

MDIM-485/WL USER MANUAL



Version Control

S no	Version no	Date	Description
1	Version 1.0	Sep 2025	Initial release of User Manual for MDIM-485/WL

Technical support contact information:

For product-related questions or technical assistance, please contact:

Support Email: support@machdatum.com

Website: <https://www.machdatum.com/>

Technical support and assistance

1. For the latest updates, manuals, and resources related to the MDIM-485/WL, please visit our official support portal at <https://machdatum.com/devices/interface/MDIM-485/WL>.
2. If additional help is required, you may contact your local distributor, authorized sales representative, or MachDatum's customer service team.
3. To ensure faster assistance, please have the following details ready when contacting support:
 - Product model and serial number
 - Details of connected devices and peripherals
 - Software environment (operating system, firmware version, and application)
 - Clear description of the issue and any troubleshooting steps already taken

Safety Instructions

1. Please read these instructions thoroughly before operating the MDIM-485/WL.
2. Keep this manual accessible for future reference.
3. Disconnect the device from its power source before cleaning. Use a dry or slightly damp cloth. Avoid using sprays, solvents, or liquid cleaners.
4. For plug-in versions, ensure that the power socket is close to the device and easily reachable.
5. Keep the device away from moisture, condensation, and direct water exposure.
6. Always install the unit on a stable, vibration-free surface. Sudden impacts may damage the internal components.
7. Ensure proper airflow around the enclosure. Do not block ventilation openings to prevent overheating.
8. Verify the input voltage range matches the device's rated power requirements before connecting.
9. Route power cables so they are protected from foot traffic or crushing by heavy objects.
10. Pay attention to all warning labels and notices marked on the device.
11. If the device will remain unused for a long period, disconnect it from the power supply to protect it against power surges or transient voltages.
12. Prevent liquids or conductive objects from entering any openings in the device.
13. Do not attempt to open or service the equipment yourself. Only qualified service personnel should perform repairs.
14. Do not store the MDIM-485/WL in environments outside its rated temperature range (-40 °C to +80 °C). Use only in controlled environments suitable for industrial equipment.

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1. Introduction

Overview

The MDIM-485/WL Gateway is designed to extend RS485 networks into IP communication systems with the flexibility of 10 Mbps Ethernet and 2.4 GHz Wi-Fi (150 Mbps). It functions as a transparent bridge, delivering accurate and real-time Modbus RTU to Modbus TCP conversion so supervisory systems and SCADA platforms can communicate with multiple RTU slaves without hardware changes. Setup is simplified through the dedicated Configuration Application, which provides quick access to network parameters and device settings. With dual DC power input support, a wide operating voltage range, and built-in surge and ESD protection, the gateway ensures reliable performance in demanding industrial conditions.

Package Checklist

- 1 X MDIM-485/WL
- 1 X antenna 2.4Ghz 3dbi
- Terminal block connectors

Note

Kindly inform your sales representative if you find any missing or damaged components.

Product features

- **Selectable Network Support** – The MDIM-485/WL can be configured to operate over 10Mbps Ethernet or 2.4 GHz Wi-Fi (150 Mbps), allowing deployment in both wired and wireless environments.
- **Seamless Modbus Bridging** – Provides transparent conversion from Modbus RTU to Modbus TCP/IP, enabling easy integration of RS485 devices into IP-based supervisory systems.
- **Multi-Slave Device Support** – Allows multiple RS485 slave devices to be connected and managed through a single gateway for efficient communication.
- **Low-Latency Communication** – Ensures fast and stable data exchange, making it suitable for time-sensitive industrial applications.
- **Configurable Network Switchover** – Users can easily switch between Ethernet and Wi-Fi operation depending on the network requirements of their system.
- **Dedicated Configuration Application** – Includes a simple software interface for setting parameters, monitoring status, and managing network configurations.
- **Advanced Electrical Protection** – Built-in safeguards against surges, ESD, and voltage fluctuations help maintain reliable operation in harsh environments.
- **Industrial-Grade Compact Design** – Designed for durability and space-saving installation, supporting DIN-rail and panel mounting options.

Product Applications

The MDIM-485/WL is designed for a wide range of industrial and commercial applications, including:

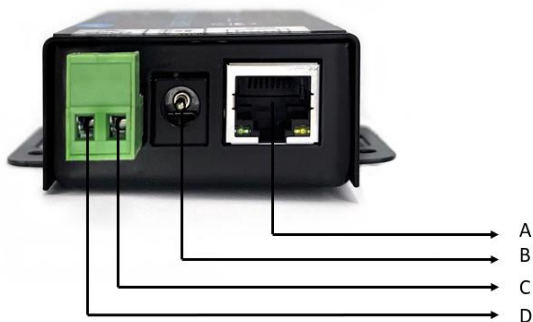
- **Factory Automation** – Connecting PLCs, sensors, and controllers to centralized SCADA systems over Ethernet or Wi-Fi.
- **Building Management Systems (BMS)** – Integrating HVAC, lighting, and access control devices with IP-based monitoring platforms.
- **Energy and Utilities** – Bridging Modbus RTU meters, solar inverters, and power monitoring equipment to supervisory networks.
- **Process Control** – Linking field instruments and control panels to Ethernet/Wi-Fi networks for real-time monitoring.

Product Specifications

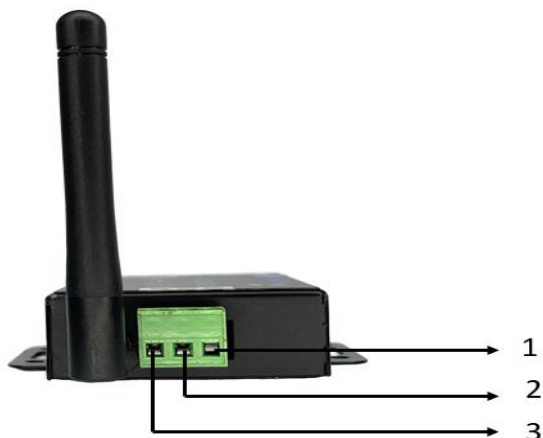
Ethernet communication	
Protocol Support	Modbus TCP
Data Rate	10 Mbps
Network Interface	1 x Ethernet (RJ45)
Compatibility	IEEE 802.3
Wireless LAN communication	
Compatibility	IEEE 802.11a/b/g/n
Network range/Speed	2.4 GHz, 150Mbps
Free space range	Open space 100m
Serial communications	
Port type	RS485
Port connector	Plug-in screw terminal block
No of ports	1
Baud rate	50bps – 921.6kbps
Data bits	5, 6, 7, 8
Parity	None, Even, ODD
Stop bits	1, 1.5, 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
Reliability	
Automatic reboot trigger	Built in WDT

Electrical specifications	
Input supply - Screw terminal	6VDC – 36VDC
Input supply - Power jack	6VDC – 36VDC
Operating current	600mA
Power consumption	3W @ 300mA
Physical dimensions	
Housing	Metal
Dimensions (with ears)	82 x 72.98 x 23 mm (3.23 x 2.87 x 0.91 in)
Dimensions (without ears)	82 x 51.5 X 23mm (3.23 x 2.03 x 0.91 in)
Weight	160.4g
Environment limits	
Operating temperature	-40 to 75 °C
Storage temperature	-40 to 85 °C
Ambient relative humidity	5 to 95% RH
Ordering information	
MDIM-485/WL	Single-Port RS485 to Ethernet & 802.11 b/g/n WLAN Bridge
Package contents	
Device	1 x MDIM-485/WL

Pin Assignments



A	RJ45 Connector
B	DC Power Jack (IN 6 – 36VDC)
C	Power Input GND
D	Power Input +VDC (6 – 36VDC)



1	Ground
2	B
3	A

2. Getting started

MDIM-485/WL



LED Indicators

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

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 transmitting data over Modbus TCP server.
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:
 - **2 Blinks** – Device is starting (occurs during power-up or restart).
 - **3 Blinks** – Device has loaded the default configuration.
 - **4 Blinks** – Device is switching to **Access Point (AP) mode** for Wi-Fi configuration.

Device Installation

Follow the steps below to properly install and power the MDIM485 Modbus RTU to TCP gateway:

1. **Connect Power Supply (Dual Input Options – Use Only One)**
 - The MDIM485 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/WL to your Modbus RTU device.
 - Connect a standard Ethernet cable to link the MDIM-485/WL with your Modbus TCP network.
 - Ensure the external antenna is securely connected to the MDIM-485/WL to enable reliable Wi-Fi communication.

3. **Mount the Device**

The MDIM485 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/WL

The MDIM-485/WL supports dual input power sources—a pluggable screw terminal and a DC power jack, both rated for 6 to 36 VDC. 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 +VDC 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/WL has no manual power switch. Once powered, the Red Power LED will turn on automatically.

2. Linking RS-485 Serial Devices

The MDIM-485/WL 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/WL features a 10 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/WL's LAN port.
2. Connect the other end to a switch, router, or control server.

