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USER MANUAL

communication module
MK-ETH-1

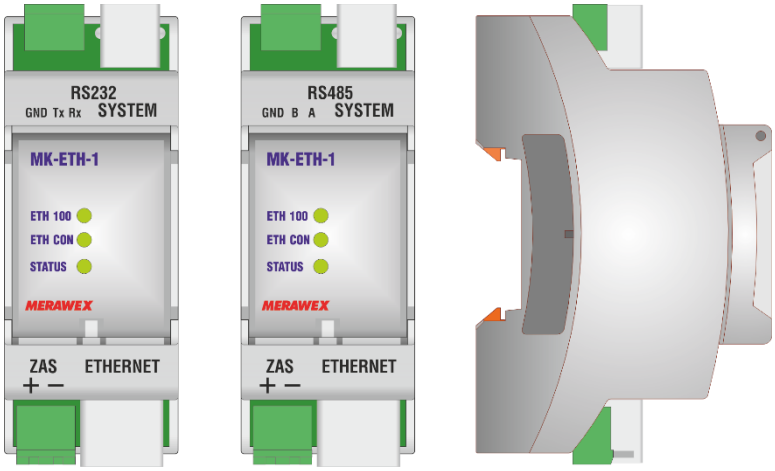
22 Jan. 2020

1. Application

The MK-ETH-1 module is dedicated for cooperation with the MERAWEX devices such as:

- Telecom power systems 3U, the SI48 and SI24 Series
- Telecom power systems 1U of the SI48-1U Series
- ZM power supplies of AC, AZC, PZC types
- ZSP135DR Series power supplies
- ZSP100/ZSP121 Series power supplies

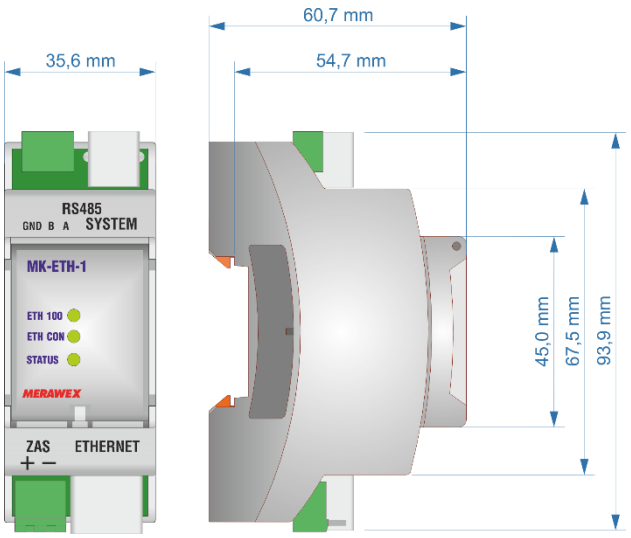
The function of the module is to enable access to devices via TCP/IP based computer networks. From the side of the monitored device, the RS232 or RS485 interface is used depending on the version. The basic information about a device status is available from the level of the web browser and the SNMP protocol agent. In addition, the module offers access from the ModbusTCP protocol. The module is designed for mounting on a TS-35 rail.



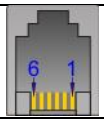
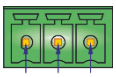
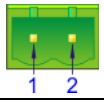
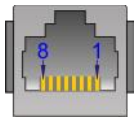
2. Technical information

Electrical and mechanical parameters

Name	Value
The range of power voltage through ZAS connector	10…65V
Max. power consumption	1.5W
Working temperature range	-40…55°C
Dimensions (W×H×D) – without plugs in sockets	35.6×93.9×60.7
Protection degree EN 60529:2003	IP20
Electrical insulation strength: • between the power circuit and the RS232 or RS485 circuit • between the power circuit and the ETH communication connector • between the ETH communication connector and the RS232 or RS485 circuit	 710V_{DC} 710V_{DC} 710V_{DC}



3. Connection

Connector	Output No.	Signal *1)	View of connector	Required plug Required cable	Function
RS232 RS485 SYSTEM	5	GND		RJ12-6/6	Device connection
	3	TxD/B			
	4	RxD/A			
	1	RxD/A		MC 1.5/2-ST-3.81 PHOENIX 2 × min 0.5mm^2	
	2	TxD/B			
	3	GND			
ZAS	1	+ of mains		MSTB 2.5/2-ST-5.08 PHOENIX 2× min 0.5mm^2	Module powering
	2	– of mains			
ETHERNET	1	RX+		RJ45-8/8 connection with: HUB: crossed PC: straight	Ethernet Connection
	2	RX-			
	3	TX+			
	4	NC			
	5	NC			
	6	TX-			
	7	NC			
	8	NC			

Description of module connectors

*1) Depending on a type of module, the RxD, TxD and GND signals for RS232 or A, B, GND signals for RS485 are available on the connector.

