

Isolated RS485 to RS485 Repeater UC-ISO-485-485

The UC-ISO-485-485 is an industrial-grade optically and galvanically isolated RS485 repeater and signal isolator. It is engineered to extend RS485 communication distances by another 1,200 meters, expand node counts by an additional 256 devices, and break ground loops between distant industrial equipment. With 2.5 kVrms signal isolation and 1 kVrms power isolation, it isolates sensitive PLCs, controllers, and field instruments against common-mode electrical noise and high-voltage line spikes.



Key Features

- 2.5 kV RMS galvanic signal isolation and 1.0 kV RMS power isolation
- Extends RS-485 bus distance up to 1,200 m (4,000 ft)
- Expands network capacity by adding up to 256 nodes per segment
- Hardware automatic send data direction control with zero latency
- Wide supported baud rates from 300 bps to 250 kbps
- ± 15 kV ESD and TVS surge protection across all terminals
- Independent LED indicators for Power, TX, and RX
- 9V to 30V DC industrial power supply input (nominal 24V DC)
- 35 mm DIN rail and wall mountable housing
- Dimensions: 110 mm $\times$ 50 mm $\times$ 55 mm

Ordering Information

Product Code	Description
UC-ISO-485-485	Isolated RS485 To RS485 Repeater (2.5kVrms Isolation, 9~24V DC)
SPD-RS485	Surge Protection Device RS485
UC-ISO-232-485	Isolated RS232 To RS485 Converter
UC-RS485-RS485	Non-Isolated RS485 to RS485 Repeater
UC-ETH-RS485-D	Ethernet to Dual RS485 Converter

Applications

- **Ground Loop Elimination:** Isolates RS485 nodes across different buildings, substations, or large facilities having differing ground potentials.
- **Bus Distance Extension:** Regenerates degraded RS485 differential signals for cable runs exceeding 1,200 meters.
- **Node Capacity Multiplication:** Splits overloaded RS485 networks into isolated segments of up to 256 devices each.
- **VFD & Heavy Motor Noise Isolation:** Protects central PLC communication lines from severe common-mode inverter noise.

Specifications

Parameter	Value
Mounting Type	35 mm DIN Rail Mounting
Dimensions	110 mm x 50 mm x 55 mm (L x W x H)
Enclosure Material	Industrial ABS Plastic
Operating Temperature	0 °C to +85 °C
Storage Temperature	−40 °C to +85 °C
Relative Humidity	5% to 95% RH (non-condensing)

Electrical Specifications

Parameter	Specification
Power Supply	9V ~ 24V DC (nominal 24V DC)
Working Current	200 mA Max
Baud Rate Range	300 bps to 250 kbps
Data Format	7/8 Data bits, 1/2 Stop bits, None/Even/Odd Parity
RS485 Bus Receivers	Up to 256 nodes per segment
RS485 Receiver Input	±12 V between A and B max
RS485 Input Transmit Output	Line A weak pull-up (+5V), Line B weak pull-down (0V)
RS485 Input Termination	No internal termination resistor (prevents mid-bus loading)
RS485 Output Transmit Output	Line A pulled up (+5V), Line B pulled down (0V)
RS485 Output Termination	120 Ω termination resistor built-in across A and B

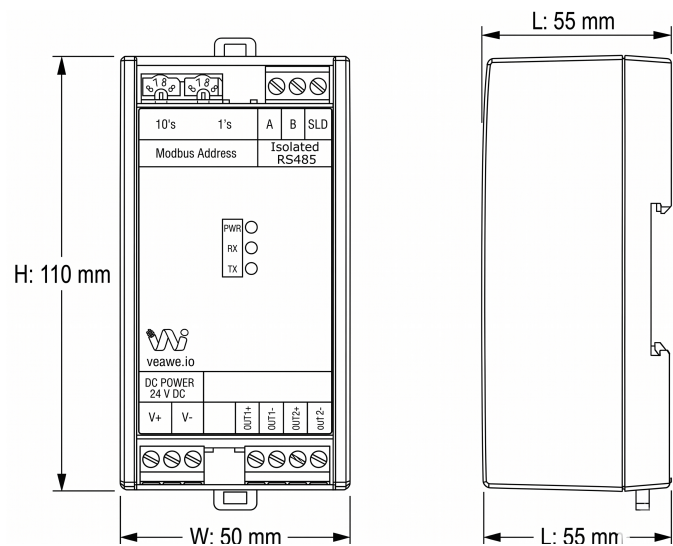
Isolation & Protection Specifications

Parameter	Value	Standard / Notes
Galvanic Signal Isolation	2,500 V RMS	Optical/digital galvanic barrier between Input and Output ports
Power Isolation	1,000 V RMS	Galvanic DC-DC isolated power supply
Reverse Polarity Protection	Integrated	Series diode on DC power input
ESD Immunity	±15 kV Air / ±8 kV Contact	IEC 61000-4-2 Air Discharge and Contact Discharge
Surge Clamping	600W TVS	High-speed transient suppression diodes on all lines

LED Indications and Diagnostics

LED	Color	Status	Description
PWR	Red	ON	Module is powered and operational
TX	Red	Blinking	Transmitting data out to downstream bus
RX	Green	Blinking	Receiving data from upstream bus

Mechanical Dimensions



Terminal Details & Port Pinouts

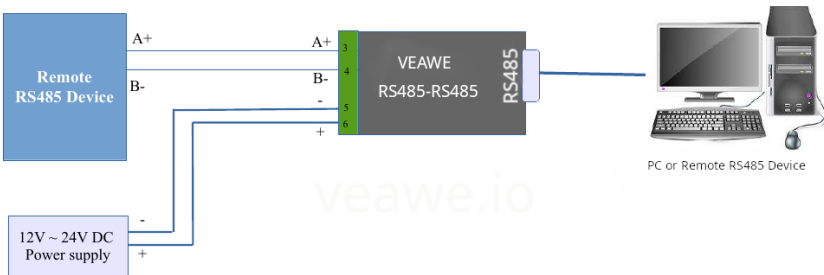
Top Terminal Block (RS485-In / Host Bus)

Terminal	Label	Function / Description
A	A	RS485-1 Non-inverting differential data line
B	B	RS485-1 Inverting differential data line
SLD	SLD	Cable Shield / Ground drain terminal

Bottom Terminal Block (Power & RS485-Out / Field Bus)

Terminal	Label	Function / Description
V+	DC 24V+	Power Supply Positive (+9V to +24V DC)
V-	DC GND	Power Supply Negative (Ground return)
A	A	RS485-2 Non-inverting differential data line
B	B	RS485-2 Inverting differential data line
SLD	SLD	Cable Shield / Ground drain terminal

Typical Connection Diagram



Revision History

Revision	Date	Description of Change
Rev 1.0	2026-09-09	Initial datasheet release

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Support

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