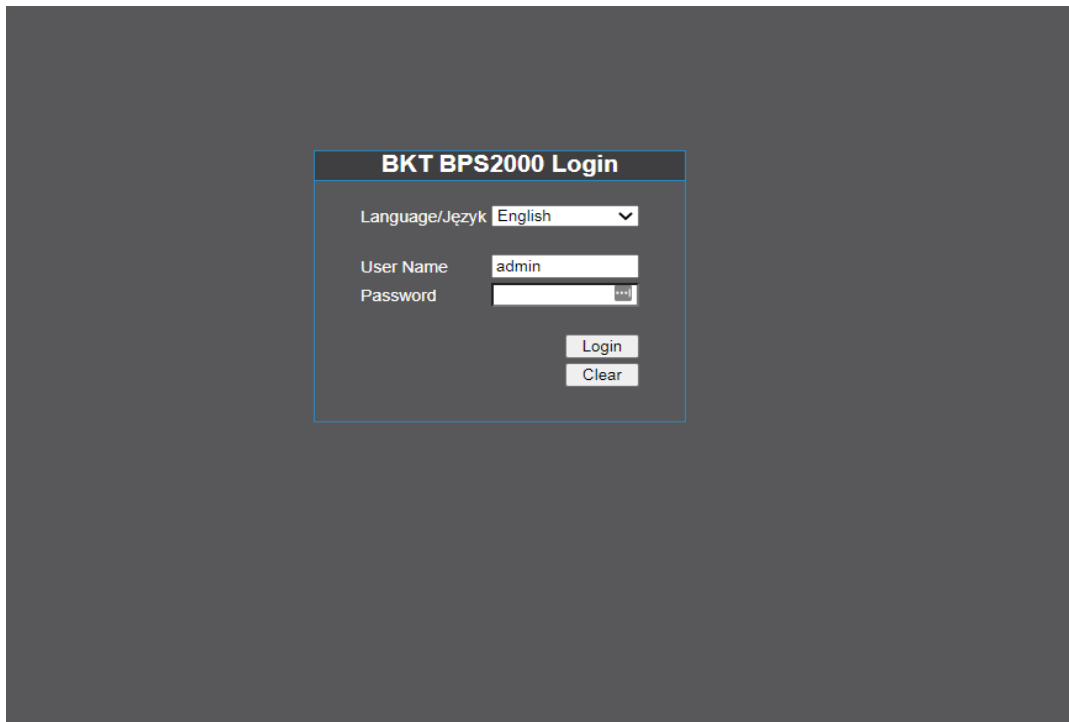
7. BPS2000v2 unit management

BPS2000v2 unit has a built-in web server for communication over the Ethernet. No additional software is required to communicate with the unit. The software allows to manage the unit, configure alarms, network settings and remotely restart the device. The web interface has been written in Polish and English.

7.1 Access through a web browser

1. The unit has a factory-set fixed IP address: 192.168.0.163

2. Enter the IP address of unit BPS2000v2 into the browser and press Enter, the login window will appear. **The default username is admin with the password admin**.

3. After logging in, the web interface is available in two language versions (Polish and English).

▸ **Status**

Available readings

- current load for each phase [A]
- supply voltage for each phase[V]
- active power for each phase [W]
- reactive power for each phase [VAR]
- apparent power for each phase [VA]
- active energy meters for each phase [kWh]
- apparent energy meters for each phase [kVAh]
- power factor (cosΦ)
- frequency [Hz]
- temperature and humidity

Green color indicates normal state.

Orange color means warning state exceeded.

Red color means alarm state exceeded.

▸ **Configuration**

1. Alarm thresholds configuration

- total load for each phase [A]
- supply voltages for each phase [V]
- temperature and humidity

2. Energy consumption measurement

Click the "Reset" button to reset the energy meter for each phase.

Resetting the energy meters requires confirmation with the password of the administrator.

3. Configuration of alarm thresholds for the module SensorBox environmental conditions

- temperature and humidity from port 1 of the SensorBox module
- temperature and humidity from port 2 of the SensorBox module

▶ **TCPIP/HTTP**

1.Network settings for IPv4/IPv6

- Connection Mode: Static/Dynamic
- IP address: *192.168.0.163 (default)*
- Subnet mask: *255.255.255.0*
- Gate: *192.168.0.1*
- DNS: 202.96.128.86

2.Settings HTTP

- Port HTTP : *default (80)*

▶ **SNMP**

1. Settings SNMP v1/v2c/v3

- SNMP agent: SNMP protocol version v1/v2c/v3
- Community read: set to private by default
- Community write: set to public by default
- Account (required for SNMPv3 only)
- Password (required only for SNMPv3)
- Private key (required for SNMPv3 only)
- IP address of trap 1
- IP address of trap 2
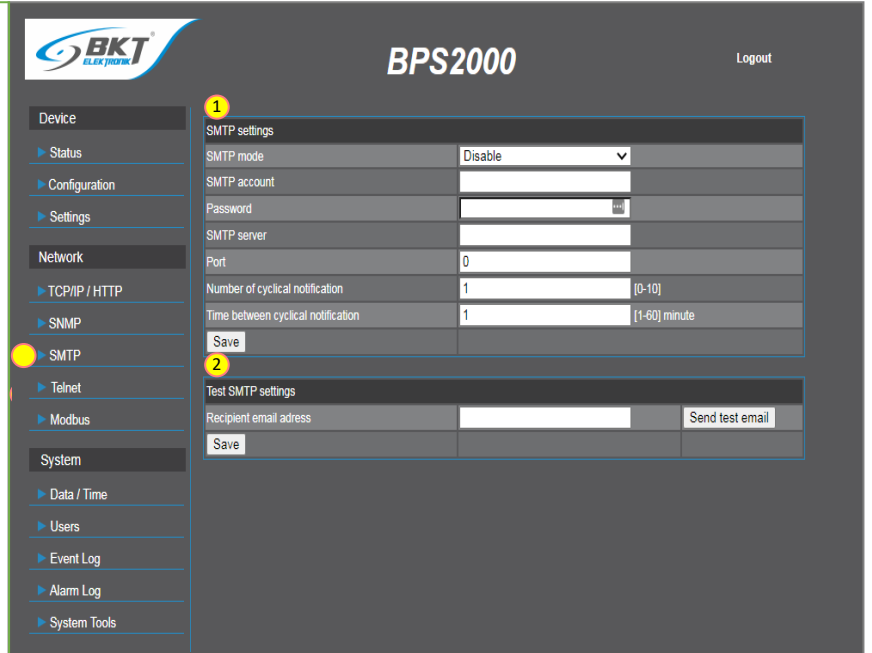
▸ **SMTP**

1. SMTP settings

- SMTP account (max 30 characters)
- Password (max 30 characters)
- SMTP server (max 30 characters)
- Port
- Cyclic notifications [0-10]:

    The alert will be sent from 1 to 10 times,

    Value 0 means no notification

- Time between cyclic notifications (from 1 to 60 sec)

2. SMTP test

Enter the email address of the recipient to whom notifications will be sent.

The "Send" button allows you to send a test message.
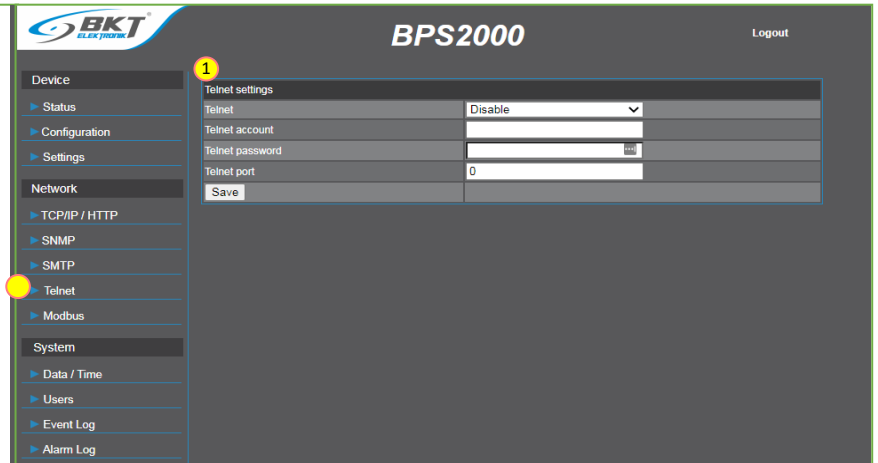
▸ **Telnet**

1. Telnet settings

- Telnet: *choose Enable or Disable*
- Telnet account: *enter account name*
- Telnet password: *enter account password*

    Telnet Port: *default is Port 23*
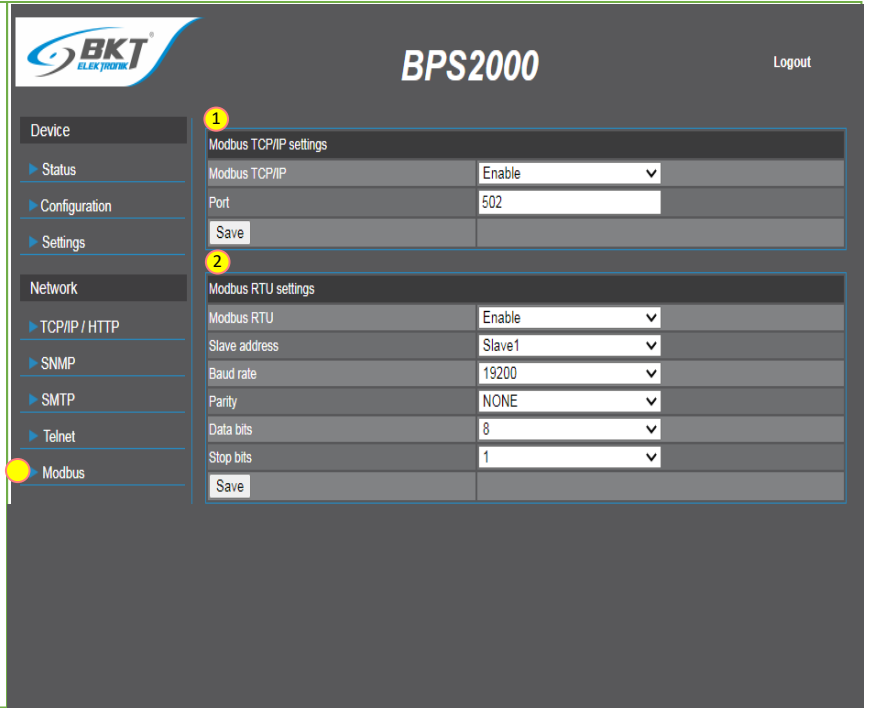
▸ **Modbus**

1. Settings Modbus TCP/IP

- Modbus TCP/IP: *choose on or off*
- Port: *default is Port 502*

2. Modbus settings RTU

- Slave address: (*Slave1-Slave32*)
- Baud rate: *4800/9600/19200/38400 [b/s]*
- Parity: NONE, ADD, EVEN
- Data bits (8 or 9*)
- Stop bits (1 or 2)

*If you need to use type parity: ADD or EVEN, data bit should be set to 9. Setting the data bit to 9 is only required after side of the BPS2000v2.

▸ **Date/Time**

1. Equipment time
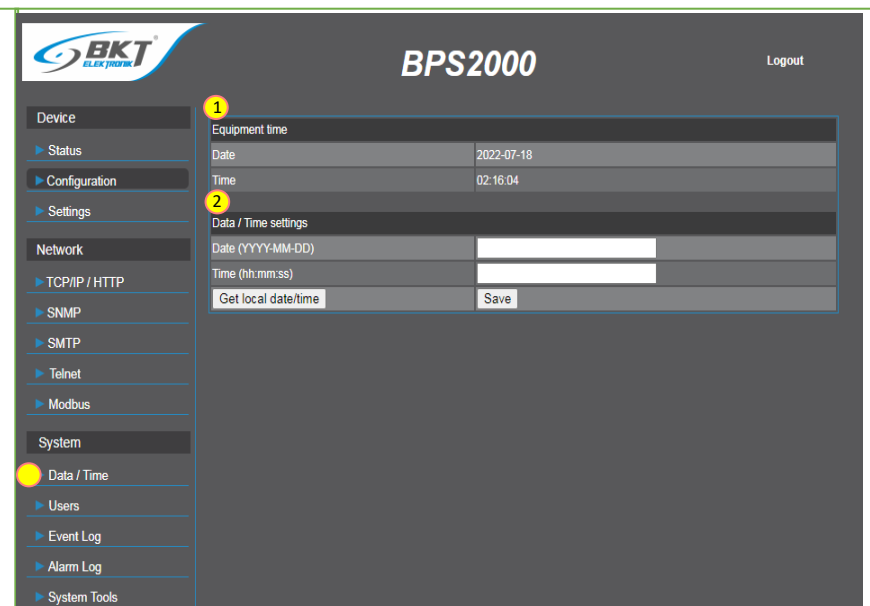
- Date: current date of the unit
- Time: current time of the unit

2. Date/Time settings

- Date (YYYY-MM-DD): *enter year, month and day*
- Time (hh:mm:ss): enter hour, minute, second

„Get local date/time"
Allows to download the current date and time from your local device (computer).

