MachDatum

MDIM – 485 USER MANUAL

OVERVIEW

The MDIM - Gateway is designed to connect serial-based field devices to Ethernet networks, enabling centralized monitoring and control across distributed systems. It serves as a reliable communication link between RS485 interfaces, commonly found in industrial equipment—and TCP/IP-based supervisory systems. The gateway acts as a transparent bridge between serial and networked systems, ensuring accurate data translation and consistent communication timing. It supports master-slave communication models, allowing Modbus TCP masters to access data from Modbus RTU slaves without modifying existing device configurations.

FEATURES

- **Seamless Modbus RTU to TCP Bridging**
  Enables effortless integration of RS-485-based Modbus RTU devices into Ethernet networks using Modbus TCP protocol.
- **Consistent Modbus TCP Throughput**
  Ensures stable and reliable data communication for demanding industrial applications.
- **Transparent Protocol Conversion**
  Converts Modbus RTU to Modbus TCP and vice versa without altering data structure or timing.
- **User-Configurable Modbus Parameters**
  Allows flexible configuration of baud rate, parity, stop bits, slave IDs, and other Modbus settings through an intuitive interface.
- Support for Multiple RTU Slaves
  Capable of managing multiple Modbus RTU slave devices over a single RS-485 bus.
- **10 Mbps Ethernet Reliability**
  Provides stable and efficient communication over 10 Mbps Ethernet networks with optimized protocol handling.
- **Enhanced Electrical Protection**
  Integrated surge protection on RS-485 and power lines ensures long-term device safety in industrial environments.

Specifications

Ethernet communication	
Protocol Support	Modbus TCP
Data Rate	10 Mbps
Network Interface	1 x Ethernet (RJ45)
Compatibility	IEEE 802.3, IEEE 802.3U
Serial communication	
Port type	RS485

Port connector	Plug-in screw terminal block
No. of ports	1
Baud rate	50bps – 921.6kbps
Data bits	7, 8
Parity	None, Even, ODD
Stop bits	1, 2
Data signals	RS-485: Data+, Data-, GND
Protection	Surge protection, ESD protection
Terminator	120 ohms
LED Indicators	Serial: Tx, Rx
Modbus RTU	
Mode	Modbus RTU - Master
Functions supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max.no.of.commands	128
Modbus TCP	
Mode	Modbus TCP - Server
Functions supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max.no.of.commands	128
Electrical specifications	
Input supply - Screw terminal	6VDC – 36VDC
Input supply – Power jack	6VDC – 36VDC
Operating current	200mA @ 12VDC
Power consumption	3W
Physical dimensions	
Housing	Metal
Dimensions	51.48 x 82 x 5 cm (L x W x H)
Weight	160.4g
Environmental limits	
Operating temperature	-40 to 75 °C
Storage temperature	-40 to 85 °C

MDIM-485 Gateway

LED Indicators

The device includes four LED indicators that provide visual cues for power status, communication activity, and configuration behavior:

1. **Power LED (Red)**
   Indicates that the device is powered ON.
   Remains steadily lit when power is supplied.
2. **Transmit LED (Green)**
   Blinks during Modbus data transmission.
   Confirms that the device is actively sending data over RS-485 or Ethernet.
3. **Receive LED (Red)**
   Blinks when Modbus data is being received.
   Indicates successful reception of data from connected devices.
4. **Status LED (White)**
   Displays boot and configuration status through blink patterns:
   - **3 Blinks** – Device is starting with the **default configuration**.
   - **5 Blinks** – Device is starting with a **previously saved configuration**.
   - **3 Blinks (Initial)** – Also blinks 3 times immediately on power-up as part of the self-check routine.

Device Installation and Wiring Instructions

Device Installation

Follow the steps below to properly install and power the MDIM-485 Modbus RTU to TCP gateway:

1. **Connect Power Supply (Dual Input Options – Use Only One)**

   - The MDIM-485 supports dual power input options, but only one input should be used at a time:
   - Pluggable Screw Terminal: Connect a DC power supply (ranging from 6 VDC to 36 VDC) to the marked terminals, ensuring correct polarity.
   - DC Power Jack: Alternatively, you can use a DC barrel jack input with the same 6 VDC to 36 VDC range.

   Do not connect power to both inputs simultaneously, as this may damage the device.

2. **Connect Communication Interfaces**

   - Use a serial RS-485 cable to connect the MDIM-485 to your Modbus RTU device.
   - Connect a standard Ethernet cable to link the MDIM-485 with your Modbus TCP network.

3. **Mount the Device**

   The MDIM-485 supports flexible installation methods:

   - **DIN-Rail Mounting**: Align the mounting clip with the DIN rail, press downward until the unit securely snaps into place.
   - **Screw Mounting**: Use M3 screws (minimum length: 10 mm) to attach the device firmly to a panel or wall using the provided mounting holes.

4. **Verify LED Indicators**

   Once power is applied, observe the Power, Status, Transmit, and Receive LEDs.

   - Refer to the LED Indicators section for interpretation of blink patterns and operational status.

WIRING INSTRUCTIONS

1. Supplying Power to the MDIM-485

The MDIM-485 supports dual input power sources—a pluggable screw terminal and a DC power jack, both rated for 6 to 36 VDC.

Important: Connect to either the terminal block or the power jack. Do not use both simultaneously.