Ethernet LED Behaviour:

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

3. Device Initial Setup

Initial Setup Instructions

Follow the steps below to perform the initial setup of the **MDIM-485/WL Gateway**.

1. Powering On the Device

1. Connect the MDIM-485/WL to the appropriate power source.
2. Upon startup, the **White LED will blink twice**, indicating the device is powering on.
3. On first use, the device starts with its **default configuration**.

2. Configuring the Device

1. Connect your computer to the device using the **default IP configuration**.
2. Launch the **Configuration Application** and establish a connection with the gateway.
3. Set the required configurable parameters according to your network and system requirements.
4. Once parameters are set, the device will be automatically reset to the newly updated configurations.
5. The initial setup is now complete.

3. Restoring Factory Default Settings

To restore the **MDIM-485/WL** device to its original factory settings:

Factory Reset via Boot Button:

- **Press and hold the Boot button for 3 seconds** during normal operation.
- The device will perform the following actions:
 1. The **white LED blinks three times**, indicating that the reset process has been triggered.
 2. The device then **automatically restarts** with the **default configuration** applied.

Note: This action will erase all custom RS485, network, and user-defined settings. Use with caution.

Default configuration settings

Network Interface	IP configuration	IP Address	Gateway	Netmask
LAN	Static	10.18.8.204	10.18.8.1	255.255.255.0

Note:

By default, the system is configured in Ethernet mode with a static IP address. If required, it can be reconfigured to operate in Wi-Fi mode. Only one network interface can be active at a time: enabling Ethernet automatically disables Wi-Fi, and enabling Wi-Fi automatically disables Ethernet.

Network Configuration Options

The device supports both **Ethernet** and **Wi-Fi** connectivity.

- **Ethernet and Wi-Fi Station Mode**

These modes can be configured using the **MDIM Manager** configuration application.

- **Wi-Fi Access Point (AP) Mode**

The device can also operate as a Wi-Fi Access Point, allowing direct connection without requiring an existing network.

Switching to Wi-Fi Access Point (AP) Mode

1. **Power on or restart** the device.
2. Observe the **white LED** – it will blink **two times**.
3. At the **second blink**, **double-press the BOOT button** with an interval of approximately **500 ms** between presses.
4. If successful, the device will switch to **AP mode**.

Connecting to the Device in AP Mode

1. On your PC or mobile device, open the list of available Wi-Fi networks.
2. Select the SSID: **MDIM-485/WL**.
3. Enter the password: **MachDatum.1**.
4. Once connected, your system will be linked directly to the device via Wi-Fi AP mode.
5. The default AP mode parameters.

Description	value
Local IP	192.168.10.5
Gateway	192.168.10.5
Subnet mask	255.255.255.0

Conversion Modes

The device provides two primary data conversion modes to suit various communication requirements.

1. Transparent Transmission Mode

In this mode, the device functions as a serial-to-Ethernet bridge, forwarding data between the RS485 and Ethernet interfaces without any protocol parsing or modification.

It supports **TCP Server**, **TCP Client**, and **UDP** communication types, allowing flexible deployment across different network architectures.

This mode is suitable for applications using custom or proprietary serial communication protocols.

2. Modbus RTU to Modbus TCP Mode

In this mode, the device performs automatic protocol conversion between Modbus RTU (on RS485) and Modbus TCP (on Ethernet).

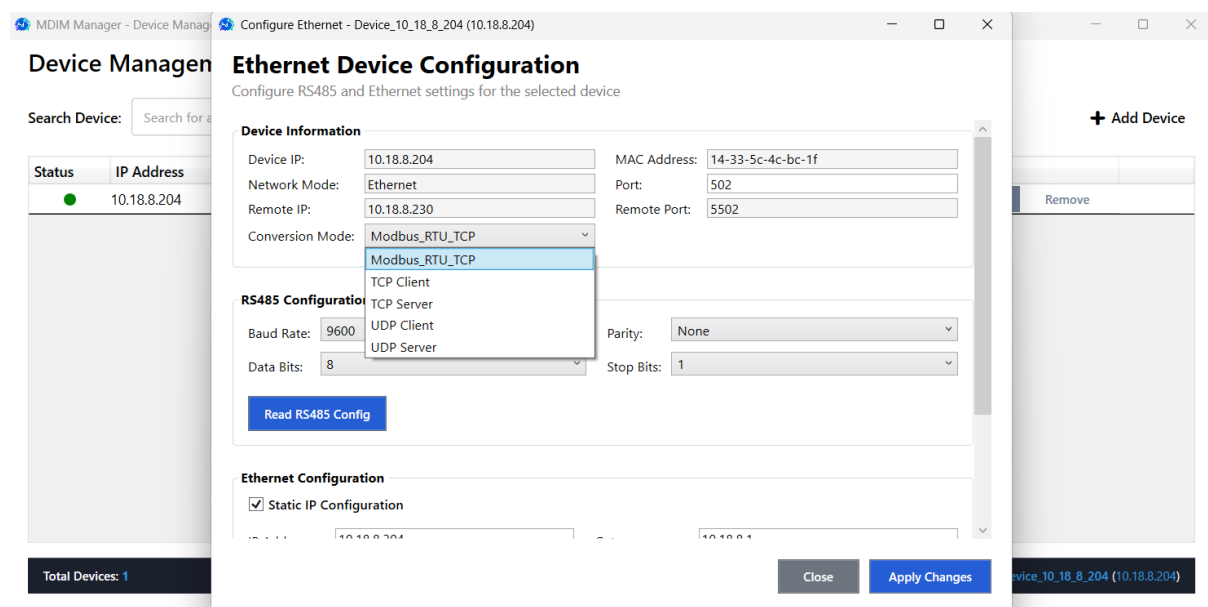
Each Modbus RTU request received on the Ethernet side is converted into a corresponding RTU frame and transmitted over the RS485 bus, while the response from the slave device is returned as a standard Modbus TCP frame.

Transparent Transmission Mode

In Transparent Mode, the device acts as a **serial-to-ethernet bridge**, transferring data between RS485 and Ethernet interfaces **without protocol conversion**. This mode supports multiple communication types:

- **TCP Server:**
The device listens for incoming TCP client connections. Once connected, RS485 data is forwarded to the client, and client data is sent to the RS485 bus. Ideal for centralized monitoring systems.
- **TCP Client:**
The device actively connects to a specified remote TCP server IP and port. Once connected, serial data is transparently exchanged between RS485 and the server. Suitable for remote systems where the server initiates the link.
- **UDP Client:**
RS485 data is sent to a predefined IP and port using UDP packets. Incoming UDP data is forwarded to RS485. Supports low-latency, unicast communication.
- **UDP Server:**
The device receives UDP packets from any client and forwards them to RS485. RS485 data is sent as UDP packets to the last client that sent data. Suitable for broadcast or multi-device applications.

Configuring conversion mode in application:



By ensuring the device is connected to the network via Ethernet or Wi-Fi, you can access the Device Information panel. From there, select the desired conversion mode:

- **Transparent Mode:** choose TCP Client, TCP Server, UDP Client, or UDP Server according to your network setup.
- **Modbus RTU to TCP Mode:** select this mode to enable automatic conversion between Modbus RTU (RS485) and Modbus TCP (Ethernet).

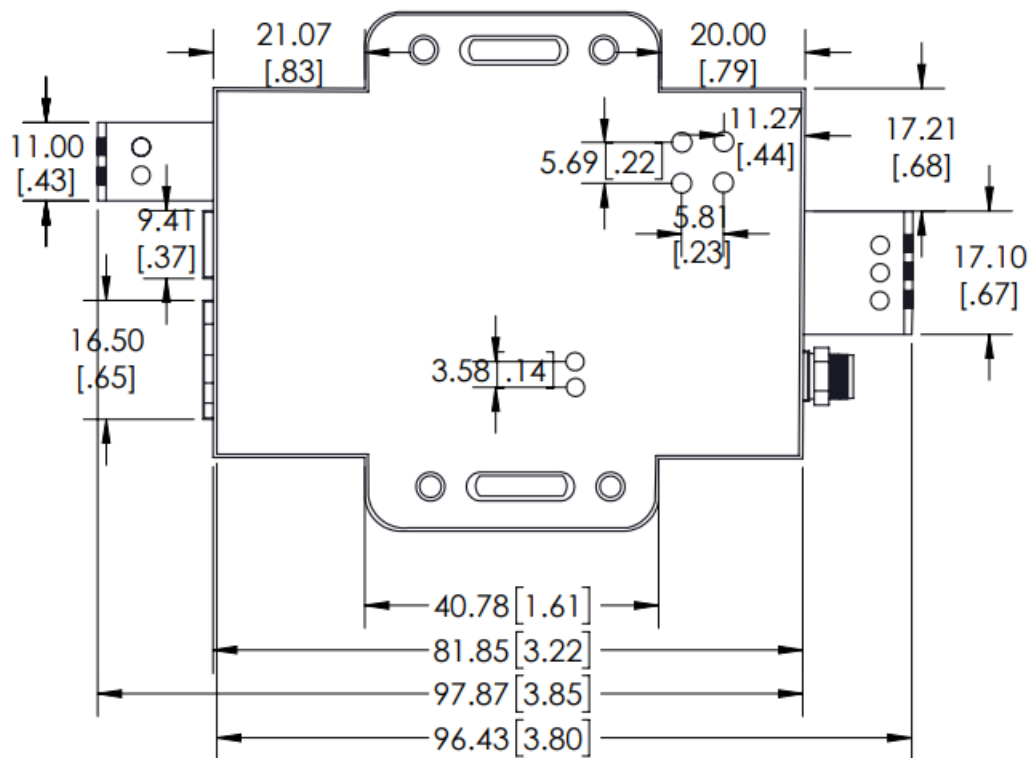
Once the mode is selected, the device will operate accordingly, allowing seamless communication between serial and networked devices.