4. Module configuration

Configuration takes place via the web interface by using a web browser. The configuration includes:

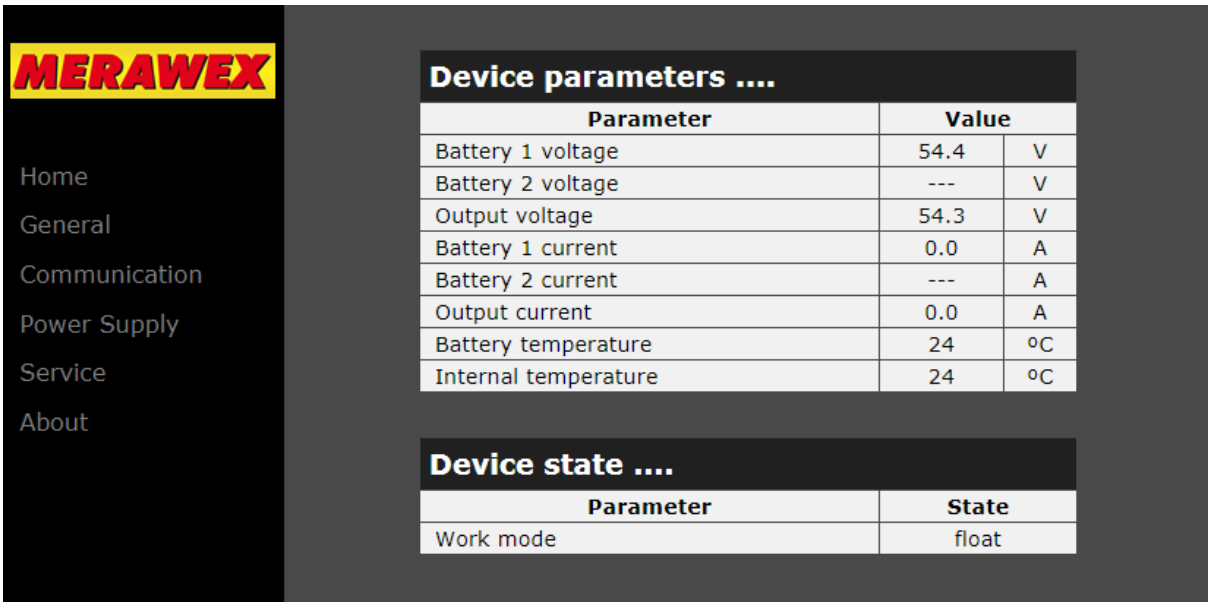
- TCP/IP network interface settings
- Indication of a device type to which the module will be connected
- SNMP agent settings
- Password setting for the module (optionally)
- Configuration of the ModbusTCP function
- TFTP server configuration

In finding the module in the local network, a dedicated netset.exe application can be helpful (available at the manufacturer).

5. WWW interface

Note: The following examples will refer to a module configured to work with a SI48-1U device.

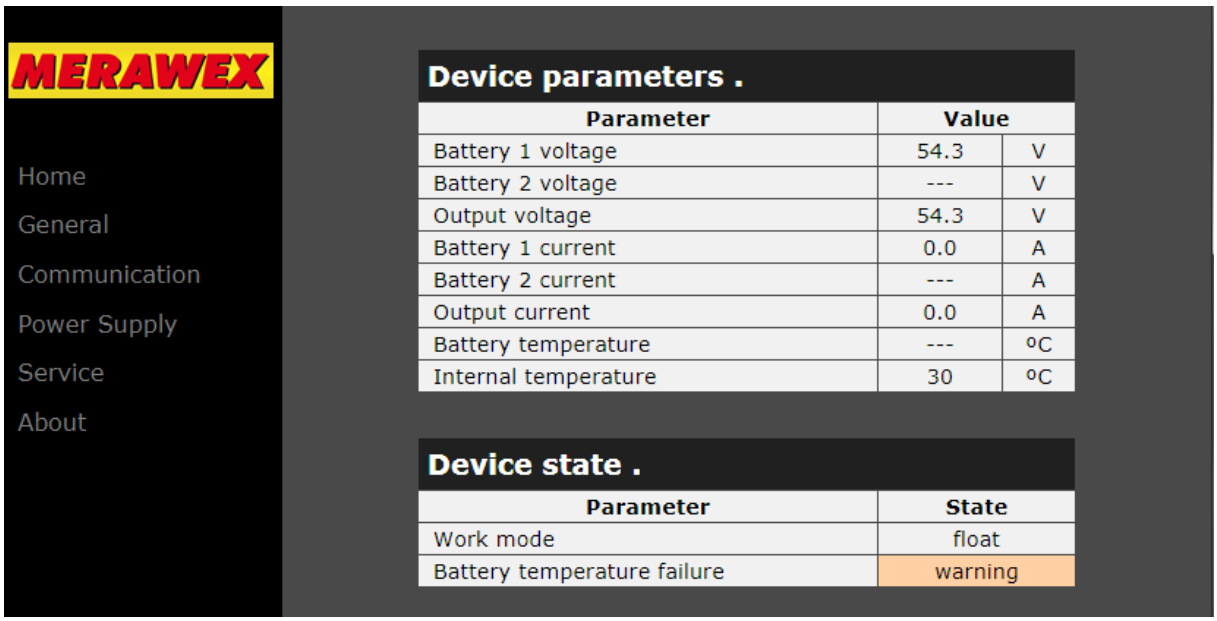
The web interface enables remote monitoring of a power system condition by means of a web browser. By entering the address of the module, for example: http://192.168.1.100 you can enter the homepage.



