REMOTE READING, CONTROL
AND DATA LOGGING SYSTEM
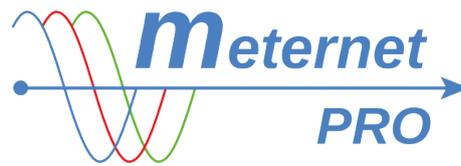
**m**eternet
PRO

USER MANUAL

for software version 3.4.x

180425EN

www.fif.com.pl

PURPOSE

The MeternetPRO program enables remote reading of states and measurements of meters, multimeters, measuring transducers, I/O extension modules and other measuring devices communicating in accordance with the Modbus RTU and M-bus protocols. Data exchange between devices is carried out in standard networks RS-485, M-bus or LAN computer networks. The program along with the database is installed on the special local server MT-CPU-1, which works in the LAN. The software user interface is a WEB application (website). Access to the program is via any web browser. In the case of LAN with public IP address, it is possible to configure the program operation and read data via the Internet.

AREAS OF APPLICATION

* large factories
* small production plants

* office buildings
* apartment buildings
* blocks of flats

* shopping centers
* marketplaces
* public buildings

* single-family housing estates
* campsites
* smallholdings

THE MOST COMMON APPLICATIONS

* measurements for energy audit
* reports on the consumption of electricity, water, gas, etc.
* calculation of sub tenants
* analysis of production and operation costs
* power / current / voltage charts
* monitoring of online parameters
* supervision of power limits (power guard)
* adjustment of electricity tariffs

ACTION

The user application together with the MT-CPU-1 server is the central unit of all system. For measuring devices it fulfills the role of Master. Data exchange between devices is carried out via the RS-485 port built into the MT-CPU-1 server, standard RS-485 or M-bus to USB converters or LAN (Ethernet / TCP-IP) converters.

The system does not require installation of the program on user equipment. The server is a LAN network device and fulfills the functions of the web server. The application is available through a web browser for each computer working in the same subnet. The system is entered via the login panel. In the case of LAN behind the router with public IP address, it is possible to read data via the Internet. The read data is archived in external memory (HDD/SDD, Flash) connected to the server or sent to an external database (hosting). The data can be freely shaped according to the application functions or exported to the user's computer in the form of csv files (and then opened in Excel or any other database program).
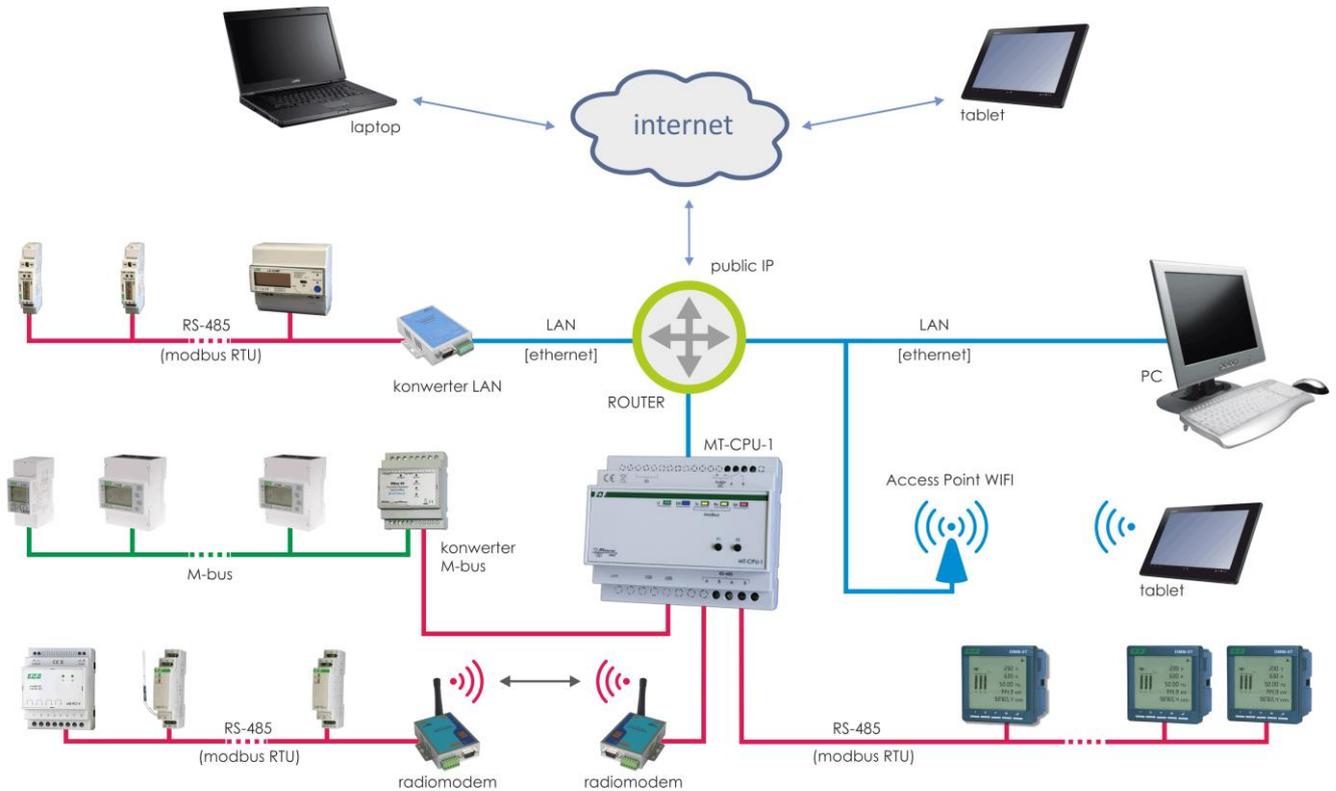
FUNCTIONS

* the system does not require installation of any programs on the user's equipment
* MT-CPU-1 server is a stand-alone unit managing devices and archives
* supported Modbus RTU and M-bus protocols
* external ports: Ethernet RJ-45, RS-485, 4 x USB
* status - view panel of performance and correctness of the system operation
* reports - view panel of current and archived recorded values (results table, charts), report filters, time ranges, subscription billing for energy consumption, etc.
* dashboard - view panel of graphic widgets, visualization and control panels (webscada)
* widgets - graphical widgets assigned to the registered values (indicators, bars, trends)
* configuration - simple application settings without programming skills, definition of device names, system settings
* data acquisition - direct write to a .csv file, transfer over LAN, data export to the .csv files on a user's computer, external PostgreSQL / MSSQL database
* program module "mathematics" - the possibility of algebraic transformations of read values
* SMS / e-mail alerts
* the differentiation function allows to convert the value of electricity consumption [kWh] into instantaneous power [kW] and, as a result, get a graphical power consumption profile that allows to track trends and find power peaks
* integration with third-party devices, such as water, gas meters, etc.

PROGRAM MODULES AND LICENSES

LIC-MT-B   basic license:
- registration of all selected parameters to the system database
- system operation status
- 10 tokens
- table of current readings
- reports: historical tabular for a given time point, historical plot for one parameter for the selected time period; export of generated reports to a csv file (opened in Excel or any other database program) and a screenshot of generated graphs to a jpg file
- dashboard: 1 dashboard + 3 any widgets

LIC-MT-D   token - device license:

Tokens are so-called system point. Each device added to the system as well as specific software license takes some number of tokens. As part of the purchased number of tokens, the user can freely assemble various devices in the system, e.g. with licenses for 8 tokens, we can set up in the system four LE-03M counters or only one LE-03MP counter. The number of tokens for a given device or software license is presented in the current assortment and price list available on the website meternetpro.pl. Recharging the system by purchased tokens is carried out by means of the transmitted license code.

LIC-MT-R   **"reports"** - software extension license

The license allows you to create multiple parallel incremental reports. It serves as calculation of the subscription fee module for electricity consumption (or other accumulated values, e.g. consumption of water, heat, etc.). It allows to calculate the increments of value in designated billing periods. Cycles: monthly, weekly, daily, hourly. In addition, the license activates the possibility of creating historical graphs for 10 any parameters on single time axis (e.g. dependence of power consumed from the temperature).

LIC-MT-P   "dashboard" - software extension license

A panel of graphic widgets of current measurements of selected parameters. The active "dashboard" license allows creating an unlimited number of dashboards and widgets.

LIC-MT-M   "mathematics" - software extension license

The module allows to make transformations (calculations) of recorded algebraic values (sum, difference, multiplication, division, differential, mean, minimum, max, etc. The result is registered as a virtual device parameter and is subject to all program rules, just like any measurements of real devices.

LIC-MT-K   "camping" - software extension license

The module allows calculating the consumption of electricity or other media (water, gas, etc.) in a given time by means of manual START/STOP control and subsequent calculation of the fee according to user's consumption and set rate. Each billing report is printed to a PDF file. The billing archive is saved in a special file in the Files tab with the option of exporting to a CSV file.

LIC-MT-Z   "prepaid" - software extension license

The module allows prepayment management of electricity or other media (water, gas, etc.). It allows automatic disconnection of the power source after exceeding the set threshold or manual ON/OFF control.

LIC-MT-I   third-party implementation

Software implementation of the system's library for third party device (not produced by F&F). Service on behalf of the client. It allows to integrate other devices compatible with the Modbus RTU protocol. Each device will have a designated individual number of tokens.

HARDWARE EQUIPMENT MT-CPU-1

It is the computer managing the system - polls devices, archives data, manages communication and data distribution.
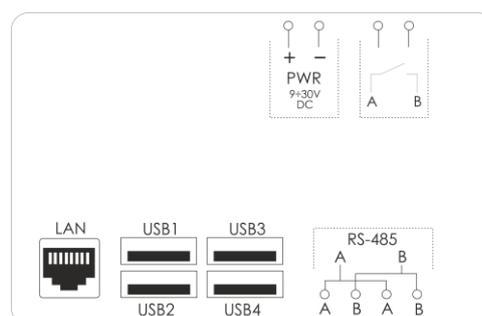
Technical data:

supply voltage	9 ÷ 30V DC
system memory	8GB
RTC clock	YES
battery type	2032 (lithium)
working temperature	-25 ÷ 50 ° C
connection	1.5mm² screw terminals
dimensions	6 modules (105mm)
mounting	on the TH-35 rail

Operating status indication (5 × LED):

U	green	supply voltage
Eth	blue	Ethernet communication
Tx	yellow	MODBUS communication - data output
Rx	yellow	MODBUS communication - data input
Err	red	error indication
Flash all LEDs <3sec.		starting the system after restarting the power supply

Description of connections:

LAN	RJ45 LAN network connection
USBx	USB 2.0 ports to connect converters or external memory
RS-485	MODBUS communication port with double A-B terminals
PWR	power supply terminals +/-
A-B	internal make contact 3A 250V cosφ = 1

Functions of F1 and F2 buttons
Function description:
- **restart of the MeternetPRO application** (rebooting may take several minutes) - Eth LED;
- restoring the server's **default IP address** - Tx LED;
- **system reboot** (causes restarting the server's operating system) - Rx LED;
- **switching off the system**. After this operation, you can safely disconnect the power supply. The device will turn on after reconnection power supply - Err LED;
Key function selection:
Hold F1 and F2 simultaneously for more than 10 seconds, then release. The blue (Eth) LED will flash. Press F1 to switch the desired function. Each of the Eth, Tx, Rx and Err LEDs indicates the corresponding function. By means of the F2 button confirm the selected function.
Entering the key function selection mode stops the MeternetPRO program.

Assembly:

WARNING!
Mount the server in a <u>separate switch box</u>. Avoid installation in switchgear boxes with devices carrying heavy loads and generating strong electromagnetic fields.

WARNING!
In case of strong interference caused by high loads, operation of induction machines (engines), operation of inverters and a large number of loads with capacitive load character (led), it is recommended to install the server in a <u>metal box with earthing</u>.
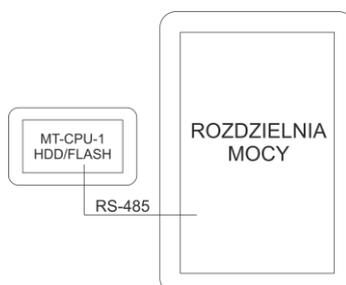
WARNING!
Recommended use of server <u>back-up power supply</u>. It may take up to 5-7 minutes for the system to restart.
During this time, no data from the system will be recorded. Also in the event of a sudden loss of voltage there is risk of damage to the recorded data in the external memory. Use UPS power or back-up power supply system based on the ECH-06 module.
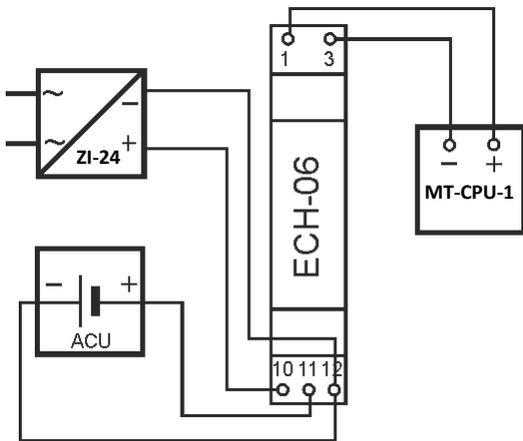

ECH-06	back-up power supply module
AKU	gel battery 12V 1,3Ah
ZI-24	stabilized power supply 24V 30W

The module constantly monitors the state of charge of the battery and recharges it automatically when the main power supply is present. In the case of disappearance of main voltage or decreasing its voltage value below the value of the battery the receiver is powered from the battery.

WARNING!
Do not connect any devices to the USB ports when the server power is on. This may cause a server hang or an automatic restart of the server. Connect only when the power is off.

