

GE-24-Cloud

Network gateway

User guide

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GE-24-Cloud_3-EN-143408-1.3
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1 Introduction

This manual describes the functions, configuration, operating instructions and troubleshooting of the GE-24-Cloud network gateway (hereinafter referred to as “device” or “gateway”).
Connection, configuration and maintenance of the device must be performed only by fully qualified personnel after reading this user guide.

1.1 Terms and abbreviations

PC – personal computer
DHCP (Dynamic Host Configuration Protocol) – network management protocol used for automatically assigning IP addresses and other communication parameters
akYtec Cloud – cloud-based SaaS (Software as a Service) service for remote monitoring, control, and management of on-site emergencies in any industries
USB (Universal Serial Bus) – serial communication interface

1.2 Symbols and key words

WARNING
WARNING indicates a potentially dangerous situation that could result in death or serious injuries.

CAUTION
CAUTION indicates a potentially dangerous situation that could result in minor injuries.

NOTICE
NOTICE indicates a potentially dangerous situation that could result in damage to property.

NOTE
NOTE indicates helpful tips and recommendations, as well as information for efficient and trouble-free operation.

1.3 Intended use

The device has been designed and built solely for the intended use described here, and may only be used accordingly. The technical specifications contained in this document must be observed.
The device may be operated only in properly installed condition.

Improper use

Any other use is considered improper. Especially to note:
– The device may not be used for medical applications.
– The device may not be used in explosive environment.
– The device may not be used in atmosphere in which there are chemically active substances.

1.4 Limitation of liability

Our company does not bear any responsibility with respect to breakdowns or damages caused by using the product in a manner other than described in the Manual or in violation of the current regulations and technical standards.

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1.5 Safety

WARNING
Ensure the mains voltage matches the voltage marked on the nameplate. Ensure the device is provided with its own power supply line and electric fuse.

WARNING
The device terminals may be under a dangerous voltage. De-energize the device before working on it. Switch on the power supply only after completing all work on the device.

NOTICE
Supply voltage may not exceed 48 VDC. Higher voltage can damage the device.
If the supply voltage is lower than 10 VDC, the device cannot operate properly but will not be damaged.

NOTICE
If the device is brought from a cold to a warm environment, condensation may form inside the device. To avoid damage to the device, keep the device in the warm environment for at least 1 hour before powering on.
The device should be mounted in a specialized cabinet access to which is limited to qualified personnel.

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2 Overview

The GE-24-Cloud network gateway is designed to connect the network devices working with the Modbus protocol via the RS485 interface to the cloud service akYtec Cloud via Ethernet.

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3 Specifications

3.1 Specifications

Table 3.1 Specifications

Parameter	Value
Power supply	
Power supply	24 (10…48) VDC
Power consumption, max.	6 W
Galvanic isolation	see *Section 3.2*
Network interface	
Interface	RS485
Protocols	Modbus RTU, Modbus ASCII, akYtec*
Baud rate	1200...115200 bps
Cable length, max.	1000 m
Cloud interface	
Interface	Ethernet
Protocols	TCP, DNS, DHCP
Baud rate	10 Mbps, 100 Mbps
Cable length, max.	100 m
Configuration interface	
Interface	USB 2.0 (Micro-USB); Ethernet 10/100 Mbps
Mechanical	
Dimensions	55 × 96 × 58 mm
IP code	IP20
Average service life	10 years
Weight	approx. 150 g

NOTE
Only devices listed in the library can be connected via the akYtec protocol.

