PMM
Power Meter Monitor

Business and Mission-

Critical Solutions Provider

Ethernet - Serial Media Converter

User Manual

Model: PMM0501
Document: User Manual
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This restriction is subject to protect the operational process of the system in the business environment, which will produce, use, and transmit radiofrequency energy. Harmful interference to radio communication could result if instructions to the correct installation and usage were not applied. The interference prevention cannot be guaranteed even with proper installation according to the manual. If the device causes a bad effect on the radio / TV signal. The user could preclude that by turning the device on/off.
When this device produces some harmful interference, the user can use the following measure to solve the interference problem:
1-Setting the receiving antenna's direction or location to increase the distance between this device and receiver.
2-Plug in the device's power connector into different circuits of the power outlet with the receiver.
3-If any technical support is needed, the dealer or experienced radio/TV technical personnel must be informed.

TECHNICAL SUPPORT AND SERVICE

Visit Pmm-usa.us to browse FAQs and get further details.
User should collect the following information before submitting technical support and service requests:
- Product name, model and serial number.
- Installed software (operating system, OS version, installed applications and so on).
- Full description of the problem
-Detailed information about every error.

SAFETY INSTRUCTIONS

- Only trained and qualified personnel can install, operate, or maintain the device.
- Before starting the installation, all safety precautions must be read, and warning labels affixed to the device must be observed. Doing so protects the device from damage and ensures your safety.
- Safety precautions provided in this document may not cover all safety aspects, note to always remain mindful of safety.
- PMM is not liable for any consequence that results from violation of regulations pertaining to safe operations or safety codes pertaining to design, production, and equipment usage.
- DO NOT use liquids or decontamination spray to clean the device surface and assure that it is totally disconnected while cleaning.
- Take all measures to prevent device drop before or during installation.
- Prior to connecting the device to power source, ensure the source and device voltage and power are 100% matched.
- Keep the cables in a suitable covered place.
- If the device is not used for a long time, shut off the power to avoid the damages by transient overvoltage.
- DO NOT allow any liquid flow into the device; to avoid fire or short circuit.
- The recommended storage temperature range should NOT be less than 30°C OR higher than 85°C.

⚠️ **Warning:**
- Read the power source and device inlet carefully.
- Handle device with both hands.
- Clean and maintain the device using recommended, safe and suitable methods.

⚠️ **Caution:**
If any unauthorized changes of settings or repairs are done without PMM approval; then user's rights of controlling this device will be canceled.

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1. INTRODUCTION

This Document is a fully descriptive operational manual for PMM's Ethernet - Serial Media Converter. Providing the operator with the needed information in terms of instruction and screen layout of the monitors, allowing for easy use.

1.1 Description

PMM0501 hardware provides the flexibility needed to fulfill the various conditions that arise with field devices that use different communication protocols to connect any type of industrial solution network such as the SCADA system. This slave device is effortlessly incorporated into an existing Modbus TCP network from any Modbus RTU device.

PMM0501 industrial grade media converter can function under harsh environmental conditions of any site. It is especially designed to meet all power substations and PV plants requirements. Furthermore, it covers all field standards of power, reliability, easy configuration and long- lasting life.

1.2 Key Features

- Converts smoothly Between Ethernet to serial Rs485 (bridge)
- Up to 4 simultaneous Ethernet masters
- Can be used as Modbus converter through using any port forwarder software
- Effortless configuration via web-based server
- 2 or 4 serial Rs485 ports options
- Baud rate: up to 115200 Kbs
- Operating temperature: -40 to 75°C (-40 to 167°F)
- EMI, EMS, EMC and shock protected
- 10-56VDC Supply voltage with Overvoltage and reverse polarity protection
- Serial port with power surge ±2.5kV and isolation protection

