Moxa PRP/HSR Redundancy Box
User's Manual

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MOXA®

Moxa PRP/HSR Redundancy Box
User's Manual

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Table of Contents

1

About this Manual

Thank you for purchasing a Moxa managed Ethernet PRP/HSR RedBox. Read this user's manual to learn how to connect your Moxa PRP/HSR RedBox to Ethernet-enabled devices used for industrial applications.

The following two chapters are covered in this user manual:

❒ **Chapter 2: Getting Started**
This chapter explains the initial installation process for the Moxa PRP/HSR RedBox. There are three ways to access the Moxa PRP/HSR RedBox's configuration settings: the USB console, command line interface, and web-based interface.

❒ **Chapter 3: Featured Functions**
This chapter explains how to access the Moxa PRP/HSR RedBox's various configuration, monitoring, and administration functions. These functions can be accessed by serial, Telnet command line, or web-based interface. The web-based interface is the most user-friendly way to configure the Moxa PRP/HSR RedBox. In this chapter, we use the web console interface to introduce the functions.

2

Getting Started

In this chapter we explain how to install a Moxa PRP/HSR RedBox for the first time. There are three ways to access the Moxa PRP/HSR RedBox's configuration settings: USB console, command line interface, or web-based interface. If you do not know the Moxa PRP/HSR RedBox's IP address, you can open the USB console by connecting the Moxa PRP/HSR RedBox to a PC's USB port with a USB cable. You can open the Telnet or web-based console over an Ethernet LAN or over the Internet.

The following topics are covered in this chapter:

❒ **USB Console Configuration (115200, None, 8, 1, VT100)**
❒ **Configuration by Command Line Interface (CLI)**
❒ **Configuration by Web Browser**

# USB Console Configuration (115200, None, 8, 1, VT100)

NOTE	• You cannot connect to the USB console and command line interface at the same time. • You can connect to the web console and another console (serial or Telnet) at the same time. However, we strongly recommend that you do NOT do so. Following this advice will allow you to maintain better control over the Moxa PRP/HSR RedBox's configuration.

NOTE	We recommend using **PComm Terminal Emulator** when opening the USB console. This software can be downloaded free of charge from the Moxa website.

Before running PComm Terminal Emulator, install the USB console driver on your PC and then connect the Moxa PRP/HSR RedBox's USB console port to your PC's COM port (generally COM1 or COM2, depending on how your system is set up) with USB to DB9-F (or RJ45 to DB25-F) cable.

After installing PComm Terminal Emulator, open the Moxa PRP/HSR RedBox's USB console as follows:

1. From the Windows desktop, click **Start → All Programs → PComm Lite Ver1.6 → PComm Terminal Emulator**.
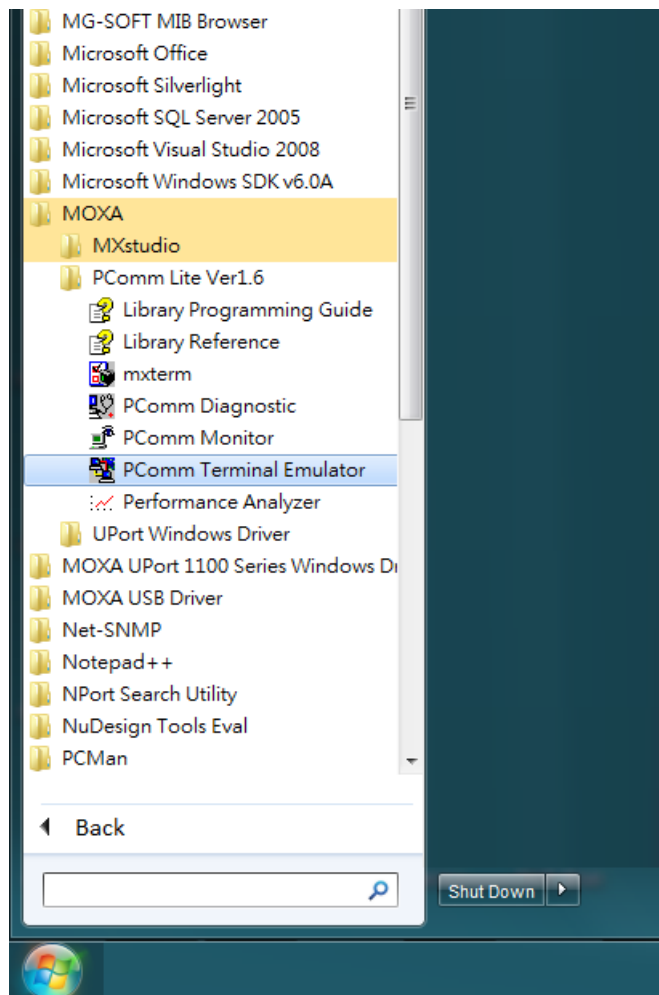
2. Select **Open** under the **Port Manager** menu to open a new connection.
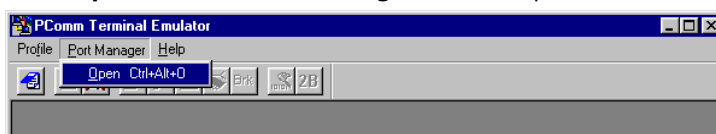
3. The **Property** window should open. On the **Communication Parameter** tab for **Ports**, select the COM port that is being used for the console connection. Set the other fields as follows: **115200** for **Baud Rate**, **8** for **Data Bits**, **None** for **Parity**, and **1** for **Stop Bits**.

4. On the **Terminal** tab, select **VT100** for **Terminal Type**, and then click **OK** to continue.
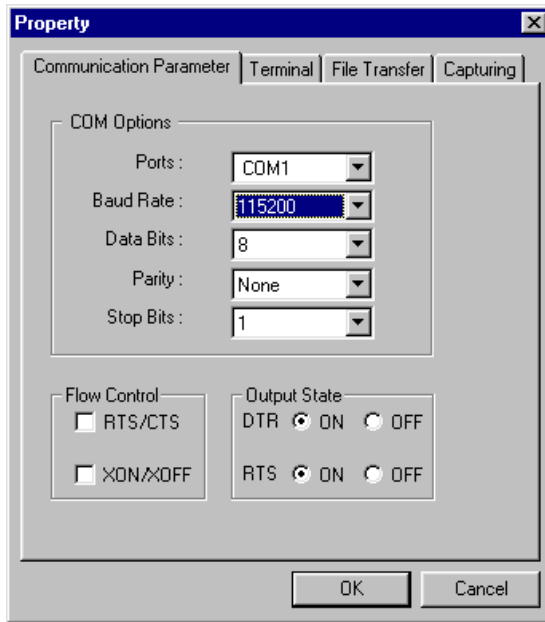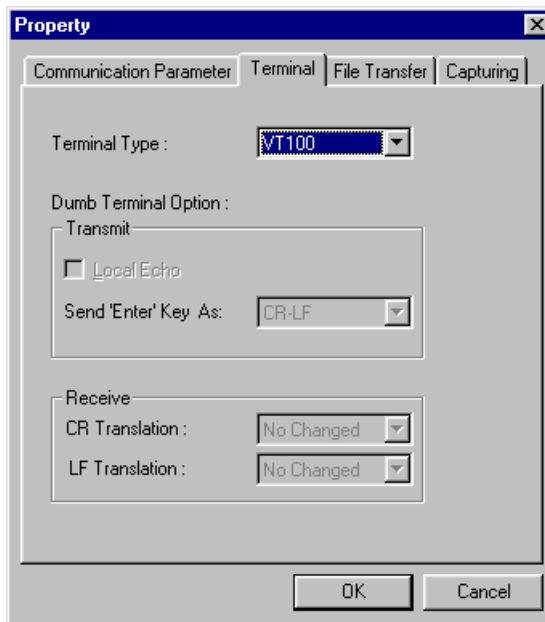

Configuration by Command Line Interface (CLI)

Opening the Moxa PRP/HSR RedBox's Telnet or web console over a network requires that the PC host and Moxa PRP/HSR RedBox are on the same logical subnet. You may need to adjust your PC host's IP address and subnet mask. By default, the Moxa PRP/HSR RedBox's IP address is 192.168.127.253 and the Moxa PRP/HSR RedBox's subnet mask is 255.255.255.0 (referred to as a Class B network). Your PC's IP address must be set to 192.168.xxx.xxx if the subnet mask is 255.255.0.0, or to 192.168.127.xxx if the subnet mask is 255.255.255.0.

NOTE	To connect to the Moxa PRP/HSR RedBox's Telnet or web console, your PC host and the Moxa PRP/HSR RedBox must be on the same logical subnet.

NOTE	When connecting to the Moxa PRP/HSR RedBox's Telnet or web console, first connect one of the Moxa PRP/HSR RedBox's Ethernet ports to your Ethernet LAN, or directly to your PC's Ethernet port. You may use either a straight-through or cross-over Ethernet cable.

NOTE	The Moxa PRP/HSR RedBox's default IP address is 192.168.127.253.

After making sure that the Moxa PRP/HSR RedBox is connected to the same LAN and logical subnet as your PC, open the Moxa PRP/HSR RedBox's Telnet console as follows:

1. Click **Start → Run** from the Windows Start menu and then Telnet to the Moxa PRP/HSR RedBox's IP address from the Windows **Run** window. You may also issue the Telnet command from a DOS prompt.