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3.2 Galvanic isolation

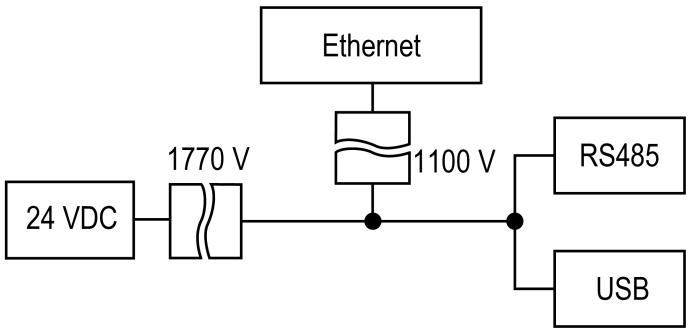


Fig. 3.1 Galvanic isolation

3.3 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 3.2 Environmental conditions

Condition	Permissible range
Ambient temperature	-40…+55 °C
Transportation and storage	-25 … +55 °C
Relative humidity	10…95 %(non-condensing)
Altitude	up to 2000 m ASL
Vibration / shock resistance	conforms to IEC 61131-2
EMC emission / immunity	

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4 Startup

To start the gateway:

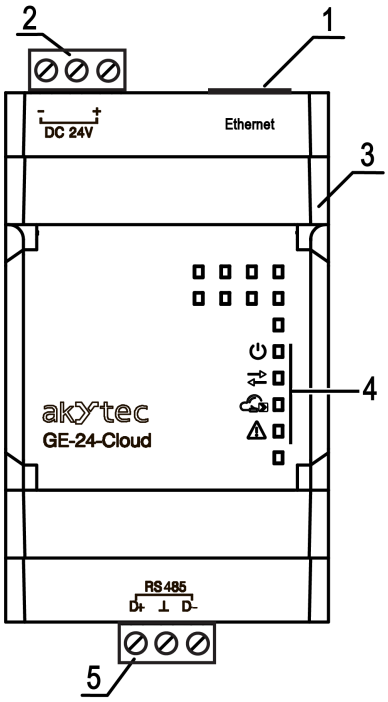
1. Mount the gateway (see *Section 6.1*).
2. Power the gateway on (see *Section 7.2*).
3. Set up the gateway network parameters (see *Section 8.1*).
4. Connect the gateway to the Ethernet network (see *Section 7.3*).
5. Power off the gateway.
6. Connect devices to the gateway (see *Section 7.4*). Ensure all devices are configured before being connected. All devices connected via RS485 must be in the Modbus Slave mode.
7. Power on the gateway and all connected devices.
8. Add the gateway and all devices connected to the gateway to akYtec Cloud (see *Section 8.2*).
9. Check LEDs on the front panel to make sure that no errors have occurred (see *Table 5.1*).

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5 Design and operation

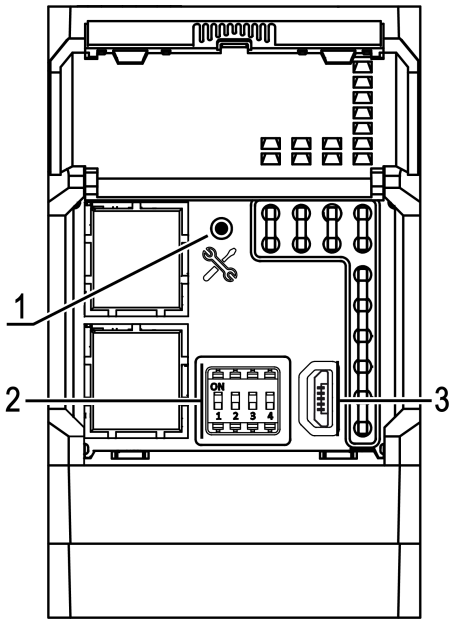
5.1 Design

The gateway is designed in a plastic enclosure for DIN rail mounting. Main components are shown in *Fig. 5.1*.



1 — Ethernet connector
2 — Detachable part of the power terminal block
3 — Gateway enclosure
4 — Indicators
5 — Detachable part of the RS485 terminal block

Fig. 5.1 Front view



1 — Service button (to reset the gateway and restore the factory settings)
2 — 4 DIP switches
3 — Micro-USB connector

Fig. 5.2 Under the front cover

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5.2 Operation

At startup the gateway connects to an internet-enabled Ethernet network and accesses to the akYtec Cloud server using the gateway's serial number. If four attempts to access to akYtec Cloud are unsuccessful, the gateway reboots.
After establishing a connection to akYtec Cloud and adding the devices connected to the gateway in the account, the gateway enters the mode of waiting for commands from the server and transmitting them to the RS485 line. At this time the gateway receives data from the RS485 line, stores them in the buffer and transmits them to akYtec Cloud.
The gateway reboots automatically every 12 hours after power on, unless data is being transmitted to the server at the moment.