To power the device via the terminal block:

1. Turn OFF the external power source.
2. Loosen the screws on the terminal block.
3. Connect the +V and GND wires from your power supply (6–36 VDC) to the appropriate terminals.
4. Tighten the screws firmly to secure the wires.
5. Switch the power source ON.

Note: The MDIM-485 has no manual power switch. Once powered, the Red Power LED will turn on automatically.

2. Linking RS-485 Serial Devices

The MDIM-485 communicates with Modbus RTU devices through its RS-485 serial interface.

Safety Tip: Ensure the device is powered OFF before connecting or disconnecting serial lines.

To connect serial devices:

1. Locate the RS-485 terminals (A, B, and GND) on the device.
2. Connect the corresponding wires from your Modbus RTU slave.
3. Double-check polarity (A ↔ A, B ↔ B) to ensure reliable communication.
4. Power on the device and verify activity via the Transmit (Green) and Receive (Red) LEDs.

3. Integrating with an Ethernet Network

The MDIM-485 features a 10/100 Mbps Ethernet port for connecting to Modbus TCP networks or SCADA systems.

To set up Ethernet communication:

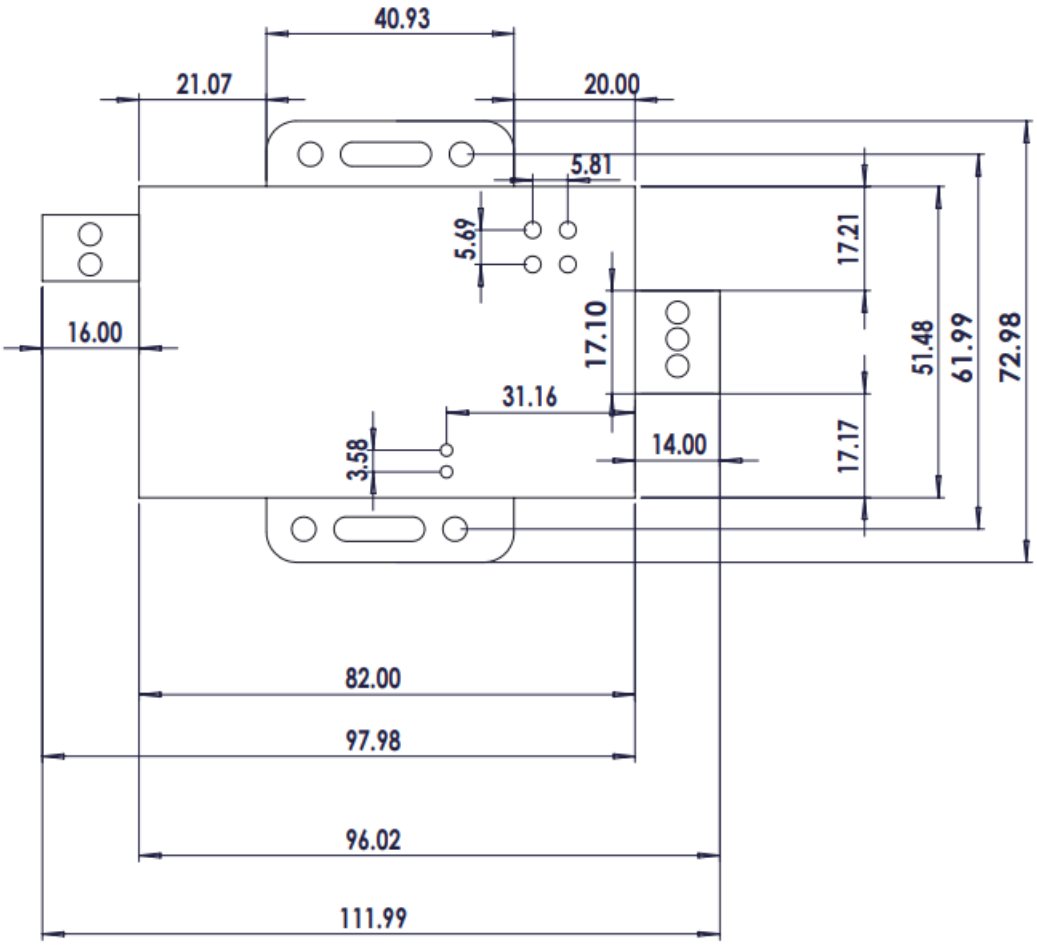
1. Insert one end of a CAT5e/CAT6 Ethernet cable into the MDIM-485's LAN port.
2. Connect the other end to a switch, router, or control server.

Ethernet LED Behavior:

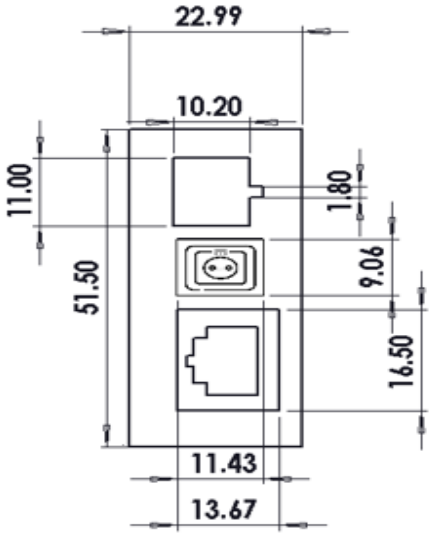
- **Link LED**: Indicates active connection
- **Activity LED**: Blinks during data transmission.

SYSTEM DIMENSIONS

Top View



Side view(Left)



Side View(Right)