DATA ARCHIVING

Data archiving takes place on the designated memory space:
- mass storage such as HDD and SSD drives with USB 3.0 / 2.0 connection
- flash memory (pendrive)
- memory available via the LAN local network (FTP, SQL,)
- memory in the "cloud" (hosting) available via the Internet
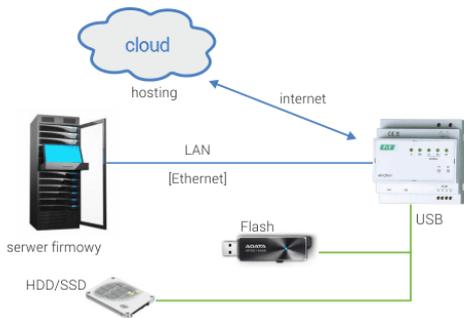
USB flash drives
If using a memory USB stick (pendrive / ssd), connect the memory to the server's USB port.

HDD/SSD USB   Flash (pendrive)

The F&F offer includes the recommended memory for the system.

WARNING!
Use shielded USB communication cables.

WARNING!
Do not connect any devices to the USB ports when the server power is on. This may cause a server hang or an automatic restart of the server. Connect only when the power is off.

WARNING!
Perform memory formatting the first time you start the system or connect the new memory to the server. The option is available in Configuration -> Settings -> Format memory. Warning! Formatting memory with the archive may result in its loss.

SYSTEM COMPONENTS

The basic MeternetPRO system library includes the following devices:

* LE-01M 1-phase direct 100A energy meter
* LE-03M 3-phase direct 100A energy meter
* LE-03M CT 3-phase current transformer 5 ÷ 6000A energy meter
* LE-01MP 1-phase direct 100A energy meter, U, I, F, AE, T measurements
* LE-01MR 1-phase direct 100A energy meter, U, I, F, AE, RE, P, Q, T measurements
* LE-03MP 3-phase direct 60A energy meter, U, I, F, AE, RE, P, Q, cos, T measurements
* LE-01MQ 1-phase direct 100A bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements
* LE-03MQ 3-phase direct 100A bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements
* LE-03MQ CT 3-phase current transformer bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements
* LE-01MB 1-phase direct 100A bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements; M-BUS
* LE-03MB 3-phase direct 100A bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements; M-BUS
* LE-03MB CT 3-phase current transformer bi-directional energy meter, U, I, F, AE, RE, P, Q, cos measurements; M-BUS
* DMM-5T multimeter, 4-quadrant current transformer measurement 5 ÷ 9000A, U, I, F, AE, RE, P, Q, cos measurements
* MB-1U-1 1-phase AC/DC voltage measuring transducer
* MB-3U-1 3-phase AC/DC voltage measuring transducer
* MB-1I-1 1-phase AC/DC current measuring transducer
* MB-3I-1 3-phase AC/DC current measuring transducer
* MB-PT-100 temperature measuring transducer, PT-100 sensor, range -100 ÷ 400 ° C
* MB-DS-2 temperature measuring transducer, 2 x DS18B20 sensors, range -50 ÷ 130 ° C
* MB-LI-4 4-channel pulse counter
* MB-LG-4 4-channel work time counter
* MR-DIO-1 6-channel digital I/O extension module
* MR-DI-4 4-channel digital inputs extension module, AC/DC
* MR-RO-1 1-channel 16A relay output extension module
* MR-RO-4 4-channel 16A relay output extension module
* MR-AI-1 4-channel analog input extension module, 4 ÷ 20mA / 0 ÷ 10V
* MR-AO-1 4-channel analog output extension module, 0 ÷ 10V

There is possibilities to work with third-party devices. This is so-called third-party implementation (**LIC-MT-I**), i.e. adding a designated device to the system library with a list of registers to read in accordance with the user's requirements.

INSTALATION
1. Disconnect the main power supply.
2. Connect the power supply cables to the MT-CPU-1 server.
3. **If using a USB memory stick (pendrive / ssd), connect the memory to the server's USB port.**
   CAUTION! Necessarily in this order!
4. **Perform formatting of the memory at the first system startup or connecting new memory to the server. The option is available in Configuration -> Settings -> Format memory. Warning! Formatting memory with the archive may result in its loss.**

5. Connect the server with RJ45 patch cable to the LAN or directly to the PC.

6. Switch on the power supply.

7. Set the local PC connection to the server's subnet.

   Factory settings for MT-CPU-1:

   IP address: 192.168.0.98

  Subnet mask: 255.255.255.0

  Port: 80

8. PC settings:

   IP address: 192.168.0.xxx (select the last IP address part for the PC in the range of 2-97/99-254)

   Subnet mask: 255.255.255.0
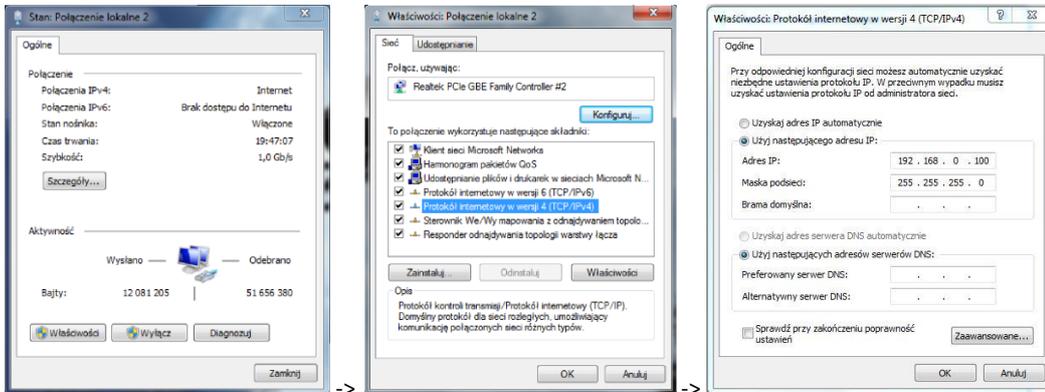
9. Open the web browser and enter the server address http://192.168.0.98, accept by ENTER.

10. The login panel will open:

Enter the default username and password:

User: admin@meternet.pl
Password: admin

11. The application interface will open in the browser window. Go to the Configuration tab and make the appropriate network parameter settings.

APPLICATION INTERFACE

STARTING THE INTERFACE AND LOGIN

Open the web browser. It is recommended to use Google Chrome.

Local access: enter the IP address of the MT-CPU-1 server, e.g. 192.168.0.98. Global access: enter the domain or public IP address of the router. The system operates on communication port No. 80.

The login panel will open. Enter username and password:

Default settings:
User: admin@meternet.pl
Password: admin

TOOLS TAB
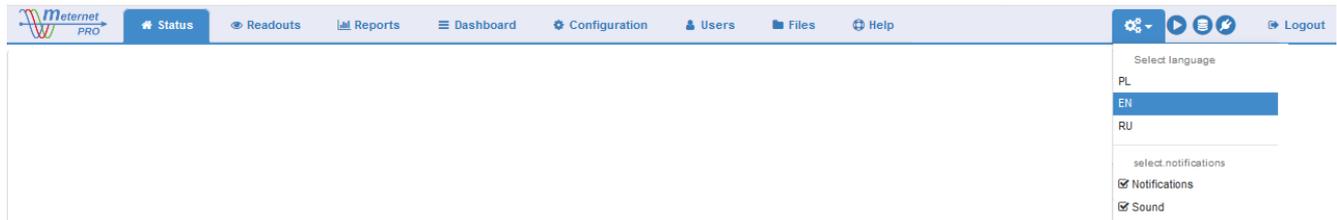
MeternetPRO logo - by hovering over the logo, you will see a label with the software version.
Status / Readouts / Reports / Dashboard / Configuration / Users / Files / Help - menu tabs
- ⚙ Settings:
    - Select language: PL - Polish; EN - English; RU - Russian
    - Select notifications:
        Notifications - the option of appearing labels informing about errors, e.g. the lack of readings of the device. The label appears temporarily in the lower right corner of the screen.

        Sound - an option for audible signaling for an error label that appears.
- ▶ Read/Stop - active reading indicator.
- 🗄 Memory - memory operation indicator
- 🔌 Online/Offline - indicator of user connection with the system.
- ⏏ Logout - exit from the system to the login panel.

STATUS

State panel
Shows server data and current parameters of its work:
Serial number - unique server number, identifies the system assigned to the given user. Licenses are issued based on this number.
Disk space usage - the number of MB available and full internal memory.
RAM load - RAM status. The load in the normal state can reach even more than 90%.
CPU temperature - normal CPU temperature is in the range of 10-55 ° C.
CPU load - normal CPU load is in the range of 1-80%.
Disk load - normal disk load is in the range of 0-80%
Server uptime - the number of days and hours of server work.
Server time - the current time of the system.
Active sessions - the number of users logged into the system.
MAC address - the unique address of the hardware network adapter.
License usage - number of used tokens per number available in the system.

Log panel
Applies to the system operation. Provides current information on readout and registration processes.
Useful when diagnosing communication and recording problems. There is possibility to filter information by category: all, info, warnings and errors as well as browsing the archive for some date.

READOUTS

Current data table
The table shows the results of the latest readouts. The table contains 100 items on one page. The next page can be manually switched using the `< << >> >` buttons

Readouts
Cyclic readout `▶ Star` `■ Stop` - starting and stopping automatic readings.
One-time readout `↻ Star` - starting of a one-time reading (possible only with cyclic readout off).

Data import
Data presented in the table can be exported to the user's computer as a CSV file. CSV is a universal data storage format that can be opened in Excel or any other database program.
To do this, press the `Download CSV ↓` button. The data will be downloaded automatically.

No.	Name of the counter	Description 1	Description 2	Description 3	Name of the parameter	Description of the parameter	Value	Quality	Percentage of false readouts	Readout time
1	MT-CPU-1				CPU		5.73	0	0 %	2018-05-17 11:55:00
2	MT-CPU-1				RAM		95 MB	0	0 %	2018-05-17 11:55:00
3	MT-CPU-1				Storage		57 GB	0	0 %	2018-05-17 11:55:00
4	MT-CPU-1				Relay		0.00	0	0 %	2018-05-17 11:55:00
5	MT-CPU-1				Sessions		1.00	0	0 %	2018-05-17 11:55:00
6	MT-CPU-1				Temperature		48.20 C	0	0 %	2018-05-17 11:55:00
7	MT-CPU-1				Latitude		52.04 °	0	0 %	2018-05-17 11:55:00
8	MT-CPU-1				Lang		140.78 °	0	0 %	2018-05-17 11:55:00
9	MT-CPU-1				Time		1,526,547,300	0	0 %	2018-05-17 11:55:00

Table columns:
Name of counter - device name assigned in the device configuration
Description 1, 2, 3 - additional descriptions assigned in the device configuration
Name of parameter - units and description of the parameter assigned in the device configuration
Description of parameter - additional parameter description assigned in the device configuration
Value - parameter value and unit
Quality - incorrectness indicator. The number indicates the number of incorrect readout queues.
Percentage of false readouts - the percentage of incorrect readouts since the beginning of the user session (since the

browser was launched). The line with the erroneous readout has a red fill.
Readout time - date and time of the last correct readout.

Filters
Search 🔍 - allows you to filter the table in terms of the given phrase or part of it. Applies to all columns. By entering successive phrases, the filter automatically narrows down the device group in the table.

Types of parameters:	Byte, Count, Current, Energy, ... (15) ▼

✓ Select all	× Deselect all

Byte	✓
Count	✓
Current	✓
Energy	✓
Frequency	✓
Humidity	✓
Impulse	✓
Power	✓
Power factor	✓
Reactive energy	✓
Reactive power	✓
Scalar	✓

Visible columns:	No., Name of the counter, Description 1, Description 2, ... (11) ▼

✓ Select all	× Deselect all

No.	✓
Name of the counter	✓
Description 1	✓
Description 2	✓
Description 3	✓
Name of the parameter	✓
Description of the parameter	✓
Value	✓
Quality	✓
Percentage of false readouts	✓
Readout time	✓
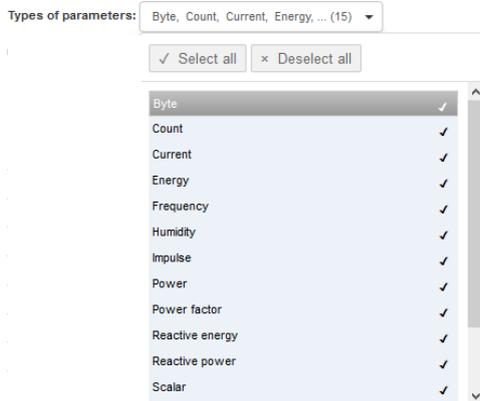
Types of parameters:
Allows to select a group of devices to view with the same parameters.
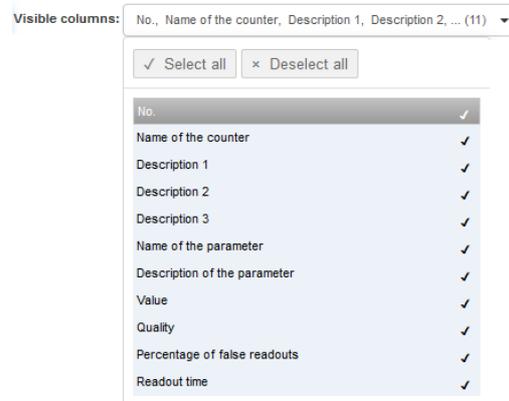
Visible columns:
Allows to select visible columns in the table.
The blue columns are always visible.

HELP
About - information about the software version of the system.

MeterNET v3.3.8 rev. 8cf3230
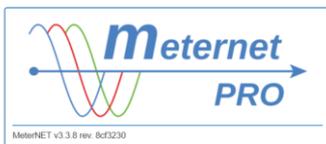
Instructions - pdf version of the user manual.
Clear Cache - clearing the cache of browser.

CONFIGURATION
System configuration tab.

Options

⟶ Data inputs
⟶ Modules
⟼ Data outputs
⚙ Options
✉ Notifiers
📶 Network settings
⏱ Time settings
☼ Astronomical clock
🔒 License
↻ Backup
⚡ Firmware
☁ Storage
⊕ Remote support
☐ Advance View
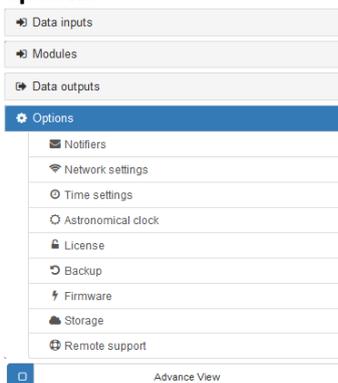
Notifiers:
Settings of the mail channel and SMS channel for the "alarms" program module.
Email - settings of the outgoing mail server from which the email messages will be sent with alarm notifications.