5.3 Indication and control

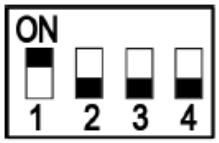
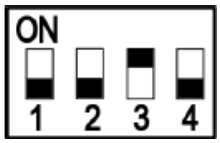
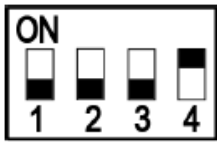
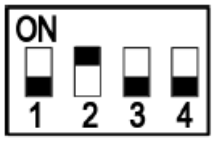
There are 4 LEDs on the front cover.

Table 5.1 LED indicators

LED	State	Description
⏻	ON	Power is on
	OFF	Power is off
⇄	flashing	Data transfer over RS485 interface
	OFF	No data transfer over RS485 interface
☁	flashing	Command transfer from akYtec Cloud
⚠	OFF	No error
	ON	Hardware / firmware error. Contact akYtec service staff
	flashing (short ON, long OFF)	Cannot establish connection to akYtec Cloud Check the network settings of the device and the Internet access point Check the integrity of the Ethernet cable
	flashing (ON and OFF of the same length)	No internet access. DNS or DHCP server failure if DHCP is enabled

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Table 5.2 DIP switches

DIP switch	Description
 DIP1 = ON	120 Ω terminating resistor is connected
 DIP3 = ON	Write commands via RS485 interface are disabled
 DIP4 = ON  DIP2 = ON	Only for akYtec service staff. The switches must be turned off during normal operation

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

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6 Installation

6.1 Mounting

The safety measures specified in *Section 1.5* must be observed during the device mounting. The device is to be mounted in enclosures, cabinets, etc. with protection of the device from dust, moisture and foreign objects.

NOTICE
Configure and program the device prior to montage and wiring.

CAUTION
Do not use the device power terminals for powering any other equipment!

To mount the gateway:

1. Ensure the sufficient space for mounting the gateway and accompanying cables.
2. Mount the gateway on the DIN rail using a clip.