▶ **Users**

There are 3 types of users with different permissions:

- Administrator— full access
- User1 - access to Status Menu only
- User2 - access only to Status Menu, Alarm Log, Event Log

1.User settings

User name (max 15 characters)
Allowable characters: uppercase, lowercase letters and numbers

2.Changing user passwords

- Old password (max 15 characters)
- New password (max 15 characters)
- Confirm password (max 15 characters)
- Acceptable characters: uppercase, lowercase letters and numbers
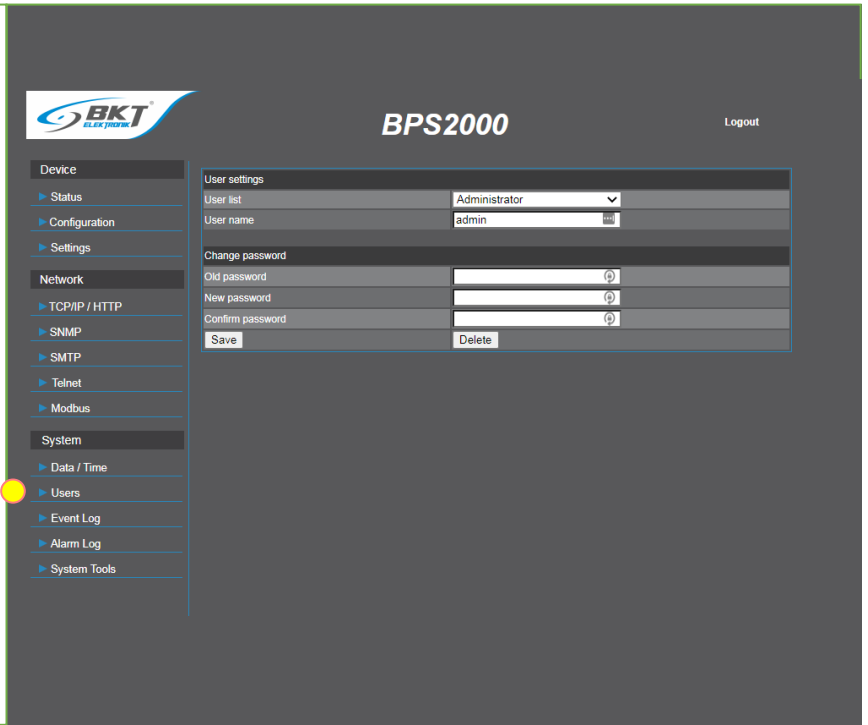
▶ **Event log**

Contains information about actions performed by the user such as: logging in, changing alarm thresholds, etc.

The event log buffer will be cleared when 500 entries are exceeded.
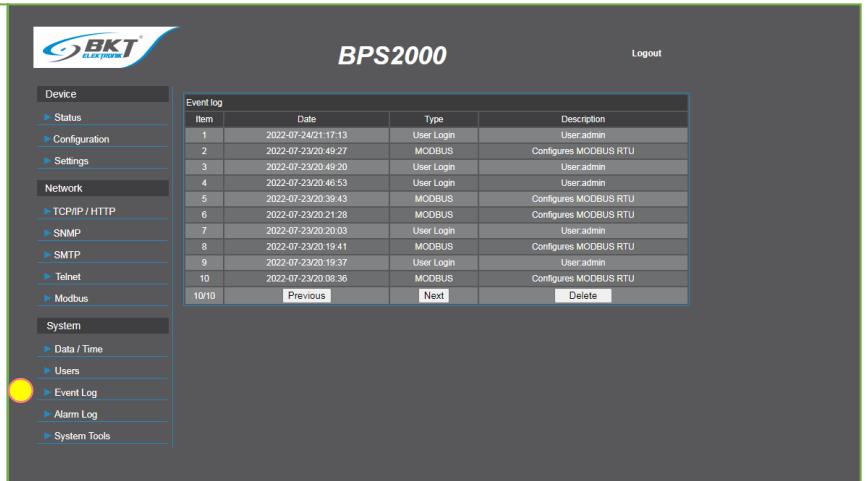
▶ **System tools**

1. Device information

- Contains information on:

MAC address of the network card, software version date of last software update.

2. Restart

- Restart (software)
- Restarting the PDU to factory defaults

all configuration data of the unit is cleared,

IP address of the unit returns to the default configuration 192.168.0.163 a login/password to admin/admin

3. Software update settings

- Enable: update possible
- Disable: Update locked

An additional TFTP application is required to perform the update.

Details of how to perform the update are available in the software update chapter.

8. Setting the unit BPS2000v2 to the factory configuration

1. Unplug the unit power or remove the control module from the module slot on the BPS2000v2 unit.

2. Turn on the power and hold down the MENU button at the same time.

3. Release the Menu button after 6 seconds.

4. The IP address will return to the factory settings 192.168.0.163 with the default login/password: admin/admin

Step 1	Step 2	Step 3
Remove the control module from the PDU housing	Hold down the Menu button for 6 seconds	Reinsert the management module into the unit housing rand elease the Menu button after 6 seconds

9. Access via Telnet protocol

BPS2000v2 unit supports access via Telnet communication protocol. It is necessary to install an additional application such as PuTTY.

To gain access, proceed as follows

- Connect the device via the Ethernet to the computer with an installed application operating a command prompt (e.g. PuTTY).

- Change Connection type to Telnet.

- Enter the IP address of the unit.

- Press Open
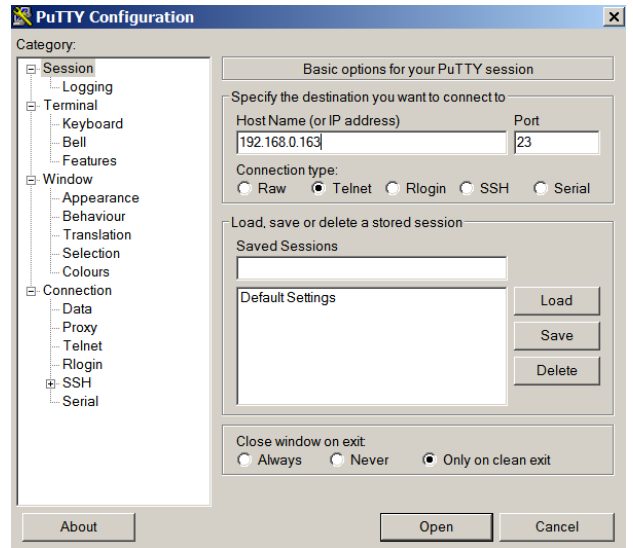
Telnet configuration from the web management interface

Telnet: choose *Disable or Enable*

• Telnet account: *enter account name*

• Telnet password: *enter account password*

• Port Telnet: *default is port 23*

BPS2000v2 cmd interface

▶ **Login**

When all steps are successfully completed, access to the Telnet console window will be enabled.

After connecting to the PDU, enter the username (default: admin) and the password (default: admin).

▶ **Available commands:**

- Show information
- Set time and date
- Users
- Network Settings
- SNMP service
- HTTP Settings
- SMTP Settings
- Threshold Settings
- Clear energy Phase
- Restart
- Logout

▶ **1. Show information**

After selecting the *1. Show information* command, a menu will be displayed with 10 available commands.

To select one of the commands, enter master or slave (depending on the unit operation mode) and a command, e.g. To display the current load, execute the *master load* command

► **2. Set time and date**

Set time and date - *date and time reading/setting.*

```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:2
System clock: Date: 2019-01-23  Time: 10:37:34
Command:1.Set Date/Time  2.Back
Command format:date yyyy-mm-dd,time hh:mm:ss

Please enter the command:
```

► **3. Users**

Users - allows you to change the user and password for access.

```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:3
Users:bkt
Command:1.Change password  2.Back
Command format: old:xxxxxx&new:xxxxxx&confirm:xxxxxx&

Please enter the command:
```
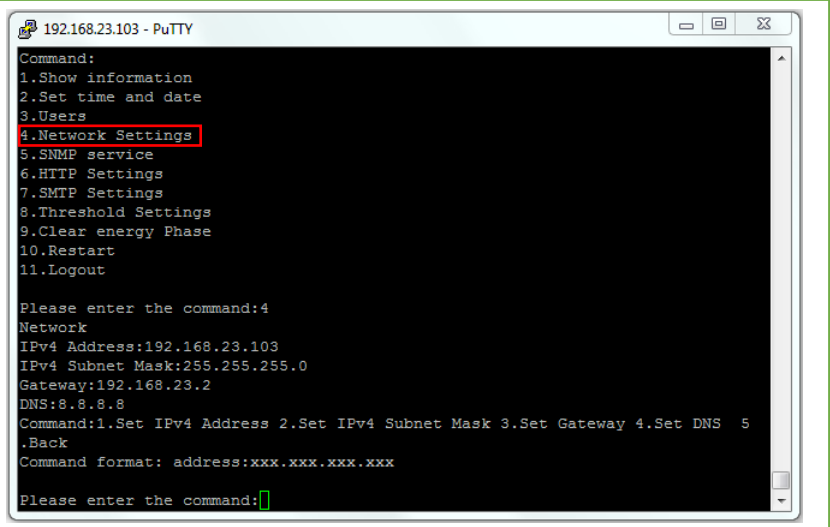
► **4. Network Settings**

Network Settings

Adress IPv4, Subnet masks IPv4, Gates, DNS.

```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:4
Network
IPv4 Address:192.168.23.103
IPv4 Subnet Mask:255.255.255.0
Gateway:192.168.23.2
DNS:8.8.8.8
Command:1.Set IPv4 Address 2.Set IPv4 Subnet Mask 3.Set Gateway 4.Set DNS  5
.Back
Command format: address:xxx.xxx.xxx.xxx

Please enter the command:
```
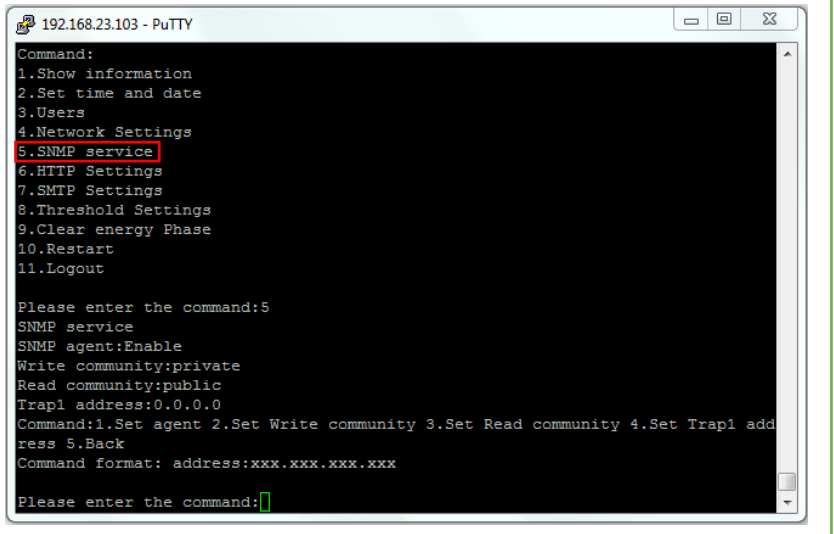
▶ **5. SNMP service**

SNMP v1 settings

- SNMP agent: *Enable/disable SNMP protocol*
- Write community: *set to private by default*
- Read community: *set to public by default*
- Trap 1 IP address
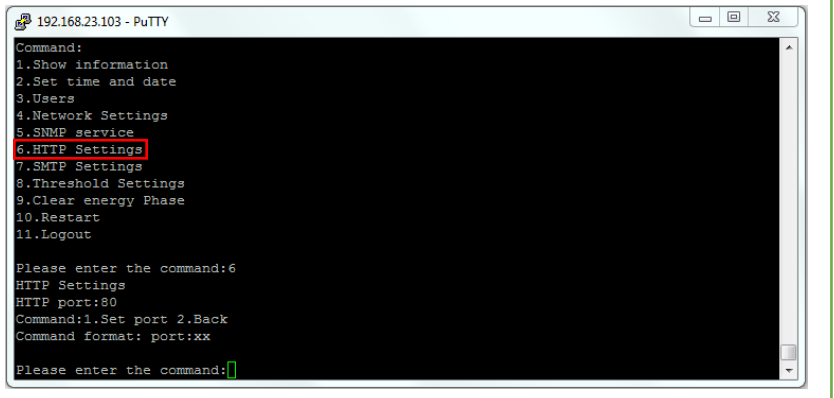

```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:5
SNMP service
SNMP agent:Enable
Write community:private
Read community:public
Trap1 address:0.0.0.0
Command:1.Set agent 2.Set Write community 3.Set Read community 4.Set Trap1 add
ress 5.Back
Command format: address:xxx.xxx.xxx.xxx

Please enter the command:
```

▶ **6. HTTP Settings**

HTTP Settings - *allows to read and set the HTTP port.*
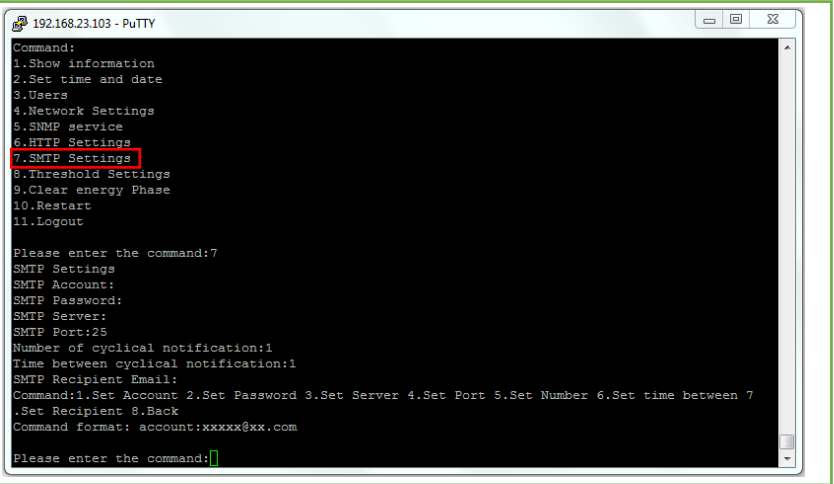

```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:6
HTTP Settings
HTTP port:80
Command:1.Set port 2.Back
Command format: port:xx

Please enter the command:
```

