MiiNePort W1 Series User's Manual

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www.moxa.com/product

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Introduction

The MiiNePort W1 series provides serial to 802.11 b/g embedded wireless solution with compact size, and ultra low power consumption features. Numerous operation modes are designed to fulfill the requirements of embedded module application. Complete driver support reduces software redesign effort and accelerate time to market.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**

Overview

The MiiNePort W1 series is a very compact module that installs in a serial device to connect it to a wireless LAN. With such a small size, around half the size of a credit card, it can be installed into almost any kind of serial device. The MiiNePort W1 series also comes with a built-in TCP/IP stack for fast integration with your serial devices. This means that your engineers can spend less time with the TCP/IP and wireless details, and more time on developing major features, shortening your product's time to market. The reliable TCP/IP communication firmware can be configured easily using a Windows utility, a web browser, or Telnet console.

An integration kit and a complete development kit are both available for evaluation and development use. The development kit contains a development board, documents, sample code, cables, and accessories.

Package Checklist

Package Checklist (modules)

- MiiNePort W1 series wireless module

Package Checklist (starter kits)

- 1 MiiNePort W1 series wireless module
- MiiNePort W1 evaluation board
- Antenna - ANT-WDB-ARM-02
- Antenna - CRF-MHF/SMA(M)-14.2
- 1 cross-over Ethernet cable
- 1 null modem serial cable
- Universal power adaptor
- Documentation and software CD
- Quick installation guide
- Warranty card

Product Features

The MiiNePort W1 series has the following features:

- 802.11 b/g compatible
- AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i security support
- 1 Serial port, up to 921.6Kbps
- 1 Ethernet port, 10/100Mbps
- HTTPS/SSH support for configuration
- Fast roaming to enhance connection reliability

Product Specifications

Form Factor

Type: Drop-in module

Dimensions: 44.4 x 44.4 x 9.7 mm(1.75 x 1.75 x 0.38 in)

System Information

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, auto MDI/MDIX

WLAN Interface

Standard Compliance: IEEE 802.11b/g

Network Modes: Infrastructure mode (b/g), Ad-Hoc mode (b/g)

Spread Spectrum Technology: DSSS, CCK, OFDM

Transmit Power:

IEEE 802.11b: 16 dBm (typical)

IEEE 802.11g: 14 dBm (typical)

Receive Sensitivity: -71 dBm (Min)

Transmission Rate:

IEEE 802.11b: 11 Mbps

IEEE 802.11g: 54 Mbps

Transmission Distance:

Up to 100 meters (in open areas)

Wireless Security:

AES, WEP 64/128-bit, WPA, WPA2, PSK, 802.11i

Serial Interface

Number of Ports: 1

Serial Standards: TTL

Serial Communication Parameters

Data Bits: 7, 8

Stop Bits: 1, 2

Parity: None, Even, Odd

Flow Control: RTS/CTS, XON/XOFF

Baudrate: 50 bps to 921.6 Kbps

Serial Signals

TTL: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND

Digital I/O Pins:

GPIO: 8 configurable I/O pins

Software

Network Protocols: ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, SNMP V1/V2c/V3, HTTP, SMTP, SNTP, SSH, HTTPS

Configuration Options: Web/Telnet/HTTPS/SSH/SNMP Console, Windows Utility, Serial command mode (configured through the data port)

Windows RealCOM Drivers: Windows 95/98/ME/NT/2000, Windows XP/2003/Vista/2008/7 x86/x64, Embedded CE 5.0/6.0, XP Embedded

Fixed TTY Drivers: SCO Unix, SCO OpenServer, UnixWare 7, UnixWare 2.1, SVR 4.2, QNX 4.25, QNX 6, Solaris 10, FreeBSD, AIX 5.x

Linux Real TTY Drivers: Linux kernel 2.4.x, 2.6.x, 3.0.x

Operation Modes: Real COM, TCP Server, TCP Client, UDP, RFC2217

Environmental Limits

Operating Temperature:

Standard Models: 0 to 55°C (32 to 131°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Storage Temperature: -40 to 60°C (-40 to 140°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Power Requirements

Input Voltage: 3.3 to 5 VDC (±5%)

Power Consumption: 360 mA @ 3.3 VDC, 290 mA @ 5 VDC input max.

Standards and Certifications

Safety: UL 60950-1, EN 60950-1

EMC: CE, FCC

EMI: EN 55022 Class A, FCC Part 15 Subpart B Class A

EMS:

EN 55024,
EN 61000-4-2 (ESD),
EN 61000-4-3 (RS),
EN 61000-4-4 (EFT),
EN 61000-4-5 (Surge),
EN 61000-4-6 (CS),
EN 61000-4-8,
EN 61000-4-11

Radio: EN301 489, EN300 328, EN300 893, FCC 15C,
EN61121/EN500 385

Shock: IEC-68-2-27

Freefall: IEC-68-2-34, IEC-68-2-32

Vibration: IEC-68-2-6

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer)

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

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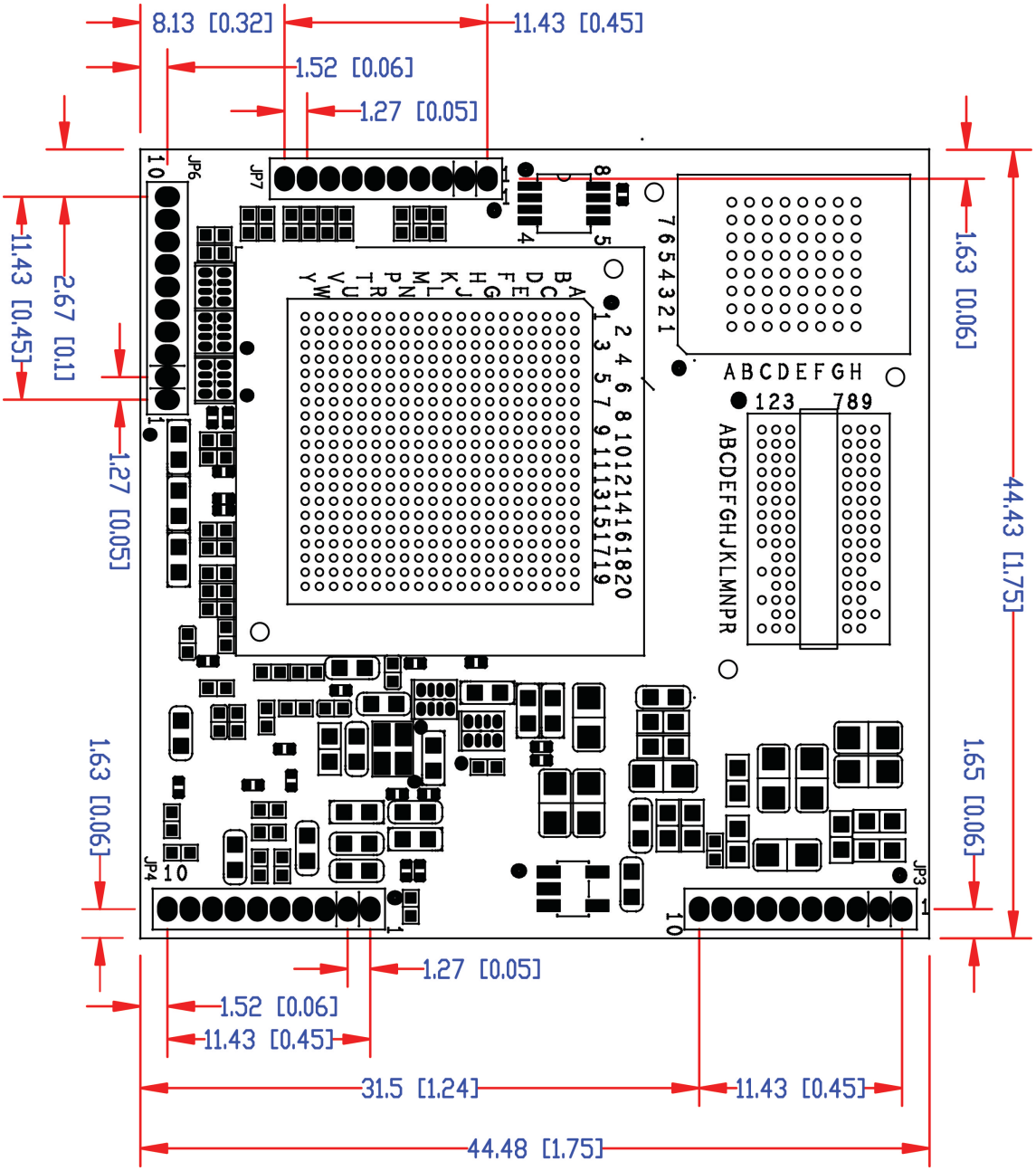
Panel Layout and Pin Assignments

This chapter includes information about the panel layouts and pin assignments for MiiNePort W1 series. The layouts and reference circuit diagrams for the evaluation boards are also covered. The evaluation boards are used for evaluation and development of applications for MiiNePort W1 series.

The following topics are covered in this chapter:

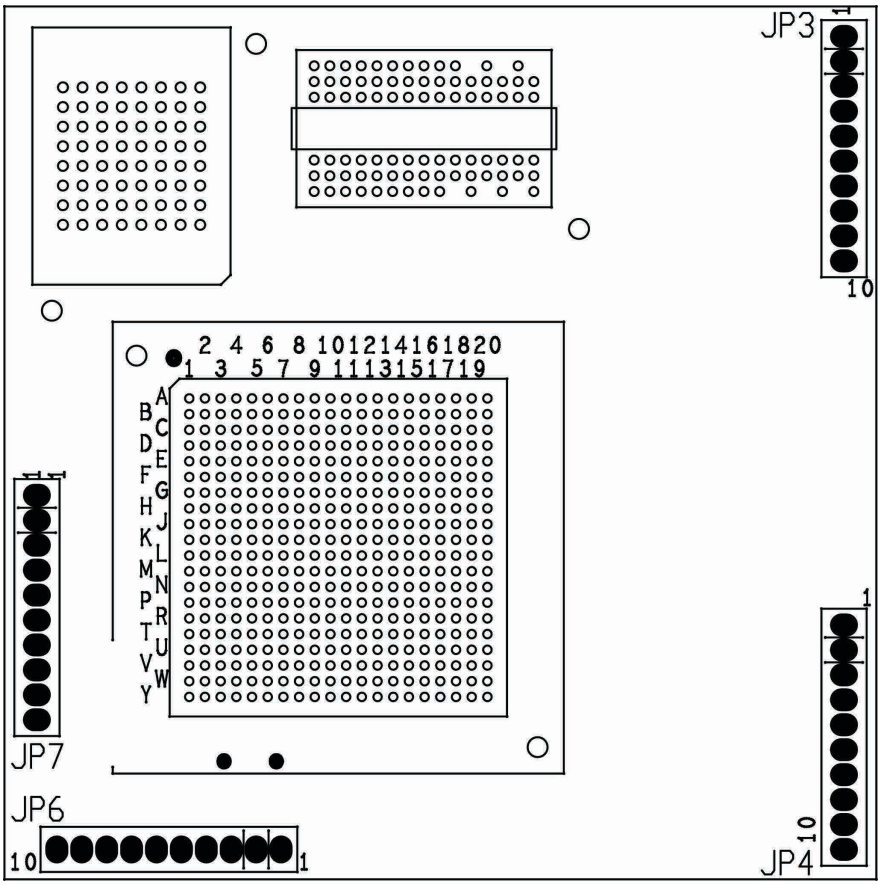
- **MiiNePort W1 Dimensions**
- **MiiNePort W1 Pin Assignments**
- **MiiNePort W1-ST LED Indicators**
- **Evaluation Board Layout**

MiiNePort W1 Dimensions



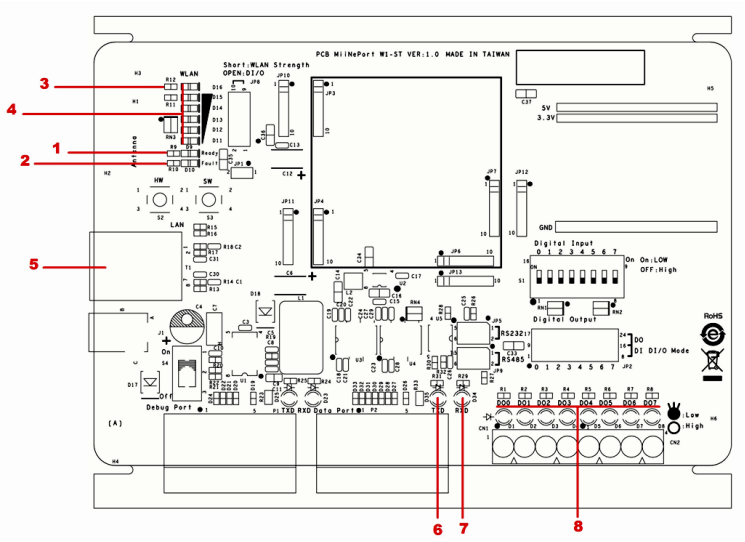
Unit: mm (inch)

MiiNePort W1 Pin Assignments



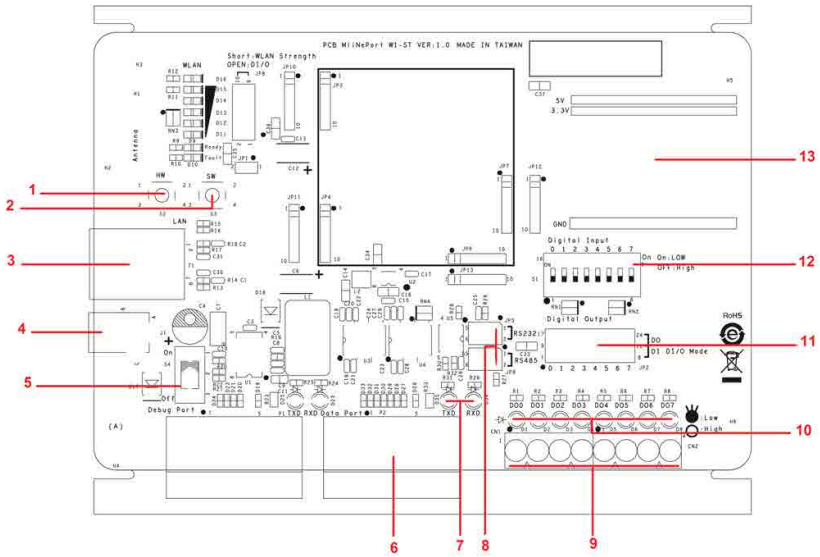
Pin	JP3	JP4	JP6	JP7
1	N.C.	Eth_10M_LED	PIO0	LTXD0
2	N.C.	Eth_100M_LED	PIO1	LRTS0
3	N.C.	Eth_Rx+	PIO2	LDTR0
4	RDY_LED	Eth_Rx-	PIO3	LRXD0
5	FLT_LED	Eth_center_tap	PIO4	LCTS0
6	HW_RESET	Eth_center_tap	PIO5	LDSR0
7	SW_RESET	Eth_Tx+	PIO6	LDCD0
8	WLAN_Link	Eth_Tx-	PIO7	N.C.
9	Vin	GND	LTXD1	LCTS1
10	Vin	GND	LRTS1	LRXD1

MiiNePort W1-ST LED Indicators



Location	Type	Color	Status	Meaning
1	Ready	Off	Off	Power is off.
				Unit is booting or rebooting.
				IP error condition occurs.
		Green	Steady On	Unit is functioning normally.
			Blinking	Unit is responding to software Locate function.
				Reset button is being held down.
2	Fault	Off	Off	Power is off.
				Unit is functioning normally.
		Red	Steady On	Unit is booting or rebooting.
			Blinking	IP conflict, DHCP or BOOTP server did not respond properly.
3	WLAN	Off	Off	Unit was booted with Ethernet cable plugged.
		Green	Steady On	Wireless LAN is activated. (Unit was booted with Ethernet cable unplugged.)
4	WLAN Strength	Off	Off	JP3 is opened.
		Green/Off	Steady On/Off	JP3 is shorted, each LED corresponds to 20% WLAN signal strength.
5	Ethernet	Off	Off	Ethernet cable is unplugged.
		Orange	Steady On	10M Ethernet connected.
		Green	Steady On	100M Ethernet connected.
6	Serial TXD	Off	Off	No data is being transmitted from unit.
		Green	On	Data is being transmitted from unit.
7	Serial RXD	Off	Off	No data is being transmitted to unit.
		Yellow	On	Data is being transmitted to unit.
8	DO1~DO8	Off	Off	GPIO mode is input
				JP2 DO is opened.
				GPIO mode is output, and state is high.
		Green	Steady On	JP2 DO is shorted, GPIO mode is output, and state is low.

Evaluation Board Layout



Number	Function
1	HW Reset (Cold start)
2	SW Reset (Reset to factory default)
3	Ethernet RJ45 Connector
4	Power Jack
5	Power Switch
6	DB9 Male Connector
7	Serial Tx/Rx LED
8	RS-232 and RS-485 2W Select Jumper
9	Digital I/O Terminal Block
10	Digital Output LED
11	Digital Input/Output Mode
12	Digital Input Switch
13	Circuit Pad

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Getting Started

This chapter includes information about installing MiiNePort W1 series.

The following topics are covered in this chapter:

- **Wiring Requirements**
- **Installing onto the MiiNePort W1 Evaluation Board**
  - Circuit Pad
- **Connecting to the Network**
- **Connecting the Power**
- **Connecting to a Serial Device**
- **DI/O Test Settings**
  - WLAN Strength and Link status LEDs Circuit Design

Wiring Requirements

ATTENTION

Before connecting the hardware, follow these important wiring safety precautions:

Disconnect power source

Do not install or wire this unit or any attached devices with the power connected. Disconnect the power before installation by removing the power cord before installing and/or wiring your unit.

Follow maximum current ratings

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Use caution - unit may get hot

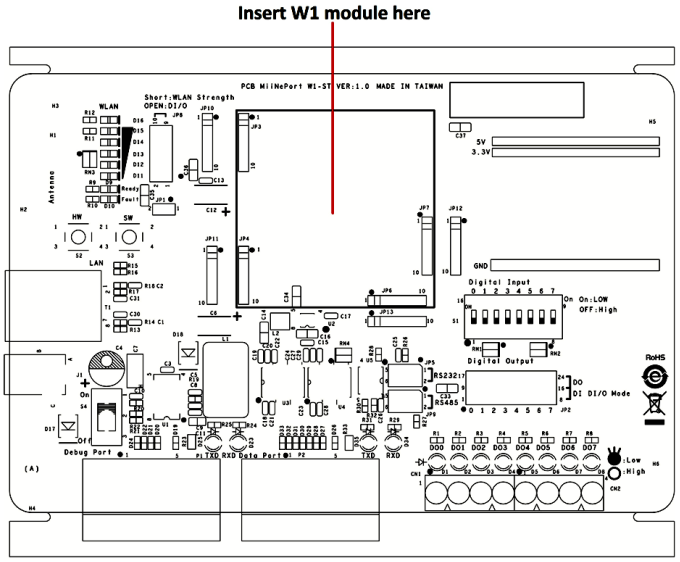
The unit will generate heat during operation, and the casing may feel hot to the touch. Take care when handling unit. Be sure to leave adequate space for ventilation.

The following guidelines will help ensure trouble-free signal communication:

- Use separate paths to route wiring for power and devices to avoid interference. Do not run signal or communication wiring and power wiring in the same wire conduit. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
- Keep input wiring and output wiring separate.
- Label all wiring to each device in the system for easier testing and troubleshooting

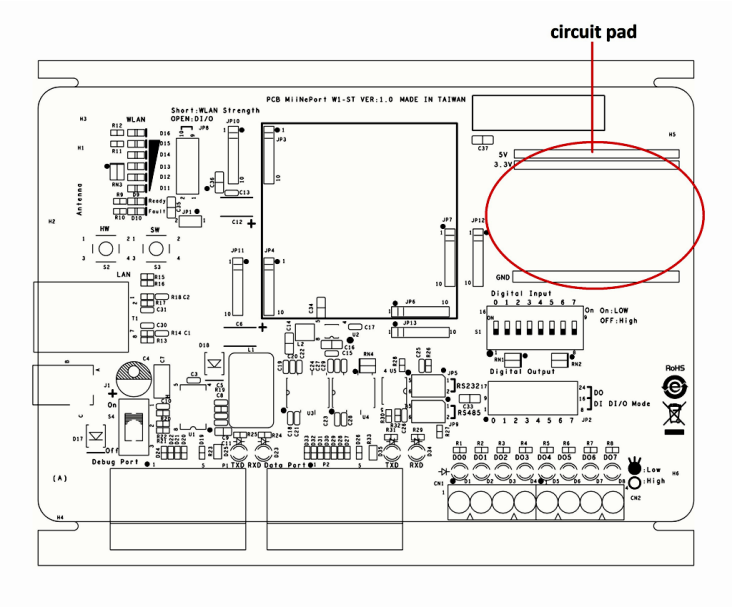
Installing onto the MiiNePort W1 Evaluation Board

The MiiNePort W1 evaluation board is a tool to help you develop your MiiNePort W1 series application. The module must first be installed on the board before the power supply, network, and serial device are connected. Align the sockets on the MiiNePort W1 series module with the pins on the MiiNePort W1 series board, as shown in the following figure.



Circuit Pad

The circuit pad on the evaluation board can be used to develop additional application circuits.



The bottom row of pins is for connecting a 5V power supply; the next row up is for connecting a 3.3V power supply. Digital I/O pins are located on the right side. The top row of pins is for grounding.

Connecting to the Network

When developing your application, you may wish to use Ethernet to configure the MiiNePort W1, especially if your wireless LAN is not functional yet. You may connect to the network using the evaluation board's RJ45 Ethernet port. In order to use the LAN connection, make sure the network cable is already plugged in before the unit is powered on.

After power is connected in the next step, the RJ45 connector will indicate a valid connection to the Ethernet as follows:

A green LED indicator indicates a valid 100 Mbps Ethernet network connection and will flicker as data is being transmitted.

A yellow LED indicator indicates a valid 10 Mbps Ethernet network connection and will flicker as data is being transmitted.

Connecting the Power

Connect the 12 to 48 VDC power line to the power jack on the evaluation board.

Connecting to a Serial Device

Use a serial cable to connect the serial device to the data port, P2, on the evaluation board. (P1 is reserved)

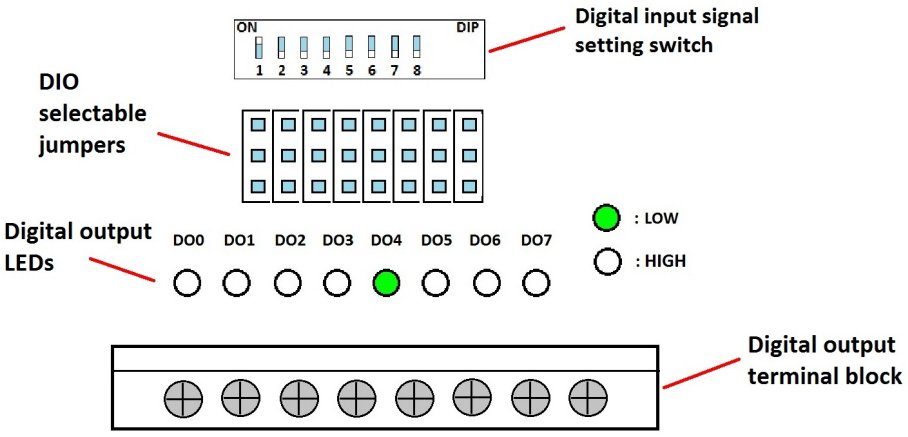
DI/O Test Settings

The MiiNePort W1 includes 8 digital I/O channels. Each digital I/O channel is a GPIO (General Purpose I/O) channel that can be set to "digital output" or "digital input" mode by software. When developing your own applications, be aware of the voltage limits. The output current is 1 mA.