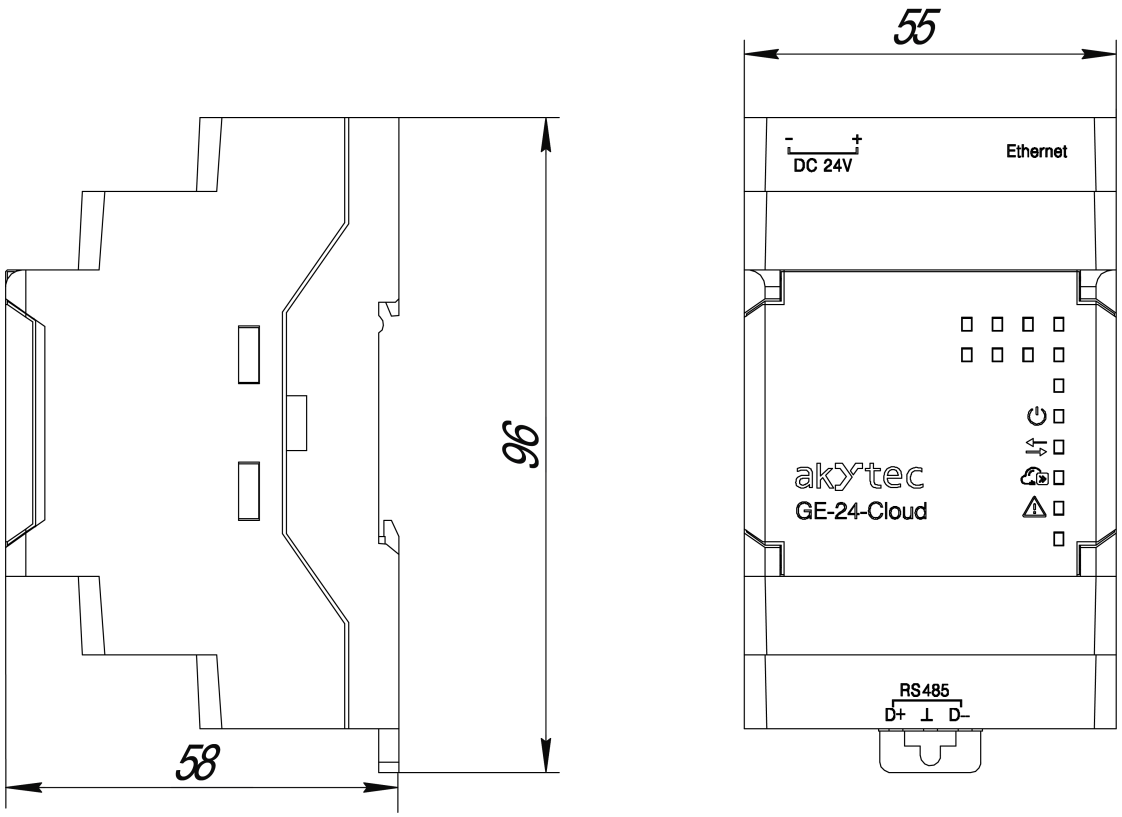


Fig. 6.1 Dimensions

6.2 Quick replacement

The gateway is equipped with plug-in terminal blocks which enable quick replacement of the device without disconnecting the existing wiring.

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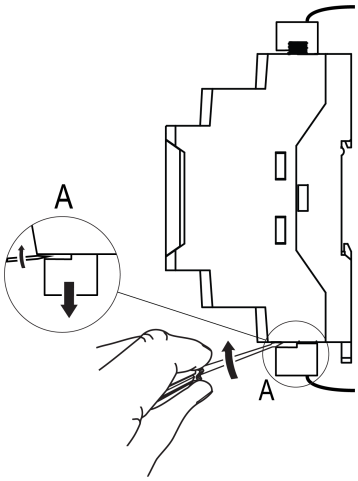


Fig. 6.2 Quick replacement

For the device quick replacement, follow the steps below:

1. Power off all connected lines including power supply.
2. Disconnect the Ethernet cable.
3. Using a screwdriver or a similar tool, unplug the terminal blocks with existing wiring connected (see *Fig. 6.2*).
4. Remove the device from the DIN rail and mount another gateway of the same modification (with the terminal blocks unplugged).
5. Plug the terminal blocks with existing wiring into mating connectors of the gateway installed.
6. Power on the gateway.
7. In akYtec Cloud, go to the gateway settings and enter the serial number of the mounted gateway (in the **New ID** field, see *Section 8.2*) .

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7 Wiring

7.1 Terminal assignments

Table 7.1 Terminal assignments

Marking	Description
–	power terminal «–», 24VDC
+	power terminal «+», 24VDC
D+	terminal D+ for RS485 line
⊥	terminal to connect RS485 shield
D-	terminal D– for RS485 line

7.2 Power connection

The following requirements must be observed when connecting the power supply:

– Do not connect more one wire to one terminal.
– The wire cross-section must be within 0.35 — 0.75 mm². Use cable lugs in case of twisted wires.
– Do not use gateway power terminals to power on other devices.

Power the gateway from its power supply of 24 VDC. The cable length should not exceed 30 m.

CAUTION
Do not power the gateway from the distributed 24 VDC power supply line.

7.3 Ethernet connection

To connect the gateway to the Ethernet network, use a twisted pair cable of category 5E or higher with the RJ45 connector.

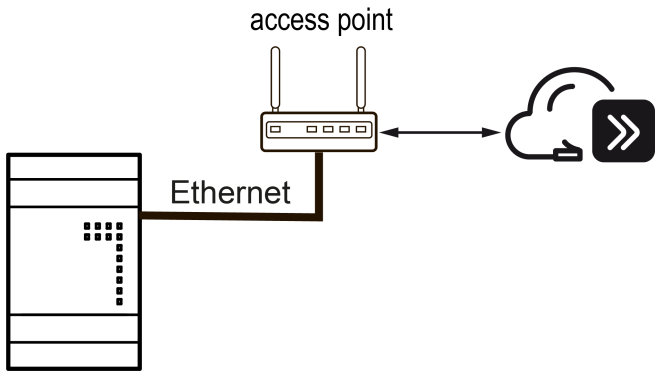


Fig. 7.1 Connection to akYtec Cloud via Ethernet

NOTE
To connect to the akYtec Cloud server, use local port 25001.