2. In the terminal window, type user name and password and then press **Enter**.
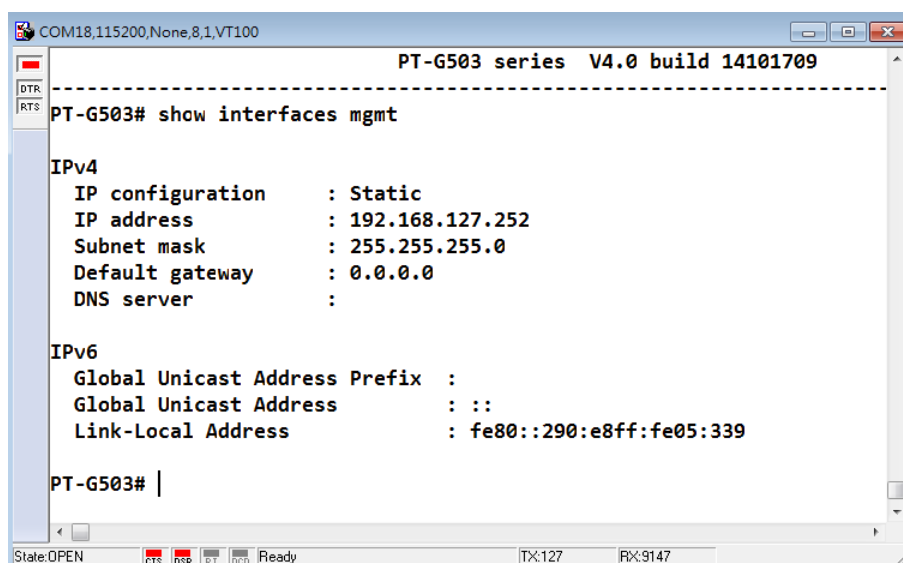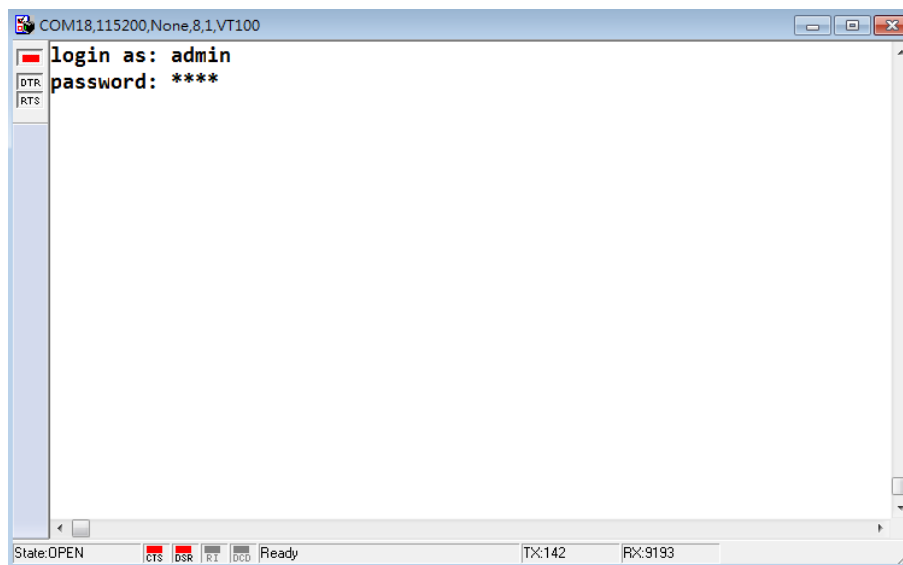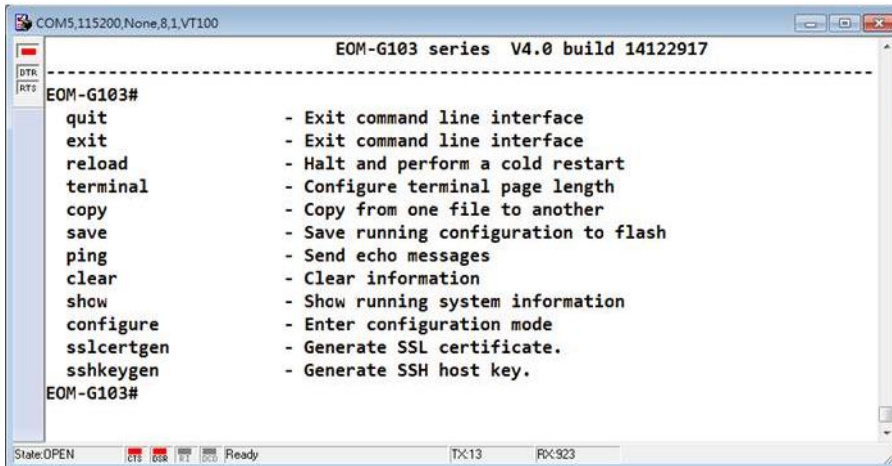
NOTE	The Telnet console looks and operates in precisely the same manner as the USB console.

Configuration by Web Browser

The Moxa PRP/HSR RedBox's web console is a convenient platform for modifying the configuration and accessing the built-in monitoring and network administration functions. You can open the Moxa PRP/HSR RedBox's web console using a standard web browser, such as Internet Explorer.
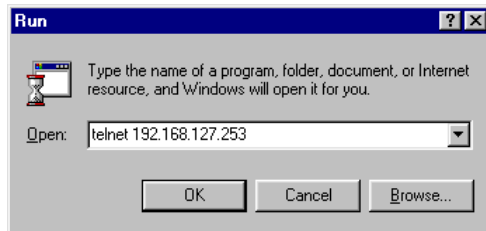
NOTE	To connect to the Moxa PRP/HSR RedBox's Telnet or web console, your PC host and the Moxa PRP/HSR RedBox must be on the same logical subnet.

NOTE	If the Moxa PRP/HSR RedBox is configured for other VLAN settings, you must make sure your PC host is on the management VLAN.

| NOTE	When connecting to the Moxa PRP/HSR RedBox's Telnet or web console, first connect one of the Moxa PRP/HSR RedBox's Ethernet ports to your Ethernet LAN, or directly to your PC's Ethernet port. You may use either a straight-through or cross-over Ethernet cable.

| NOTE	The Moxa PRP/HSR RedBox's default IP address is 192.168.127.253.

After making sure that the Moxa PRP/HSR RedBox is connected to the same LAN and logical subnet as your PC, open the Moxa PRP/HSR RedBox's web console as follows:

1. Connect your web browser to the Moxa PRP/HSR RedBox's IP address by entering it in the **Address** or **URL** field.
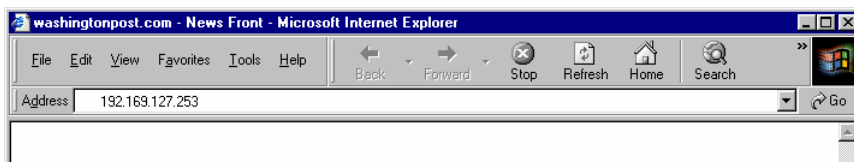
2. The Moxa PRP/HSR RedBox's web console will open, and you will be prompted to log in. Select the login account (admin or user) and enter the **Password**. This password will be required to access any of the consoles (web, serial, Telnet).
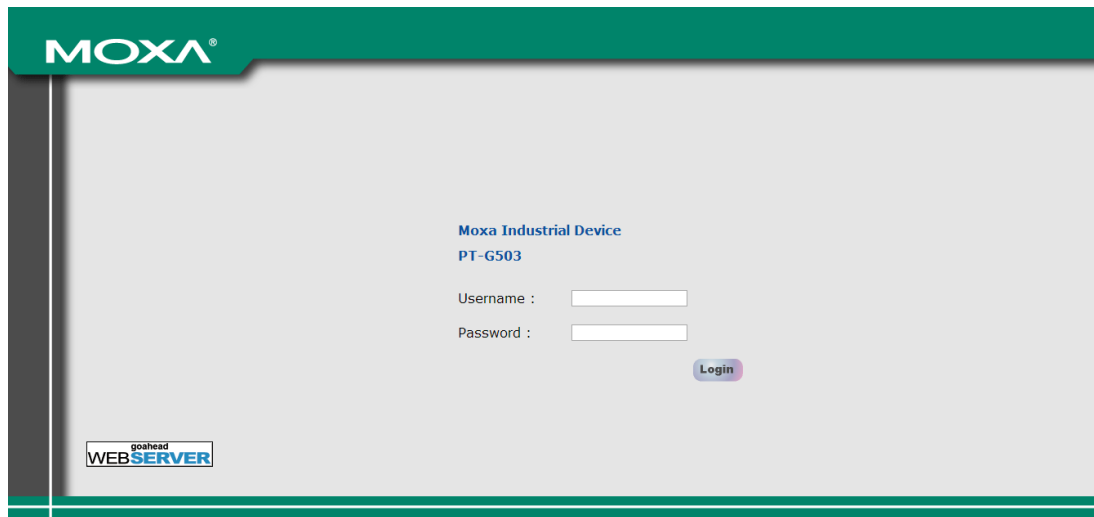
NOTE   By default, the password assigned to the Moxa PRP/HSR RedBox is **moxa**. Be sure to change the default
password after your first log in to maintain a higher level of security.