The structure of the web interface is divided into the following tabs:

5.1. Home

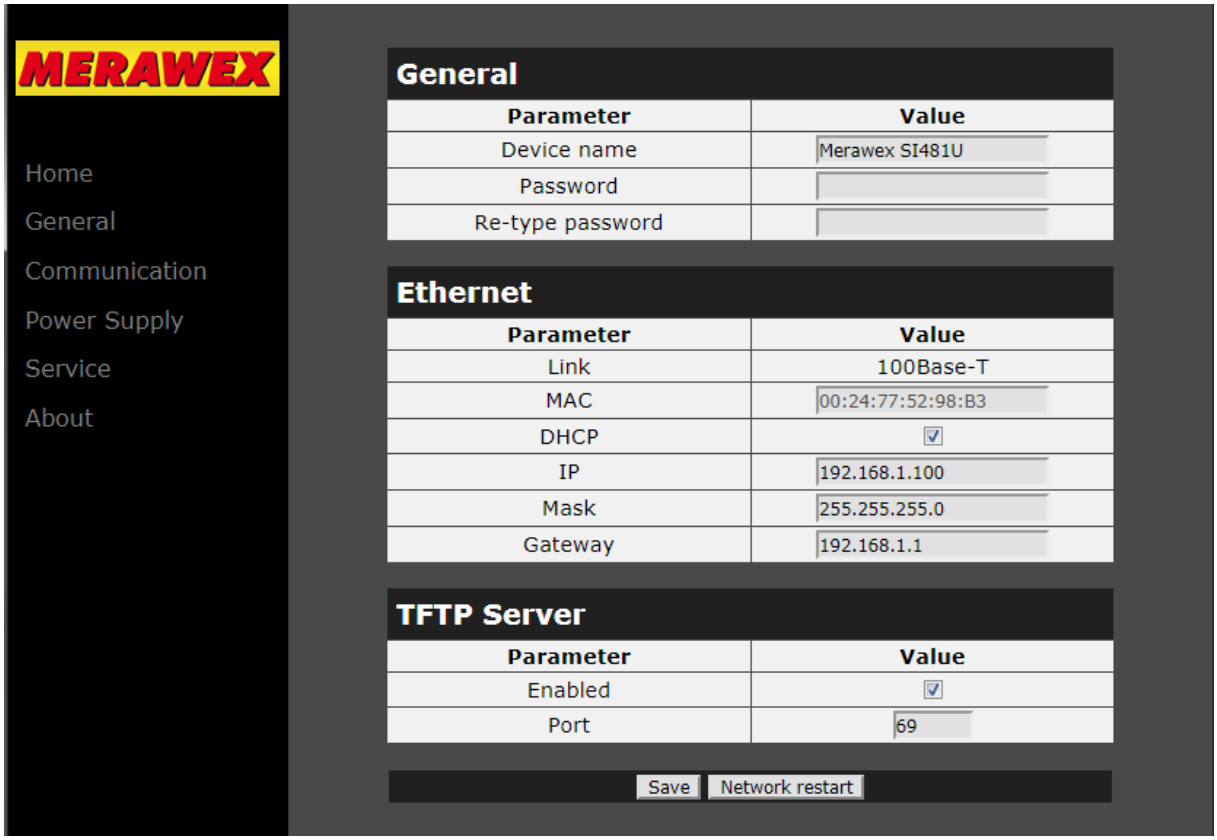
The view of this tab depends on a type of a device to which the module is connected and shows the current state of the device. In the picture below you can see the current measurements of voltage, current, temperature, operating status and detected faults and errors.



5.2. General

In this place the basic module settings, i.e. are done:

- Giving a name which will identify a given module/device
- You can set a password that will be required to use the web interface
  Note: The http connection to the module is not encrypted and may be intercepted in public networks.
- TCP/IP network settings, i.e.: address, subnet mask, gateway and DHCP client
- The TFTP server setting that is used to change the module firmware and that should normally be turned off