4. Product Dimension

Mechanical Information

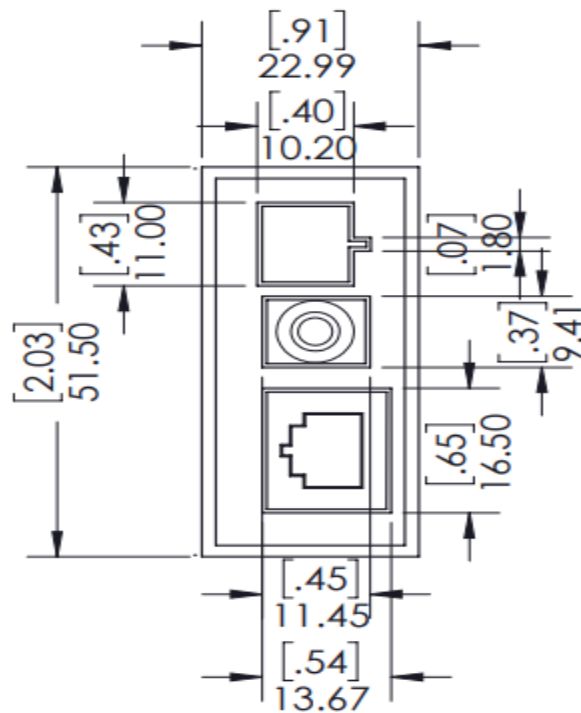
Description	Properties	Values
Enclosure & Material	Material	Mild Steel (Powder-Coated)
	Finish	Industrial-grade black matte coating
	Properties	Durable
Enclosure Assembly	Enclosure fastening	Closed with screws
	Screw type	Steel, Self tapped, Zinc coated
	Screw size	M3 6mm
	Number of screws used	2
Mounting details	Mounting type	Wall-mount/ Panel mount
	Mounting Hardware	Not included (user-supplied)
Device Dimension	Width, Height, Depth, weight	

Top View

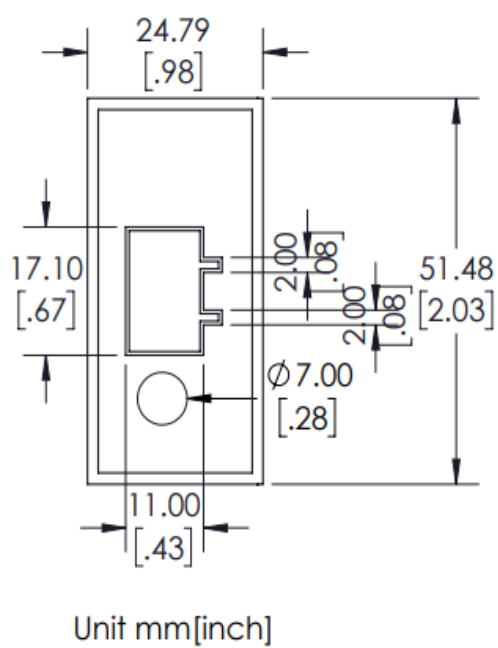


Unit mm[inch]

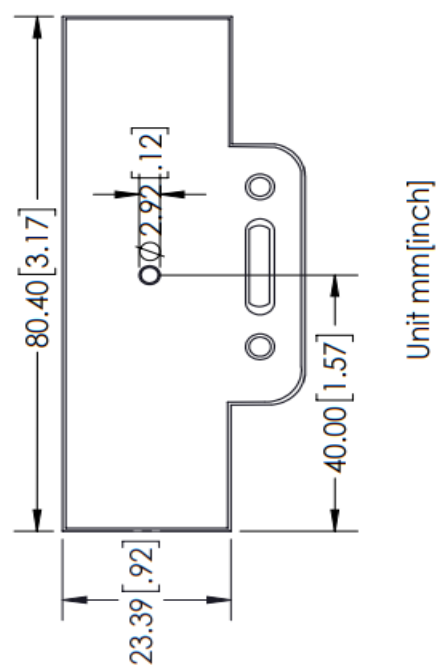
Top View



Bottom View



Side View



4. Product Configuration

MDIM-MANAGER

The MDIM-MANAGER application is a Windows-based configuration utility developed to manage and configure the RS485-to-TCP converter. It provides a simple and user-friendly interface for setting up the required network and communication parameters in industrial systems.

Designed for industrial-grade use, MDIM-MANAGER eliminates the need for manual command entry by providing clear configuration screens that ensure fast, accurate, and consistent setup.

With MDIM-MANAGER, users can:

- Configure Ethernet network parameters such as IP address, subnet mask, and gateway.
- Set up Wi-Fi connectivity including SSID, password, and security type.
- Define RS485 communication parameters such as baud rate, parity, data bits, and stop bits.
- Save and apply configuration changes directly to the device.

System Requirements

Before installing and operating **MDIM-MANAGER**, ensure that the host computer and network environment meet the following requirements:

PC Requirements

- **Processor:** Intel® Core™ i3 / AMD Ryzen 3 or equivalent (1 GHz or higher)
- **Memory:** Minimum 2 GB RAM (4 GB or higher recommended)
- **Storage:** Minimum 200 MB free disk space
- **Display:** 1024 × 768 resolution or higher

Operating System

- Microsoft Windows 10 (32-bit / 64-bit)
- Microsoft Windows 11 (recommended)
- Administrator privileges are required for installation

Network Setup

- **Ethernet:** One available LAN port (for wired device configuration)
- **Wi-Fi:** 802.11 b/g/n compatible adapter (for wireless device configuration)
- **TCP/IP:** Properly configured IP address within the same subnet as the RS485-to-TCP converter

