# MBC-24 Modbus RTU-ASCII-TCP Gateway (RS485 / Ethernet)

Short guide

## Safety

**WARNING**
***Dangerous voltage!***
***Electric shock could kill or seriously injure.***
***All electrical connections must be performed by a fully qualified electrician.***
***Ensure that the mains voltage matches the voltage marked on the device.***
***Ensure that the device is provided with its own power supply line and electric fuse.***

**NOTICE**
***Switch on the power supply only after wiring of the device has been completed.***

## 1. Overview

The MBC-24 Modbus RTU-ASCII-TCP Gateway is designed for bidirectional conversion and routing communication between ModbusRTU / ASCII via RS485 and Modbus TCP via the Ethernet interface. The Master and Slave modes are supported.

For detailed information please refer to the MBC-24 user guide available at *www.akytec.de*.

## 2. Specifications

*Table 1 Specifications*

| Parameter | Value |
|---|---|
| **Power supply** | |
| Power supply | 24 (10…48) V DC |
| Power consumption, max. | 6 W |
| Galvanic isolation | 1770V |
| **RS485** | |
| Protocols | Modbus RTU (Master/Slave)<br>Modbus ASCII (Master/Slave) |
| Baud rate | 1200, 2400, 4800, 9600, 14400, 19200,<br>38400, 57600, 115200 bps |
| Cable length, max. | 1200 m |
| Default address | 1 |
| Number of Slaves, max. | 32 |
| **Ethernet** | |
| Protocol | Modbus TCP (Master/Slave) |
| Baud rate | 10/100 Mbps |
| Type of connector | 8P8C (RJ45) |
| Default address | 192.168.1.99 |
| Slave ID (fixed) | 1 |
| Number of Slaves, max. | 31 |
| **USB** | |
| Standard | USB 2.0 |
| Connector type | Micro-USB |
| Device power supply | yes |
| **Mechanical** | |
| Mounting | DIN rail |
| Dimensions | 55 × 96 × 58 mm |
| IP code | IP20 |
| Weight | approx. 150 g |
| Average service life | 10 years |
| Mean time between failures (MTBF) | 80000 hours |

## 3. Environmental conditions

The device is designed for natural convection cooling which should be taken into account when choosing the installation site.

The following environmental conditions must be observed:

- clean, dry and controlled environment, low dust level;
- closed non-hazardous areas, free of corrosive or flammable gases.

*Table 2 Environmental conditions*

| Condition | Permissible range |
|---|---|
| Ambient temperature | −40...+55 °C |
| Relative humidity | 10...95 % (non-condensing) |
| Altitude | up to 2000 m above sea level |
| EMC emission / immunity | conforms to IEC 61131-2 |
| Vibration / shock resistance | |

## 4. Dimensions

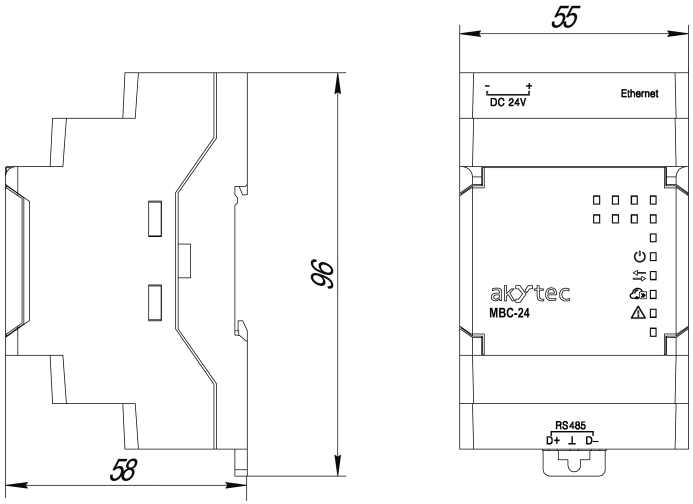



*Fig. 1 Dimensions*

## 5. Connection

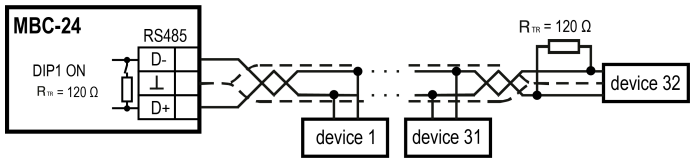



*Fig. 2 Connection*

## 6. Indication and control

There are 4 LEDs on the front panel of the gateway:

*Table 3 Indicators*

| LED | State | Description |
|---|---|---|
| ⏻ | ON | Power is on |
| **RS** | Flashing | Data transfer over RS485 interface |
| **Eth** | Flashing | Data transfer over Ethernet interface |
| ⚠ | OFF | No errors |
| | ON | Error (see *Table 4*) |


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*Table 4 Error indication and remedy*

| LED | State | Description | Remedy |
|---|---|---|---|
| ⚠ | ON | Hardware / firmware error | Contact akYtec service staff |
| | Flashing | Static IP address setup error | Reassign IP address if it was configured using *akYtec Tool Pro* |
| | | Cannot establish connection over Ethernet | Check the Ethernet cable and connection |
| ⏻ ■<br>RS ■<br>Eth □<br>⚠ ■ | ON (⏻, **RS,** ⚠) | Invalid RS485 configuration: 7-N-1 | Select a valid combination of parameters (see *Table 5*) |
| ⏻ ■<br>RS ■<br>Eth ■<br>⚠ ■ | ON (All LEDs) | Firmware startup error | Restart the device. Repeat the firmware update if necessary |

*Table 5 Supported Modbus data parameters' combinations*

| Modbus RTU | Modbus ASCII |
|---|---|
| 8-N-1 | 8-N-1 |
| 8-N-2 | 8-N-2 |
| 8-O-1 | 8-O-1 |
| 8-O-2 | 8-O-2 |
| 8-E-1 | 8-E-1 |
| 8-E-2 | 8-E-2 |
| — | 7-O-1 |
| — | 7-O-2 |
| — | 7-E-1 |
| — | 7-E-2 |

**NOTE**
The parameter value Data bits = 7 is not supported by Modbus RTU.
The combinations 7-N-1 and 7-N-2 are not supported by Modbus ASCII.

Under the cover:

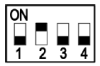
- Service button;
- 4 DIP switches;
- Micro-USB connector.

The service button can be used for the following functions:

- Factory settings restoration (long press up to 12 s.);
- Device reset (short press).

**NOTE**
DIP switch positions are read in ascending order starting from 1.

*Table 6 DIP switches*

| DIP switch | Description |
|---|---|
|  DIP1 = ON | 120 Ω terminating resistor is connected |
|  DIP2 = ON | Only for akYtec service staff. DIP switches 2, 3 and 4 must be turned off during normal operation |
|  DIP3 = ON | |
|  DIP4 = ON | |

## 7. Using the device

The gateway configuration parameters must be set before using the device. Connect the gateway to the *akYtec Tool Pro* software and set the following configuration parameters: the operation mode, the connected device address in the RS485 network, Ethernet settings, and the data conversion protocol required. After the gateway is disconnected from PC and powered, it starts bidirectional Modbus RTU/ASCII and Modbus TCP conversion.

For more information please see HELP of the *akYtec Tool Pro* software and the MBC-24 user guide available at *www.akytec.de*

Before use it is necessary to determine the interface to be assigned for Master and then configure the data communication scenario accordingly.

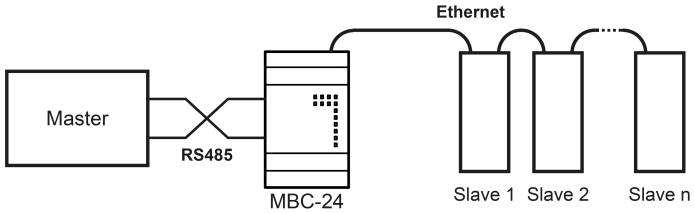



*Fig. 3 Using the gateway with Master via RS485 interface*

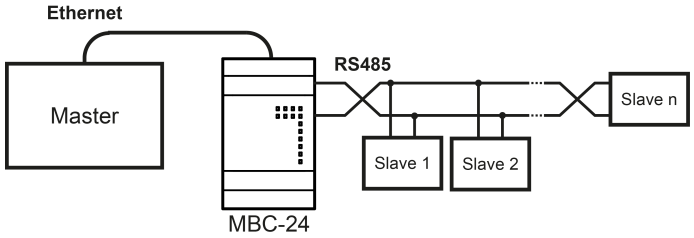



*Fig. 4 Using the gateway with Slaves via RS485 interface*

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