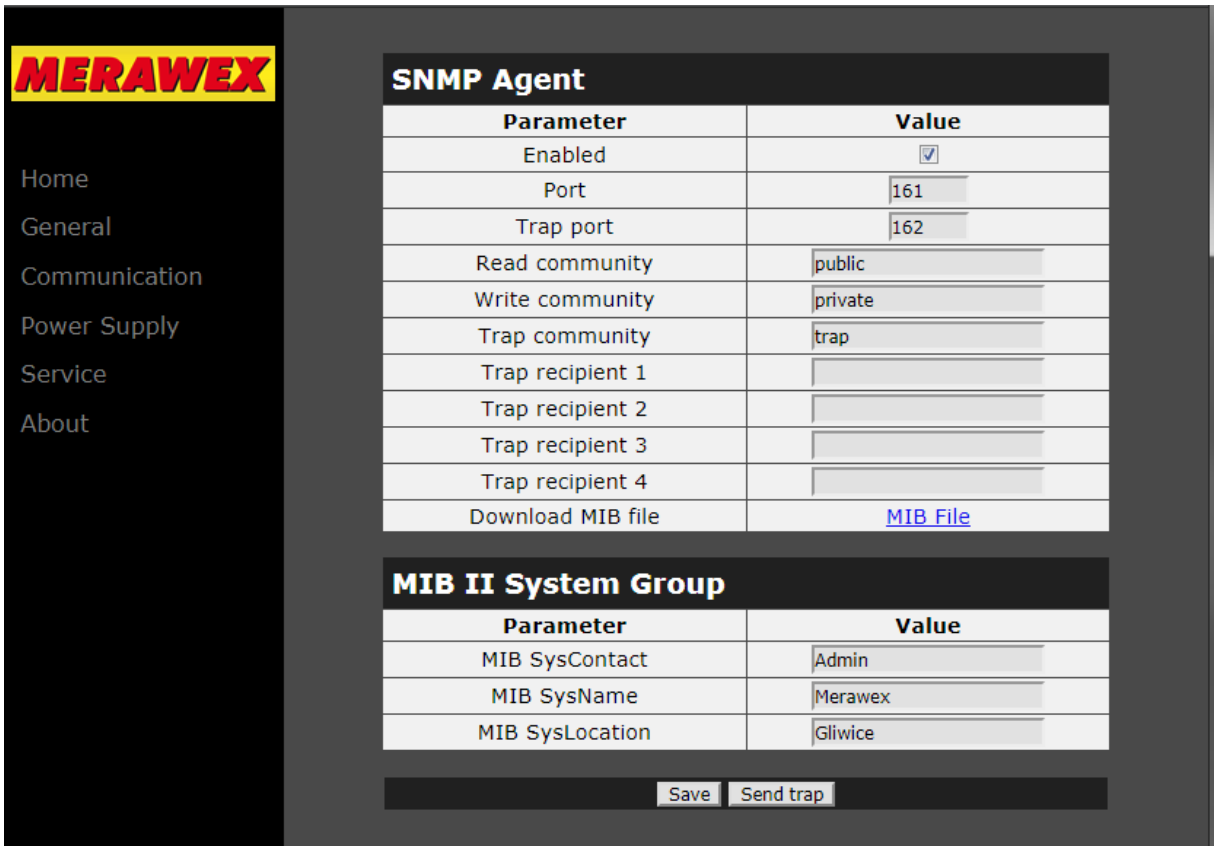


5.3. Communication

In this place the basic settings of the SNMP agent are done, i.e.:

- Activation or deactivation of the agent
- SNMP protocol port settings; the default is 161 and 162
- Fixing names for the SNMP protocol 'community'
- Indication of up to 4 IP addresses to which *trap* notifications will be sent
- Setting the basic required SNMP protocol information, i.e.: name, location and contact

After saving the settings, you can check the correctness of the action by sending a test notification (test gangway).
From this place you can also download the MIB file with the module SNMP data structure definition.



5.4. Power Supply

In this place, you can indicate a device to which the module will be connected, i.e.:

- SI-3U: telecom power systems of the SI48 and SI24 Series
- SI-1U: telecom power systems of the SI48-1U Series
- ZM..AC, AZC, PZC: power supplies of the ZM Series
- ZSP135DR: fire protection power supplies of the ZSP135DR Series
- ZSP100/121: fire protection power supplies of the ZSP100 and ZSP121 Series
- Modbus TCP gateway: ModbusTCP protocol gateway function; description below.

Note: The other types shown in the list, i.e.:

- SI48-2U
- ZDSO400-xR1
- ZDSO400-xR2/R4

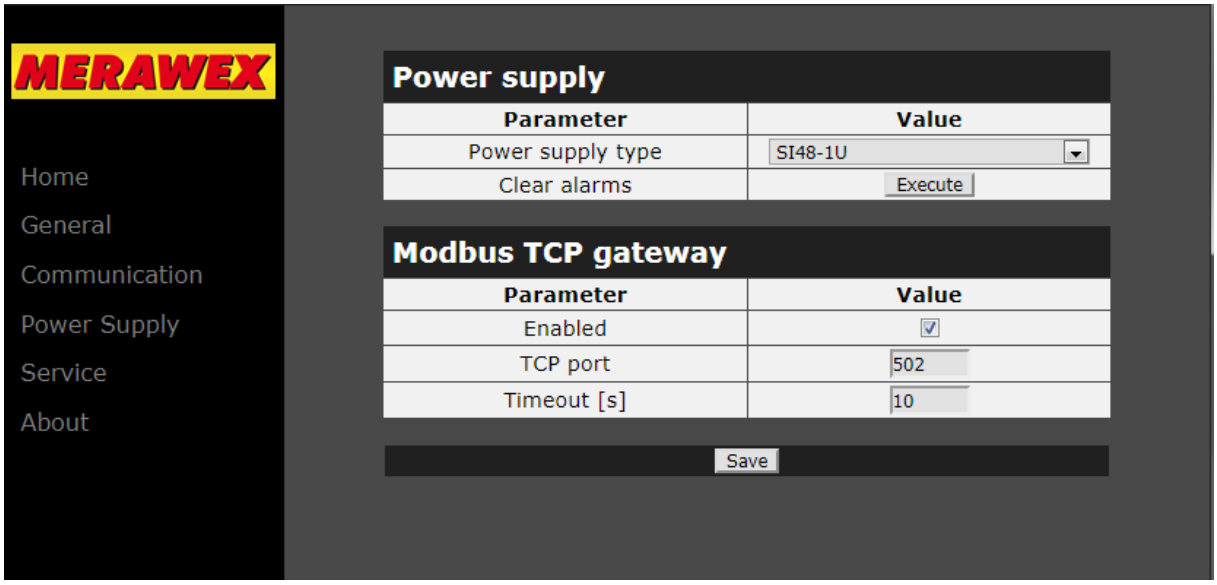
they are not for use in this module and thy should not be chosen .

Note: If the module works with the SI-3U or SI-1U devices, the (*Clear alarms*) item is visible. This is due to the specificity of these devices in which reported faults are recorded and must be deleted manually to disable their signalization. Of course, such the deletion will be effective only when the cause of the fault disappears. Please see the User Manual of a specific device for more information.

Note: The module communicates with devices by using their interface. Depending on a device type, it can be ModbusASCII for SI-3U, SI-1U, ZM and ZSP135DR, or ModbusTCP for ZSP100/121. To provide the correct operation, please, make sure that the devices have such the protocols set up and that their addresses (*SlaveID*) are set to the value 1.

The module offers access to the connected device by using the ModbusTCP protocol. This function should be disabled if it is not used. The use of this function requires knowledge of the device memory map, which can be found in the device documentation or ask the manufacturer for its availability.