		Min.	Max.	Unit	Conditions
Low-level input voltage	Maximum voltage when DI is set to "Low" status.	-----	0.8	V	
High-level input voltage	Minimum voltage when DI is set to "High" status.	2	-----	V	
Low-level input voltage	Maximum voltage when DO is set to "Low" status.	-----	0.4	V	
High-level input voltage	Minimum voltage when DO is set to "High" status	2.4	-----	V	

The output current for each digital output channel carries only 1 mA.

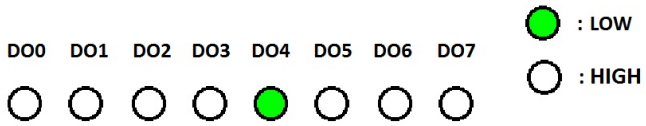
On the evaluation board, the DIO mode jumper selects whether a digital channel will be connected to the DIP switch for input testing, or to the LED for output testing. If DIO1 is set to digital input mode on the MiiNePort W1, you can use a jumper setting on the evaluation board to connect DIO1 to the DIP switch. Digit one on the DIP switch will then be the input device for DIO1. When you flip the switch on or off, you can see the status of DIO1 change on the web console or in the Windows utility.



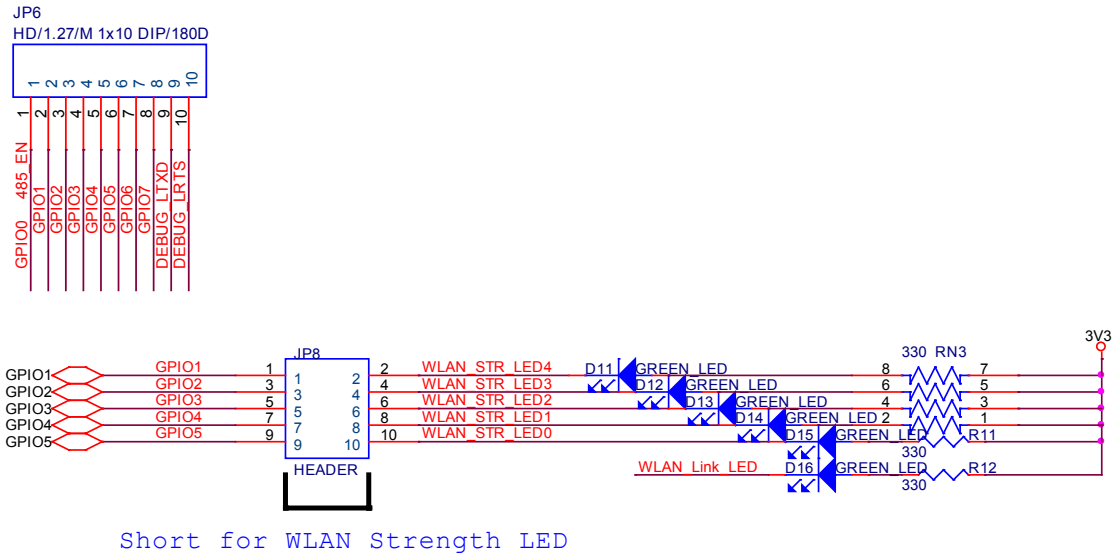
1. First, position the jumpers so they correspond with the input/output mode of each digital I/O channel. In the example below, channels 0 through 3 are output (DO) channels and channels 4 through 8 are input (DI) channels.

2. After setting the jumpers, use the DIP switches to set the status for input channels 0 through 3. You can set the status to either low (on) or high (off). In the example below, channel 0 is set to low, and channels 1 through 3 are set to high. Note that channel 0 corresponds to switch 1.

3. Use the web console to set the status of output channels. If you set channel 3's status to "Low" and the others to "High," the DO3 LED will glow and the other LEDs will remain dark. Please refer to Chapter 9 for more configuration details.



WLAN Strength and Link status LEDs Circuit Design



Note: For more information on circuit design, please refer to the MiiNePort W1 Schematic Design Guide.

4

Selecting an Operation Mode

In this section, we describe the available operation modes for the MiiNePort W1. There is a mode that relies on a driver installed on the host computer, and other modes that rely on TCP/IP socket programming concepts. After determining the proper operation mode for your application, please refer to Chapter 8 for instructions on configuring that mode.

The following topics are covered in this chapter:

- **Overview**
- **TCP Server Mode**
- **TCP Client Mode**
- **UDP Mode**
- **Real COM Mode**

Overview

The MiiNePort W1 series connects serial devices to the wireless LAN. It has a built-in TCP/IP stack that saves you the effort of programming networking protocols. Simply select the proper operating mode to allow your computer to access, manage, and configure your serial device over the Internet.

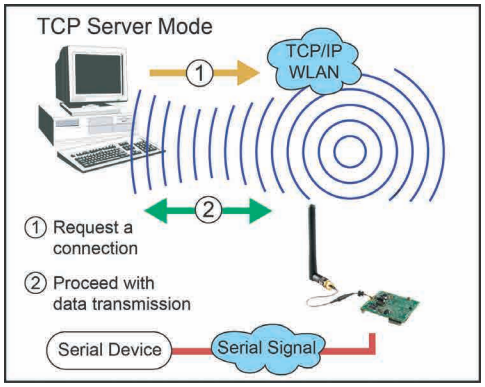
Traditional SCADA and data collection systems collect data from various instruments over serial connections (RS-232/422/485). Since MiiNePort W1 series is designed to convert between serial and Ethernet signals, both local and remote devices can be connected to a standard TCP/IP network and made accessible to SCADA and data collection systems.

Real COM and **RFC2217** modes allow serial-based software to access the module's serial port as if it were a local serial port on a PC. These modes are appropriate when your application relies on Windows or Linux software that was originally designed for locally attached COM or TTY devices. With these modes, you can access your devices from the network using your existing COM/TTY-based software, without investing in additional software.

Three different socket modes are available for user-developed socket programs: **TCP Server**, **TCP Client**, and **UDP**. For TCP applications, the appropriate mode depends on whether the connection will be hosted or initiated from the module's serial port or from the network. The main difference between the TCP and UDP protocols is that TCP guarantees delivery of data by requiring the recipient to send an acknowledgement to the sender. UDP does not require this type of verification, making it possible to offer speedier delivery. UDP also allows multi-unicasting of data to groups of IP addresses and would be suitable for streaming media or non-critical messaging applications such as LED message boards.

TCP Server Mode

In **TCP Server** mode, the module's serial port is assigned an IP:port address that is unique on your TCP/IP network. It waits for the host computer to establish a connection to the attached serial device. This operation mode also supports up to four simultaneous connections, so multiple hosts can collect data from the attached device at the same time.

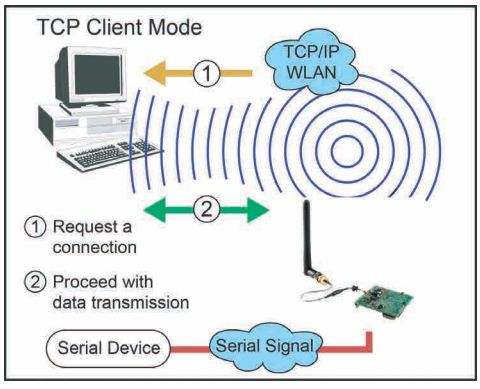


Data transmission proceeds as follows:

1. A host requests a connection to the module's serial port.
2. Once the connection is established, data can be transmitted in both directions—from the host to the device, and from the device to the host.

TCP Client Mode

In TCP Client mode, the module actively establishes a TCP connection to a specific network host when data is received from the attached serial device. After the data has been transferred, the module can automatically disconnect from the host computer through the Inactivity time settings. Please refer to Chapter 8 for details on these parameters.

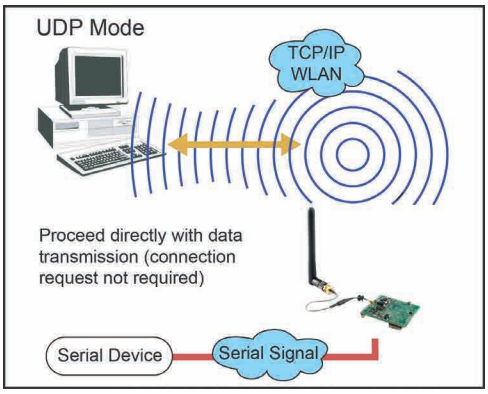


Data transmission proceeds as follows:

1. The module requests a connection from the host.
2. The connection is established and data can be transmitted in both directions between the host and device.

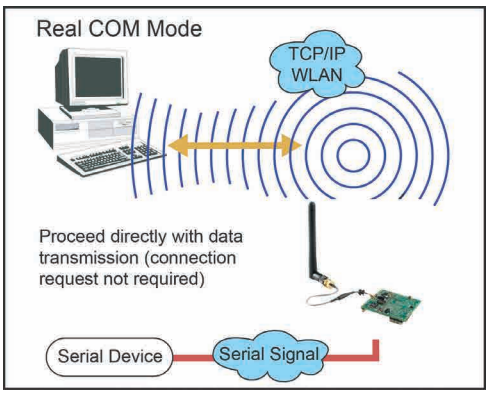
UDP Mode

UDP is similar to TCP but is faster and more efficient. Data can be broadcast to or received from multiple network hosts. However, UDP does not support verification of data and would not be suitable for applications where data integrity is critical. It is ideal for message display applications.



Real COM Mode

Real COM mode is designed to work with drivers that are installed on a network host. COM drivers are provided for Windows systems, and TTY drivers are provided for Linux and UNIX systems. The driver establishes a transparent connection to the attached serial device by mapping a local serial port to the module's serial port. Real COM mode supports up to four simultaneous connections, so multiple hosts can collect data from the attached device at the same time.



ATTENTION

Real COM drivers are installed and configured through the included Windows utility.

Real COM mode allows you to continue using your serial communications software to access devices that are now attached to the MiiNePort W1 series module. On the host, the Real COM driver automatically intercepts data sent to the COM port, packs it into a TCP/IP packet, and redirects it to the network. At the other end of the connection, the MiiNePort W1 series accepts the Ethernet frame, unpacks the TCP/IP packet, and sends the serial data to the appropriate device.

ATTENTION

In Real COM mode, several hosts can have simultaneous access control over the serial port on the module. If necessary, you can limit access by using the Accessible IP settings. Please refer to Chapter 9 for additional information on Accessible IP settings.

5

Initial IP Address Configuration

When setting up your MiiNePort W1 series module for the first time, the first thing you should do is configure the IP address. This chapter introduces the methods that can be used to configure the MiiNePort W1 series' IP address. For more details about network settings, please refer to Chapter 7.

The following topics are covered in this chapter:

- **Selecting an IP Address or Configuration**
- **Assigning IP Address with ARP**
- **Assigning IP Address with Telnet Console**

ATTENTION

Please refer to active interface . (chapter 7)

Selecting an IP Address or Configuration

For most applications, you will assign a fixed IP address to the module, which means that you set the IP address directly. However, for certain network environments, your module's IP address will need to be assigned by a DHCP or BOOTP server. In this case, instead of directly assigning the module's IP address, you will need to configure the module to receive its IP address from the appropriate DHCP or BOOTP server.

If you are not sure whether you need to configure your module for a dynamic or static IP address, consult the administrator who set up the LAN. You will also need to consult the network administrator if you wish to use a fixed IP address in a DHCP or BOOTP environment.

Factory Default IP Address

Network Interface	IP Configuration	IP Address
LAN	Static	192.168.126.254
WLAN	Static	192.168.127.254

If the module is configured to obtain its IP settings from a DHCP or BOOTP server but is unable to get a response, it will use the factory default IP address and netmask.

The 192.168.xxx.xxx set of addresses are private IP addresses, since they cannot be directly accessed from a public network. You cannot ping a device with a 192.168.xxx.xxx address from an outside Internet connection. If your application requires sending data over a public network, such as the Internet, you will need to assign a valid public IP address, which can be leased from a local ISP.

Assigning IP Address with ARP

The ARP (Address Resolution Protocol) command can be used to assign an IP address to the module. The ARP command tells your computer to associate the module's MAC address with the specified IP address. You must then use Telnet to access the module, at which point the module's IP address will be reconfigured. This method only works when the module is configured with default IP settings.

ATTENTION

When using ARP to set the module's IP address, be aware of the following items:

- Your computer and your module must be connected to the same LAN or WLAN. You may use a cross-over Ethernet cable to connect the module directly to your computer's Ethernet port.
- Your module must be configured with the factory default IP address before executing the ARP command. When connected to a LAN, the default IP is 192.168.126.254. When connected to a WLAN, the default IP is 192.168.127.254.

1. Select a valid IP address for your MiiNePort W1 series module. Consult with your network administrator if necessary.
2. Obtain the module's MAC address from the label on the module.
3. From the DOS prompt, execute the **arp** -s command with the desired IP address and the module's MAC address, as in the following example:

   arp -s 192.168.200.100 00-90-E8-xx-xx-xx

   In this example 192.168.200.100 is the new IP address that you wish to assign to the module, and 00-90-E8-xx-xx-xx is the module's MAC address.
4. From the DOS prompt, execute a special Telnet command using port 6000, as in the following example:

   telnet 192.168.200.100 6000

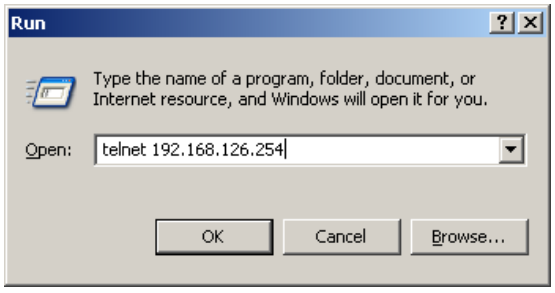
   In this example, 192.168.200.100 is the new IP address that is being assigned to the module.
5. You should see a message indicating that the connection failed.

6. The module will automatically reboot with the new IP address. You can verify that the configuration was successful by connecting to the new IP address with Telnet, ping, or another method.

Assigning IP Address with Telnet Console

Depending on how your computer and network are configured, you may find it convenient to use network access to set up your MiiNePort W1 series module's IP address. This can be done using the Telnet program.

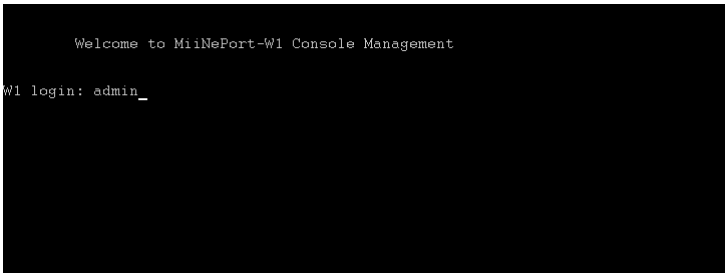
1. Select **Run...** from the Windows Start menu.
2. Enter the **telnet** command using your module's current IP address and click **OK**.



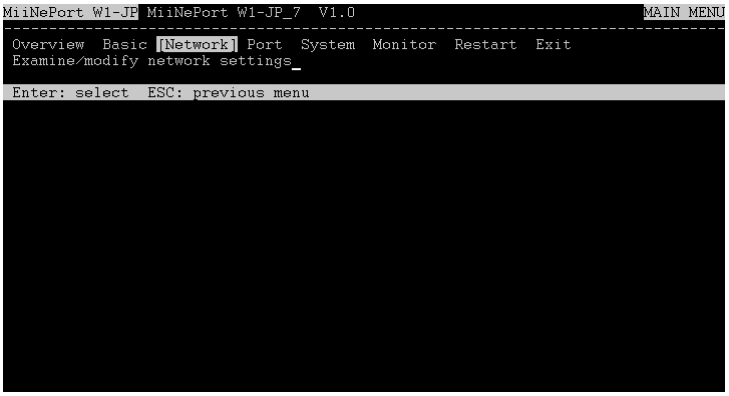
3. Input login account name and password.

   W1 Login: admin

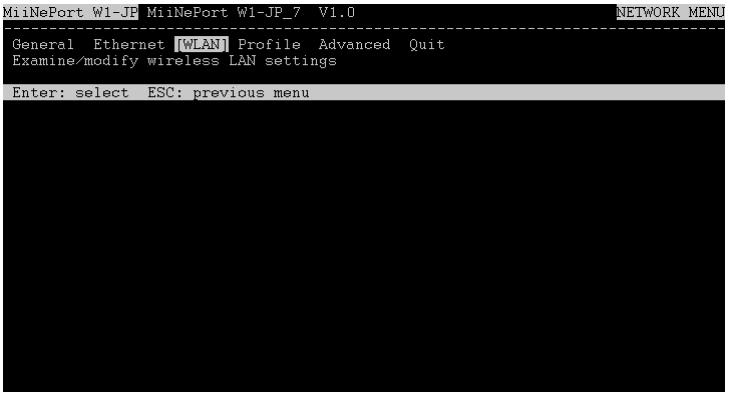
   Password: (default is empty)



4. Select **Network** by pressing **N** or by using the cursor keys. Press **ENTER** after making the selection.



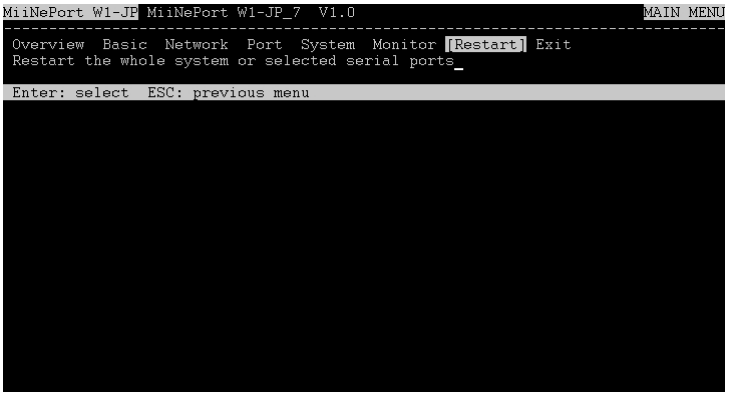
5. Select **Ethernet** or **WLAN** and press **ENTER**.



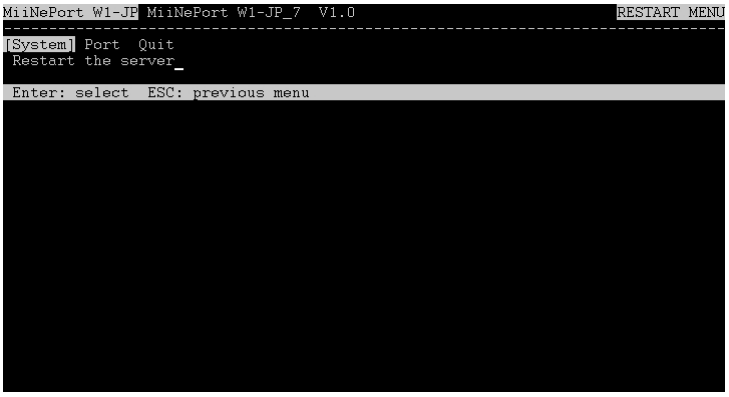
6. Use the cursor keys to navigate between the different fields. For **IP address**, **Netmask**, and **Gateway**, enter the desired values directly. For **IP configuration** and **LAN speed**, press **ENTER** to open a submenu and select between the available options.

7. Press **ESC** to return to the menu. Press **ESC** again to return to the main menu. When prompted, press **Y** to save the configuration changes.

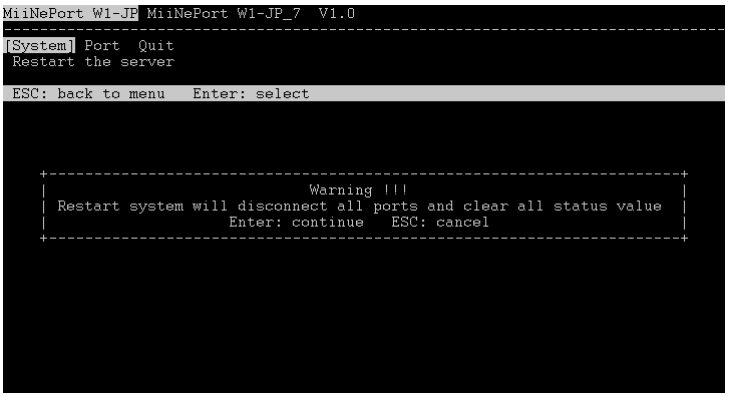
8. Select **Restart** and then press **ENTER**.



9. Select **System** and then press **ENTER**.



10. Press **Enter** to restart the module. It will reboot with the new IP settings.



6

Utility Console and Driver Installation

This chapter describes the installation of utilities and drivers, which are used to perform simple configurations and driver installations

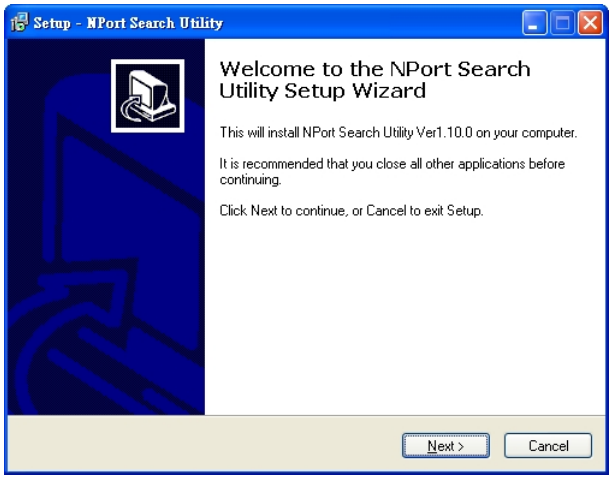
The following topics are covered in this chapter:

- **NPort Search Utility**
  - Installing NPort Search Utility
  - NPort Search Utility Configuration
- **NPort Windows Driver Manager**
  - Installing NPort Windows Driver Manager
  - Using NPort Windows Driver Manager
- **The Linux Real TTY Driver**
  - Mapping TTY Ports
  - Removing Mapped TTY Ports
  - Removing Linux Driver Files
- **The UNIX Fixed TTY Driver**
  - Installing the UNIX Driver
  - Configuring the UNIX Driver
- **Web Browser Settings**
  - Navigating the Web Console

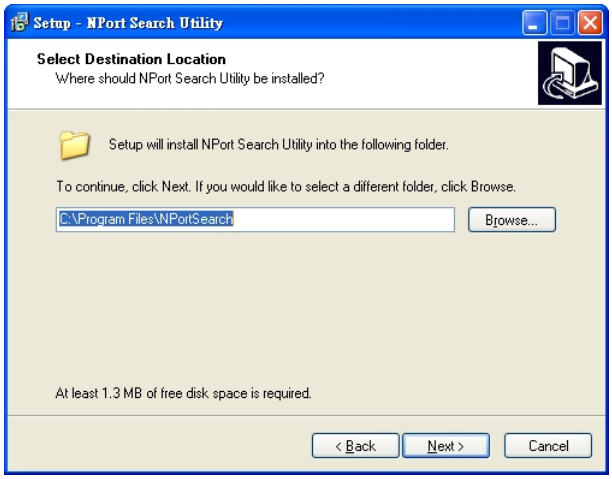
NPort Search Utility

Installing NPort Search Utility

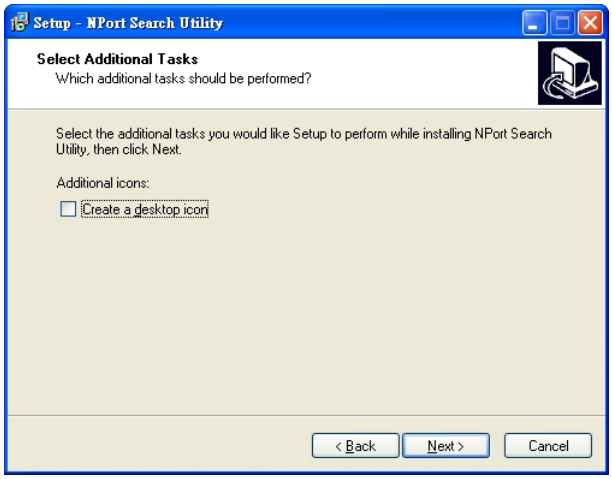
1. Click the **INSTALL UTILITY** button in the MiiNePort Installation CD to install NPort Search Utility. Once the program starts running, click **Yes** to proceed.
2. Click **Next** when the Welcome screen opens to proceed with the installation.