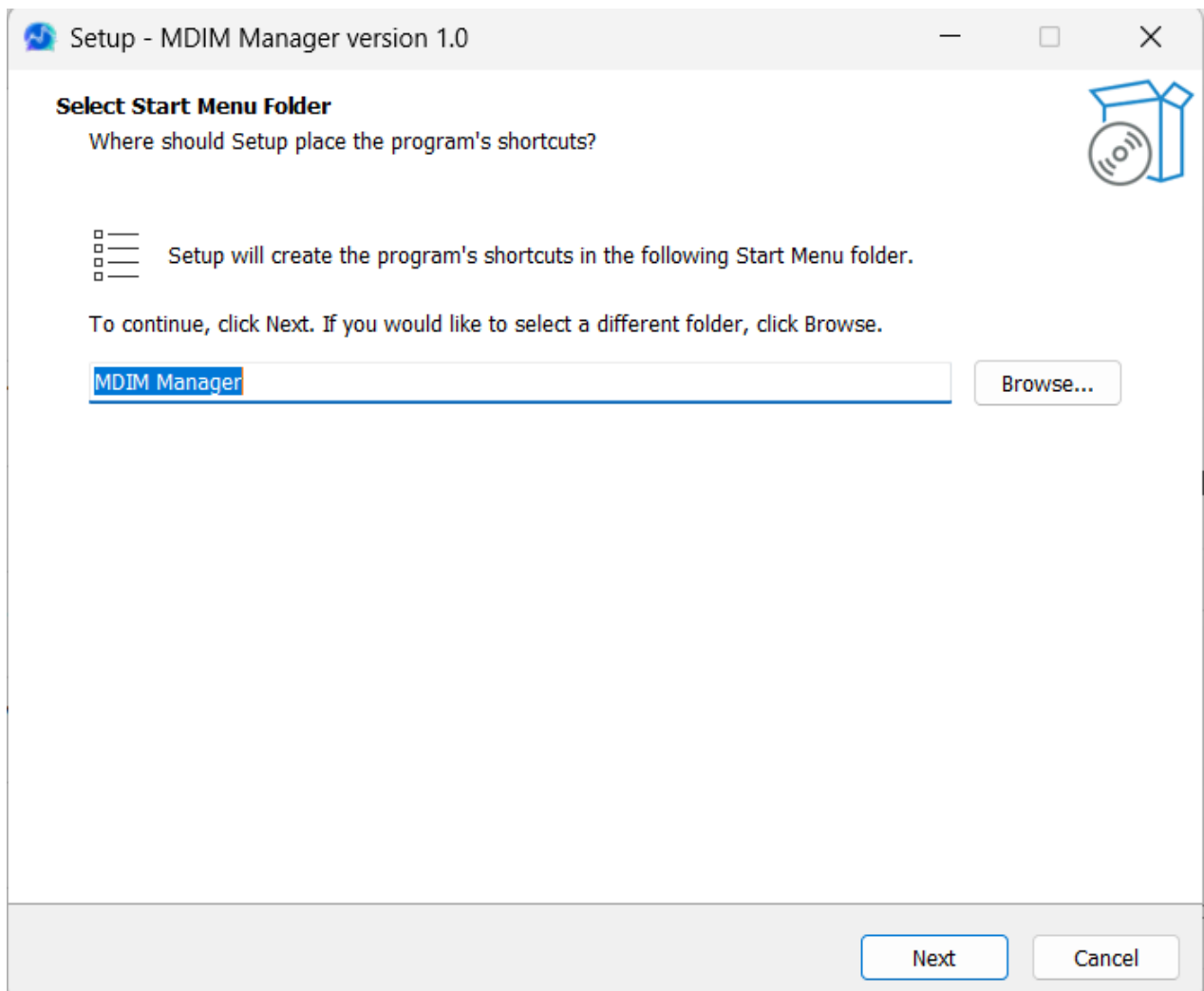
Installation Procedure

1. Start the Installer

- Run the MDIM-MANAGER setup file provided with the product package.
- The installation wizard will guide you through the setup process.

2. Select Start Menu Folder

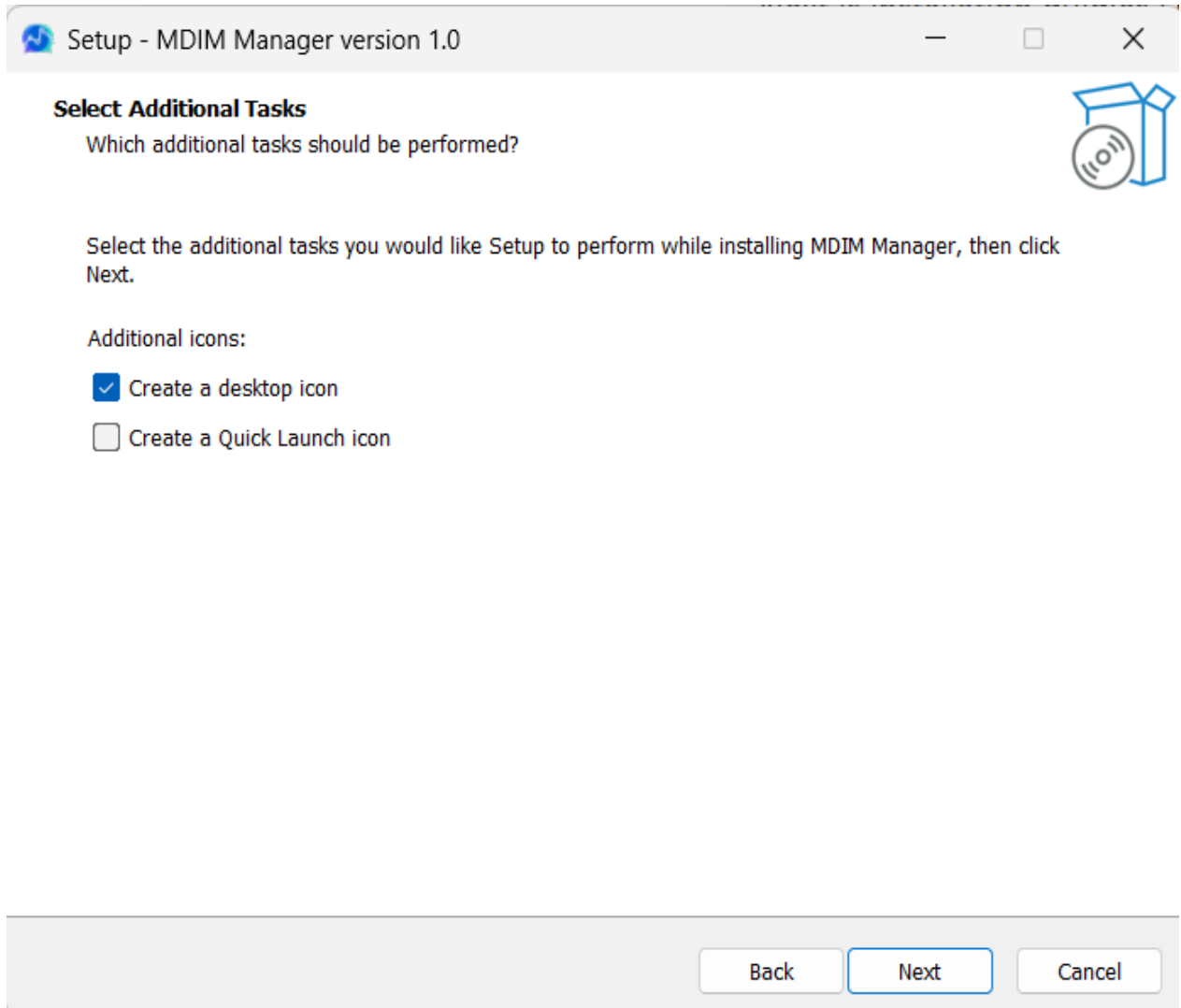
- The wizard prompts for the Start Menu folder where program shortcuts will be created.
- By default, the folder name is set to *MDIM Manager*.
- You may change this location by clicking **Browse...**, or keep the default and click **Next**.



3. Select Additional Tasks

- Choose optional shortcuts for quick access to the application.
- Available options include:
 - ✓ **Create a desktop icon** (recommended).
 - ✓ **Create a Quick Launch icon** (optional).