SMS - settings of the SMS channel name with alarm notifications on the user's phone.

Network settings:
Settings of the server's network communication parameters.
Set the required parameters. Then click $\boxed{\mathcal{C} \text{ Apply settings}}$. The system will be available at the new address - enter a new address in the browser.

Time settings:
System time setting.
Set the server date and time using the calendar window ▦. Then click $\boxed{\mathcal{C} \text{ Apply settings}}$.

License:
The code activation panel for the purchased tokens and program modules.
Tokens - click the button $\boxed{\checkmark \text{ Add tokens}}$. Point to the file with the license code. Then click $\boxed{\mathcal{C} \text{ Activate}}$ button.
Program module - the system must have the required number of tokens to activate the module. The number of tokens is shown in the lower right corner of the module description. To add the selected software module, click the green button $\boxed{+}$
A popup will appear with the activation or resignation buttons and with a warning that the activation of the module is irreversible. The activated module is highlighted with a blue marker $\boxed{\checkmark}$. His panel will appear in the Program Module tab.

Backup:
Config Download - export configuration file to user's computer. Click $\boxed{\text{Download}}$ button. The file will be automatically downloaded.
Restore config - restore configuration from saved file. Click $\boxed{\text{Restore}}$ button.
Configuration files (last 10 files) are archived in the Files tab in the config_backup folder. Files are automatically created each time you change and save in the Configuration tab.

Firmware:
MeternetPRO system upgrade. Click on the field "Click or drag". Select the update file. Then click $\boxed{\mathcal{C} \text{ Upload update}}$ or $\boxed{\mathcal{C} \text{ Cancel}}$.

Storage:
Operations on mass memory storage (pendrive, HDD drive, SSD) connected to the server.
Fix - repair memory in case of suspension of data registration and lack of archived data. Before starting, try to reset the MeternetPRO system and check the memory operation.

Format – it is necessary to format new memory connected to the system for the first time.
Warning! Formatting memory with the archive may result in its loss.

Power off safely - securely disconnect memory from the server.
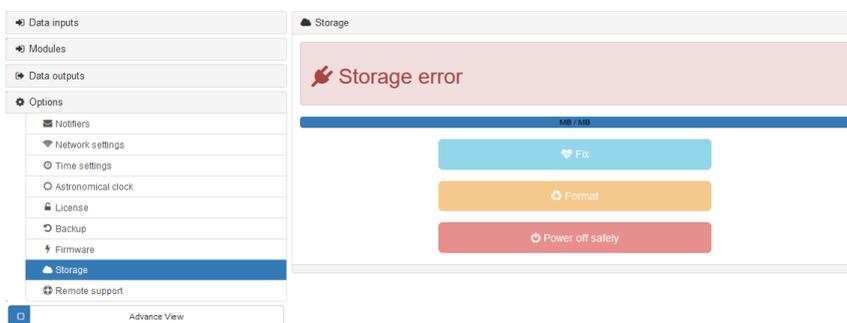
Remote support:
Remote support allows to help the user in configuring and diagnosing system operation. Our specialized employees provide access to the server via the Internet. Communication takes place via an encrypted VPN channel, which is activated during the active remote support option. The connection is completely safe for the user and the owner/administrator of the LAN. The serviceman/programmer has access and the possibility of interfering only with the MeternetPRO system. There is no access to the LAN and user network devices.
In order for remote support to be available, it is necessary to have access to the Internet. By default, each server has remote support enabled.

`Turn on` - enabling remote support.

`Turn off` - disable remote support.

Advance View

Switching on the view of additional advanced configuration items.

Data outputs

Bookmark for selecting and configuring archives (registration databases)
The archives operate in parallel, i.e. each record is made to all configured archives. By default, after archive creating, all parameters are saved to it. It is possible to select parameters that will be saved and which will only be read. The selection is made in the "Data inputs" bookmark - in the archive table of the device added in groups or individually in the device parameter.

Repository - option of selecting the archive as the main one, i.e. the one whose data is used to create reports and current views.

Repository	Label	Type
☑	internal	Internal DB

Archives

Internal DB
Write to the system (basic) database. Physically it is the HDD/SSD/Flash memory connected to the server USB port. By default, the registration data is stored in this database.

CSV file
Write to the file in CSV universal format. The file is saved in the designated place configured in the file manager (Files tab). It is available for download directly in the browser from the designated folder in the Files tab.
Label - default or user defined name
Description - additional description
CSV rolling periodicity - daily, weekly, monthly - selection of the period for creating a new, next archive file. The name contains the date the file was created.
Storage directory - selection of the storage location of archive files in the file manager.
Prefix - the prefix of the file name that is automatically attached before the file creation date.

PostgreSQL DB / MS SQL DB
Write to the database of the designated standard. After entering all communication parameters, the database is automatically established by the MeternetPRO system. The selected database can be a "data source" - the main archive whose data is used to create reports.
Name - original or user defined name.
Description - additional description.
Host - database server address
Port - database server port

Login - database username with at least CREATE rights
Password - access password for the username
Database - database name
Number of connections - maximum number of simultaneous sessions
SSL - option to select encrypted transmission

Data inputs

Configuration of remote read networks - adding communication interfaces and devices operating in the system, their parameterization and descriptions of read parameters. The multi-level segmented diagram is a reflection of the physical remote reading network divided into segments (communication interfaces) by communication channels: LAN converters, USB converters, the MT-CPU-1 embedded RS-485 port and devices connected to them.

The MT-CPU-1 interface and its parameters are factory-set and can not be removed. They represents server operation parameters.
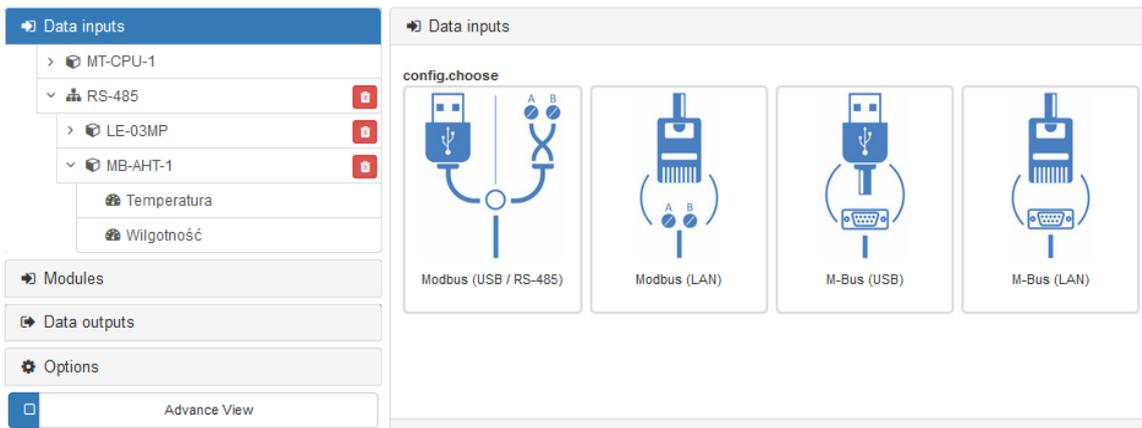
Adding interfaces.
Select the Data Inputs segment and then select the appropriate interface:
Modbus (USB/RS-485) - USB port or server's built-in RS-485 port for Modbus RTU devices
Modbus (LAN) - input via a LAN converter for Modbus TCP devices
M-bus (USB) - USB input for M-bus devices
M-bus (LAN) - input via a LAN converter for M-bus devices
Then click [+ Add input] .

Modbus (USB/RS-485) / M-bus (USB)
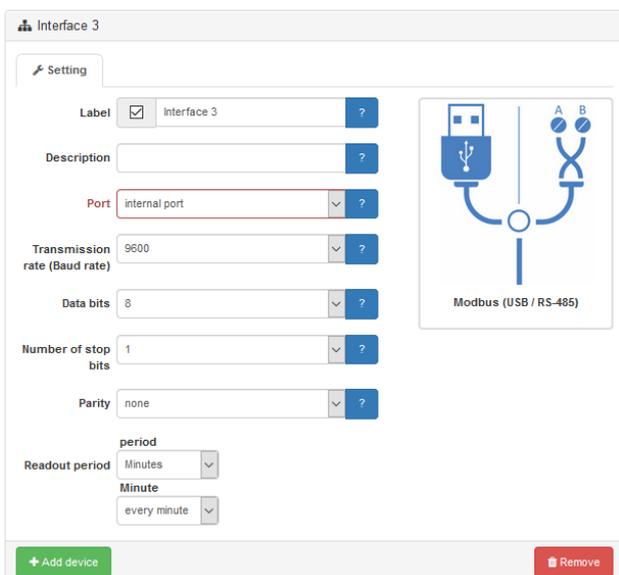
Label - interface name (default or user defined)
Description - additional description
Port - input selection: USB or RS-485 embedded port
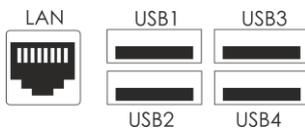
Transmission rate

Data bits

Number of stop bits

Parity

- interface communication parameters. It must be compatible with the parameters of connected devices.

Readout period - set read cycle of connected devices:
   Period - select the appropriate period type from the list and set its time parameters:
      Minutes - minutes of readout delay after full hour
      Hourly - choose from the list of hours and minutes to delay the reading after the full hour in which the reading will take place. You can mark selected hours, e.g. 6, 14, 22, to create a so-called shifting readout or tick all to create a typical hourly readout.
      Daily - select the time of reading from the list and the minute of reading after full hour
      Weekly - select the day of the week of reading, the time of reading and the minute of reading after full hour
      Monthly - select the day of the month, the time of reading and the minute of reading after full hour

Modbus (LAN) / M-bus (LAN)
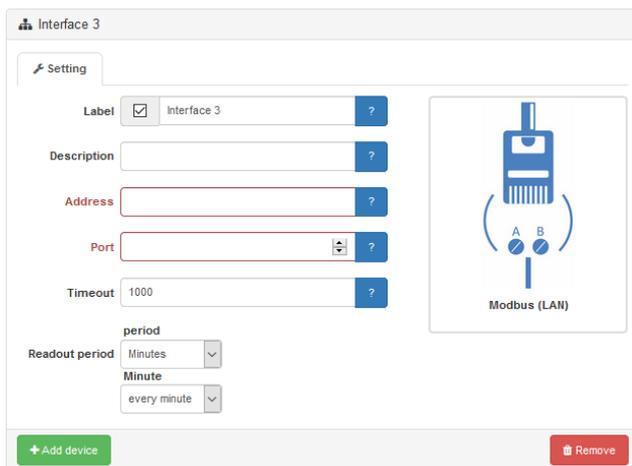
Label - interface display name (default or user defined)
Description - additional description

Address

Port

- IP address and port of the device in the local LAN.

Timeout - maximum waiting time for a response from the device. After receiving a response from the device, the program polls another device.
Readout period - set read cycle of connected devices:
   Period - select the appropriate period type from the list and set its time parameters:
      Minutes - minutes of readout after full hour
      Hourly - choose from the list of hours and minutes to delay the reading after the full hour in which the reading will take place. You can mark selected hours, e.g. 6, 14, 22, to create a so-called shifting readout or tick all to create a typical hourly readout.
      Daily - select the time of reading from the list and the minute of reading after full hour

Weekly - select the day of the week of reading, the time of reading and the minute of reading after full hour

Monthly - select the day of the month, the time of reading and the minute of reading after full hour

Expert view for adding interfaces

☑	Advance View

▼ Simple write rouls			
Output name	config.momentRules.default	config.momentRules.activateAll	config.momentRules.deactivateAll
CSV_arch	☐	+ config.momentRules.activateAll	✖ config.momentRules.deactivateAll
internal	☑	+ config.momentRules.activateAll	✖ config.momentRules.deactivateAll

> 📦 LE-03MP				

∨ 📦 MB-AHT-1				
Name	Write	Output name	Deadband	Minimum rate
Temperatura	☑	CSV_arch		
	☑	internal		
Wilgotność	☑	CSV_arch		
	☑	internal		

Simple write rules

List of all parameters that are read from a given device with the option to choose to save a given parameter to the selected archive.

Archive (outputs):

> Output name - a list of defined archives.

> Default - selection indicator - selection means that all parameters of each newly added device in this interface will be automatically saved to this archive.

> Activate all / Deactivate all - option to quickly mark / unmark the readout to the archives of all parameters of all devices connected to the given interface.

Devices:

> Name - name from the parameter segment - default or user defined

> Write - option to choose to write to the selected archive. By default, all defined archives are selected.

> Output name - a list of defined archives.

> Deadband - defining the range of the parameter change, which forces the record to be archived. This is for reducing the amount of data stored in the archive. Data that does not change or change below the set value is not recorded. Only exceeding the given change value from the last saved forces a new record. The change value is considered up and down the parameter. Enter the change value (without unit and sign).

> Minimum rate - frequency of the sample recording of a given parameter, i.e. how many samples should be forced to write despite the lack of changes determined in the Deadband.

Adding a device
Select the Communication Interface segment, and then click the + Add device button. The device library will opens.

Select the device and click the + Add

Label - display name of the device (default or user defined)
Description 1, 2, 3 - additional descriptions allowing for precise description and distinguishing groups of devices.
Modbus / m-bus address - the unique device address for this interface.
Period - optional settings of device parameters individual recording period to the archive. It distinguishes data recording of

this device from the main setting for the whole communication interface.

Example: the interface A contains 10 active energy meters and one multimeter. All meters are polled every 1 hour, while a multimeter with such parameters like voltage, current and power is polled every 1 minute.

Select the appropriate period type from the list and set its time parameters:

Default - setting inherited from the entire communication interface.

Minutes - minutes of readout after full hour

Hourly - choose from the list of hours and minutes to delay the reading after the full hour in which the reading will take place. You can mark selected hours, e.g. 6, 14, 22, to create a so-called shifting readout or tick all to create a typical hourly readout.