▶ **7. SMTP Settings**

Read/settings for: account, password, SMTP server and port, number of notifications, cyclic notifications (from 1 to 10 sec), recipient e-mail.


```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:7
SMTP Settings
SMTP Account:
SMTP Password:
SMTP Server:
SMTP Port:25
Number of cyclical notification:1
Time between cyclical notification:1
SMTP Recipient Email:
Command:1.Set Account 2.Set Password 3.Set Server 4.Set Port 5.Set Number 6.Set time between 7
.Set Recipient 8.Back
Command format: account:xxxxx@xx.com

Please enter the command:
```
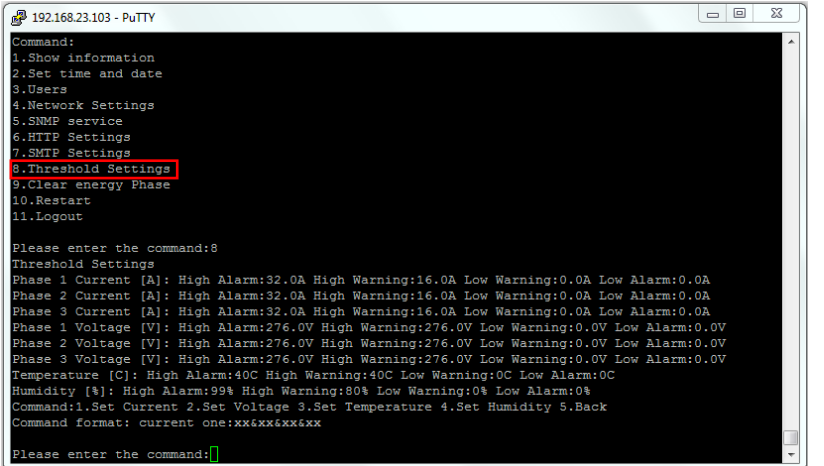
▸ **8. Threshold Settings**

Threshold Settings - allows to set maximum and minimum alarm thresholds for:

- current load of the PDU from each phase
- temperature and humidity
- PDU supply voltage for each phase
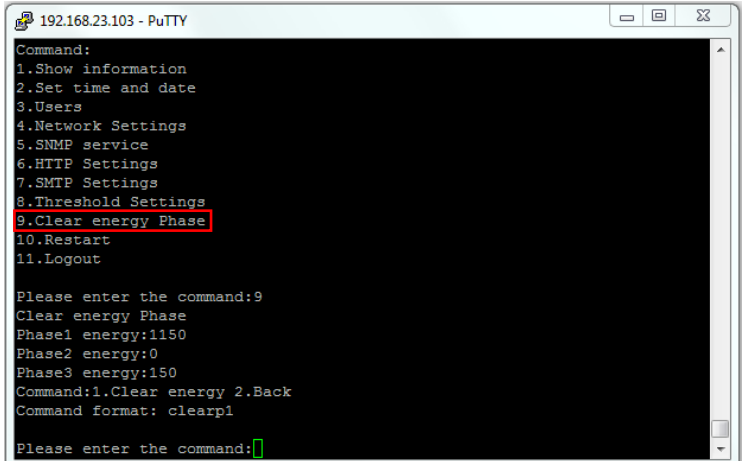
```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:8
Threshold Settings
Phase 1 Current [A]: High Alarm:32.0A High Warning:16.0A Low Warning:0.0A Low Alarm:0.0A
Phase 2 Current [A]: High Alarm:32.0A High Warning:16.0A Low Warning:0.0A Low Alarm:0.0A
Phase 3 Current [A]: High Alarm:32.0A High Warning:16.0A Low Warning:0.0A Low Alarm:0.0A
Phase 1 Voltage [V]: High Alarm:276.0V High Warning:276.0V Low Warning:0.0V Low Alarm:0.0V
Phase 2 Voltage [V]: High Alarm:276.0V High Warning:276.0V Low Warning:0.0V Low Alarm:0.0V
Phase 3 Voltage [V]: High Alarm:276.0V High Warning:276.0V Low Warning:0.0V Low Alarm:0.0V
Temperature [C]: High Alarm:40C High Warning:40C Low Warning:0C Low Alarm:0C
Humidity [%]: High Alarm:99% High Warning:80% Low Warning:0% Low Alarm:0%
Command:1.Set Current 2.Set Voltage 3.Set Temperature 4.Set Humidity 5.Back
Command format: current one:xx&xx&xx&xx

Please enter the command:
```

▸ **9. Clear energy Phase**

Clear energy Phase - reading/resetting current load for each phase.
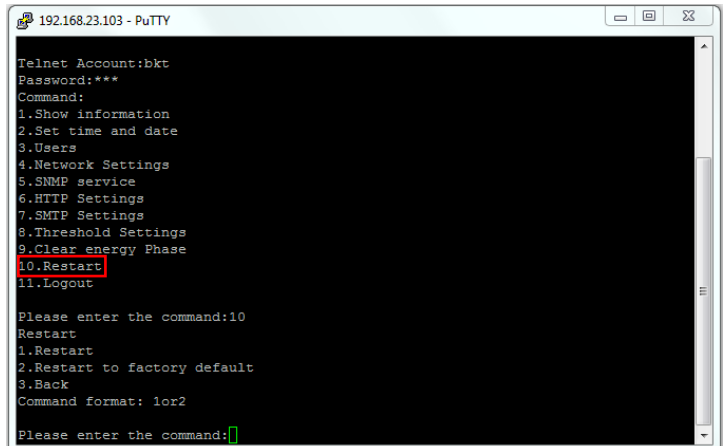
```
192.168.23.103 - PuTTY
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:9
Clear energy Phase
Phase1 energy:1150
Phase2 energy:0
Phase3 energy:150
Command:1.Clear energy 2.Back
Command format: clearp1

Please enter the command:
```

▶ **10. Restart**

Restart - *restarting the unit*

Restart to factory default - *restarting the unit and restoring factory defaults.*
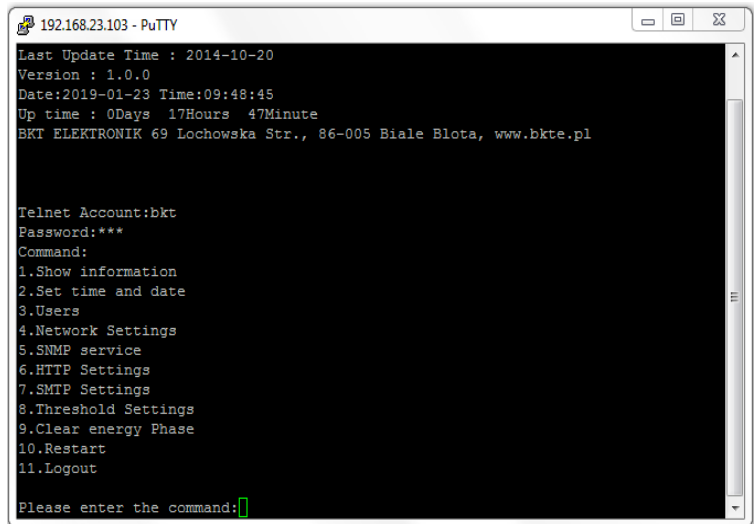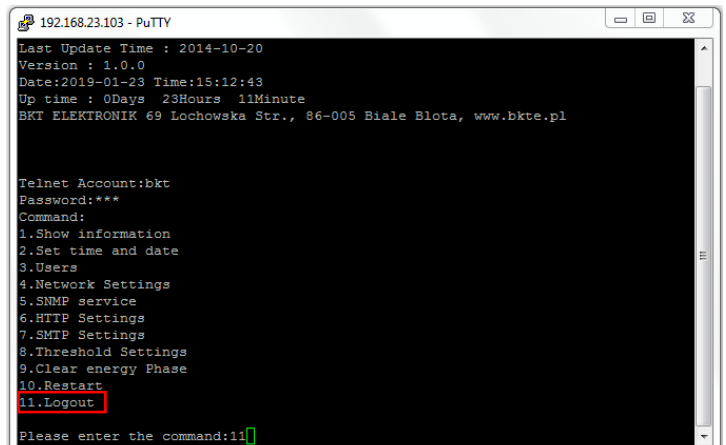
```
192.168.23.103 - PuTTY

Telnet Account:bkt
Password:***
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:10
Restart
1.Restart
2.Restart to factory default
3.Back
Command format: 1or2

Please enter the command:
```
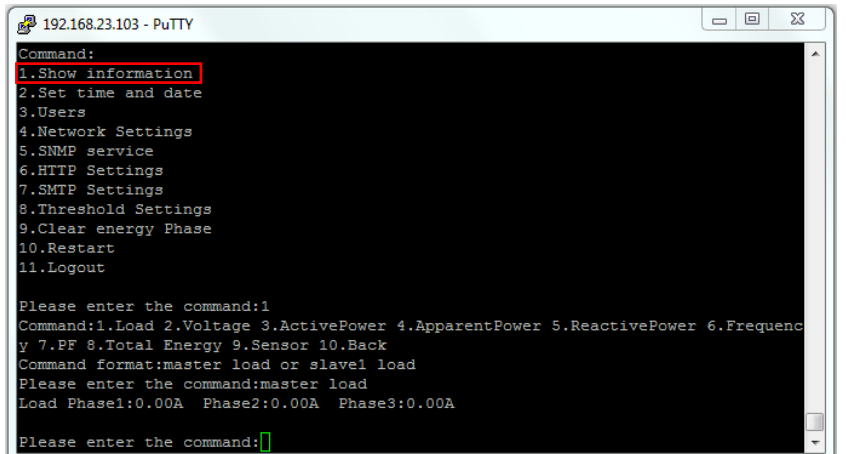
▶ **11. Logout**

Logout - *logging out of the command line (Telnet).*

```
192.168.23.103 - PuTTY

Last Update Time : 2014-10-20
Version : 1.0.0
Date:2019-01-23 Time:15:12:43
Up time : 0Days  23Hours  11Minute
BKT ELEKTRONIK 69 Lochowska Str., 86-005 Biale Blota, www.bkte.pl


Telnet Account:bkt
Password:***
Command:
1.Show information
2.Set time and date
3.Users
4.Network Settings
5.SNMP service
6.HTTP Settings
7.SMTP Settings
8.Threshold Settings
9.Clear energy Phase
10.Restart
11.Logout

Please enter the command:11
```
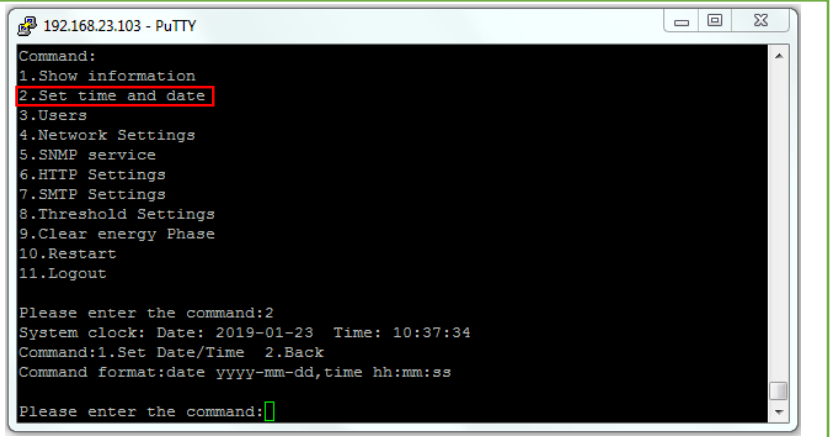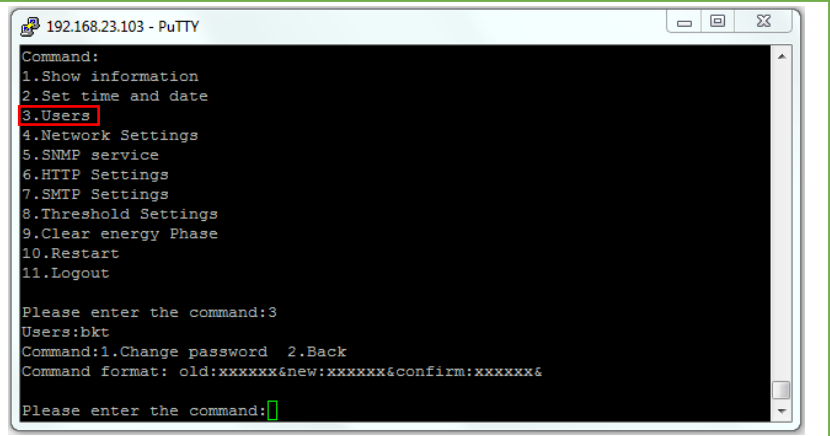
10. Access using SNMP protocol

The unit allows communication via SNMP protocol version v1/v2c/v3. Configuration of SNMP protocol settings is performed in the web interface of the PDU, details available on page 13 of this manual.
Units can be connected serially in a chain, the maximum number of units in a chain for SNMP protocol is 6 PDU's.

Master/Slave serial connection

- The first BPS2000v2 PDU is set as MASTER and the others as SLAVE.
  Maximum 6 devices can be connected, including 5 working as SLAVE.

- Connect the IN port of the MASTER unit to the OUT port of the SLAVE1 unit using an ETH cable, then connect the IN port of SLAVE1 unit to the OUT port of SLAVE2 unit.
  We connect subsequent units in an identical manner.