1. After selecting, click **Next**.

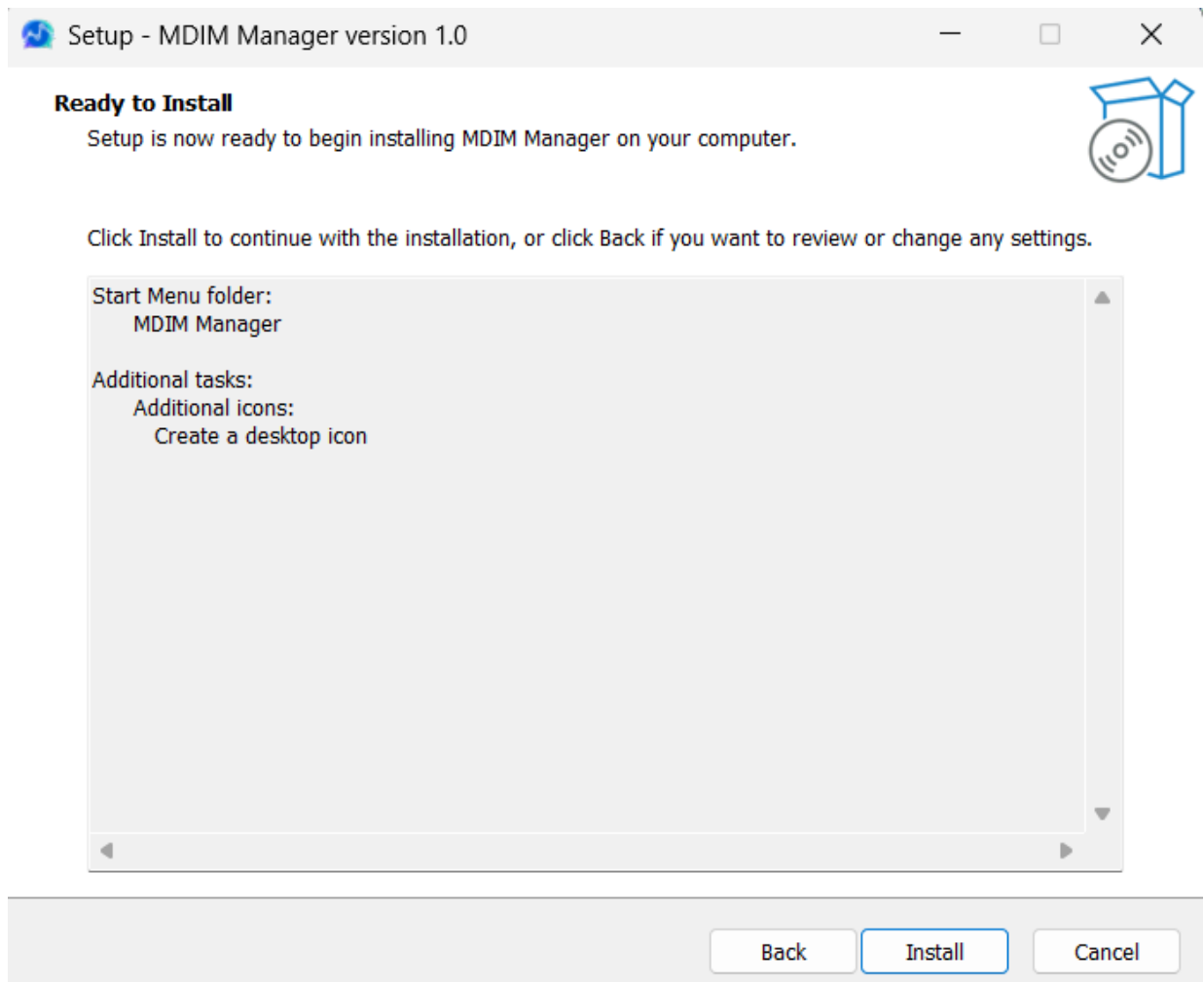


The screenshot shows a Windows-style window titled "Setup - MDIM Manager version 1.0". The window has standard minimize, maximize, and close buttons. The main content area is titled "Select Additional Tasks" and asks "Which additional tasks should be performed?". Below this, it instructs the user to "Select the additional tasks you would like Setup to perform while installing MDIM Manager, then click Next." Under the heading "Additional icons:", there are two options: "Create a desktop icon" (which is selected with a checked checkbox) and "Create a Quick Launch icon" (which is not selected). In the bottom right corner, there are three buttons: "Back", "Next" (which is highlighted with a blue border), and "Cancel". An icon of a box with a coin is visible in the top right corner of the window's content area.

4. Ready to Install

The wizard displays a summary of the installation settings, including the Start Menu folder and selected shortcut options.

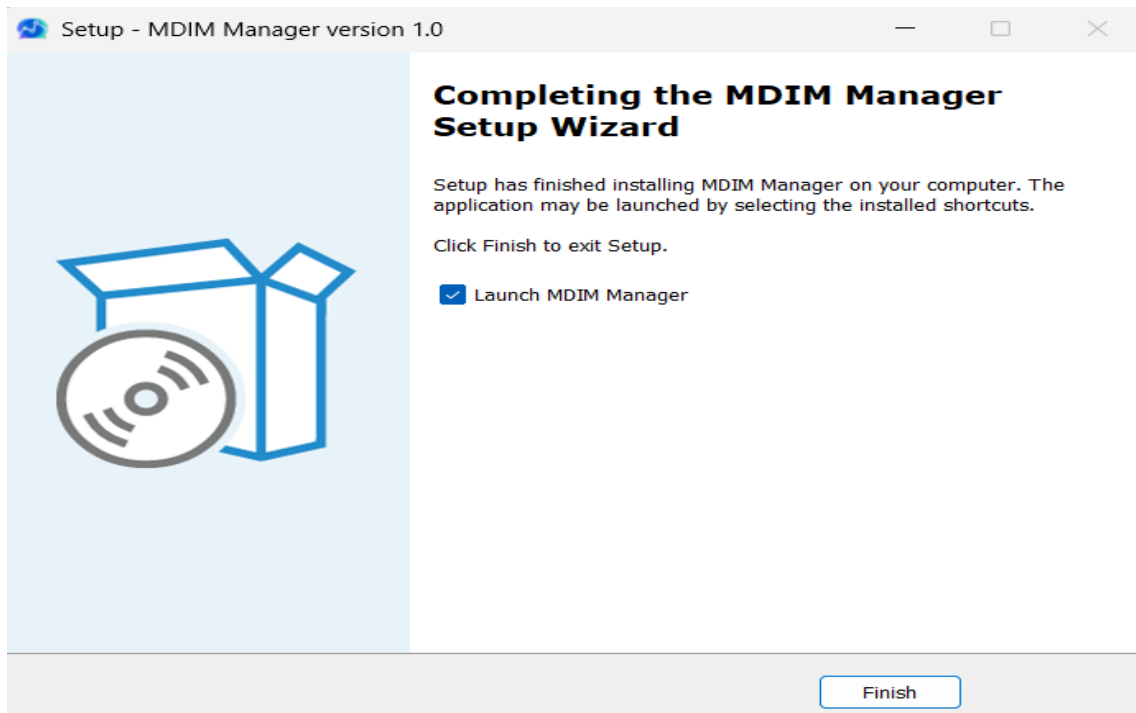
- Review the information. If changes are needed, click Back.
- Once ready, click Install to begin installation.



5. Completing Installation

After installation, a confirmation screen appears.

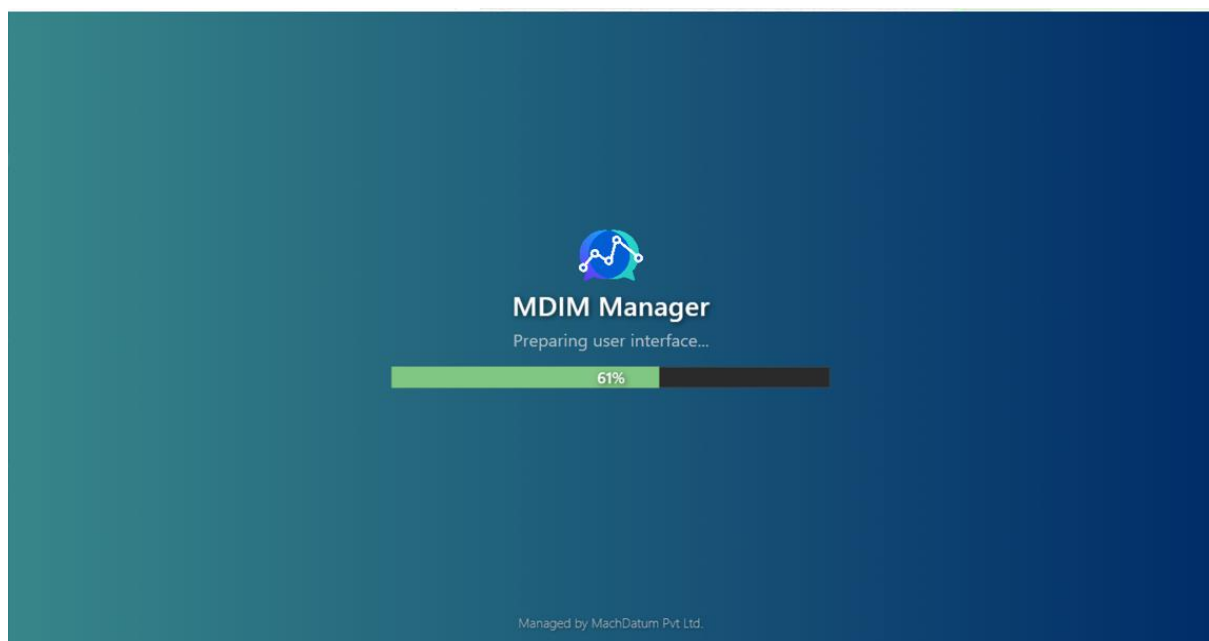
- Click **Finish** to close the wizard.
- If the option to launch MDIM-MANAGER is available, select it to start the application immediately.



Functional Overview

Startup Screen:

When the MDIM Manager application is launched, the startup screen is displayed while the system initializes. During this process, the application prepares the user interface and loads the required modules. A progress bar is shown to indicate the initialization status. Once the loading reaches completion, the main application window opens automatically.