Daily - select the time of reading from the list and the minute of reading after full hour

Weekly - select the day of the week of reading, the time of reading and the minute of reading after full hour

Monthly - select the day of the month, the time of reading and the minute of reading after full hour

Expert view for adding a device

Output name	config.momentRules.default	config.momentRules.activateAll	config.momentRules.deactivateAll
CSV_arch	☐	+ config.momentRules.activateAll	✗ config.momentRules.deactivateAll
internal	☐	+ config.momentRules.activateAll	✗ config.momentRules.deactivateAll

Name	Write	Output name	Deadband	Minimum rate
L1 phase voltage	☐	CSV_arch		
	☑	internal		
L2 phase voltage	☐	CSV_arch		
	☑	internal		
L3 phase voltage	☐	CSV_arch		
	☑	internal		
L1 phase current	☐	CSV_arch		
	☑	internal		
L2 phase current	☐	CSV_arch		
	☑	internal		

Simple write rules

List of all parameters that are read from a given device with the option to choose to save a given parameter to the selected archive.

Archive (outputs):

Output name - a list of defined archives.

Default - selection indicator - selection means that all parameters of each newly added device in this interface will be automatically saved to this archive.

Activate all / Deactivate all - option to quickly mark / unmark the readout to the archives of all parameters of current device.

Device:

Name - name from the parameter segment - default or user defined

Write - option to choose to write to the selected archive. By default, all defined archives are selected.

Output name - a list of defined archives.

Deadband - defining the range of the parameter change, which forces the record to be archived. This is for reducing the amount of data stored in the archive. Data that does not change or change below the set value is not recorded. Only exceeding the given change value from the last saved forces a new record. The change value is considered up and down the parameter. Enter the change value (without unit and sign).

Minimum rate - frequency of the sample recording of a given parameter, i.e. how many samples should be forced to write despite the lack of changes determined in the Deadband.

Parameter
Individual configuration of the parameter of measuring devices.
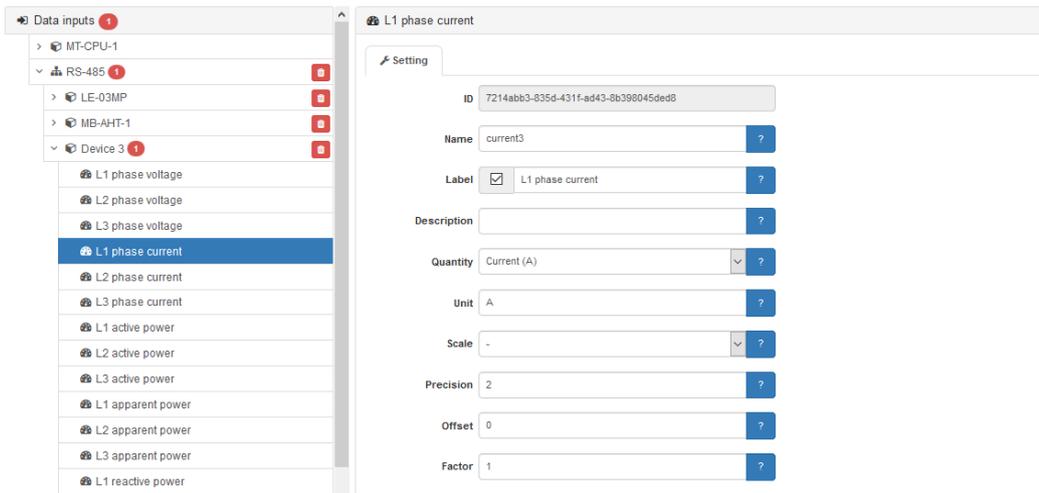
Expand the device segment and select the segment of the given parameter:

ID - an individual parameter number assigned automatically when adding a device.

Label - display name of the parameter (default or user defined)

Description - additional descriptions allowing for precise description and highlighting of parameter groups.

Quantity – physical type of parameter. This setting allows to compile specific parameter groups using filters in the reports and the table of current readings. By default, the correct physical type for this parameter is set but can be redefined.

Unit - unit assigned for a given physical type of parameter. You can redefine it manually.

Scale - dimension of the unit. The "-" sign means no dimension is set.

Precision - number of digits after the comma parameter.

Offset / Factor - allow for algebraic transformation of the read parameter and saving the transformed result. The transformation algorithm is a linear function: y = ax + b, where a - factor; b - offset; x - read value; y- saved result.

Example. The offset parameter allows you to shift the value of the result to + or -. If the given meter already has a counted value, e.g. 123kWh, then by setting the offset value to -123, we effectively reset it. The readouts starts from 0. The factor/multiplier parameter allows you to increase or decrease the readout result proportionally. If the 3-phase system is symmetrically loaded and we measure energy consumption only on one phase, by setting the multiplier to 3, we obtain the consumption value for the whole system.

Individual configuration of the device parameters for digital and relay outputs.
For MR-DIO-1, MR-RO-1, MR-RO-4 devices and MT-CPU-1 embedded relay contact.
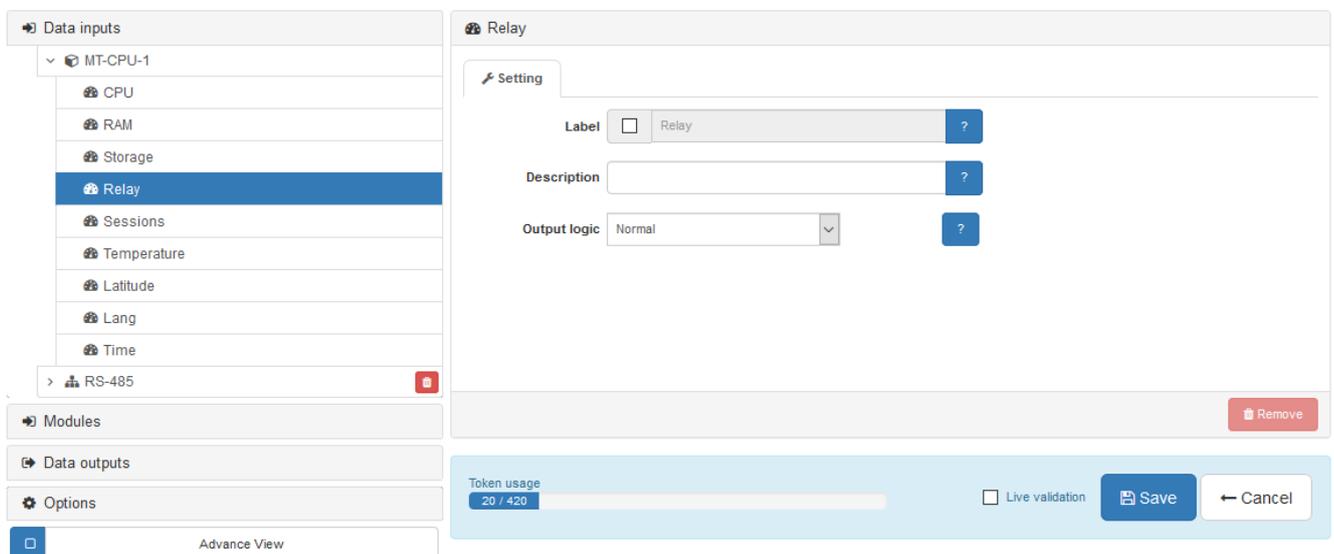
Label - display name of the output (default or user defined)

Description - additional descriptions allowing to describe and highlight the output.

Output logic - selection of the output control option depending on the value of the input parameter.

Normal - normal control logic. For the input parameter 1, the output state is 1 (closed). For the input parameter 0, the output state is 0 (open).

Inverse - allows to reverse the output logic (logical NOT). For the input parameter 1, the output state is 0 (open). For the input parameter 0, the output state is 1 (closed). The control example is described in detail in the configuration of the "prepaid" program module.

Modules

Configuration bookmark for active program modules. Each active module is visible in this tab. Activation of modules takes place in the Options -> Licenses bookmark.

The description of the configuration of a given module can be found in the chapter Program modules.

REPORTS

Historical data report

The table shows the results for a given time point selected by the user.

Historical data report			
Search	**Types of parameters:**	**Readout time:**	
Search 🔍	Byte, Count, Current, Energy, ... (15) ▼	2018-05-18 11:47:31 📅 Show ⟳ Download CSV ⬇	
	Visible columns:	**Toleration:**	
	Name of the counter, Name of the parameter, Value ▼	- 1 min ▼	« ‹ 1 › »

Name of the counter ▾	Name of the parameter	Value
LE-03MP	Częstotliwość	
LE-03MP	Współczynnik mocy - Faza L3	
LE-03MP	Współczynnik mocy - Faza L2	
LE-03MP	Współczynnik mocy - Faza L1	
LE-03MP	Moc bierna - Całkowita	
LE-03MP	Moc bierna - Faza L3	
LE-03MP	Moc bierna - Faza L2	
LE-03MP	Moc bierna - Faza L1	
LE-03MP	Energia bierna	
LE-03MP	Energia	
LE-03MP	Moc czynna - Całkowita	
LE-03MP	Moc czynna - Faza L3	

Readout time - setting the date and time of the report

Toleration - +/- search tolerance. Determining the time tolerance allows to find and present the results of the readouts to the nearest date. When selecting, take into account the readout frequency, i.e. set the time of the report as close as possible to the set readout time. Otherwise, the tolerance may "fail to reach" the result and present an incomplete table.

Filters

Search 🔍 - allows to filter the table in terms of the given phrase or part of it. Applies to all columns. By entering successive phrases, the filter automatically narrows down the device group in the table.

Types of parameters - allows selecting a group of devices to view with the same parameters.

Visible columns - setting of visible columns. The blue columns are always visible.

Data export

Data presented in the table can be exported to the user's computer as a CSV file. CSV is a universal data storage format that can be opened in Excel or any other database program.

To do this, press the Download CSV ⬇ button. The data will be downloaded automatically.

Historical data chart

It allows you to select the parameter of a given device and present it in the form of a trend within a specified time range. The report window shows time range defined by the user in the report wizard.

Navigation:

Scrolling back and forward of the designated range is done by "grabbing" the chart plane (pressing the left mouse button) and moving it to the right or left. To return to the originally set time range, click the ➲ button on the chart.

ZOOM - the scrolling of the mouse wheel does increasing and decreasing the resolution of the graph. To return to the original resolution (set time range) click the ⛶ button on the chart.
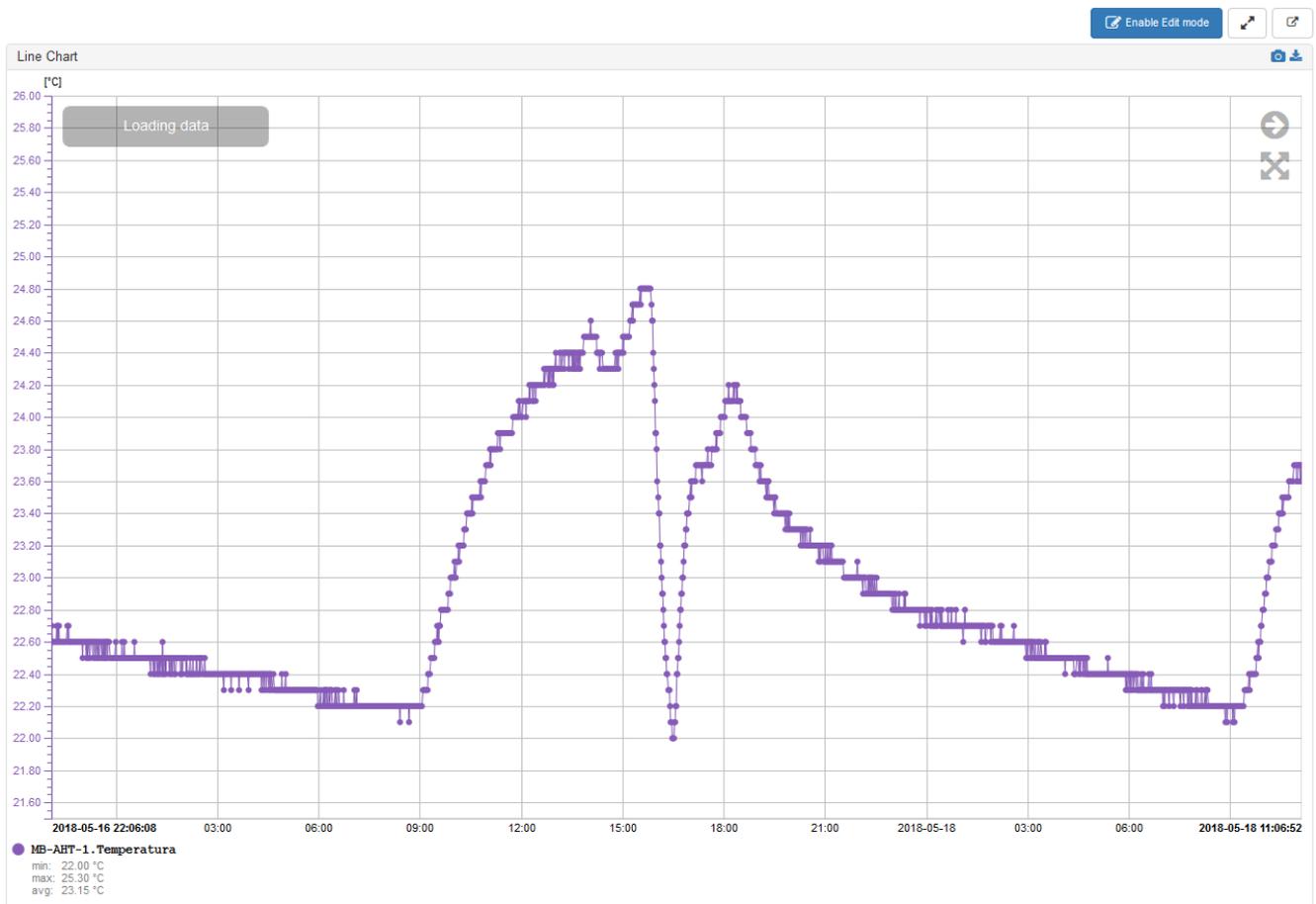
Buttons:

⬈ - switching the report to a new window

⤢ - enable/disable full screen mode

✎ Enable Edit mode - switching to editing mode

📷 - screenshot of generated screen to jpg file

⬇ - export of generated data to a CSV file

Report Wizard

Click [✏ Enable Edit mode] . Then click the ⚙ button. The wizard window will open.

