



Power Meter Monitor

**Business and Mission-
Critical Solutions Provider**

Basic Modbus TCP to RTU Gateway

Data Sheet



Model: PMM0407
Document: User Manual
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DECLARATION OF CONFORMITY

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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KEY FEATURES

- Converts smoothly between Modbus TCP to 2 or 4 RTU with optional Fiber Optic Internal Switch
- Up to 20 simultaneous TCP masters
- Easy and smooth configuration via web-based server
- Embedded traffic monitoring as well as diagnostic information for fast trouble shooting
- Optional 2 or 4 Ethernet 10/100 ports
- Optional supports 2.4/5 GHz WIFI
- Optional 2x customized Fiber optic ports
- 2 or 4 RS485 - RS232 Serial communication ports (Customizable)
- Baud rate: 110-256000 bps
- Different Power supply options with over voltage and reverse polarity protection
- Operating temperature: -40 to 75°C (-40 to 167°F)
- Storage temperature: -40 to 85°C (-40 to 185°F)
- Ambient relative humidity 5 to 95% (non-condensing)
- EMI, EMS, EMC and shock protected
- Serial port with power surge ± 2.5 kV isolation protection
- Enclosure Ingress Protection Code: IP54

DESCRIPTION

PMM0407 is a highly configurable industrial Ethernet gateway device capable of quick protocol conversion on Modbus Networks.

Modbus slave devices are simply incorporated into an existing Modbus TCP network, where slave devices are easily reached by their respective masters. PMM0407 provides the flexibility needed to fulfill the different conditions that happen with field devices that use diverse communication protocols to connect any type of industrial solution network such as the SCADA system.

PMM0407 gateways support a system log that main function is to record events so it can be easily monitored; users can easily review log data remotely through the web interface. The gateways also support status monitoring and fault protection functions. The status monitoring function notifies the SCADA system. When a device gets disconnected or does not respond or faces any error or failures, in such cases the SCADA system gets alarms of the status of each end device to the operators to make corrective actions immediately.

SOFTWARE SPECIFICATIONS

Ethernet Software Features

Protocols	Modbus TCP
Configuration Options	Web Console (HTTP/HTTPS), Telnet Console
Time Management	NTP Client

Serial Software Features

Protocols	Modbus RTU/ASCII
Configuration Options	Serial Console

HARDWARE SPECIFICATIONS

PMM0407 can be housed in several PMM CPU platforms such as:

1. PMM0102 (default platform): PMM Industrial Computer, **CPU:** Allwinner H3, Quad-core Cortex-A7, **DRAM:** 512MB RAM and Embedded 8GB eMMC hard drive, **Interfaces:** 2x Ethernet ,4 x Serial ports.
2. PMM0304: PMM Industrial Ethernet switch with Wi-Fi, **CPU:** MediaTek MT7688AN MIPS24KEc, **DRAM:**128GB, **Interfaces:** 4x 10/100 Ethernet (RJ45) + SFP or SC1X9).
3. PMM0305: PMM Industrial Ethernet switch, **CPU:** MediaTek MT7688AN MIPS24KEc, **DRAM:**128GB, **Interfaces:** 2x Ethernet + 2x fiber optics + 2x Serial ports.
4. PMM0103: PMM Industrial Computer, **CPU:** Allwinner H3, Quad-core Cortex-A7, **DRAM:** 512MB RAM and Embedded 8GB eMMC hard drive equipped with 3x RS485 Serial ports, and plastic light housing.

The hardware platform is chosen in the order configuration, refer to PMM website for more details about the CPUs <https://www.pmm-usa.us/Industrial-Computer.php>