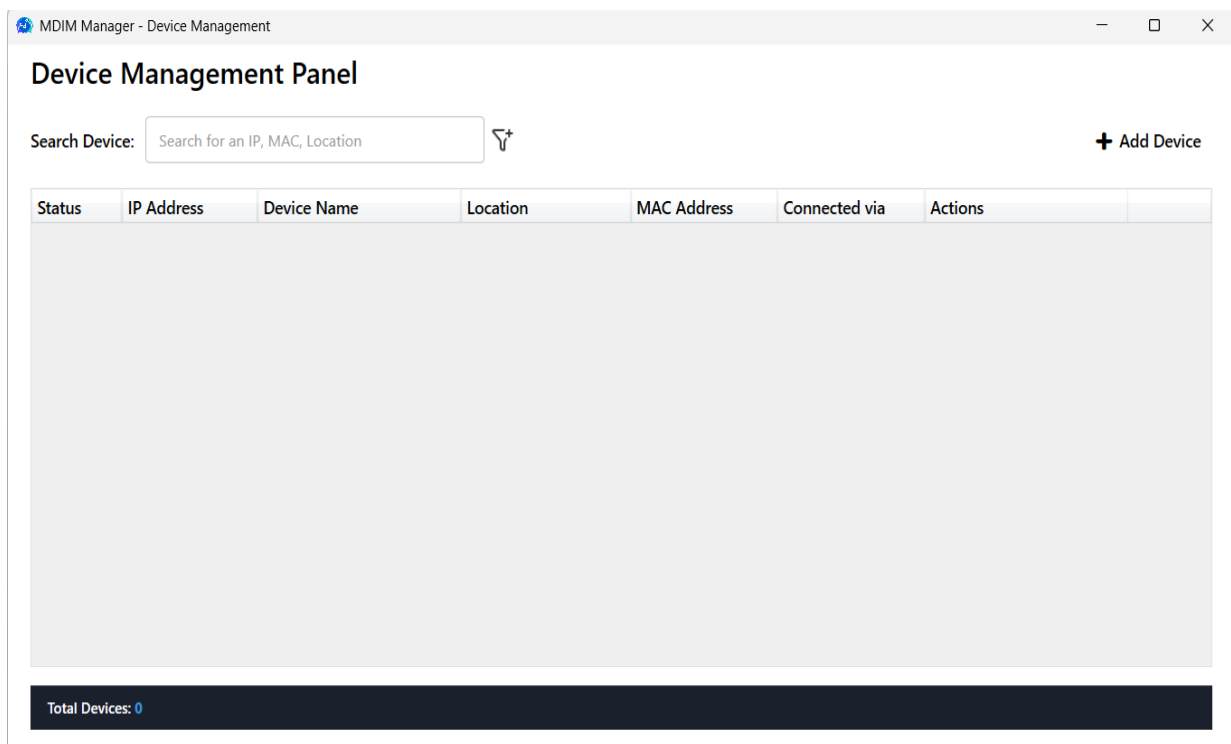


Device Management Panel

The Device Management Panel is the initial screen displayed upon launching the MDIM Manager application. This panel provides the central interface for registering and managing MDIM-485/WL devices.

Functions:

- Add Device – Registers a new MDIM-485/WL unit. Initially, the device list is empty until at least one device is added.
- Search Device – Locates a device by IP address, MAC address, device name, or location.
- Device List – Displays all registered devices with the following parameters:
 - Status (Online/Offline)
 - IP Address
 - Device Name
 - Location
 - MAC Address
 - Connection Type (Wi-Fi/Ethernet)
 - Actions (Configure, Edit, Remove)



Device Discovery

The **Device Discovery** page enables automatic scanning of MDIM-485/WL devices available on the network. Devices connected within the same subnet and operating on the configured TCP port are detected and displayed in this panel.

Functions:

- **Network Information**
 - **Ethernet IP / Subnet** – Displays the assigned IP and subnet mask for the Ethernet interface (shows *Cable Disconnected* if not connected).
 - **Wi-Fi IP / Subnet** – Displays the assigned IP and subnet mask for the Wi-Fi interface.
 - **Current IP / Gateway** – Indicates the active IP address of the host system and its corresponding gateway.
- **Scan Devices** – Initiates a scan to detect all MDIM-485/WL devices available on the same subnet and TCP port.
- **Device List** – Displays the discovered devices with the following details:
 - Selection Checkbox
 - IP Address
 - Port
 - MAC Address
- **Select All** – Selects all discovered devices for bulk actions.
- **Manage Device** – Opens configuration options for a selected device.
- **Add Selected Devices** – Registers the discovered devices into the Device Management Panel.

MDIM Manager - Device Management

Device Discovery

Ethernet IP : Cable Disconnected
Subnet : Cable Disconnected

WiFi IP : 192.168.0.104
Subnet : 255.255.255.0

Current IP : 192.168.0.104

Gateway : 192.168.0.1

Scan Devices

☐ Select All

Select	IP Address	Port	MAC Address

Manage Device

Add Selected Devices

MDIM Manager - Device Management

Device Discovery

Ethernet IP : 10.18.8.25
Subnet : 255.255.255.0

WiFi IP : 10.18.8.24
Subnet : 255.255.255.0

Current IP : 10.18.8.24

Gateway : 10.18.8.1

Scan Devices

☐ Select All

Select	IP Address	Port	MAC Address
☐	10.18.8.208	502	08-d1-f9-a6-ac-87

Manage Device

Add Selected Devices

Device Management Panel (With Added Device)

Once a device is discovered and registered, it appears in the **Device Management Panel** with its details and current connection status. This panel provides a centralized view of all active MDIM-485/WL devices and allows further configuration or removal.

Displayed Information:

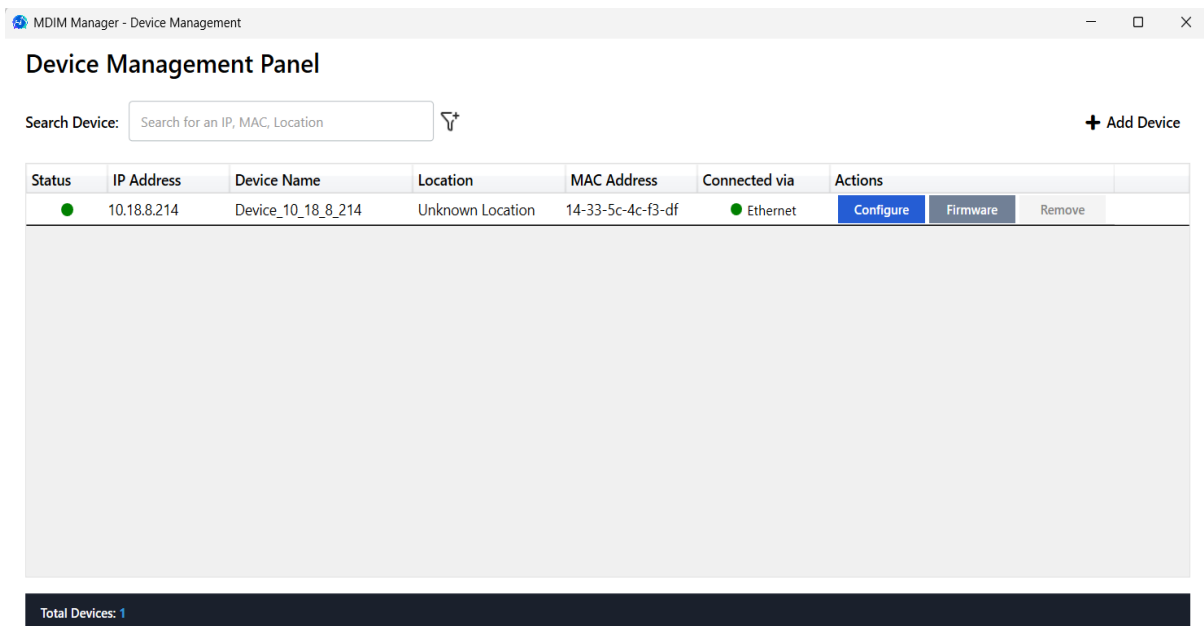
- **Status** – Online/Offline indication (green dot for active).
- **IP Address** – Network address of the registered device.
- **Device Name** – Assigned name for device identification.
- **Location** – User-defined location label.
- **MAC Address** – Unique hardware identifier of the device.
- **Connected via** – Communication interface (Wi-Fi/Ethernet).

Actions:

- **Configure** – Opens the configuration window for the selected device to modify communication and operational parameters.
- **Remove** – Deletes the device from the management panel.

Summary:

- The bottom bar displays the **total number of devices** registered.
- The currently selected device is shown with its name and IP address for quick reference.



The screenshot shows a window titled "MDIM Manager - Device Management". Inside, the "Device Management Panel" has a search bar labeled "Search Device:" with the placeholder text "Search for an IP, MAC, Location". To the right of the search bar is a "+ Add Device" button. Below the search bar is a table with the following columns: Status, IP Address, Device Name, Location, MAC Address, Connected via, and Actions. The table contains one row with the following data: Status (green dot), IP Address (10.18.8.214), Device Name (Device_10_18_8_214), Location (Unknown Location), MAC Address (14-33-5c-4c-f3-df), Connected via (green dot Ethernet), and Actions (Configure, Firmware, Remove). At the bottom of the window, a dark bar displays "Total Devices: 1".

Status	IP Address	Device Name	Location	MAC Address	Connected via	Actions
●	10.18.8.214	Device_10_18_8_214	Unknown Location	14-33-5c-4c-f3-df	● Ethernet	Configure Firmware Remove

Total Devices: 1

Device configuration

The **Configure** button in the Device Management Panel is used to initiate communication mode selection for the selected **MDIM-485/WL** device.