Title - Enter your own name for the chart

Data source (expand the wizard with ✚ button):

> Device - select a device from the list.
>
> Parameter - select the device parameter from the list.
>
> Name - give the name of the waveform or leave it as default.
>
> **d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).**
>
> Color of line / Style - choose the color of the waveform line and its thickness in pixels
>
> Color of marker / Style - choose the color of the measuring point on the waveform and its diameter in pixels
>
> Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.
>
> **WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.**
>
> Scale - selection of the Y axis (values) of the parameter. Select the axis type: Separate - individual for this parameter or select one of the available ones defined for another parameter.
>
> Order - selection of the unit prefix of the value
>
> Precision - the number of zeros after the decimal point
>
> Color of value - select the color of numbers on the value axis
>
> Color of axis - select the color of the value axis and markers
>
> Range - Auto: the system will automatically set the range of values of the Y axis based on the minimum and maximum registered values of the parameter; Manual: specify range - Min and Max value in the appropriate fields.
>
> [Add series ✚] - button for adding another data source panel. Available with active LIC-MT-R "reports" program module.

Data timespan:

> Mode - choice of data range:
>
>> Current data - option to present data in the time range up to 24 hours back. Set the Length of the buffer do desired value.
>>
>> Historical data - option of data presentation within the range designated manually by the user. Determine the time interval in the Timespan fields.

Grid formatting:

> Axis x configuration:
>
>> Color of grid 1 - set the color of the vertical grid lines
>
> Axis y configuration:
>
>> Grid value series - selection of the parameter to which the horizontal grid will be created. Choosing "-" means no horizontal grid.
>>
>> Grid - selection of horizontal grid density:
>>
>>> More - only main points.
>>>
>>> Dense - all points.
>>
>> Color of grid 1 - the color of the main grid lines.
>>
>> Color of grid 2 - the color of the dense grid lines.

Complex charts

It allows to plot up to 10 graphs of any parameters of any devices and present them on one time axis. The option is available when the LIC-MT-R "reports" program module is activated.
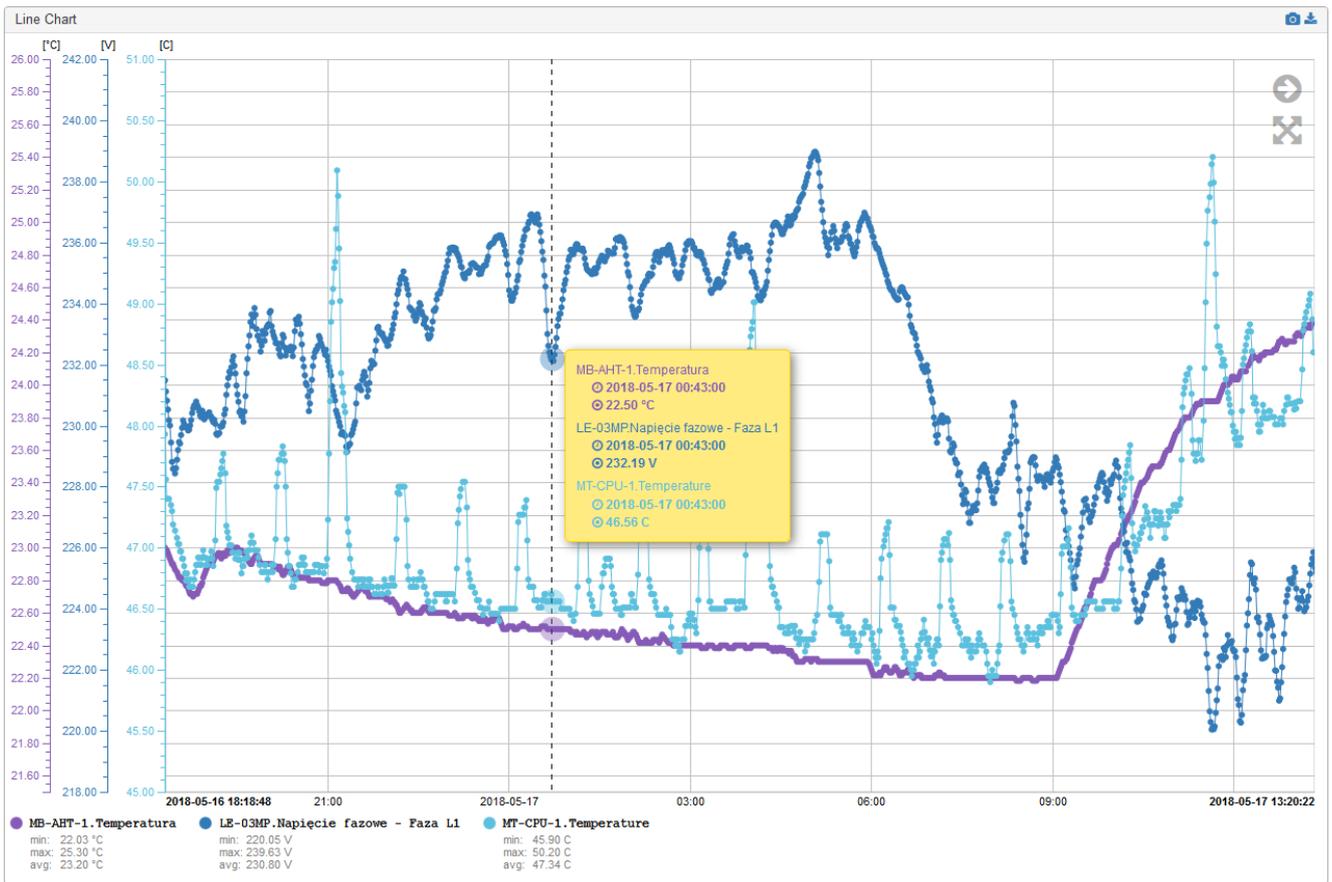
Incremental report

Available with the LIC-MT-R "reports" program module active.
A module for electricity-based billing or other cumulative values, e.g. consumption of water, heat, etc. It allows calculation of increments of values in designated billing periods (time intervals). Cycles: monthly, weekly, daily, hourly. The module allows creating many individual and parallel reports.

Energy consumption report

Counter	Description 1	Description 2	Description 3	Description of the parameter	08-09.05.2018	09-10.05.2018	10-11.05.2018	11-12.05.2018	12-13.05.2018	13-14.05.2018	14-15.05.2018	15-16.05.2018	16-17.05.2018	17-18.05.2018
Energia czynna					1.84 kWh	0.73 kWh	0.72 kWh	1.72 kWh	0.73 kWh	0.74 kWh	2.67 kWh	1.91 kWh	1.64 kWh	2.50 kWh
Energia bierna					0.27 kVarh	0.01 kVarh	0.01 kVarh	0.33 kVarh	0.01 kVarh	0.02 kVarh	0.59 kVarh	0.21 kVarh	0.25 kVarh	0.44 kVarh

← Previous   Next →

The report is created in the Configuration -> Modules -> Incremental report (see the chapter Program extension modules -> "reports"). Each defined incremental report is visible under given name in the Reports tab.

DASHBOARD

Panel of graphical widgets of current readings.
In the basic version of the software, the user can only set up any three widgets on one dashboard.
The version with the "dashboard" license allows you to combine an unlimited number of dashboards and widgets.

Buttons:

⬀ - switching the report to a new window

⤢ - enable/disable full screen mode

⏮ - return to the previous dashboard

✎ Enable Edit mode - switching to editing mode

📷 - screenshot of generated screen to jpg file

⬇ - export of generated data to a CSV file

Dashboard wizard

Click 🖉 **Enable Edit mode** . There will be new buttons and a used widgets bar.

⚙ **Edit** - selection of the dashboard structure (module layout). You can place multiple widgets in each module. They are automatically scaled. The user can transfer each widget to any module. It can be placed on its own or create a group of widgets in a given module.
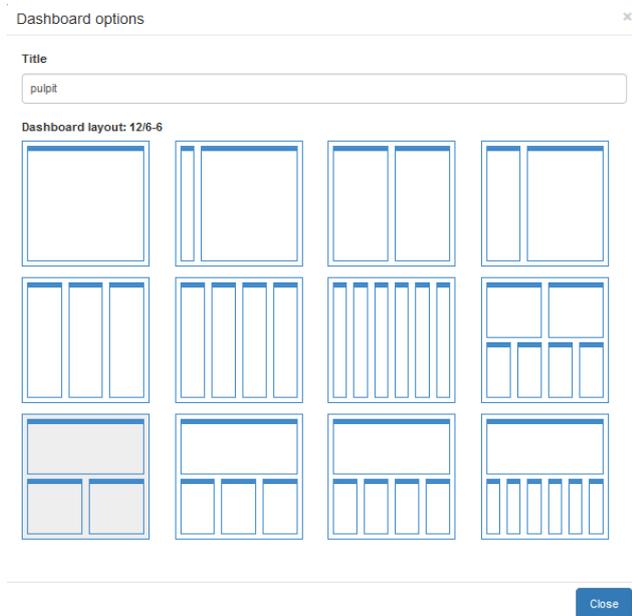
➕ **Add Widget** - widget selection.

Click on the selected widget. It will be automatically added to the module. Then move it to the selected place on the dashboard.

Widget in edit mode:

✛ - moving the widget to another window. Grab with the cursor and move to another window (drug & drop).

⚙ - enabling the widget editing panel

🗑 - removing the widget

Round gauge

Title:

    Display name of the widget. Enter your own name for the widget

Data source (expand the wizard with the button ✚):

    Device - select a device from the list.

    Parameter - select the device parameter from the list.

    Name - give the name of the waveform or leave it as default.

    d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).

    Scale - selection of the unit prefix of the value

    Unit - selection of the unit prefix of the value

    Precision - the number of zeros after the decimal point

    Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.

    WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.

    Ticks:

        Major tick - specify the number of major divisions of a grid.

        Minor tick - specify the number of subdivision of the major divisions.

        Min / Max - enter the value of the beginning and end of the scale

    Color configuration:

        Min / Max / Color - set the value ranges for the selected colors. Set the ranges in relation to the adopted Min/Max scale.

        Press ✚ to add another colored value range.

Half-round gauge

Title:

    Display name of the widget. Enter your own name for the widget

Data source (expand the wizard with the button ✚):

    Device - select a device from the list.

    Parameter - select the device parameter from the list.

    Name - give the name of the waveform or leave it as default.

    d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).

    Scale - selection of the unit prefix of the value

    Unit - selection of the unit prefix of the value

    Precision - the number of zeros after the decimal point

    Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.

    WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.

    Ticks:

        Major tick - specify the number of major divisions of a grid.

        Minor tick - specify the number of subdivision of the major divisions.

   Min / Max - enter the value of the beginning and end of the scale

    Color configuration:

        Min / Max / Color - set the value ranges for the selected colors. Set the ranges in relation to the adopted Min/Max scale.

        Press ✚ to add another colored value range.

Thermometer

Title:

Display name of the widget. Enter your own name for the widget

Data source (expand the wizard with the button ✚):

Device - select a device from the list.

Parameter - select the device parameter from the list.

Name - give the name of the waveform or leave it as default.

d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).

Scale - selection of the unit prefix of the value

Unit - selection of the unit prefix of the value

Precision - the number of zeros after the decimal point

Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.

WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.

Ticks:

Major tick - specify the number of major divisions of a grid.

Minor tick - specify the number of subdivision of the major divisions.

Min / Max - enter the value of the beginning and end of the scale

Color configuration:

Min / Max / Color - set the value ranges for the selected colors. Set the ranges in relation to the adopted Min/Max scale.

Press ✚ to add another colored value range.

Digital gauge

MB-AHT-1.Temperatura

21,40 °C

2018-04-05 22:54:00

Digital gauge   ×

Title ❓

Digital gauge

Data source

Device ❓   Parameter ❓   Name ❓   d/dt ❓

—   -   🗑

Scale ❓   Unit ❓   Precision ❓   Samples for averaging ❓

-         Unit   2   1

Color configuration ❓

Min		Max		Color	
0.00	-	50.00	-	🟩	🗑
Min		Max		Color	
50.00	-	75.00	-	🟧	🗑
Min		Max		Color	
75.00	-	100.00	-	🟥	🗑

➕

Cancel   Save

Title:

Display name of the widget. Enter your own name for the widget

Data source (expand the wizard with the button ✚):

Device - select a device from the list.

Parameter - select the device parameter from the list.

Name - give the name of the waveform or leave it as default.

d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).

Scale - selection of the unit prefix of the value

Unit - selection of the unit prefix of the value

Precision - the number of zeros after the decimal point

Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.

WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.

Color configuration:

Min / Max / Color - set the value ranges for the selected colors. Set the ranges in relation to the adopted Min/Max scale.

Press ✚ to add another colored value range.

Line Chart

Title:

Display name of the widget. Enter your own name for the widget

Data source (expand the wizard with ✚ button):

Device - select a device from the list.

Parameter - select the device parameter from the list.

Name - give the name of the waveform or leave it as default.

d/dt - differential: calculation of the first derivative from an incremental value, e.g. energy consumption. It allows presenting the instantaneous power graph from the Energy parameter. Select the range of hours or sec to differential (for kWh choose h).

Color of line / Style - choose the color of the waveform line and its thickness in pixels

Color of marker / Style - choose the color of the measuring point on the waveform and its diameter in pixels

Samples for averaging - enter the number of last results counted to the average value. Parameter 1 displays the actual result of the last readout. Averaging allows you to smooth the graph.

WARNING! In the case of the active or reactive power parameter, averaging allows to see the exceeded average power for a designated time interval, e.g. 15 min.