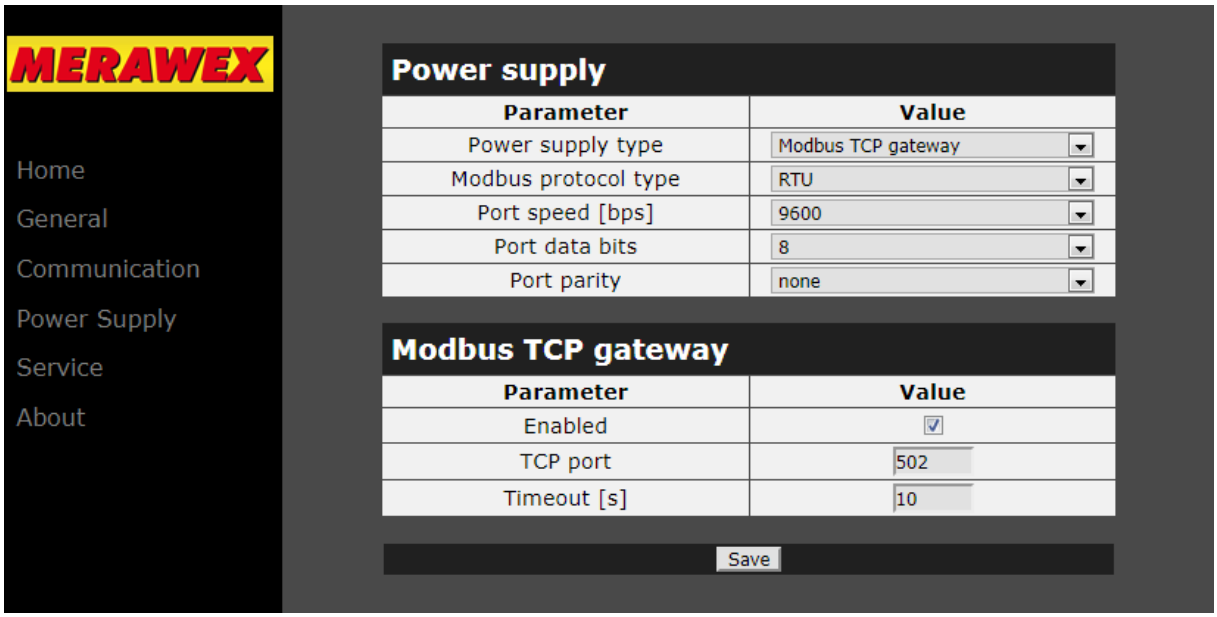
Note: The ModbusTCP connection statement suppresses the SNMP and WWW protocols. The *Timeout* parameter determines the time after which the connection will be broken if there is no data exchange.
The implementation of the ModbusTCP protocol in the module imposes a limit on the total protocol frame length to the value of 255 bytes.



Working in Modbus TCP Gateway mode

The module can be set as a ModbusTCP protocol gate, which means that the received ModbusTCP queries will be converted to the selected RTU or ASCII protocol on the serial interface side, and the responses are converted in the opposite direction. This allows access using the ModbusTCP protocol to devices that are not on the list.

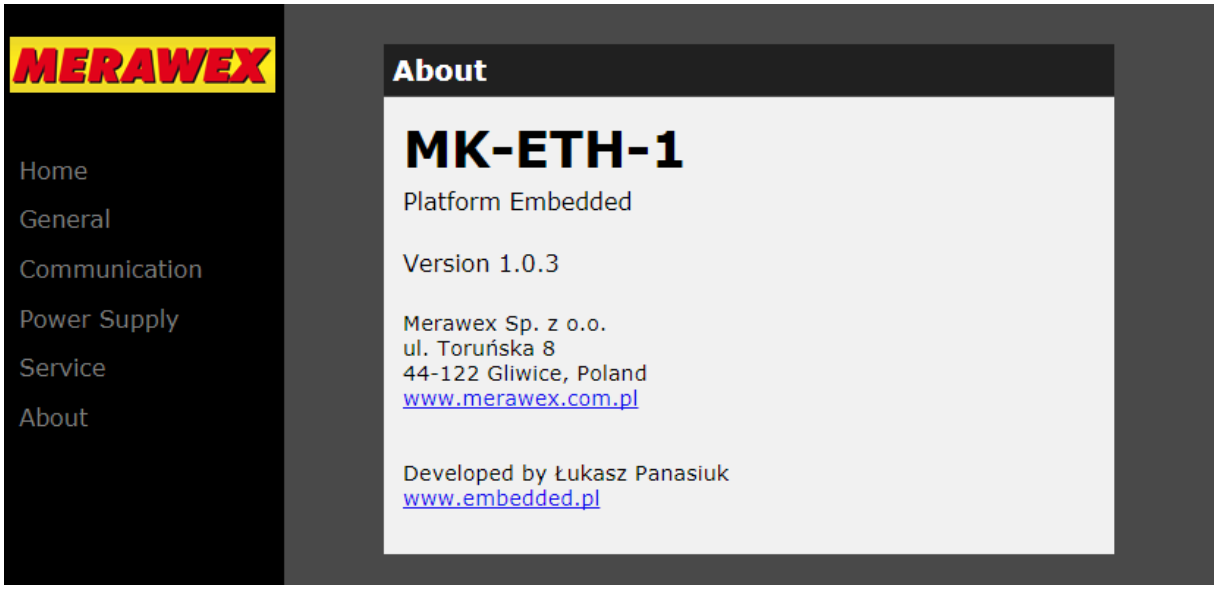
After selecting from the list and setting this function, the serial port configuration items appear which have to be set to the desired values.