3. After logging in, you may need to wait a few moments for the web console to appear. Use the folders in the
    left navigation panel to navigate between different pages of configuration options.

3
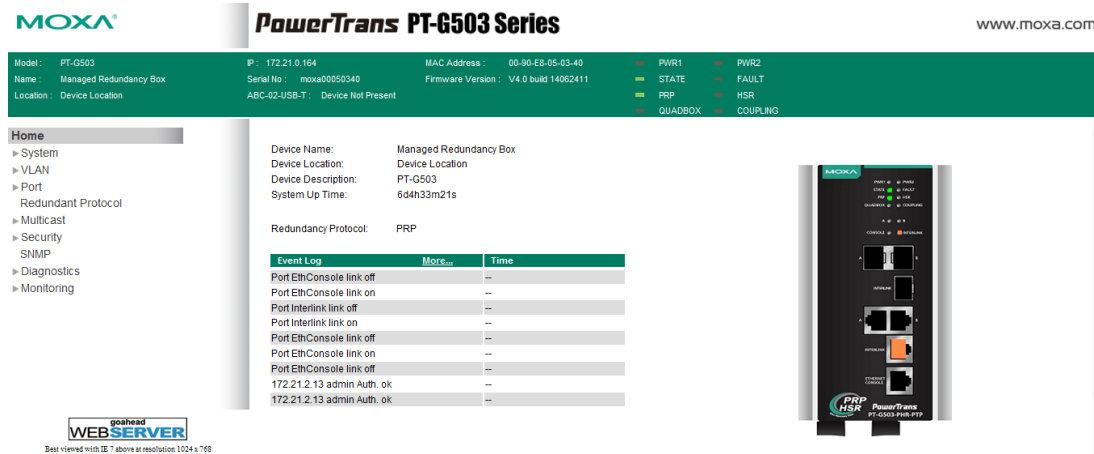
Featured Functions

In this chapter, we explain how to access the Moxa PRP/HSR RedBox's various configuration, monitoring, and administration functions. These functions can be accessed by serial, Telnet, or web console. The USB console can be used if you do not know the Moxa PRP/HSR RedBox's IP address and requires that you connect the Moxa PRP/HSR RedBox to a PC COM port. The Telnet and web consoles can be opened over an Ethernet LAN or the Internet.

The web console is the most user-friendly interface for configuring a Moxa PRP/HSR RedBox. In this chapter, we use the web console interface to introduce the functions. There are only a few differences between the web console, USB console, and Telnet console.

The following topics are covered in this chapter:

Home

The **Home** page shows a summary of the Moxa PRP/HSR RedBox information, including System Information, Redundancy Protocol, Event log, and Device virtualization panel. With an organized key summary, operators can easily understand the system and port link status at a glance.

System Settings

The **System Settings** section includes the most common settings required by administrators to maintain and control a Moxa PRP/HSR RedBox.

System Information

Configure the following **System Information** to make it easier to identify different PRP/HSR RedBoxes connected to your network.

Device Name

Setting	Description	Factory Default
Max. 30 characters	This option is useful for differentiating between the roles or applications of different units. Example: Factory PRP/HSR RedBox 1.	none

Device Location

Setting	Description	Factory Default
Max. 80 characters	This option is useful for differentiating between the locations of different units. Example: production line 1.	PRP/HSR RedBox Location

Device Description

Setting	Description	Factory Default
Max. 30 characters	This option is useful for recording a more detailed description of the unit.	PRP/HSR RedBox Model name

Contact Information

Setting	Description	Factory Default
Max. 30 characters	This option is useful for providing information about who is responsible for maintaining this unit and how to contact this person.	None

User Account

The Moxa PRP/HSR RedBox supports the management of accounts, including establishing, activating, modifying, disabling, and removing accounts. There are two levels of configuration access, admin and user. Accounts with **admin** authority have read/write access to all configuration parameters, whereas accounts with **user** authority only have read access to configuration parameters.

NOTE	1. In order to maintain a higher level of security, be sure to change the default password after your first log in. 2. The user with 'admin' account name cannot be deleted or disabled.

Active

Setting	Description	Factory Default
Checked	The Moxa PRP/HSR RedBox can be accessed by the activated user name	Enabled
Unchecked	The Moxa PRP/HSR RedBox can't be accessed by the non-activated user	

Authority

Setting	Description	Factory Default
admin	The account has read/write access of all configuration parameters.	admin
user	The account can only read configuration but without any modification.	

Creating a New Account

To create a new account, input the user name and password, and assign the desired level of authority. Once you apply the new settings, the new account will appear in the Account List table.

Setting	Description	Factory Default
User Name (Max. of 30 characters)	User Name	None
Password	Password for the user account. Minimum requirement is 4 characters, maximum of 16 characters	None

Modifying an Existing Account

Select the existing account from the Account List table. Modify the details accordingly and then apply the settings to save the configuration.

Deleting an Existing Account

Select the existing account from the Account List table, and then press the delete button to delete the account.
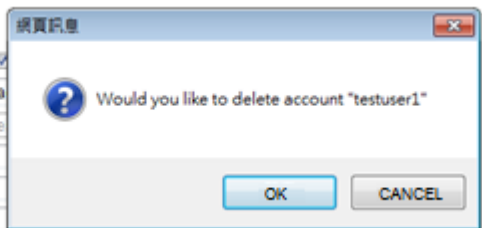
Network

Network configuration allows users to configure both IPv4 and IPv6 parameters for management access over the network. The Moxa PRP/HSR RedBox supports both IPv4 and IPv6, and can be managed through either of these address types.

IP Setting

The IPv4 settings include the PRP/HSR RedBox's IP address and subnet mask, as well as the IP address of the default gateway. In addition, input cells are provided for the IP addresses of a 1st and 2nd DNS server.

The IPv6 settings include two distinct address types—Link-Local Unicast addresses and Global Unicast addresses. A Link-Local address makes the PRP/HSR RedBox accessible over IPv6 for all devices attached to the same local subnet. To connect to a larger network with multiple segments, the PRP/HSR RedBox must be configured with a Global Unicast address.

IP Settings

Get IP From	Manual ▾
IP Address	192.168.127.253
Subnet Mask	24(255.255.255.0) ▾
Default Gateway	
1st DNS Server	
2nd DNS Server	
IPv6 Global Unicast Address Prefix	
IPv6 Global Unicast Address	::
IPv6 Link-Local Address	fe80::290:e8ff:fe00:268

Apply

Get IP From

Setting	Description	Factory Default
DHCP	The Moxa PRP/HSR RedBox's IP address will be assigned automatically by the network's DHCP server.	DHCP
BOOTP	The Moxa PRP/HSR RedBox's IP address will be assigned automatically by the network's BootP server.	
Manual	The Moxa PRP/HSR RedBox's IP address must be set manually.	

IP Address

Setting	Description	Factory Default
IP address for the Moxa PRP/HSR RedBox	Assigns the Moxa PRP/HSR RedBox's IP address on a TCP/IP network.	192.168.127.253

Subnet Mask

Setting	Description	Factory Default
Subnet mask for the Moxa PRP/HSR RedBox	Identifies the type of network the Moxa PRP/HSR RedBox is connected to (e.g., 255.255.0.0 for a Class B network, or 255.255.255.0 for a Class C network).	24(255.255.255.0)

Default Gateway

Setting	Description	Factory Default
IP address for gateway	Specifies the IP address of the router that connects the LAN to an outside network.	None

DNS IP Address

Setting	Description	Factory Default
IP address for DNS server	Specifies the IP address of the DNS server used by your network. After specifying the DNS server's IP address, you can use the Moxa PRP/HSR RedBox's URL (e.g., www.PT.company.com) to open the web console instead of entering the IP address.	None
IP address for 2nd DNS server	Specifies the IP address of the secondary DNS server used by your network. The Moxa PRP/HSR RedBox will use the secondary DNS server if the first DNS server fails to connect.	None

IPv6 Global Unicast Address Prefix (Prefix Length: 64 bits) Default Gateway

Setting	Description	Factory Default
Global Unicast Address Prefix	The prefix value must be formatted according to the RFC 2373 "IPv6 Addressing Architecture," using 8 colon-separated 16-bit hexadecimal values. One double colon may be used in the address to indicate the appropriate number of zeros required to fill the undefined fields.	None

IPv6 Global Unicast Address

Setting	Description	Factory Default
None	Displays the IPv6 Global Unicast address. The network portion of the Global Unicast address can be configured by specifying the Global Unicast Prefix and using an EUI-64 interface ID in the low order 64 bits. The host portion of the Global Unicast address is automatically generated using the modified EUI-64 form of the interface identifier (PRP/HSR RedBox's MAC address).	None

IPv6 Link-Local Address

Setting	Description	Factory Default
None	The network portion of the Link-Local address is FE80 and the host portion of the Link-Local address is automatically generated using the modified EUI-64 form of the interface identifier (PRP/HSR RedBox's MAC address)	None

IPv6 Neighbor Cache

The information in the neighbor cache includes the neighboring node's IPv6 address, the corresponding Link-Layer address, and the current state of the entry.

Date and Time

The Moxa PRP/HSR RedBox has a time calibration function based on information from an NTP server or user specified time and date, allowing functions such as automatic warning emails to include a time and date stamp.

