

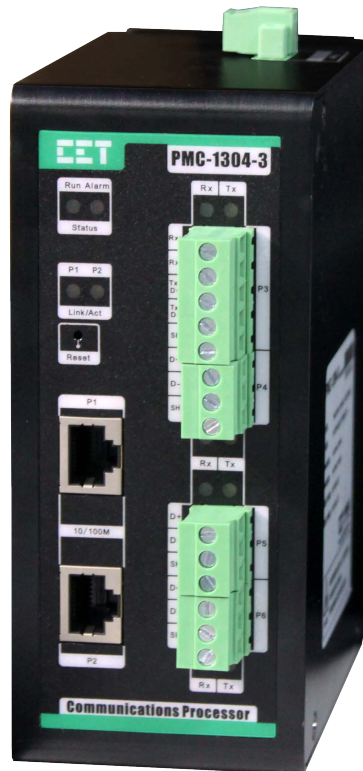
PMC-1304-3

Communications Processor

User Manual

Version: V1.0

July 26, 2016



This manual may not be reproduced in whole or in part by any means without the express written permission from EcoXplore PTE LTD

The information contained in this manual is believed to be accurate at the time of publication; however, EcoXplore assumes no responsibility for any errors which may appear here and reserves the right to make changes without notice. Please consult EcoXplore is your local representative for the latest product specifications.



DANGER

Failure to observe the following instructions may result in severe injury or death and/or equipment damage.

- Before connecting the device to the power source, check the label of the device to ensure that it is equipped with the appropriate power supply.
- Under no circumstances should the device be connected to a power source if it is damaged.
- Make sure the device is mounted to a well-grounded mounting surface.
- To prevent potential fire or shock hazard, do not expose the device to rain or moisture.
- DO NOT open or repair the device under any circumstances, unless it is clearly specified in the manual.

Limited warranty

- EcoXplore offers the customer a minimum of 12-month functional warranty on the device for faulty parts or workmanship from the date of dispatch from the distributor. This warranty is on a return to factory for repair basis.
- EcoXplore does not accept liability for any damage caused by device malfunctions. EcoXplore accepts no responsibility for the suitability of the device to the application for which it was purchased.
- Failure to install, set up or operate the device according to the instructions herein will void the warranty.
- Only EcoXplore's duly authorized representative may open your device. The unit should only be opened in a fully anti-static environment. Failure to do so may damage the electronic components and will void the

Table of Contents

Table of Contents	5
Chapter 1 Introduction.....	7
1.1 Overview	7
1.2 Features.....	7
1.3 Typical Applications.....	8
1.3.1 Single Networking	8
1.3.2 Dual Networking	9
1.4 Getting more information.....	11
Chapter 2 Installation.....	12
2.1 Appearance.....	12
2.2 Unit Dimension	12
2.3 Mounting.....	12
2.4 Power Supply Wiring	13
2.5 Chassis Ground Wiring	14
2.6 Ethernet Port Wiring	14
2.6.1 Straight through Connection.....	14
2.6.2 Cross-over Connection.....	15
2.7 Serial Port Wiring	15
2.7.1 P3 (RS-422/485) Wiring	15
2.7.2 P4/P5/P6 (RS485) Wiring	16
Chapter 3 Operating the PMC-1304-3	17
3.1 LED Indicators	17
3.2 Reset Button	17
Chapter 4 Configuring the PMC-1304-3 via the Web Console	18
4.1 On-line Web Console Login.....	18
4.2 Off-line Web Console Login.....	20
4.3 Web Interface	21
4.3.1 Device Settings.....	21
4.3.2 Channel Management	24
4.3.3 Data Cache Management	31
4.3.4 System Maintenance	35
Chapter 5 Modbus Register Map	40
5.1 Analog Input Register	40
5.2 Digital Input Register	40
5.3 Energy Register	41
5.4 Remote Control.....	41
5.5 SOE.....	41
5.6 Time	42
5.7 Data Recorder Log	42
5.8 Historic SOE Log	43
5.9 WFR Log.....	44
5.10 Device Information.....	45

Appendix A Technical Specifications..... 47

Appendix B Standards Compliance..... 49

Appendix C Ordering Guide 50

Contact us..... 51

Chapter 1 Introduction

This manual explains how to use the PMC-1304-3 Communications Processor. Throughout the manual the term “PMC-1304-3” generally refers to all models. Differences between models are indicated with the appropriate model number.

This chapter provides an overview of the PMC-1304-3 Communications Processor and summarizes many of its key features.

1.1 Overview

The PMC-1304-3 is the ideal embedded equipment for connecting RS-422 or RS-485 enabled serial devices to an IP-based LAN, making it possible for SCADA or other applications to access serial devices over a LAN for monitoring and control applications. The PMC-1304-3 has been specifically designed with industrial automation in mind and therefore provides un-surpassed performance and reliability under the harshest industrial environments. The basic Model, PMC-1304-3-T, provides Modbus Gateway function from Modbus TCP to RTU and supports interrogation from multiple Modbus Masters. The optional RTU Model, PMC-1304-3-R, provides Modbus Mastering capability with local data caching and logging to enhance overall system performance and redundancy. Not only does the RTU Model support the polling of Real-Time data, it also supports the uploading of Data Logs, Event Logs and Waveform Logs for EcoXplore devices that provide these advanced capabilities.

The PMC-1304-3 comes with Tx/Rx LEDs for the serial ports on the front panel. The LEDs not only indicate the network status but also help to monitor the communications activities of the attached serial devices.

The PMC-1304-3 can be setup through its user-friendly web console.

1.2 Features

- Dual 10/100BaseT (RJ45)
- Standard 2Xrs-485, optional 4Xrs-485
- Basic Model
 - ❖ Modbus Gateway function for 32 Slave IEDs per RS-485 or a maximum of 128 Slave IEDs per device
- RTU Model
 - ❖ Modbus Mastering, Local Data Caching and logging for 64 Slave IEDs per RS-485 port or 256 Slave IEDs per device for a maximum of 25,600 data points.
 - ❖ 2GB On-Board Log Memory, sufficient for storing data @ 60-minute interval for 900 days
 - ❖ Scheduled uploading of Data Log in CSV format to an external FTP Server
- The PMC-1304-3 is designed to withstand the harshest industrial environments
 - ❖ 15kV (contactless) & 6kV (contact) ESD protection and 3kV isolation protection for all Serial signals
 - ❖ 1.5kV isolation protection for Ethernet ports
- Simple port configuration via its built-in web interface
- DIN-Rail or Surface Mounting

Models and Functions

Functions	PMC-1304-3 Models	
	T	RTU
Modbus Gateway	▪	▪
Data collecting and Transmission	▪	▪
Local Data Logging		▪
Data Storing		▪
FTP/Uploading CSV Files		▪
Offline Configuration		▪
Online Configuration	▪	▪
Online Debugging		▪

▪ Supported

1.3 Typical Applications

The PMC-1304-3 is an ideal instrument to connect serial devices to an IP based Ethernet LAN for any industrial automation systems that require insulation protection as well as high reliability. With its built-in dual Ethernet ports, the PMC-1304-3 is capable of operating under a Single Networking or Dual Networking architecture.

1.3.1 Modbus TCP to RTU Gateway

The PMC-1304-3 supports the Modbus TCP to RTU Gateway function that makes it extremely simple for any Modbus TCP Master Application to interface with Modbus RTU enabled IEDs over a local area network. A simple web-based interface allows the users to easily configure the TCP to RTU address mapping as well as which downstream RS-485 port the Slave IEDs are located.

Notes for Basic Model:

- 32 Slave IEDs per RS-485 port or a maximum of 128 Slave IEDs per device
- 4 Modbus Masters per device

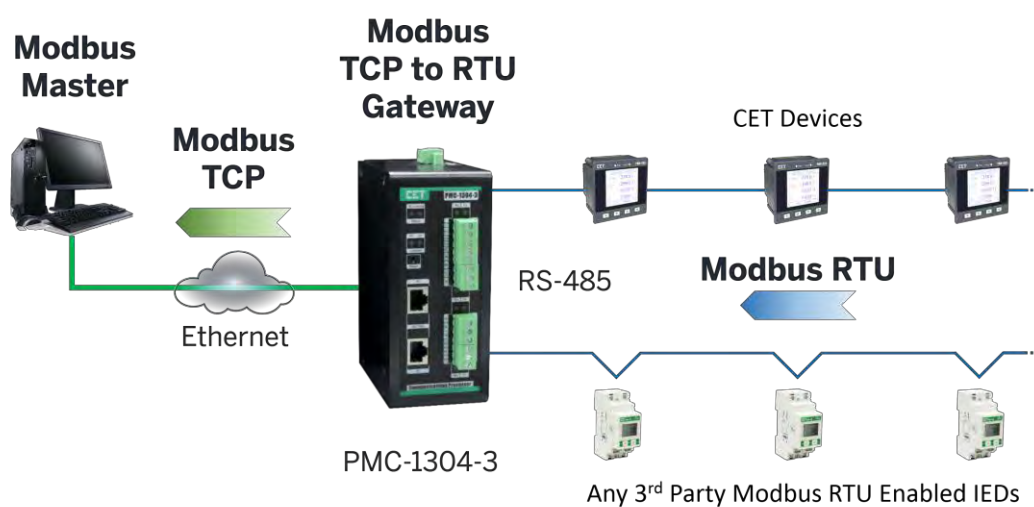


Figure 1-1 Modbus RTU to TCP Gateway

1.3.2 Multiple Modbus TCP Masters Support

The PMC-1304-3 supports multiple Modbus TCP Master simultaneously to facilitate information sharing while minimizing the implementation cost. For highly data or communication intensive applications. The RTU Model is recommended.

Notes for RTU Moles:

- 64 Slave IEDs per RS-485 port or a maximum of 256 Slave IEDs per device
- 16 Modbus Masters per device

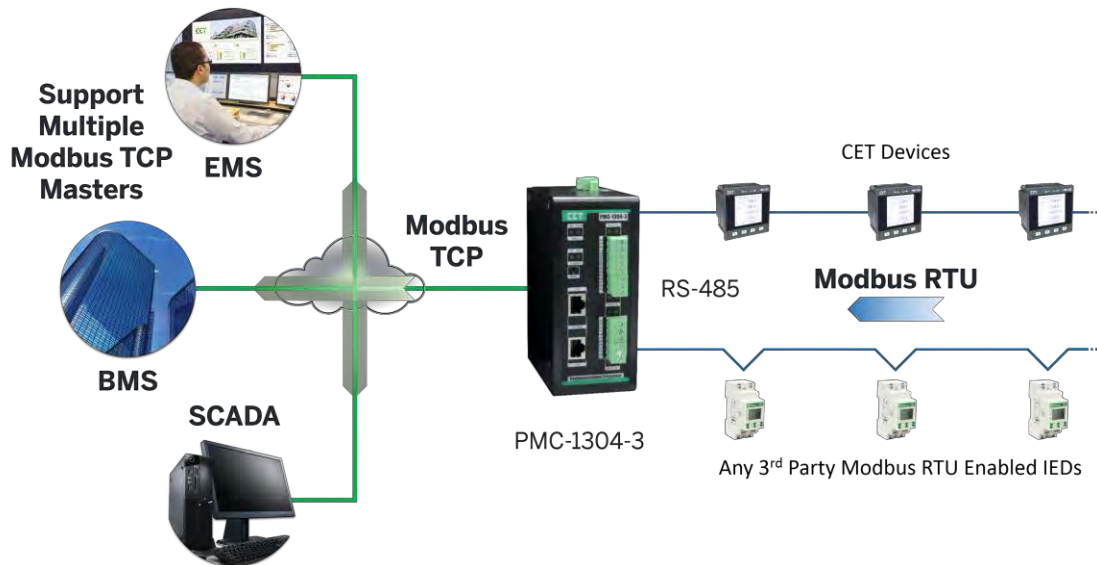


Figure 1-2 One PMC-1304-3 Serving 3 Modbus Masters Simultaneous

1.3.3 Data Logging

The RTU Model supports embedded Modbus RTU mastering as well as Local Data Caching and Data Logging of real-time parameters from Slave IEDs for a maximum of 25,600 data points. The device can be configured to perform data logging from 1-minute to 60-minute intervals. With its large on-board non-volatile Log Memory, the device is capable of storing interval. These features enhance the overall system performance and reliability, reduce the CPU loading of the Head-End applications such as EMS, BMS or SCADA and provide an extra level of data redundancy for IEDs without any on-board memory.