Note. Modbus TCP Gateway mode operation results in inactivity of the SNMP agent and the device status will not be displayed on the website.

5.5. Information and Service (About, Service)

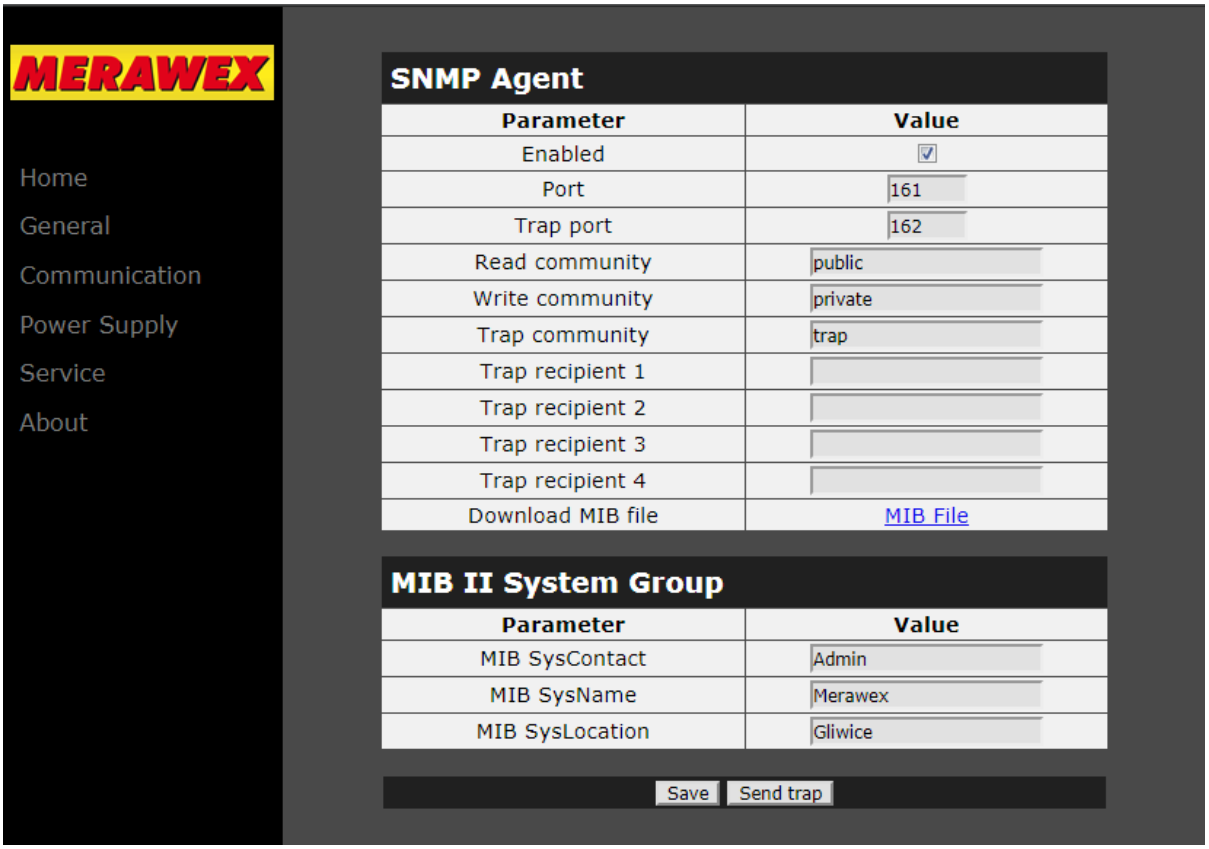
The Service tab does not contain any relevant information from the user's point of view.
On the Information tab, you can check the current firmware version of the module.