2. HARDWARE

2.1 Enclosure Dimensions
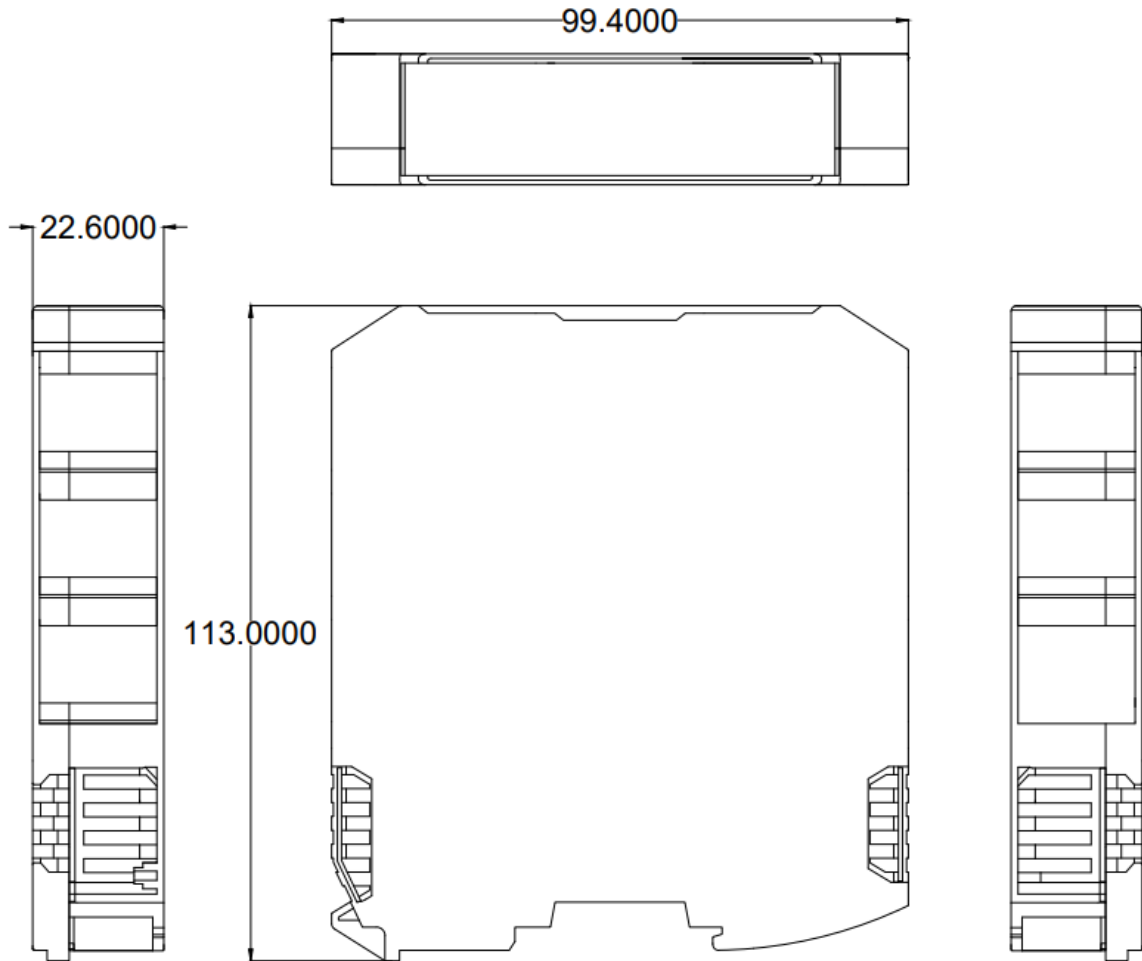
2.2 LED Indicators

PMM0501 has 2x Green LED Indicators at the front view as following:

LED INDICATOR	
Rx	Blinking: Data is being transmitted or received through the port Off: No Data is being transmitted or received through the port
Tx	Blinking: Data is being transmitted or received through the port Off: No Data is being transmitted or received through the port

2.3 Technical Specifications

Interfaces

Serial	2 or 4 customized Serial ports of the following options: • Isolated RSR85 port • Isolated RS422 port • Isolated RS232 port	
Ethernet	1x 10/100/1000Base-T RJ45	
LED Indicators	2x LED for full duplex	

Power Parameters

Input Power Supply Options	10-48 VAC / 10-60 VDC

Physical Characteristics

Housing	Plastic
Dimensions	4.05 x 4.05 x 1.45 inch (103 x 103 x 36.83 mm)
Mounting Options	DIN Rail

