1. Overview

The IC200-MRTU-LW converter connects to equipment via the RS-485 interface using Modbus RTU and transmits data via the LoRaWAN network. The device has one pulse input that can be reconfigured to security mode and one open collector digital output to control external devices. The device is battery-powered and can be connected to an external DC power supply.

2. Specifications

Table 1   General specification

Parameter	Value
Data transmission interface	
Data transmission	LoRaWAN 1.0.4, Class A, C
Frequency bands	EU868 - default, US915 and others - by request
ADR support	Yes
Activation method	ABP/OTAA
Antenna type	Internal/External
RS-485 (Modbus)	
Number of ports	1
Digital input	
Number	1
Operating mode switching	Software
Frequency of registered pulses, max., Hz	100 (200 Hz, with additional EMI protection)
Internal pull-up to device power supply	Yes
ESD protection	Yes
Type of connected devices	"Dry contact", open collector
Digital output	
Number	1
Type	Open collector
Maximum load current/voltage	1 A/24 V
Power supply	
Battery type/voltage	2 × CR123A/3 V
Battery life	Up to 5 years (depending on settings)
External DC power supply	5…30 V
Mechanical	
IP code	IP65
Dimensions	129 x 79 x 29 mm

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:

- non-hazardous areas, free of corrosive or flammable gases

Table 2   Environmental conditions

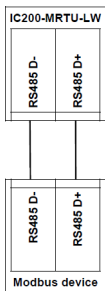| Condition	Permissible range
Ambient temperature, operation and transportation	-40…+70 °C
Relative humidity, operation	10…95 % (non-condensing)

3. Connection

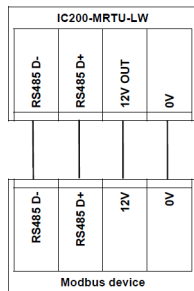

Fig. 1 – Standard RS-485 connection diagram

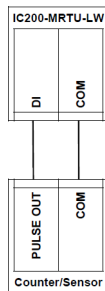Fig. 2 – RS-485 connection with IC200-MRTU-LW power

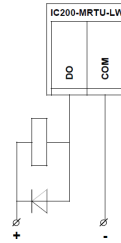Fig. 3 – Counter/Sensor connection diagram

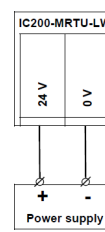Fig. 4 – External device connection diagram

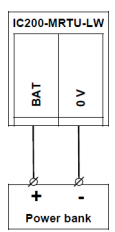Fig. 5 – Power supply connection diagram

Fig. 6 – Power bank connection diagram

NOTICE
The digital output uses an NPN open-collector transistor. Maximum load current is 1 A. Switching voltage is up to 24 V.

NOTICE
The type of connected device is "dry contact" or open collector.

4. Mounting

To mount the device on the DIN rail, install the universal bracket in the standard mounting seat. To mount the device on a wall or any flat surface, use 4 holes for screws in the device enclosure. Use the same holes to fasten the device on a pipe with stainless steel cable ties (or nylon zip cable ties).
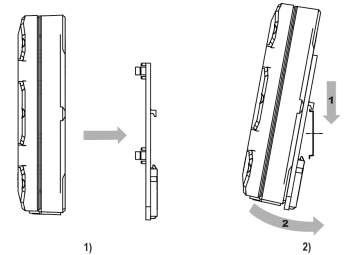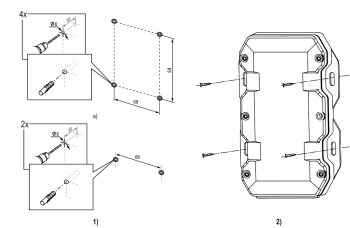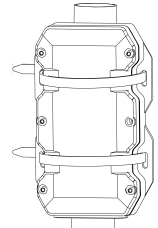

Fig. 7 – DIN rail mounting

Fig. 8 – Wall mounting

Fig. 9 – Mounting with cable ties

5. Quick start

- Go to the device page on the akYtec website via the QR code and download the mobile application in a convenient way. The full version of the user guide is also available on the website.
- Download the **akYtec IoT Configurator** mobile application to your smartphone.
- Install and connect the device.
- Activate NFC and Bluetooth on your smartphone.
- Start **akYtec IoT Configurator**.
- Hold your smartphone close to the NFC mark on the front panel of the device to activate it.
- When you start the application, the application window appears. Click the **Connect** button and select the desired device by tapping its name. Please note that it may take 10-15 seconds before your device appears in the list.
- After selecting the device, enter the password to access the device (default password: 1111).

NOTICE
Change the default password before device usage.

NOTICE
The application is currently only available for Android.