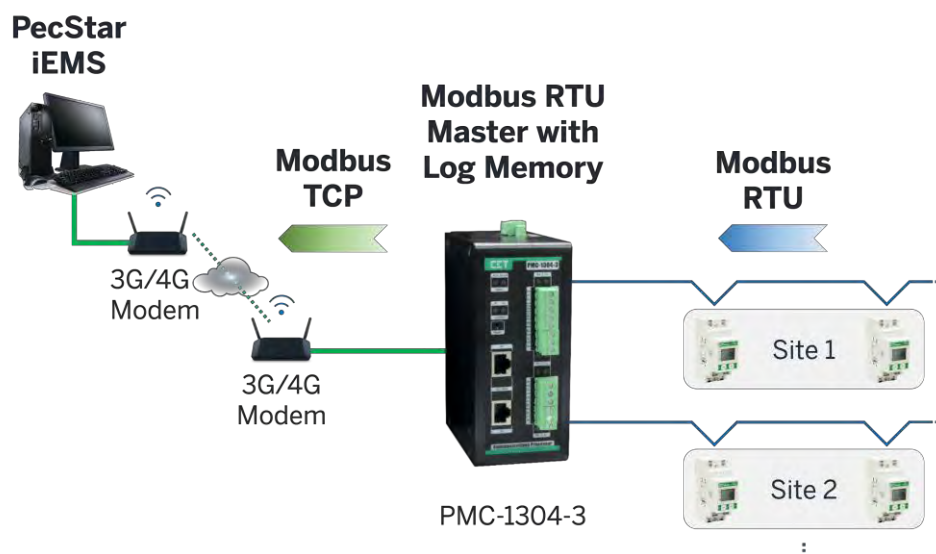


Figure 1-3 Multi-site Data Collection through 3G/4G Modems

In addition, the RTU Model may be deployed as a stand-alone Data Logger without any Head-End systems in a Local Area Network or in remote locations when it's paired with an external 3G/4G modem. The RTU Model's FTP allows manual access and uploading of historical information in zipped CSV format. This versatile function allows users to perform simple data logging of Slave IEDs locally or remotely without any expensive software.

Not only does the RTU Model support Modbus Slave Devices from ECOXPLORE, it can also support the Modbus RTU Mastering of practically and 3rd party Modbus IEDs with customized device drivers.

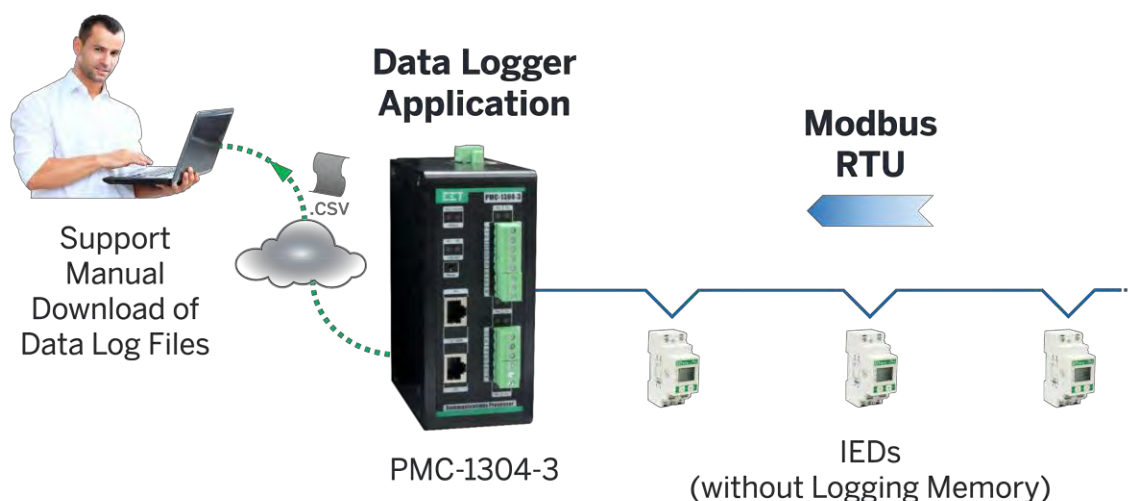


Figure 1-4 Stand-alone Data Logger Application

1.3.4 FTP Client Support

The RTU Model can be configured as an FTP Client to push the most recent data log files in CSV format to an external FTP Server over an intranet or internet at pre-determined intervals from hourly to weekly. This is especially useful for distributed or remote Energy Management applications where real-time data update is not required. The log files will be deposited at the FTP Server at scheduled intervals which can then be processed by 3rd party applications.

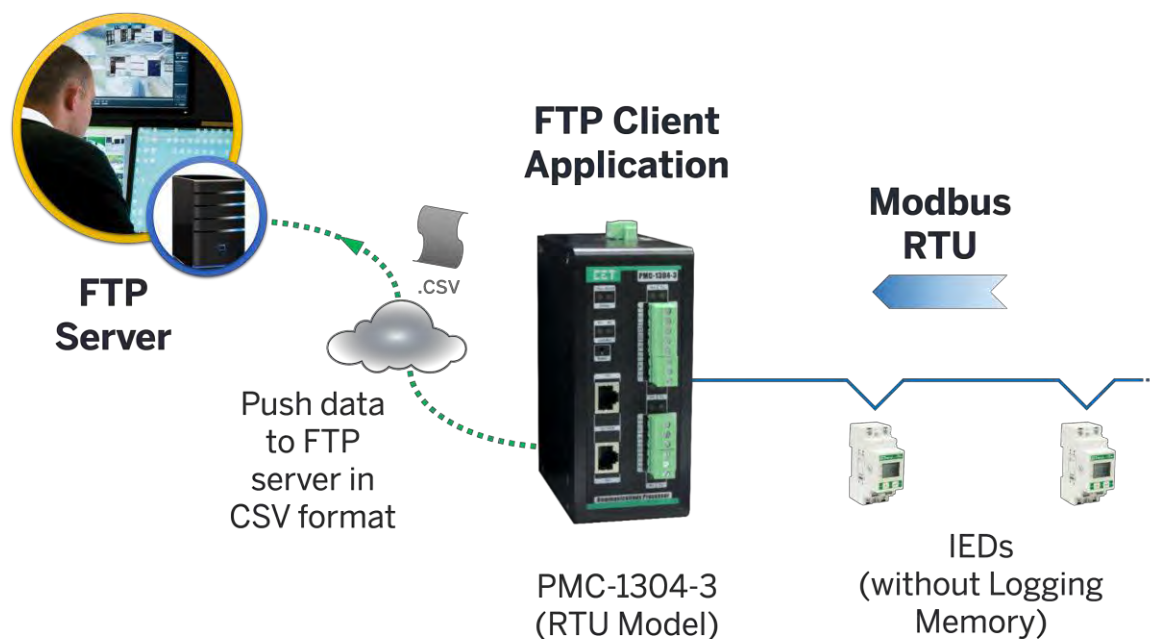


Figure 1-5 Data Push to FTP Server in CSV Format

The table below lists the PMC-1304-3's various historical data as per configured recording intervals which can be implemented by **IBD_admin**, please contact your local ECOXPLORE Representatives for authority for further configuration.

Recording Interval ()	Historical Data (Days)
1	15
5	60
10	120
15	180

1.4 Getting more information

Additional information is available from EcoXplore PTE LTD via the following sources:

- Visit www.EcoXplore.com
- Contact your local representative
- Contact EcoXplore directly via email or telephone

Chapter 2 Installation

2.1 Appearance

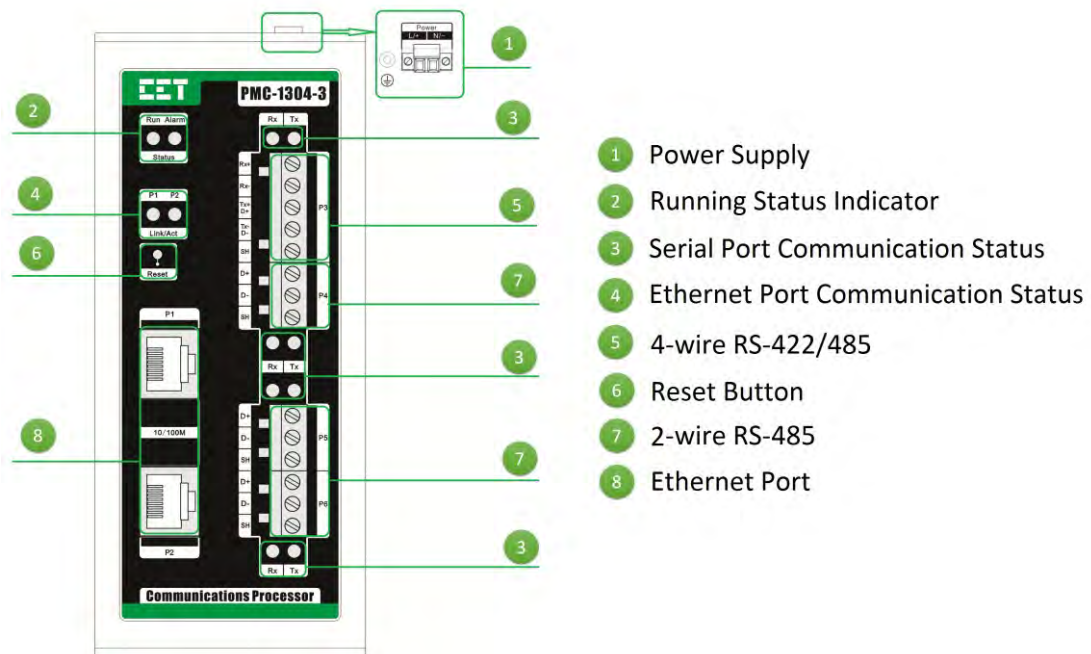


Figure 2-1 Appearance

2.2 Unit Dimension

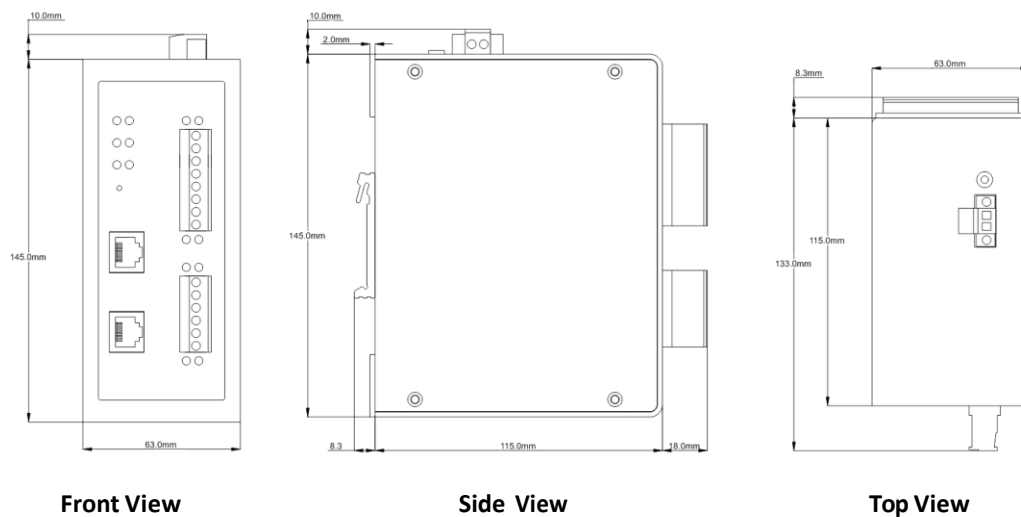


Figure 2-2 Unit Dimension

2.3 Mounting

The PMC-1304-3 should be installed in a dry environment with no dust and kept away from heat, radiation and electrical noise source.