- Connect the NET port of the MASTER unit to the network port of the computer/network switch.
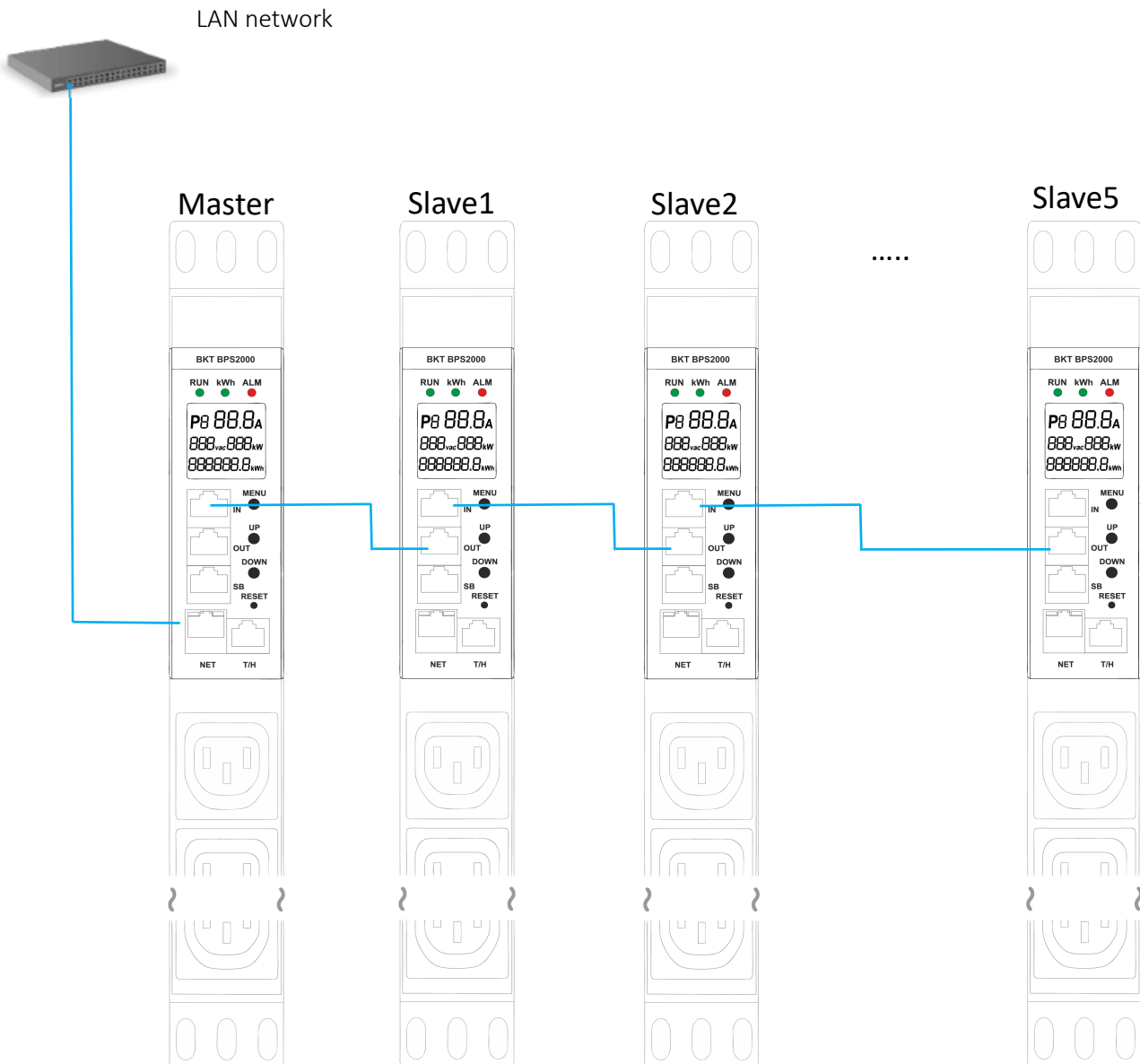
10.1 OID table

Variable name	Unique object identifier (OID)	Variable description
device name	.1.3.6.1.4.1.47394.1.1.1.0	Device name
masterCurrentL1	.1.3.6.1.4.1.47394.1.2.1.0	Master Line 1, total current L1
masterVoltageL1	.1.3.6.1.4.1.47394.1.2.2.0	Master Line 1, total voltage L1
masterPowerL1	.1.3.6.1.4.1.47394.1.2.3.0	Master Line 1, active power L1
masterReactivepowerL1	.1.3.6.1.4.1.47394.1.2.4.0	Master Line 1, reactive power L1
masterApparentPowerL1	.1.3.6.1.4.1.47394.1.2.5.0	Master Line 1, apparent power L1
masterFrequencyL1	.1.3.6.1.4.1.47394.1.2.6.0	Master Line 1, frequency L1
masterActiveEnergyL1	.1.3.6.1.4.1.47394.1.2.7.0	Master Line 1, active energy L1
masterApparentEnergyL1	.1.3.6.1.4.1.47394.1.2.8.0	Master Line 1, apparent energy L1
masterPFL1	.1.3.6.1.4.1.47394.1.2.9.0	Master Line 1, power factory L1
masterCurrentL2	.1.3.6.1.4.1.47394.1.2.10.0	Master Line 2, total current L2
masterVoltageL2	.1.3.6.1.4.1.47394.1.2.11.0	Master Line 2, total voltage L2
masterPowerL2	.1.3.6.1.4.1.47394.1.2.12.0	Master Line 2, active power L2
masterReactivepowerL2	.1.3.6.1.4.1.47394.1.2.13.0	Master Line 2, reactive power L2
masterApparentPowerL2	.1.3.6.1.4.1.47394.1.2.14.0	Master Line 2, apparent power L2
masterFrequencyL2	.1.3.6.1.4.1.47394.1.2.15.0	Master Line 2, frequency L2
masterActiveEnergyL2	.1.3.6.1.4.1.47394.1.2.16.0	Master Line 2, active energy L2
masterApparentEnergyL2	.1.3.6.1.4.1.47394.1.2.17.0	Master Line 2, apparent energy L2
masterPFL2	.1.3.6.1.4.1.47394.1.2.18.0	Master Line 2, power factor L2
masterCurrentL3	.1.3.6.1.4.1.47394.1.2.19.0	Master Line 3, total current L3
masterVoltageL3	.1.3.6.1.4.1.47394.1.2.20.0	Master Line 3, total voltage L3
masterPowerL3	.1.3.6.1.4.1.47394.1.2.21.0	Master Line 3, active power L3
masterReactivePowerL3	.1.3.6.1.4.1.47394.1.2.22.0	Master Line 3, reactive power L3
masterApparentPowerL3	.1.3.6.1.4.1.47394.1.2.23.0	Master Line 3, apparent power L3
masterFrequencyL3	.1.3.6.1.4.1.47394.1.2.24.0	Master Line 3, frequency L3
masterActiveEnergyL3	.1.3.6.1.4.1.47394.1.2.25.0	Master Line 3, active energy L3
masterApparentEnergyL3	.1.3.6.1.4.1.47394.1.2.26.0	Master Line 3, apparent energy L3
masterPFL3	.1.3.6.1.4.1.47394.1.2.27.0	Master Line 3, power factory L3

OID Table - continued

masterTemperature	.1.3.6.1.4.1.47394.1.2.28.0	Master, temperature
masterTemperature1	.1.3.6.1.4.1.47394.1.2.29.0	Master, temperature1
masterTemperature2	.1.3.6.1.4.1.47394.1.2.30.0	Master, temperature2
masterHumidity	.1.3.6.1.4.1.47394.1.2.31.0	Master, humidity
masterHumidity1	.1.3.6.1.4.1.47394.1.2.32.0	Master, humidity1
masterHumidity2	.1.3.6.1.4.1.47394.1.2.33.0	Master, humidity2
masterSmoke	.1.3.6.1.4.1.47394.1.2.34.0	Master, smoke
masterWater	.1.3.6.1.4.1.47394.1.2.35.0	Master, water
masterDoor1	.1.3.6.1.4.1.47394.1.2.36.0	Master, door1
masterDoor2	.1.3.6.1.4.1.47394.1.2.37.0	Master, door2
slaveOneCurrentL1	.1.3.6.1.4.1.47394.1.3.1.0	Slave 1, total current L1
slaveOneVoltageL1	.1.3.6.1.4.1.47394.1.3.2.0	Slave 1, voltage L1
slaveOneActivePowerL1	.1.3.6.1.4.1.47394.1.3.3.0	Slave 1, active power L1
slaveOneReactivePowerL1	.1.3.6.1.4.1.47394.1.3.4.0	Slave 1, reactive power L1
slaveOneApparentPowerL1	.1.3.6.1.4.1.47394.1.3.5.0	Slave 1, apparent power L1
slaveOneFrequencyL1	.1.3.6.1.4.1.47394.1.3.6.0	Slave 1, frequency L1
slaveOneActiveEnergyL1	.1.3.6.1.4.1.47394.1.3.7.0	Slave 1, active energy L1
slaveOneApparentEnergyL1	.1.3.6.1.4.1.47394.1.3.8.0	Slave 1, apparent energy L1
slaveOnePFL1	.1.3.6.1.4.1.47394.1.3.9.0	Slave 1, power factor L1
slaveOneCurrentL2	.1.3.6.1.4.1.47394.1.3.10.0	Slave 1, total current L2
slaveOneVoltageL2	.1.3.6.1.4.1.47394.1.3.11.0	Slave 1, votage L2
slaveOneActivePowerL2	.1.3.6.1.4.1.47394.1.3.12.0	Slave 1, active power L2
slaveOneReactivePowerL2	.1.3.6.1.4.1.47394.1.3.13.0	Slave 1, reactive power L2
slaveOneApparentPowerL2	.1.3.6.1.4.1.47394.1.3.14.0	Slave 1, apparent power L2
slaveOneFrequencyL2	.1.3.6.1.4.1.47394.1.3.15.0	Slave 1, frequency L2
slaveOneActiveEnergyL2	.1.3.6.1.4.1.47394.1.3.16.0	Slave 1, active energy L2
slaveOneApparentEnergyL2	.1.3.6.1.4.1.47394.1.3.17.0	Slave 1, apparent energy L2
slaveOnePFL2	.1.3.6.1.4.1.47394.1.3.18.0	Slave 1, power factor L2
slaveOneCurrentL3	.1.3.6.1.4.1.47394.1.3.19.0	Slave 1, total current L3
slaveOneVoltageL3	.1.3.6.1.4.1.47394.1.3.20.0	Slave 1, votage L3
slaveOneActivePowerL3	.1.3.6.1.4.1.47394.1.3.21.0	Slave 1, active power L3
slaveOneReactivePowerL3	.1.3.6.1.4.1.47394.1.3.22.0	Slave 1, reactive power L3
slaveOneApparentPowerL3	.1.3.6.1.4.1.47394.1.3.23.0	Slave 1, apparent power L3

slaveOneFrequencyL3	.1.3.6.1.4.1.47394.1.3.24.0	Slave 1, frequency L3
slaveOneActiveEnergyL3	.1.3.6.1.4.1.47394.1.3.25.0	Slave 1, total active energy L3
slaveOneApparentEnergyL3	.1.3.6.1.4.1.47394.1.3.26.0	Slave 1, apparent energy L3
slaveOnePFL3	.1.3.6.1.4.1.47394.1.3.27.0	Slave 1, power factor L3
slaveOneTemperature	.1.3.6.1.4.1.47394.1.3.28.0	Slave 1, temperature
slaveOneTemperature1	.1.3.6.1.4.1.47394.1.3.29.0	Slave 1, temperature1
slaveOneTemperature2	.1.3.6.1.4.1.47394.1.3.30.0	Slave 1, temperature2
slaveOneHumidity	.1.3.6.1.4.1.47394.1.3.31.0	Slave 1, humidity
slaveOneHumidity1	.1.3.6.1.4.1.47394.1.3.32.0	Slave 1, humidity1
slaveOneHumidity2	.1.3.6.1.4.1.47394.1.3.33.0	Slave 1, humidity2
slaveOneSmoke	.1.3.6.1.4.1.47394.1.3.34.0	Slave1, smoke
slaveOneWater	.1.3.6.1.4.1.47394.1.3.35.0	Slave1, water
slaveOneDoor1	.1.3.6.1.4.1.47394.1.3.36.0	Slave1, door1
slaveOneDoor2	.1.3.6.1.4.1.47394.1.3.37.0	Slave1, door2
slaveTwoCurrentL1	.1.3.6.1.4.1.47394.1.4.1.0	Slave 2, total current L1
slaveTwoVoltageL1	.1.3.6.1.4.1.47394.1.4.2.0	Slave 2, total votage L1
slaveTwoActivePowerL1	.1.3.6.1.4.1.47394.1.4.3.0	Slave 2, active power L1
slaveTwoReactivePowerL1	.1.3.6.1.4.1.47394.1.4.4.0	Slave 2, reactive power L1
slaveTwoApparentPowerL1	.1.3.6.1.4.1.47394.1.4.5.0	Slave 2, apparent power L1
slaveTwoFrequencyL1	.1.3.6.1.4.1.47394.1.4.6.0	Slave 2, frequency L1
slaveTwoActiveEnergyL1	.1.3.6.1.4.1.47394.1.4.7.0	Slave 2, active energy L1
slaveTwoApparentEnergyL1	.1.3.6.1.4.1.47394.1.4.8.0	Slave 2, apparent energy L1
slaveTwoPFL1	.1.3.6.1.4.1.47394.1.4.9.0	Slave 2, power factor L1
slaveTwoCurrentL2	.1.3.6.1.4.1.47394.1.4.10.0	Slave 2, total current L2
slaveTwoVoltageL2	.1.3.6.1.4.1.47394.1.4.11.0	Slave 2, total votage L2
slaveTwoActivePowerL2	.1.3.6.1.4.1.47394.1.4.12.0	Slave 2, active power L2
slaveTwoReactivePowerL2	.1.3.6.1.4.1.47394.1.4.12.0	Slave 2, reactive power L2
slaveTwoApparentPowerL2	.1.3.6.1.4.1.47394.1.4.14.0	Slave 2, apparent power L2
slaveTwoFrequencyL2	.1.3.6.1.4.1.47394.1.4.15.0	Slave 2, frequency L2
slaveTwoActiveEnergyL2	.1.3.6.1.4.1.47394.1.4.16.0	Slave 2, active energy L2
slaveTwoApparentEnergyL2	.1.3.6.1.4.1.47394.1.4.17.0	Slave 2, apparent energy L2
slaveTwoPFL2	.1.3.6.1.4.1.47394.1.4.18.0	Slave 2, power factor L2
slaveTwoCurrentL3	.1.3.6.1.4.1.47394.1.4.19.0	Slave 2, total current L3
slaveTwoVoltageL3	.1.3.6.1.4.1.47394.1.4.20.0	Slave 2, total votage L3
slaveTwoActivePowerL3	.1.3.6.1.4.1.47394.1.4.21.0	Slave 2, active power L3