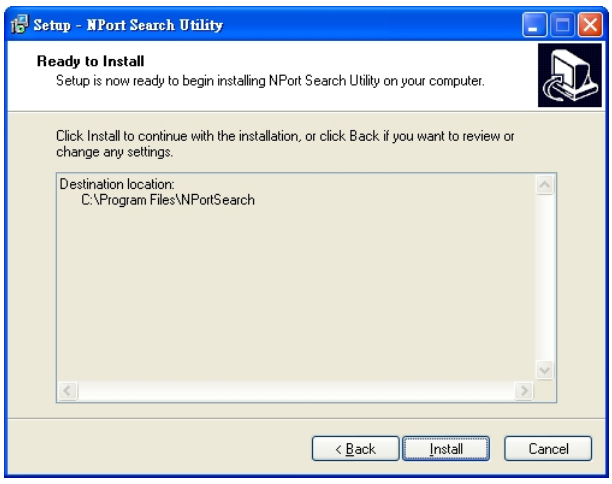
3. Click **Browse** to select an alternate location and then click **Next** to install program files to directory displayed in the input box.



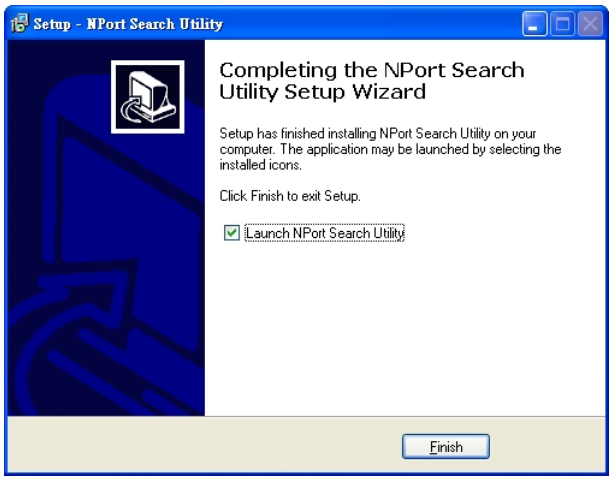
4. Click **Next** to install the program's shortcuts in the appropriate **Start Menu** folder.



5. The installer will display a summary of the installation options. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen.



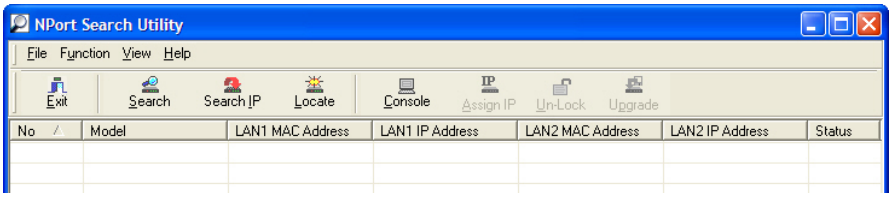
6. Click **Finish** to complete the installation of NPort Search Utility.



NPort Search Utility Configuration

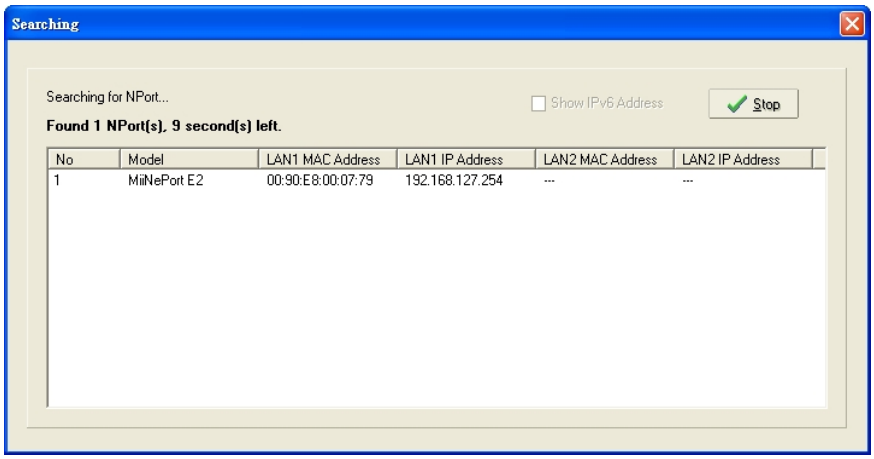
The Broadcast Search function is used to locate all MiiNePort modules that are connected to the same LAN as your computer. After locating a MiiNePort, you will be able to change its IP address. Since the Broadcast Search function searches by MAC address and not IP address, all MiiNePort modules connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

1. Start the **NPort Search Utility** and then click the **Search** icon.

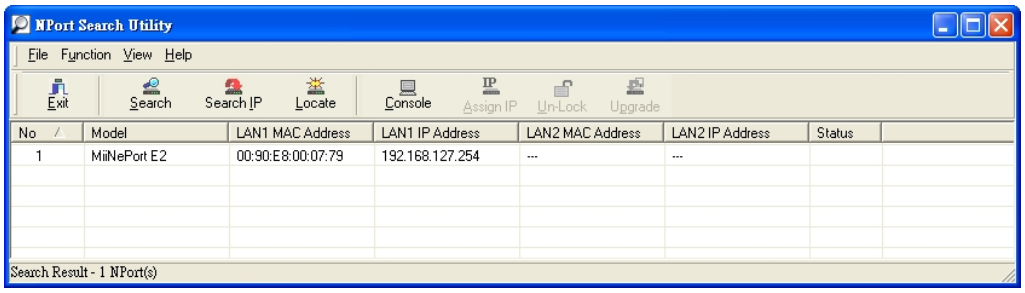


Note: Users running Windows Vista and Windows 7 will see a "User Account Control" popup and should allow the program.

2. The **Searching** window indicates the progress of the search.



3. When the search is complete, all MiiNePort modules that were located will be displayed in the NPort Search Utility window.



4. To modify the configuration of the highlighted MiiNePort, click the **Console** icon to open the web console. This will take you to the web console, where you can make configuration changes. Refer to **Chapter 7: Web Console Configuration** for information on how to use the web console.

ATTENTION

If you are looking for information related to TCP Server, TCP Client, Ethernet Modem, RFC2217, or UDP modes, you can ignore the following Driver sections, including NPort Windows Driver Manager and Linux Real TTY Driver, and instead jump directly to **Chapter 7: Web Console Configuration** for additional settings.

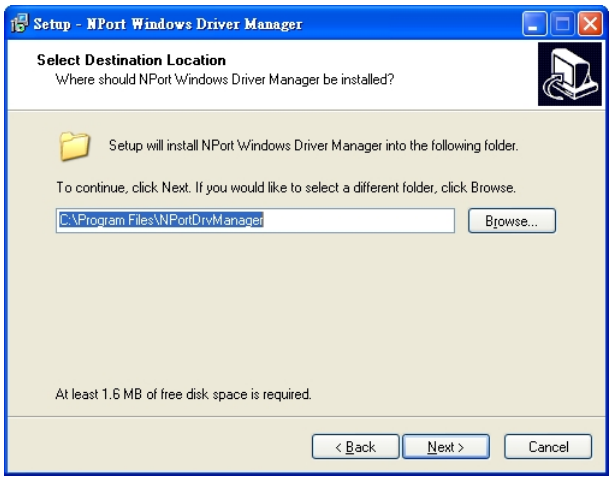
NPort Windows Driver Manager

Installing NPort Windows Driver Manager

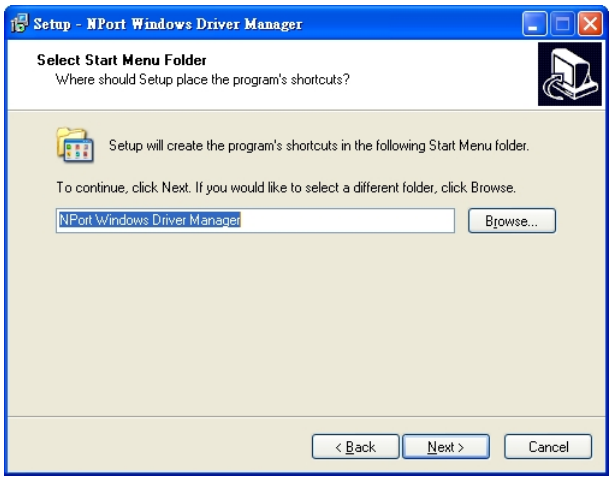
NPort Windows Driver Manager is intended for use with serial ports that are set to Real COM mode. The software manages the installation of drivers that allow you to map unused COM ports on your PC to your device through the MiiNePort's serial port. The driver screenshots below were captured in Windows XP/2003/Vista/2008/7 (x86/x64) When the drivers are installed and configured, devices that are embedded with the MiiNePort will be treated as if they are attached to your PC's own COM ports.

1. Click the **INSTALL COM Driver** button in the MiiNePort Installation CD to install the NPort Windows Driver. Once the installation program starts running, click **Yes** to proceed.
2. Click **Next** when the Welcome screen opens to proceed with the installation.

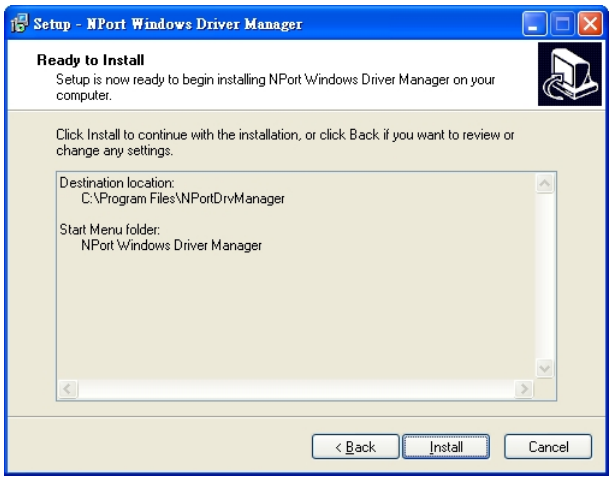
3. Click **Browse** to select the destination directory and then click **Next** to install program files to the directory displayed in the input box.



4. Click **Next** to install the program's shortcuts in the appropriate **Start Menu** folder.



5. The installer will display a summary of the installation options. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen.



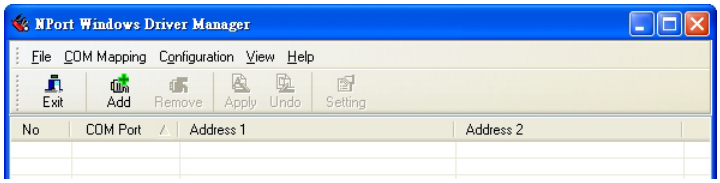
6. Click **Finish** to complete the installation of NPort Windows Driver Manager.

Using NPort Windows Driver Manager

After you install NPort Windows Driver Manager, you can set up the MiiNePort's serial port, which is connected to your device's main board, as remote COM ports for your PC host. Make sure that the serial port on your MiiNePort is already set to Real COM mode when mapping COM ports with the NPort Windows Driver Manager.

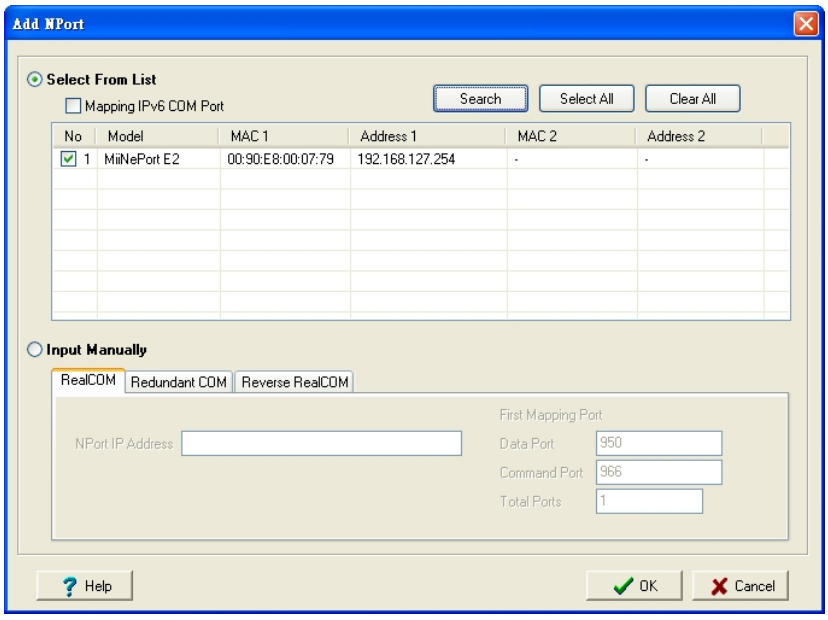
NOTE Refer to **Chapter 7: Web Console Configuration** to learn how to configure your MiiNePort to Real COM mode.

1. Go to **Start** → **NPort Windows Driver Manager** → **NPort Windows Driver Manager** to start the COM mapping utility.
2. Click the **Add** icon.

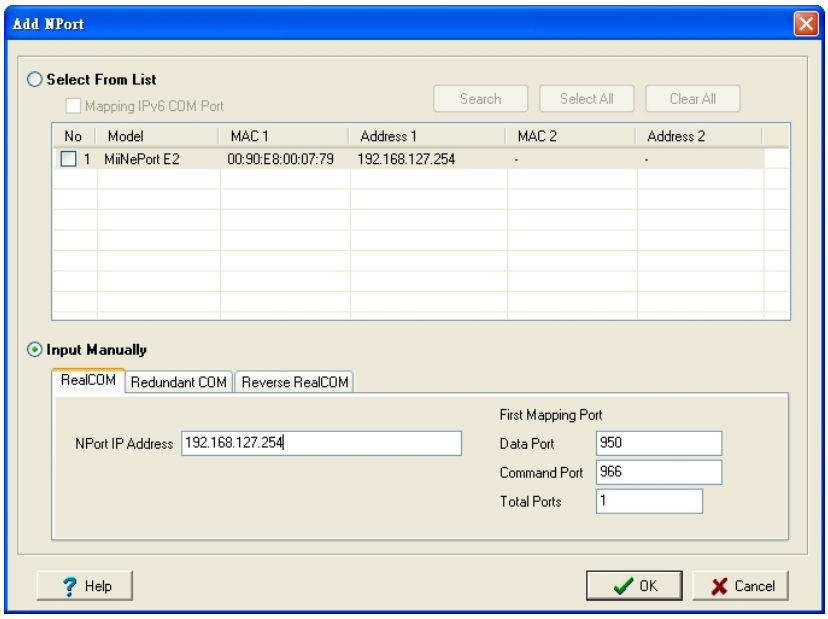


Note: Users running Windows Vista and Windows 7 will see a "User Account Control" popup and should allow the program.

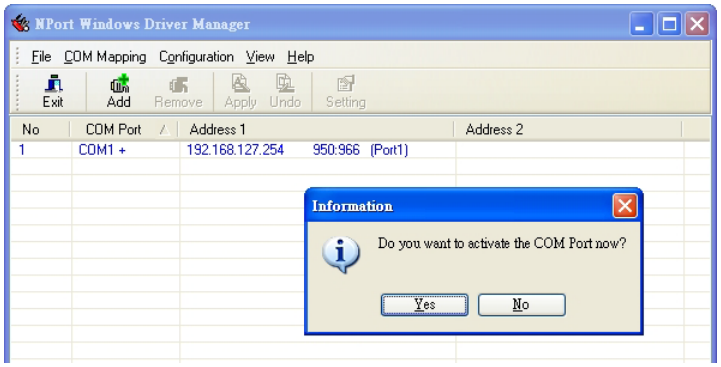
3. Click **Search** to search for the MiiNePort modules. From the list that is generated, select the server to which you will map COM ports, and then click **OK**.



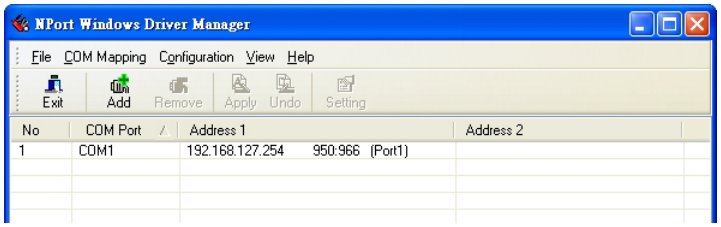
4. Alternatively, you can select **Input Manually** and then manually enter the MiiNePort module's **IP Address**, **1st Data Port**, **1st Command Port**, and **Total Ports** to which COM ports will be mapped. Click **OK** to proceed to the next step. Note that the **Add NPort** page supports FQDN (Fully Qualified Domain Name), in which case the IP address will be filled in automatically.



5. COM ports and their mappings will appear in blue until they are activated. Activating the COM ports saves the information in the host system registry and makes the COM port available for use. The host computer will not have the ability to use the COM port until the COM ports are activated. Click **Yes** to activate the COM ports at this time, or click **No** to activate the COM ports later.



6. Ports that have been activated will appear in black.



The Linux Real TTY Driver

1. Obtain the driver file from the included CD-ROM or the Moxa website, at http://www.moxa.com.
2. Log in to the console as a super user (root).
3. Execute **cd** / to go to the root directory.
4. Copy the driver file **npreal2xx.tg**z to the / directory.
5. Execute tar xvfz **npreal2xx.tgz** to extract all files into the system.
6. Execute **/tmp/moxa/mxinst**.
   For RedHat AS/ES/WS and Fedora Core1, append an extra argument as follows:
   # /tmp/moxa/mxinst SP1
   The shell script will install the driver files automatically.
7. After installing the driver, you will be able to see several files in the **/usr/lib/npreal2/driver** folder:
   > **mxaddsvr** (Add Server, mapping tty port)
   > **mxdelsvr** (Delete Server, un-mapping tty port)
   > **mxloadsvr** (Reload Server)
   > **mxmknod** (Create device node/tty port)
   > **mxrmnod** (Remove device node/tty port)
   > **mxuninst** (Remove tty port and driver files)

At this point, you will be ready to map the MiiNePort serial port to the system tty port.

Mapping TTY Ports

Be sure to set the operation mode of the serial port of the MiiNePort to Real COM mode. After logging in as a super user, enter the directory **/usr/lib/npreal2/driver** and then execute **mxaddsvr** to map the target MiiNePort serial port to the host tty ports. The syntax of **mxaddsvr** is as follows:

mxaddsvr [MiiNePort IP Address] [Total Ports] ([Data port] [Cmd port])

The **mxaddsvr** command performs the following actions:

1. Modifies npreal2d.cf.
2. Creates tty ports in directory /dev with major and minor number configured in npreal2d.cf.
3. Restarts the driver.

Mapping tty ports automatically

To map tty ports automatically, execute mxaddsvr with just the IP address and number of ports, as in the following example:

 # cd /usr/lib/npreal2/driver
 # ./mxaddsvr 192.168.3.4 16

In this example, 16 tty ports will be added, all with IP 192.168.3.4, with data ports from 950 to 965 and command ports from 966 to 981.

Mapping tty ports manually

To map tty ports manually, execute **mxaddsvr** and manually specify the data and command ports, as in the following example:

 # cd /usr/lib/npreal2/driver
 # ./mxaddsvr 192.168.3.4 16 4001 966

In this example, 16 tty ports will be added, all with IP 192.168.3.4, with data ports from 4001 to 4016 and command ports from 966 to 981.

Removing Mapped TTY Ports

After logging in as root, enter the directory **/usr/lib/npreal2/driver** and then execute **mxdelsvr** to delete a server. The syntax of mxdelsvr is:

mxdelsvr [IP Address]

Example:

 # cd /usr/lib/npreal2/driver
 # ./mxdelsvr 192.168.3.4

The following actions are performed when executing mxdelsvr:

1. **npreal2d.cf** is modified.
2. Relevant tty ports in directory **/dev** are removed.
3. The driver is restarted.

If the IP address is not provided in the command line, the program will list the installed servers and total ports on the screen. You will need to choose a server for deletion from the list.

Removing Linux Driver Files

A utility is included that will remove all driver files, mapped tty ports, and unload the driver. To do this, you only need to enter the directory **/usr/lib/npreal2/driver**, and then execute **mxuninst** to uninstall the driver. The following actions will be performed:

1. The driver is unloaded.
2. All files and directories in **/usr/lib/npreal2** are deleted.
3. The directory **/usr/lib/npreal2** is deleted.
4. The script file that initializes the system is modified.

The UNIX Fixed TTY Driver

Installing the UNIX Driver

1. Log in to UNIX and create a directory for the Moxa TTY. To create a directory named /usr/etc, execute the command:
   # mkdir –p /usr/etc

2. Copy **moxattyd.tar** to the directory you created. If you created the **/usr/etc** directory above, you would execute the following commands:
   # cp moxattyd.tar /usr/etc
   # cd /usr/etc

3. Extract the source files from the tar file by executing the command:
   # tar xvf moxattyd.tar

   The following files will be extracted:

   README.TXT
   moxattyd.c --- source code
   moxattyd.cf --- an empty configuration file
   Makefile --- makefile
   VERSION.TXT --- fixed tty driver version
   FAQ.TXT

4. Compile and Link

   For SCO UNIX:
   # make sco

   For UnixWare 7:
   # make svr5

   For UnixWare 2.1.x, SVR4.2:
   # make svr42

Configuring the UNIX Driver

Modify the configuration:

The configuration used by the **moxattyd program** is defined in the text file **moxattyd.cf**, which is in the same directory that contains the program **moxattyd**. You may use **vi**, or any text editor to modify the file, as follows:

ttyp1 192.168.1.1 950

For more configuration information, view the file **moxattyd.cf**, which contains detailed descriptions of the various configuration parameters.

NOTE The "Device Name" depends on the OS. See the Device Naming Rule section in README.TXT for more information.

Start the moxattyd daemon that you configured in moxattyd.cf. If you would like to set the connection timeout, you can add a "-t min" parameter to specify the connection timeout value in minutes. For example:

 # /usr/etc/moxattyd/moxattyd -t 1

NOTE You will now be able to use tty, which is configured in moxattyd.cf.

To start the moxattyd daemon after system bootup, add an entry into **/etc/inittab**, with the tty name you configured in **moxattyd.cf**, as in the following example:

ts:2:respawn:/usr/etc/moxattyd/moxattyd –t 1

Device naming rule

For UnixWare 7, UnixWare 2.1.x, and SVR4.2, use:

pts/**[*n*]**

For all other UNIX operating systems, use:

ttyp**[*n*]**

Adding an additional server

1. Modify the text file **moxattyd.cf** to add an additional server. You may use **vi** or any text editor to modify the file. For more configuration information, look at the file **moxattyd.cf**, which contains detailed descriptions of the various configuration parameters.

2. Find the process ID (PID) of the program **moxattyd**.
   # ps -ef | grep moxattyd

3. Update configuration of the **moxattyd** program.
   # kill -USR1 **[*PID*]**
   (e.g., if moxattyd PID = 404, kill -USR1 404**)**

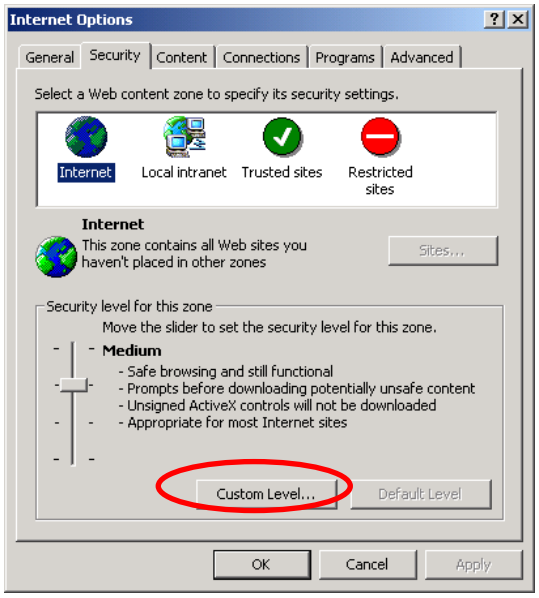
   Execute the moxattyd program again to activate the new settings, as follows:
   # /usr/etc/moxattyd/moxattyd -t 1

This completes the process of adding an additional server.