NOTE	The Moxa PRP/HSR RedBox does not have a real time clock. The user must update the Current Time and Current Date to set the initial time for the Moxa PRP/HSR RedBox after each reboot, especially when there is no NTP server on the LAN or Internet connection.

System Time

System Up Time	0d1h59m50s
Current Time	2013/06/19 15:43:49

Clock Source   ⦿ Local ◯ NTP ◯ SNTP

Time Settings

⦿ Manual Time Settings

Date (YYYY/MM/DD)   2013 / 06 / 19

Time (HH:MM:SS)   15 : 43 : 49

◯ Sync. from Local Device Time 2013/6/19 15:43:56

☐ Enable NTP/SNTP Server

Time Zone   (GMT)Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London ▼

Daylight Saving	Month	Week	Day	Hour
Start Date	-- ▼	-- ▼	-- ▼	-- ▼
End Date	-- ▼	-- ▼	-- ▼	-- ▼
Offset(hr)	0 ▼			

[Refresh] [Apply]

System Up Time

Indicates how long the Moxa PRP/HSR RedBox remained up since the last cold start.

Current Time

Setting	Description	Factory Default
User-specified time	Indicates time in yyyy-mm-dd format.	None

Clock Source

Setting	Description	Factory Default
Local	Configure clock source from local time	Local
NTP	Configure clock source from NTP	
SNTP	Configure clock source from SNTP	

Time Zone

Setting	Description	Factory Default
Time zone	Specifies the time zone, which is used to determine the local time offset from GMT (Greenwich Mean Time).	GMT (Greenwich Mean Time)

Daylight Saving Time

The Daylight Saving Time settings are used to automatically set the Moxa PRP/HSR RedBox's time adjustments according to national standards.

Start Date

Setting	Description	Factory Default
User-specified date	Specifies the date that Daylight Saving Time begins.	None

End Date

Setting	Description	Factory Default
User-specified date	Specifies the date that Daylight Saving Time ends.	None

Offset

Setting	Description	Factory Default
User-specified hour	Specifies the number of hours that the time should be set forward during Daylight Saving Time.	None

NOTE   Changing the time zone will automatically correct the current time. Be sure to set the time zone before setting the time.

Time Server IP/Name

Setting	Description	Factory Default
IP address or name of time server	The IP or domain address (e.g., 192.168.1.1, time.stdtime.gov.tw, or time.nist.gov).	None
IP address or name of secondary time server	The Moxa PRP/HSR RedBox will try to locate the secondary NTP server if the first NTP server fails to connect.	

Enable NTP/SNTP Server

Setting	Description	Factory Default
Enable/Disable	Enables SNTP/NTP server functionality for clients	Disabled

Warning Notification

Since industrial Ethernet devices are often located at the endpoints of a system, these devices will not always know what is happening elsewhere on the network. This means that an PRP/HSR RedBox that connects to these devices must provide system maintainers with real-time alarm messages. Even when control engineers are out of the control room for an extended period of time, they can still be informed of the status of devices almost instantaneously when exceptions occur. The Moxa PRP/HSR RedBox supports different approaches to warn engineers automatically, such as email, trap, syslog, and relay output. It also supports two digital inputs to integrate sensors into your system to automate alarms by email and relay output.

System Event Settings

System Events are related to the overall function of the PRP/HSR RedBox. Each event can be activated independently with different warning approaches. Administrator also can decide the severity of each system event.

System Event Settings

Active	Event	Action					Severity
		Trap	E-Mail	Syslog	Relay1		
☑	Cold Start	☐	☐	☐			Critical ▼
☑	Warm Start	☐	☐	☐			Warning ▼
☑	Config. Changed	☐	☐	☐			Warning ▼
☑	PWR 1 Off->On	☐	☐	☐			Warning ▼
☑	PWR 2 Off->On	☐	☐	☐			Warning ▼
☑	PWR 1 On->Off	☐	☐	☐	☐		Warning ▼
☑	PWR 2 On->Off	☐	☐	☐	☐		Warning ▼
☑	Auth. Fail	☐	☐	☐			Warning ▼
☑	Password Changed			☐			Warning ▼
☐	TACACS Auth. Fail			☐			Warning ▼

Apply

System Events	Warning email is sent when…
Cold Start	Power is cut off and then reconnected.
Warm Start	The Moxa PRP/HSR RedBox is rebooted, such as when network parameters are changed (IP address, subnet mask, etc.).
Configuration Change	Any configuration item has been changed.
PWR1 Off→On	The Moxa PRP/HSR RedBox is powered down.
PWR2 Off→On	
PWR1 On→Off	The Moxa PRP/HSR RedBox is powered up.
PWR2 On→Off	
Auth. Success	The user has logged in to the system.
Auth. Fail	An incorrect password was entered.
Auth. Attempts Over Limit	More than 3 Auth. Attempts were tried
Password Change	User changed the account password
DI1 (On→Off)	Digital Input 1 was triggered by an on to off transition
DI1 (Off→On)	Digital Input 1 was triggered by an off to on transition
ABC-02 Status	Occurs when an ABC-02-USB-T was connected to or disconnected from the PRP/HSR RedBox, or when the ABC-02-USB-T automatically imported, exported, or backed up a configuration.
LLDP Table Change	The LLDP table has been changed to account for recently connected devices

Port Event Settings

Port Events are related to the activity of a specific port.

| Active | Port | Link | | Fiber Check | | | | Action | | | | Severity |
		On	Off	Tx Low Power	Rx Low Power	Tx High Power	Temperature	Trap	E-Mail	Syslog	Relay1	
☑	A	☑	☑	☐	☐	☐	☐	☑	☐	☑	☐	Warning ▼
☑	B	☑	☑	☐	☐	☐	☐	☑	☐	☑	☐	Warning ▼
☑	Interlink	☑	☑	☐	☐	☐	☐	☑	☐	☑	☐	Warning ▼
☐	EthConsole	☑	☑	☐	☐	☐	☐	☑	☐	☑	☐	Warning ▼

Apply

Fiber Check Alarm Threshold

| Idx | Fiber Type | Model Name | Transciever | Temp. (°C) | Tx Power(dBm) | | Rx Power(dBm) |
				Max	Max	Min	Min
1	SFP-LX	SFP-1GLXLC	1000BASE-LX	120	0	-12.5	-20
2	SFP-SX	SFP-1GSXLC-T	1000BASE-SX	120	-1	-12.5	-18
3	SFP-LHX	SFP-1GLHXLC	1000BASE-LX	120	4	-7	-24
4	SFP-ZX	SFP-1GZXLC	1000BASE-LX	120	8	-3	-24
5	SFP-EZX-120	SFP-1GEZXLC-120	1000BASE-LX	120	6	-5	-33
6	SFP-ZX	SFP-1GZXLC-T	1000BASE-LX	120	8	-3	-24
7	SFP-M	SFP-1FEMLC-T	100BASE-FX	120	-5	-21	-37
8	SFP-S	SFP-1FESLC-T	100BASE-LX	120	3	-8	-37

Port Events	Warning email is sent when…
Link-ON	The port is connected to another device.
Link-OFF	The port is disconnected (e.g., the cable is pulled out, or the opposing device shuts down).
Tx Low Power	The port's transmitted power is under the Tx Power-Threshold for that port
Rx Low Power	The port's received power is under the Rx Power-Threshold for that port
Tx High Power	The port's transmitted power is over the Tx Power-Threshold for that port
Temperature	The port's temperature surpasses the Temperature-Threshold for that port

Four response actions are available when events are triggered.

Action	Description
Trap	The PT-G503-PHR-PTP series will send notification to the trap server when an event is triggered
E-Mail	The PT-G503-PHR-PTP series will send notification to the email server defined in the Email Settings
Syslog	The PT-G503-PHR-PTP series will record a syslog to syslog server defined in Syslog Server Settings
Relay	The PT-G503-PHR-PTP series supports digital inputs to integrate sensors. When an event is triggered, the device will automate alarms by relay output

Severity

Severity	Description
Emergency	System is unusable
Alert	Action must be taken immediately
Critical	Critical conditions
Error	Error conditions
Warning	Warning conditions
Notice	Normal but significant condition
Information	Informational messages
Debug	Debug-level messages

Email Settings

Mail Server IP/Name

Setting	Description	Factory Default
IP address	The IP Address of your email server.	None

User Name

Setting	Description	Factory Default
Max. 45 of charters	Your email account.	None

Password Setting

Setting	Description	Factory Default
Password	The email account password.	None

Email Address

Setting	Description	Factory Default
Max. of 30 characters	You can set up to 4 email addresses to receive alarm emails from the Moxa PRP/HSR RedBox.	None

Send Test Email

After you complete the email settings, you should first click **Apply** to activate those settings, and then press the **Test** button to verify that the settings are correct.

NOTE	Auto warning email messages will be sent through an authentication protected SMTP server that supports the CRAM-MD5, LOGIN, and PAIN methods of SASL (Simple Authentication and Security Layer) authentication mechanism. We strongly recommend not entering your Account Name and Account Password if auto warning email messages can be delivered without using an authentication mechanism.

Syslog Server Settings

The Syslog function provides the event logs for the syslog server. The function supports 3 configurable syslog servers and syslog server UDP port numbers. When an event occurs, the event will be sent as a syslog UDP packet to the specified syslog servers. Each Syslog server can be activated separately by selecting the check box and enabling it.