DIN-Rail Mounting

Installation step:

- Before installation, make sure that the DIN rail is already in place
- Move the installation clip at the bottom of the PMC-1304-3 downward to the “unlock” position
- Mount the PMC-1304-3 on the DIN rail
- Push the installation clip upward to the “lock” position to secure the PMC-1304-3 on to the DIN Rail

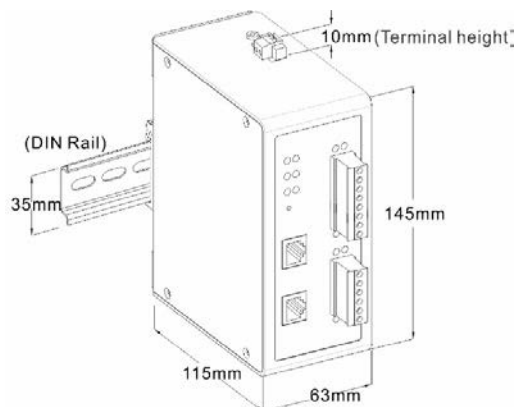


Figure 2-3 DIN-Rail Mounting

Surface Mounting

Installation steps:

- Pre-drill the mounting holes based on the mounting diagram as shown in Figure 2-4
- Fit the device through the cutout
- Use four screws to fix the device tightly against the panel

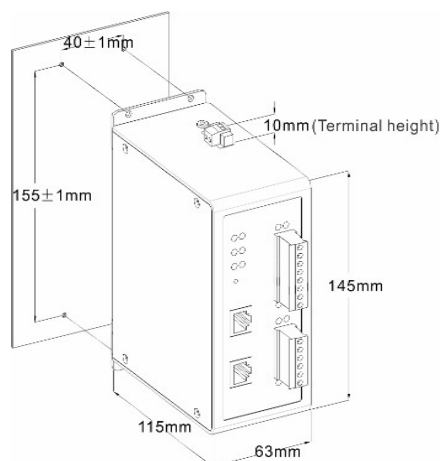


Figure 2-4 Surface Cutout Mounting

2.4 Power Supply Wiring

Please consult the serial number label to ensure that the supply voltage is within the range of the PMC-1304-3's power supply specifications.

For AC supply, connect the live wire to the L/+ terminal and the neutral wire to the N/- terminal.

For DC supply, connect the positive wire to the L/+ terminal and the negative wire to the N/- terminal.

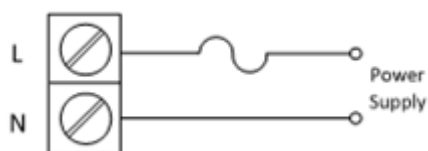


Figure 2-5 Power Supply Connections

2.5 Chassis Ground Wiring

Installation:

- Connect one end of the ground wire to the Chassis Ground terminal on the PMC-1304-3 using a spade connector
- Connect the other end of the ground wire to an Earth ground

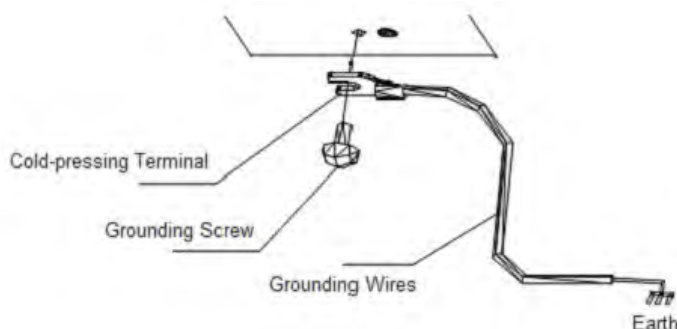


Figure 2-6 Chassis Ground Connection

2.6 Ethernet Port Wiring

Connect one end of the Ethernet cable to PMC-1304-3 Ethernet port and the other end of the cable to the Ethernet network.



Figure 2-7 RJ45 Connector

Pin	Meaning
1	Transmit Data+
2	Transmit Data-
3	Receive Data+
4,5,7,8	NC
6	Receive Data-

Table 2-1 RJ45 Connector Pin Description for 10/100BaseT Applications

2.6.1 Straight through Connection

A straight through RJ45 cable should be used if the PMC-1304-3 is connected to an Ethernet switch or hub. The following figure illustrates the definition of an 8-pin RJ45 straight through cable. The color-coded wires should be connected to the pins of the RJ45 connector as follows:

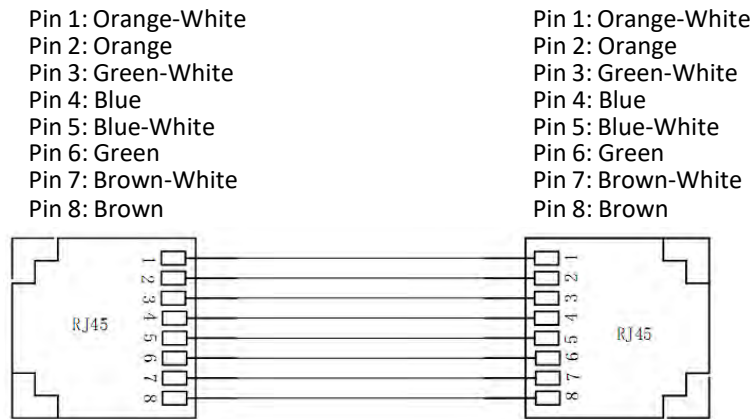


Figure 2-8 Straight through Connection

2.6.2 Cross-over Connection

A cross-over RJ45 cable should be used if the PMC-1304-3 is connected directly to a PC's Ethernet port. The following figure illustrates the definition of an 8-pin RJ45 cross-over cable. The color-coded wires should be connected to the pins of the RJ45 connector as follows:

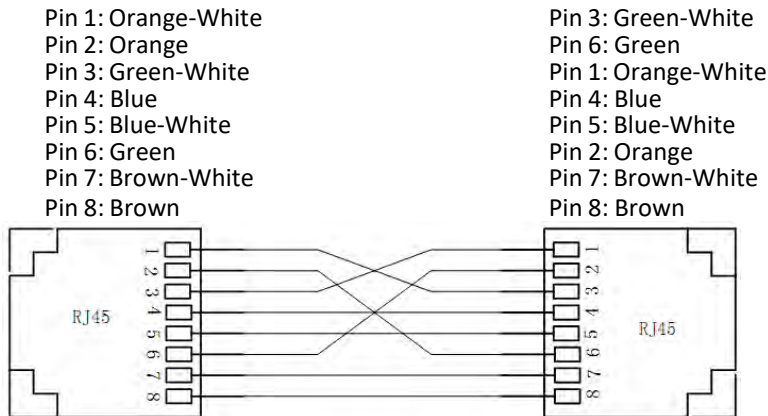


Figure 2-9 Cross-over Connection

2.7 Serial Port Wiring

2.7.1 P3 (RS-422/485) Wiring

The P3 port of PMC-1304-3 can be used as a RS-485 or a RS-422 port. The following figure illustrates the RS-422/485 communications connections on the PMC-1304-3:

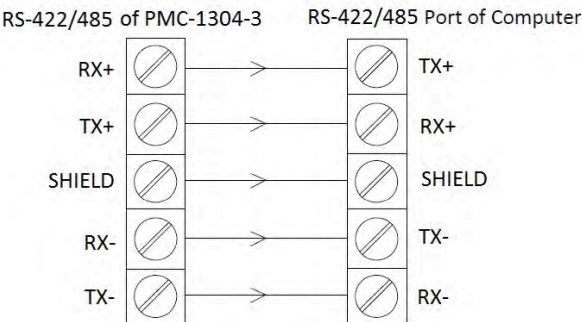


Table 2-3 RS-422/485 Connection

2.7.2 P4/P5/P6 (RS485) Wiring

The PMC-1304-3 provides three RS-485 ports (P4, P5 and P6). The following figure illustrates the RS-485 communications connections on the PMC-1304-3:

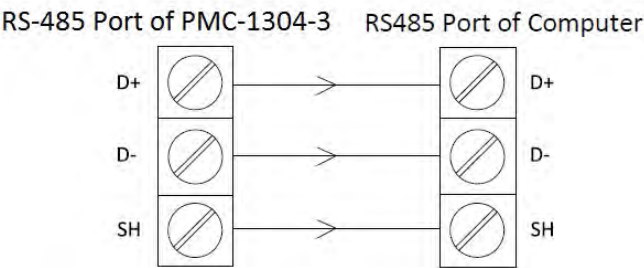


Table 2-3 RS-485 Connection

Chapter 3 Operating the PMC-1304-3

3.1 LED Indicators

There are 12 LED indicators on the PMC-1304-3's front panel as described in the following table.

LED Indicator		Color	Status	Description
RUN		Green	On	Abnormal Condition
			Off	Not powered up or abnormal condition
			Blinking	Working normally
Alarm		Red	On	Abnormal condition
			Blinking	Restoring default parameters
P1/P2		Yellow	On	Connected but no data activities
			Off	Disconnected
			Blinking	Data activities
P3~P6	Rx	Green	Blinking	Receiving data
	Tx	Yellow	Blinking	Transmitting data

Table 3-1 LED Indicators

3.2 Reset Button

The front panel has a **Reset** button. Use a pointed object, such as a straightened paper clip or the tip of a ball-point pen to access the **Reset** button.

- Press and hold the **Reset** button for less than 5 seconds will cause the PMC-1304-3 to initiate a reboot sequence. The reboot process would be completed when the **Run** indicator is off.
- Press and hold the **Reset** button for longer than 5 seconds will lead the PMC-1304-3 to reset to default, when the **Alarm** indicator will be on and off with 0.5 second interval, and then blinks for three times.

Chapter 4 Configuring the PMC-1304-3 via the Web Console

This section gives corresponding Web operations for the T Model and RTU Model.

- For the T Model, there is only On-line Web Console that can be used to configure a PMC-1304-3-T.
- For the RTU Model, PMC-1304-3-R Web Console has two programming modes: On-Line and Off-Line. The On-Line mode is used to query and configure a connected PMC-1304-3-R, while the Off-Line mode is used to configure most of parameters for a PMC-1304-3-R without physically connecting to the PMC-1304-3-R.

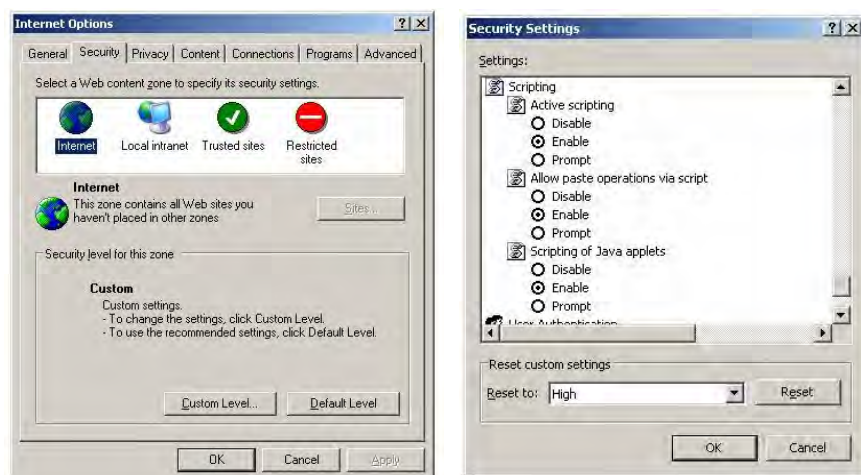
Web Console Menus and Models:

Menus		PMC-1304-3 Models	
1 st level	2 nd level	T	RTU
Device Settings	Network	▪	▪
	Time		▪
	FTP Password		▪
Channel Management	Channel Settings		▪
	Slave IED Management		▪
	Driver Management		▪
	Modbus Gateway	▪	▪
	Serial Port	▪	
Data Cache Management	Cache Management		▪
	Data Cache		▪
System Maintenance	Password Setup	▪	▪
	Statistic		▪
	Clear History		▪
	Backup/Restore	▪	▪
	System Information	▪	▪
	Reboot	▪	▪

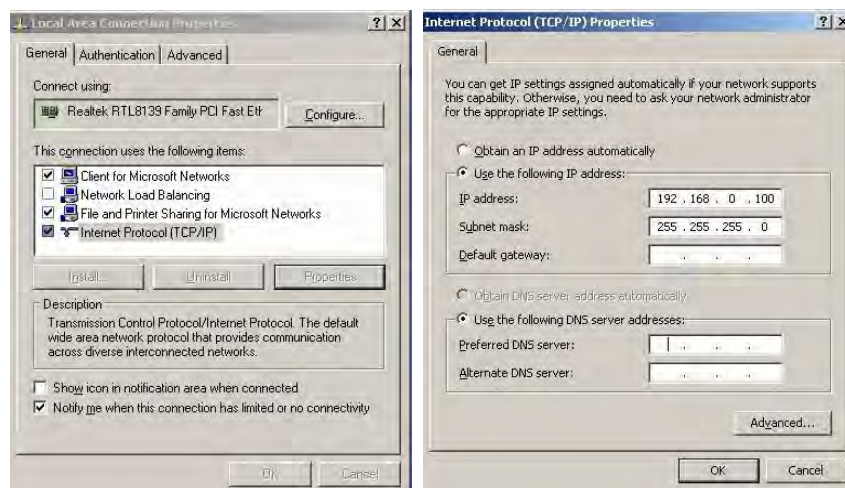
▪ Available

4.1 On-line Web Console Login

1) Open your Internet Explorer with the scripting function enabled. To enable scripting for your browser, right click on your Internet Explorer icon and select Properties from the pop-up dialog box. The **Internet Options** window appears. Select the Security tab and then click on the **Custom Level** button near the bottom of the window. The **Security Settings** window appears. Enable the three options as shown below and then click **OK**.