Web Browser Settings

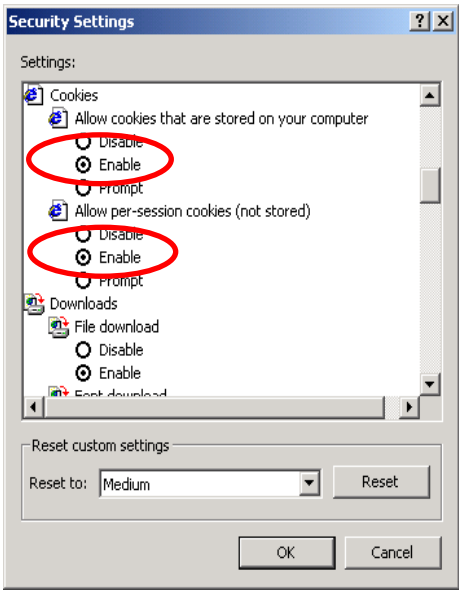
In order to use the web console, you will need to have cookies enabled for your browser. Please note that the web console uses cookies only for password transmission.

For Internet Explorer, cookies can be enabled by right-clicking the Internet Explorer icon on your desktop and selecting Properties from the context menu. On the Security tab, click "Custom Level…"



Enable these two items:

- Allow cookies that are stored on your computer
- Allow per-session cookies (not stored)



ATTENTION

If you are not using Internet Explorer, cookies are usually enabled through a web browser setting such as "allow cookies that are stored on your computer" or "allow per-session cookies." Cookies are used for password transmission only.

Navigating the Web Console

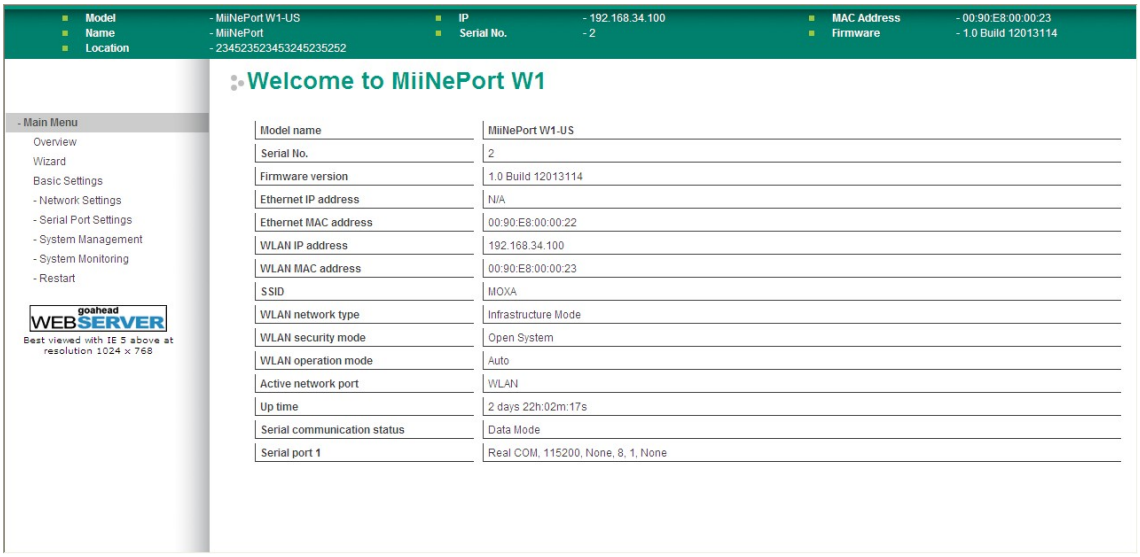
To open the web console, enter your module's IP address in the website address line. If you are configuring the unit for the first time over an Ethernet cable, you will use the default LAN IP address, **192.168.126.254**. Please refer to Chapter 5 for instructions on assigning the IP address.

If prompted, enter the console password. You will only be prompted for a password if you have enabled password protection on the module. The password will be transmitted with MD5 encryption over the Ethernet.

ATTENTION

If you have forgotten the password, you can use the reset button to load factory defaults. This will erase all previous configuration information.

The web console will appear as shown below.



Settings are presented on pages that are organized by folder. Pages are selected in the left navigation panel. For example, if you click **Basic Settings** in the navigation panel, the main window will show a page of basic settings that you can configure. Certain folders can be expanded by clicking the adjacent "+" symbol.

After you have made changes on a page, you must click **Submit** in the main window before jumping to another page. Your changes will be lost if you do not click **Submit**.

After you have finished modifying the desired pages, you must save and restart the module for the new settings to take effect. You may complete this in one step by clicking **Save/Restart** after you submit a change. Changes will not take effect until they are saved and the unit is restarted. If you restart the module without saving your configuration, all configuration changes will be lost.

ATTENTION

You may use Web Console to export the configuration file when you have finished configuring the module. This way, you can restore your settings if you need to reset the module. Please refer to Chapter 9 for additional information about using the Export and Import functions.

7

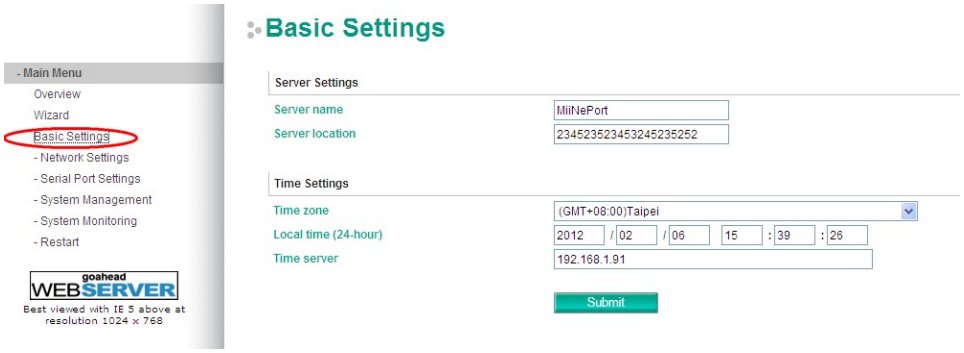
Web Console Configuration

The web console is the most user-friendly method available to configure your MiiNePort module. This chapter introduces the web console function groups and function definitions.

The following topics are covered in this chapter:

- **Basic Settings**
  - Network Settings
- **Serial Port Settings**
  - Operation Modes
  - Serial Parameter
- **System Management**
  - Misc. Network Settings
  - Auto Warning Settings
  - Maintenance
  - System Settings
  - Certificate
- **System Monitoring**
  - Serial Status
  - System Status
- **Restart**
  - Restart System
  - Restart Ports

Basic Settings



On the **Basic Settings** page, you can configure **Server name**, **Server location, Time zone**, **Local time**, and **Time server**.

Server Name

Default	
Options	free text (e.g., "Server 1")
Description	This is an optional free text field to help you differentiate one module from another. It does not affect operation of the module.

Server Location

Default	
Options	free text (e.g., "Building 4, Level 2")
Description	This is an optional free text field to help you differentiate one module from another. It does not affect operation of the module.

Time Zone

Default	(GMT)Greenwich Mean Time
Options	(GMT)Greenwich Mean Time (GMT-01:00)Azores, Cape Verde Is. (GMT-02:00)Mid-Atlantic etc.
Description	This field shows the currently selected time zone and allows you to select a different time zone.

Local Time

Default	1970/01/01 00:00:00
Options	Date (yy:mm:dd), Time (hh:mm:ss)

ATTENTION

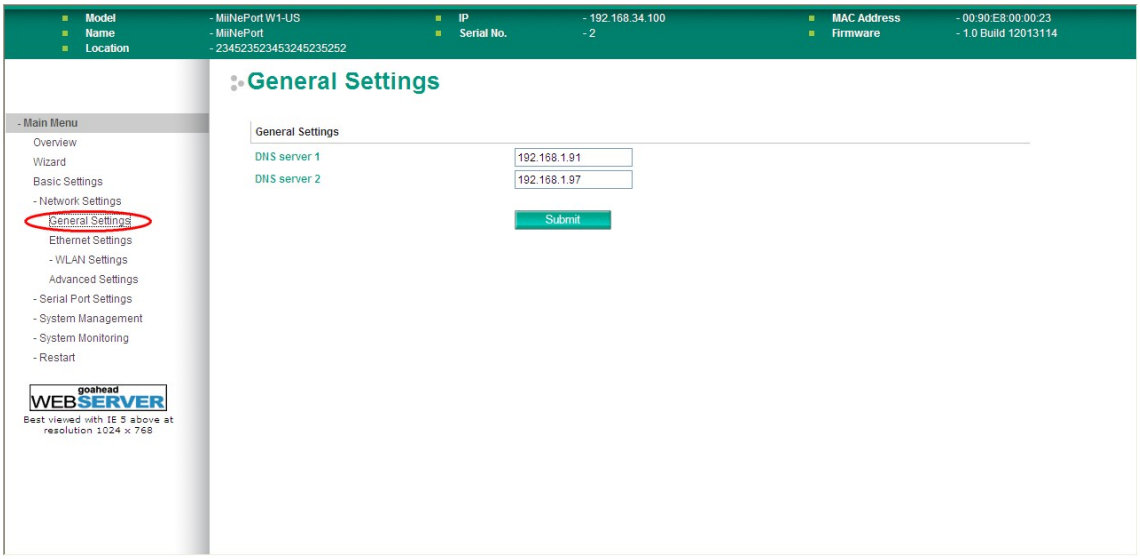
When modifying the local time, select the time zone first. The time display will be updated to reflect the specified time zone.

Time Server

Default	
Options	IP address or domain name (e.g., "192.168.1.1" or "time.nist.gov")
Description	This optional field specifies your time server's IP address or domain name, if a time server is used in your network. The module supports SNTP (RFC-1769) for automatic time calibration. The module will request time information from the specified time server every 10 minutes.

Network Settings

General Settings

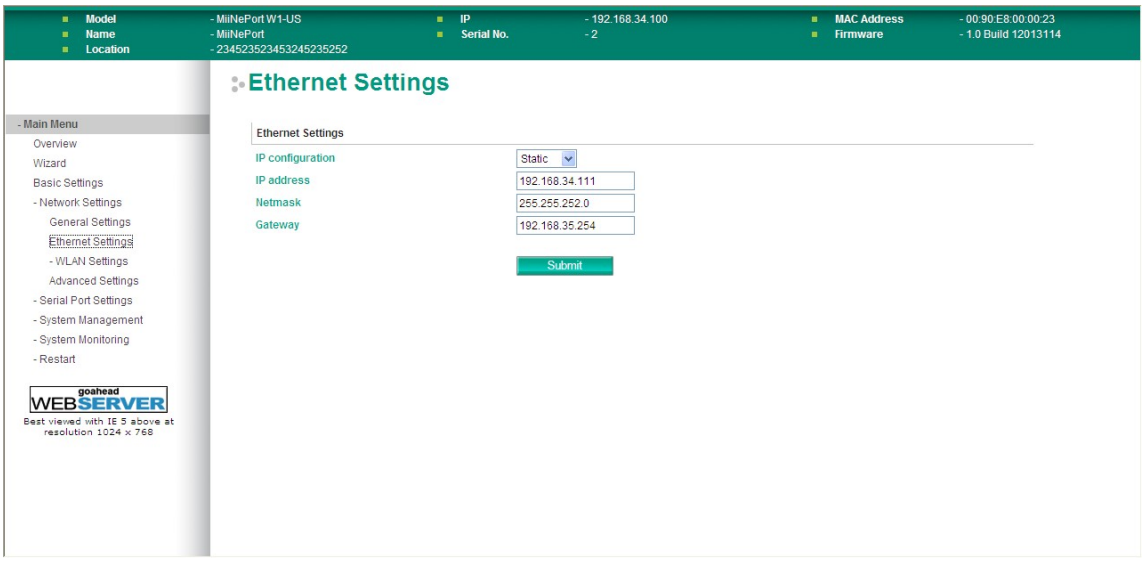


On the **General Settings** page in the **Network Settings** folder, you can modify **DNS server 1** and **2**.

DNS Server 1 and 2

Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the DNS server's IP address, if applicable. With the DNS server configured, the MiiNePort W1 series module can use domain names instead of IP addresses to access hosts. Domain Name System (DNS) is how Internet domain names are identified and translated into IP addresses. A domain name is an alphanumeric name, such as www.moxa.com, that it is usually easier to remember than the numeric IP address. A DNS server is a host that translates a text-based domain name into an IP address in order to establish a TCP/IP connection. When the user wants to visit a particular website, the user's computer sends the domain name (e.g., www.moxa.com) to a DNS server to request that website's numeric IP address. When the IP address is received from the DNS server, the user's computer uses that information to connect to the website's web server. The MiiNePort W1 series will play the role of a DNS client, actively querying the DNS server for the IP address associated with a particular domain name.

Ethernet Settings



On the **Ethernet Settings** page in the **Network Settings** folder, you can modify **IP configuration**, **IP address**, **Netmask**, **Gateway**, and **Speed**.

You must assign a valid IP address to the MiiNePort W1 series before it will work in your network environment. Your network system administrator should provide you with an IP address and related settings for your network. The IP address must be unique within the network; otherwise the MiiNePort W1 series will not have a valid connection to the network. First-time users should refer to Chapter 5 for more information.

IP Configuration

Default	Static
Options	Static, DHCP, DHCP/BOOTP, BOOTP
Description	This field determines how the MiiNePort W1 series' IP address will be assigned. Static: IP address, netmask, and gateway are user-defined. DHCP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. DHCP/BOOTP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. IP address is assigned by BOOTP server if DHCP server does not respond. BOOTP: IP address is assigned by BOOTP server.

IP Address

Default	192.168.126.254
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address that will be assigned to your MiiNePort W1/MiiNePort W1-T module. An IP address is a number assigned to a network device (such as a computer) as a permanent address on the network. Computers use the IP address to identify and talk to each other over the network. Choose a proper IP address that is unique and valid in your network environment. If your module will be assigned a dynamic IP address, set the "IP configuration" parameter appropriately.

Netmask

Default	255.255.255.0
Options	Netmask setting (e.g., "255.255.0.0")
Description	This field is for the subnet mask. A subnet mask represents all of the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the MiiNePort W1 series module will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on the local network segment. If the address is on the same network segment as the module, a connection is established directly from the module. Otherwise, the connection is established through the gateway as specified in the "Gateway" parameter.

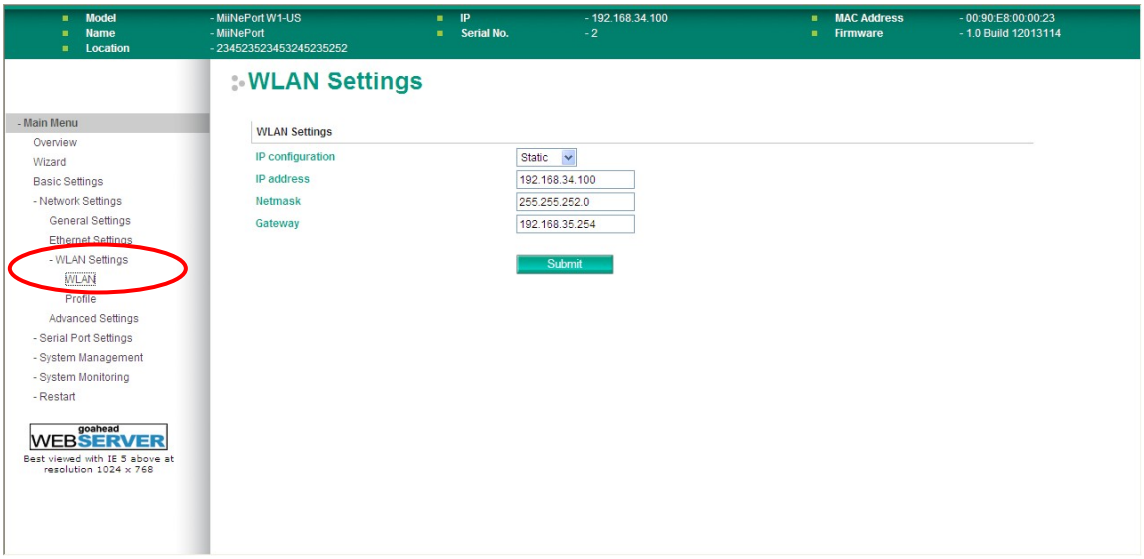
Gateway

Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address of the gateway, if applicable. A gateway is a network computer that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. The MiiNePort W1 series module needs to know the IP address of the default gateway computer in order to communicate with the hosts outside the local network environment. Consult your network administrator if you do not know how to set this parameter.

ATTENTION

In dynamic IP environments, the MiiNePort W1 series will send 3 requests every 30 seconds to the DHCP or BOOTP server until the network settings have successfully been assigned. The first request will time out after one second; the second request will time out after three seconds, and the third request will timeout after five second. If the DHCP or BOOTP server is unavailable, the MiiNePort W1 series will use the factory default network settings.

WLAN Settings > WLAN



The **WLAN** page is located under **WLAN Settings** in the **Network Settings** folder. You can modify **IP configuration**, **IP address**, **Netmask**, and **Gateway** for your WLAN.

The MiiNePort W1 series support IEEE 802.11b/g wireless network interfaces. The supported IP configurations are static and dynamic (BOOTP, DHCP, or BOOTP+DHCP). Users can set up the IP configuration with the Web/Telnet consoles through the MiiNePort W1 series' Ethernet interface.

IP Configuration

Default	Static
Options	Static, DHCP, DHCP/BOOTP, BOOTP
Description	This field determines how the MiiNePort W1/MiiNePort W1-T's IP address will be assigned. Static: IP address, netmask, and gateway are user-defined. DHCP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. DHCP/BOOTP: IP address, netmask, gateway, DNS, and time server are assigned by DHCP server. IP address is assigned by BOOTP server if DHCP server does not respond. BOOTP: IP address is assigned by BOOTP server.

IP Address

Default	192.168.127.254
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address that will be assigned to your MiiNePort W1/MiiNePort W1-T module. An IP address is a number assigned to a network device (such as a computer) as a permanent address on the network. Computers use the IP address to identify and talk to each other over the network. Choose a proper IP address that is unique and valid in your WLAN environment. If your module will be assigned a dynamic IP address, set the "IP configuration" parameter appropriately.

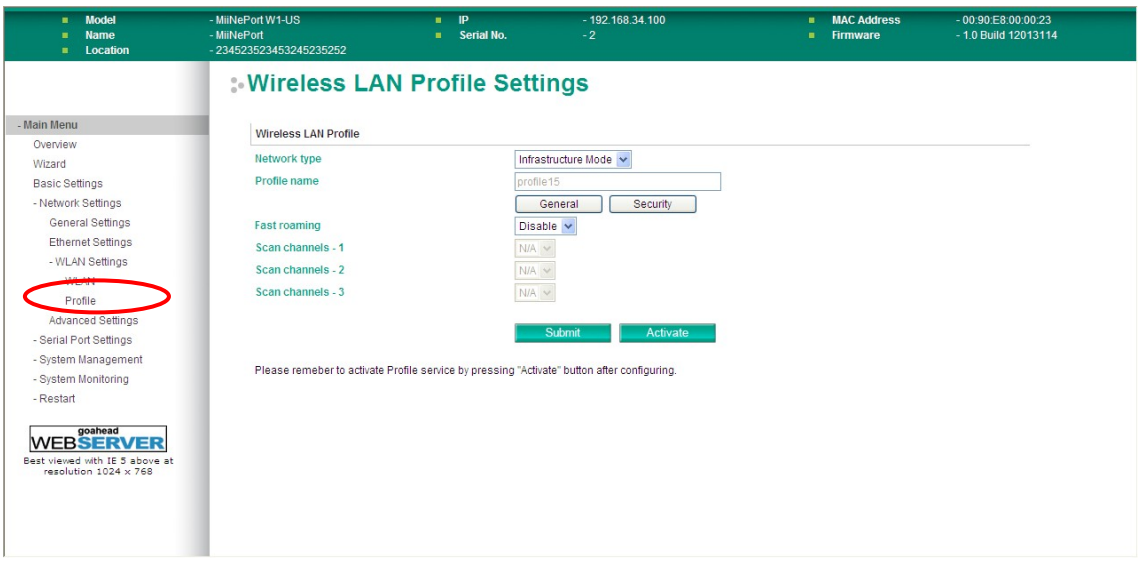
Netmask

Default	255.255.255.0
Options	Netmask setting (e.g., "255.255.0.0")
Description	This field is for the subnet mask. A subnet mask represents all of the network hosts at one geographic location, in one building, or on the same local area network. When a packet is sent out over the network, the MiiNePort W1/MiiNePort W1-T module will use the subnet mask to check whether the desired TCP/IP host specified in the packet is on the local network segment. If the address is on the same network segment as the module, a connection is established directly from the module. Otherwise, the connection is established through the gateway as specified in the "Gateway" parameter.

Gateway

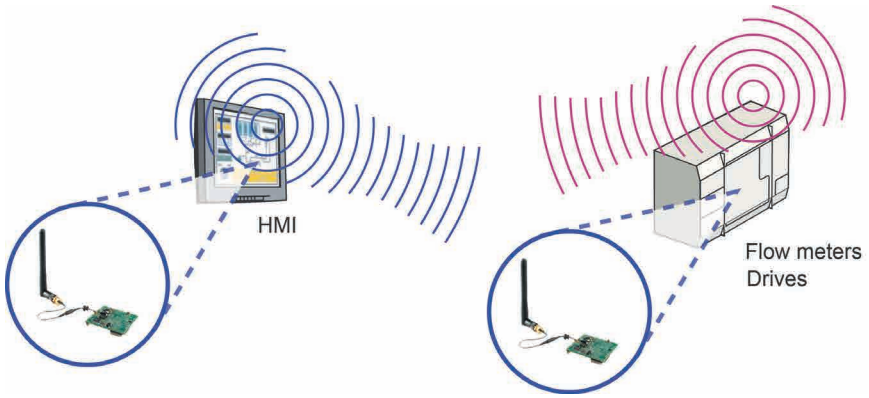
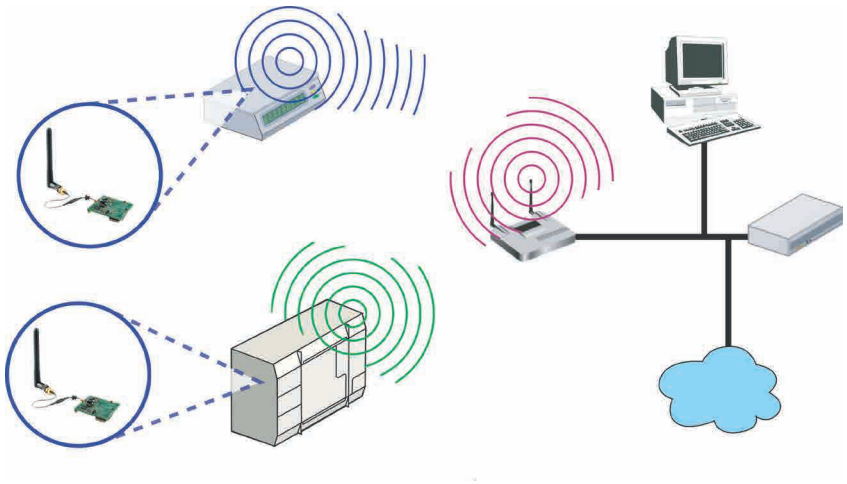
Default	
Options	IP address (e.g., "192.168.1.1")
Description	This field is for the IP address of the gateway, if applicable. A gateway is a network computer that acts as an entrance to another network. Usually, the computers that control traffic within the network or at the local Internet service provider are gateway nodes. The MiiNePort W1/MiiNePort W1-T module needs to know the IP address of the default gateway computer in order to communicate with the hosts outside the local network environment. Consult your network administrator if you do not know how to set this parameter.