Syslog Settings

Syslog 1	☐
Server	
UDP Port	514 (1~65535)
Syslog 2	☐
Server	
UDP Port	514 (1~65535)
Syslog 3	☐
Server	
UDP Port	514 (1~65535)

Apply

Syslog Server 1/2/3

Setting	Description	Factory Default
IP Address	Enter the IP address of Syslog server 1/2/3, used by your network.	None
Port Destination (1 to 65535)	Enter the UDP port of Syslog server 1/2/3.	514

NOTE	The following events will be recorded into the Moxa PRP/HSR RedBox's Event Log table, and will then be sent to the specified Syslog Server: • Cold start • Warm start • Configuration change activated • Power 1/2 transition (Off (On)), Power 1/2 transition (On (Off)) • Auth. Success • Auth. Fail • Auth. Attempts Over Limit • Password Change • ABC-02 status • LLDP Table Change

Relay Warning Status

When a relay warning is triggered by either system or port events, the administrator can decide to shut down the hardware warning buzzer by clicking the **Apply** button. The event will still be recorded in the event list.

MAC Address Table

The MAC address table shows the MAC address list passed through the Moxa PRP/HSR RedBox. The MAC Address table can be configured to display the following Moxa PRP/HSR RedBox MAC address groups, which are selected from the drop-down list.

Drop Down List

ALL	Select this item to show all of the Moxa PRP/HSR RedBox's MAC addresses.
ALL Learned	Select this item to show all of the Moxa PRP/HSR RedBox's Learned MAC addresses.
Port A	Select this item to show all MAC addresses of related ports.
Port B	Select this item to show all MAC addresses of related ports.
Port Interlink	Select this item to show all MAC addresses of related ports.
Port Ethernet	Select this item to show all MAC addresses of related ports.

Console	

The table displays the following information:

MAC	This field shows the MAC address.
Type	This field shows the type of this MAC address.
Port	This field shows the port that this MAC address belongs to.

System Files

Firmware Upgrade

The Moxa PRP/HSR RedBox supports 3 ways to upgrade the up-to-date firmware, including local database, remote TFTP Server, and Auto Backup Configurator (ABC-02).

Local

1. Download the updated firmware (*.rom) file from Moxa's website (www.moxa.com).
2. Browse for the (*.rom) file and then press the **Upgrade** button

TFTP Server

1. Enter the TFTP Serve IP
2. Input the firmware file name (*.rom) and press the **Upgrade** button

Auto Backup Configurator (ABC-02)

1. Download the updated firmware (*.rom) file from Moxa's website (www.moxa.com).
2. Save the file to the ABC-02's **Moxa** folder. The file name cannot be longer than 8 characters, and the file extension must be **.rom**.
3. Browse for the ABC-02 firmware and then press the **Upgrade** button

Configuration Backup and Restore

The Moxa PRP/HSR RedBox supports 3 ways to back up and restore a configuration file to/from a local database—remote TFTP Server, and Auto Backup Configurator (ABC-02).

⋮• Configuration Backup and Restore

◉ Local ◯ TFTP Server ◯ Auto Backup Configurator (ABC-02)

Backup Configuration File to Local Device **Backup**

Restore Configuration From [   ] **Browse**

Restore

☑ Auto load configuration from ABC to system when boot up

☐ Auto backup to ABC-02 when configuration change

Apply

Local

1. Click the **Backup** button to back up the configuration file to the local database.
2. Browse for the configuration file from the local database and then press the **Restore** button.

TFTP Server

1. Enter the TFTP Server IP.
2. Input the backup/restore file name (supports up to 54 characters, including .ini) and then press the **Backup/Restore** button.

Auto Backup Configurator (ABC-02)

1. Click **Backup** to save the configuration file to the ABC-02. The file will be saved in the **Moxa** folder of the ABC-02. The file name is **Sys.ini**.
   The configuration file will be saved to the ABC-02-USB's "Moxa" folder as two independent files named **Sys.ini** and **MAC.ini**. The purpose of saving to two files is to identify the file while using **Auto load configuration from ABC to system when boot up.**

   Note: MAC.ini is named using the last 6 digits of the PRP/HSR RedBox's MAC address, without spaces.

2. Click **Browse** to select the configuration file, and then click **Restore** to start loading the file into your PRP/HSR RedBox.

3. **Auto load configuration from ABC-02 to system when booting up**
   Select the **Auto load configuration from ABC to system when boot up** checkbox, and then click **Apply**. This function is enabled by default.

   First, power off your PRP/HSR RedBox and then plug in the ABC-02. Next, power on your PRP/HSR RedBox. The system will detect the configuration file on the ABC-02 automatically. The PRP/HSR RedBox will recognize file names using the following sequencing priority:

   First priority: MAC.ini
   Second priority: Sys.ini

   If a matching configuration file is not found, the fault LED light will turn on and the PRP/HSR RedBox will boot up normally.

4. Note: MAC.ini is named using the last 6 digits of the PRP/HSR RedBox's MAC address, without spaces.

5. **Auto backup to ABC-02 when configuration changes**
Select the **Auto backup to ABC-02 when configuration changes** checkbox and then click **Apply**. This function is disabled by default.

The ABC-02 can back up PRP/HSR RedBox configuration files automatically. While the ABC-02 is plugged into the PRP/HSR RedBox, enable the **Auto backup to ABC-02 when configuration change** option and then click **Apply**. Once this configuration has been modified, the PRP/HSR RedBox will back up the current configuration to the ABC-02's **/His_ini** folder. The file name is created from the system date/time in the following format: **MMDDHHmm.ini**.

Note: MM=month, DD=day, HH=hour, mm=minutes, from the system time

Log File Backup

The Moxa PRP/HSR RedBox reset button allows users to quickly back up files to the ABC-02. Simply press the Reset button on top of the RedBox to force the RedBox to start backing up the current system configuration files and event logs to the ABC-02.

NOTE   DO NOT remove the ABC-02 while performing upgrade, backup, or restore functions.

Restart

This function provides users with a quick way of restarting the system.

Restart

This function will restart the system.

Apply

Factory Default

This function provides users with a quick way of restoring the Moxa PRP/HSR RedBox's configuration to factory defaults. You can apply this function from the USB serial, Telnet, web-based consoles, or using the hardware reset button.

Factory Default

Warning ! The switch will be reset to factory default and then restart

Apply

NOTE   After restoring the Moxa PRP/HSR RedBox to the factory default configuration, you will need to use the default network settings to re-establish a web or Telnet console connection with the Moxa PRP/HSR RedBox.

VLAN

Setting up Virtual LANs (VLANs) on your Moxa PRP/HSR RedBox increases the efficiency of your network by dividing the LAN into logical segments, as opposed to physical segments. In general, VLANs are easier to manage.

Virtual LAN (VLAN) Filtering

What is VLAN Filtering?

The Moxa PRP/HSR RedBox supports a virtual LAN filtering function. The VLAN filtering function is enabled on the Interlink port. By adding the VLAN ID in the VLAN field, the interlink port will only forward packets that have this VLAN ID. Packets that do not have this VLAN ID will be dropped.

Enable VLAN Filtering

Setting	Description	Factory Default
Enable/Disable	Enables or disables the VLAN filtering function	Disable

VLAN

Setting	Description	Factory Default
VLAN ID ranges from 1 to 4094	Set the VLAN IDs, using commas (,) to differentiate different VIDs that will be filtered by the interlink port (this product supports up to 256 VLAN groups)	None

Port

Port Settings

Port settings are included to give the user control over port access, port transmission speed, flow control, and port type (MDI or MDIX).

Media Type

Setting	Description	Factory Default
Media type	Displays the media type for each module's port	N/A

Description

Setting	Description	Factory Default
Max. 63 characters	Specifies an alias for the port to help administrators differentiate between different ports. Example: PLC 1	None

Speed

Setting	Description	Factory Default
Auto	Allows the port to use the IEEE 802.3u protocol to negotiate with connected devices. The port and connected devices will determine the best speed for that connection.	Auto
1G-Full	Choose one of these fixed speed options if the connected Ethernet device has trouble auto-negotiating for line speed.	
100M-Full		
10M-Full		

MDI/MDIX

Setting	Description	Factory Default
Auto	Allows the port to auto-detect the port type of the connected Ethernet device and change the port type accordingly.	Auto

Port Status

The following table shows the status of each port, including media type, link status, flow control, and port state.

Port Status

Port	Media Type	Link Status	MDI/MDIX Status	Port State
A	1000TX,RJ45.	Link Down	--	--
B	1000TX,RJ45.	Link Down	--	--
Interlink	1000TX,RJ45.	100M Full	MDI	Forwarding
EthConsole	1000TX,RJ45.	Link Down	--	--

Redundant Protocol

The Moxa PRP/HSR RedBox supports four redundant protocols: PRP, HSR, Coupling*, and QuadBox*. Depending on the topology of your network, you can choose one of these redundancy protocols. All four protocols support a 0 ms recovery time.

PRP: Copies of each packet are sent from the source to the destination via two LANs.
HSR: Copies of each packet are sent from the source to destination via an HSR ring.
Coupling: Coupling is used to connect PRP and HSR*.
QuadBox: QuadBox is used to connect two HSR rings*

*Only available on the PT-G503-PHR-PTP series..