slaveTwoReactivePowerL3	.1.3.6.1.4.1.47394.1.4.22.0	Slave 2, reactive power L3
slaveTwoApparentPowerL3	.1.3.6.1.4.1.47394.1.4.23.0	Slave 2, apparent power L3
slaveTwoFrequencyL3	.1.3.6.1.4.1.47394.1.4.24.0	Slave 2, frequency L3
slaveTwoActiveEnergyL3	.1.3.6.1.4.1.47394.1.4.25.0	Slave 2, active energy L3
slaveTwoApparentEnergyL3	.1.3.6.1.4.1.47394.1.4.26.0	Slave 2, apparent energy L3
slaveTwoPFL3	.1.3.6.1.4.1.47394.1.4.27.0	Slave 2, power factor L3
slaveTwoTemperature	.1.3.6.1.4.1.47394.1.4.28.0	Slave 2, temperature
slaveTwoTemperature1	.1.3.6.1.4.1.47394.1.4.29.0	Slave 2, temperature1
slaveTwoTemperature2	.1.3.6.1.4.1.47394.1.4.30.0	Slave 2, temperature2
slaveTwoHumidity	.1.3.6.1.4.1.47394.1.4.31.0	Slave 2, humidity
slaveTwoHumidity1	.1.3.6.1.4.1.47394.1.4.32.0	Slave 2, humidity1
slaveTwoHumidity2	.1.3.6.1.4.1.47394.1.4.33.0	Slave 2, humidity2
slaveTwoSmoke	.1.3.6.1.4.1.47394.1.4.34.0	Slave2, smoke
slaveTwoWater	.1.3.6.1.4.1.47394.1.4.35.0	Slave2, water
slaveTwoDoor1	.1.3.6.1.4.1.47394.1.4.36.0	Slave2, door1
slaveTwoDoor2	.1.3.6.1.4.1.47394.1.4.37.0	Slave2, door2
slaveThreeCurrentL1	.1.3.6.1.4.1.47394.1.5.1.0	Slave 3, total current L1
slaveThreeVoltageL1	.1.3.6.1.4.1.47394.1.5.2.0	Slave 3, total votage L1
slaveThreeActivePowerL1	.1.3.6.1.4.1.47394.1.5.3.0	Slave 3, active power L1
slaveThreeReactivePowerL1	.1.3.6.1.4.1.47394.1.5.4.0	Slave 3, reactive power L1
slaveThreeApparentPowerL1	.1.3.6.1.4.1.47394.1.5.5.0	Slave 3, apparent power L1
slaveThreeFrequencyL1	.1.3.6.1.4.1.47394.1.5.6.0	Slave 3, frequency L1
slaveThreeActiveEnergyL1	.1.3.6.1.4.1.47394.1.5.7.0	Slave 3, total active energy L1
slaveThreeApparentEnergyL1	.1.3.6.1.4.1.47394.1.5.8.0	Slave 3, total apparent energy L1
slaveThreePFL1	.1.3.6.1.4.1.47394.1.5.9.0	Slave 3, power factor L1
slaveThreeCurrentL2	.1.3.6.1.4.1.47394.1.5.10.0	Slave 3, total current L2
slaveThreeVoltageL2	.1.3.6.1.4.1.47394.1.5.11.0	Slave 3, total votage L2
slaveThreeActivePowerL2	.1.3.6.1.4.1.47394.1.5.12.0	Slave 3, active power L2
slaveThreeReactivePowerL2	.1.3.6.1.4.1.47394.1.5.13.0	Slave 3, reactive power L2
slaveThreeApparentPowerL2	.1.3.6.1.4.1.47394.1.5.14.0	Slave 3, apparent power L2
slaveThreeFrequencyL2	.1.3.6.1.4.1.47394.1.5.15.0	Slave 3, frequency L2
slaveThreeActiveEnergyL2	.1.3.6.1.4.1.47394.1.5.16.0	Slave 3, active energy L2
slaveThreeApparentEnergyL2	.1.3.6.1.4.1.47394.1.5.17.0	Slave 3, apparent energy L2
slaveThreePFL2	.1.3.6.1.4.1.47394.1.5.18.0	Slave 3, power factor L2
slaveThreeCurrentL3	.1.3.6.1.4.1.47394.1.5.19.0	Slave 3, total current L3

slaveThreeVoltageL3	.1.3.6.1.4.1.47394.1.5.20.0	Slave 4, total votage L3
slaveThreeActivePowerL3	.1.3.6.1.4.1.47394.1.5.21.0	Slave 3, active power L3
slaveThreeReactivePowerL3	.1.3.6.1.4.1.47394.1.5.22.0	Slave 3, reactive power L3
slaveThreeApparentPowerL3	.1.3.6.1.4.1.47394.1.5.23.0	Slave 3, apparent power L3
slaveThreeFrequencyL3	.1.3.6.1.4.1.47394.1.5.24.0	Slave 3, frequency L3
slaveThreeActiveEnergyL3	.1.3.6.1.4.1.47394.1.5.25.0	Slave 3, active energy L3
slaveThreeApparentEnergyL3	.1.3.6.1.4.1.47394.1.5.26.0	Slave 3, apparent energy L3
slaveThreePFL3	.1.3.6.1.4.1.47394.1.5.27.0	Slave 3, power factor L3
slaveThreeTemperature	.1.3.6.1.4.1.47394.1.5.28.0	Slave 3, temperature
slaveThreeTemperature1	.1.3.6.1.4.1.47394.1.5.29.0	Slave 3, temperature1
slaveThreeTemperature2	.1.3.6.1.4.1.47394.1.5.30.0	Slave 3, temperature2
slaveThreeHumidity	.1.3.6.1.4.1.47394.1.5.31.0	Slave 3, humidity
slaveThreeHumidity1	.1.3.6.1.4.1.47394.1.5.32.0	Slave 3, humidity1
slaveThreeHumidity2	.1.3.6.1.4.1.47394.1.5.33.0	Slave 3, humidity2
slaveThreeSmoke	.1.3.6.1.4.1.47394.1.5.34.0	Slave3, smoke
slaveThreeWater	.1.3.6.1.4.1.47394.1.5.35.0	Slave3, water
slaveThreeDoor1	.1.3.6.1.4.1.47394.1.5.36.0	Slave3, door1
slaveThreeDoor2	.1.3.6.1.4.1.47394.1.5.37.0	Slave3, door2
slaveFourCurrentL1	.1.3.6.1.4.1.47394.1.6.1.0	Slave 4, total current L1
slaveFourVoltageL1	.1.3.6.1.4.1.47394.1.6.2.0	Slave 4, total votage L1
slaveFourActivePowerL1	.1.3.6.1.4.1.47394.1.6.3.0	Slave 4, active power L1
slaveFourReactivePowerL1	.1.3.6.1.4.1.47394.1.6.4.0	Slave 4, reactive power L1
slaveFourApparentPowerL1	.1.3.6.1.4.1.47394.1.6.5.0	Slave 4, apparent power L1
slaveFourFrequencyL1	.1.3.6.1.4.1.47394.1.6.6.0	Slave 4, frequency L1
slaveFourActiveEnergyL1	.1.3.6.1.4.1.47394.1.6.7.0	Slave 4, active energy L1
slaveFourApparentEnergyL1	.1.3.6.1.4.1.47394.1.6.8.0	Slave 4, apparent energy L1
slaveFourPFL1	.1.3.6.1.4.1.47394.1.6.9.0	Slave 4, power factor L2
slaveFourCurrentL2	.1.3.6.1.4.1.47394.1.6.10.0	Slave 4, total current L2
slaveFourVoltageL2	.1.3.6.1.4.1.47394.1.6.11.0	Slave 4, total votage L2
slaveFourActivePowerL2	.1.3.6.1.4.1.47394.1.6.12.0	Slave 4, total power L2
slaveFourReactivePowerL2	.1.3.6.1.4.1.47394.1.6.13.0	Slave 4, reactive power L2
slaveFourApparentPowerL2	.1.3.6.1.4.1.47394.1.6.14.0	Slave 4, apparent power L2
slaveFourFrequencyL2	.1.3.6.1.4.1.47394.1.6.15.0	Slave 4, frequency L2
slaveFourActiveEnergyL2	.1.3.6.1.4.1.47394.1.6.16.0	Slave 4, active energy L2
slaveFourApparentEnergyL2	.1.3.6.1.4.1.47394.1.6.17.0	Slave 4, apparent energy L2
slaveFourPFL2	.1.3.6.1.4.1.47394.1.6.18.0	Slave 4, power factor L2
slaveFourCurrentL3	.1.3.6.1.4.1.47394.1.6.19.0	Slave 4, total current L3
slaveFourVoltageL3	.1.3.6.1.4.1.47394.1.6.20.0	Slave 4, total votage L3
slaveFourActivePowerL3	.1.3.6.1.4.1.47394.1.6.21.0	Slave 4, active power L3
slaveFourReactivePowerL3	.1.3.6.1.4.1.47394.1.6.22.0	Slave 4, reactive power L3
slaveFourApparentPowerL3	.1.3.6.1.4.1.47394.1.6.23.0	Slave 4, apparent power L3
slaveFourFrequencyL3	.1.3.6.1.4.1.47394.1.6.24.0	Slave 4, frequency L3

slaveFourActiveEnergyL3	.1.3.6.1.4.1.47394.1.6.25.0	Slave 4, active energy L3
slaveFourApparentEnergyL3	.1.3.6.1.4.1.47394.1.6.26.0	Slave 4, apparent energy L3
slaveFourPFL3	.1.3.6.1.4.1.47394.1.6.27.0	Slave , power factor L3
slaveFourTemperature	.1.3.6.1.4.1.47394.1.6.28.0	Slave 4, temperature
slaveFourTemperature1	.1.3.6.1.4.1.47394.1.6.29.0	Slave 4, temperature1
slaveFourTemperature2	.1.3.6.1.4.1.47394.1.6.30.0	Slave 4, temperature2
slaveFourHumidity	.1.3.6.1.4.1.47394.1.6.31.0	Slave 4, humidity
slaveFourHumidity1	.1.3.6.1.4.1.47394.1.6.32.0	Slave 4, humidity1
slaveFourHumidity2	.1.3.6.1.4.1.47394.1.6.33.0	Slave 4, humidity2
slaveFourSmoke	.1.3.6.1.4.1.47394.1.6.34.0	Slave 4, smoke
slaveFourWater	.1.3.6.1.4.1.47394.1.6.35.0	Slave 4, water
slaveFourDoor1	.1.3.6.1.4.1.47394.1.6.36.0	Slave 4, door1
slaveFourDoor2	.1.3.6.1.4.1.47394.1.6.37.0	Slave 4, door2
slaveFiveCurrentL1	.1.3.6.1.4.1.47394.1.7.1.0	Slave 5, total current L1
slaveFiveVoltageL1	.1.3.6.1.4.1.47394.1.7.2.0	Slave 5, total votage L1
slaveFiveActivePowerL1	.1.3.6.1.4.1.47394.1.7.3.0	Slave 5, active power L1
slaveFiveReactivePowerL1	.1.3.6.1.4.1.47394.1.7.4.0	Slave 5, reactive power L1
slaveFiveApparentPowerL1	.1.3.6.1.4.1.47394.1.7.5.0	Slave 5, apparent power L1
slaveFiveFrequencyL1	.1.3.6.1.4.1.47394.1.7.6.0	Slave 5, frequency L1
slaveFiveActiveEnergyL1	.1.3.6.1.4.1.47394.1.7.7.0	Slave 5, active energy L1
slaveFiveApparentEnergyL1	.1.3.6.1.4.1.47394.1.7.8.0	Slave 5, apparent energy L1
slaveFivePFL1	.1.3.6.1.4.1.47394.1.7.9.0	Slave 5, power factor L1
slaveFiveCurrentL2	.1.3.6.1.4.1.47394.1.7.10.0	Slave 5, total current L2
slaveFiveVoltageL2	.1.3.6.1.4.1.47394.1.7.11.0	Slave 5, total votage L2
slaveFiveActivePowerL2	.1.3.6.1.4.1.47394.1.7.12.0	Slave 5, active power L2
slaveFiveReactivePowerL2	.1.3.6.1.4.1.47394.1.7.12.0	Slave 5, reactive power L2
slaveFiveApparentPowerL2	.1.3.6.1.4.1.47394.1.7.14.0	Slave 5, apparent power L2
slaveFiveFrequencyL2	.1.3.6.1.4.1.47394.1.7.15.0	Slave 5, frequency L2
slaveFiveActiveEnergyL2	.1.3.6.1.4.1.47394.1.7.16.0	Slave 5, active energy L2
slaveFiveApparentEnergyL2	.1.3.6.1.4.1.47394.1.7.17.0	Slave 5, apparent energy L2
slaveFivePFL2	.1.3.6.1.4.1.47394.1.7.18.0	Slave 5, power factor L2
slaveFiveCurrentL3	.1.3.6.1.4.1.47394.1.7.19.0	Slave 5, total current L3
slaveFiveVoltageL3	.1.3.6.1.4.1.47394.1.7.20.0	Slave 5, total votage L3
slaveFiveActivePowerL3	.1.3.6.1.4.1.47394.1.7.21.0	Slave 5, power L3