3. PIN Assignments
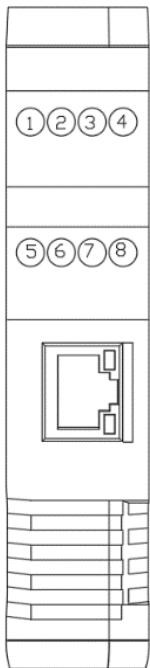
1. D- (RS485)
2. D+ (RS485)
3. Earth
4. Earth
5. V DC+ (9-56)
6. V DC- (9-56)
7. Earth
8. Earth
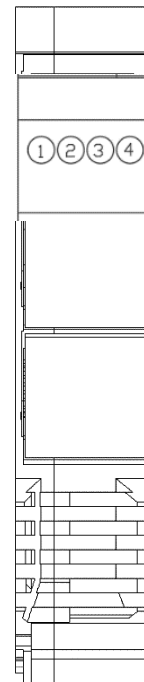
1. D+ (RS485)
2. Earth
3. D- (RS485)
4. Earth

4. HARDWARE CONNECTION

4.1 Connecting Power

PMM0501 has two power supply options 10-60V DC or 10-40 V AC, the user has to connect the positive power line (+) to pin no.5 in the top view and the negative line (-) to pin no.6 as illustrated in the pin's assignments. **Note:** the power is protected against overvoltage and reverse polarity in case of wrong connection.

4.2 Connecting a Serial Device

The unit's serial port is located on the top panel. If you are connecting an RS485 multidrop network with multiple devices, note the following:

1. All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).
2. Connect the D+ with pin no.1 and D- with pin no.2 and Earth with pin no.4 as illustrated in the pin's assignments to complete the connection successfully.
3. Turn on the dip switch to have 120 Ω termination resistor between the D+ and D- lines. Refer hardware configuration section.

4.3 Connecting to a Host or the Network

There is a 10/100 Ethernet port at the unit's front panel. This port is used to connect the unit with a host or Ethernet network.
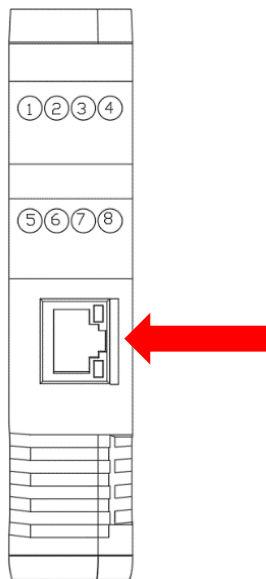
5. TARGET APPLICATIONS

- **Link a serial master device with Ethernet slave devices**

    Many HMI (Human Machine Interface) systems use a serial interface to connect to DCS (Discrete Control System). However, many DCSs are now Ethernet-based and operate as a Modbus TCP slave device. PMM0501 can link serial HMI to distributed DCSs over an Ethernet network.

- **Let Modbus serial devices communicate over the Internet**

    Many Modbus devices communicate over RS-485, which limits the number of devices in a network to 32 and the transmission distance to 1.2 km. With PMM0501 Modbus gateway, you can link all Modbus devices over an Ethernet network. Up to 32 Modbus gateways can be installed in a single control network, so each device can now be accessed from anywhere the TCP/IP network can reach.