Function:

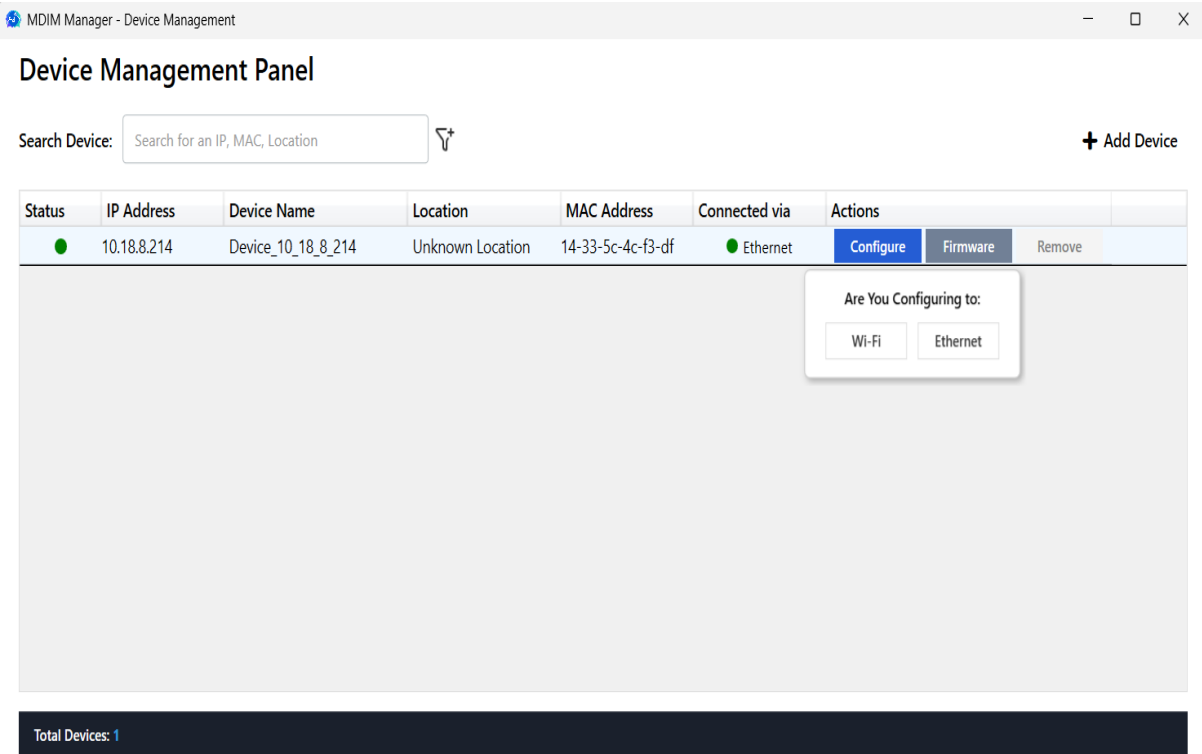
Clicking **Configure** opens a dialog box that prompts the user to choose the desired communication interface for configuration.

This selection determines which interface (Wi-Fi or Ethernet) will be configured next.

Usage:

- Select **Wi-Fi** to proceed with network mode Wi-Fi and configure wireless network parameters.
- Select **Ethernet** to proceed with network mode Ethernet and configure wired network parameters.

No configuration is performed at this stage — the selection simply routes the user to the appropriate configuration screen.



The screenshot shows the MDIM Manager - Device Management window. The title bar reads "MDIM Manager - Device Management". The main panel is titled "Device Management Panel". Below the title is a search bar labeled "Search Device:" with the placeholder text "Search for an IP, MAC, Location" and a magnifying glass icon. To the right of the search bar is a "+ Add Device" button. Below the search bar is a table with the following columns: Status, IP Address, Device Name, Location, MAC Address, Connected via, and Actions. The table contains one row with the following data: Status (green dot), IP Address (10.18.8.214), Device Name (Device_10_18_8_214), Location (Unknown Location), MAC Address (14-33-5c-4c-f3-df), Connected via (green dot Ethernet), and Actions (Configure, Firmware, Remove). A dialog box titled "Are You Configuring to:" is open over the table, with two buttons: "Wi-Fi" and "Ethernet". At the bottom of the window, a dark blue bar displays "Total Devices: 1".

Status	IP Address	Device Name	Location	MAC Address	Connected via	Actions
●	10.18.8.214	Device_10_18_8_214	Unknown Location	14-33-5c-4c-f3-df	● Ethernet	Configure Firmware Remove

Are You Configuring to:

Wi-Fi Ethernet

Total Devices: 1

Wi-Fi Configuration

This screen is used to configure **RS485** parameters and **Wi-Fi (STATION) network settings** for the selected **MDIM-485/WL** device.

Sections:

- **Device Information:**
Displays the device's IP, MAC address, port, and current network mode.
- **RS485 Configuration:**
Set serial parameters: Baud Rate, Data Bits, Parity, and Stop Bits.
Use **Read RS485 Config** to load current values.
- **Wi-Fi Configuration:**
Configure wireless settings:
 - SSID, Password
 - IP, Gateway, DNS, Subnet (if Static IP is enabled)
 - Use **Read WiFi Config** to fetch existing settings.

Actions:

- **Apply Changes:** Saves and applies configuration.
- **Close:** Exits without saving.

Ensure the device is reachable and values are correct before applying changes.

Configure WiFi - Device_10_18_8_203 (10.18.8.203)

WiFi Device Configuration

Configure RS485 and WiFi settings for the selected device

Device Information

Device IP: 10.18.8.203
MAC Address: 08-d1-f9-a6-ac-87
Network Mode: Wifi
Port: 502

RS485 Configuration

Baud Rate: 9600
Parity: None
Data Bits: 8
Stop Bits: 1

Read RS485 Config

WiFi Configuration

☒ Static IP Configuration

SSID: MachDatum_2.4
Password: MachDatum.1
IP: 10.18.8.203
Gateway: 10.18.8.1
Primary DNS: 8.8.8.8
Secondary DNS: 8.8.4.4
Subnet Mask: 255.255.255.0

Read WiFi Config

Close
Apply Changes

Ethernet Configuration

This screen is used to configure **RS485** parameters and **Ethernet network settings** for the selected **MDIM-485/WL** device.

Sections:

- **Device Information:**
Shows the device's IP, MAC address, port, and network mode.
- **RS485 Configuration:**
Set serial communication parameters: Baud Rate, Data Bits, Parity, Stop Bits.
Use **Read RS485 Config** to fetch current RS485 values.
- **Ethernet Configuration:**
Define Ethernet network settings:
 - Static IP, Gateway, DNS (Primary & Secondary), and Netmask
 - Use **Read Ethernet Config** to retrieve current settings.

Actions:

- **Apply Changes:** Saves and writes the configuration to the device.
- **Close:** Exits without saving.

Ensure the device is connected via Ethernet and reachable before applying changes.

Configure Ethernet - Device_10_18_8_203 (10.18.8.203)

Ethernet Device Configuration

Configure RS485 and Ethernet settings for the selected device

Device Information

Device IP:	10.18.8.203	MAC Address:	08-d1-f9-a6-ac-87
Network Mode:	Ethernet	Port:	502

RS485 Configuration

Baud Rate:	9600	Parity:	None
Data Bits:	8	Stop Bits:	1

Read RS485 Config

Ethernet Configuration

☒ Static IP Configuration

IP Address:	10.18.8.203	Gateway:	10.18.8.1
Primary DNS:	8.8.8.8	Secondary DNS:	8.8.4.4
Netmask:	255.255.255.0		

Read Ethernet Config

Close

Apply Changes

Updated new configuration:

Once all RS485 and network parameters are set (either Wi-Fi or Ethernet), click **Apply Changes** to save and apply the configuration to the selected **MDIM-485/WL** device. To update the device to the new configuration the device must be restarted. Click OK to restart.

Post-Configuration Behavior

After clicking **Apply Changes**, the application automatically verifies the device's connectivity and updates its status accordingly.

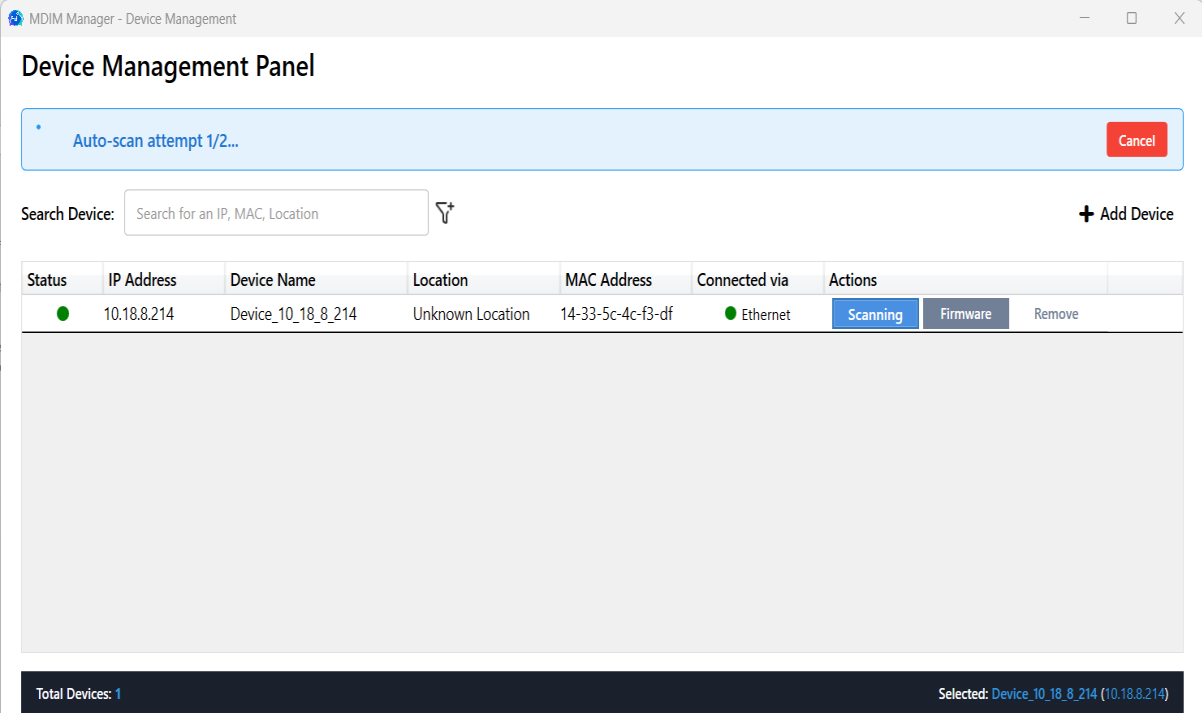
Auto-Scan Function:

- Once settings are applied, an **auto-scan** is triggered for the configured device.
- If the **device's IP address has changed**, the application detects the new IP automatically and re-establishes connection without manual intervention.
- This ensures uninterrupted tracking even after IP reassignment.