WLAN Settings > Profile



The **Profile** page is located under **WLAN Settings** in the **Network Settings** folder. This is where you configure the MiiNePort W1 series for Ad-hoc or Infrastructure operation. Different settings are available depending on whether you select Ad-hoc Mode or Infrastructure Mode.

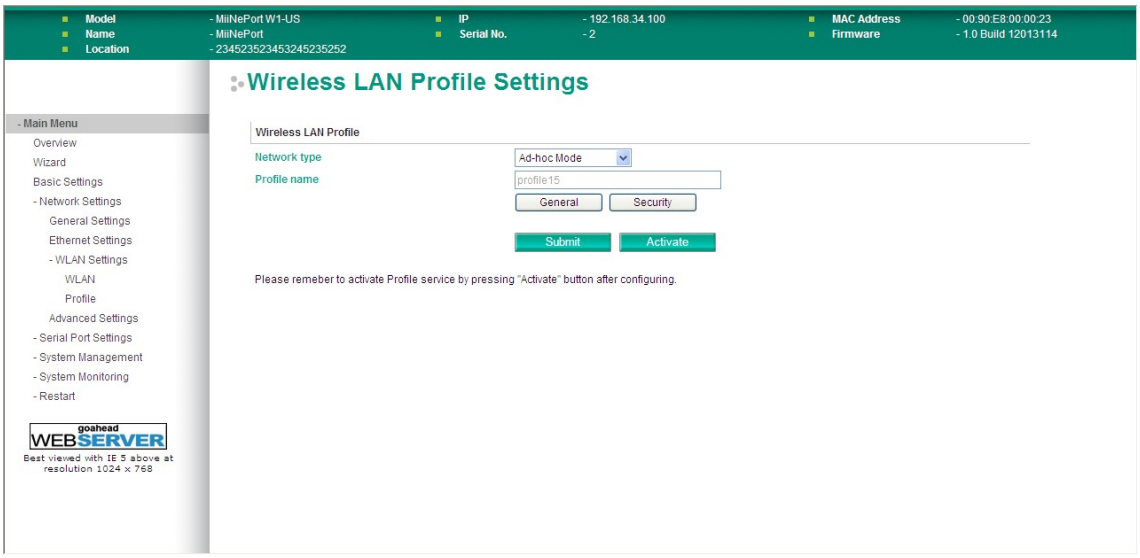
Network Type

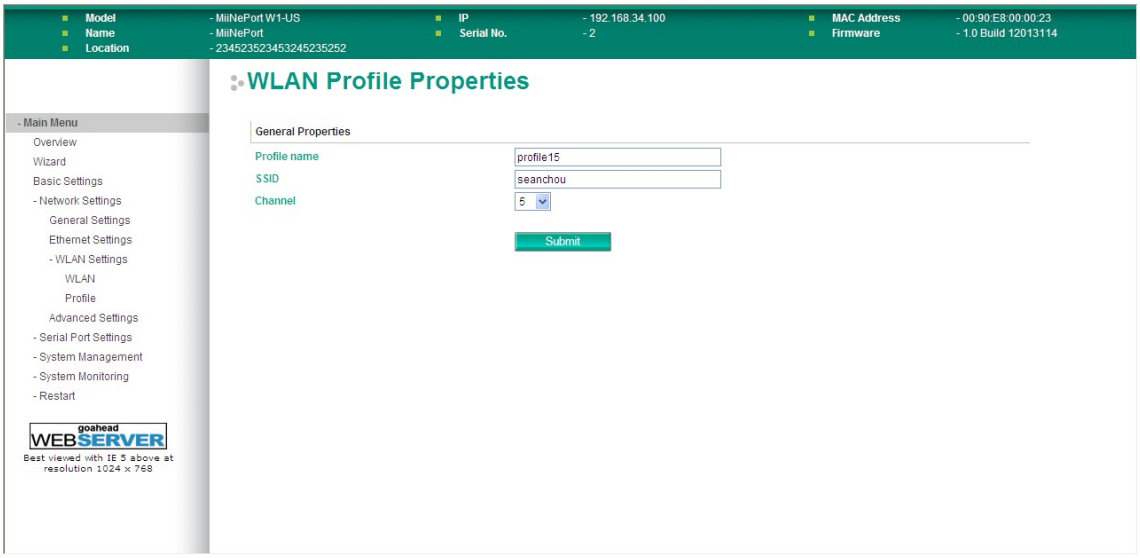
Default	Infrastructure Mode
Options	Infrastructure Mode, Ad-hoc Mode
Description	This field specifies whether the MiiNePort W1 series will operate in Ad-hoc or Infrastructure Mode. For all wireless networking devices, there are two possible modes for communication with another wireless device. Devices that are configured for Ad-hoc Mode automatically detect and communicate directly with each other and do not require a wireless access point (AP) or gateway. Wireless devices that are configured for Infrastructure Mode do not communicate directly with each other, but through a wireless access point (AP). Devices can only communicate with devices operating in the same mode. Devices in Ad-Hoc Mode cannot communicate with devices in Infrastructure Mode. **Example of Ad-Hoc Mode**  **Example of Infrastructure Mode**  After setting the **Network type**, you will need to adjust the **General** and **Security** settings for the profile. In Ad-hoc Mode, only one profile is available. In Infrastructure Mode, three profiles can be defined.

General Settings for WLAN Profile

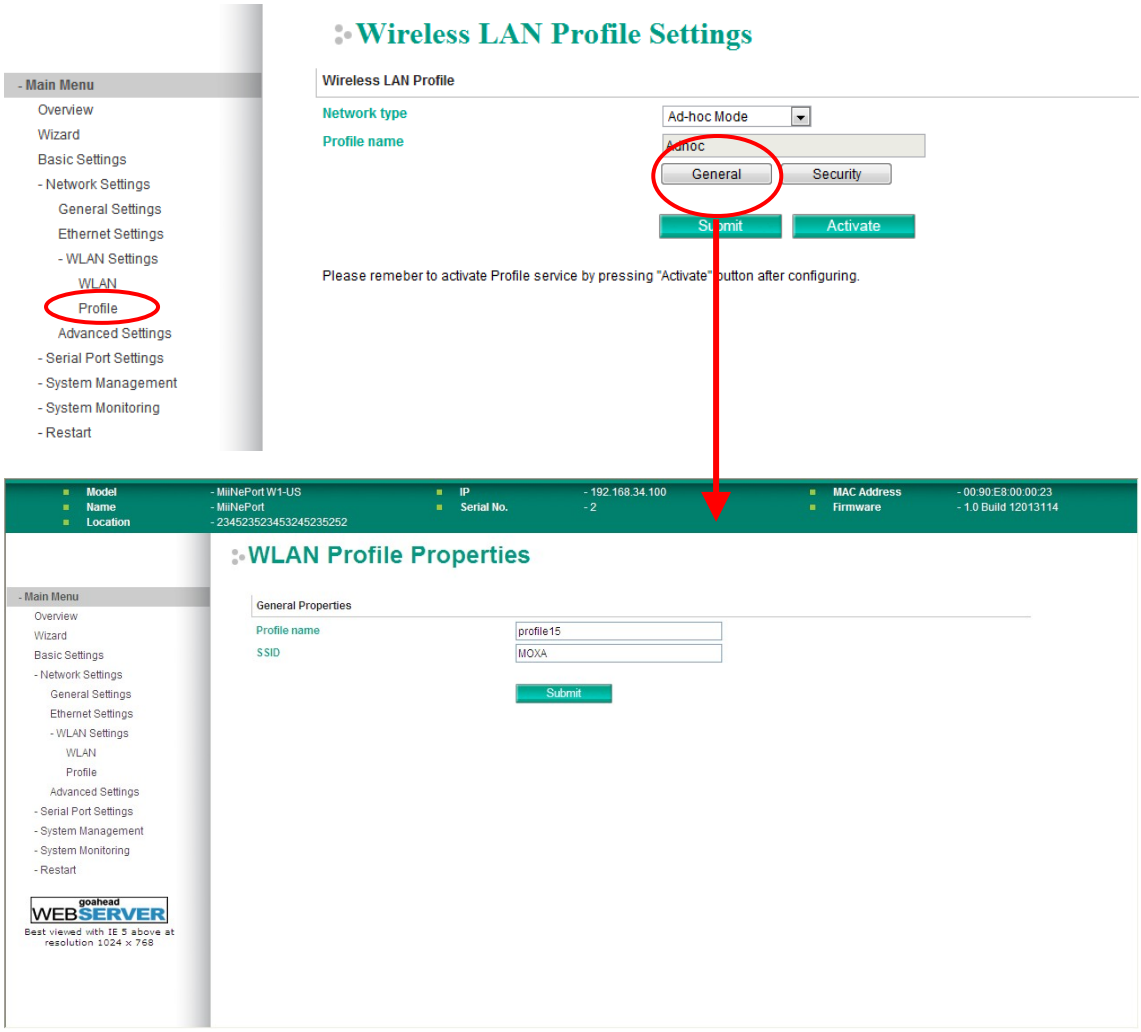
The **General** page is opened through the **Profile** page, under **WLAN Settings** in the **Network Settings** folder. After selecting Ad-hoc or Infrastructure Mode, click **General** to view or modify the general properties for that profile.

In Ad-hoc Mode





In Infrastructure Mode



On the General page, you can configure **Profile name** and **SSID**. Additional settings are also available depending on whether you select Ad-hoc Mode or Infrastructure Mode.

Profile Name

Default	Ad-hoc (in Ad-hoc Mode) Infrastructure (in Infrastructure Mode)
Options	free text (e.g., "Primary Connection")
Description	This is a free text field to help you differentiate one profile from another. It does not affect operation of the MiiNePort W1/MiiNePort W1-T.

SSID

Default	Profile 1 (in Infrastructure Mode)
Options	free text (e.g., "Coffeeshop WLAN")
Description	This field specifies the SSID, or name, of the wireless network (SSID) that will be used by the MiiNePort W1/MiiNePort W1-T. Wireless devices must use the same SSID in order to communicate with each other.

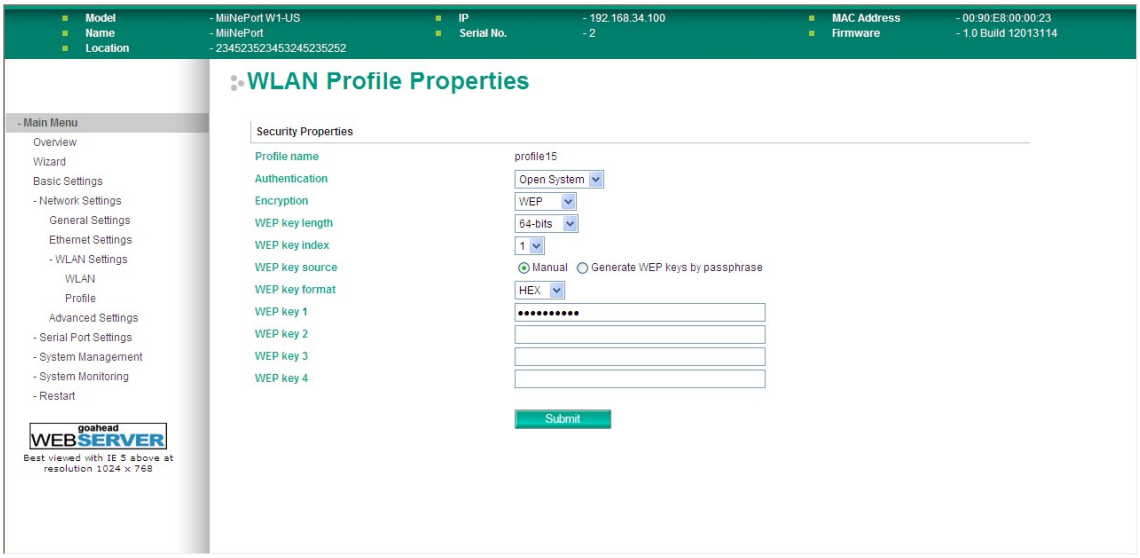
Channel

Default	4
Options	1,2,3,4,5,6,7,8,9,10,11
Description	This field is for Ad-Hoc Mode only and specifies the radio channel to use for the wireless network. In Infrastructure Mode, the AP specifies the channel automatically.

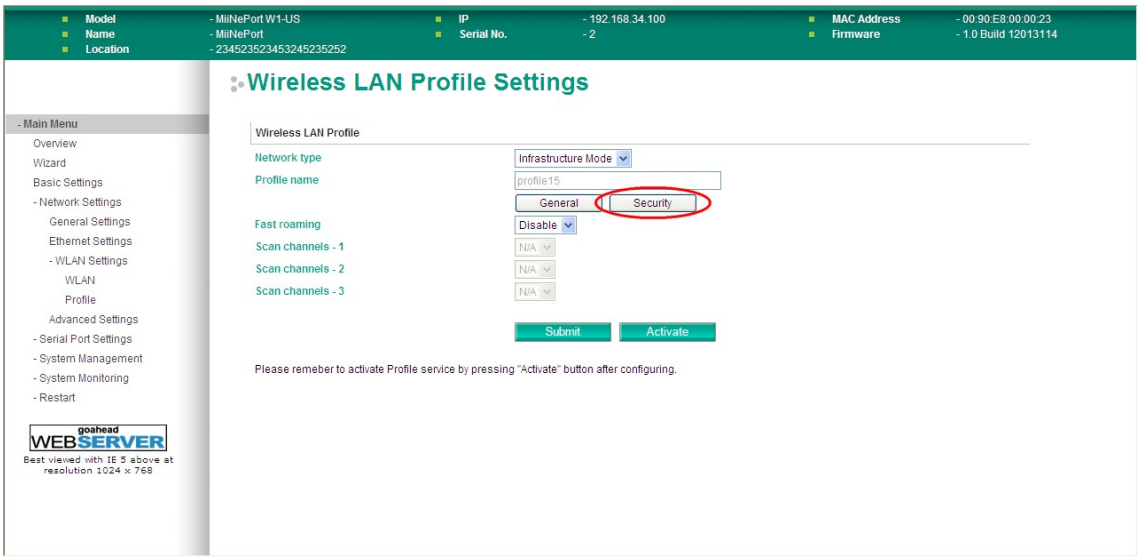
Security Settings for WLAN Profile

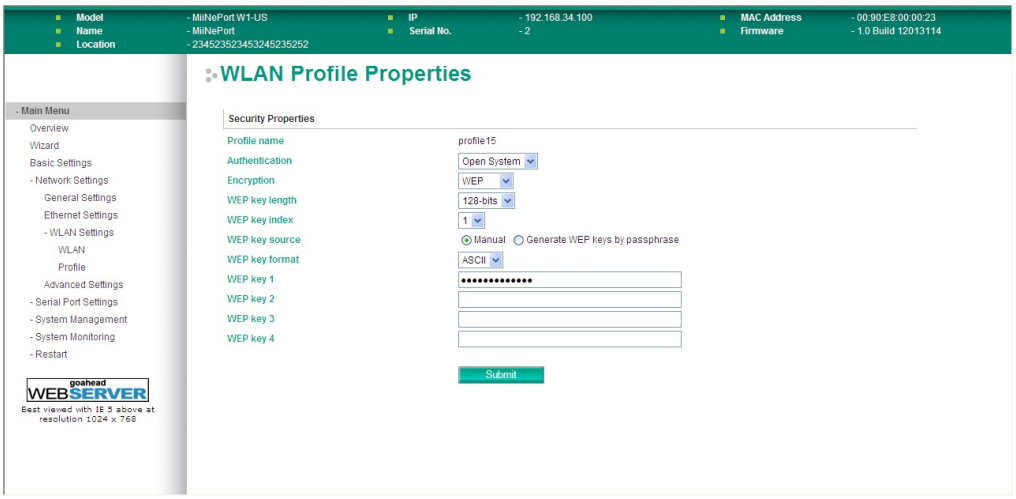
The **Security** page is opened through the **Profile** page, under **WLAN Settings** in the **Network Settings** folder. After selecting Ad-hoc or Infrastructure Mode, click **Security** to open the Security page for that profile.

In Ad-hoc Mode



In Infrastructure Mode





You will need to configure **Authentication** and **Encryption**. These settings must match the settings on the wireless device at the other end of the connection (such as the AP). Different settings and options are available depending on how **Authentication** and **Encryption** are configured.

Authentication

Default	Open System
Options	Open System, Shared Key, WPA, WPA-PSK, WPA2, WPA2-PSK
Description	This field specifies how wireless devices will be authenticated. Only authenticated devices will be allowed to communicate with the MiiNePort W1 series. If a RADIUS server is used, this setting must match the setting on the RADIUS server. Open System: The MiiNePort W1 series will simply announce a desire to associate with another station or access point. No authentication is required. For Ad-hoc Mode, this is the only option for authentication, since Ad-hoc Mode was designed for open communication. Shared Key: This option is only available in Infrastructure Mode. Authentication involves a more rigorous exchange of frames to ensure that the requesting station is authentic. WEP encryption is required. WPA: This is a managed authentication option that is only available in Infrastructure Mode. WPA was created by the Wi-Fi Alliance, the industry trade group that owns the Wi-Fi trademark and certifies devices with the Wi-Fi name. It is based on Draft 3 of the IEEE 802.11i standard. Each user uses a unique key for authentication, distributed from an IEEE 802.1X authentication server, also known as a RADIUS server. This option is also referred to as WPA Enterprise Mode, since it is intended to meet rigorous enterprise security requirements. Tunneled authentication is supported, depending on the EAP method selected. WPA-PSK: This is an unmanaged authentication option that is only available in Infrastructure Mode. Instead of a unique key for each user, a pre-shared key (PSK) is manually entered on the access point to generate an encryption key that is shared among all users. Consequently, this method does not scale well for enterprise. A PSK that uses a mix of letters, numbers and non-alphanumeric characters is recommended. This option is also referred to as WPA Personal Mode, since it is designed for the needs and capabilities of small home and office WLANs. WPA2: This is a managed authentication option that is only available in Infrastructure Mode. WPA2 implements the mandatory elements of 802.11i. Supported encryption algorithms include TKIP, Michael, and AES-based CCMP, which is considered fully secure. Since March 13, 2006, WPA2 has been mandatory for all Wi-Fi-certified devices. This option may also be referred to as WPA Enterprise Mode. Tunneled authentication is supported, depending on the EAP method selected. WPA2-PSK: This is an unmanaged authentication option that is only available in Infrastructure Mode. It employs WP2 encryption algorithms but relies on a PSK for authentication. A PSK that uses a mix of letters, numbers and non-alphanumeric characters is recommended. This option can also be referred to as WPA Personal Mode.

Encryption

Default	Disable
Options	Disable, WEP
Description	This field specifies the type of encryption to use during wireless communication. Different encryption methods are available depending on the Authentication setting. Also, each encryption method has its own set of parameters that may also require configuration. Disable: No encryption is applied to the data during wireless communication. WEP: Wired Equivalent Privacy (WEP) is only available for Open System and Shared Key authentication methods. Data is encrypted according to a key. The MiiNePort W1/MiiNePort W1-T supports both 64 and 128-bit keys. This method may deter casual snooping but is not considered very secure.

Security Settings for WEP Encryption

When **Encryption** is set to WEP on the **Security** page for the WLAN profile, you will be able to configure **WEP key length**, **WEP key index**, and **WEP key source**. Other settings will be displayed depending on how **WEP key source** is configured.

WEP Key Length

Default	64bits
Options	64bits, 128bits
Description	This field specifies the length of the WEP key. 64bits is the industry standard for WEP, but 128bits provides better protection.

WEP Key Index

Default	1
Options	1 through 4
Description	This field specifies the primary WEP key to use for the WLAN.

WEP Key Source

Default	Manual
Options	Manual, Generate WEP keys by passphrase
Description	This field specifies whether the WEP key will be generated manually or through a user-specified passphrase. A passphrase is equivalent to a free-text password that will be used to generate the WEP key. A passphrase is typically easier to remember and enter than a long and complicated WEP key.

WEP Key Format

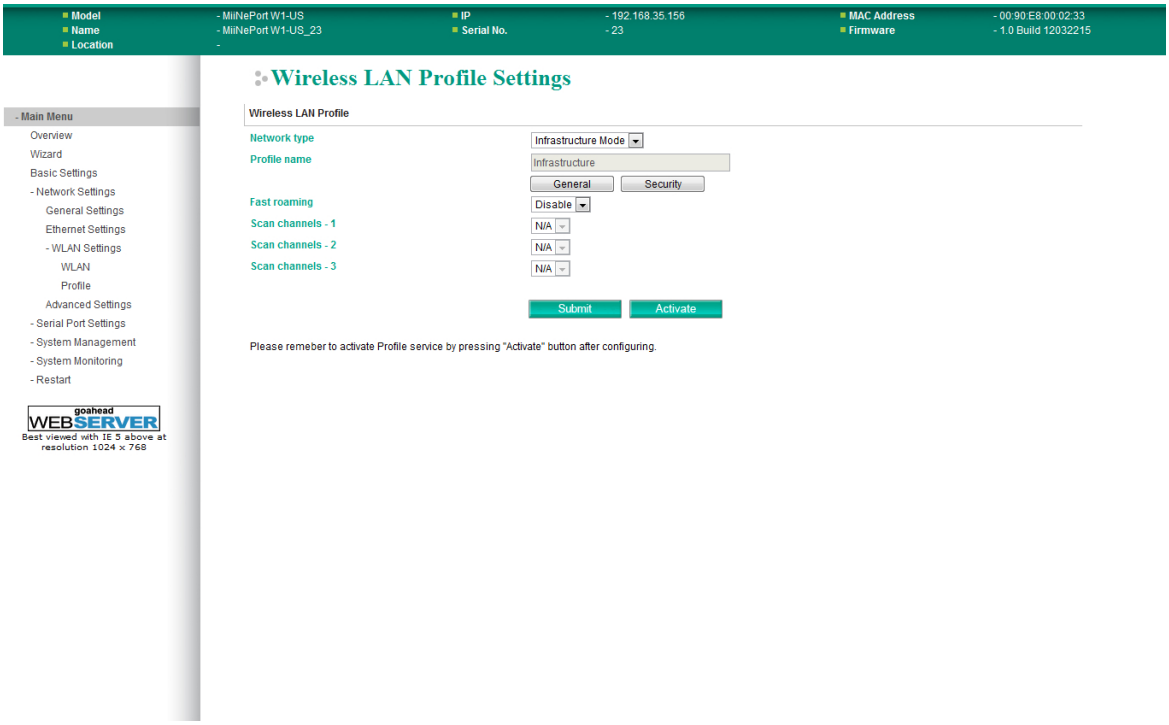
Default	ASCII
Options	ASCII, HEX
Description	This field is only available if **WEP key source** is set to "Manual". It specifies the format you will use to enter the WEP key.

WEP Key 1 Through 4

Default	
Options	free text in ASCII or HEX
Description	These fields are only available if **WEP key source** is set to "Manual". Enter each WEP key in ASCII or HEX as specified in **WEP key format**. The number of characters required for each key depends on **WEP key length** and **WEP key format**.

