# Modbus (RS485) to the LoRaWAN

The product is designed for an efficient readings of any device communicating via RS485, most commonly using the Modbus protocol—for example, actuators, electricity meters and other measurement devices. It enables the integration of RS485 devices into the LoRaWAN wireless network, facilitating the data collection and analysis at specified intervals.

## \\ Modbus (RS485) to the LoRaWAN
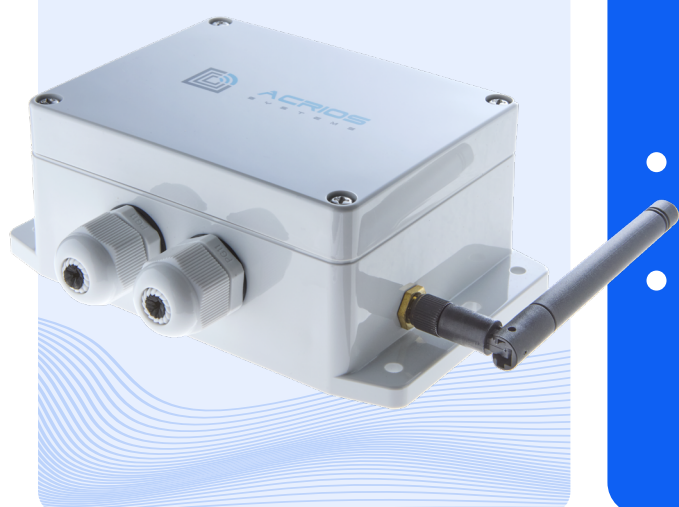


- We can read any sensor or meter with the RS485 communication—whether it's using the Modbus, DLMS or the IEC62052 protocol, either directly or through an optical head.

- We can provide the converter with an external power supply options for the sensors or detectors, ranging from 3 to 30 V DC—allowing you to connect external probes, water level measurement devices or weather stations.

- It finds application in the industrial automation, energy, agriculture or the smart city projects.

- Connect up to 96 devices with a single converter to maximize the flexibility during the installation while avoiding the need to add a converter to each meter and thereby reducing the project costs.

## \\ Installation, Operation and Longevity without Worries

Our solution is suitable for small businesses and big heating plants alike. We have experience with building and operating the private LoRaWAN networks and we can implement a device library and reduce the message length to the necessary minimum while maintaining the versatility. The client defines the library, so you can add any device.

The antenna connectors of our converters are designed for the minimal loss and the maximum reception sensitivity, making them suitable even in the heat exchanger stations. We use dual D-Cell batteries, which provide reliable operation for more than 10 years and for the demanding applications, an option with a permanent external power supply is available.

# \\ Technical specifications

## General specification

| | |
|---|---|
| Dimension | 145 x 90 x 55 mm |
| Weight | 166 g |
| IP rating | IP67 |
| Mounting | 6 fixation points for mounting to the wall, tube or collar |
| Mounting holes | 4x M4 pan screw and 2x oval hole for zip-tie fixation |
| HS code | 85269200 |

## Opearting conditions

| | |
|---|---|
| Operational temperature: | -30 to +60 °C |
| Humidity | 0 to 85% RH (non-condensing) |

## Regulations and certifications

| | |
|---|---|
| Standard | CE, RoHS |

## Device configuration

| | |
|---|---|
| Local device configuration | Over the cable via ACR-CONFIG and the configuration app |
| Remote device configuration | Downlink via network |
| FUOTA support | Yes |
| Configuration options | Configuration via LUA scripting interface |

## LoRaWAN

| | |
|---|---|
| LoRaWAN specification | 1.0.3 |
| Registration method | OTAA by default, ABP configurable |
| Class | A by default, B and C configurable |
| Frequency | EU868 |
| TX Power | 12.7 dBm |
| Maximum payload length | 51B uplink/downlink and up to 235B uplink/downlink* |

\* dependant on the network and spreading factor

## RS-485 interface

| | |
|---|---|
| Communication protocol | Modbus RTU, Modbus ASCII, Profibus DP, IEC 62056, proprietary protocols |
| Physical layer | RS-485 |
| Device type | Master by default, slave configurable |
| Communication speed | 300 - 115 200 Bd |
| Maximum connected devices | 96 UL |
| Compatibility | Any device with RS-485 interface |
| Signals | TX +-, RX +- |
| Polarization resistors | 560 Ohms |
| Termination resistor | 120 Ohms |
| Functionality | Modbus addressing, two way RS-485 communication, configurable RS-485 interface, RS-485 data receive (slave) |
| Connector | WAGO 2604 CAGE CLAMP® |

## Optional auxiliary power supply*

| | |
|---|---|
| Voltage | 5V - 24V DC |
| Connector | WAGO 2604 CAGE CLAMP® |

\* Version with auxiliary power supply has its own ordering code

## Device power supply

| | |
|---|---|
| Voltage | 85 - 305 V AC |
| Frequency | 47 - 63 Hz |
| Energy consumption | Max 4 W |
| Connector | WAGO 2604 CAGE CLAMP® |

## Packaging

| | |
|---|---|
| 1x RS-485 to NB-IoT converter | 1x installation manual |
| | 1x NB-IoT 2JW1024 antenna; 4G LTE |

## Optional accessories

| | |
|---|---|
| ACR-CONFIG | Configuration cable |

## Ordering codes

| | |
|---|---|
| ACR-CV-101L-R-EAC | RS-485 to LoRaWAN externally powered |
| ACR-CV-101L-R12-EAC | RS-485 to LoRaWAN externally powered with 5V - 24V DC auxiliary power supply |