

Modbus to LoRaWAN Converter

Product Datasheet (Version 1.0)

Modbus to LoRaWAN Converter

Industrial Wireless Gateway for Modbus RTU Devices

The **MatrixAI Modbus to LoRaWAN Converter** is an industrial-grade communication gateway designed to connect Modbus RTU devices to LoRaWAN networks. It enables wireless monitoring of PLCs, energy meters, HVAC controllers, environmental sensors, VFDs, and other Modbus equipment without requiring additional wiring.

The gateway periodically polls Modbus slave devices, converts the collected data into LoRaWAN payloads, and securely transmits them to a LoRaWAN gateway for cloud-based monitoring, analytics, and control.

Key Features

- Modbus RTU Master
- LoRaWAN Class A Device
- Supports OTAA & ABP Activation
- Long Range Wireless Communication
- Ultra Low Power Consumption
- Industrial Grade Design
- DIN Rail Mountable
- Supports Multiple Modbus Registers
- Local Configuration via USB
- Remote Parameter Update
- AES-128 Encryption
- Watchdog Protection
- OTA Firmware Upgrade
- Status LEDs
- Wide DC Power Supply
- Reverse Polarity Protection



Applications

- Building Management Systems (BMS)
- HVAC Monitoring
- Energy Meter Monitoring

- Water Meter Reading
- Gas Meter Monitoring
- Industrial Automation
- Pump Stations
- Solar Plants
- Remote Equipment Monitoring
- Smart Buildings
- Smart Agriculture
- Smart Factory
- Smart Utility Monitoring

Technical Specifications

Communication

Parameter	Specification
Interface	RS485
Protocol	Modbus RTU Master
Baud Rate	1200–115200 bps
Data Bits	7 / 8
Stop Bits	1 / 2
Parity	None / Even / Odd
Max Slaves	32
Polling Interval	1 sec – 24 Hours

LoRaWAN

Parameter	Specification
Protocol	LoRaWAN 1.0.3 / 1.0.4
Device Class	Class A
Activation	OTAA / ABP
Encryption	AES-128
Frequency	EU868 / US915 / AS923 / AU915 / IN865 / RU864
RF Output Power	Up to +22 dBm
Receiver Sensitivity	-137 dBm
Communication Distance	Up to 15 km (LOS)

Modbus Support

Supported Function Codes

- 01 Read Coil Status
 - 02 Read Input Status
 - 03 Read Holding Registers
 - 04 Read Input Registers
 - 05 Write Single Coil
 - 06 Write Single Register
 - 15 Write Multiple Coils
 - 16 Write Multiple Registers
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Register Types

- Coil
 - Discrete Input
 - Input Register
 - Holding Register
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Device Capacity

Feature	Capacity
Modbus Devices	32
Registers	1000+
Polling Profiles	50
LoRa Payload	Up to Regional Limit
Data Buffer	20,000 Records
Event Logs	10,000

Power Supply

Parameter	Specification
Input Voltage	9–36 VDC
Typical Current	70 mA
Maximum Current	250 mA
Sleep Current	<5 mA
Reverse Protection	Yes
Over Voltage Protection	Yes

Hardware

Parameter	Specification
CPU	32-bit ARM Cortex
Flash	16 MB
RAM	8 MB
RTC	Built-in
Watchdog	Hardware
Configuration	USB-C / RS485

Indicators

LED	Function
Power	Power Status
LoRa	Network Status
TX	Data Transmission
RX	Data Reception
RS485	Communication
Alarm	Fault Status

Configuration Parameters

- Device Name
 - Device ID
 - LoRa DevEUI
 - JoinEUI
 - AppKey
 - Network Server Address
 - Modbus Baud Rate
 - Slave Address
 - Register Mapping
 - Polling Interval
 - Data Upload Interval
 - Alarm Threshold
 - Scaling Factor
 - Data Type
 - Byte Order
 - Time Synchronization
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Supported Data Types

- Int16

- UInt16
 - Int32
 - UInt32
 - Float32
 - Float64
 - Boolean
 - ASCII
 - BCD
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Alarm Features

- High Alarm
 - Low Alarm
 - Digital Alarm
 - Communication Failure
 - Device Offline
 - Sensor Fault
 - Power Failure
 - Threshold Notification
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Security

- AES-128 Encryption
 - CRC Validation
 - Secure Boot
 - Password Protected Configuration
 - Firmware Integrity Verification
 - Device Authentication
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Environmental

Parameter	Specification
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Humidity	5–95% RH
Protection	IP20
Mounting	DIN Rail
Material	Flame Retardant ABS
Cooling	Natural Air

Mechanical

Parameter	Specification
Dimensions	95 × 70 × 35 mm (<i>customizable</i>)
Weight	Approx. 180 g
Mounting	DIN Rail

Terminal Description

Terminal	Description
A	RS485 A
B	RS485 B
G	Signal Ground
VIN+	DC Positive
VIN-	DC Negative

Package Includes

- MatrixAI Modbus to LoRaWAN Converter
 - LoRa Antenna
 - Quick Installation Guide
 - DIN Rail Clip
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Certifications

- CE
 - FCC
 - RoHS
 - LoRa Alliance Compatible
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Typical Applications

- Smart Buildings
- Building Management Systems (BMS)
- Smart Metering

- Industrial Automation
 - Water Utilities
 - Agriculture
 - HVAC Systems
 - Oil & Gas
 - Renewable Energy Plants
 - Data Centers
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Ordering Information

Model	Description
MAI-LW-MB01	Modbus RTU to LoRaWAN Converter
MAI-LW-MB02	Modbus RTU to LoRaWAN Converter with External Antenna
MAI-LW-MB03	Industrial Extended Temperature Version