2) The default IP Addresses of the PMC-1304-3's two Ethernet Ports (P1 and P2) are 192.168.0.127 and 192.168.1.127, respectively. Configure the IP address of the PC to the same network segment as the connected Ethernet port. For example, configure the IP Address and the Subnet Mask of the PC as 192.168.0.100 and 255.255.255.0 as shown below, if connected to Ethernet Port 1 192.168.0.127. If connecting to Ethernet Port 2 of the PMC-1304-3, the PC's IP address and Subnet Mask should be configured as 192.168.1.100 and 255.255.255.0, respectively.



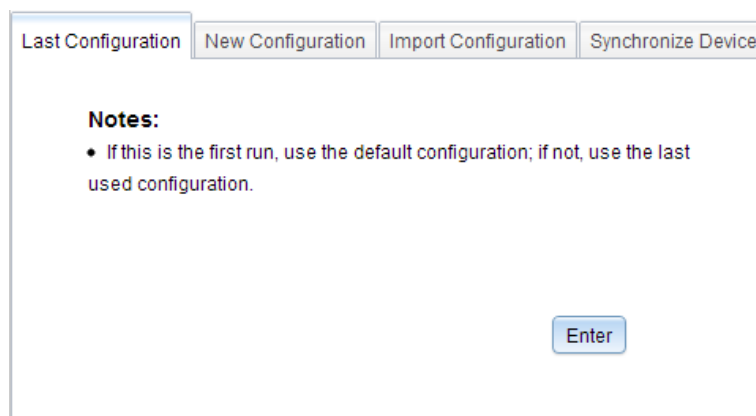
3) Enter the IP Address of the PMC-1304-3 in the Address input box of the Internet Explorer (IE) and then press <Enter>. The default IP address is 192.168.0.127 for Ethernet 1 and 192.168.1.127 for Ethernet 2.

4) The PMC-1304-3's On-line Web Console's Login page appears. Enter the User name and Password. The default user name is "user", and the default password is "123456".



4.2 Off-line Web Console Login

To run the PMC-1304-3 Off-Line Web Console, the program should be installed by double clicking the “PMC-1304-3 Web Console Setup.exe”. After installation, double click the “PMC-1304-3_EN” to open Off-Line Web Console. The PMC-1304-3’s Off-line Web Console’s Login page appears. Enter the User name and Password. The default user name is “user”, and the default password is “123456”. Click “Login” to choose the way to enter the Web Console.



Option	Description	Setting
Last Configuration	If the user is running it for first time, the New Configuration should be used, otherwise, select Last Configuration	
New Configuration	Select the model and then perform configuration based on its default one	Default: PMC-1304-3-R-00-04-2-T2-XX-XXXX-I
Import Configuration	Import a backup configuration file	
Synchronize Device: Synchronize the PMC-1304-3's device configuration to Off-Line Web Console via an Ethernet connection		
IP Address	Enter the static IP address of PMC-1304-3 to synchronize device configuration	0.0.0.0 to 255.255.255.255
Discover PMC-1304	Discover the IP addresses of all PMC-1304-3 in LAN to choose	
<Enter>	Enter the selected configuration page	

4.3 Web Interface

4.3.1 Device Settings

4.3.1.1 Network Settings

This option is available in both T Model and RTU Model. For the RTU Model, this option exists in both the On-Line and Off-Line programming modes.

Click on **Network** under **Device Settings** on the left-hand pane and the following screen appears. Modify the networking settings based on the actual situation. Click **<Submit>** and **<Save>** to save your changes. Please be reminded that the IP addresses for the two Ethernet ports should not be in the same subnet.

T Model:

PMC-1304 Web Console [Save] [Quit]

Device Settings (selected)
 Channel Management
 System Maintenance

Network (selected)
 Serial Port
 Modbus Gateway
 Password Setup
 Backup/Restore
 System Information
 Reboot

Ethernet 1
 IP Address: 192.168.0.127
 Subnet Mask: 255.255.255.0

Ethernet 2
 IP Address: 192.168.1.127
 Subnet Mask: 255.255.255.0

Others
 Default Gateway: 192.168.0.1

[Submit]

RTU Model:

The screenshot shows the 'PMC-1304 Web Console' interface. On the left is a sidebar menu with 'Device Settings' expanded, showing 'Network', 'Time', 'Channel Management', 'Data Cache Management', and 'System Maintenance'. The main area is titled 'Submit' and contains three sections: 'Ethernet 1', 'Ethernet 2', and 'Others'. Each section has input fields for 'IP Address' and 'Subnet Mask'. The 'Others' section has input fields for 'Default Gateway', 'DNS1', and 'DNS2'. At the top right of the console are 'Save' and 'Quit' buttons.

Option	Description	Setting
IP Address	Configure the PMC-1304-3's IP address	Default IP1 = 192.168.0.127 Default IP2 = 192.168.1.127
Subnet Mask	Configure the Subnet Mask	Default = 255.255.255.0
Default Gateway	Configure the Default Gateway's IP address	Default = 192.168.0.1
DNS1/DNS2	Configure the Domain Name System (DNS) that connected to the network. The two parameters are only available in the RTU Model.	Default = Null

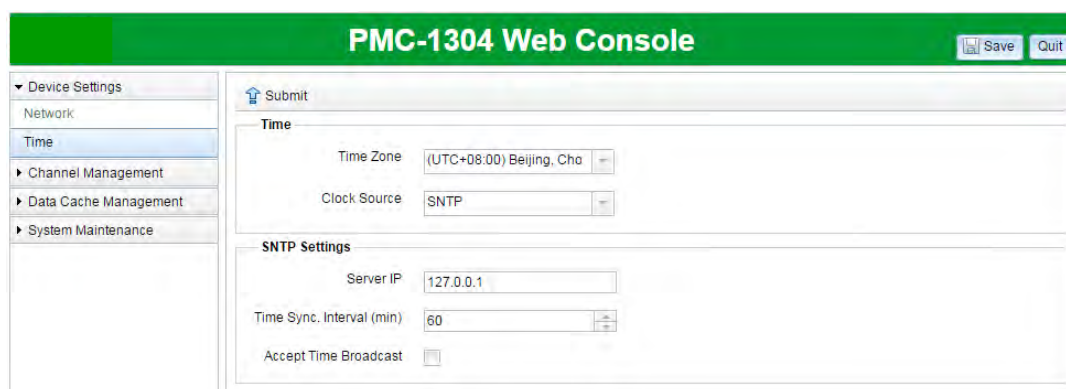
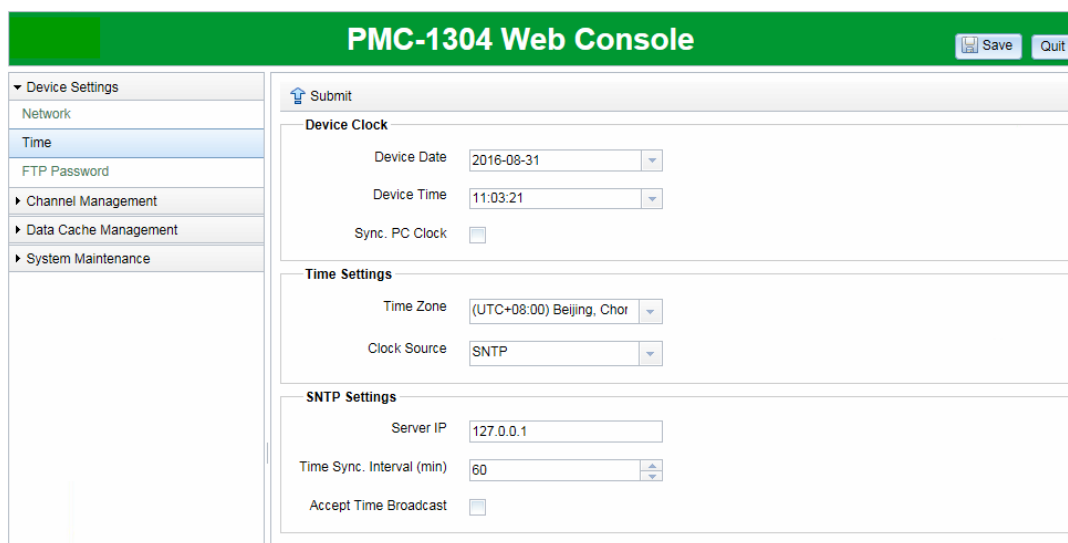
Notes:

- 1) The IP addresses for the two Ethernet ports must be in different subnets.
- 2) The Default Gateway must be in the same subnet as one of the IP addresses.
- 3) Click **<Submit>** at the upper left-hand corner of the right-hand pane to store the new configuration in a local cache before leaving this page.
- 4) Save configuration.
 - For on-line mode, click **<Save>** at the upper right-hand corner of the web page to save the new configuration and it will be take effect only after the device reboots.
 - For off-line model, click **<Save>** at the upper right-hand corner of the web page to save the new configuration to the device's configuration file that is stored on the PC for Off-Line programming and then synchronize the new configuration to the device via **System Maintenance > Backup/Restore > Synchronization Settings** menu.
- 5) Click **<Quit>** to leave the PMC-1304-3 Web Console. Please ensure that your changes have been saved before leaving.

4.3.1.2 Time Settings

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model.

Click on **Time** under **Device Settings** on the left-hand pane and the following screen appears. Click **<Submit>** and **<Save>** to save your changes after modification.

Off-line Mode:

On-line Mode:


Option	Description	Setting
Device Clock (On-line Mode)		
Device Date	Configure the device date	
Device Time	Configure the device time	
Sync. PC Clock	Synchronize with PC Clock by selecting check-box	Default = Disabled
Time Settings		
Time Zone	Configure the Time Zone	Default = UTC + 08:00
Clock Source	Select the clock source for Time Sync. RTC: Internal RTC SNTP: Simple Network Time Protocol	Default = RTC
SNTP Settings		
Server IP	Specify the SNTP Server's IP address	Default = 127.0.0.1
Time Sync. Interval (min)	Specify how often the PMC-1304-3 contacts the NTP server for the correct time	1 to 300 minutes Default = 60
Accept Time Broadcast	Allow the PMC-1304-3 to accept time broadcast	Default = disabled

Notes:

- 1) The Default Gateway must be properly configured if the SNTP Server is not located on the same subnet as one of the Ethernet ports.

4.3.1.3 FTP Password

The PMC-1304-3's built-web supports modifying FTP Password when the device is deployed as a FTP Client. This option only exists in the RTU Model's On-line programming mode. Click on **FTP Password** under **Device Settings** on the left-hand pane and the following screen appears. Enter the old username, old password, new user name and new password, and then click **Submit** to store the new password.

PMC-1304 Web Console [Save] [Quit]

▼ Device Settings

- Network
- Time
- FTP Password**
- ▶ Channel Management
- ▶ Data Cache Management
- ▶ System Maintenance

Submit

FTP Password Setup

Old Username

Old Password

New Username

New Password

Confirm Password

4.3.2 Channel Management

4.3.2.1 Channel Settings

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model.

Click on **Channel Settings** under **Channel Management** on the left-hand pane and the following screen appears.

PMC-1304 Web Console [Save] [Quit]

▼ Device Settings

- Network
- Time
- ▼ Channel Management
 - Channel Settings**
 - Slave IED Management
 - Driver Management
 - Modbus Gateway
- ▶ Data Cache Management
- ▶ System Maintenance

Submit

	Enabled	Description	Channel Config	Baudrate	Data Bits	Parity	Stop Bits	Advanced
P3	✓	Channel 1	ModbusMaster	9600	8	Even	1	⚙
P4	✓	Channel 2	ModbusMaster	9600	8	Even	1	⚙
P5	✓	Channel 3	ModbusMaster	9600	8	Even	1	⚙
P6	✓	Channel 4	ModbusMaster	9600	8	Even	1	⚙

Click on a particular parameter to modify the detailed settings.