ORDERING INFORMATION

Order Configuration table																																		
PMM0407		-x	-09xx	-09xx	-09xx	Table1* Comm port options																												
1. CPU Platform: PMM0102																																		
Power supply						<table border="1"> <thead> <tr> <th colspan="2">COM Ports Options</th> </tr> </thead> <tbody> <tr> <td>Analog input</td> <td>PMM0901</td> </tr> <tr> <td>Analog output</td> <td>PMM0902</td> </tr> <tr> <td>CANBUS (UART)</td> <td>PMM0910</td> </tr> <tr> <td>CANBUS (UART)</td> <td>PMM0910i</td> </tr> <tr> <td>CANBUS (SPI)</td> <td>PMM00911</td> </tr> <tr> <td>CANBUS (SPI)</td> <td>PMM0911i</td> </tr> <tr> <td>RS485</td> <td>PMM0912</td> </tr> <tr> <td>RS422</td> <td>PMM0913</td> </tr> <tr> <td>RS422</td> <td>PMM0914</td> </tr> <tr> <td>RS232</td> <td>PMM0915</td> </tr> <tr> <td>LTE</td> <td>PMM0916</td> </tr> <tr> <td>Digital input</td> <td>PMM0920</td> </tr> <tr> <td>Digital output</td> <td>PMM0921</td> </tr> </tbody> </table>	COM Ports Options		Analog input	PMM0901	Analog output	PMM0902	CANBUS (UART)	PMM0910	CANBUS (UART)	PMM0910i	CANBUS (SPI)	PMM00911	CANBUS (SPI)	PMM0911i	RS485	PMM0912	RS422	PMM0913	RS422	PMM0914	RS232	PMM0915	LTE	PMM0916	Digital input	PMM0920	Digital output	PMM0921
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10-56 VDC	-1																																	
8-40 VAC	-2																																	
36-72 VDC	-3																																	
25-50 VAC	-4																																	
85-285 VAC/100-300 VDC	-5																																	
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CAN Bus		-0910																																
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GSM/GPRS		-0917																																
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COM Port 2 (Same as COM Port 1 options)				-09xx																														
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COM Port 4 (Same as COM Port 1&2&3 options)																																		
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2. CPU Platform: PMM0103																																		
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					-09xx																													

PMM0407

3. CPU Platform: PMM0304

Power supply	-X	-X
10-56 VDC	-1	
8-40 VAC	-2	
36-72 VDC	-3	
25-50 VAC	-4	
85-285 VAC/100-300 VDC	-5	
Fiber Optic Options		
1x SC Ports		-A
1x SFP Ports		-B

PMM0407

4. CPU Platform: PMM0305

Power supply		
10-56 VDC	-1	
8-40 VAC	-2	
36-72 VDC	-3	
25-50 VAC	-4	
85-285 VAC/100-300 VDC	-5	
Fiber Optic Options		
1x SC Ports		-A
1x SFP Ports		-B
Fiber Optic Options		
1x SC Ports		-A
1x SFP Ports		-B

CONTACT INFORMATION:

For direct inquiries or any customized orders,
contact us on sales@Pmm-usa.us

MODBUS GATEWAY INTERFACE

login

- Type the username “**admin**” and the password “**admin**”.
 - Click on “Login” to login into the system.
- 📌 **NOTE:** the username must be lowercase because the web server is case sensitive.



Once the user has logged in successfully the default main web page “General Information” will be displayed as shown in the figure below.



Set General Information and Web Page Theme

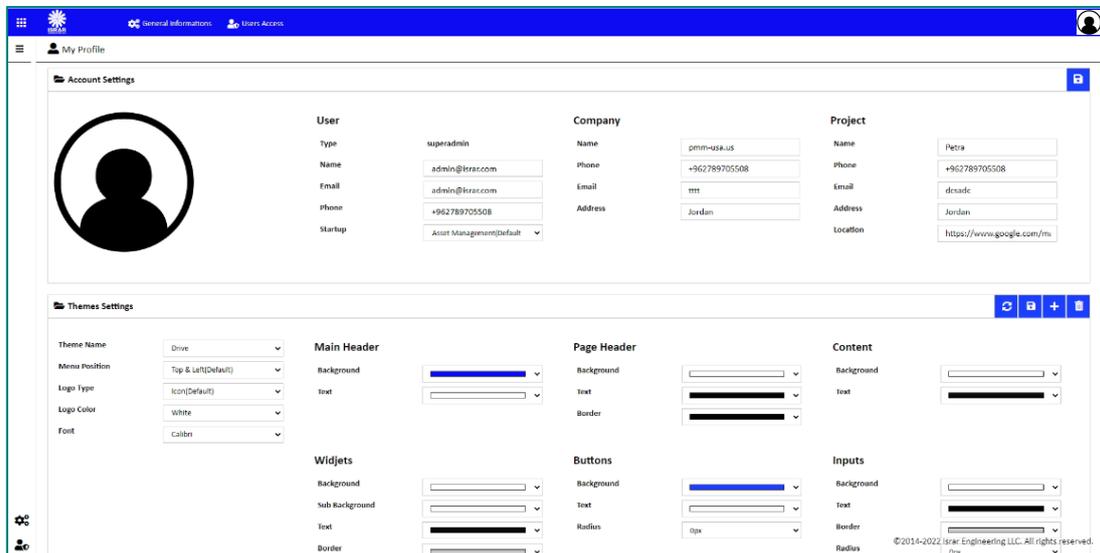
The “general information” that is displayed at the main page must be set originally by the user. As well as, the user can redesign his own theme style to make the web page more comfortable.