6. SNMP Interface

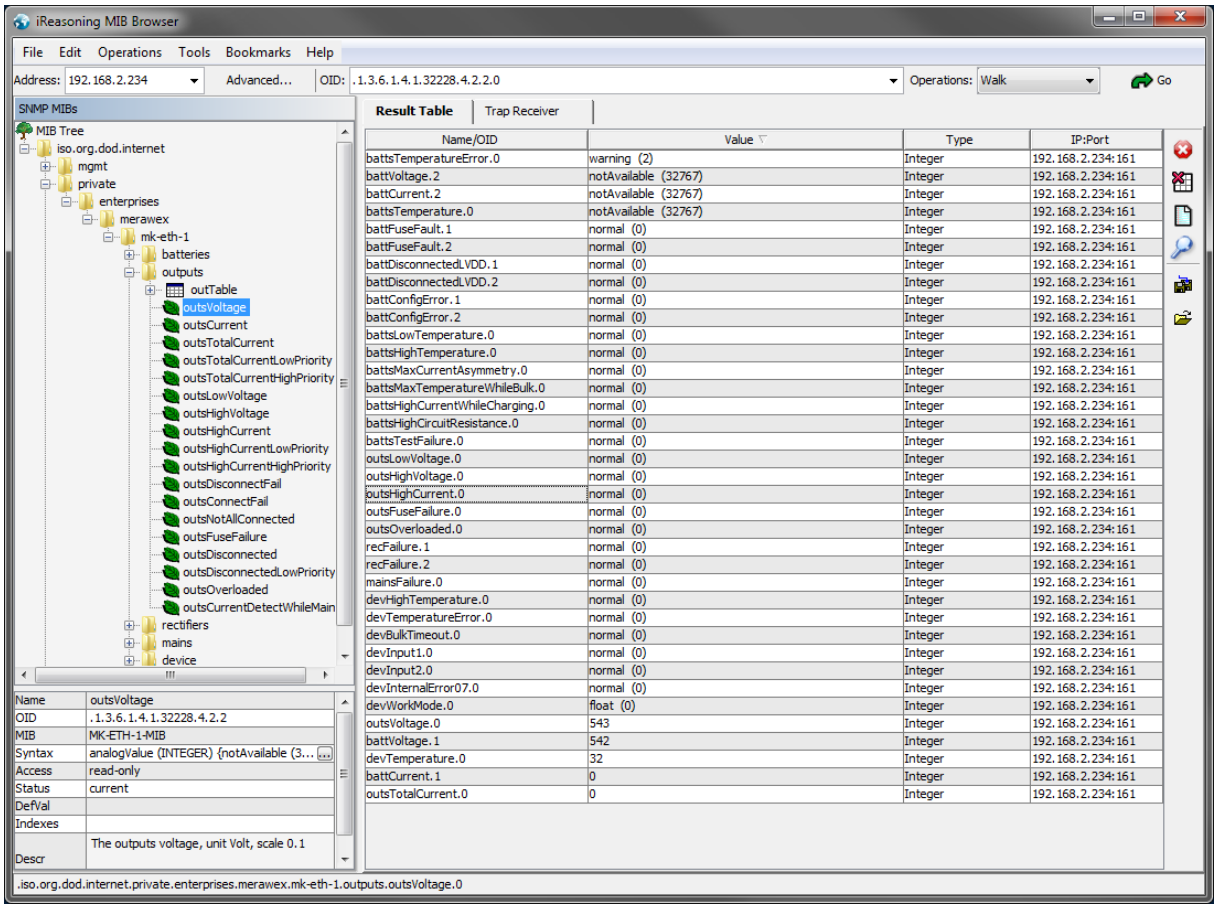
The module supports the SNMP protocol version 1 together with the asynchronous sending of trap notifications to maximum 4 recipients. For servicing many Merawex devices, a universal MIB has been designed. It contains all possible signals in supported devices. A specific device supports only a subset of the universal base, depending on the equipment and capabilities. The main OID in the MIB structure is .1.3.6.1.4.1.32228.4

The configuration of the basic SNMP agent operation parameters is possible in the Communication tab (the figure below). In this tab you can also download the current MIB file for this firmware version.

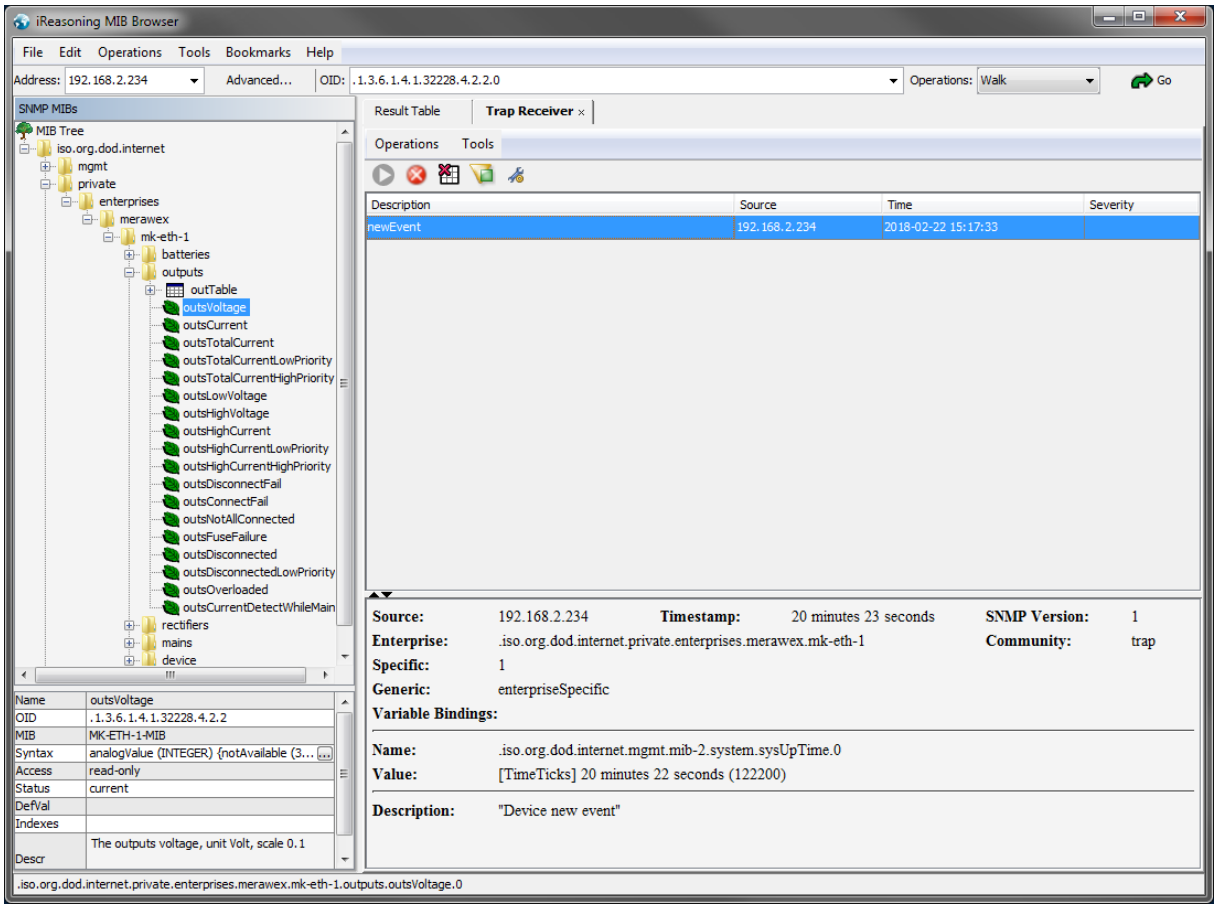


An example of appearance of data returned by the SNMP agent

Note. Modbus TCP Gateway mode operation results in inactivity of the SNMP.