Option	Description	Setting
Enabled	Checked if the Channel is enabled	Enabled by default
Description	Channel description	Default = "Channel X"
Channel Config	Only support ModbusMaster, cannot be modified	ModbusMaster
Baudrate	Select the Baudrate	300, 600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600, 115200

Data Bits	Select the number of Data Bits	5, 6, 7, 8*
Parity	Select the Parity setting	None, Odd, Even*, Mark, Space
Stop Bits	Select the number of Stop Bits	1*, 2

*Default

Advanced Settings

The screenshot shows a software window titled 'Edit' with a sub-section 'Advanced Settings'. It contains several input fields with numerical values and spin buttons for adjustment:

- Polling Delay (ms): 30
- Packet Timeout (ms): 1000
- Byte Timeout (ms): 20
- Transmit Delay (ms): 0
- Time Sync. Interval (s): 300
- Loop Delay (s): 0
- Reserved: (empty field)

Option	Description	Setting
Polling Delay (ms)	Time delay between the requests of consecutive Slave IEDs	0 to 60000 ms Default = 30
Packet Timeout (ms)	The maximum waiting time for a response packet	0 to 60000 ms Default = 1000
Byte Timeout (ms)	Specify the maximum amount of time between the reception of two consecutive bytes before a packet frame is considered to have ended	0 to 60000 ms Default = 20
Transmit Delay (ms)	Time delay for sending the next request packet after the last response packet has been received	0 to 60000 ms Default = 0
Time Sync. Interval (s)	Select how often the Time Sync. Packets are sent	0 to 60000 s Default = 300
Loop Delay (s)	Time delay between successive scans of the entire loop of Slave IEDs	0 to 60000 s Default = 0
Reserved	Enter extended parameters	Default =Null

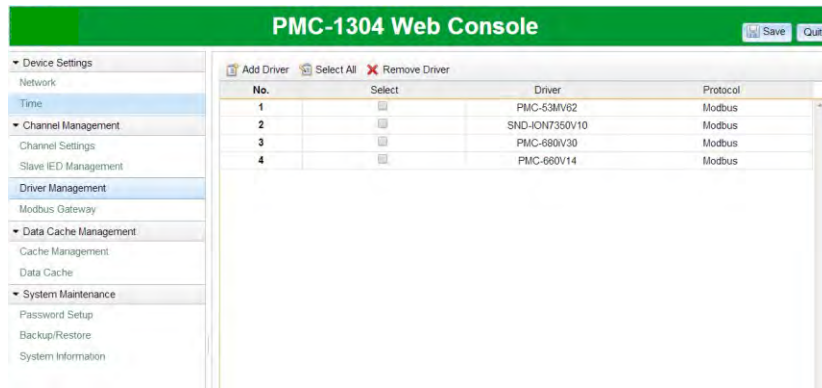
Notes:

- 1) Only experienced personnel should modify the Advanced Settings of the PMC-1304-3.

4.3.2.2 Driver Management

This option exists in both the On-Line and Off-Line programming modes, but only for the RTU Model. For the On-Line mode, only .SO file can be uploaded while .DRI file can be uploaded for the Off-Line mode.

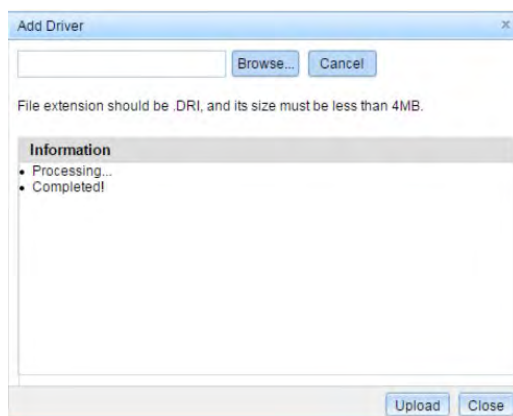
Click on **Driver Management** under **Channel Management** on the left-hand pane and the following screen appears.



Option	Description	Setting
Add Driver	Add a new Driver by clicking Add Driver	
Select All	Select all drivers	
Remove Driver	Remove the selected (checked) driver(s)	
Select	Select a Driver by checking the check box	Default = Un-checked
Driver	Driver Description	
Protocol	The Protocol implemented for the Driver	

Notes:

- 1) Once the driver has been removed, all devices requiring this driver will be removed, and their corresponding data will become N/A.

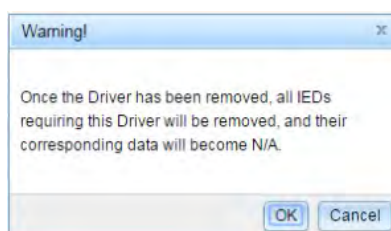
Add Driver

Click **Browse...** to select a .DRI file and the file size must be less than 4MB.

Click **Upload**, the process information will be shown under **Information**.

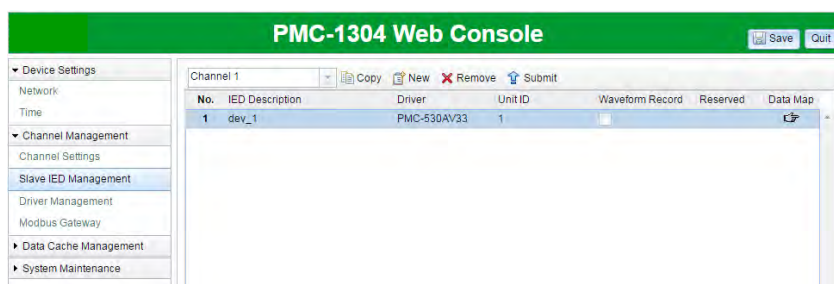
Remove Driver

Select a driver from the driver list and click **Remove Driver**, the warning information will be shown as below. Click **OK** to remove the driver and **Cancel** to give up removing.

**4.3.2.3 Slave IED Management**

This option exists in both On-Line and Off-Line programming modes, but only for RTU Model. Please note that before adding slave IED, the corresponded drivers should be configured.

Click on **Slave IED Management** under **Channel Management** on the left-hand pane and the following screen appears.

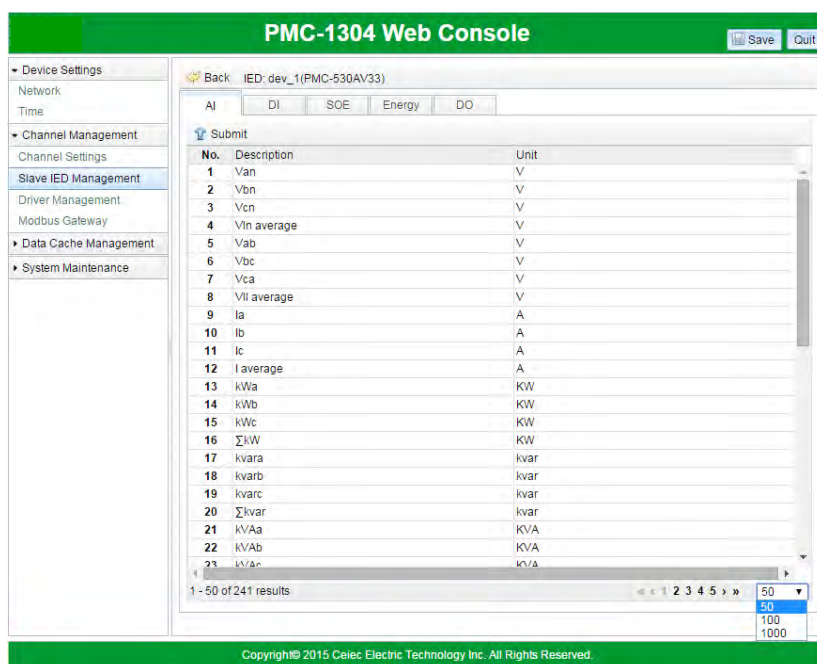


Option	Description	Setting
Channel X	Select the Channel to modify	Channel 1 to 4
Copy	Copy from this Channel to another	
New	Add a new Slave IED	
Remove	Remove the selected Device	
No.	IED number	
IED Description	IED description	Maximum 51 characters
Driver	Driver description	
Unit ID	Slave IED Unit ID	
Waveform Record	Enable the collection of Waveform Records for ECOXPLORE devices that support this feature	Enable or Disable Default = Disable
Reserved	Enter extended parameters	NULL = Default
Data Map	View Driver's Data Map for the IED	

Notes:

- 1) Once the slave IED has been removed, its corresponding data will become N/A.
- 2) Use <Shift> and <Ctrl> keys to select multiple devices.

Click on  icon on the right side to reveal the data mapping information for a particular Driver as illustrated below. The data mapping is divided into five categories: AI (Analog Input), DI (Digital Input), SOE (Sequence of Event), Energy (Electrical energy) and DO (Digital Output).



PMC-1304 Web Console

Back: IED: dev_1(PMC-530AV33)

AI DI SOE Energy DO

Submit

No.	Description	Unit
1	Van	V
2	Vbn	V
3	Vcn	V
4	Vin average	V
5	Vab	V
6	Vbc	V
7	Vca	V
8	Vll average	V
9	Ia	A
10	Ib	A
11	Ic	A
12	I average	A
13	kWa	KW
14	kWb	KW
15	kWc	KW
16	ΣkW	KW
17	kvara	kvar
18	kvarb	kvar
19	kvarc	kvar
20	Σkvar	kvar
21	kVAa	KVA
22	kVAb	KVA
23	kVAc	KVA

1 - 50 of 241 results

Copyright© 2015 Celec Electric Technology Inc. All Rights Reserved.

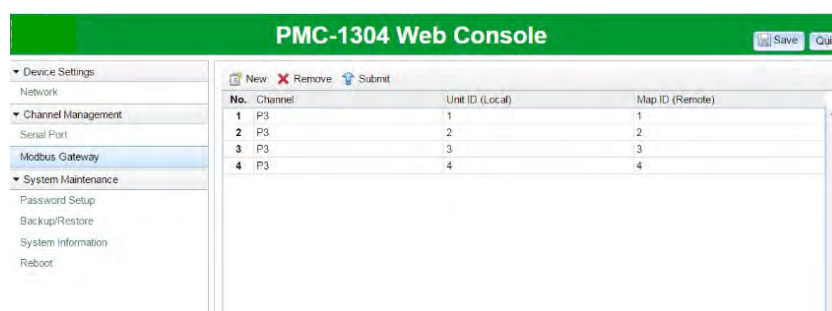
Option	Description	Setting
<Back>	Return to Slave IED Management page	
IED: XXXX	IED's name and Driver info.	
AI	Analog Input data	
DI	Digital Input data	
SOE	Sequence of Event	
Energy	Electrical energy data	
DO	Digital Output data	
Description	Parameter name	Maximum 31 characters
Unit	Measurement unit	

4.3.2.4 Modbus Gateway

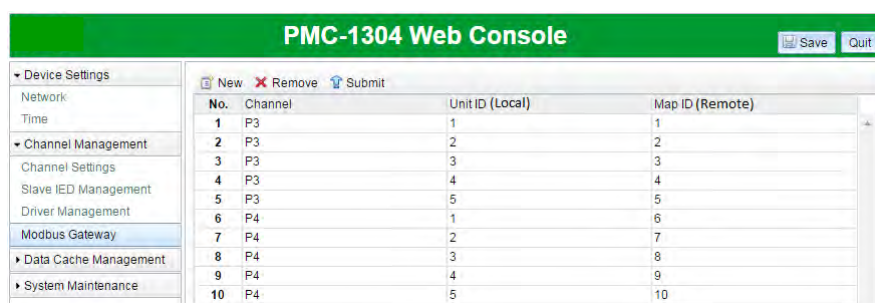
This option is available in both T and RTU Models. For the RTU Model, it exists in both the On-Line and Off-Line programming modes.

Click on **Modbus Gateway** under **Channel Management** on the left-hand pane and the following screen appears. **Modbus Gateway** is used to configure mapping relationship between Ethernet and Modbus Gateway of the serial port.

T Model:



RTU Model:



Option	Description	Setting
New	Add a new mapping relationship by clicking New .	
Remove	Remove the selected mapping relationship.	
No.	Modbus Gateway number	
Channel	Channel P3 to P6.	
Unit ID (Local)	Serial Device's Unit ID, each of channel's unit ID must be unique.	1~247
Map ID (Remote)	Ethernet Mapping ID, each of Map ID must be unique, no matter it belongs to same channel or not.	1~247

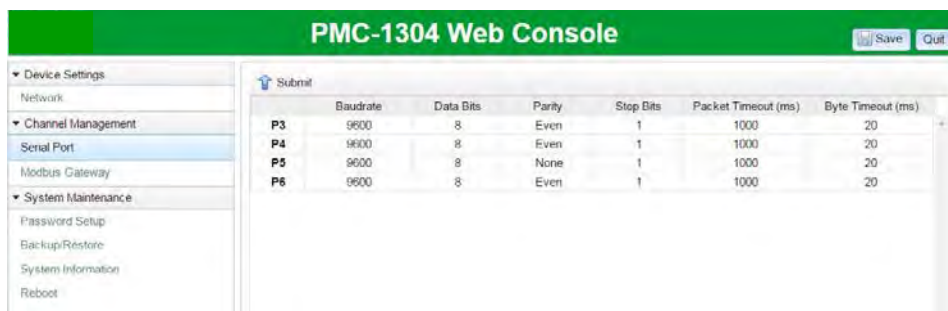
Notes:

- 1) The default port number of Modbus Gateway is 502.