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7.4 RS485 network

When connecting via the RS485 interface:

– Ensure all devices are configured before being connected.
– Observe the polarity: connect line D+ to terminal D+, line D- to terminal D- .
– Use a shielded twisted-pair cable with the wire cross section of at least 0.2 mm² and a maximum linear capacitance of 60 pF/m.
– The total length of the RS485 line should not exceed 1000 m.
– If the RS485 line is over 10 m, use terminating resistors. The gateway has the in-built terminating resistor which can be connected with the DIP switch (see *Table 5.2*).

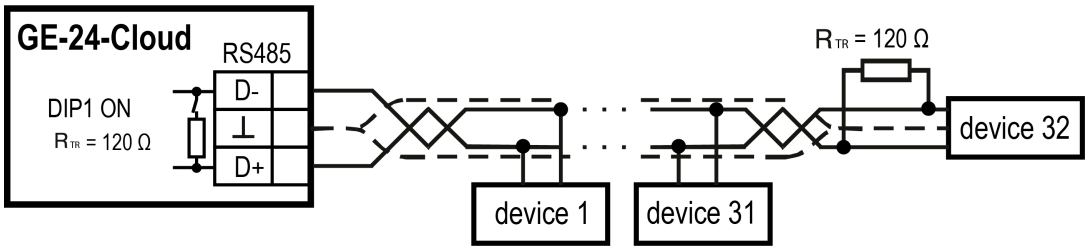


Fig. 7.2 RS485 network

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8 Configuration

You only need to configure the gateway if you want to assign a static IP address and/or change the default safe mode settings (see *Section 8.1.4*). If the network where you plan to use the gateway has a DHCP server, then the gateway will be able to get an IP address from it without making any additional settings in *akYtec Tool Pro*.

8.1 Connection and configuration in akYtec Tool Pro

To configure the gateway, use *akYtec Tool Pro* .
The gateway is connected to *akYtec Tool Pro* via the interfaces:

– USB (recommended)
– Ethernet.

NOTE
When being configured over USB, the device is powered by USB and the main power supply is not required. For configuration over Ethernet, the device must be powered on.

NOTE
Detailed information on connection and operation is given in the *akYtec Tool Pro* help. To view the help, click the **F1** button.

8.1.1 Connection over USB

To add the gateway to a *akYtec Tool Pro* project:

1. Connect the gateway to a PC over USB.
2. Start *akYtec Tool Pro*.
3. In the **Project** tab, click the **Add devices** toolbar item. A window will appear:

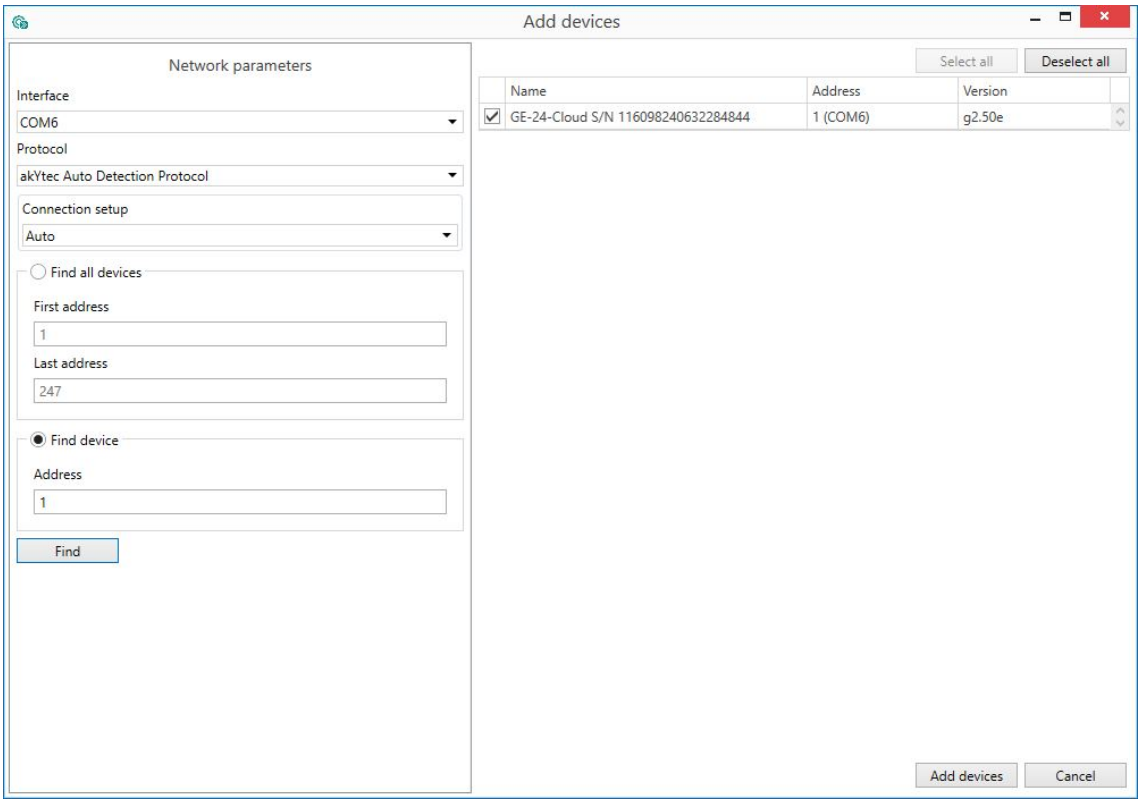


Fig. 8.1 Interface menu

– In the **Interface** field, select the COM port assigned to the gateway You can check the port number and name in Windows Device Manager.

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– In the **Protocol** field, select **akYtec Auto Detection Protocol**.
– Select **Find device**.
– Enter the address of the connected device (factory setting — **1**).
– Click the **Find** button. The gateway with the address will be displayed in the right part of the window.
– Select the checkbox next to the gateway and click the **Add devices** button. The device will be added to the project.

8.1.2 Connection over Ethernet

By default, the gateway's IP address is assigned by a DHCP server. If you are connecting the gateway to a local network with an active DHCP server, the gateway's IP address will change. To avoid this, connect the gateway directly to a PC with network adapter properly configured. If you connect the gateway to a network without a DHCP server, you need to configure the gateway's Ethernet parameters.
To connect to *akYtec Tool Pro* over Ethernet:

1. Select **Find device**.
2. Enter the IP address of the connected device.

   NOTE
   The default IP address (factory setting) is **192.168.1.99**.

3. Click the **Find** button. The device with the IP address will be displayed in the window.
4. Select the checkbox next to the device and click the **Add devices** button. The device will be added to the project.

8.1.3 Static IP address assignment

Open the gateway settings and set the following parameters in the **Network settings** / **Ethernet settings** node:
– **DHCP mode = OFF**
– IP address
– subnet mask
– gateway (router) IP address
To get the IP address from the DHCP server, set **DHCP mode** to **On**.The DHCP server will assign network settings automatically.

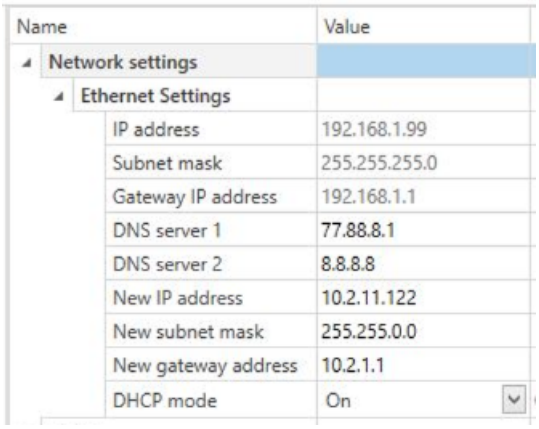
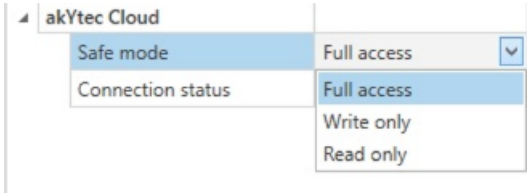