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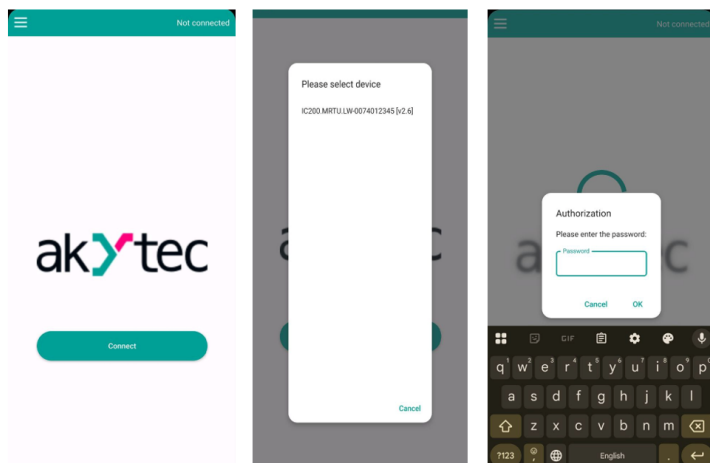Tel.: +49 (0) 511 16 59 672-0 · www.akytec.de

*Fig. 10 – Device connection using **akYtec IoT Configurator***

- Open the **Settings** tab and set **Data transmission period**, and change the **Activation** mode (OTAA or ABP).
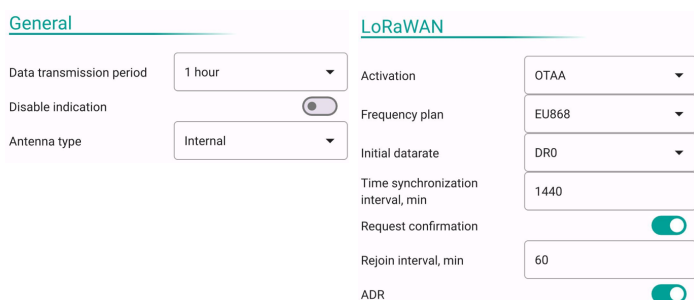

Fig. 11 – Selection of settings

- Open the **Personalization** tab to check and save the **data for device integration** to the networks:

   OTAA keys:

   – DevEUI: Unique device identifier in the LoRaWAN network

   – AppEUI: Unique application ID to identify the application provider

   – AppKey: Application key used to get NwkSKey and AppSKey session keys

   ABP keys:

   – DevAddr: Unique device ID in the LoRaWAN network

   – AppSKey: Unique encryption key
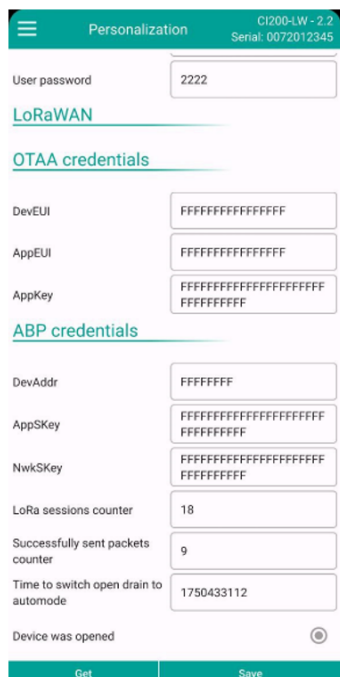
   – NwkSKey: Unique encryption key

Fig. 12 – LoRaWAN settings

6. Indication

You can disable/enable indication in ***Setting > General > Disable indication***.

- ⚡ **External power supply indication**: The indicator flashes red when the external supply is 5 V to 9 V. The indicator is solid red when the external supply is greater than 9 V.

- ⬇ **Measurement indication**: Series of green flashes

- ⬆ **Data transmission indication**: During data transmission the indicator flashes blue. Upon successful packet transmission, if the confirmation of successful packet transmission is enabled, the green indicator will flash once.

7. LoRaWAN network integration

Device integration to LoRaWAN network server (LNS) requires performing a few standard steps in the LNS interface.

- In the window with the list of available devices, click the **+New Device** button.

- In the window that appears, fill the standard fields:

   – Name: Device name

   – Class: Device class

   – Activation: Activation mode: ABP, OTAA, OTAA+ABP

      ♦ To register the device using OTAA, enter DevEUI, AppEUI and AppKey.

      ♦ To register the device using ABP, enter DevEUI, DevAddr, NwkSKey and AppSKey.

   ⓘ **NOTICE**
   The device activation mode (OTAA/ABP) can be set on the **Settings** tab of the **akYtec IoT Configurator** mobile application. You can find all necessary data to add the device to the LoRaWAN network on the **Personalization** tab of the **akYtec IoT Configurator** mobile application.

- After entering the data, click the **Save** button.

The new device and its status are indicated in the window. The device is ready to use.