Inserting general information instructions:

- Click on “the user’s icon” in the right top of the page.



- Click on “My Profile” then the web page at which the user can modify the information manually will be displayed as shown below.



- Type the user’s name, Email, and phone.
- Select the startup page which will be displayed once the user has logged in to the server.
- ✎ **NOTE:** The default startup page is “Assets Management”.
- Type the company’s name, phone, Email, and address.
- Type the project’s name, phone, Email, address, and location.
- After completing inserting all the user’s, company’s and project’s information accurately click on “Save”.
- If the information is saved “Updated successfully” will be displayed at the head of the page.
- ✎ **NOTE:** if the information is updated successfully the user will be able to view the general information at the startup page.

Web page theme settings:

1) Apply existed theme instructions:

- Select the desired theme from the theme name list.
- Click on “Refresh” to apply the theme.

2) Adjust existed theme instructions:

- Edit the chosen theme as wanted.
- Click on “Save”.
- If the theme is saved “Updated Successfully” will be displayed at the head of the page.

🔗 **NOTE:** the default theme is not editable.

3) Create new theme instructions:

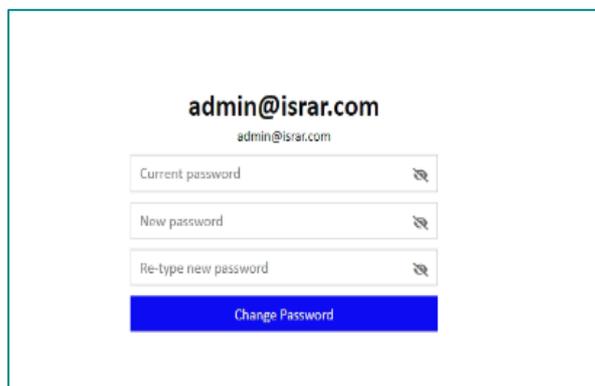
- To add a new theme, click on “Add”.
- Name the theme as wanted.
- Select the theme style.
- Click on “Save”.
- If the theme is saved “Updated Successfully” will be displayed at the head of the page.
- Select the added theme from the theme name list.
- Click on “Refresh” to apply the theme.

Change password

The user can change the password in order to enhance the security after the first login or any other time as necessary.

Change password instructions:

- Type the current password.
- Type the new password.
- Retype the new password for confirmation.
- Click on “Change password”.
- If the new password is saved “Updated Successfully” will be displayed at the head of the page.



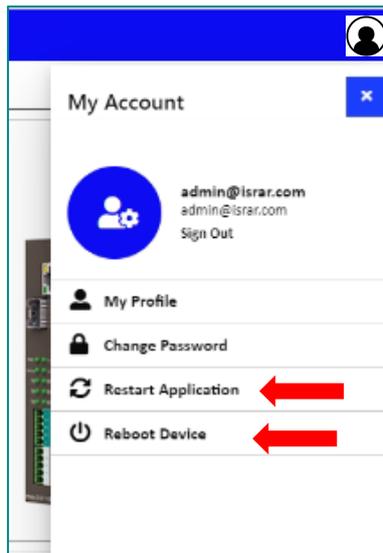
The screenshot shows a web form for changing a password. At the top, it displays the email address 'admin@israr.com' and a smaller version of the same address below it. There are three input fields: 'Current password', 'New password', and 'Re-type new password'. Each field has a small eye icon to the right, indicating a toggle for password visibility. Below the input fields is a blue button labeled 'Change Password'.