slaveFiveActiveEnergyL3	.1.3.6.1.4.1.47394.1.7.25.0	Slave 5, active energy L3
slaveFiveApparentEnergyL3	.1.3.6.1.4.1.47394.1.7.26.0	Slave 5, apparent energy L3
slaveFivePFL3	.1.3.6.1.4.1.47394.1.7.27.0	Slave 5, power factor L3
slaveFiveTemperature	.1.3.6.1.4.1.47394.1.7.28.0	Slave 5, temperature
slaveFiveTemperature1	.1.3.6.1.4.1.47394.1.7.29.0	Slave 5, temperature1
slaveFiveTemperature2	.1.3.6.1.4.1.47394.1.7.30.0	Slave 5, temperature2
slaveFiveHumidity	.1.3.6.1.4.1.47394.1.7.31.0	Slave 5, humidity
slaveFiveHumidity1	.1.3.6.1.4.1.47394.1.7.32.0	Slave 5, humidity1
slaveFiveHumidity2	.1.3.6.1.4.1.47394.1.7.33.0	Slave 5, humidity2
slaveFiveSmoke	.1.3.6.1.4.1.47394.1.7.34.0	Slave 5, smoke
slaveFiveWater	.1.3.6.1.4.1.47394.1.7.35.0	Slave 5, water
slaveFiveDoor1	.1.3.6.1.4.1.47394.1.7.36.0	Slave 5, door1
slaveFiveDoor2	.1.3.6.1.4.1.47394.1.7.37.0	Slave 5, door2

11. Access via Modbus TCP protocol

The ModBus TCP protocol is available on port 502.

This port can be changed to any port in the management interface of the power unit available in the Network tab of Modbus TCP/IP.
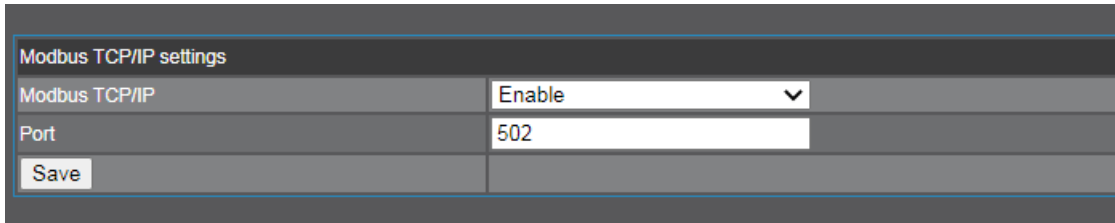
Diagram of connection of power units using Modbus TCP protocol.
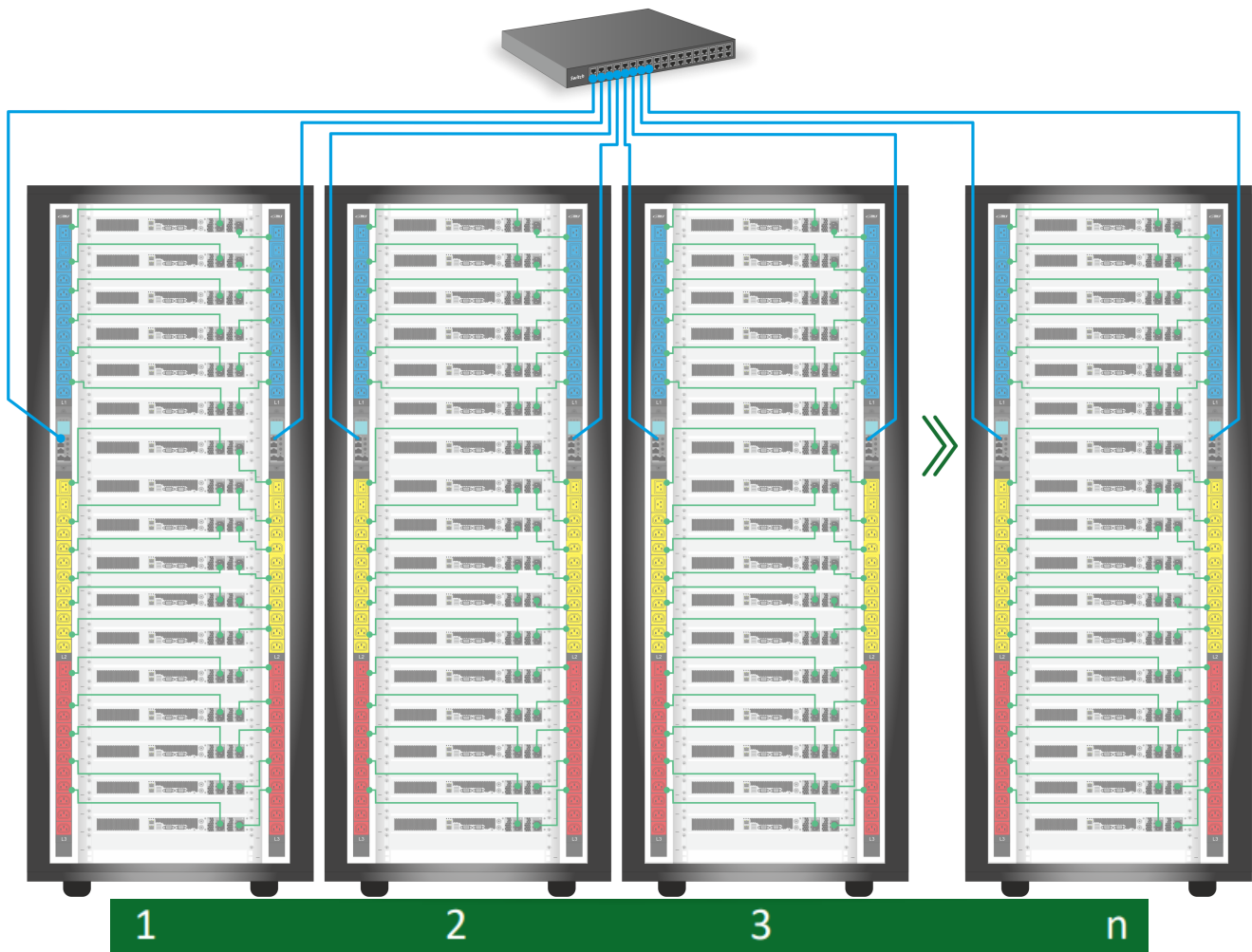
12. Access via Modbus RTU protocol

Modbus RTU is available on the RJ45/RS485 ports of the unit management module labeled IN / OUT ports, which are used for cascade / chain connection.

Up to 32 units can be connected to the Modbus RTU bus.

Function code 03 of the Modbus protocol is used to read the parameter, and function code 06 is used to writing.

- RJ45 plug diagram from the RS485 port side of BPS2000v2 unit

Cable colour	RJ45/RS485 connector	
	Description	Pin number
Blue	RS485 -A Rx+	4
White and blue	RS485 -B Rx-	5

RJ45 (IN)

RS485 -A RX+
RS485 -B RX-

RS485 -A RX+
RS485 -B RX-

RJ45 (OUT)
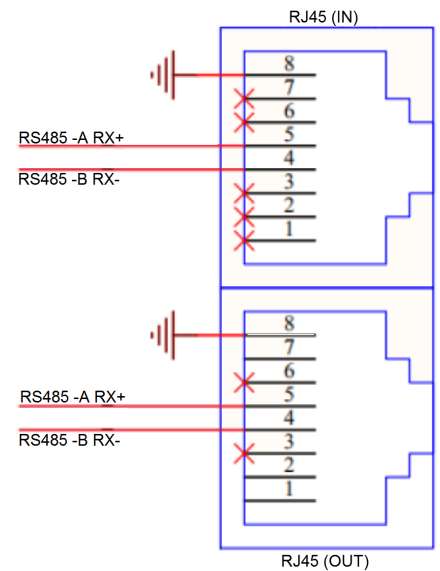
Diagram of the connection of the BPS2000v2 unit by the RS485 bus

Slave1   Slave2   Slave3   .....   Slave32

ModBus gateway
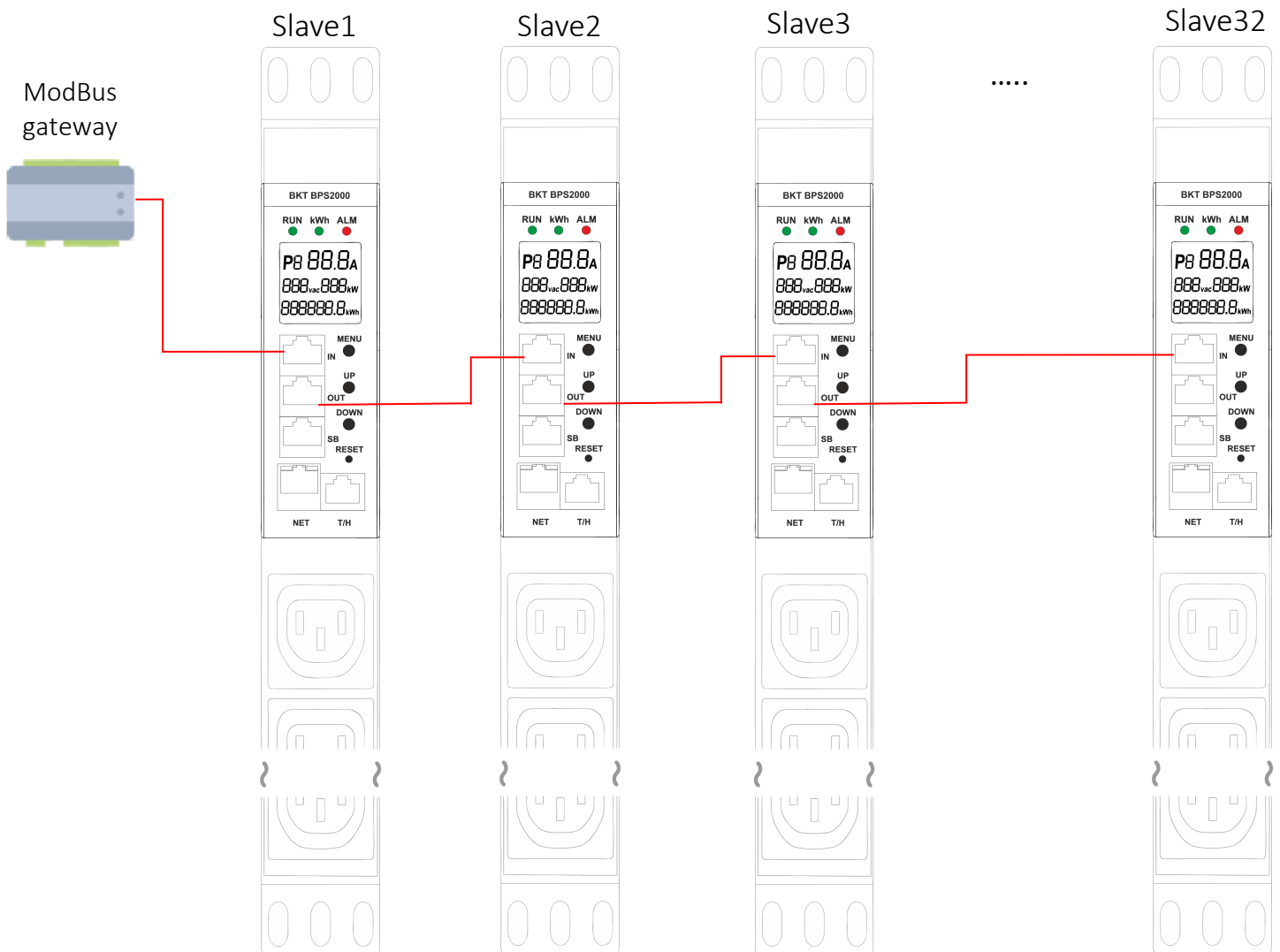
- **Madbus RTU protocol version**

    Interface: serial transmission port with two RS485 lines, asynchronous transmission, bidirectional semi-duplex transmission, the least significant bit will have priority.

Example of Modbus RTU frame

Default transmission attributes in BPS2000v2

- Boud rate: 9600b/s
- Data Bit: 8
- Parity: No
- Stop bit: 1

Modbus RTU frame				
Master				
Slave address	Function code	Register first address	Data length	CRC code
1 byte	1 byte	2 bytes	2 bytes	2 bytes
01	03	00 00	00 01	84 0A
Slave1				
Slave address	Function code	Data length	Data	CRC code
1 byte	1 byte	1 byte	N bytes	2 bytes
01	03	02	09 0E	3F D0

BPS2000v2 web interface

ModBus settings

Slave address: (Slave1-Slave32)

Baud rate: 4800/9600/19200/38400 [b/s]

Parity: NONE, ADD, EVEN

Data bits (8/9*)

Stop bits (1/2)

*If you need to use type parity: ADD or EVEN, data bit should be set to 9.