- ## Serial Redirector

    PMM0501 can be inserted to a serial system in which the slaves connected to one serial port and the masters to another serial port. PMM0501 allows Ethernet master devices to connect with serial slaves and simultaneously provides a serial redirector which allows the serial master to continue controlling the serial slaves.
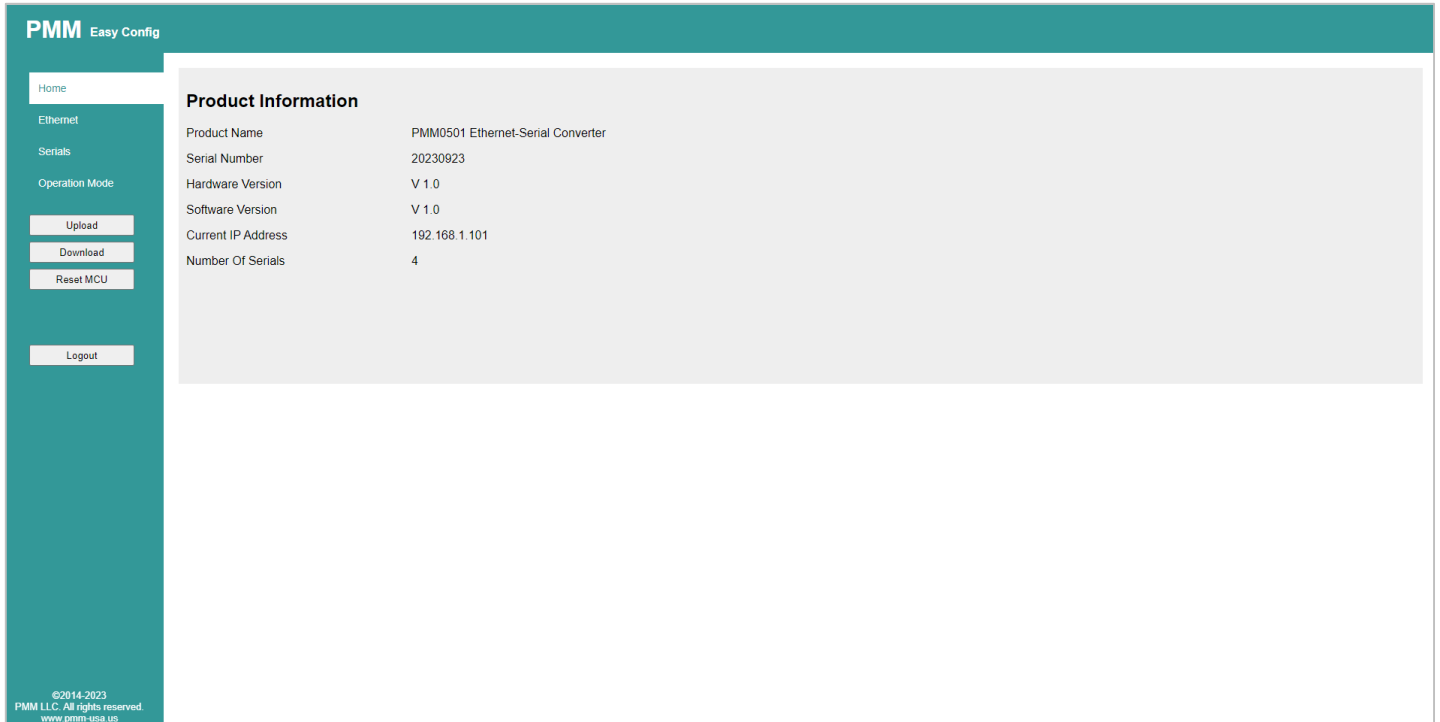
6. PMM0501 Easy Config

PMM Easy config enables the user to set PMM0501 settings easily and effortlessly and control them any time, the user can upload the settings that the device is running by, change them as suitable then download the updated settings on the main controller again.