WEP Key Length	WEP Key Format	Key Length
64bits	ASCII	5 characters
	HEX	10 characters
128bits	ASCII	13 characters
	HEX	26 characters

Fast Roaming

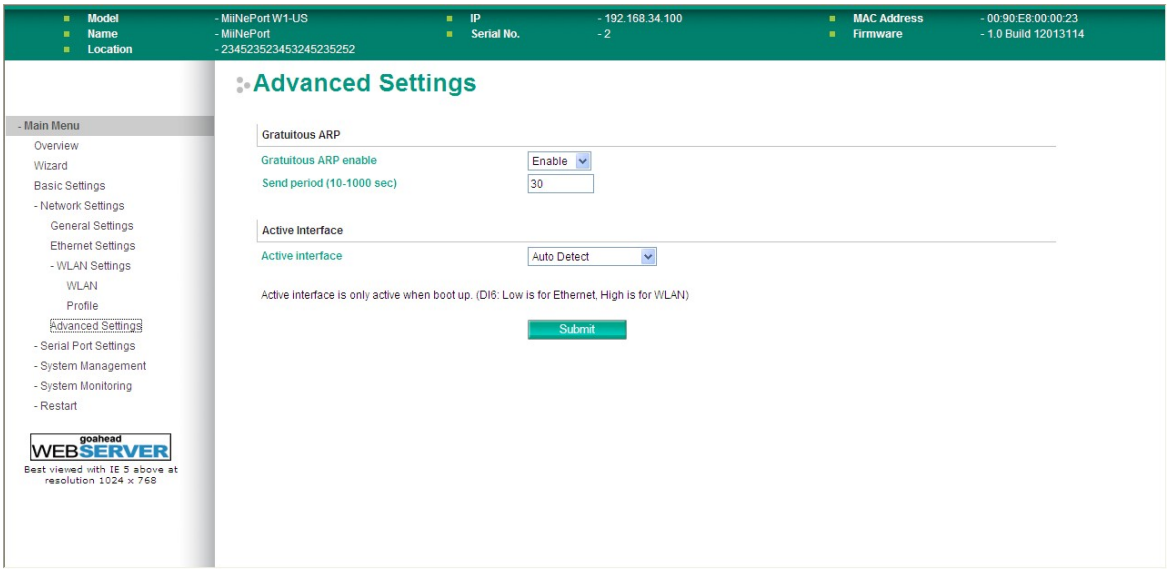


Default	Disable
Options	Disable, Enable
Description	This field is only available in Infrastructure Mode and is used to specify the MiiNePort W1 roaming behavior. Roaming is the ability to connect to different APs so wireless communication is not confined to one area or one particular AP. The MiiNePort W1 will only roam between APs, as specified by the SSID. Disable: Fast Roaming function will be disabled. MiiNePort W1 will scan all available channels and roam between APs as specified by the SSID. It scans the channel when booting up and will associate with the highest signal strength AP. Only when the associated AP is loses, then it will re-associate again. Enable: Fast Roaming function will be enabled. MiiNePort W1 will only scan the pre-defined " **Scan Channels - 1, Scan Channels - 2 & Scan Channels – 3 "** and roam between APs as specified by the SSID. It scans the channel and will associate with the highest signal strength AP. It also scans the channel regularly and will re-associate with the highest signal strength AP (if there is) by automatically.

Scan Channels - 1, Scan Channels - 2 & Scan Channels - 3

Default	N/A
Options	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Description	This field is only available in Infrastructure Mode and is used to specify the MiiNePort W1 Fast Roaming scans channels.

Advanced Settings

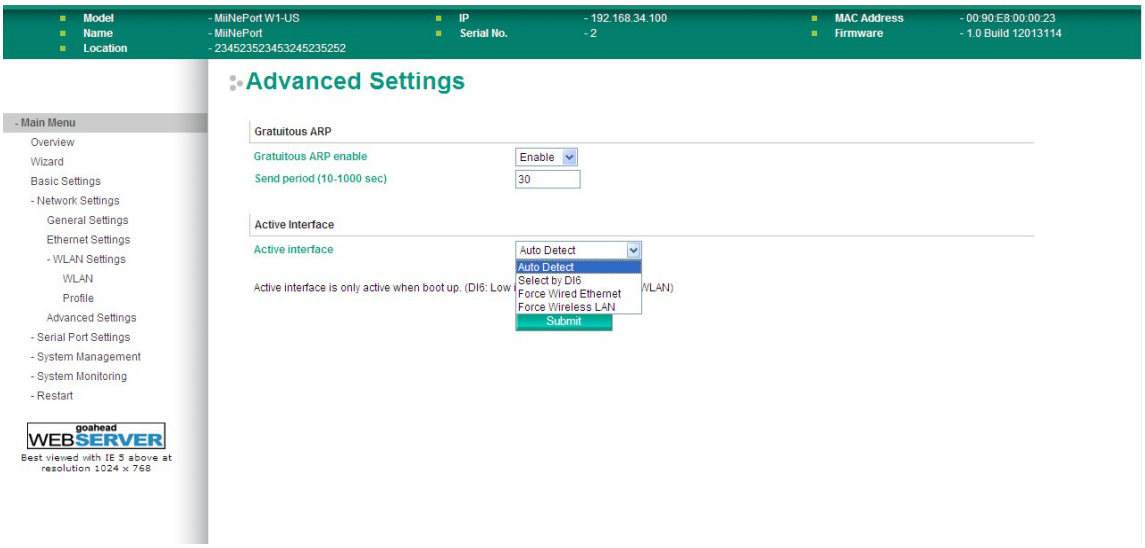


On the **Advanced Settings** page in the **Network Settings** folder, you can modify **Gratuitous ARP** and **Active interface**.

Gratuitous ARP

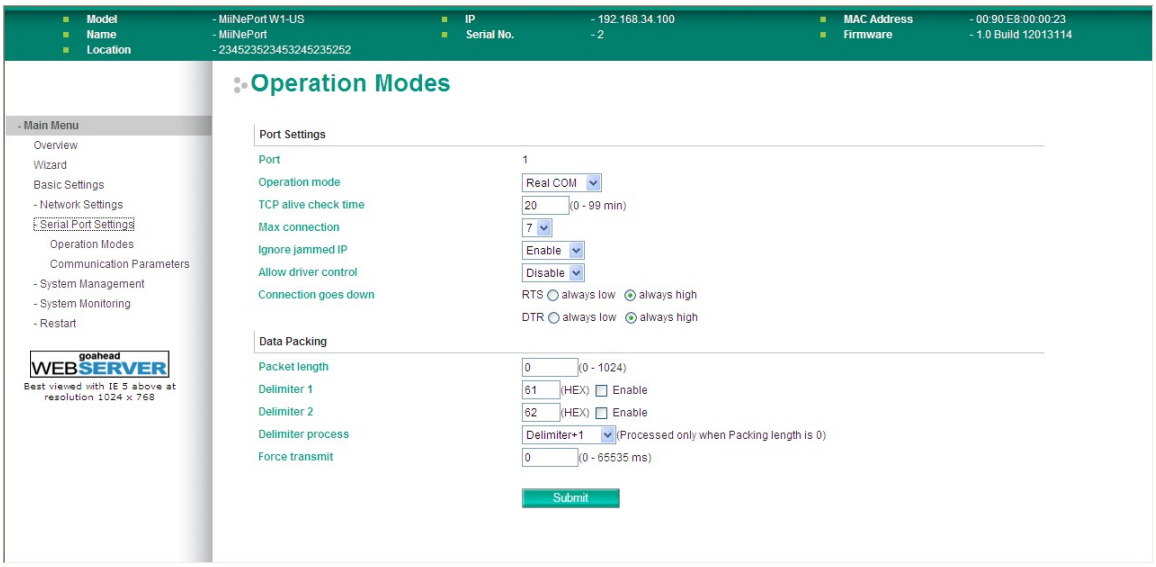
Default	Disabled
Options	Disabled, Enabled (default value: 300 sec.)
Description	This field specifies how often the MiiNePort W1/MiiNePort W1-T sends broadcast packets to update the ARP table. This may be required for certain applications. Disabled: The MiiNePort W1/MiiNePort W1-T will not send broadcast packets to update the ARP table. Enabled: The MiiNePort W1/MiiNePort W1-T will send periodically send broadcast packets at the time interval as specified in Send period.

Active Interface



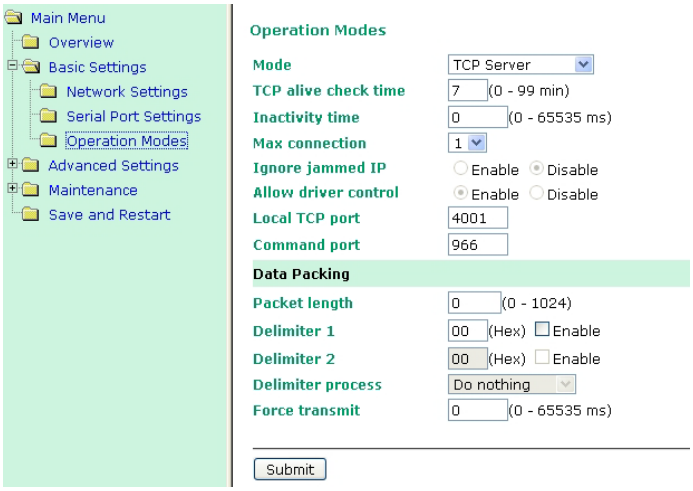
Default	Auto Detect
Options	Auto Detect, Select by DI6, Force Wired Ethernet, Force Wireless LAN
Description	This field specifies how the MiiNePort W1/MiiNePort W1-T will select whether to use the wired LAN connection or the wireless (WLAN) connection. Auto Detect: The LAN connection will be used if a valid connection is detected when the module is powered on. Otherwise, the module will use the WLAN connection. Select by DI6: The network connection will be determined by the signal from DIO channel 6. This channel must be set to DI mode. When the signal is low, the module will use the LAN connection. When the signal is high, the module will use the WLAN connection. Force Wired Ethernet: The module will only use the LAN connection. The WLAN connection will be ignored. Force Wireless LAN: The module will only use the WLAN connection. The LAN connection will be ignored.

Serial Port Settings



The **Operation Modes** page is where you configure the serial port's operation mode and related settings. For an introduction to the different operation modes, please refer to Chapter 4.

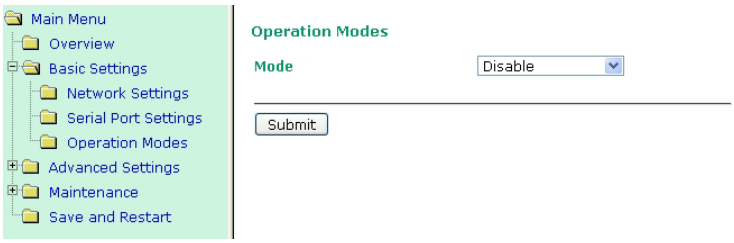
Operation Modes



Before reading this section, refer to **Chapter 3: Choosing the Proper Operation Mode** to select the operation mode that best fits your device application.

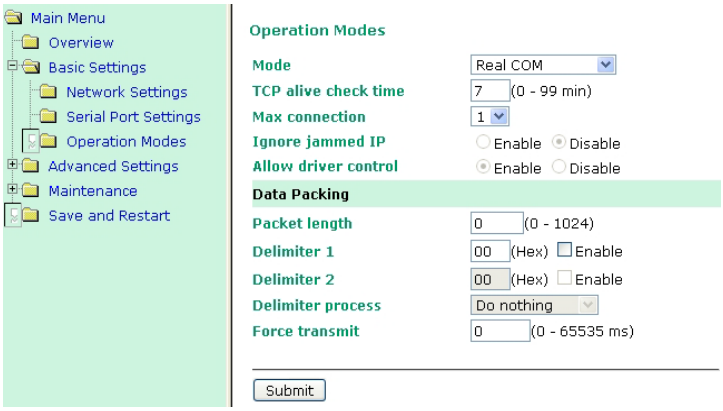
Click **Operation Modes**, located under the Main Menu, to display the operating settings for the MiiNePort's two serial ports.

Disable Mode



When **Mode** is set to **Disable**, that particular port will be disabled. Check **Apply the above settings to all serial ports** to apply this setting to all ports.

Real COM Mode



ATTENTION

To use Real COM mode, refer to **Chapter 6: Utility Console and Driver Installation** for instructions on how to install the Real COM driver on Windows or Linux machines.

TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: The TCP connection is not closed due to an idle TCP connection.

1 to 99 min: The module automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the module starts listening for another host's TCP connection.

Max connection

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

Max connection is used when the device needs to receive data from different hosts simultaneously.

The factory default only allows 1 connection at a time. When Max Connection is set to 1, the Real COM driver on the specific host has full control.

Max connection 1: The module will only allow 1 host's Real COM driver to open a connection to the module's serial port.

Max connections 2 to 4: When set to 2 or higher, Real COM drivers for up to the specified number of hosts may open this port at the same time. When Real COM drivers for multiple hosts open the port at the same time, the COM driver only provides a pure data tunnel with no control ability. The serial port parameters will use firmware settings instead of your application program (AP) settings.

Application software that is based on the COM driver will receive a driver response of "success" when the software uses any of the Win32 API functions. The firmware will only send data back to the driver on the host. Data will be sent first-in-first-out when data is received by the MiiNePort from the Ethernet interface.

ATTENTION

When Max connection is greater than 1, the MiiNePort module will use a multiple connection application (i.e., 2 to 4 hosts are allowed access to the port at the same time). When using a multi connection application, the module will use the serial communication parameters as defined here in the web console, and all hosts connected to the port must use identical serial settings. If one of the hosts opens the COM port with different serial settings, data will not be transmitted properly.

Ignore jammed IP

Setting	Factory Default	Necessity
Enable, Disable	Disable	Required when Max connection is greater than 1

This option determines how the port will proceed if multiple hosts are connected and one or more of the hosts stops responding as the port is transmitting data. If you select Disable, the port will wait until the data has been transmitted successfully to all hosts before transmitting the next group of data. If you select Enable, the port will ignore the host that stopped responding and continue data transmission to the other hosts.

NOTE Ignore Jammed IP is only active when Max connection is greater than 1.

Allow driver control

Setting	Factory Default	Necessity
Enable, Disable	Enable	Required when Max connection is greater than 1

This option determines how the port will proceed if driver control commands are received from multiple hosts that are connected to the port. If Disable is selected, driver control commands will be ignored. If Enable is selected, control commands will be accepted, with the most recent command received taking precedence.

NOTE Allow driver control is only active when Max connection is greater than 1.

Packet length

Setting	Factory Default	Necessity
0 to 1024 bytes	0 byte	Required

The **Packet length** setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When packet length is set to 0 (the default), a maximum amount is not specified and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon as it reaches the specified length.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	"0" for None	Optional

The Delimiter fields are used to specify a 1-character or 2-character sequence that acts as a marker to control packing of serial data. By default, delimiter characters are not defined, so the module transmits data as soon as it is received. When a delimiter character or characters are defined, the module will hold data in its buffer until it receives the delimiter character or 2-character sequence. When the delimiter is received, the module will pack the data into its buffer and send it out through the Ethernet port.

Use Delimiter 1 to define the first delimiter character in hex. If only one delimiter character is used, Delimiter 2 should be set to "0". If the delimiter is a two-character sequence, use Delimiter 2 to define the second character. To disable the use of delimiters, set both Delimiter 1 and Delimiter 2 to "0".

Note that data packing is controlled not only by the delimiter but is also influenced by the module's buffer size and the Force transmit field. If the delimiter has not been received by the time the 1K buffer is full, the module will pack the data for network transmission and clear the buffer. In addition, the module will also pack data for network transmission if the next byte of data is not received within the Force transmit time.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1 KB, the MiiNePort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Delimiter process

Setting	Factory Default	Necessity
Do Nothing, Delimiter+1, Delimiter+2, Strip Delimiter	Do Nothing (only effective when Delimiter is enabled)	Optional

The **Delimiter process** field determines how the data is handled when a delimiter is received. Delimiter 1 must be enabled for this field to have effect. If Delimiters 1 and 2 are both enabled, both characters must be received for the delimiter process to take place.

[Do Nothing]: Data in the buffer will be transmitted when the delimiter is received.

[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.

[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.

Force transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: The force transmit timeout is disabled.

1 to 65535: If the module does not receive the next byte of data within the time specified, it will pack the data in its buffer into the same data frame for network transmission.

The **Force transmit** field is typically used in conjunction with the Delimiter fields to specify how data in the module's buffer is packed for network transmission. When delimiters are used, the module accumulates data in its buffer as it waits to receive a delimiter. If there is a break in communication, data will be held in the buffer as the module continues to wait for a delimiter. The Force transmit field allows you to specify the maximum amount of time that the module will wait for data. With Force transmit enabled, the module will automatically pack the data in the buffer for network transmission if no data is received for the specified time.

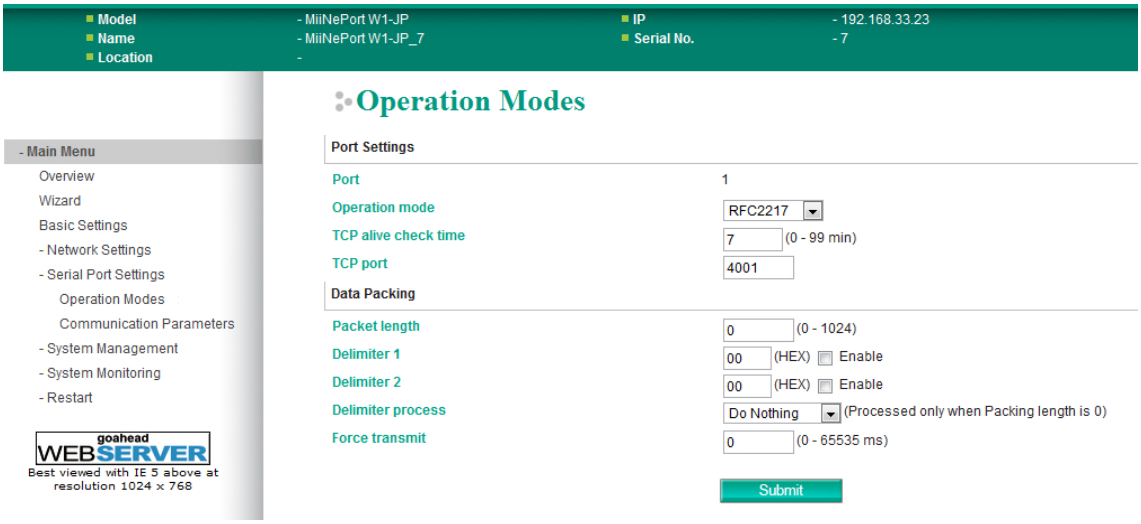
When set to 0, Force transmit is disabled, which means there is no time limit for how long the module will wait to receive data. When set between 1 and 65535, the module will pack data if serial data is not received in the specified time.

The optimal force transmit time depends on your application, but it should be larger than one character interval within the specified baudrate to have any effect. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send one character is 10 bits, and the time required to transfer one character is

(10 bits / 1200 bits/s) × 1000 ms/s = 8.3 ms.

Since it requires about 9 ms to send one character, the Force transmit should be 10 ms or more to have any effect. At 9 ms or less, the module will simply pack every character as it is received, which would be the same as if delimiter characters or a Force transmit time were not specified.

RFC 2217 Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: The MiiNePort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the MiiNePort starts listening for another host's TCP connection.

Local TCP port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The **Local TCP port** is the TCP port that the MiiNePort uses to listen to connections, and that other devices must use to contact the MiiNePort. To avoid conflicts with well known TCP ports, the default is set to 4001.

Packet length

Setting	Factory Default	Necessity
0 to 1024	0	Optional

The Packet length setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When packet length is set to 0 (the default), a maximum amount is not specified and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon as it reaches the specified length.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

The Delimiter fields are used to specify a 1-character or 2-character sequence that acts as a marker to control packing of serial data. By default, delimiter characters are not defined, so the module transmits data as soon as it is received. When a delimiter character or characters are defined, the module will hold data in its buffer until it receives the delimiter character or 2-character sequence. When the delimiter is received, the module will pack the data into its buffer and send it out through the Ethernet port.

Use Delimiter 1 to define the first delimiter character in hex. If only one delimiter character is used, Delimiter 2 should be set to "0". If the delimiter is a two-character sequence, use Delimiter 2 to define the second character. To disable the use of delimiters, set both Delimiter 1 and Delimiter 2 to "0".

Note that data packing is controlled not only by the delimiter but is also influenced by the module's buffer size and the Force transmit field. If the delimiter has not been received by the time the 1K buffer is full, the module will pack the data for network transmission and clear the buffer. In addition, the module will also pack data for network transmission if the next byte of data is not received within the Force transmit time.

Delimiter process

Setting	Factory Default	Necessity
Do Nothing, Delimiter +1, Delimiter +2, Strip Delimiter	Do Nothing	Optional

The Delimiter process field determines how the data is handled when a delimiter is received. Delimiter 1 must be enabled for this field to have effect. If Delimiters 1 and 2 are both enabled, both characters must be received for the delimiter process to take place.

[Do Nothing]: Data in the buffer will be transmitted when the delimiter is received.

[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.

[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.

Force transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: The force transmit timeout is disabled.

1 to 65535: If the module does not receive the next byte of data within the time specified, it will pack the data in its buffer into the same data frame for network transmission.

The **Force transmit** field is typically used in conjunction with the Delimiter fields to specify how data in the module's buffer is packed for network transmission. When delimiters are used, the module accumulates data in its buffer as it waits to receive a delimiter. If there is a break in communication, data will be held in the buffer as the module continues to wait for a delimiter. The Force transmit field allows you to specify the maximum amount of time that the module will wait for data. With Force transmit enabled, the module will automatically pack the data in the buffer for network transmission if no data is received for the specified time.

When set to 0, Force transmit is disabled, which means there is no time limit for how long the module will wait to receive data. When set between 1 and 65535, the module will pack data if serial data is not received in the specified time.

The optimal force transmit time depends on your application, but it should be larger than one character interval within the specified baudrate to have any effect. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send one character is 10 bits, and the time required to transfer one character is

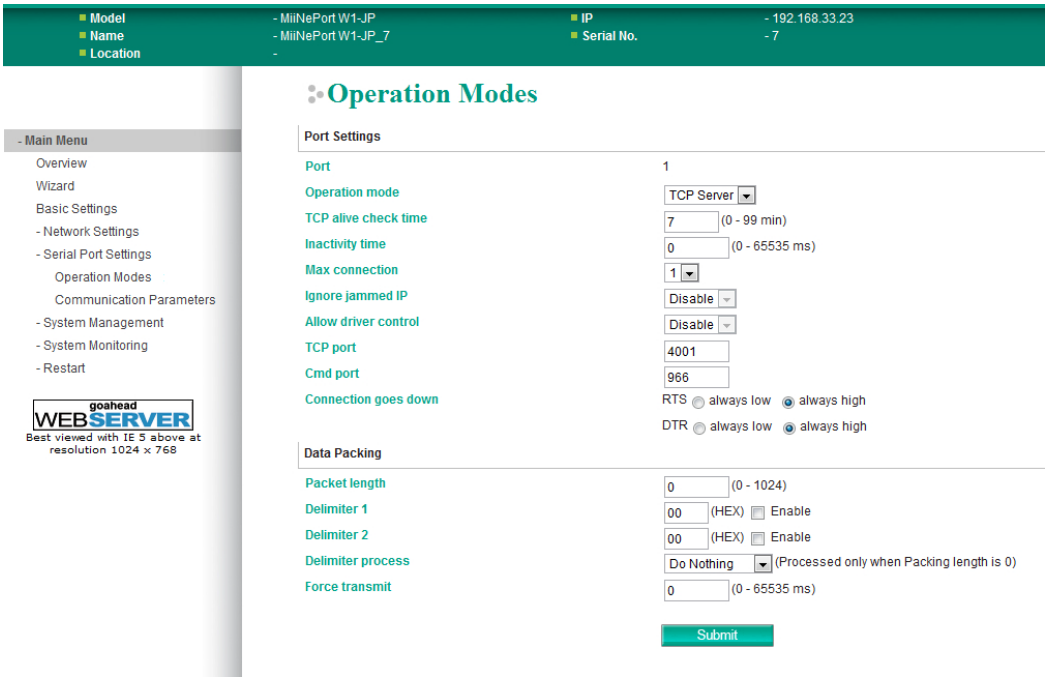
(10 bits / 1200 bits/s) × 1000 ms/s = 8.3 ms.