Scale - selection of the Y axis (values) of the parameter. Select the axis type: Separate - individual for this parameter or select one of the available ones defined for another parameter.

Order - selection of the unit prefix of the value

Precision - the number of zeros after the decimal point

Color of value - select the color of numbers on the value axis

Color of axis - select the color of the value axis and markers

Range - Auto: the system will automatically set the range of values of the Y axis based on the minimum and maximum registered values of the parameter; Manual: specify range - Min and Max value in the appropriate fields.

Add series ✚ - button for adding another data source panel. Available with active LIC-MT-R "reports" program module.

Data timespan:

Mode - choice of data range:

Current data - option to present data in the time range up to 24 hours back. Set the Length of the buffer do desired value.

Historical data - option of data presentation within the range designated manually by the user. Determine the time interval in the Timespan fields.

Grid formatting:

Axis x configuration:

Color of grid 1 - set the color of the vertical grid lines

Axis y configuration:

Grid value series - selection of the parameter to which the horizontal grid will be created. Choosing "-" means no horizontal grid.

Grid - selection of horizontal grid density:

More - only main points.

Dense - all points.

Color of grid 1 - the color of the main grid lines.

Color of grid 2 - the color of the dense grid lines.

Visualization

It allows you to connect the visualization of the object/system in the form of a picture on which can be placed labels with the parameter value. Labels can have colored backgrounds depending on the designated ranges of the selected parameter. **Each label can be an active link to the selected dashboard**.

Title:

 Display name of the widget. Enter your own name for the widget.

Image settings:

 Width / Height - dimensions of the image given in pixels. It allows you to freely transform and match the image to the dashboard module.

 Choose a background image / Remove background image - adding and deleting an image (jpg, gif, png format)

Data source (expand the wizard with ✚ button):

 Device - selection connected devices from the list

 Parameter - selection of the device parameter from the list

 X / Y position - position of the parameter label on the x- and y-axes. The position is expressed in % of the width and height of the image.

 Show value:

  Show - displays the parameter value in the label.

  Hide - does not display the parameter value in the label.

 Precision - the number of zeros after the decimal point

 Unit - selection of the parameter unit

 Font size - selection of the font size

 Choose dashboard - add active link from the current label to the desired dashboard

 Scope configuration:

  Label - the text that adds to the parameter value or just the text that is displayed according to the parameter value ranges.

  Min / Max - set the value ranges for the selected text of the label.

  Label and frame color - set the label and frame colors for the selected range.

  Press ✚ to add another value range.

Heat map

It allows you to connect the visualization of the object in the form of a picture, place labels with the parameter value and **apply a gradient of colors depending on the value of the parameter (visualization of cold and hot zones).** Labels can have colored backgrounds depending on the designated ranges of the selected parameter. **Each label can be an active link to the selected dashboard**.

Title:

    Display name of the widget. Enter your own name for the widget.

Image settings:

    Width / Height - dimensions of the image given in pixels. It allows you to freely transform and match the image to the dashboard module.

    Choose a background image / Remove background image - adding and deleting an image (jpg, gif, png format)

Gradient settings:

    Min / Max - range of temperature presentation from blue to red color. Set values for minimum and maximum, e.g. -5 ... +35

    Width / Height - gradient mesh resolution (width x height). The given values divide the map into a designated number of pixels creating the smallest part of the grid filled with color.

Data source (expand the wizard with ✚ button):

    Device - selection connected devices from the list

    Parameter - selection of the device parameter from the list

    X / Y position - position of the parameter label on the x- and y-axes. The position is expressed in % of the width and height of the image.

    Show value:

        Show - displays the parameter value in the label.

        Hide - does not display the parameter value in the label.

    Precision - the number of zeros after the decimal point

    Unit - selection of the parameter unit

    Font size - selection of the font size

    Choose dashboard - add active link from the current label to the desired dashboard

    Scope configuration:

        Label - the text that adds to the parameter value or just the text that is displayed according to the parameter value ranges.

        Min / Max - set the value ranges for the selected text of the label.

        Label and frame color - set the label and frame colors for the selected range.

        Press ✚ to add another value range.

Controls panel

Two-state 1/0 control widget. You can control independently each output of the MR-RO-1, MR-RO-4, MR-DIO-1 output module and embedded 1Z relay of the MT-CPU-1 server. Clicking the mouse pointer on the widget control causes it to switch to the opposite state. State 1 is signaled as green and state 0 - as red.

Title:
  Display name of the widget. Enter your own name for the widget
Settings:
  Layout - option of selecting the button layout and name: vertical or horizontal.
Data source (expand the wizard with ✚ button):
  Output - selection of the output from the list of all connected output modules.
  Name - enter the name of the output or leave the original.
  Text when "1" - enter the name displayed on the widget for state 1 (green).
  Text when "0" - enter the name displayed on the widget for state 0 (red).

Indicators panel

Two-state 1/0 widget. Indicates the status of the selected output connected to the MR-RO-1, MR-RO-4, MR-DIO-1 output module and embedded 1Z relay of the MT-CPU-1 server. Additionally, it can signal the logic state of any parameter value depending on rules: value > 0 => state 1; value = 0 => state 0.
Example: voltage L1 = 230V -> POWER SUPPLY is good (green); voltage L1 = 0 -> POWER SUPPLY is failed (red)
State 1 is signaled as green and state 0 - as red.

Title:
  Display name of the widget. Enter your own name for the widget
Settings:
  Layout - option of selecting the button layout and name: vertical or horizontal.
Data source (expand the wizard with ✚ button):
  Output - selection of the output from the list of all connected output modules.
  Name - enter the name of the output or leave the original.
  Text when "1" - enter the name displayed on the widget for state 1 (green).
  Text when "0" - enter the name displayed on the widget for state 0 (red).

Tabular widget

No.	Name	Value
1	MB-AHT-1.Temperatura	23.70 °C
2	LE-03MP.Napięcie fazowe - Faza L1	229.57 V
3	MT-CPU-1.Temperature	47.60 C

It allows you to compile the table of selected parameters (similar to the table of the Readout tab) in the Dashboard module.

Title:

Display name of the widget. Enter your own name for the widget

Visible columns - select which columns will be displayed:

- No. - ordinal number
- Name - parameter identifier from the configuration
- Name of counter - the name given in the configuration
- Description 1, 2, 3 - next elements of descriptions given in the configuration, which allow to properly sort the data of the device
- Name of the parameter - name of the parameter describing the read value (assigned automatically for the parameter of a given device)
- Description of the parameter - description given in the configuration, which allow segregating the given parameters
- Value - value of the last correct readout along with the unit
- Quality - incorrectness indicator. The value indicates the number of incorrect read queues.
- Percentage of false readouts - percentage of incorrect readouts since the beginning of the user session (since the browser was launched). The line with the erroneous readouts has a red fill.
- Readout time - timestamp of the last correct readout

Data source (expand the wizard with ✚ button):

Device - select a device from the list.

Parameter - select the device parameter from the list.

Name - select the parameter name or leave the default.

Energy consumption report

Available with the LIC-MT-R "reports" program module active.

It allows displaying an incremental report (similar to the Reports tab) in the Dashboard module.

The report is created in the Configuration -> Modules -> Incremental report bookmark (see the chapter Program extension modules -> "reports"). Each defined incremental report is visible under the name given in the Incremental report bookmark.

Title:

Display name of the widget. Enter your own name for the widget.

Data source:

Report - selection of incremental reports available.

Visible columns - select columns that will be visible:

- Date - exact date and time of reading the meter value
- Value - total meter value for the time of reading
- Increase - the value of the meter increment in a given time interval

Columns - number of visible columns in the report

File manager
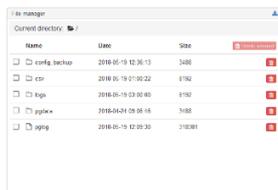
It allows you to display any directory with files or folders (similar to the Files tab) in the Dashboard module.
Title:

> Display name of the widget. Enter your own name for the widget.

Root path – selection of root folder to display.

Read-only - the option of blocking the ability to delete files from the widget level.

Current directory - active display path (link). Click the selected folder to go higher in the folder structure.

Name / Date - the contents of the currently selected folder that will be visible in the folder widget.
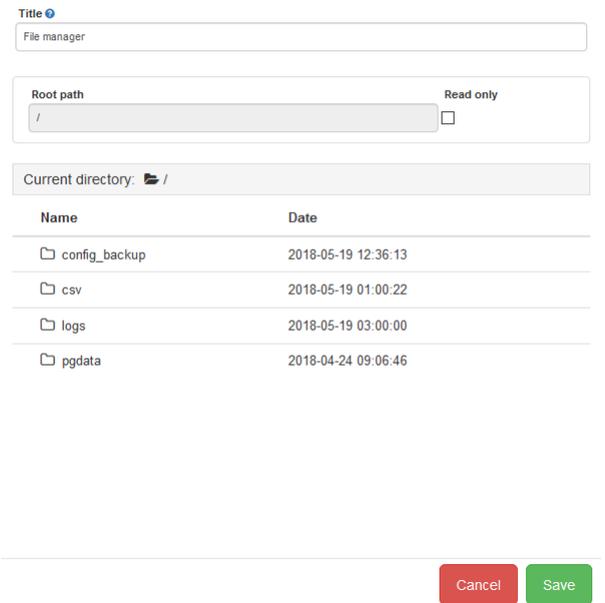
Application status
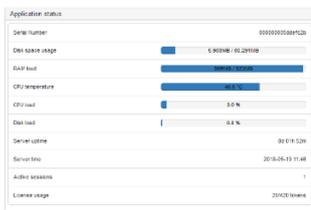
It allows displaying current information about the server and parameters of its current work status in the Dashboard module (similar to the Status tab).
Title:

> Display name of the widget. Enter your own name for the widget.

Events panel

It allows displaying current information on the readout and registration processes in the Dashboard module (similar to the Status tab).
Title:

> Display name of the widget. Enter your own name for the widget.

Panel prepaid

Available when the LIC-MT-Z "prepaid" program module is active.
It allows displaying the subscriber group of the "prepaid" module in the Dashboard module.
The group is created in the Configuration -> Modules -> Prepaid bookmark (see the chapter Program extension modules -> "prepaid"). Each defined receiving group is visible under the name given in the Prepaid bookmark.
Title:
> Display name of the widget. Enter your own name for the widget.

Data source:
> Receiving group - selection of available subscriber group.

The setting of the limit value for a given subscriber and manual control takes place in the fields of a given subscriber.

Entering the subscriber management panel is done via the button in the Manage column:
> Input counter value - current value of the counter
> Output counter value - ON - subscriber attached; OFF - subscriber detached.
> Limit value - set threshold of subscriber operation
> Automatic control:
> > Limit - enter the threshold value. Click the Set button.
> Manual control - manual control (control option independent of value and threshold).

Camping panel

Available when the LIC-MT-K "camping" - program module is active.

The module allows calculating the consumption of electricity or other media (water, gas, etc.) in a given time by means of manual START/STOP control and subsequent calculation of the fee according to user's consumption and set rate. Each billing report is printed to a PDF file. The billing archive is saved in a special file in the Files tab with the option of exporting to a CSV file.

Title:

    Display name of the widget. Enter your own name for the widget.

Settings:

    Name of PDF report - report title

    Header of PDF report - company data

    Price - value of the account rate

    Currency - the name of the account currency

    Scale - selection of the rate unit prefix

    Unit - unit of the account value

    Precision - the number of zeros after the decimal point

Data source:

    Device - select a device from the list.

    Parameter - select the device parameter for account from the list.

    Name - give the name of the readout or leave the default.

The user can set the content of the printed PDF report, such as company data, report name, billing rate and currency.

USERS

Tab for adding system users and granting them access rights.

Groups			
No.	**Group name**		
1	Produkcja	✎	🗑
2		✎	🗑
			+ New

Users						
No.	**Email**	**Enabled**	**Permissions**	**Groups**		
1	admin@meternet.pl	Yes	Admin		✎ 🔒 🗑	
2	user@meternet.pl	Yes	User		✎ 🔒 🗑	
						+ New

✎ - user profile edition

🔒 - password change

🗑 - deleting the profile

+ New - button to add another user or group.

Groups: definition of group and rights for a group of users. You can assign a user to a group that automatically inherits all the permissions granted to the group.
Group name - group name.
Permissions:

> Name - a list of all available dashboards
> Read - option for the group to view the selected dashboard:
> > YES / NO
>
> Write - option for the group to edit the selected dashboard:
> > YES / NO

Users: definition of users and its access rights to the system.
Enable - enabling the current profile.
Admin - option to give administrator rights to the current user
Group - selecting a group and assigning its user rights. You can change the partial rights assigned from the group.
Permissions:

> Tame - list of all available dashboards
> Read - option for the user to view the selected dashboard:
> > YES / NO
>
> Write - option for the user to edit the selected dashboard:
> > YES / NO
>
> Effective read - status of the permissions prescribed from the group. The selection informs that they are compatible with the profile of the selected group. No selection indicates that individual changes have been made to this user distinguishing him from the group.
>
> Effective write - status of the permissions prescribed from the group. The selection informs that they are compatible with the profile of the selected group. No selection indicates that individual changes have been made to this user distinguishing him from the group.