Network Mode Sync:

- If the **network mode** (Wi-Fi ↔ Ethernet) is updated, the **Device Management Panel** reflects the new mode in real-time.
- There is **no need to remove and re-add** the device after changing network modes or IP settings.
- This ensures seamless configuration updates with minimal user action and avoids device duplication or loss of visibility.

If the device cannot be reached after both attempts, its status will appear as offline until connectivity is restored. In that case remove the device and Re-add the device to ensure the connectivity.



The screenshot shows the 'MDIM Manager - Device Management' window. The title bar includes standard window controls. The main content area is titled 'Device Management Panel'. At the top, there is a blue status bar indicating 'Auto-scan attempt 1/2...' with a red 'Cancel' button. Below this is a search bar labeled 'Search Device:' with the placeholder text 'Search for an IP, MAC, Location' and a magnifying glass icon. To the right of the search bar is a '+ Add Device' button. The main area contains a table with the following columns: Status, IP Address, Device Name, Location, MAC Address, Connected via, and Actions. The table has one data row: Status is a green dot, IP Address is 10.18.8.214, Device Name is Device_10_18_8_214, Location is Unknown Location, MAC Address is 14-33-5c-4c-f3-df, Connected via is a green dot and Ethernet, and Actions are Scanning, Firmware, and Remove. Below the table is a large empty grey area. At the bottom, a dark blue footer bar shows 'Total Devices: 1' on the left and 'Selected: Device_10_18_8_214 (10.18.8.214)' on the right.

Status	IP Address	Device Name	Location	MAC Address	Connected via	Actions
●	10.18.8.214	Device_10_18_8_214	Unknown Location	14-33-5c-4c-f3-df	● Ethernet	Scanning Firmware Remove

Total Devices: 1

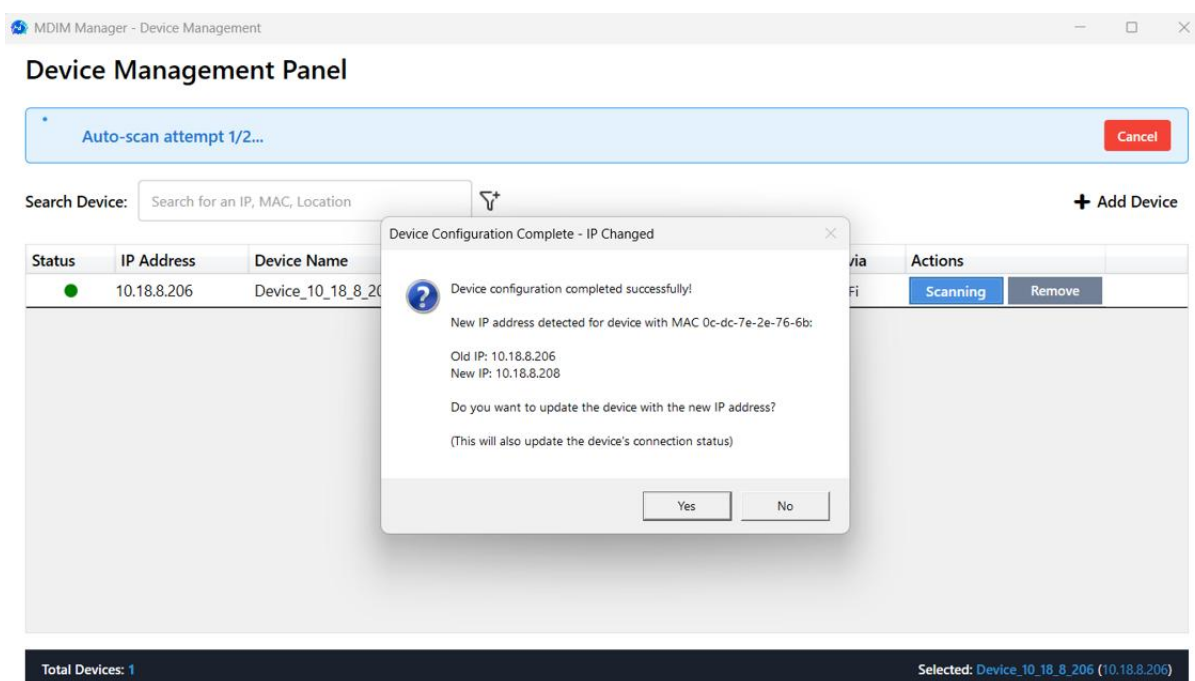
Selected: Device_10_18_8_214 (10.18.8.214)

When a device's IP address changes, MDIM Manager displays a confirmation popup during the auto-scan process.

Popup Message:

- **Device configuration completed successfully.**
- New IP detected for device with MAC example: 0c-dc-7e-2e-76-6b.
 - **Old IP:** 10.18.8.206
 - **New IP:** 10.18.8.208

If the new IP is not updated during autoscan, remove the device and re-add the device and ensure the network connectivity strength is better.



Firmware Upgrade Procedure

1. **Verify Firmware Requirement**
 - Confirm whether a firmware update is required by checking the device's current firmware version against the manufacturer's release notes.
 - Proceed only if an update is necessary.
2. **Navigate to the Device Management Panel**

Ensure that the device is listed with an active status indicator (green).
3. **Select the Target Device**

From the device list, click on the device entry that requires a firmware update.
4. **Initiate Firmware Upgrade**
 - Click the **Firmware** button under the *Actions* column.
 - A confirmation pop-up will appear.
 - Select **Yes** to continue or **No** to cancel.

MDIM Manager - Device Management

Device Management Panel

Search Device:  + Add Device

Status	IP Address	Device Name	Location	MAC Address	Connected via	Actions
●	10.18.8.214	Device_10_18_8_214	Unknown Location	14-33-5c-4c-f3-df	● Ethernet	Configure Firmware Remove

Firmware Update Confirmation

 You are about to open the firmware update window

Device: Device_10_18_8_214
IP: 10.18.8.214
Status: Connected

Do you want to proceed?

Total Devices: 1 Selected: Device_10_18_8_214 (10.18.8.214)

5. Authenticate the Device

- Verify the **IP Address** and **Port**.
- Click **Authenticate** to establish a secure connection.
- Once authenticated, the system will display *Connected – Ready for firmware upload*.
- **Note:** Without authentication, firmware upload cannot proceed.

6. Upload the Firmware File

- Click **Select Bin File** and browse to the firmware file provided by the manufacturer.
- Select **Upload Firmware** to begin the process.
- The upload progress will be displayed as a percentage, with the status indicating *Uploading firmware....*

MDIM Manager - Device Management

Device Management Panel

Search Device: + Add Device

Status	IP Address	Device Name
●	10.18.8.214	Device_10_18_8_214

Firmware Update

Connection Setup

IP Address: Port:

Connected - Ready for firmware upload

Firmware Update

Firmware File:

12.6%

Status

Uploading firmware...

Log Output

```
[19:19:56] ESP32 OTA Update Tool initialized
[19:19:56] Selected Device IP: 10.18.8.214
[19:21:55] Connecting to 10.18.8.214:8080...
[19:21:55] Connected! Waiting for challenge...
[19:21:55] Challenge received: 0x040525ED
[19:21:55] Ready for authentication
[19:21:55] Generating authentication response...
[19:21:55] ✓ Authentication successful! Ready for firmware upload
```

Total Devices: 1 Selected: Device_10_18_8_214 (10.18.8.214)

7. Completion

- After the upload reaches 100%, the device will automatically apply the new firmware.
- The device may restart during this process.
- A confirmation message will indicate successful completion.

⚠ Caution:

- Only proceed if a firmware update is required.
- Ensure uninterrupted power and a stable network connection.
- Do not disconnect or turn off the device during the update.