4.3.2.5 Serial Port

This option is only available in the T model.

Click on **Serial Port** under **Channel Management** on the left-hand pane and the following screen appears.



Option	Description	Setting
Baudrate	Select the Baudrate	300, 600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600, 115200
Data Bits	Select the number of Data Bits	5, 6, 7, 8*
Parity	Select the Parity setting	None, Odd, Even*, Mark, Space
Stop Bits	Select the number of Stop Bits	1*, 2
Packet Timeout (ms)	The maximum waiting time for a response packet	0 to 60000 ms Default = 1000
Byte Timeout (ms)	Specify the maximum amount of time between the reception of two consecutive bytes before a packet frame is considered to have ended	0 to 60000 ms Default = 20

Notes:

- 1) PMC-1304-3 supports up to 16 TCP connections for Client access over Ethernet.

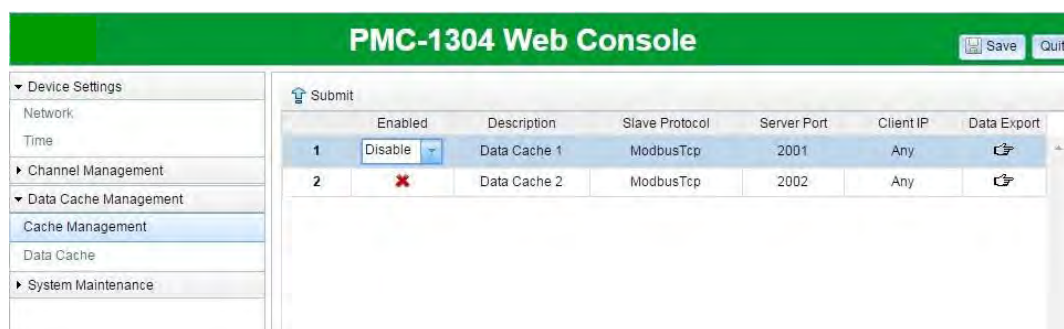
4.3.2 Data Cache Management

This option is only available in the RTU Model. RTU Model can serve as a standalone data logger which provides 2GB On-Board Memory, sufficient for storing data from downstream IED @ 60 minutes interval for 900 days.

4.3.2.1 Cache Management

This option exists in both the On-Line and Off-Line programming modes.

Click on **Cache Management** under **Data Cache Management** on the left-hand pane and the following screen appears.



Option	Description	Setting
Enabled	Enable the Data Cache	Enable or Disable Default = Disable
Description	Data Cache Name	Default = Data Cache X
Slave Protocol	Only support ModbusTcp and cannot be modified.	Default = ModbusTcp
Slave Port	Slave Communications Port	Default = 2001 to 2002
Client IP	If the IP address is entered, only the Client with the specified IP Address will have access to this particular Data Cache. Otherwise, keep it empty to allow access by any Clients.	0.0.0.0 to 255.255.255.255 Default = Any

Notes:

- 1) PMC-1304-3 supports up to 16 TCP connections for Client access over Ethernet.

Data Export Setting

Click the  icon on the right to edit the Data Cache configuration.

The following dialog box displays in the Basic Settings when the Slave Port is set to Ethernet.

The screenshot shows a configuration window titled 'Edit'. It contains three main sections:

- Logging:** An 'Interval' dropdown menu is set to '5 min'. To the right, it indicates a retention of '≈75 Days'.
- Schedule:**
 - 'Interval' dropdown is set to '1 Hour'.
 - 'Time of Day' dropdown is set to '00:00'.
 - 'Day of the Week' dropdown is set to 'Sunday'.
- FTP Server:**
 - 'Server': An empty text input field.
 - 'Server Port': A dropdown menu set to '21'.
 - 'Username': An empty text input field.
 - 'Password': An empty text input field.
 - 'Directory': An empty text input field.
 - 'Mode': A dropdown menu set to 'Passive'.

Option	Description	Setting
Logging		
Interval	The interval of storing data that belong to the channel.	1~60min
Schedule		
Interval	The interval of FTP server uploads CSV file. When the Logging's Interval is set to 1min, the weekly option for Schedule's Interval is not available.	1hour, 4hour, 8hour, 12hour, daily, weekly
Time of Day	Configure a fixed time to upload CSV file. This is valid only Interval is set to Daily or Weekly.	Default = 00:00
Day of the Week	Configure a fixed day to upload CSV file. This is valid only Interval is set to Weekly.	Default = Sunday
FTP Server		
Server	FTP Server IP address or domain name.	
Server Port	FTP Server port.	Default = 21
User Name	The user name to login FTP Server.	
Password	The password to login FTP Server.	
Directory	The directory that store CSV files.	
Mode	The mode of FTP Server.	Passive (Default), Active

Notes:

- 1) The On-line mode support testing configuration via clicking **Test Data Export**.

The screenshot shows a web-based configuration window titled "Edit". At the top, there is a tab labeled "Test Data Export" which is highlighted with a red rectangle. Below the tab, the window is divided into three main sections: "Logging", "Schedule", and "FTP Server".

- Logging:** Contains an "Interval" dropdown set to "1 min" and a text field showing "≈15 Days".
- Schedule:** Contains an "Interval" dropdown set to "8 Hour", a "Time of Day" dropdown set to "00:00", and a "Day of the Week" dropdown set to "Sunday".
- FTP Server:** Contains several input fields: "Server" (empty), "Server Port" (set to "21"), "Username" (empty), "Password" (empty), "Directory" (empty), and "Mode" (set to "Passive").

4.3.2.2 Data Cache

This option exists in both the On-Line and Off-Line programming modes. Click on **Data Cache** under **Data Cache Management** on the left-hand pane and the following screen appears.

Off-line Mode:

The screenshot shows the "PMC-1304 Web Console" interface. The title bar is green with the text "PMC-1304 Web Console" and "Save" and "Quit" buttons. On the left, there is a navigation pane with a tree view containing "Device Settings", "Channel Management", "Data Cache Management", "Cache Management", "Data Cache", and "System Maintenance". The "Data Cache" item is selected and highlighted in blue.

The main content area displays the "Data Cache 1" configuration. It includes a dropdown menu for "Data Cache 1", buttons for "Add Parameters", "Copy", and "Export Parameters to Excel". Below these are tabs for "AI", "DI", "SOE", "Energy", and "DO". There are also buttons for "Remove Parameters", "Delete Parameters", "Sort", and "Submit". At the bottom, there is a table with the following headers: "No.", "Parameter Description", "IED Description", "Channel Description", "Scaling Factor", and "Deadband(%)". The table is currently empty.

On-line Mode:

PMC-1304 Web Console Save Quit

Device Settings

Network

Time

Channel Management

Data Cache Management

Cache Management

Data Cache

System Maintenance

Password Setup

Statistics

Clear History

Backup/Restore

System Information

Reboot

Data Cache 1

Refresh Export Data Log

AI DI SOE Energy DO

No.	Parameter Description	IED Description	Channel Description	Scaling Factor	Deadband(%)	Real-time Value	Unit
1	Van	test(PMC-D726MV10)	Channel 2	1.000	1.000	219.540	
2	Vbn	test(PMC-D726MV10)	Channel 2	1.000	1.000	219.510	
3	Vcn	test(PMC-D726MV10)	Channel 2	1.000	1.000	219.430	
4	Vln average	test(PMC-D726MV10)	Channel 2	1.000	1.000	219.490	
5	Vab	test(PMC-D726MV10)	Channel 2	1.000	1.000	380.250	
6	Vbc	test(PMC-D726MV10)	Channel 2	1.000	1.000	380.200	
7	Vca	test(PMC-D726MV10)	Channel 2	1.000	1.000	380.060	
8	Vll average	test(PMC-D726MV10)	Channel 2	1.000	1.000	380.170	
9	Ia	test(PMC-D726MV10)	Channel 2	1.000	1.000	5.001	
10	Ib	test(PMC-D726MV10)	Channel 2	1.000	1.000	5.001	
11	Ic	test(PMC-D726MV10)	Channel 2	1.000	1.000	5.000	
12	I average	test(PMC-D726MV10)	Channel 2	1.000	1.000	5.001	
13	kWa	test(PMC-D726MV10)	Channel 2	1.000	1.000	0.992	
14	kWb	test(PMC-D726MV10)	Channel 2	1.000	1.000	0.991	
15	kWc	test(PMC-D726MV10)	Channel 2	1.000	1.000	0.992	

1 - 29 of 29 results

Copyright© 2015 Celec Electric Technology Inc. All Rights Reserved.

Option	Description	Setting
Data Cache X	Select which Cache to modify	
Add Parameters	Add parameters to the selected Data Cache	
Copy	Copy parameters from the selected Data Cache to another Data Cache	
Export Parameters to Excel (Off-line mode)	Export all the parameters in selected Data Cache to Excel	
Export Data log (On-line mode)	Export data logs to Excel file. Users can open the excel file or save it after clicking Export Data Log .	
AI ¹	Analog Input data for the selected Data Cache	
DI ²	Digital Input data for the selected Data Cache	
SOE ³	Sequence Of Events for the selected Data Cache	
Energy ⁴	Electrical Energy data for the selected Data Cache	
DO ⁵	Digital Output data for the selected Data Cache	
Remove Parameters	Remove the selected parameters and fill the original position with N/A, a null parameter	
Delete Parameters	Delete the selected parameters to delete shift the next parameters up by one position	
Sort	The parameters which have been removed will be deleted from the list, and the remaining parameters will be sorted again.	
No.	Parameter index	
Parameter Description	View-only Parameter name	
IED Description	View-only IED name	
Channel Description	The Channel to which a parameter belongs	

Scaling Factor	PMC-1304-3 transmits the product of real-value and scaling factor. This is only valid for IEC101 or IEC104.	0.001 to 1000 Default = 1.000
Deadband	When the value of a parameter fluctuates by an amount that is larger than the specified Deadband, PMC-1304-3 will upload the value to the Master using Report by Exception. This is only valid for IEC101 or IEC104	0.001 to 100 Default = 1.000

Notes:

- 1) The maximum no. of AI in each Data Cache is 2048.
- 2) The maximum no. of DI in each Data Cache is 2048.
- 3) The maximum no. of SOE in each Data Cache is 1024.
- 4) The maximum no. of Energy in each Data Cache is 1024.
- 5) The maximum no. of DO in each Data Cache is 512.
- 6) Use <Shift> and <Ctrl> keys to select multiple devices.

4.3.2 System Maintenance**4.3.2.1 Password Setup**

This option is available in both T and RTU Models. For RTU Models, this option exists in both the On-Line and Off-Line programming modes. However, on-line mode and off-line mode have their own password, please login corresponding web to modify passwords.

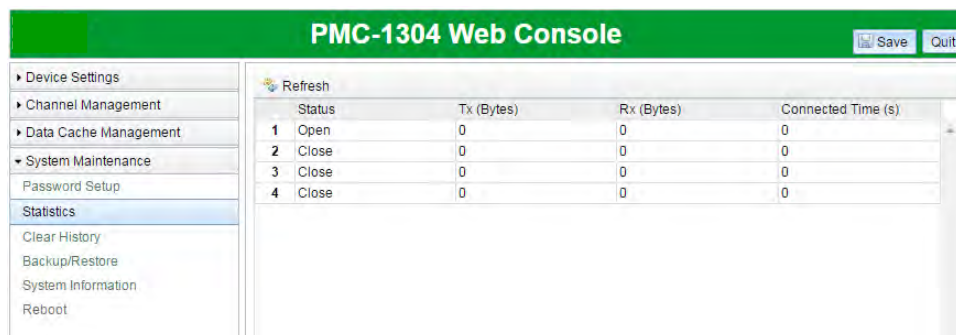
Click on **Password Setup** under **System Maintenance** on the left-hand pane and the following screen appears. Click <Submit> and then <Save> to save your changes after modification.