Redundant Protocol

Protocol	PRP ▼

Status

Active Protocol	**PRP**	Entry Forget time(ms)	**100**
Net ID	--	LAN ID	--

Settings

Entry Forget time(ms)	100 ▼			
Net ID	1 ▼	LAN ID	A ▼	**Apply**

Protocol

Setting	Description	Factory Default
PRP/HSR/ Coupling*/QuadBox*	Select redundancy protocol	PRP

*Only available on the PT-G503-PHR-PTP series.

Entry Forget time (ms)

Setting	Description	Factory Default
10/100	Select **100** (ms) for 100M, and **10** (ms) for 1000M	10

Net ID (only available on the PT-G503-PHR-PTP series)

Setting	Description	Factory Default
1 to 7	Allows the user set a Net ID, ranging from 1 to 7 (Coupling mode only)	Auto

LAN ID

Setting	Description	Factory Default
A/B	Allows the user to set a LAN ID (Coupling mode only)	Auto

Multicast Filtering

The Moxa PRP/HSR RedBox provides a multicast filtering function. You can enable the source port and set it to drop or forward ingress traffic that comes from the designated port with a specific multicast MAC address.

Action

Setting	Description	Factory Default
Drop/Forward	The RedBox will drop or forward traffic, depending on the setting	Drop

Priority Index

Setting	Description	Factory Default
1 to 8	Items with priority 1 will be acted on first, followed by items with priority 2, etc.	1

Source Port

Setting	Description	Factory Default
Interlink Port or A/B	Multicast filtering applies to the source port	None

MAC Address

Setting	Description	Factory Default
MAC Address	Input the multicast MAC address	None

Compared Length

Setting	Description	Factory Default
Bytes	Between 1 and 6 bytes. The RedBox will compare the first x bytes of ingress packet of the multicast MAC address.	None

Security

Security can be categorized into two levels: user name / password level, and port access level. The Moxa PRP/HSR RedBox provides a number of different security functions, including Login Authentication, Management Interface, Trusted Access, Authentication Certificate, IEEE 802.1A, Port Security, and Loop Protection.

Login Authentication

The Moxa PRP/HSR RedBox provides two different user login options: Terminal Access Controller Access-Control System Plus (TACACS+), and Remote Authentication Dial In User Service (RADIUS). The TACACS+ and RADIUS mechanisms are centralized "AAA" (Authentication, Authorization, and Accounting) systems for connecting to network services. The fundamental purpose of both TACACS+ and RADIUS is to provide an efficient and secure mechanism for user account management.

Login Authentication

Authentication Protocol	○ RADIUS ● TACACS+
Server IP/Name	
TCP Port	49
Shared Key	
Authentication Type	ASCII
Timeout (sec)	30

Apply

Login Authentication

Authentication Protocol	● RADIUS ○ TACACS+
Server IP/Name	
UDP Port	1812
Shared Key	
Authentication Type	EAP-MD5
Timeout (sec)	5

Apply

Setting	Description	Factory Default
Authentication Protocol	Authentication protocol selection	TACACS+
Server IP/Name	Set the IP address of an external TACACS+/RADIUS server as the authentication database	None
TCP/UDP Port	Set the communication port of an external TACACS+/RADIUS server as the authentication database	TACACS+: 49 RADIUS: 1812
Shared Key	Set specific characters for server authentication verification	None
Authentication Type	Authentication mechanism selection. ASCII, PAP, CHAP, and MSCHAP are for TACACS+, and EAP-MD5 is for RADIUS.	ASCII for TACACS+
Timeout (sec)	The timeout period to wait for a server response	TACACS+: 30 RADIUS: 5

Management Interface

Enable HTTP

Setting	Description	Factory Default
Select/Deselect	Checkmark the appropriate check boxes to enable HTTP.	Select Port: 80

Enable SSL

Setting	Description	Factory Default
Select/Deselect	Checkmark the appropriate check boxes to enable SSL.	Select Port: 443

Enable Telnet

Setting	Description	Factory Default
Select/Deselect	Checkmark the appropriate check boxes to enable Telnet	Select Port: 23

Enable SSH

Setting	Description	Factory Default
Select/Deselect	Checkmark the appropriate check boxes to enable SSH	Select Port: 5

Web Auto Logout (min)

Setting	Description	Factory Default
Integer	Sets the web auto logout period	5

Trusted Access

The Moxa PRP/HSR RedBox uses an IP address-based filtering method to control access.

:• Trusted Access

☐ Enable trusted access   **Apply**

Please add your local IP address first, otherwise, your PC will not be able to connect the device again

☐ All	IP Address	Subnet Mask
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼
☐		32(255.255.255.255) ▼

Delete

You may add or remove IP addresses to limit access to the Moxa PRP/HSR RedBox. When the accessible IP list is enabled, only addresses on the list will be allowed access to the Moxa PRP/HSR RedBox. Each IP address and netmask entry can be tailored for different situations:

- **Grant access to one host with a specific IP address**
  For example, enter IP address 192.168.1.1 with netmask 255.255.255.255 to allow access to 192.168.1.1 only.
- **Grant access to any host on a specific subnetwork**
  For example, enter IP address 192.168.1.0 with netmask 255.255.255.0 to allow access to all IPs on the subnet defined by this IP address / subnet mask combination.
- **Grant access to all hosts**
  Make sure the accessible IP list is not enabled. Remove the checkmark from **Enable the accessible IP list**.

The following table shows additional configuration examples:

Hosts That Need Access	Input Format
Any host	Disable
192.168.1.120	192.168.1.120 / 255.255.255.255
192.168.1.1 to 192.168.1.254	192.168.1.0 / 255.255.255.0
192.168.0.1 to 192.168.255.254	192.168.0.0 / 255.255.0.0
192.168.1.1 to 192.168.1.126	192.168.1.0 / 255.255.255.128
192.168.1.129 to 192.168.1.254	192.168.1.128 / 255.255.255.128

Authentication Certificate

SSL Certificate Re-generate

Setting	Description	Factory Default
Select/Deselect	Enable SSL Certificate Re-generation	Deselect

SSH Key Re-generate

Setting	Description	Factory Default
Select/Deselect	Enable SSH Key Re-generation	Deselect

SNMP

The Moxa PRP/HSR RedBox supports SNMP V1, V2c, and V3. SNMP V1 and SNMP V2c use a community string match for authentication, which means that SNMP servers access all objects with read-only or read/write permissions using the community strings *public* and *private* by default. SNMP V3 requires that you select an authentication level of MD5 or SHA, and is the most secure protocol. You can also enable data encryption to enhance data security.

Supported SNMP security modes and levels are shown in the following table. Select the security mode and level that will be used to communicate between the SNMP agent and manager.

Protocol Version	UI Setting	Authentication	Encryption	Method
SNMP V1, V2c	V1, V2c Read Community	Community string	No	Uses a community string match for authentication.
	V1, V2c Write/Read Community	Community string	No	Uses a community string match for authentication.
SNMP V3	No-Auth	No	No	Uses an account with admin or user to access objects
	MD5 or SHA	Authentication based on MD5 or SHA	No	Provides authentication based on HMAC-MD5, or HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.
	MD5 or SHA	Authentication based on MD5 or SHA	Data encryption key	Provides authentication based on HMAC-MD5 or HMAC-SHA algorithms, and data encryption key. 8-character passwords and a data encryption key are the minimum requirements for authentication .and encryption.

These parameters are configured on the SNMP page. A more detailed explanation of each parameter is given below the figure.

SNMP

SNMP Versions	V1, V2c, V3 ▾
Admin Auth. Type	No-Auth ▾
☐ Enable Admin Data Encryption	Data Encryption Key [ ]
User Auth. Type	No-Auth ▾
☐ Enable User Data Encryption	Data Encryption Key [ ]

Community

V1,V2c Read Community	public
V1,V2c Write/Read Community	private

Trap/inform Recipient

Trap Mode	Trap V1 ▾
Host IP Address 1	[ ]
1st Trap Community	public
Host IP Address 2	[ ]
2nd Trap Community	public

Apply

SNMP Read/Write Settings

SNMP Versions

Setting	Description	Factory Default
V1, V2c, V3, or V1, V2c, or V3 only	Specifies the SNMP protocol version used to manage the PRP/HSR RedBox.	V1, V2c

V1, V2c Read Community

Setting	Description	Factory Default
Max. 30 characters	Specifies the community string to authenticate the SNMP agent for read-only access. The SNMP agent will access all objects with read-only permissions using this community string.	Public

V1, V2c Write/Read Community

Setting	Description	Factory Default
Max. 30 characters	Specifies the community string to authenticate the SNMP agent for read/write access. The SNMP server will access all objects with read/write permissions using this community string.	Private

For SNMP V3, two levels of privilege are available to access the Moxa PRP/HSR RedBox. **Admin** privilege provides access and authorization to read and write the MIB file. **User** privilege allows reading of the MIB file only.

Admin Auth. Type (for SNMP V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
No-Auth	Allows the admin account to access objects without authentication.	No
MD5-Auth	Authentication will be based on the HMAC-MD5 algorithms. 8-character passwords are the minimum requirement for authentication.	No
SHA-Auth	Authentication will be based on the HMAC-SHA algorithms. 8-character passwords are the minimum requirement for	No

	authentication.	