Setting the data bit to 9 is only required in the web interface of the BPS2000v2 PDU.
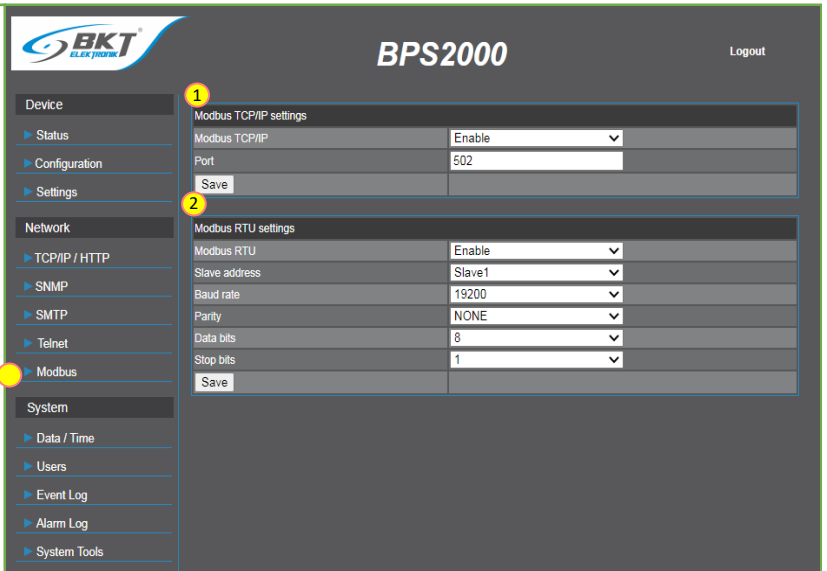
12.1 Modbus RTU/TCP memory map

Registry name	Registry address		Unit	Access W/R	Actual value	Size
	Decimal	Hexadecimal				
Total voltage L1	00000	0x0000	V	R	=register/10	2 Bytes
Total voltage L2	00001	0x0001	V	R	=register/10	2 Bytes
Total voltage L3	00002	0x0002	V	R	=register/10	2 Bytes
Total current L1	00003	0x0003	A	R	=register/100	2 Bytes
Total current L2	00004	0x0004	A	R	=register/100	2 Bytes
Total current L3	00005	0x0005	A	R	=register/100	2 Bytes
Active power L1	00006	0x0006	W	R	=register/10	2 Bytes
Active power L2	00007	0x0007	W	R	=register/10	2 Bytes
Active power L3	00008	0x0008	W	R	=register/10	2 Bytes
Reactive power L1	00009	0x0009	VAR	R	=register/10	2 Bytes
Reactive power L2	00010	0x000A	VAR	R	=register/10	2 Bytes
Reactive power L3	00011	0x000B	VAR	R	=register/10	2 Bytes
Apparent power L1	00012	0x000C	VA	R	=register/10	2 Bytes
Apparent power L2	00013	0x000D	VA	R	=register/10	2 Bytes
Apparent power L3	00014	0x000E	VA	R	=register/10	2 Bytes
Frequency L1	00015	0x000F	Hz	R	=register/100	2 Bytes
Frequency L2	00016	0x0010	Hz	R	=register/100	2 Bytes
Frequency L3	00017	0x0011	Hz	R	=register/100	2 Bytes

Registry name	Registry address		Unit	Access W/R	Actual value	Size
	Decimal	Hexadecimal				
Power Factor L1	00018	0x0012		R	=register/100	2 Bytes
Power Factor L2	00019	0x0013		R	=register/100	2 Bytes
Power Factor L3	00020	0x0014		R	=register/100	2 Bytes
Active energy L1	00021-00024	0x0015-0x0018	kWh	R	=register/1000	8 Bytes
Active energy L2	00025-00028	0x0019-0x001C	kWh	R	=register/1000	8 Bytes
Active energy L3	00029-00032	0x001D-0x0020	kWh	R	=register/1000	8 Bytes
Apparent energy P1	00033-00036	0x0021-0x0024	kVAh	R	=register/1000	8 Bytes
Apparent energy P2	00037-00040	0x0025-0x0028	kVAh	R	=register/1000	8 Bytes
Apparent energy P3	00041-00044	0x0029-0x002C	kVAh	R	=register/1000	8 Bytes
Active energy L1+L2+L3	00045-00048	0x002D-0x0030	kWh	R	=register/1000	8 Bytes
Apparent energy L1+L2+L3	00049-00052	0x0031-0x0034	kVAh	R	=register/1000	8 Bytes
Temperature	00053	0x0035	C	R	=register/10	2 Bytes
Temperature	00054	0x0036	C	R	=register/10	2 Bytes
Temperature	00055	0x0037	C	R	=register/10	2 Bytes
Humidity	00055	0x0038	%	R	=register/10	2 Bytes
Humidity	00056	0x0039	%	R	=register/10	2 Bytes
Humidity	00057	0x003A	%	R	=register/10	2 Bytes
Door 1	59	0x003B			1=Open 2=Closed	2 Bytes
Door 2	60	0x003C			1=Open 2=Closed	2 Bytes

Modbus RTU/TCP memory map-continuation

Registry name	Registry address		Unit	Access W/R	Actual value	Size
	Decimal	Hexadecimal				
Smoke	61	0x003D		R	1=Yes 2=No	2 Bytes
Water	62	0x003E		R	1=Yes 2=No	2 Bytes
Low Alarm L1 Voltage	00063	0x003F	V	R/W	=register/10	2 Bytes
High Alarm L1 Voltage	00064	0x0040	V	R/W	=register/10	2 Bytes
Low Alarm L2 Voltage	00065	0x0041	V	R/W	=register/10	2 Bytes
High Alarm L2 Voltage	00066	0x0042	V	R/W	=register/10	2 Bytes
Low Alarm L3 Voltage	00067	0x0043	V	R/W	=register/10	2 Bytes
High Alarm L3 Voltage	00068	0x0044	V	R/W	=register/10	2 Bytes
Low Alarm L1 Current	00069	0x0045	A	R/W	=register/10	2 Bytes
High Alarm L1 Current	00070	0x0046	A	R/W	=register/10	2 Bytes
Low Alarm L2 Current	00071	0x0047	A	R/W	=register/10	2 Bytes
High Alarm L2 Current	00072	0x0048	A	R/W	=register/10	2 Bytes
Low Alarm L3 Current	00073	0x0049	A	R/W	=register/10	2 Bytes
High Alarm L3 Current	00074	0x004A	A	R/W	=register/10	2 Bytes
Low Alarm Temperature	00075	0x004B	°	R/W	=register	2 Bytes
High Alarm Temperature	00076	0x004C	°	R/W	=register	2 Bytes
Low Alarm Temperature1	00077	0x004B	°	R/W	=register	2 Bytes
High Alarm Temperature1	00078	0x004C	°	R/W	=register	2 Bytes
Low Alarm Temperature2	00079	0x004F	°	R/W	=register	2 Bytes
High Alarm Temperature2	00080	0x0050	°	R/W	=register	2 Bytes

Registry name	Registry address		Unit	Access W/R	Actual value	Size
	Decimal	Hexadecimal				
Low Alarm Humidity	00081	0x0051	%	R/W	=register	2 Bytes
High Alarm Humidity	00082	0x0052	%	R/W	=register	2 Bytes
Low Alarm Humidity 1	00083	0x0053	%	R/W	=register	2 Bytes
High Alarm Humidity 1	00084	0x0054	%	R/W	=register	2 Bytes
Low Alarm Humidity 2	00085	0x0055	%	R/W	=register	2 Bytes
High Alarm Humidity 2	00086	0x0056	%	R/W	=register	2 Bytes
Voltage alarm L1 [V]	00087	0x0057		R		2 Bytes
Voltage alarm L2 [V]	00088	0x0058		R		2 Bytes
Voltage alarm L3 [V]	00089	0x0059		R		2 Bytes
Current alarm L1 [A]	00090	0x005A		R		2 Bytes
Current alarm L2 [A]	00091	0x005B		R		2 Bytes
Current alarm L3 [A]	00092	0x005C		R		2 Bytes
Temperature alarm	00093	0x005D		R	00=Normal 01= Low Alarm 16= High Alarm	2 Bytes
Temperature 1 alarm	00094	0x005E		R		2 Bytes
Temperature 2 alarm	00095	0x005F		R		2 Bytes
Humidity alarm	00096	0x0060		R		2 Bytes
Humidity 1 alarm	00097	0x0061		R		2 Bytes
Humidity 2 alarm	00098	0x0062		R		2 Bytes

Example presentation of data reading for phase L1 active energy meter

Registry name	Registry address		Unit	Access W/R	Actual value	Size
	Decimal	Hexadecimal				
Active energy L1	00021-00024	0x0015-0x0018	kWh	R	=register/1000	8 Bytes

To obtain the result of the indication for the active energy meter of phase L1, it is necessary to make an algebraic transformation of the obtained four register values according to the formula:

$(R21 \times 256^3 + R22 \times 256^2 + R23 \times 256 + R24) / 1000$

Where:
R21 - register value 21
R22 - register value 22
R23 - register value 23
R24 - register value 24

Example

Phase 1 active energy meter readings: 1800.12 kWh

Item	Name	Unit	Phase 1	Phase 2	Phase 3
1	Load	A	0.03	0	0
2	Voltage	V	239.7	240	240.3
3	Active Power	W	2.3	0	0
4	Reactive Power	VAR	6.7	0	0
5	Apparent Power	VA	7.1	0	0
6	Frequency	Hz	50	50	50
7	Active Energy	kWh	3.1	0.48	0
8	Apparent Energy	kVAh	3.20	0.50	0.00
9	Power Factor		0.32	0	0

Reading the values of registers R21-R24 of the active energy meter Phase 1

21	0
22	27
23	119
24	184

R21=0
R22=27
R23=119
R24=184
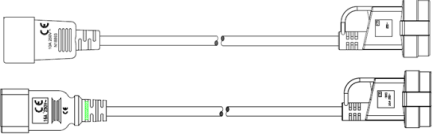
13. Technical parameters of BPS2000 unit

No.	Item		Parameters
1	Inputs	Input voltage	110/230V/400V 50/60HZ
		Maximum input load	16A/32A/3x16A/3x32A
		Cable specification	250V/16A: $3\times2.5mm^2\times3M$ 250V/32A: $3\times6.0mm^2\times3M$ 400V/16A: $5\times2.5mm^2\times3M$ 400V/32A: $5\times6.0mm^2\times3M$
		Input plug	250V/16A: $3\times2.5mm^2\times3M$ IEC60309 plug 250V/32A: $3\times6.0mm^2\times3M$ IEC60309 plug 400V/16A: $5\times2.5mm^2\times3M$ IEC60309 plug 400V/32A: $5\times6.0mm^2\times3M$ IEC60309 plug
2	Outputs	Output voltage	230V AC
		Maximum output load	10A for IEC 320 C13 16A for IEC 320 C19
		Sockets standard	IEC320 C13, IEC320 C19, NF C61-314, DIN49440
		Number of sockets	From 5 to 42 depending on configuration
3	Display	Hot Swap module	LCD screen displays voltage [V], load [A], power [kW], power meter [kWh]
4	Specification	Dimensions	L×W×H [mm]: x × 44.4 × 68
		Case colour	Black aluminium
5	Mounting		Vertical mounting or horizontal depending on models 1U 19" or 0U
6	Environment	Temperature	0°C ÷ 60°C
		Relative humidity	10% ÷ 95%
		Storage	-20°C ÷ 70°C

13.1 Control module specification

Lp.	Item	Connectors	Description
1	Output connectors	NET Port	RJ45
		T/H Port	RJ12
		IN Port	RS485/Modbus RTU
		OUT Port	RS485/Modbus RTU
		SB	RS485/SensorBox
2	Housing	Dimensions [mm]	144 × 44.4 × 49
		Color	Black
3	Working environment	Temperature	0°C do 60°C
		Humidity	10% ÷ 95%

13.2 Additional accessories

Temperature and humidity sensor (1134DTH01) for direct connection to the NET port of the BPS2000v2 unit		Environmental conditions monitoring module Sensor-Box	
		Catalog number	1134SBX01
		Number of sensor ports	6 x RJ12
Temperature and humidity sensor (1134CTH01)*		Max number of sensors supported	2 x Temperature and humidity sensors, 2 x Door opening sensors, 1 x Flood sensor, 1 x Smoke sensor
Door opening sensor* (1134CDS01)		View of the power supply 250V AC /12V DC	
Smoke sensor* (1134CSS01)		Power adapters DIN49440/IEC 320 C14 — 11480798.03 DIN49440/IEC 320 C19 — 11480799.03	
Flood sensor* (1134CWS01)			

*Required connection of SensorBox environmental monitoring module to SB port of BPS2000v2 control module

14. Warranty

Devices belonging to the Energy Distribution Systems category sold by BKT ELEKTRONIK are covered by warranty protection and the buyer is granted a quality warranty on the following principles:

14.1 Object of warranty

The object of the warranty are devices from Appendix 1 to the Warranty Terms and Conditions SDE_V1.0_2015. In case of physical defects of the device, BKT ELEKTRONIK undertakes to repair the defective device or its component free of charge during the warranty period. The following provisions relating to the device also apply to the components thereof. BKT ELEKTRONIK may decide to replace the defective device with a defect-free one instead of repairing it. Replacement will also be carried out under the following conditions.