Fig. 8.2 DHCP mode configuration

8.1.4 Restricting data exchange over akYtec Cloud

If you have devices connected to the gateway over the RS485 interface, you can restrict access to the devices over akYtec Cloud. You can set up access restrictions in *akYtec Tool Pro.*
Open the **Network settings / akYtec Cloud** node:

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Select one of the following:
– **Full access (default)** — write and read commands are enabled
– **Write only** — only write commands are enabled
– **Read only** — only read commands are enabled.

8.2 Adding the gateway and connected devices to akYtec Cloud

To add the gateway and connected devices to akYtec Cloud:

1. Go to website.*akYtec Cloud*
2. In the **Administrating** section, select **Add device** and specify parameters of the device connected to the gateway over the RS485 interface:
   – Type of the connected device
   – Gateway ID (serial number) marked on the gateway's enclosure
   – Address of the device connected to the gateway
   – Serial number of the connected device
   – Name of the connected device to display in akYtec Cloud
   – Time zone in which the device is physically located.
3. Configure RS485 settings.

   NOTE
   The gateway only supports 8-bit data exchange over the RS485 interface. 7-bit data exchange over the RS485 interface is not supported.

   It is recommended to set the following network parameters in RS485 settings of the connected device and in akYtec Cloud:
   – Data bits — 8
   – Number of stop bits — 1 (recommended)
   – Parity — none.
4. Review and, if necessary, revise the list of sampling parameters for the connected device.

Repeat steps 2-4 for each device connected to the gateway. If the device was connected correctly, the data received from the device will be displayed in your akYtec Cloud account.
The detailed description how to connect devices to akYtec Cloud is given in the *akYtec Cloud* user guide.

8.3 Firmware update

You can update the firmware using *akYtec Tool Pro:*.
To update firmware:

1. Connect the gateway to a PC (see *Section 8.1*).
2. Click  in the context menu of the device or on the control panel.
3. Select a firmware update file. Use the firmware file with **.fw.** extension. Wait for the file to upload to the gateway and firmware update to complete (during update, signal level LEDs indicate update progress).

8.4 Factory settings restoration

To restore the factory settings:

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1. Open the front cover.
2. Press and hold the service button for at least 12 s.
3. Power off and then power on the gateway.

The gateway settings and RS485 port settings will be reset to default factory settings. Routing settings and network settings will not be reset to defaults, with the exception of **DHCP mode — OFF**.

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9 Maintenance

The safety requirements (see *Section 1.5*) must be observed when the maintenance is carried out.

WARNING
Cut off all power before maintenance.

The maintenance includes:

– cleaning of the housing and terminal blocks from dust, dirt and derbis;
– checking the device fastening;
– checking the wiring (connecting wires, terminal connections, absence of mechanical damages).

NOTICE
The device should be cleaned with a dry or slightly damp cloth only. No abrasives or solvent-containing cleaners may be used.

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10 Transportation and storage

Pack the device in such a way as to protect it reliably against impact for storage and transportation. The original packaging provides optimum protection.
If the device is not taken immediately after delivery into operation, it must be carefully stored at a protected location. The device should not be stored in an atmosphere with chemically active substances.
The environmental conditions must be taken into account during transportation and storage.

NOTICE
The device may have been damaged during transportation.
Check the device for transport damage and completeness!
Report the transport damage immediately to the shipper and akYtec GmbH!

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11 Scope of delivery

— GE-24–Cloud network gateway	1 pc.
— Short guide	1 pc.
— 2EGTK-5-03P-11 terminal block	2 pc.

NOTE
The manufacturer reserves the right to make changes to the scope of delivery.

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