Enable Admin Data Encryption Key (for SNMP V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
Enable	Enables data encryption using the specified data encryption key (between 8 and 30 characters).	No
Disable	Specifies that data will not be encrypted.	No

User Auth. Type (for SNMP V1, V2c, V3 and V3 only)

Setting	Description	Factory Default
No-Auth	Allows the admin account and user account to access objects without authentication.	No
MD5-Auth	Authentication will be based on the HMAC-MD5 algorithms. 8-character passwords are the minimum requirement for authentication.	No
SHA-Auth	Authentication will be based on the HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.	No

Enable User Data Encryption Key (for SNMP V1, V2c, V3 and V3 only)

Setting	Description	Factory Default
Enable	Enables data encryption using the specified data encryption key (between 8 and 30 characters).	No
Disable	No data encryption	No

Trap Settings

SNMP traps allow an SNMP agent to notify the NMS of a significant event. The PRP/HSR RedBox supports two SNMP modes, **Trap** mode and **Inform** mode.

Trap/inform Recipient

Trap Mode	Trap V1
Host IP Address 1	
1st Trap Community	public
Host IP Address 2	
2nd Trap Community	public

SNMP Trap Mode—Trap

In Trap mode, the SNMP agent sends an SNMPv1 trap PDU to the NMS. No acknowledgment is sent back from the NMS so the agent has no way of knowing if the trap reached the NMS.

SNMP Trap Mode—Inform

SNMPv2 provides an inform mechanism. When an inform message is sent from the SNMP agent to the NMS, the receiver sends a response to the sender acknowledging receipt of the event. This behavior is similar to that of the get and set requests. If the SNMP agent does not receive a response from the NMS for a period of time, the agent will resend the trap to the NMS agent. The maximum timeout time is 300 sec (default is 1 sec), and the maximum number of retries is 99 times (default is 1 time). When the SNMP agent receives acknowledgement from the NMS, it will stop resending the inform messages.

Host IP Address 1

Setting	Description	Factory Default

| IP or name | Specifies the IP address or name of the primary trap server used by your network. | None |

1st Trap Community

Setting	Description	Factory Default
Max. 30 characters	Specifies the community string to use for authentication.	Public

Host IP Address 2

Setting	Description	Factory Default
IP or name	Specifies the IP address or name of the secondary trap server used by your network.	None

2nd Trap Community

Setting	Description	Factory Default
Max. 30 characters	Specifies the community string to use for authentication.	Public

Diagnostics

The Moxa PRP/HSR RedBox provides three important tools for administrators to diagnose network systems.

LLDP

Overview

LLDP is an OSI Layer 2 protocol defined by IEEE 802.11AB. LLDP standardizes the self-identification advertisement method, and allows each networking device, such as a Moxa managed PRP/HSR RedBox, to periodically send its system and configuration information to its neighbors. Because of this, all LLDP devices are kept informed of each other's status and configuration, and with SNMP, this information can be transferred to Moxa's MXview for auto-topology and network visualization purposes.
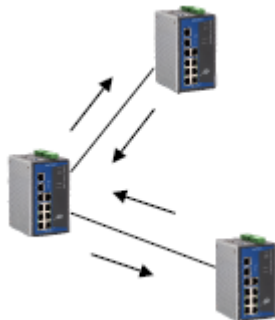
From the PRP/HSR RedBox's web interface, you can enable or disable LLDP, and set the LLDP transmit interval. In addition, you can view each PRP/HSR RedBox's neighbor-list, which is reported by its network neighbors. Most importantly, enabling the LLDP function allows Moxa's MXview to automatically display the network's topology and system setup details, such as VLAN and Trunking, for the entire network.

Configuring LLDP Settings

⁝•LLDP

☑ Enable LLDP
Message Transmit Interval (sec)   5

Apply

Port	Neighbor ID	Neighbor Port	Neighbor Port Description	Neighbor System

General Settings

LLDP

Setting	Description	Factory Default
Enable or Disable	Enables or disables the LLDP function.	Enable

Message Transmit Interval

Setting	Description	Factory Default
5 to 32768 sec.	Sets the transmit interval of LLDP messages, in seconds.	5 (seconds)

LLDP Table

The LLDP Table displays the following information:

Parameter	Description
Port	The port number that connects to the neighbor device.
Neighbor ID	A unique entity (typically the MAC address) that identifies a neighbor device.
Neighbor Port	The port number of the neighbor device.
Neighbor Port Description	A textual description of the neighbor device's interface.
Neighbor System	Hostname of the neighbor device.

Ping

The **Ping** function uses the *ping* command to give users a simple but powerful tool for troubleshooting network problems. The function's most unique feature is that even though the ping command is entered from the user's PC keyboard, the actual ping command originates from the Moxa PRP/HSR RedBox itself. In this way, the user can essentially sit on top of the Moxa PRP/HSR RedBox and send ping commands out through its ports.

To use the Ping function, type in the desired IP address, and then press **Enter** from the Console utility, or click **Ping** when using the Web Browser interface.

⁝•Ping

IP address/Name   [   ]   **Ping**

Port Mirror

The **Port Mirror** function can be used to monitor data being transmitted through a specific port. This is done by setting up another port (the mirror port) to receive the same data being transmitted from, or both to and from, the port under observation. Using a mirror port allows the network administrator to **sniff** the observed port to keep tabs on network activity.

Port Mirroring Settings

Setting	Description
Monitored Port	Select the ports whose network activity will be monitored. Multiple port selection is acceptable.
Sniffer Mode	• RX: Select this option to monitor only those data packets coming into the Moxa PRP/HSR RedBox's port.
Mirror Port	The Ethernet console port is used to monitor the activity of the monitored port.

Monitoring

You can monitor statistics in real time from the Moxa PRP/HSR RedBox's / DSL extender's web console and USB console.

CPU/Memory Utilization

The **CPU/Memory Utilization** page displays how much system resources are being utilized. Monitor this information to get a quick snapshot of the PRP/HSR RedBox's current status.

CPU Utilization

Setting	Description	Factory Default
Read-only	CPU usage volume in the past 5 seconds, 30 seconds, or 5 minutes	Past 5 secs

Free Memory

Setting	Description	Factory Default
Read-only	Amount of free memory currently available	N/A

Power Consumption

Setting	Description	Factory Default
Read-only	Amount of power currently being consumed by the PRP/HSR RedBox (±7%, unit = watts)	None

Statistics

Access the Monitor by selecting **Monitoring** from the left selection bar. Monitor by System allows the user to view a graph that shows the combined data transmission activity of all of the Moxa PRP/HSR RedBox's 18 ports. Click one of the four options—**Total Packets**, **TX Packets**, **RX Packets**, or **Error Packets**—to view transmission activity of specific types of packets. Recall that TX Packets are packets sent out from the Moxa PRP/HSR RedBox, RX Packets are packets received from connected devices, and Error Packets are packets that did not pass TCP/IP's error checking algorithm. The Total Packets option displays a graph that combines TX, RX, and TX Error, RX Error Packet activity. The graph displays data transmission activity by showing **Packets/s** (i.e., packets per second, or pps) versus **sec.** (seconds). In fact, three curves are displayed on the same graph: **Uni-cast** packets (in red color), **Multi-cast** packets (in green color), and **Broad-cast** packets (in blue color). The graph is updated every few seconds, allowing the user to analyze data transmission activity in real-time.

Statistics

All Ports ▾   Total Packets ▾   Clear

Packet/sec

40	
32	
24	
16	
8	
0	
	0 168 336 504 672

Unicast   Multicast   Broadcast   sec
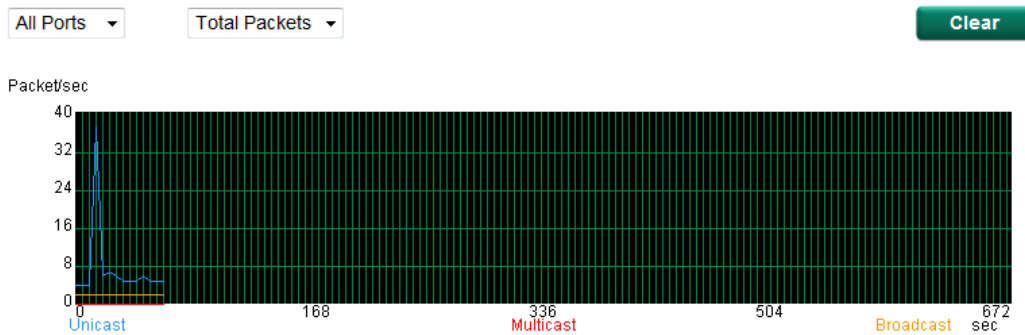
[Format] Total Packets + Packets in past 5 secs   Update Interval: every 5 secs

Port	Tx	Tx Error	Rx	Rx Error
1	0+0	0+0	0+0	0+0
2	16927+54	0+0	25077+50	0+0
3	0+0	0+0	0+0	0+0
4	0+0	0+0	0+0	0+0
5	0+0	0+0	0+0	0+0
6	0+0	0+0	0+0	0+0
7	1375+1	0+0	184+0	0+0
G1	0+0	0+0	0+0	0+0
G2	0+0	0+0	0+0	0+0

Monitor by Port

Access the "Monitor by Port" function by selecting **FE or GE Ports** or **Port i**, in which i = 1, 2, …, G2, from the left dropdown list. The Port i options are identical to the Monitor by System function discussed above, in that users can view graphs that show All Packets, TX Packets, RX Packets, or Error Packets activity, but in this case, only for an individual port. The All Ports option is essentially a graphical display of the individual port activity that can be viewed with the Console Monitor function discussed above. The All Ports option shows three vertical bars for each port. The height of the bar represents Packets/s for the type of packet, at the instant the bar is being viewed. That is, as time progresses, the height of the bar moves up or down so that the user can view the change in the rate of packet transmission. The blue colored bar shows Uni-cast packets, the red colored bar shows Multi-cast packets, and the orange colored bar shows Broad-cast packets. The graph is updated every few seconds, allowing the user to analyze data transmission activity in real-time.