Since it requires about 9 ms to send one character, the Force transmit should be 10 ms or more to have any effect. At 9 ms or less, the module will simply pack every character as it is received, which would be the same as ifa delimiter characters or Force transmit time were not specified.

ATTENTION

If you want to send a series of characters in the same packet, the serial device attached to the MiiNePort should send that series of characters during a time interval less than the Force transmit timeout for the MiiNePort, and the total length of data must be less than or equal to the MiiNePort's internal buffer size. The serial communication buffer size for the MiiNePort is 1 KB per port.

TCP Server Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: TCP connection is not closed due to an idle TCP connection.

1 to 99 min: The MiiNePort automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the MiiNePort starts listening for another host's TCP connection.

Inactivity time

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: The MiiNePort automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, the MiiNePort starts listening for another host's TCP connection.

This parameter defines the maintenance status as Closed or Listen for the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the Inactivity time is set to 0, the current TCP connection is kept active until a connection close request is received. Although Inactivity time is disabled, the MiiNePort will check the connection status between the MiiNePort and the remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, the MiiNePort assumes that the connection was closed unintentionally. The MiiNePort will then force the existing TCP connection to close.

ATTENTION

The Inactivity time should be greater than the Force transmit timeout. To prevent the unintended loss of data due to the session being disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

ATTENTION

Inactivity time is ONLY active when "TCP connect on" is set to "Any character."

Max connection

Setting	Factory Default	Necessity
1, 2, 3, 4	1	Required

Max connection is used when the device needs to receive data from different hosts simultaneously.

The factory default only allows 1 connection at a time. When Max Connection is set to 1, the Real COM driver on the specific host has full control.

Max connection 1: The module will only allow 1 host's Real COM driver to open a connection to the module's serial port.

Max connections 2 to 4: When set to 2 or higher, Real COM drivers for up to the specified number of hosts may open this port at the same time. When Real COM drivers for multiple hosts open the port at the same time, the COM driver only provides a pure data tunnel with no control ability. The serial port parameters will use firmware settings instead of your application program (AP) settings.

Application software that is based on the COM driver will receive a driver response of "success" when the software uses any of the Win32 API functions. The firmware will only send data back to the driver on the host. Data will be sent first-in-first-out when data is received by the MiiNePort from the Ethernet interface.

Ignore jammed IP

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This option determines how the port will proceed if multiple hosts are connected and one or more of the hosts stops responding as the port is transmitting data. If you select Disable, the port will wait until the data has been transmitted successfully to all hosts before transmitting the next group of data. If you select Enable, the port will ignore the host that stopped responding and continue data transmission to the other hosts.

NOTE Ignore Jammed IP is only active when Max connection is greater than 1.

Allow driver control

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This option determines how the port will proceed if driver control commands are received from multiple hosts that are connected to the port. If Disable is selected, driver control commands will be ignored. If Enable is selected, control commands will be accepted, with the most recent command received taking precedence.

NOTE Allow driver control is only active when Max connection is greater than 1.

Local TCP port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The **Local TCP port** is the TCP port that the MiiNePort uses to listen to connections, and that other devices must use to contact the MiiNePort. To avoid conflicts with well known TCP ports, the default is set to 4001.

Command port

Setting	Factory Default	Necessity
1 to 65535	966	Optional

The **Command port** is a "listen TCP port" for IP-Serial Lib commands from the host. In order to prevent a TCP port conflict with other applications, the user can set the Command port to another port if needed. IP-Serial Lib will automatically check the Command Port on the MiiNePort so that the user does not need to configure the program.

Packet length

Setting	Factory Default	Necessity
0 to 1024	0	Optional

The **Packet length** setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When packet length is set to 0 (the default), a maximum amount is not specified and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon as it reaches the specified length.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	None	Optional

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	None	Optional

The Delimiter fields are used to specify a 1-character or 2-character sequence that acts as a marker to control packing of serial data. By default, delimiter characters are not defined, so the module transmits data as soon as it is received. When a delimiter character or characters are defined, the module will hold data in its buffer until it receives the delimiter character or 2-character sequence. When the delimiter is received, the module will pack the data into its buffer and send it out through the Ethernet port.

Use Delimiter 1 to define the first delimiter character in hex. If only one delimiter character is used, Delimiter 2 should be set to "0". If the delimiter is a two-character sequence, use Delimiter 2 to define the second character. To disable the use of delimiters, set both Delimiter 1 and Delimiter 2 to "0".

Note that data packing is controlled not only by the delimiter but is also influenced by the module's buffer size and the Force transmit field. If the delimiter has not been received by the time the 1K buffer is full, the module will pack the data for network transmission and clear the buffer. In addition, the module will also pack data for network transmission if the next byte of data is not received within the Force transmit time.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1 KB, the MiiNePort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Delimiter process

Setting	Factory Default	Necessity
Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do Nothing	Optional

The **Delimiter process** field determines how the data is handled when a delimiter is received. Delimiter 1 must be enabled for this field to have effect. If Delimiters 1 and 2 are both enabled, both characters must be received for the delimiter process to take place.

[Do Nothing]: Data in the buffer will be transmitted when the delimiter is received.

[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.

[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.

Force transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: The force transmit timeout is disabled.

1 to 65535: If the module does not receive the next byte of data within the time specified, it will pack the data in its buffer into the same data frame for network transmission.

The **Force transmit** field is typically used in conjunction with the Delimiter fields to specify how data in the module's buffer is packed for network transmission. When delimiters are used, the module accumulates data in its buffer as it waits to receive a delimiter. If there is a break in communication, data will be held in the buffer as the module continues to wait for a delimiter. The Force transmit field allows you to specify the maximum amount of time that the module will wait for data. With Force transmit enabled, the module will automatically pack the data in the buffer for network transmission if no data is received for the specified time.

When set to 0, Force transmit is disabled, which means there is no time limit for how long the module will wait to receive data. When set between 1 and 65535, the module will pack data if serial data is not received in the specified time.

The optimal force transmit time depends on your application, but it should be larger than one character interval within the specified baudrate to have any effect. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send one character is 10 bits, and the time required to transfer one character is

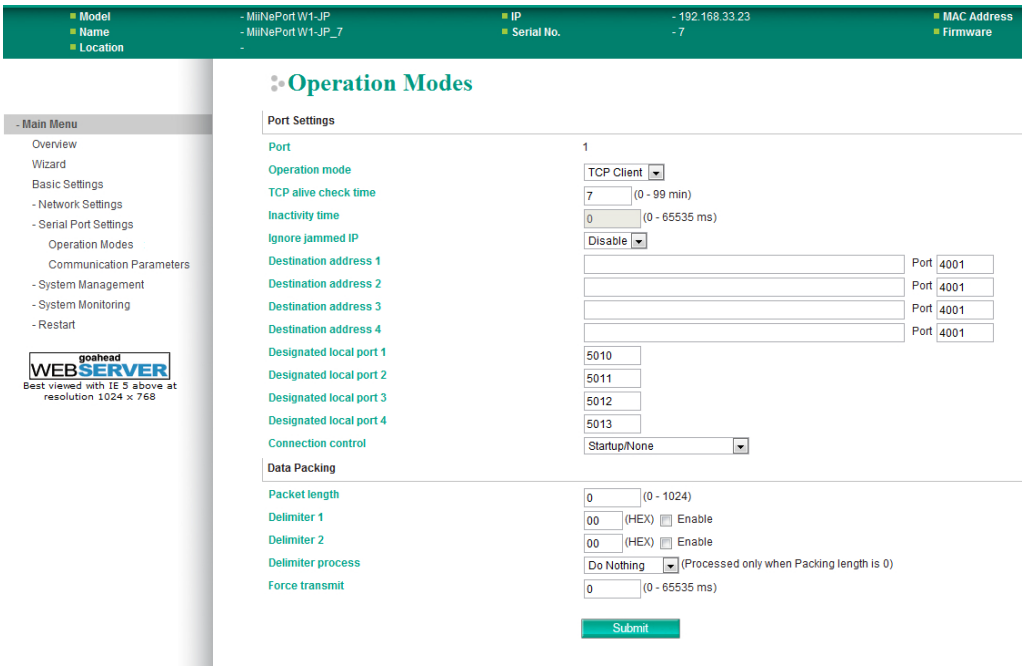
(10 bits / 1200 bits/s) × 1000 ms/s = 8.3 ms.

Since it requires about 9 ms to send one character, the Force transmit should be 10 ms or more to have any effect. At 9 ms or less, the module will simply pack every character as it is received, which would be the same as if delimiter characters or a Force transmit time were not specified.

ATTENTION

If you want to send a series of characters in the same packet, the serial device attached to the MiiNePort should send that series of characters during a time interval less than the Force transmit timeout for the MiiNePort, and the total length of data must be less than or equal to the MiiNePort's internal buffer size. The serial communication buffer size for the MiiNePort is 1 KB per port.

TCP Client Mode



TCP alive check time

Setting	Factory Default	Necessity
0 to 99 min	7 min	Optional

0 min: The TCP connection is not closed due to an idle TCP connection.

1 to 99 min: The module automatically closes the TCP connection if there is no TCP activity for the given time. After the connection is closed, the module starts listening for another host's TCP connection.

Inactivity time

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0 ms: TCP connection is not closed due to an idle serial line.

0-65535 ms: The MiiNePort automatically closes the TCP connection if there is no serial data activity for the given time. After the connection is closed, the MiiNePort starts listening for another host's TCP connection.

This parameter defines the maintenance status as Closed or Listen for the TCP connection. The connection is closed if there is no incoming or outgoing data through the serial port during the specific Inactivity time.

If the Inactivity time is set to 0, the current TCP connection is kept active until a connection close request is received. Although Inactivity time is disabled, the MiiNePort will check the connection status between the MiiNePort and the remote host by sending "keep alive" packets periodically. If the remote host does not respond to the packet, the MiiNePort assumes that the connection was closed unintentionally. The MiiNePort will then force the existing TCP connection to close.

ATTENTION

The Inactivity time should be greater than the Force transmit timeout. To prevent the unintended loss of data due to the session being disconnected, it is highly recommended that this value is set large enough so that the intended data transfer is completed.

ATTENTION

Inactivity time is ONLY active when "TCP connect on" is set to "Any character."

Ignore jammed IP

Setting	Factory Default	Necessity
Enable, Disable	Disable	Optional

This option determines how the port will proceed if multiple hosts are connected and one or more of the hosts stops responding as the port is transmitting data. If you select Disable, the port will wait until the data has been transmitted successfully to all hosts before transmitting the next group of data. If you select Enable, the port will ignore the host that stopped responding and continue data transmission to the other hosts.

NOTE Ignore Jammed IP is only active when Max connection is greater than 1.

Packet length

Setting	Factory Default	Necessity
0 to 1024	0	Optional

The **Packet length** setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When packet length is set to 0 (the default), a maximum amount is not specified and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon as it reaches the specified length.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	"00" for None	Optional

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	"00" for None	Optional

The Delimiter fields are used to specify a 1-character or 2-character sequence that acts as a marker to control packing of serial data. By default, delimiter characters are not defined, so the module transmits data as soon as it is received. When a delimiter character or characters are defined, the module will hold data in its buffer until it receives the delimiter character or 2-character sequence. When the delimiter is received, the module will pack the data into its buffer and send it out through the Ethernet port.

Use Delimiter 1 to define the first delimiter character in hex. If only one delimiter character is used, Delimiter 2 should be set to "0". If the delimiter is a two-character sequence, use Delimiter 2 to define the second character. To disable the use of delimiters, set both Delimiter 1 and Delimiter 2 to "0".

Note that data packing is controlled not only by the delimiter but is also influenced by the module's buffer size and the Force transmit field. If the delimiter has not been received by the time the 1K buffer is full, the module will pack the data for network transmission and clear the buffer. In addition, the module will also pack data for network transmission if the next byte of data is not received within the Force transmit time.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1 KB, the MiiNePort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Delimiter process

Setting	Factory Default	Necessity
Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do Nothing	Optional

The **Delimiter process** field determines how the data is handled when a delimiter is received. Delimiter 1 must be enabled for this field to have effect. If Delimiters 1 and 2 are both enabled, both characters must be received for the delimiter process to take place.

[Do Nothing]: Data in the buffer will be transmitted when the delimiter is received.

[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.

[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.

Force transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: The force transmit timeout is disabled.

1 to 65535: If the module does not receive the next byte of data within the time specified, it will pack the data in its buffer into the same data frame for network transmission.

The **Force transmit** field is typically used in conjunction with the Delimiter fields to specify how data in the module's buffer is packed for network transmission. When delimiters are used, the module accumulates data in its buffer as it waits to receive a delimiter. If there is a break in communication, data will be held in the buffer as the module continues to wait for a delimiter. The Force transmit field allows you to specify the maximum amount of time that the module will wait for data. With Force transmit enabled, the module will automatically pack the data in the buffer for network transmission if no data is received for the specified time.

When set to 0, Force transmit is disabled, which means there is no time limit for how long the module will wait to receive data. When set between 1 and 65535, the module will pack data if serial data is not received in the specified time.

The optimal force transmit time depends on your application, but it should be larger than one character interval within the specified baudrate to have any effect. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send one character is 10 bits, and the time required to transfer one character is

(10 bits / 1200 bits/s) × 1000 ms/s = 8.3 ms.

Since it requires about 9 ms to send one character, the Force transmit should be 10 ms or more to have any effect. At 9 ms or less, the module will simply pack every character as it is received, which would be the same as if delimiter characters or a Force transmit time were not specified.

Destination IP address 1/2/3/4

Setting	Factory Default	Necessity
IP address or Domain Name (E.g., 192.168.1.1)	None	Required

Up to 4 **Destination IP addresses** (or domain names) can be specified. The MiiNePort will be able to actively connect to each of these remote addresses.

ATTENTION

The connection speed or throughput may be slow if one of the four connections is slow, since the 1 slow connection will slow down the other 3 connections.

ATTENTION

Both IP address and Domain Name can be used in the "Destination IP address" field.

Designated Local Port 1/2/3/4

Setting	Factory Default	Necessity
TCP Port No.	5011 (Port 1) 5012 (Port 2) 5013 (Port 3) 5014 (Port 4)	Required

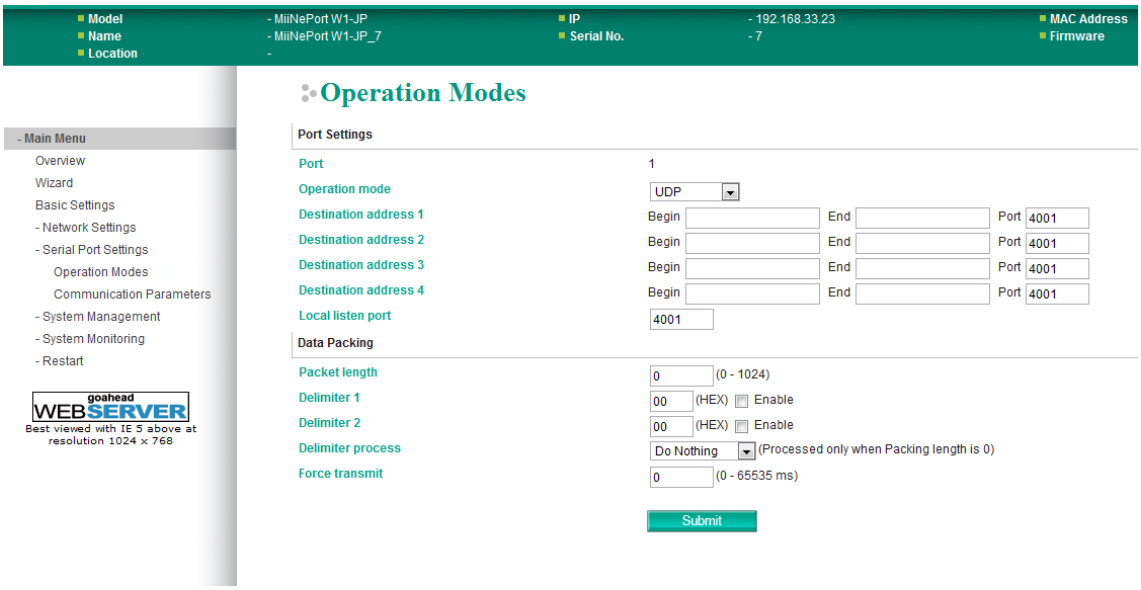
Connection control

Setting	Factory Default	Necessity
Startup/None, Any Character/None, Any Character/Inactivity Time, DSR ON/DSR OFF, DSR ON/None, DCD ON/DCD OFF, DCD ON/None	Startup/None	Required

The meaning of each of the above settings is given in the following table. In general, both the Connect condition and Disconnect condition are given.

Connect/Disconnect	Description
Startup / None (default)	A TCP connection will be established on startup, and will remain active indefinitely.
Any Character / None	A TCP connection will be established when any character is received from the serial interface, and will remain active indefinitely.
Any Character / Inactivity Time	A TCP connection will be established when any character is received from the serial interface, and will be disconnected when the Inactivity time out is reached.
DSR On / DSR Off	A TCP connection will be established when a DSR "On" signal is received, and will be disconnected when a DSR "Off" signal is received.
DSR On / None	A TCP connection will be established when a DSR "On" signal is received, and will remain active indefinitely.
DCD On / DCD Off	A TCP connection will be established when a DCD "On" signal is received, and will be disconnected when a DCD "Off" signal is received.
DCD On / None	A TCP connection will be established when a DCD "On" signal is received, and will remain active indefinitely.

UDP Mode



Destination IP address 1

Setting	Factory Default	Necessity
IP address range E.g., Begin: 192.168.1.1 End: 192.168.1.10	Begin: Empty End: Empty Port: 4001	Required

Destination IP address 2/3/4

Setting	Factory Default	Necessity
IP address range E.g., Begin: 192.168.1.11 End: 192.168.1.20	Begin: Empty End: Empty Port: 4001	Optional

Local listen port

Setting	Factory Default	Necessity
1 to 65535	4001	Required

The **Local listen port** is the UDP port that the MiiNePort listens to, and that other devices must use to contact the MiiNePort. To avoid conflicts with well known UDP ports, the default is set to 4001.

Packet length

Setting	Factory Default	Necessity
0 to 1024	0	Optional

The **Packet length** setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When packet length is set to 0 (the default), a maximum amount is not specified and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. When a packet length between 1 and 1024 bytes is specified, data in the buffer will be sent as soon as it reaches the specified length.

Delimiter 1

Setting	Factory Default	Necessity
00 to FF	"00" for None	Optional

Delimiter 2

Setting	Factory Default	Necessity
00 to FF	"00" for None	Optional

The Delimiter fields are used to specify a 1-character or 2-character sequence that acts as a marker to control packing of serial data. By default, delimiter characters are not defined, so the module transmits data as soon as it is received. When a delimiter character or characters are defined, the module will hold data in its buffer until it receives the delimiter character or 2-character sequence. When the delimiter is received, the module will pack the data into its buffer and send it out through the Ethernet port.

Use Delimiter 1 to define the first delimiter character in hex. If only one delimiter character is used, Delimiter 2 should be set to "0". If the delimiter is a two-character sequence, use Delimiter 2 to define the second character. To disable the use of delimiters, set both Delimiter 1 and Delimiter 2 to "0".

Note that data packing is controlled not only by the delimiter but is also influenced by the module's buffer size and the Force transmit field. If the delimiter has not been received by the time the 1K buffer is full, the module will pack the data for network transmission and clear the buffer. In addition, the module will also pack data for network transmission if the next byte of data is not received within the Force transmit time.

ATTENTION

Delimiter 2 is optional. If left blank, then Delimiter 1 alone trips clearing of the buffer. If the size of the serial data received is greater than 1 KB, the MiiNePort will automatically pack the data and send it to the Ethernet. However, to use the delimiter function, you must at least enable Delimiter 1. If Delimiter 1 is left blank and Delimiter 2 is enabled, the delimiter function will not work properly.

Delimiter process

Setting	Factory Default	Necessity
Do Nothing, Delimiter + 1, Delimiter + 2, Strip Delimiter	Do Nothing	Optional

The **Delimiter process** field determines how the data is handled when a delimiter is received. Delimiter 1 must be enabled for this field to have effect. If Delimiters 1 and 2 are both enabled, both characters must be received for the delimiter process to take place.

[Do Nothing]: Data in the buffer will be transmitted when the delimiter is received.

[Delimiter + 1] or [Delimiter + 2]: The data will be transmitted when an additional byte (for Delimiter +1), or an additional 2 bytes (for Delimiter +2) of data is received after receiving the Delimiter.

[Strip Delimiter]: When the Delimiter is received, the Delimiter is deleted (i.e., stripped), and the remaining data is transmitted.

Force transmit

Setting	Factory Default	Necessity
0 to 65535 ms	0 ms	Optional

0: The force transmit timeout is disabled.

1 to 65535: If the module does not receive the next byte of data within the time specified, it will pack the data in its buffer into the same data frame for network transmission.

The **Force transmit** field is typically used in conjunction with the Delimiter fields to specify how data in the module's buffer is packed for network transmission. When delimiters are used, the module accumulates data in its buffer as it waits to receive a delimiter. If there is a break in communication, data will be held in the buffer as the module continues to wait for a delimiter. The Force transmit field allows you to specify the maximum amount of time that the module will wait for data. With Force transmit enabled, the module will automatically pack the data in the buffer for network transmission if no data is received for the specified time.

When set to 0, Force transmit is disabled, which means there is no time limit for how long the module will wait to receive data. When set between 1 and 65535, the module will pack data if serial data is not received in the specified time.

The optimal force transmit time depends on your application, but it should be larger than one character interval within the specified baudrate to have any effect. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send one character is 10 bits, and the time required to transfer one character is

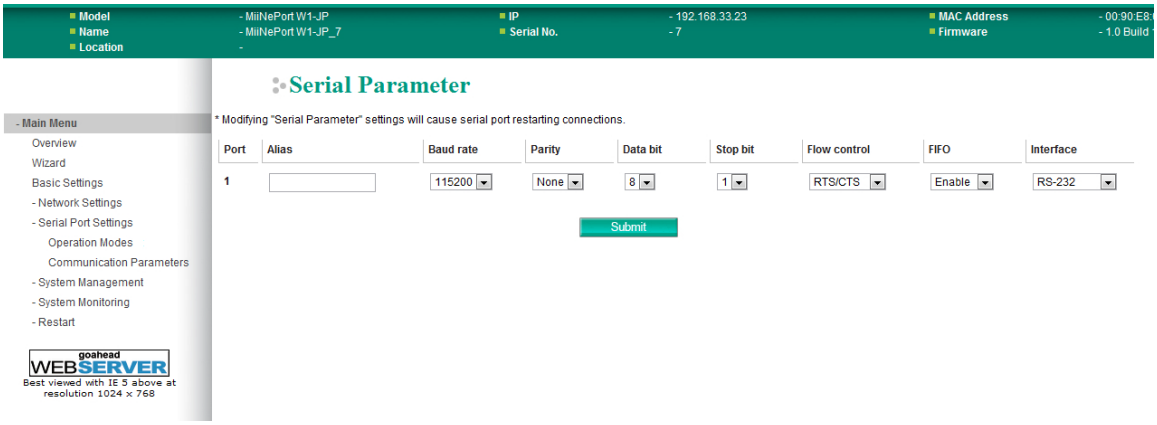
(10 bits / 1200 bits/s) × 1000 ms/s = 8.3 ms.

Since it requires about 9 ms to send one character, the Force transmit should be 10 ms or more to have any effect. At 9 ms or less, the module will simply pack every character as it is received, which would be the same as if delimiter characters or a Force transmit time were not specified.