In the case of appearance or change of the fault status or error in the operation of the monitored device, the module sends a *newEvent* notification (SNMP Trap function) to the indicated IP addresses. Then, in order to recognize the event, the SNMP manager must read the current state of the device.



Note: The ModbusTCP connection statement suppresses the SNMP and WWW protocols.

7. Module software update

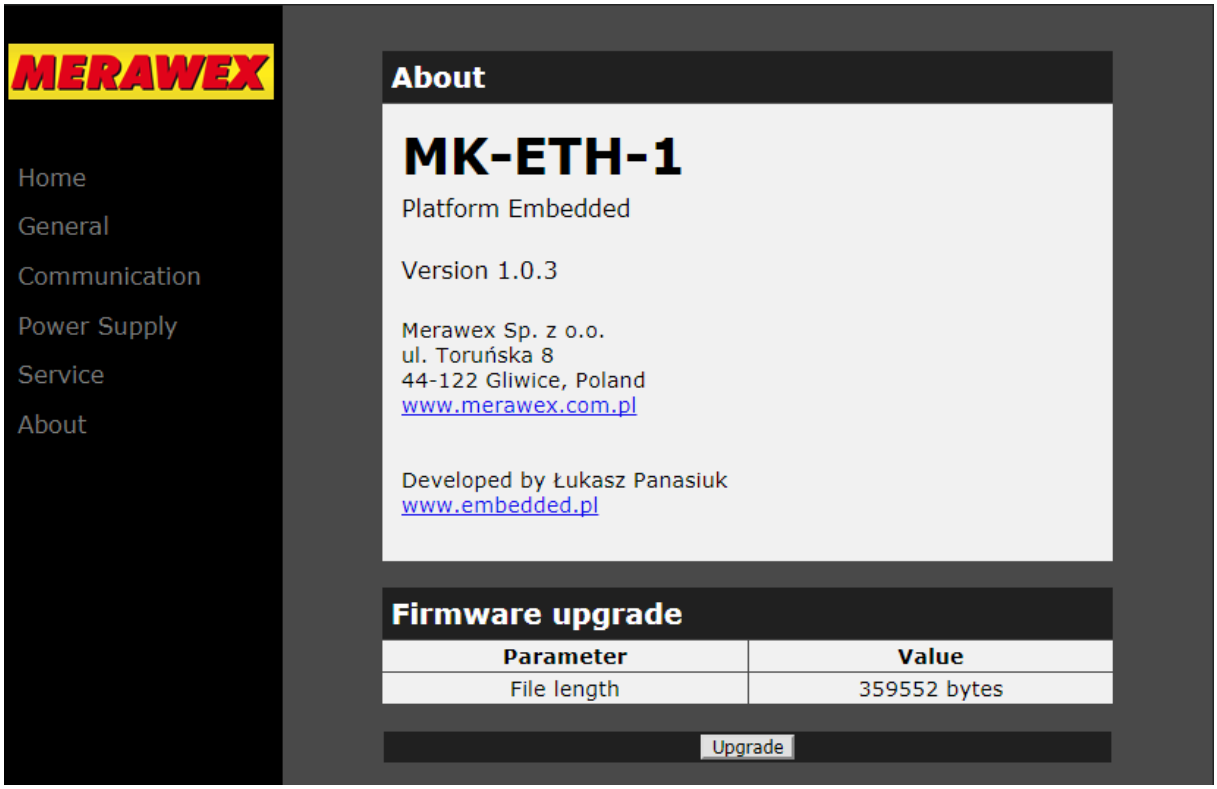
If necessary, the software update of the module is carried out using any TFTP client or application from the manufacturer. A file with the new firmware version is sent to the module and then an update is performed. Things to do in order to upgrade:

1. The module must have an active TFTP server, see: General tab
2. By using a TFTP client, a firmware binary file is sent to the module using the name of the target file *firmware.bin*
3. After the transfer, go to the About tab of the WWW and press the Upgrade button to complete process.
4. After a few seconds, the module will restart with the new software version.

Example of sending a firmware file to a module of the IP address *192.168.2.239*, file named *MK ETH 1_v1.0.3_EN.tpc.bin*, by using the TFTP client which is available in the Windows operating system.

```
tftp -i 192.168.2.239 put MK-ETH-1_v1.0.3_EN.tpc.bin firmware.bin
```

The view of the Information (About) tab after loading the file:



8. Signalization

LED diode name	Colour / Sequence of colours	Description
ETH 100	off	The module works in a 10Mb/s network
	green	The module works in a 100Mb/s network
ETH CON	green	Signalization of Ethernet connection and communication
STATUS	green	Normal operation, web interface and SNMP. For the Modbus TCP Gateway mode operation, signaling active TCP connection.
	flashing green	The ModbusTCP connection on, the WWW and SNMP interfaces have been stopped
	red	Communication error with the connected device
	off	For the Modbus TCP Gateway mode operation, signaling no active TCP connection.
	another indication	Internal error of the module, contact with the manufacturer required

Appendix A - Connection cables

Connection cable for the SI48-1U and SI48-3U power systems.