6.1 log In

6.2 Home Page
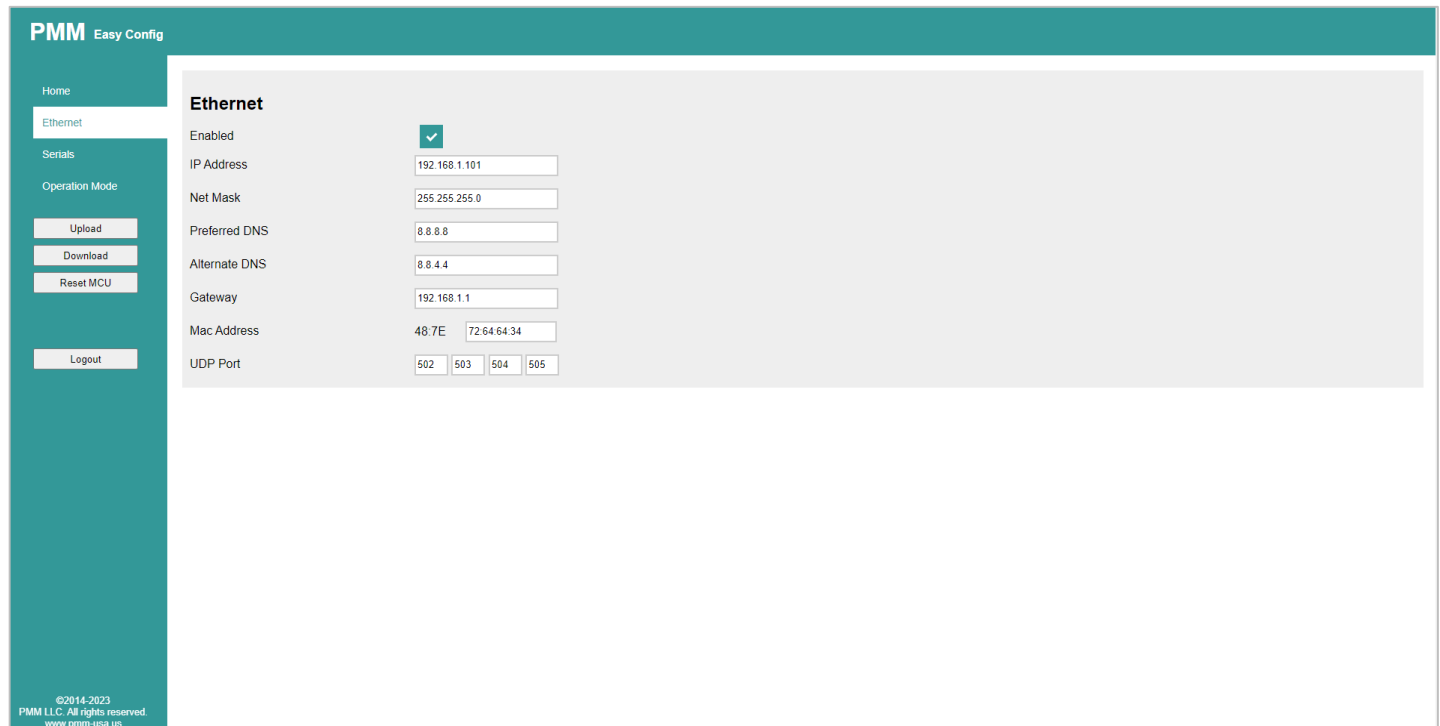
This page provides the user with the basic information about the PMM device "Ethernet -Serial Media Converter" such as Model Name, Serial Number, Firmware Version, Current IP Address and Number of Serial ports.

6.3 Ethernet Configuration

Ethernet configuration parameters:

- IP address: it uniquely identifies each device on the network and devices use it to communicate with each other, default IP address is set to 192.168.1.200.

- Net Mask: identifies an octet in the IP address which is part of the subnet address (network address). Using Net Mask, we know which part of IP address the network address and which part is the host address.
- Preferred DNS: to provide the IP address of a DNS server (DNS 1) so that we can use logical names on our network.
- Alternate DNS.
- Gateway: To allow a host to communicate with computers on different subnets we must define the Gateway address.
- MAC Address.
- UDP Port.

6.4 Serial Configuration

Serial configuration parameters:
- Check the Enabled box.
- Select the needed serial port to be configurator from the drop list; there are 4 serial ports.

Note: Serial 00 is the Ethernet port, and Serial 01,02,03 are the RS485 ports.

- Baud Rate: The baud rate is the communication speed, which is the number of times per second a serial communication signal changes states; a state being either a voltage level, a frequency, or a frequency phase angle.
- Data Bit: Number of bits to represent one character of data 8 (default).
- Stop Bit: The stop bits are used in asynchronous communication as a means of timing or synchronizing the data characters being transmitted.
- Parity: The parity bit is to determine if the data character being transmitted is correctly received by the remote device. Interface: Serial communication.
- Interface.
- Port ID (must be from 1-30).

6.5 Operation Mode

- The user can choose between serial server mode or peer to peer connection.
- In case of choosing peer to peer, the user must set the remote IP address.
- Click on "Upload" to upload the settings that the device is already running by
- Click on "Download" to download the new updated settings on the controller.
- Click on "Reset MCU" to reset the device in order to operate according to the new updated settings correctly.
- Click on "Logout" to logout from PMM Easy Config.

Note: The user can complete the settings configuration either through the web server as illustrated above or through PMM2003 Easy Config Tool. For more details please refer to PMM2003 Easy Config