14.2 Warranty time

In case of purchase, the warranty is granted for the devices for the warranty period specified in Appendix 1 to SDE_V1.0_2015 Warranty Terms and Conditions. The warranty period is counted from the date of purchase of the device by the Buyer confirmed by a purchase document (invoice).

14.3 Notice period

The Buyer undertakes to inform BKT ELEKTRONIK immediately about the defect of the device, but not later than within 14 days from the occurrence of the defect. The rules of notification are specified in these warranty conditions.

14.4 Scope of warranty

14.4.1 The warranty only covers defects that are attributable to the device - manufacturing defects (hidden defects) that are not attributable to improper use of the device.

14.4.2 The warranty does not cover defects that arise in particular from:

- improper mounting, installation or operation of the device, which means, in particular, performing these actions contrary to the intended use of the device, the technical parameters of the device or the operating instructions,

- influence of any external force or factor, including ionizing radiation, magnetic field, chemical or mechanical factors, flooding of the device, electric discharge and impact of natural forces,

- using the device together with other equipment not intended for use therewith or equipment other than recommended in the technical specification of the device,

- faulty transport, storage, cleaning or maintenance of the device,

- short circuit in the electrical system outside the device,

- operation of the device in extremely unfavourable conditions, e.g. high dustiness,

- use of chemically aggressive substances, temperature/moisture exceeding the range of proper operation of the device and specified in the technical specification, data sheet or rating plate of the device (if any).

- any defects caused by disassembling any elements of the device, repairing them on its own and interfering with the device's design solutions,

- damage caused by overvoltages, including switching overvoltages, incorrect selection of the rated voltage and exceeding the maximum load [A] of the whole device, or exceeding the maximum load [A] of each power supply socket,

- damage caused by a faulty power supply network or faulty or inadequately selected power supply equipment,

- incorrect discharge of the temperature emitted from the device, or failure to provide adequate ventilation at the place of installation of the devices from Appendix 1 to Warranty Terms and Conditions SDE_V1.0_2015.

14.4.3 The warranty does not cover parts subject to normal wear and tear and consumables,

14.4.4 The warranty does not cover activities related to the replacement of fuses and manageable modules,

14.4.5 The warranty also does not cover damage resulting from the connection of devices whose total power exceeds the permissible range contained in the data sheet, technical specifications, or data contained on the device's rating plate.

14.5 Processing of warranty claims

14.5.1 The Buyer is obliged to report the defect of the device in writing by completing the complaint form on https://www.bkte.pl/en/support/claim-form

The claimed device should be delivered to:

BKT ELEKTRONIK, ul.Wiejska 6, 86-065 Lisi Ogon

14.5.2 The complaint form must contain:

- Date of reporting

- Details of Buyer/Reporting Person

- Purchase invoice number

- Article reference of the device

- Item/device name

- Device serial number (if any)

- Reason for complaint

Lack of the above information on the complaint form will result in the complaint not being considered until the data is completed by the Buyer/Reporting Person.

14.5.3 If the device is to be delivered to BKT ELEKTRONIK, it shall be delivered in original or substitute packaging ensuring safe transport and storage conditions similar to those provided by the original packaging.In the absence of factory packaging, the risk of damage to the device during transport and storage is borne by the Buyer.

14.5.4 The claimed product should be sent back at its own expense to the address indicated in point 13.5 - (Processing warranty claims).

14.5.5 The repaired product shall be sent back to the Customer at the cost of BKT ELEKTRONIK in the case of a justified complaint.

14.5.6 If the delivered product does not contain defects covered by this warranty, the Buyer shall be immediately informed thereof.

14.5.7 A device with a defect found by the Buyer may be tested by BKT ELEKTRONIK in order to determine or locate the defect. If the tests performed do not confirm the existence of the defect identified by the Buyer and do not indicate the existence of another defect not identified by the Buyer covered by the warranty, BKT ELEKTRONIK reserves the right to charge the resulting costs to the Buyer.

14.5.8 At the request of BKT ELEKTRONIK, the Buyer shall make available all technical and operational documentation related to the application or installation of the device.

14.5.9 The decision to replace the equipment or a component thereof shall be taken exclusively by BKT ELEKTRONIK.

14.5.10 If it is not possible to replace the equipment with a new one, the customer shall be entitled to replace it with other equipment with approximate parameters or to a refund of the price paid.

14.5.11 BKT ELEKTRONIK is not obliged to provide the Buyer with a replacement device for the duration of the warranty repair.

14.5.12 In the event of a decision to replace a defective device with a new one, BKT ELEKTRONIK reserves the right to charge the Buyer with additional costs resulting from the failure to deliver a complete device that was purchased, on a par with the value of the missing elements.

14.5.13 BKT ELEKTRONIK does not carry out warranty repairs at the place of installation or use.

14.6 Loss of warranty rights

The Buyer loses the rights under this warranty in case of:

12.6.1 any repair or modification of the device on its own or by a third party, or entrusting the performance of the repair to a person other than an authorized BKT ELEKTRONIK service technician;

12.6.2 finding any tampering with, damage to, or breakage of seals, or covering them up in any way that makes them impossible to identify;

12.6.3 finding any damage, tampering with or removal of the serial number or other markings identifying the device, or covering them up in any way that makes them impossible to identify;

12.6.4 breaching the obligations arising for the Buyer under this warranty;

12.6.5 expiry of the warranty period;

12.6.6 misuse of the device;

14.7 Limitation of liability

BKT ELEKTRONIK is not liable for:

12.7.1 damage resulting from the use of the device contrary to its intended use or the operating instructions; any ensuing damage may not constitute grounds for warranty and repair claims or legal claims.

12.7.2 damage and lost profits of the Buyer resulting from the need to repair the device.

14.8 Additional provisions

12.8.1 Any deletions or amendments made to these warranty terms and conditions by an entity other than BKT ELEKTRONIK are null and void.

12.8.2 In matters not regulated by these terms and conditions, the relevant provisions of the Civil Code on Quality Warranty shall apply.

14.9 Warranty table

DEVICE TYPE - MODEL/SERIES	Warranty term in months
BPS2000v2 monitoring power distribution unit	24
BKT Temperature and Humidity sensor	24

15. Unit BPS2000v2 software update

In order to update the software, you will need:
- PC with Windows operating system
- Ethernet port on the PC
- RJ45/RJ45 network cable
- Software update tool using TFTP application (e.g.:tftp32)
- Software update file

Before starting the software update, follow these steps

15.1 Check that there is a stable Ethernet connection between the computer and the BPS2000v2/BPS2500v2 unit

To do this, invoke a console window from the Windows operating system with the command "cmd"
Execute the ping command with the local address of the power strip BPS2000v2/BPS2500v2
A direct local connection between the computer and the power unit is required, it is recommended that the unit address be from the following numbering range
IP: 192.168.0.2-192.168.0.254, for this you can use the restart to factory settings in the System Tools tab of the BPS2000v2/BPS2500v2 unit management interface

The following screen confirms the availability of the BPS2000v2/BPS2500v2 on the local network.
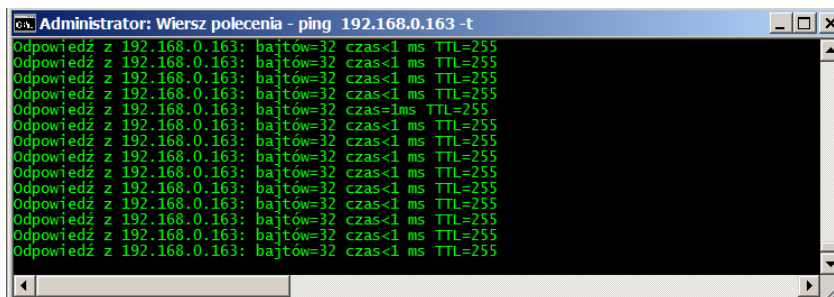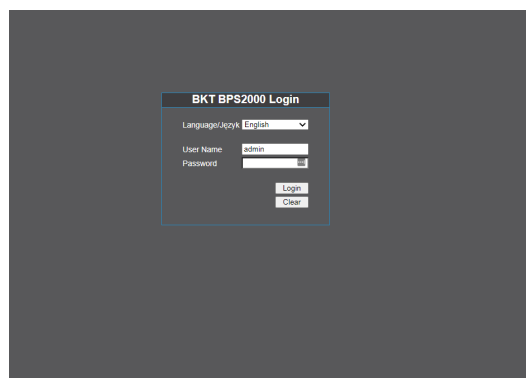

15.2 Log in to the BPS2000v2/BPS2500v2 PDU by entering the unit's current IP address in a web browser, or via the default IP address: 192.168.0.163
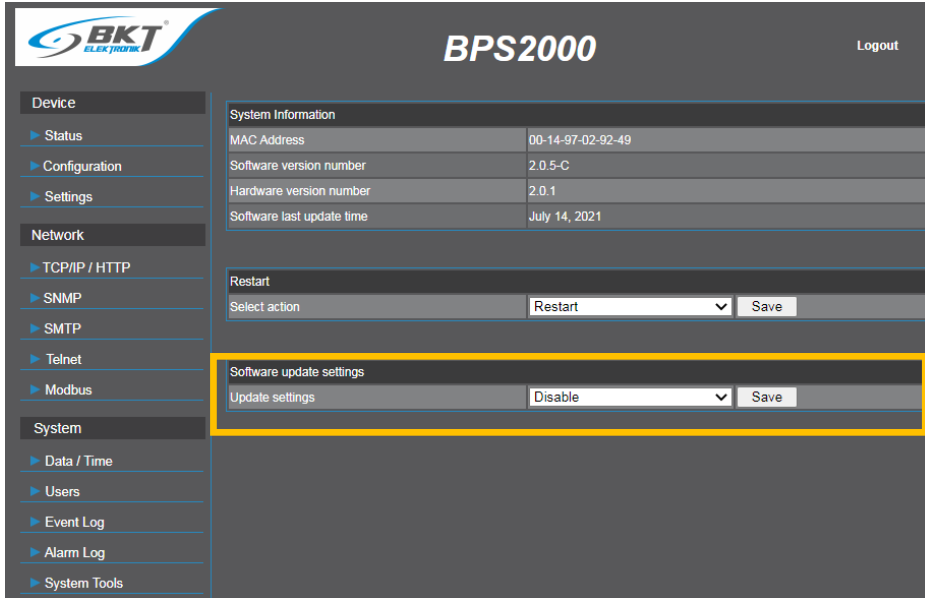
Default login credentials
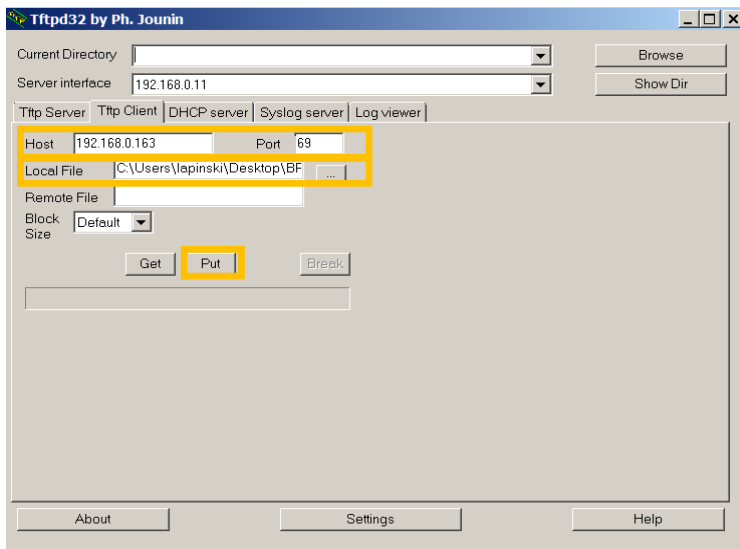
User name: admin

Password: admin

15. Unit BPS2000v2/BPS2500v2 software upgrade

15.3 Go to the System Tools tab and allow the update to be performed by changing the Software Update parameter from Disable to Enable

15.4 Run the TFTP application to perform the software update, e.g.:tftpd32

Select the tab Tftp Client

Host *Field*: Enter the current IP address of the BPS2000v2/BPS2500v2 or the default IP address: 192.168.0.163

Port *Field:* 69

Local File: Enter the path of the update file: e.g.: BPS2500-3.bin

Put *key* : Will start uploading the update file to the unit BPS2000v2/BPS2500v2

15. Unit BPS2000v2/BPS2500v2 software upgrade

15.5 A correctly uploaded update file to the BPS2000v2/BPS2500v2 will automatically restart the unit

and display the following window from the TFTP application

xxx blocks transferred in xx seconds
0 block retransmitted
MD5: xxxxxxxxxxxxxxxxxxxxxxxxxx

OK
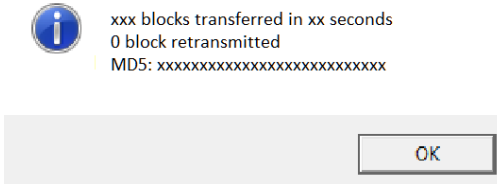
15.6 The software update takes from several seconds to several minutes, depending on the size of the changes in the software.

15.7 After the software is uploaded correctly, the unit will restart the management software and one short sound sygnal will be heard.

15.8 You may need to clear your browsing history on your PC's web browser after updating the software.

15.9 If you have problems with the correct operation of the new functions in the unit software, please perform a restart to factory settings [Restart to default Settings], during the restart all unit configuration data will be lost.

Warning:

During the software update, all unit configuration data may be lost.

To ensure proper execution of the update, ensure:

1. continuity of the unit's electrical power supply

2. a stable network connection (Ethernet) between the computer and the unit BPS2000v2/BPS2500v2.

Failure to maintain any of the above points will result in erroneous software upload and loss of communication and management over the unit.