To restart the application

- Click on “Restart Application”.

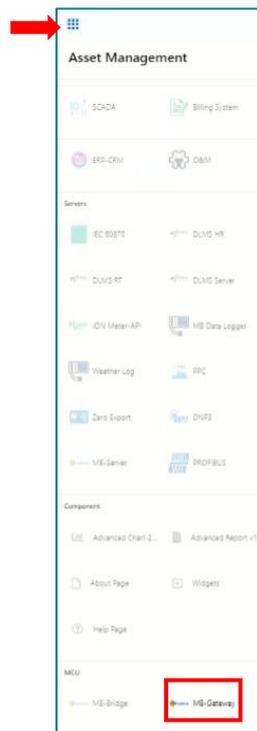
To reboot the device:

- Click on “Reboot Device”.
- The reboot process may take a while.



In order to set the converter settings configuration:

- Login to the converter.
- Click on the left screen at the startup page.
- Click on MB-Gateway as shown in the figure below.
- The overview page will be displayed.



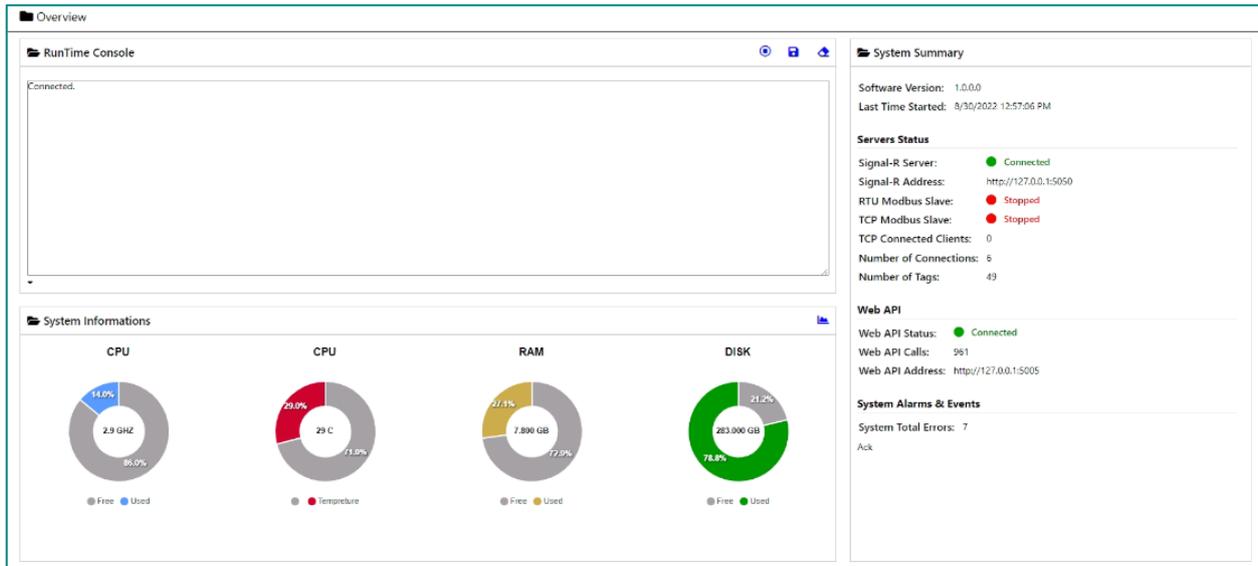
Overview

Overview displays the status of the device and connected devices.

Overview consists of three sections:

- 1) Run Time Console: displays the device status, alarms and operational modes.
- 2) system Information: displays system’s performance measures as it illustrates the usage and free percentage of:
 - CPU.

- CPU.
 - RAM.
 - Disk.
- 3) System Summary which displays:
- The software version.
 - Last Time Started.
 - Servers' status which displays the status of Signal-R server and its address, RTU Modbus Slave and TCP Modbus slave, the number of connected TCP clients, number of connections and number of tags.
 - Web API status, address, and number of calls.
 - Alarms & Events.