Statistics
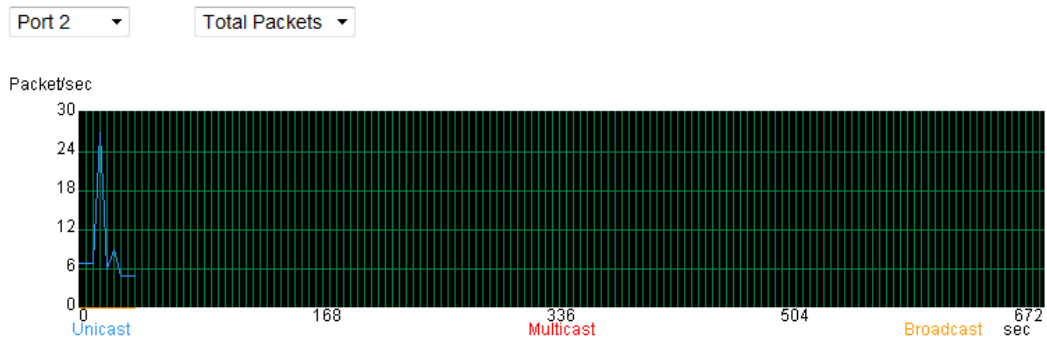
| Port 2 ▼ | | Total Packets ▼ |

Packet/sec

[Format] Total Packets + Packets in past 5 secs   Update Interval: every 5 secs

Tx Total	Tx Unicast	Tx Multicast	Tx Broadcast	Tx Collision
16745+15	13910+14	2815+1	20+0	0+0

Rx Total	Rx Unicast	Rx Multicast	Rx Broadcast	Rx Pause
24848+20	18055+20	801+0	5992+0	0+0

Tx		Rx					
Late	Excessive	CRC Error	Discard	Undersize	Fragments	Oversize	Jabber
0+0	0+0	0+0	0+0	0+0	0+0	0+0	0+0

Fiber Check

Optical fiber is commonly used for long distance data transmission. However, when link issues occur, it is very costly to troubleshoot fiber cables and fiber transceivers at remote sites. To solve this problem, the Moxa PRP/HSR RedBox provides digital diagnostics and monitoring functions on the Moxa SFP optical fiber links that allow users to measure optical parameters and performance from the central site. This function makes it much easier to troubleshoot optical fiber links, and virtually eliminates the cost of onsite debugging at remote sites.

SFP Digital Diagnostic Monitor

Port	Model Name	Temperature (°C)	Voltage (V)	Tx Power (dBm)	Rx Power (dBm)
G2	SFP-1GLXLC-T	31.5	3.3	-7.5	-29.7
G3	SFP-1GLXLC-T	35.6	3.3	-6.7	-35.4

Refresh

Parameter	Description
Port No.	PRP/HSR RedBox port number with SFP plugged in
Model Name	Moxa SFP model name
Temperature (°C)	SFP casing temperature
Voltage (V)	Voltage supplied to the SFP
Tx power (dBm)	The amount of light being transmitted into the fiber optic cable
Rx power (dBm)	The amount of light being received from the fiber optic cable

NOTE   Certain tolerances exist between real data and measured data

Parameter	Tolerance
Temperature (°C)	±3°C
Voltage (V)	±0.1 V
Tx power (dBm)	±3 dB
Rx power (dBm)	±3 dB

Event Log

The Event Log Table displays the following information:

Index	Event index assigned to identify the event sequence.
Bootup Number	This field shows how many times the Moxa PRP/HSR RedBox has been rebooted or cold started.
Date	The date is updated based on how the current date is set on the Basic Settings page.
Time	The time is updated based on how the current time is set on the Basic Settings page.
System Startup Time	The system startup time related to this event.
Event	Events that have occurred.

NOTE	The following events will be recorded into the Moxa PRP/HSR RedBox's Event Log Table:
	• Cold start
	• Warm start
	• Configuration change activated
	• Power 1/2 transition (Off (On), Power 1/2 transition (On (Off))
	• Auth. Success
	• Auth. Fail
	• Auth. Attempts Over Limit
	• Password Change
	• ABC-02 status
	• LLDP Table Change

System Services

This page shows the services summary running on the RedBox device.

System Services

Service	Address Family	Protocol	Local Port
SSH	IPv4	TCP	22
SSH	IPv6	TCP	22
Telnet	IPv4	TCP	23
Telnet	IPv6	TCP	23
Web Server(Http)	IPv4	TCP	80
Web Server(Http)	IPv6	TCP	80
MMS	IPv4	TCP	102
NTP/SNTP	IPv4	UDP	123
NTP/SNTP	IPv4	UDP	123
SNMP Agent	IPv4	UDP	161
Web Server(Https)	IPv4	TCP	443
DNS Client	IPv4	UDP	949
Moxa Utility Service	IPv4	TCP	4000
Moxa Utility Service	IPv4	UDP	4000

A

MIB Groups

The Moxa PRP/HSR RedBox comes with built-in SNMP (Simple Network Management Protocol) agent software that supports cold/warm start trap, line up/down trap, and RFC 1213 MIB-II.

The standard MIB groups that the Moxa PRP/HSR RedBox supports are as follows:

MIB II.1—System Group

> sysORTable

MIB II.2—Interfaces Group

> ifTable

MIB II.4 – IP Group

> ipAddrTable
> ipNetToMediaTable
> IpGroup
> IpBasicStatsGroup
> IpStatsGroup

MIB II.5—ICMP Group

> IcmpGroup
> IcmpInputStatus
> IcmpOutputStats

MIB II.6—TCP Group

> tcpConnTable
> TcpGroup
> TcpStats

MIB II.7—UDP Group

> udpTable
> UdpStats

MIB II.10—Transmission Group

> dot3
> dot3StatsTable

MIB II.11—SNMP Group

> SnmpBasicGroup
> SnmpInputStats
> SnmpOutputStats

The Moxa PRP/HSR RedBox also provides a private MIB file, located in the file **Moxa-[PRP/HSR RedBox's model name]-MIB.my** on the Moxa PRP/HSR RedBox utility CD-ROM.

Public Traps

- Cold Start
- Warm Start
- Link Up
- Link Down
- Authentication Failure
- Fiber Check

Private Traps

- Configuration Changed
- Power On
- Power Off
- LLDPChgTrap

B

CLI Command Support for the EOM-G103-PHR-PTP Module

Basic Commands

Command	Display Information
quit	Exit command line interface
exit	Exit command line interface
reload	Halt and perform a cold restart
reload factory-default	Halt and perform a cold restart with factory default
terminal length	Configure terminal page length
terminal default	Reset the terminal length to the default
copy xmodem device-firmware	copy System firmware from xmodem
save	Save running configuration to flash
clear logging	clear System event logs
clear counters	Clear statistics counters

Show Commands

Command	Display Information
show version	System version information
show system	System hardware and software status
show interfaces hw_interface	Display hardware interface configuration
show clock	Display the system clock
show redundancy PRP/HSR	Display redundancy protocol status
show redundancy mode	Current redundancy protocol mode
show mac-address-table [learned/interface]	Display MAC address forwarding table by interface/learned
show logging event-log	Display system event logs
show vlan-filtering	Display vlan filtering configuration
show multicast-filtering	Display Multicast Filtering status

Configuration Commands

Command	Display Information
hostname <string:token1>	Set system's network name (maximum 35 characters)
clock set <STRING:time> - hh:mm:ss	Adjust the clock
clock timezone gmt <INT:offset_hour>	Time zone hour shifting
clock summer-time start-date <STRING:month>	The date summer time offset (daylight savings time) starts
clock summer-time end-date <STRING:month>	The date when summer time offset (daylight savings time) ends
clock summer-time offset <UINT:hour>	Summer time offset (daylight savings time)
redundancy mode [PRP/HSR]	Specify the redundancy protocol
multicast-filter action [drop/forward]	Set multicast filter action
multicast-filter <UINT:index>	Enable Multicast filter priority entry
multicast-filter addr <UINT:index> <MACADDR:MacAddress>	set multicast-filter address
multicast-filter src-port <UINT:index> <UINT:port>	Set source port of the multicast priority entry
multicast-filter mac-compare-length <UINT:index> <UINT:len>	Set Compared length of multicast address
vlan-filtering vid-list <STRING:vlanids>	setting VLANs list
vlan-filtering vid [add/remove] <STRING:vlanids>	VLAN filtering parameters

Configuration Redundancy Commands

Command	Display Information
entryforgettime	Set Entry forget time

Configuration Port Interface Commands

Command	Display Information
hw_interface [SGMII / 1000BaseX]	Set hardware interface as SGMII or 1000BaseX