Edit group

| Group name | Produkcja | | | | |

Permissions	**Read**		**Write**	
Name	**Allow**	**Deny**	**Allow**	**Deny**
1. wskaźniki	☑	☐	☐	☐
2. wizualizacja	☑	☐	☐	☐
3. wykresy złożone	☑	☐	☐	☐
7. statusy	☑	☐	☐	☐
4. moc P liczona z kWh	☑	☐	☐	☐
5. prepaid	☑	☐	☐	☑
8. raporty przyrostowe	☑	☐	☐	☐
99. sesje	☑	☐	☐	☐
6. "kemping" - rozliczenia START/STOP	☑	☐	☐	☐
9. SKONFIGURUJ PULPIT	☑	☐	☐	☐
pulpit	☑	☐	☐	☐
Zegar astronomiczny	☐	☐	☐	☐
Readouts	☐	☐		
Reports	☐	☐		

Save **Cancel**

Edit user

☑ Enabled
☑ Admin

| Groups | | | | | | |

Permissions	**Read**		**Write**		**Effective Read**	**Effective Write**
Name	**Allow**	**Deny**	**Allow**	**Deny**		
1. wskaźniki	☐	☐	☐	☐	☐	☐
2. wizualizacja	☐	☐	☐	☐	☐	☐
3. wykresy złożone	☐	☐	☐	☐	☐	☐
7. statusy	☐	☐	☐	☐	☐	☐
4. moc P liczona z kWh	☐	☐	☐	☐	☐	☐
5. prepaid	☐	☐	☐	☐	☐	☐
8. raporty przyrostowe	☐	☐	☐	☐	☐	☐
99. sesje	☐	☐	☐	☐	☐	☐
6. "kemping" - rozliczenia START/STOP	☐	☐	☐	☐	☐	☐
9. SKONFIGURUJ PULPIT	☐	☐	☐	☐	☐	☐
pulpit	☐	☐	☐	☐	☐	☐
Zegar astronomiczny	☐	☐	☐	☐	☐	☐
Readouts	☑	☐			☑	☐
Reports	☑	☐			☑	☐

Save **Cancel**

FILES

File manager tab with all folders and system or user files.

Name	Date	Size	🗑 Delete selected
☐ 🗁 config_backup	2018-05-19 14:15:51	3488	🗑
☐ 🗁 csv	2018-05-19 01:00:22	8192	🗑
☐ 🗁 logs	2018-05-19 03:00:00	8192	🗑
☐ 🗁 pgdata	2018-04-24 09:06:46	3488	🗑
☐ 🗋 pglog	2018-05-19 14:09:30	321469	🗑

Current directory: 🗁 /

Description of folders and their contents:

config_beckup - folder storing system configuration files (last 10). Files are created automatically after each change and saving in the Configuration tab.

csv - folder storing csv archive files

pgdata - a folder that stores internal database files

pglog - folder storing database log files

PROGRAM EXTENSION MODULES

LIC-MT-R "reports" module

Complex charts

It allows to plot up to 10 graphs of any parameters of any devices and present them on one time axis.

A module for electricity-based billing or other cumulative values, e.g. consumption of water, heat, etc. It allows calculation of increments of values in designated billing periods (time intervals). Cycles: monthly, weekly, daily, hourly. The module allows creating many individual and parallel reports.

Report view (columns):

Counter - the row name to be used when creating the report

Description - compatible with names and descriptions made in the Configuration tab.

Billing cells - with time ranges (cycles), designed up to a maximum of 6 on one page. With the Next / Previous buttons, you can switch between previous and next ranges. The billing cells can be divided into 3 columns:

- date - exact date and time of reading the value
- value - total value of the meter for the time of reading
- increase - the value of the increment in a given time interval

Buttons:

⬈ - switching the report to a new window

↗ - enable/disable full screen mode

✎ Enable Edit mode - switching to editing mode

📷 - screenshot of generated screen to jpg file

⬇ - export of generated data to a CSV file

Editing the report view
Press the button ✏ Enable Edit mode . Then press ⚙. The edit panel will open.
Select the visible columns and their number. Save or cancel changes.

The report is created in the Configuration -> Modules -> Incremental report. Each defined incremental report is visible under given name in the Reports tab.

Adding a report.
Select the Incremental report segment in the Program modules segment.
Then click the button ✚ Add .

WARNING!
The edition makes permanent and irreversible changes to the current data structure and they are not available later.
Before editing, we recommend exporting current data to a CSV file.

Settings
Name - the name of the report visible in the reports menu
Settlement periods settings:
    Period - monthly, weekly, daily, hourly
    Day / Hour / Minute – appropriate to the period time settings
Columns - number of columns of billing periods visible on one page
Visible columns - select visible columns

Simple write rules
List of all parameters that are read from a given device with the option to choose to save a given parameter to the selected archive.
Archive (outputs):
    Output name - a list of defined archives.
    Default - selection indicator - selection means that all parameters of each newly added device in this interface will be automatically saved to this archive.
    Activate all / Deactivate all - option to quickly mark / unmark the readout to the archives of all parameters of all devices connected to the given interface.
Devices:
    Name - name from the parameter segment - default or user defined
    Write - option to choose to write to the selected archive. By default, all defined archives are selected.
    Output name - a list of defined archives.
    Deadband - defining the range of the parameter change, which forces the record to be archived. This is for reducing the amount of data stored in the archive. Data that does not change or change below the set value is not recorded. Only exceeding the given change value from the last saved forces a new record. The change value is considered up and down the parameter. Enter the change value (without unit and sign).
    Minimum rate - frequency of the sample recording of a given parameter, i.e. how many samples should be forced to write despite the lack of changes determined in the Deadband.

Adding devices and parameters for the report
Select the segment of the defined report, and then click the ✚ Add button.
Name - the name of the report visible in the reports menu
Description - additional description
Aggregation parameter - select device and parameter for settlements

<div style="border:2px solid red">

Registration of the value for the report takes place on the designated day of the month / week and at the designated time. The settlement report depends on the basic registration of the data set in the Configuration. For the correctness of the report's operation and billing security, the basic registration must be run in parallel. In the event of impossibility or correct reading at the designated time point closing the billing period, the system will then download the nearest basic registration data for a given meter and put it in the closing report. Example: for a monthly report set the basic registration for a reading cycle once a day.

</div>

LIC-MT-M "mathematics" module

The module allows to make transformations (calculations) of recorded algebraic values (sum, difference, multiplication, division, differential, mean, minimum, max, etc. The result is registered as a virtual device parameter and is subject to all program rules, just like any measurements of real devices.
The module is activated in the Configuration -> Options -> Licenses bookmark.
The active modules are located in the Configuration -> Modules.

Adding Device / Parameter.

Select the Mathematics module.
Settings:
      Name - module name
      Description - additional description
      Readout period - set the calculation cycle for the entire module and thus for all created virtual devices and their parameters.
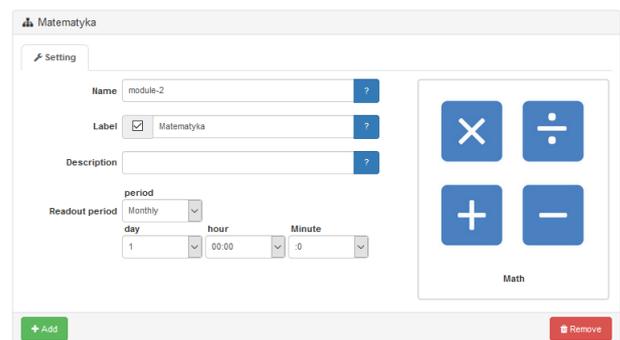
Adding a virtual device:
Click the green **+ Add** button. The pane for the device being created appears in the module.

Settings:
      Name - the name of the virtual device
      Description 1, 2, 3 - additional descriptions
      Readout period - set the calculation cycle for a virtual device. The "Inherited" period assumes the main setting of the Mathematics module.
Simple write rules:
List of all parameters that are read from a given device with the option to choose to save a given parameter to the selected archive.
      Archive (outputs):
            Output name - a list of defined archives.
            Default - selection indicator - selection means that all parameters of each newly added device in this interface will be automatically saved to this archive.
            Activate all / Deactivate all - option to quickly mark / unmark the readout to the archives of all parameters of all devices connected to the given interface.
      Devices:
            Name - name from the parameter segment - default or user defined
            Write - option to choose to write to the selected archive. By default, all defined archives are selected.
            Output name - a list of defined archives.
            Deadband - defining the range of the parameter change, which forces the record to be archived. This is for reducing the amount of data stored in the archive. Data that does not change or change below the set value is not recorded. Only exceeding the given change value from the last saved forces a new record. The change value is considered up and down the parameter. Enter the change value (without unit and sign).
            Minimum rate - frequency of the sample recording of a given parameter, i.e. how many samples should

be forced to write despite the lack of changes determined in the Deadband.

Adding a virtual parameter:
Click the green [+ Add parameter] button. The bookmark of the parameter being created will appear under the device bookmark. Choose the parameter type:

> Combination - performing mathematical operations on many parameters
> Aggregation - it used to perform actions on one parameter. Actions: minimum value, maximum value, oldest value, youngest value, average value, etc.

Select the type and click the green [+ Add] button. The appropriate configuration pane will open.

Combination:

Settings:

> Name - the name of the virtual parameter.
> Description - additional descriptions
> Quantity / Unit - selection of the parameter physical type and unit
> Offset / Factor - allow for algebraic conversion of the obtained result and saving it as a result of the action. The transformation algorithm is a linear function y = ax + b, where a - factor; b - offset; x - initial value or the result of the equation; y - the result that is saved.
> *Example. The offset parameter allows you to shift the value of the result to + or -. If the given meter already has a counted value, e.g. 123kWh, then by setting the offset value to -123, we effectively reset it. The readouts starts from 0. The factor/multiplier parameter allows you to increase or decrease the readout result proportionally. If the 3-phase system is symmetrically loaded and we measure energy consumption only on one phase, by setting the multiplier to 3, we obtain the consumption value for the whole system.*

Formula Wizard:

> Parameter x - selection of the device and parameter for mathematical transformation. Add another parameter by clicking the green [+ Add parameter] button. Each parameter receives its variable name according to pattern and which starts from 0, e.g. m[0] .value, m[1].value, etc. The blue buttons [→] carry the name of the parameter variable to the formula window. You can also enter variable names manually.
> Functions – quick expressions (pattern is created automatically): Sum all - sum of all variables
> Expression - window for the function pattern. Enter the mathematical transformation formula. Variables can be freely combined using basic mathematical signs: + - * / ()
> *Examples of the expressions:*
> *m [0] .value * m [1] .value - product of two variables*
> *(m [0] .value + m [1] .value + m [3] .value) / 3 - mean value from three variables*

Aggregation:

Settings:

Name - the name of the virtual parameter.

Description - additional descriptions

Quantity / Unit - selection of the parameter physical type and unit

Offset / Factor - allow for algebraic conversion of the obtained result and saving it as a result of the action. The transformation algorithm is a linear function y = ax + b, where a - factor; b - offset; x - initial value or the result of the equation; y - the result that is saved.

Example. The offset parameter allows you to shift the value of the result to + or -. If the given meter already has a counted value, e.g. 123kWh, then by setting the offset value to -123, we effectively reset it. The readouts starts from 0. The factor/multiplier parameter allows you to increase or decrease the readout result proportionally. If the 3-phase system is symmetrically loaded and we measure energy consumption only on one phase, by setting the multiplier to 3, we obtain the consumption value for the whole system.

Formula Wizard:

Aggregation parameter - selection of device and parameter for mathematical transformation

Lenght - number of last samples of the selected parameter for the calculation of the virtual parameter

Functions – quick expressions (pattern is created automatically):

min [# min (m)] - minimal value from the selected number of samples

max [# max (m)] - maximum value from the selected number of samples

avg [#avr (m)] - average value from the selected number of samples

oldest [# oldest (m)] - the oldest value from the selected number of samples

newest [# newest (m)] - the youngest value from the selected number of samples

Expression - window for the function pattern. Enter the mathematical transformation formula. Variables can be freely combined using basic mathematical signs: + - * / ()

Examples of the expressions:

#avg (m) - #min (m) - smallest value subtracts from the average

*#newest (m) / #avg (m) * 100 - percentage from the average of the youngest sample*

LIC-MT-Z "prepaid" module

The module allows prepayment management of electricity or other media (water, gas, etc.). It allows automatic disconnection of the power source after exceeding the set threshold or manual ON/OFF control.

The "prepaid" control system is realized by means of a contactor switching the user power supply circuit and either MR-RO-1, MR-RO-4 relay output modules or MR-DIO-1 output module controlled directly from the MeternetPRO system. Each exceeding of set limit causes turn-off of the contactor and thus disconnection of the power supply circuit. After setting a new limit, the contactor is turned-on again.
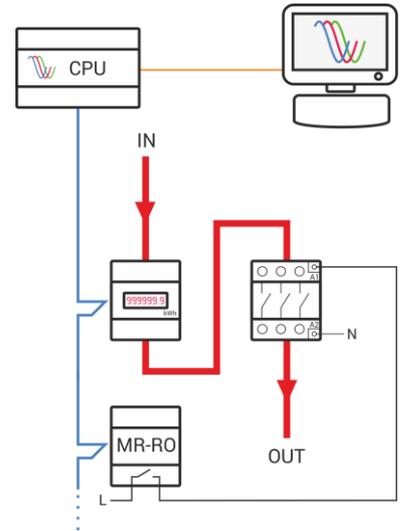
Module configuration
Each defined receiving group of subscribers is visible as a bookmark widget under the name given in the Receiving group pane.