Option	Description	Setting
Old User Name	Enter the old user name	
Old Password	Enter the old password	
New User Name	Enter the new user name	The new User Name cannot be admin .
New Password	Enter the new password	
Confirm Password	Confirm the new password	

4.3.2.2 Channel Debugging

The RTU Model has capacity of debugging channels and capturing four channels sending and receiving message. However, this menu only exists in both the On-Line programming modes.

Click on **Statistics** under **System Maintenance** on the left-hand pane and the following screen appears.

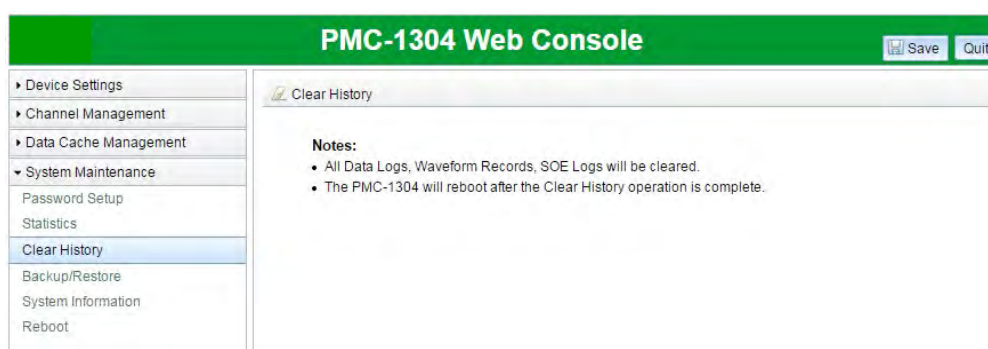


Option	Description	Setting
Status	The status of the serial port, open or closed.	
Tx (Bytes)	The data (bytes) that the device transmitted.	
Rx (Bytes)	The data (bytes) that the device received.	
Connected Time (s)	The time the serial port has been connected.	

4.3.2.3 Clear History

This option only exists in the RTU Model's on-line programming mode.

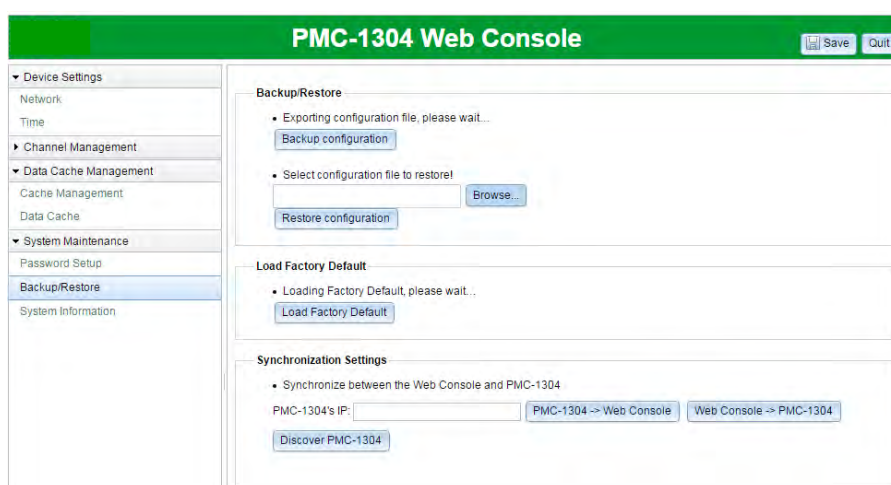
Click on **Clear History** under **System Maintenance** on the left-hand pane and the following screen appears. Click **Clear History** to clear all data logs, waveform records and SOE logs. Once clear completed, the device will reboot automatically.



4.3.2.4 Backup/Restore

This option is available in both T and RTU Models. For the RTU Models, this option exists in both the On-Line and Off-Line programming modes.

Click on **Backup/Restore** under **System Maintenance** on the left-hand pane and the following screen appears.

T Model:**RTU Model:**

Option	Description	Setting
Backup Configuration	Create a backup copy, named “cmdata.cfg”, of the Web Console’s configuration on the local computer.	
Browse	Select a configuration file on the local computer to restore to the Web Console	
Restore Configuration	Restore the selected configuration to the Web Console	
Load Factory Default	Reset all settings of the Web Console’s configuration file to factory default. All previous settings are overwritten.	
PMC-1304’s IP*	Specify the IP address of the PMC-1304-3 to synchronize	0.0.0.0 to 255.255.255.255
PMC-1304 -> Web Console**	Upload the complete configuration from the connected PMC-1304-3 to the Web Console	
Web Console -> PMC-1304**	Download the complete configuration from the Web Console to the connected PMC-1304-3	
Discover PMC-1304**	Discover if there are any PMC-1304-3 devices on the LAN and list their IP addresses	

* This option exists only in the Off-Line programming mode.

This option exists only in the RTU Model.

4.3.2.5 System Information

This option is available in both T and RTU Models. For the RTU Model, it exists in both the On-Line and Off-Line programming modes.

Click on **System Information** under **System Maintenance** on the left-hand pane and the following screen appears. The user will need to select the correct PMC-1304-3 model by specifying the requested information here to create a factory default configuration for making further changes. It's not recommended to use this option to create an off-line configuration file for a PMC-1304-3. It would be easier and safer for the user to connect to a real PMC-1304-3 for the first time and then to upload its configuration for future off-line changes.

T Model:

PMC-1304 Web Console

Submit

Model: PMC-1304-3-T-00-04-2-T2-XX-XXXX-E

Information

Name: PMC-1304-3

Version: 1.00.11

Date: 2016.01.15

S/N: 1507250001

MAC 1: 00-00-03-ef-68-11

MAC 2: 00-00-93-ef-68-12

RTU Model:

PMC-1304 Web Console

Submit

Model: PMC-1304-3-R-00-04-2-T2-XX-XXXX-E

Information

Name: PMC-1304-3

Version: 1.00.10

Date: 2015-10-19

S/N: 1307230001

MAC 1: 00-00-93-ef-68-11

MAC 2: 00-00-93-ef-68-12

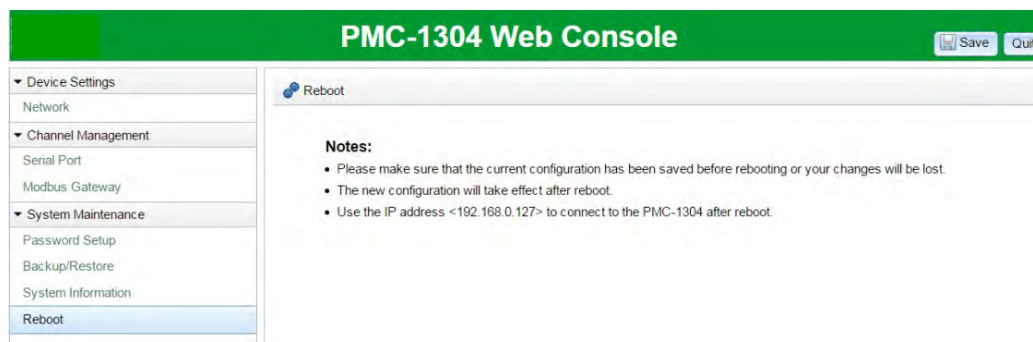
Option	Description	Setting
Model	Select the correct model for configuration	Default = PMC-1304-3-T-00-04-2-T2-XX-XXXX-E /PMC-1304-3-R-00-04-2-T2-XX-XXXX-E
Name	Specify a name for the PMC-1304-3	Default = PMC-1304-3 (Max. 31 characters)
Version	Firmware Version	
Date	Firmware's Date and Time	
S/N	Device's Serial Number	
MAC1	MAC address of Ethernet Port 1	
MAC2	MAC address of Ethernet Port 2	

4.3.2.6 Reboot

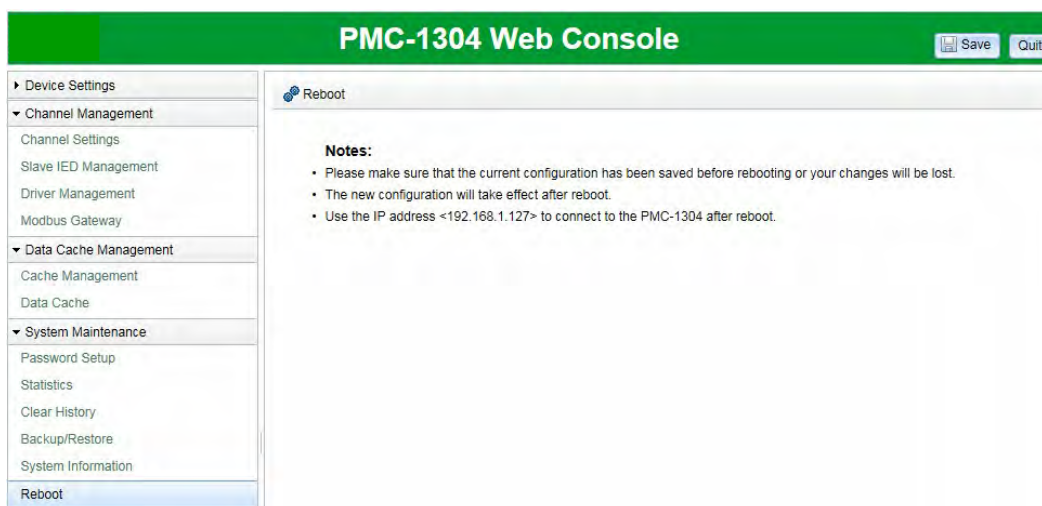
This option is available in both T and RTU Models. For the RTU Model, it exists only in the On-Line programming mode.

Click on **Reboot** under **System Maintenance** on the left-hand pane and the following screen appears. After reading notes carefully, users can click **Reboot** to restart the device.

T Model:



RTU Model:



Chapter 5 Modbus Register Map

This chapter provides a complete description of the Modbus register map (Protocol Version 1.1 and above) for the PMC-1304-3-R communication processor to facilitate the development of 3rd party communication driver for accessing information on the RTU Model.

The PMC-1304-3-R supports the following Modbus function:

- 1) Read Holding Registers (Function Code 0x03)
- 2) Force Single Coil (Function Code 0x05)
- 3) Preset Multiple Registers (Function Code 0x10)

For a complete Modbus Protocol Specification, please visit <http://www.modbus.org>.

5.1 Analog Input Register

Register	Property	Description	Format
40000	RO	AI1	Float
40002	RO	AI2	Float
40004	RO	AI3	Float
...	RO	...	Float
44094	RO	AI2048	Float

Table 5-1 AI Measurements

Notes:

- 1) When the AIx's reading is 0x7fffffff, the register value is invalid. For example, when the AI's corresponding IDE cannot be connected normally; the register's reading would be 0x7fffffff.

5.2 Digital Input Register

Register	Property	Description	Format
45000	RO	DI01~DI16	UINT16
45001	RO	DI17~DI32	UINT16
45002	RO	DI33~DI48	UINT16
...	RO	...	UINT16
45127	RO	DI2033~DI2048	UINT16
45128	RO	SOE Total ¹	UINT32

Table 5-2 DI Measurements

Notes:

- 1) The range of the registers is between 0 and 0xFFFFFFFF, the register will roll over to 1 if its current value is 0xFFFFFFFF, as the resetting register will be recorded as a SOE event. The master will read the register's value and compare with last reading.
 - If the latest value is same as the last value, there is no newly SOE event.
 - If the latest value is different from the last value, there are newly SOE events. For example, the last reading and the latest reading are 10 and 15, respectively, then there are 5 newly SOE events.
- 2) Each of connected devices will be defined as a virtual DI to show communication status, where 1 means **Connected**, while 0 means **Disconnected**.

5.3 3 Energy Register

Register		Property	Description	Format	
46000	46000	RO	PI1	INT32	INT64
46002	46004	RO	PI2	INT32	INT64
46004	46008	RO	PI3	INT32	INT64
...	...	RO	...	INT32	INT64
48046	50092	RO	PI1024	INT32	INT64

Table 5-3 Energy Measurements

Notes:

- 1) When the PIx's reading is 0x7fffffff, the register value is invalid. For example, when the PI's corresponding IDE cannot be connected normally, and the register's reading would be 0x7fffffff.

5.4 Remote Control

Register	Property	Description	Format
61000	WO	Arm Remote Control #1 Close/Open	UINT16
61001	WO	Execute Remote Control # 1 Close/Open	UINT16
61002	WO	Arm Remote Control #2 Close/Open	UINT16
61003	WO	Execute Remote Control #2 Close/Open	UINT16
...	WO	...	UINT16
62022	WO	Arm Remote Control #512 Close/Open	UINT16
62023	WO	Execute Remote Control #512 Close/Open	UINT16

Table 5-4 Remote Control

Notes:

- 1) Only writing the value 0xFF00 to the specific register to "Arm" or "Execute" a particular relay.