Monitoring:

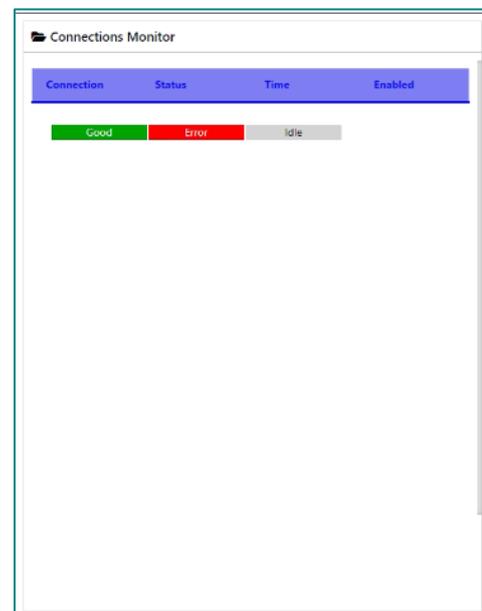
The user is able to monitor the status of connections and tags from this page.

- To the auto refresh of the status check the box "Auto Refresh"

Connections Monitor:

- Displays the connections, their status whether **Good**, **Error**, **Idle**, the time and whether the connection is enabled or disabled.

Status	Description
Good	The connection status is good and has no problem
Error	There is an error with the connection that the user must fix
Idle	The connection is neither connected nor has a problem to fix



Tags/Points Monitor:

- Displays the connection name (COM1, COM2, COM3 or COM4), the tag name which in the form of (command_Slave ID_Address), slave ID, address and the read value.

Connection Name	Tag Name	Slave ID	Address	Value
COM1	Command_11_0	11	0	833
COM1	Command_11_0	11	0	1918
COM1	Command_11_0	11	0	-6508
COM1	Command_11_0	11	0	0
COM1	Command_11_0	11	0	9912
COM1	Command_11_0	11	0	865
COM1	Command_11_0	11	0	826
COM1	Command_11_0	11	0	848
COM1	Command_11_0	11	0	833
COM1	Command_11_0	11	0	818
COM1	Command_11_0	11	0	840
COM1	Command_11_0	11	0	846
COM1	Command_11_0	11	0	863
COM1	Command_11_0	11	0	832
COM1	Command_11_0	11	0	834

Basic Settings

Basic Settings

Server Name: PMM/Converter

Server Location: Amman

Time Zone: Amman - 09:31

Local Date: 22 / 10 / 04

Local Time: 15 : 29 : 50

Set Clock to: Server (NTP)

HTTP Address: 127.0.0.1

General Servers Configuration

Server Auto Start:

Web & API Auto Start:

API Port: 5005

Reading Cycle: 1000

TCP Port: 502

Network Settings

Name	Value	Name	Value
Ethernet1	Manual	Ethernet2	DHCP
IP Assignment	Manual	IP Assignment	DHCP
IP Address	192.168.1.43	IP Address	192.168.2.114
Netmask	255.255.255.0	Netmask	255.255.255.0
Gateway	192.168.1.1	Gateway	192.168.2.0/24
DNS Server 1	8.8.0.0	DNS Server 1	8.8.8.8
DNS Server 2	0.0.0.0	DNS Server 2	4.4.8.8
Max Retry	5	Max Retry	1
Status	Connected	Status	ETHERNET2 NOT FOUND

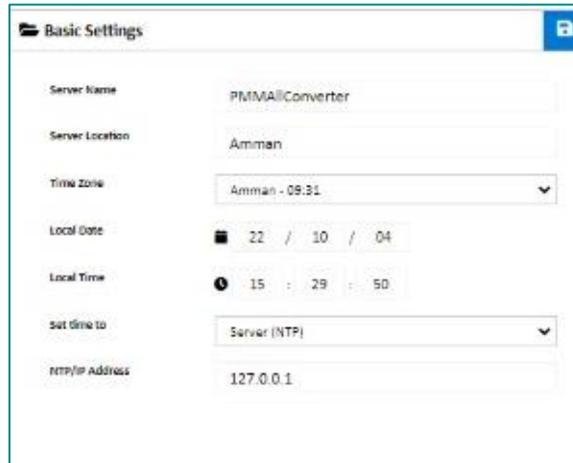
Serial Settings

Port 1 Name	COM1	Port 2 Name	COM2	Port 3 Name	COM3	Port 4 Name	COM4
Baud Rate	9600						
Parity	None	Parity	None	Parity	None	Parity	None
Data Bits	8						
Stop Bits	1						
Flow Control	None						
Interface	RS-485 2-wire						
Timeout	3000	Timeout	3000	Timeout	3000	Timeout	3000
Type	Master	Type	Master	Type	Master	Type	Master
Max Retry	0						
Status	available	Status	not available	Status	available	Status	not available

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Basic Settings

Basic settings display the server's name, location, time zone, local date and time, set time to and NTP/ IP address.