Adding receiving groups
Select the Prepaid segment in the Modules segment.
Setting:
      Name - the name of the receiving group.
      Description - additional description
Then click the **＋ Add Receivers group** button.
Each defined receiving group is displayed as a bookmark widget.
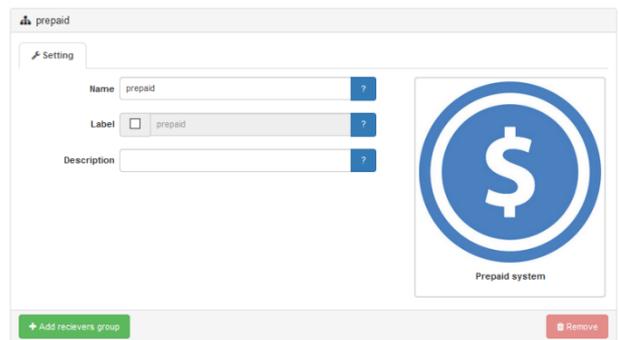
Adding recipient.
Select the segment of the defined receivers group
Setting:
      Name - the name of the report visible in the Reports menu.
      Description 1, 2, 3 - additional descriptions.
      Verification period - the period of checking the conditions and possible operation:
        - monthly - checking the designated date of each month at the appointed time;
        - weekly - checking the designated day of each week at the appointed time;
        - daily - check daily at the appointed time;
        - hourly - checking at designated times.
Then click the **＋ Add recipient** button.
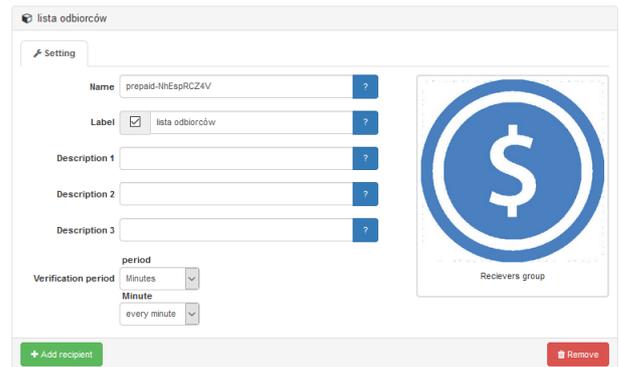
Select the recipient of the defined receivers group
Setting:
      Name - name of the recipient visible in the reports menu
      Description - additional description
      Input parameter - select device and parameter for settlements
      Actuator - list of all outputs of connected extension modules (MR-RO-1, MR-RO-4, MR-DIO-1) - choose the output for a given recipient.
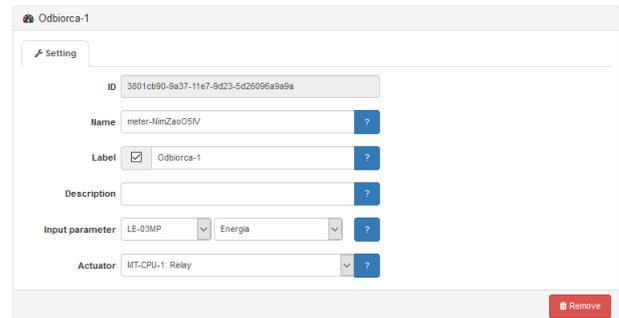
Widget of the panel prepaid
On the Dashboard tab, enter the edit mode. Add a widget. Select the prepaid module. Then configure the widget.
Title:
   Display name of the widget. Enter your own name for the widget.
Data source:
   Receiving group - selection of available subscriber group.

The setting of the limit value for a given recipient and manual control takes place in the fields of a given recipient:

Panel prepaid							
Name	Description	Input timestamp	Input counter value	Limit value	Output counter value	Last verification	Manage
Odbiorca-1		2018-05-19 08:04:00	3,584.72 kWh	Inactive	ON	2018-05-19 12:55:00	🔧
Odbiorca-2		2018-05-19 08:04:00	3,347.41 kVarh	Inactive	ON	2018-05-19 12:55:00	🔧

   Name - the recipient's name is assigned in the configuration of the receiving group
   Description - additional description
   Reading time - the last time the device was read
   Counter status - current value of the counter
   Limit value - set threshold of operation
   Output status - indication of the output status: ON - switched on; OFF - turned off.
   Output verification - time of reading the output status
   Manage - access to the limit and automatic and manual control panel

Entering the subscriber management panel is done via the 🔧 button in the Manage column:

Manage		✕
Input counter value:	3,584.72 kWh	
Output counter value:	ON	
Limit value:	Inactive	

Automatic control   Limit   [ ] kWh [Set]
     Recharge   [ ] kWh [Add]

Manual control   [DISABLE] [ENABLE]

[Close]

   Input counter value - current value of the counter
   Output counter value - ON - subscriber attached; OFF - subscriber detached.
   Limit value - set threshold of subscriber operation
   Automatic control:
     Limit - enter the threshold value. Click the Set button.
   Manual control - manual control (control option independent of value and threshold).

Controlling
The Normal or Inverse output control options is set in the output configuration of the particular device (Configuration -> Data inputs -> [device] -> [output].

Normal control
Using a contactor with normally open contacts (normally open - NO)
Contactor coil is powered during normal operation (value below the threshold)
Exceeding the threshold switches off the contactor coil.

Power supply ON

Threshold: 100
Value: 99
State: output -> 1 (ON); contacts -> 1 (ON)

Power supply OFF
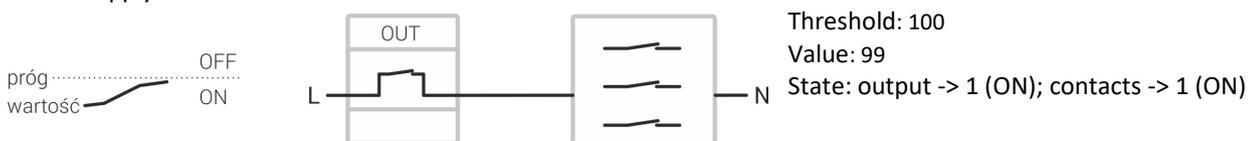
Threshold: 100
Value: 101
State: output -> 0 (OFF); contacts -> 0 (OFF)

Inverse control
Using a contactor with normally closed contacts (normally closed -NC)
Contactor coil is not powered at normal operation (value below the threshold).
Only when the threshold is exceeded the contactor coil is activated.

Power supply ON
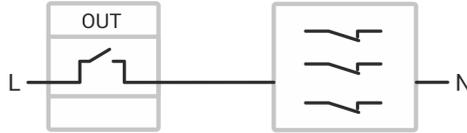
Threshold: 100
Value: 99
State: output -> 0(OFF); contacts -> 1(ON)

Power supply OFF

Threshold: 100
Value: 101
State: output -> 1(ON); contacts -> 0(OFF)

WARNING!
For energy saving reasons, the recommended is inverse control solution with normally closed relay contacts.

APPENDIX

The structure of the external SQL database

Device Table
The table contains all **devices** added to the configuration in MeternetPRO

	device_id uuid	name text
1	504e2530-1513-11e7-a15d-bbc0276f79e6	Lab 1
2	ddf5f5ca-9ef6-4fef-96de-d4291b920a34	1oclahostwe
3	2395a47c-fffa-46eb-8619-56fb7e14ba88	Wytłaczarka nr 3
4	499313b2-80da-4f62-82ad-f7b7ba792749	Wytłaczarka nr 4
5	38ecd8fa-258a-46d5-9465-c3926bb46567	Wytłaczarka nr 5
6	424fc2c5-4cac-4855-8b70-9e90afb94f04	Wytłaczarka 6 grzan
7	47bb2fc9-e993-4de9-be40-b28ec1064aaa	Wyt. 6 NAPĘD
8	6a9efbbd-f4d4-4823-b3fd-bf32300ca1b7	Lab 2
9	c79e9bd8-1948-4e3a-9e84-e6e0779d6169	Lab 3
10	739455d7-d163-4250-b7f2-967b0c2d2cab	Wtryskarka BAT
11	49bfdae5-3e1a-4600-927f-a8b7598a5fd5	Wtryskarka BOY
12	71fde3ae-275e-471f-8470-4e1e21d86745	Sprężarka
13	fac39837-39eb-4e80-85a4-f54c867c8ec0	Chłodnia
14	56b37380-000f-11e7-a2ff-f5e09704dc98	Wytłaczarka nr 1
15	b4c46320-10af-11e7-b002-ffe29ec878ad	Suszarki_lab
16	35ecb690-1395-11e7-a9e4-9995ad68c154	suszarki

The name of the device in the database is inherited from the MeternetPRO program as Name.

Parameters Table.
The table contains all device parameters added to the configuration in MeternetPRO

|	device_id uuid	param_id uuid	name text
1	38ecd8fa-258a-46d5-9465-c3926bb46567	7169fa74-3cad-4dbd-8432-ead369c60c59	Power factor L1
2	38ecd8fa-258a-46d5-9465-c3926bb46567	a0e2332e-c7ed-4c8b-9cb4-a9c671eab96c	Power factor L2
3	38ecd8fa-258a-46d5-9465-c3926bb46567	4ef2c674-8152-42dc-b5ca-4be895a946b4	Frequency
4	424fc2c5-4cac-4855-8b70-9e90afb94f04	f212bb55-cec3-4c8c-9ca9-6f7fb93b627f	VoltageL1
5	424fc2c5-4cac-4855-8b70-9e90afb94f04	fb6c313d-0948-406f-a0d5-33b1133140a0	VoltageL2
6	47bb2fc9-e993-4de9-be40-b28ec1064aaa	7371a9ba-1894-477e-98a4-3544d2a3109f	CurrentL3
7	47bb2fc9-e993-4de9-be40-b28ec1064aaa	e1787370-779a-4aea-804a-412d6efd7b37	AvgCurrent
8	47bb2fc9-e993-4de9-be40-b28ec1064aaa	fc2c33f7-423d-45aa-9506-280875274940	ApparentPowerL1
9	47bb2fc9-e993-4de9-be40-b28ec1064aaa	9837f52f-dcb0-434c-837a-cd8f20d1dbde	ApparentPowerL2
10	47bb2fc9-e993-4de9-be40-b28ec1064aaa	8f3746d0-3460-4917-bad3-0bcf7c5c8f32	ApparentPowerL3
11	47bb2fc9-e993-4de9-be40-b28ec1064aaa	1fd7e8e2-726c-4afb-931e-1b5f24c8ca26	ApparentPowerTot
12	47bb2fc9-e993-4de9-be40-b28ec1064aaa	a37ce659-3862-4694-a5c0-0bf6697ac1fe	ActivePowerL1
13	ddf5f5ca-9ef6-4fef-96de-d4291b920a34	61e235ea-bcfa-41e5-b6f9-5c9ba9e93249	RAM
14	38ecd8fa-258a-46d5-9465-c3926bb46567	f9922f44-64ec-4ab3-9bc5-d5bc95ab8fb9	VoltageL3
15	38ecd8fa-258a-46d5-9465-c3926bb46567	36218996-9ed2-4b87-acce-13355239e524	CurrentL1
16	38ecd8fa-258a-46d5-9465-c3926bb46567	e2fbd569-6055-420e-af38-e8ed4ff6a27f	CurrentL2
17	38ecd8fa-258a-46d5-9465-c3926bb46567	21439215-bfd8-48f5-80ae-cb5e47e04430	CurrentL3
18	38ecd8fa-258a-46d5-9465-c3926bb46567	f2db7f78-bede-4162-b485-211031b4b345	PowerL1
19	38ecd8fa-258a-46d5-9465-c3926bb46567	e93e85a2-36c8-4e95-b591-4d197611a589	PowerL2
20	38ecd8fa-258a-46d5-9465-c3926bb46567	daaa0d37-d8b0-4ea2-a8ad-f50fe022a370	PowerL3
21	38ecd8fa-258a-46d5-9465-c3926bb46567	56116cdb-81c7-4a18-a2bd-d16ab27af78a	Moc czynna całkowita

The parameter ID can be checked in the MeterntPRO configuration:
1. Go to the Configuration tab
2. Go to Data inputs bookmark
3. Choose the device bookmark

4. Choose the device parameter bookmark

5. Read parameter ID
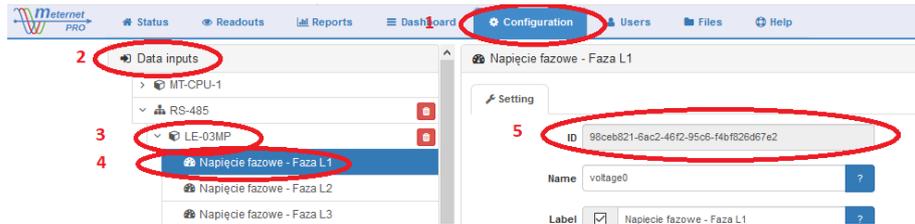
To see the parameter ID in the Configuration tab, there must be active "Advanced view" options:

Readouts Table.

The table contains values of parameter readouts and readout timestamps.

	timestamp timestamp without time zone	param_id [PK] uuid	value double precision	retry_count smallint
1	2017-12-11 11:58:01.72	02555784-c2cc-4c91-96ac-0666dcd317bd	246.09	0
2	2017-12-11 11:59:01.686	02555784-c2cc-4c91-96ac-0666dcd317bd	246.32	0
3	2017-12-11 12:00:01.685	02555784-c2cc-4c91-96ac-0666dcd317bd	246.64	0
4	2017-12-11 12:01:01.666	02555784-c2cc-4c91-96ac-0666dcd317bd	246.44	0
5	2017-12-11 12:02:01.704	02555784-c2cc-4c91-96ac-0666dcd317bd	246.35	0
6	2017-12-11 12:03:01.683	02555784-c2cc-4c91-96ac-0666dcd317bd	246.54	0
7	2017-12-11 12:04:01.686	02555784-c2cc-4c91-96ac-0666dcd317bd	246.14	0
8	2017-12-11 12:05:01.684	02555784-c2cc-4c91-96ac-0666dcd317bd	246.38	0
9	2017-12-11 12:06:01.66	02555784-c2cc-4c91-96ac-0666dcd317bd	246.4	0
10	2017-12-11 12:07:01.677	02555784-c2cc-4c91-96ac-0666dcd317bd	246.6	0
11	2017-12-11 12:08:01.713	02555784-c2cc-4c91-96ac-0666dcd317bd	246.44	0
12	2017-12-11 12:09:01.694	02555784-c2cc-4c91-96ac-0666dcd317bd	246.32	0
13	2017-12-11 12:10:01.685	02555784-c2cc-4c91-96ac-0666dcd317bd	246.17	0
14	2017-12-11 12:11:01.664	02555784-c2cc-4c91-96ac-0666dcd317bd	246.06	0
15	2017-12-11 12:12:01.662	02555784-c2cc-4c91-96ac-0666dcd317bd	246.02	0
16	2017-12-11 12:13:01.665	02555784-c2cc-4c91-96ac-0666dcd317bd	246.41	0
17	2017-12-11 12:14:01.661	02555784-c2cc-4c91-96ac-0666dcd317bd	247.1	0
18	2017-12-11 12:15:01.704	02555784-c2cc-4c91-96ac-0666dcd317bd	247.17	0
19	2017-12-11 12:16:01.663	02555784-c2cc-4c91-96ac-0666dcd317bd	247.32	0
20	2017-12-11 12:17:01.676	02555784-c2cc-4c91-96ac-0666dcd317bd	246.95	0
21	2017-12-11 12:18:01.671	02555784-c2cc-4c91-96ac-0666dcd317bd	246.73	0