5.5 SOE

Register	Property	Description	Format
52000~52009	RO	SOE1	See Table 5-6 SOE Log Data Structure
52010~52019	RO	SOE2	
52020~52029	RO	SOE3	
52030~52039	RO	SOE4	
...	RO	...	
54550~54559	RO	SOE256	

Table 5-5 SOE Buffer

Offset	Properties	Description	Format	Note
+0	RO	High-order Byte: Storage Location	UINT16	-
		Low-order Byte: Event Classification		
+1	RO	High-order Byte: Channel No	UINT16	
		Low-order Byte: Unit ID ¹		
+2	RO	High-order Byte: Reserved	UINT16	1=Alarm Return/Open 2=Alarm/Closed
		Low-order Byte: DPI		
+3	RO	SOE Position No in Data Cache	UINT16	

+4	RO	High-order Byte: Year (-2000)	UINT16	0-99 (Year-2000)
		Low-order Byte: Month		1 to 12
+5	RO	High-order Byte: Day	UINT16	1 to 31
		Low-order Byte: Hour		0 to 23
+6	RO	High-order Byte: Minute	UINT16	0 to 59
		Low-order Byte: Second		0 to 59
+7	RO	Millisecond	UNIT16	0 to 999
+8	RO	Event Value ²	Float	-

Table 5-6 SOE Log Data Structure

Notes:

- 1) The unit ID is the actually communication ID. Only the last 2 characters will be uploaded if ID is longer than 4 characters, for example a device's unit ID is 123456789012, then only 12 will be uploaded.
- 2) Please refer to connected device's user manual to find the event meaning. Invalid operation will be recorded as 0x7ffffff.

5.6 Time

Register	Property	Description	Format	Note
60000	WO	High-order Byte: Year	UINT16	1-37 (Year-2000)
		Low-order Byte: Month		1 to 12
60001	WO	High-order Byte: Day	UINT16	1 to 31
		Low-order Byte: Hour		0 to 23
60002	WO	High-order Byte: Minute	UINT16	0 to 59
		Low-order Byte: Second		0 to 59
60003	WO	Millisecond	UINT16	0 to 999

Table 5-7 Time Registers

5.7 Data Recorder Log

The PMC-1304-3's real-time data, including AI and PI, is recorded as data recorder log. A DR log records all of the AI and PI data in data cache at a certain moment. As for recording depth, users can configure via the **Data Export** web interface under **Data Cache Management > Cache Management** menu.

Register	Property	Description	Format
30000	RO	DR Log Index	UINT32
30002	RW	Current DR Log Pointer	UINT32
30004	RO	DR Depth	UINT16
30005	RO	High-order Byte: Year	UINT16
		Low-order Byte: Month	
30006	RO	High-order Byte: Day	UINT16
		Low-order Byte: Hour	
30007	RO	High-order Byte: Minute	UINT16
		Low-order Byte: Second	

Table 5-8 Data Recorder Log

Notes:

- 1) The register 30000~30007 should be read at the same time.
- 2) **DR Log Index** indicates the latest DR Log index in data cache, and its range is between 0 to 0xFFFFFFFF. The register is incremented by 1 and will roll over to 1 when its current value is 0xFFFFFFFF.
- 3) The **Current DR Log Index** indicates the DR Log index which is reading now.

AI Log Buffer

Register	Property	Description	Format
30100	RO	AI1	Float
30102	RO	AI2	Float
32104	RO	AI3	Float
....		...	
34194	RO	AI2048	Float

Table 5-9 AI Log Buffer**PI Log Buffer**

Register		Property	Description	Format	
35000	35000	RO	PI1	INT32	INT64
35002	35004	RO	PI2	INT32	INT64
35004	35008	RO	PI3	INT32	INT64
....	...		...		
37046	39092	RO	PI1024	INT32	INT64

Table 5-10 PI Log Buffer**5.8 Historic SOE Log**

Register	Property	Description	Format
25000	RO	SOE Log Index	UINT32
25002	RW	Current SOE Log Pointer	UINT32

Table 5-11 Historical SOE Log

Register	Property	Description	Format
25100~25109	RO	SOE#1	See Table 5-13 Historic SOE Log Data Structure
25110~25119	RO	SOE#2	
25120~25129	RO	SOE#3	
25130~25139		SOE#4	
....		...	
27650~27659	RO	SOE#256	

Table 5-12 Historical SOE Log Buffer

Offset	Properties	Description	Format	Note
+0	RO	High-order Byte: Storage Location	UINT16	
		Low-order Byte: Event Classification		
+1	RO	High-order Byte: Channel No	UINT16	
		Low-order Byte: Unit ID ¹		
+2	RO	High-order Byte: Reserved	UINT16	
		Low-order Byte: DPI		1=Alarm Return/Open 2=Alarm/Closed
+3	RO	SOE Position No in Data Cache	UINT16	
+4	RO	High-order Byte: Year (-2000)	UINT16	0-99 (Year-2000)
		Low-order Byte: Month		1 to 12
+5	RO	High-order Byte: Day	UINT16	1 to 31
		Low-order Byte: Hour		0 to 23
+6	RO	High-order Byte: Minute	UINT16	0 to 59
		Low-order Byte: Second		0 to 59
+7	RO	Millisecond	UNIT16	0 to 999
+8	RO	Event Value ²	Float	-

Table 5-13 Historical SOE Data Structure

Notes:

- 1) The unit ID is the actually communication ID. Only the last 2 characters will be uploaded if ID is longer than 4 characters, for example a device's unit ID is 123456789012, then only 12 will be uploaded.
- 2) Please refer to connected device's user manual to find the event meaning. Invalid operation will be recorded as 0x7fffffff.

5.9 WFR Log

The PMC-1304-3 can read and store waveform into **/wave** directory in FTP server. Masters can retrieve waveform via FTP protocol with user name **EcoXploreadmin** and password **Ceiec4567\$%^&**. Up to 4 channels and 4 directories can be defined in **/wave** which should follow the rules below:

/wave/channel directory/device directory/file name

Where

- Channel directory name should be channel1 to channel4
- The device directories correspond to communication ports and should be defined according to the unit IDs of the connected devices.
- All of the waveforms which were generated by the same device are stored in corresponding directory. Each of directories can store 8 waveforms at most with first-in-first-out mode.

For example: */wave/channel2/10/20150517150110150* indicates the waveform file which was generated at 15:01:10 150ms, 17th May, 2015, by the device whose Unit ID is 10 and belongs to P4.

Notes:

- 1) All of the directories that used to store waveform files must start with **wave**.

- 2) When a device's unit ID is modified or deleted, the sub-directory that corresponds to the unit ID would be deleted.

Register	Property	Description	Format
64000	RO	Waveform Index	UINT32
64002	RW	Current waveform Pointer	UINT32

Table 5-14 Waveform Log

Notes:

- 1) If the reading of **Waveform Index** is larger than last time, it indicates that there are newly generated waveform files.
- 2) The **Current waveform Pointer**'s range is 0 to 0xFFFFFF, the register will roll over to 1, which will be used to retrieve the latest waveform, if its current value is 0xFFFFFF.
- 3) The registers 64000 to 64003 should be read continuously at the same time when retrieving waveform log.

Register	Property	Description	Format
64010~64034	RO	Waveform Storage Directory	ASCII

Table 5-15 Waveform Storage Directory

5.10 Device Information

Register	Property	Description	ASCII	Note
65000	RO	Device Model ¹	ASCII	
65020	RO	Firmware Version	UINT16	e.g. 10000 shows the version is V1.00.00
65021	RO	Protocol Version	UINT16	e.g. 10 shows the version is V1.0
65022	RO	Firmware Update Date: Year-2000	UINT16	e.g.150709 means July 9,2015
65023	RO	Firmware Update Date: Month	UINT16	
65024	RO	Firmware Update Date: Day	UINT16	
65025	RO	Energy Data Type	UINT16	0: Unit32 1: Int64
65026	RO	Reserved	UINT16	

Table 5-16 Device Information

Note:

- 1) The Device Model appears in registers 65000 to 65019 and contains the ASCII encoding of the string "PMC-1304-3" as shown in the following table.

Register	Value(Hex)	ASCII
65000	0x50	P
65001	0x4D	M
65002	0x43	C

65003	0x2D	-
65004	0x31	1
65006	0x33	3
65007	0x30	0
65008	0x34	4
65009	0x2D	-
65010	0x33	3
65010~65019	0x20	<Null>

Table 5-17 ASCII Encoding of "PMC-1304-3"

Appendix A Technical Specifications

10/100 Base Ethernet Port (P1, P2)	
Standard	10/100BaseT, RJ45 connector
Cable	CAT5, CAT5e (100m maximum)
Serial Ports (P3, P4, P5, P6)	
Standard	1xRS-422/485 (P3), 3 xRS-485 (P4,P5, P6)
Comm. Parameters	
Data bits	5, 6, 7, 8
Stop bits	1, 2
Parity	None, Even, Odd, Mark, Space
Baud rate	300 to 115,200 bps
LED Indicators	
Run (Green)	On – Abnormal condition
	Blinking – Working normally
	Off – Not powered up or abnormal condition
Alarm (Red)	On – Abnormal condition
	Blinking – Restoring default parameters
P1 &P2 (Yellow)	On – Connected but no data activities
	Blinking – Data activities
	Off – Disconnected
P3&P4&P5&P6	
Rx – Green	Blinking – Receiving data
Tx - Yellow	Blinking – Transmitting data
Protocol	
Protocol	Modbus RTU, Modbus TCP, FTP, HTTP
Power Supply (L/+, N/-)	
Standard	95-250VAC/DC, 47-440Hz
Burden	<5W
Protection	
ESD Protection	15kV (Contactless) and 6kV (Contact) ESD protection for all serial signals
Isolation Protection	3kV for all Serial signals 1.5kV for Ethernet Ports
Environmental Conditions	
Operating Temp.	-25°C to +70°C
Storage Temp.	-40°C to +85°C
Humidity	5% to 95% non-condensing
Atmospheric pressure	70 kPa to 110kPa
Mechanical Characteristics	
Casing	Galvanized Iron
Unit Dimensions	115x63x145mm
Shipping Weight	0.95kg

Shipping Dimensions	300x210x150mm
Mounting	DIN-Rail or Surface Mounting
IP Rating	30

Appendix B Standards Compliance

Safety Requirements			
Insulation		IEC 60255-5-2000	
Dielectric Test		2kV @ 1 minute	
Insulation Resistance		>100MΩ	
Impulse Voltage		5kV	
Electromagnetic Compatibility			
Electrostatic Discharge		IEC 61000-4-2:2001 Level IV	
Radiated Fields		IEC 61000-4-3:2006 Level III	
Fast Transients		IEC 61000-4-4:2004 Level IV	
Surges		IEC 61000-4-5:2005 Level IV	
Conducted Disturbances		IEC 61000-4-6:2006 Level III	
Magnetic Fields		IEC 61000-4-8:2001 Class III	
Oscillatory waves		IEC 61000-4-12:1995 Level III	
Mechanical Tests			
Vibration Test	Response	IEC 60255-21-1:1988	Level I
	Endurance	IEC 60255-21-1:1988	Level I
Shock Test	Response	IEC 60255-21-2:1988	Level I
	Endurance	IEC 60255-21-2:1988	Level I
Bump Test		IEC 60255-21-2:1988	Level I

Appendix C Ordering Guide

	
Product Code	Description
PMC-1304-3 Communications Processor	
Basic Function	
T	Modbus TCP/RTU Gateway with Multi-Master Support
R*	Modbus Mastering with 2GB On-Board Storage
Serial Port	
00-02	2xRS-485 (P3-P4)
00-04*	4xRS-485 (P3-P6)
Power Supply	
2	95-250VAC/DC, 47-440Hz
Ethernet Port	
T2-XX-XXXX	100BaseT (P1/P2)
Interface Language	
E	English
PMC-1304-3 - T - 00-02 - 2 - T2-XX-XXXX - E	PMC-1304-3-T-00-02-2-T2-XX-XXXX-E (Standard Model)

* Additional charges apply

Contact us



ECOXPLORE PTE LTD
 120 LOWER DELTA ROAD
 #12-15/16 CENDEX CENTRE
 SINGAPORE 169208
 TEL: (65) 6274 4840
 FAX: (65) 6274 2939
 EMAIL: sales@ecoxplore.com.sg

WWW.ECOXPLORE.COM