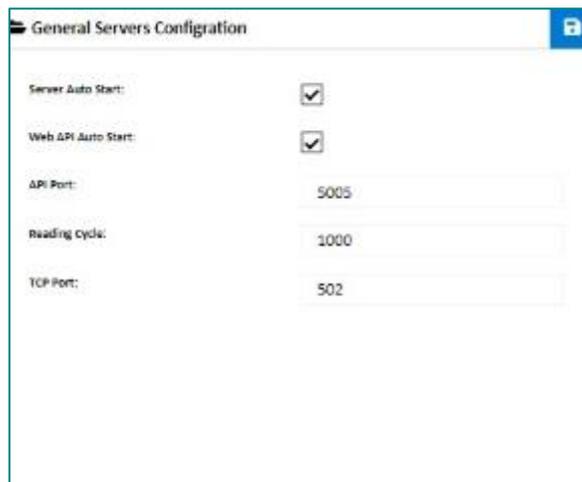


The screenshot shows a window titled "Basic Settings" with a lock icon in the top right corner. The window contains the following fields:

Server Name	PMMAConverter
Server Location	Amman
Time Zone	Amman - 09:31
Local Date	22 / 10 / 04
Local Time	15 : 29 : 50
Set time to	Server (NTP)
NTP/IP Address	127.0.0.1

- The user can change the time zone based on the server location.

General Server Configuration



The screenshot shows a window titled "General Servers Configuration" with a lock icon in the top right corner. The window contains the following fields:

Server Auto Start:	<input checked="" type="checkbox"/>
Web API Auto Start:	<input checked="" type="checkbox"/>
API Port:	5005
Reading Cycle:	1000
TCP Port:	502

- To enable the server auto start, check the box "server auto start".
- Type the API port.
- Type the reading cycle.
- Type the TCP port.

Network Settings

It is required to insert the settings for each port manually by the user for the TCP ports.

The screenshot shows a 'Network Settings' window with two columns for 'Ethernet1' and 'Ethernet2'. Each column contains fields for Name, IP Assignment, IP Address, Netmask, Gateway, DNS Server 1, DNS Server 2, Max Retry, and Status. Ethernet1 is set to Manual IP assignment with IP 192.168.1.43, Netmask 255.255.255.0, Gateway 192.168.1.1, and DNS servers 8.8.0.0 and 0.0.0.0. Ethernet2 is set to DHCP assignment with IP 192.168.2.114, Netmask 255.255.255.0, Gateway 192.168.2.0/24, and DNS servers 8.8.8.8 and 4.4.8.8. The status for Ethernet1 is 'Connected' and for Ethernet2 is 'ETHERNET2 NOT FOUND'.

- Insert the IP Address, Netmask, Gateway for each port.
- After the user completes inserting the settings for the ports, click on “Save”.
- If the settings are saved “Updated Successfully” will be displayed at the head of the page.

NOTE: once the user has set the ports settings the status of each port will be updated.

Network Settings:

Parameter	Value	Notes
Name	Ethernet 1, Ethernet 2	
IP Address	Default IP Address is 192.168.1.240 (or other 32-bit number)	The IP (Internet Protocol) address identifies the server on the TCP/IP network.
Netmask	255.255.255.0 (or other 32-bit number)	Netmask identifies the server as belonging to a Class A, B, or C network.
Gateway	192.168.1.1, 192.168.2.1, 192.168.3.1, 192.168.4.1	
Status	Connected/ disconnected/ not found	Displays the connection status

Serial Settings

The screenshot shows a 'Serial Settings' window with the following parameters: Port Name (COM11), Baud Rate (9600), Parity (None), Data Bits (8), Stop Bits (1), Flow Control (None), Interface (RS-485 2 wire), Timeout (3000), Type (Master), Max Retry (0), and Status (Available).

There are four serial ports the user must set the required parameters for each port.

- Select the Baud Rate ranges from 75 to 128000 bps, Parity, Data Bits, Stop Bits, flow control, interface and type.
- Type the timeout in (ms).
- Click on “Save”
- If the settings are saved “Updated Successfully” will be displayed at the head of the page

✎ **NOTE:** selecting the mode is adjustable only if the user has chosen Modbus gateway mode.

Serial settings:

Parameter	Value	Notes
Port Name	COM1, COM2, COM3, COM4	
Baud Rate	75, 110, 134, 150, 300, 600, 1200, 1800, 2100, 4800, 7200, 9600, 14400, 19200, 38400, 57600, 115200, 128000 bps	The serial port baud rate on the server must match the serial baud rate of the connected device.
Parity	None, Odd, Even, Mark, Space	This setting must match the data format of the connected device
Data Bits	7,8	This setting must match the data format of the connected device
Stop Bits	1, 1.5, 2	This setting must match the data format of the connected device
Flow control	None, RTS/CTS, RTS Toggle	
Interface	RS-232, RS-422, RS-485 2 wires, RS-485 4 wires	
Timeout	Any inserted value in ms	Timeout field is used to configure how long the gateway will wait for a response from a Modbus ASCII or RTU slave. ✎ NOTE: This field is set independently for each serial port ✎ NOTE: the timeout is set in ms

About

About Page consists of three sections:

- 1) General Information: Displays general information about the Modbus converter server including:
 - Model Name.
 - Serial Number.
 - Software Version.
 - Firmware Version.
 - Hardware Base.
 - Hardware Version.

✎ **NOTE:** general information is set by the manufacturer and it is not editable.

- 2) Project settings & Firmware:

- Click on “Backup” to create project settings backup.
- Click on “Restore” to restore a previously created project setting.

✎ **NOTE:** Same instructions are applicable for Firmware as the user can create firmware backup or restore a previously created firmware.

- 3) Alarms & Events Log: The user may adjust the duration of keeping logs, download logs and delete logs.

Adjust Keeping Alarms & Events Log Duration Instructions:

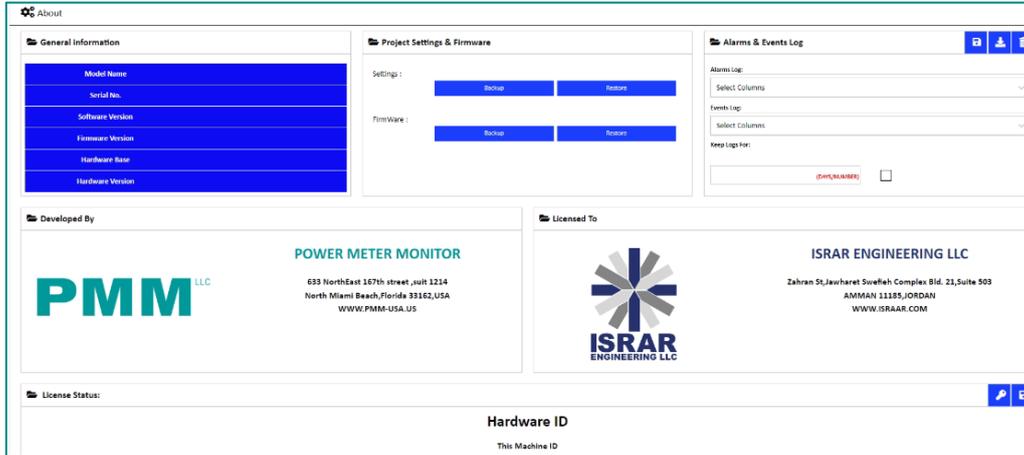
- Type the number of days you want to keep the logs for in the specified field and check the box to enable the setting.
- Click on “Save”.

Download Alarms & Events Log Instructions:

- Choose the required alarms & events log based on the day and date from the drop list.
- Click on “Download”.

Delete Alarms & Events Log Instructions:

- Choose the required alarms & events log based on the day and date from the drop list.
- Click on “Delete”.



Sign Out

After completing settings configuration, the user signs out of the system.

- Click on “Admin”.
- Click on “Sign out” then the log in window will be displayed.