ATTENTION

If you want to send a series of characters in the same packet, the serial device attached to the MiiNePort should send that series of characters during a time interval less than the Force transmit timeout for the MiiNePort, and the total length of data must be less than or equal to the MiiNePort's internal buffer size. The serial communication buffer size for the MiiNePort is 1 KB per port.

Serial Parameter



Port Alias

Setting	Factory Default	Necessity
1 to 15 characters (E.g., PLC-No.1)	None	Optional

This function is designed for future use. You may enter a string to help in the module's serial port from other serial ports.

ATTENTION

Refer to the serial communication parameters in your serial device's user's manual. The module's serial parameters should be the same as the parameters used by your serial device.

Baudrate

Setting	Factory Default	Necessity
50 bps to 921.6 Kbps (supports non-standard baudrates)	115.2 Kbps	Required

The MiiNePort supports the **Any Baudrate (non-standard baudrate)** feature. If your baudrate is not listed, select **Other** from the drop-down list and type the baudrate in the input box. The MiiNePort will use the closest baudrate that is supported.

Data Bit

Setting	Factory Default	Necessity
5, 6, 7, 8	8	Required

Stop Bit

Setting	Factory Default	Necessity
1, 1.5, 2	1	Required

Stop Bits will be set to 1.5 when Data Bits is set to 5 bits.

Parity

Setting	Factory Default	Necessity
None, Even, Odd, Space, Mark	None	Required

Flow control

Setting	Factory Default	Necessity
None, RTS/CTS, DTR/DSR, XON/XOFF	RTS/CTS	Required

FIFO

Setting	Factory Default	Necessity
Enable, Disable	Enable	Required

Each module's serial port provides a 128-byte FIFO both in the Tx and Rx directions. Disable the FIFO setting when your serial device does not have a FIFO to prevent data loss during communication.

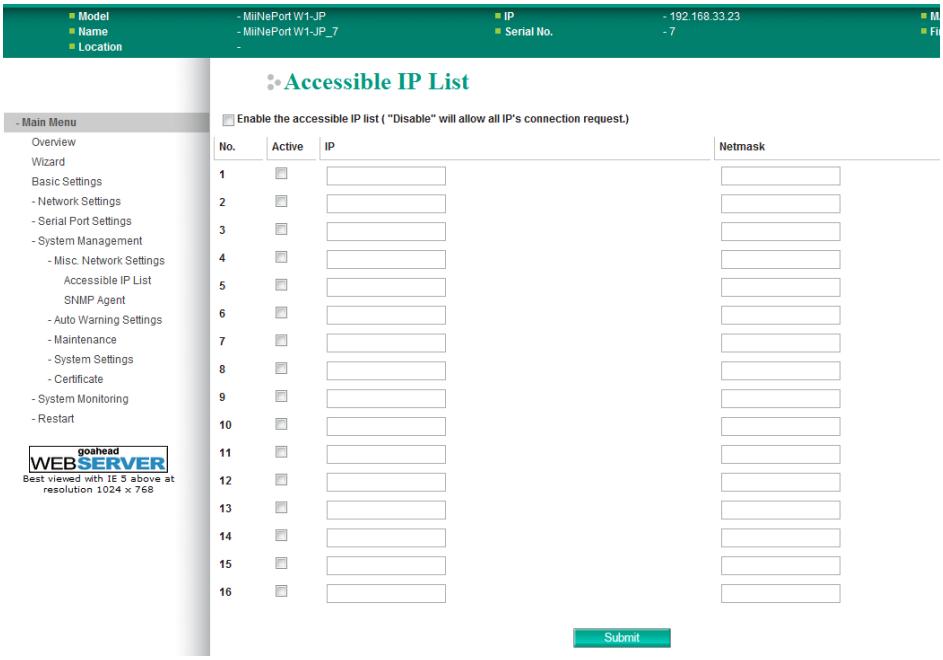
Interface

Setting	Factory Default	Necessity
RS-232, RS-422/485	RS-232	Required

System Management

Misc. Network Settings

Accessible IP List



The **Accessible IP List** page is located under **Misc. Network Settings** in the **System Management** folder. This page is used this restrict access to the module by IP address. Only IP addresses on the list will be allowed access to the module. You may add a specific address or range of addresses by using a combination of IP address and netmask, as follows:

To allow access to a specific IP address
Enter the IP address in the corresponding field; enter 255.255.255.255 for the netmask.

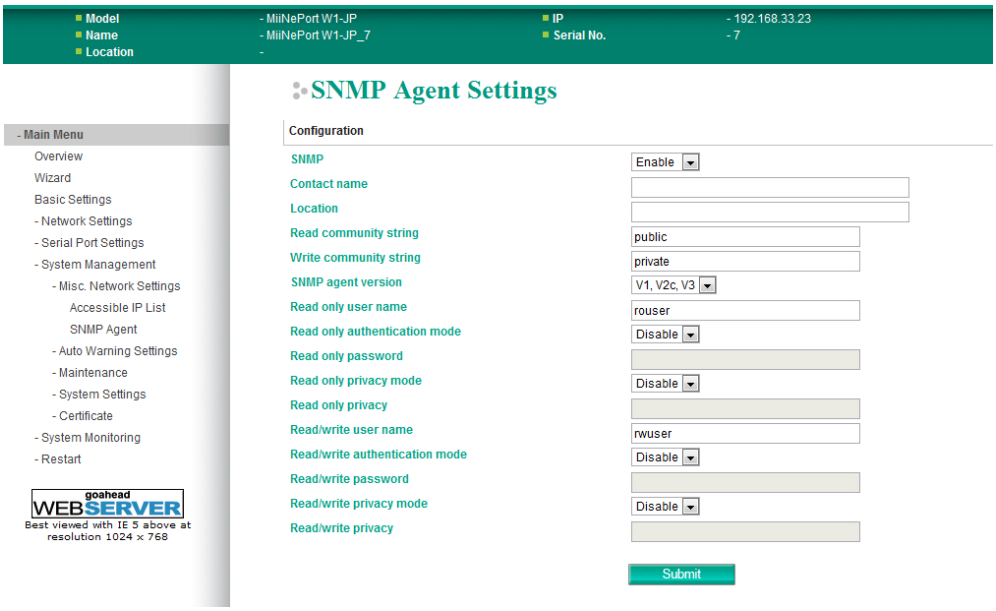
To allow access to hosts on a specific subnet
For both the IP address and netmask, use 0 for the last digit (e.g., "192.168.1.0" and "255.255.255.0").

To allow access to all IP addresses
Make sure that **Enable the accessible IP list** is not checked.

Additional configuration examples are shown in the following table:

Desired IP Range	IP Address Field	Netmask Field
Any host	Disable	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

SNMP Agent Settings



The **SNMP Agent** page is located under **Misc. Network Settings** in the **System Management** folder. This page is used to configure the SNMP Agent on the MiiNePort W1/MiiNePort W1-T.

SNMP: To enable the SNMP Agent function, select the **Enable** option, and enter a community name (e.g., **public**).

Read community string (default=public): This is a text password mechanism that is used to weakly authenticate queries to agents of managed network devices.

Write community string (default=private): This is a text password mechanism that is used to weakly authenticate changes to agents of managed network devices.

Contact name: The optional SNMP contact information usually includes an emergency contact name and telephone or pager number.

Location: Use this optional field to specify the location string for SNMP agents such as "Office A". This string is usually set to the street address where the MiiNePort is physically located.

SNMP agent version: The MiiNePort supports SNMP V1, V2c, and V3.

Read-only and Read/write access control

The following fields allow you to define user names, passwords, and authentication parameters for two levels of access: read-only and read/write. The name of the field will indicate which level of access it refers to. For example, **Read only** authentication mode allows you to configure the authentication mode for read-only access, whereas **Read/write** authentication mode allows you to configure the authentication mode for read/write access. For each level of access, you may configure the following:

User name: Use this optional field to identify the user name for the specified level of access.

Authentication mode (default=Disable): Use this field to select MD5 or SHA as the method of password encryption for the specified level of access, or to disable authentication

Privacy mode (default=Disable): Use this field to enable to disable DES_CBC data encryption for the specified level of access.

Password: Use this field to set the password for the specified level of access.

Privacy: Use this field to define the encryption key for the specified level of access

Community String

Default	public
Options	free text (e.g., "public community")
Description	This field specifies the community string used for the SNMP Agent. This is a text password mechanism that is used to weakly authenticate queries to agents of managed network devices.

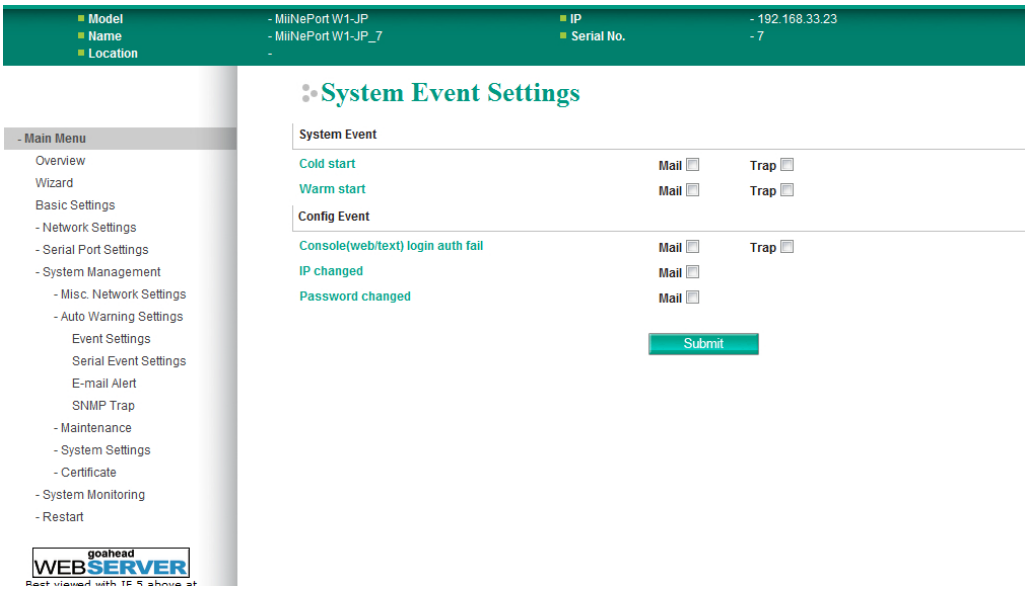
Contact Name

Default	
Options	free text (e.g., "J Smith")
Description	This is an optional free text field that can be used to specify the SNMP emergency contact name, telephone, or pager number.

Location

Default	
Options	free text (e.g., "Building XYZ")
Description	This is an optional free text field that can be used to specify the location for SNMP agents such as the module.

Event Settings

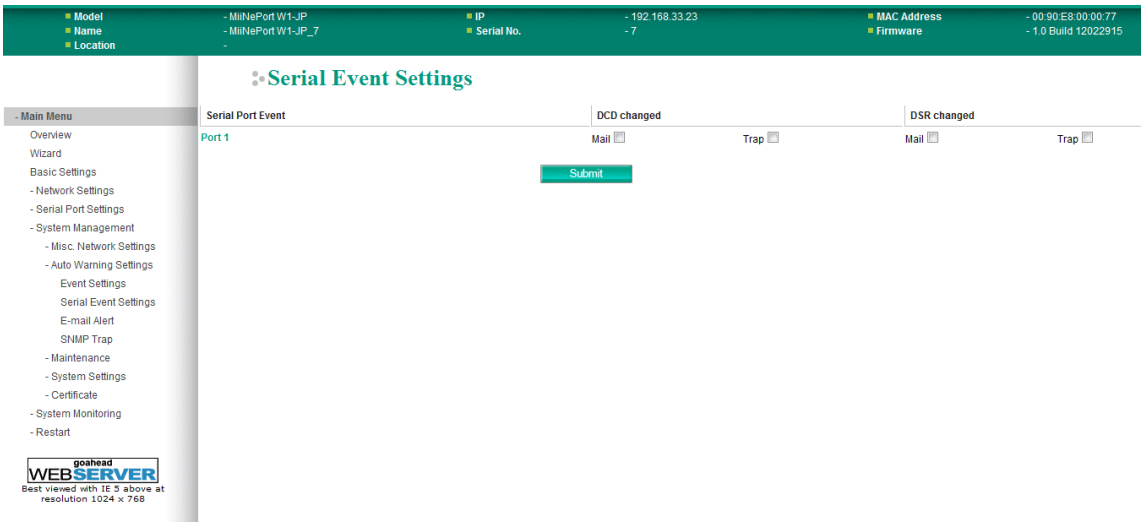


The **Event Settings** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how the MiiNePort W1/MiiNePort W1-T will notify you of system and configuration events. Depending on the event, different options for notification are available, as shown above. **Mail** refers to sending an e-mail to a specified address. **Trap** refers to sending an SNMP trap.

Event	Description
Cold start	The module was powered on, or was restarted after a firmware upgrade.
Warm start	The module restarted without powering off.
Console login auth fail	An attempt has been made to open the web, Telnet, but the password was incorrect.
IP changed	The IP address has been changed.
Password changed	The password to the console has been changed.

Auto Warning Settings

Serial Event Settings



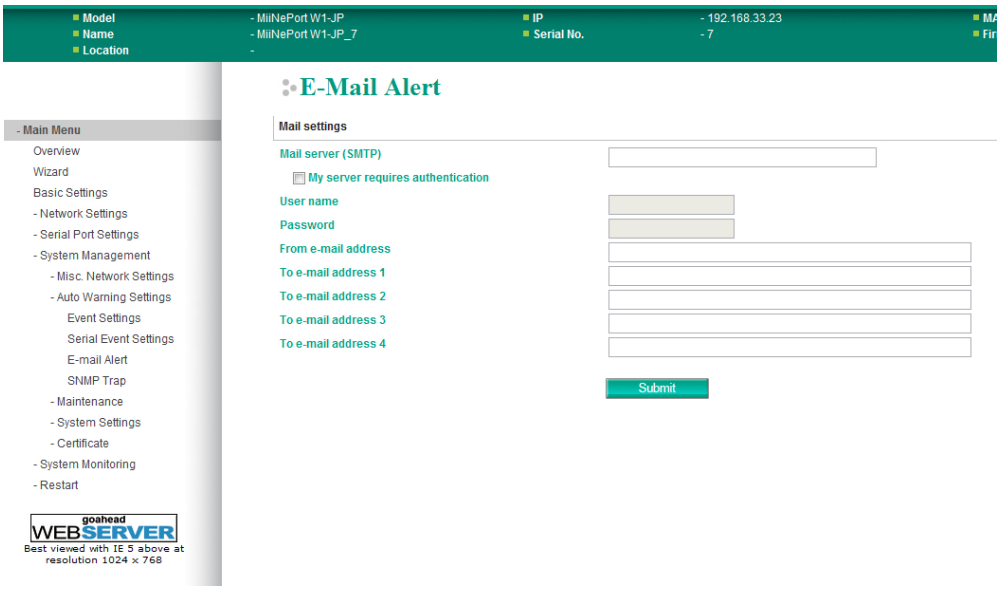
The **Serial Event Settings** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how the MiiNePort W1/MiiNePort W1-T will notify you of DCD and DSR events for each serial port. **Mail** refers to sending an e-mail to a specified address. **Trap** refers to sending an SNMP trap.

A change in the DCD (Data Carrier Detect) signal indicates that the modem connection status has changed. If the DCD signal changes to low, it indicates that the connection line is down. A change in the DSR (Data Set Ready) signal indicates that the data communication equipment is powered off. If the DSR signal changes to low, it indicates that the data communication equipment is powered down.

ATTENTION

SNMP indicates a change in DCD or DSR signals but does not differentiate between the two. A change in either signal from "–" to "+" is indicated by "link up" and a change in either signal from "+" to "–" is indicated by "link down."

E-mail Alert



The **E-mail Alert** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify how and where e-mail is sent for automatic notification of system and serial port events.

ATTENTION

Consult your network administrator or ISP for the mail server settings to use for your network. If these settings are not configured correctly, e-mail notification may not work properly.

Mail Server

Default	
Options	free text (e.g., "192.168.3.3")
Description	This field specifies the IP address of the mail server that will be used when sending automatic warning e-mails. If the mail server requires authentication, select "My server requires authentication" and enter the username and password.

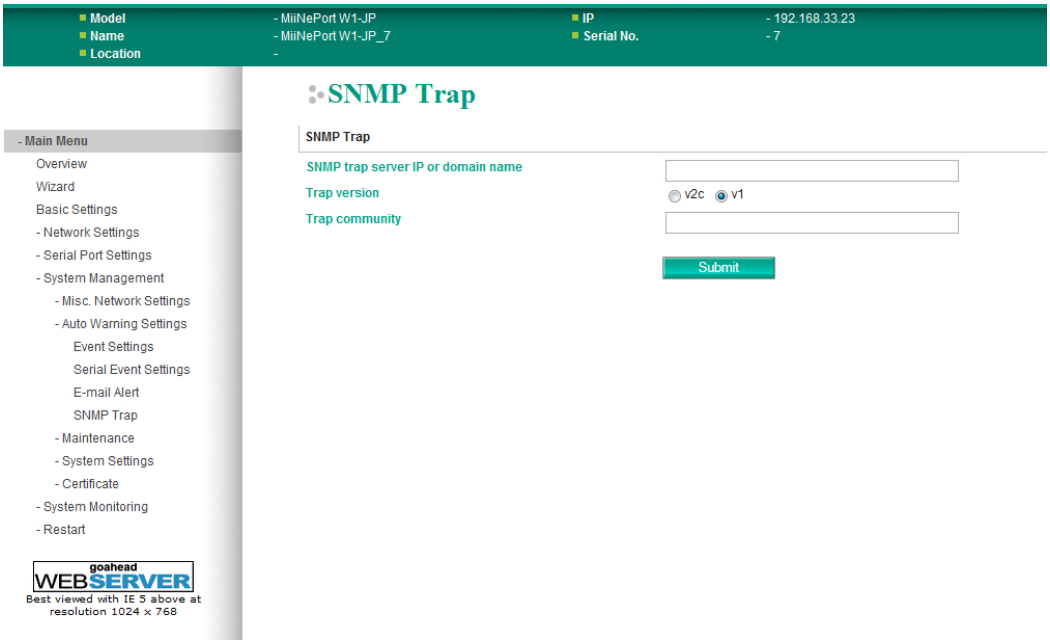
From E-mail Address

Default	
Options	free text (e.g., "jsmith@xyz.com")
Description	This field specifies the e-mail address that will be listed in the e-mail's "From" field.

To E-mail Address 1 to 4

Default	
Options	free text (e.g., "admin@abc.com")
Description	These fields specify the destination e-mail address(es) for the automatic e-mail warnings.

SNMP Trap



The **SNMP Trap** page is located under **Auto Warning Settings** in the **System Management** folder. This is where you specify the SNMP trap settings to use for automatic notification of system and serial port events.

SNMP Trap Server IP or Domain Name

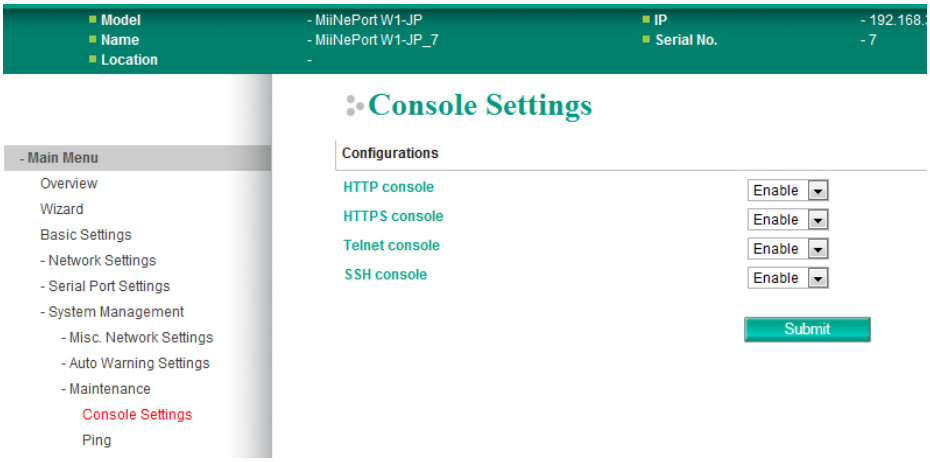
Default	
Options	IP address (e.g., “192.168.5.5”) or domain name (e.g., "Trapserver 1")
Description	This field specifies the IP address or domain name of the SNMP trap server that will receive SNMP traps.

Trap Version

Default	v1
Options	v1, v2c
Description	This field specifies the SNMP trap version to use.

Maintenance

Console Settings



The **Console Settings** page is located under **Maintenance** in the **System Management** folder. This is where you enable or disable access to the various module configuration consoles. You may modify **HTTP console**, **HTTPS console**, **Telnet console**, and **SSH console**.

HTTP Console

Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the HTTP (web) console.

HTTPS Console

Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the HTTPS (web) console.

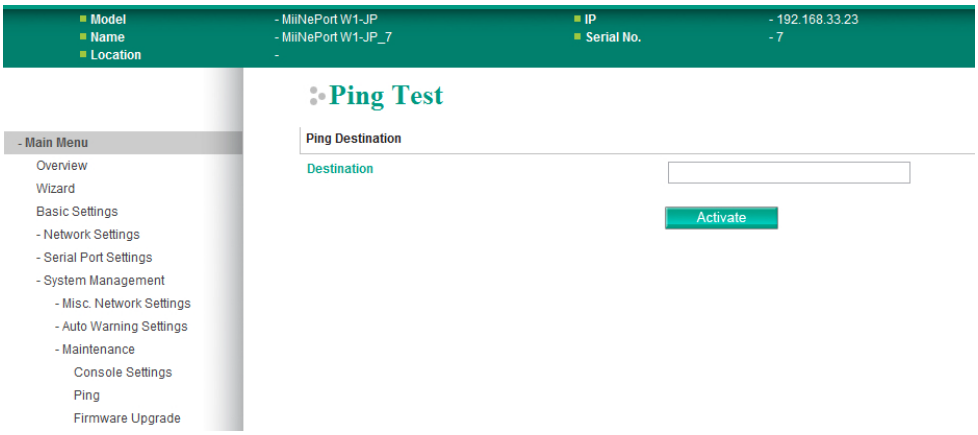
Telnet Console

Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the Telnet console.

SSH Console

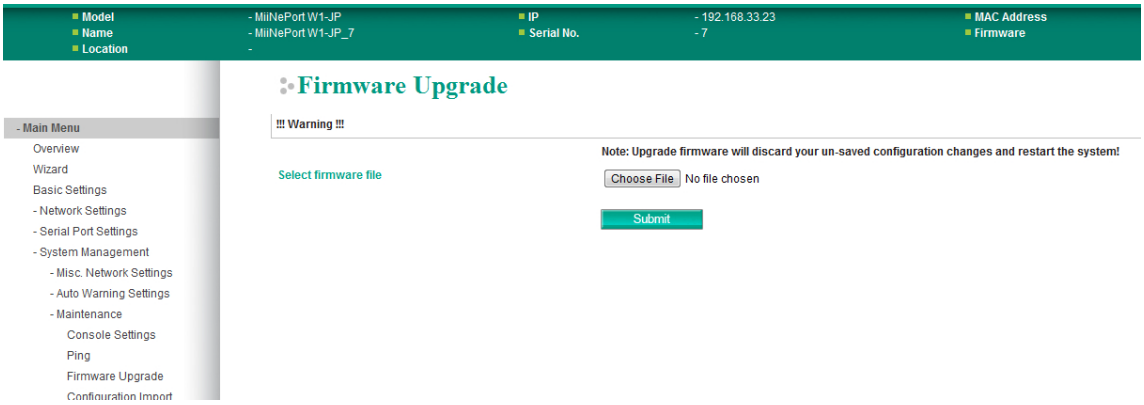
Default	Enable
Options	Enable, Disable
Description	This field enables or disables access to the SSH console.

Ping



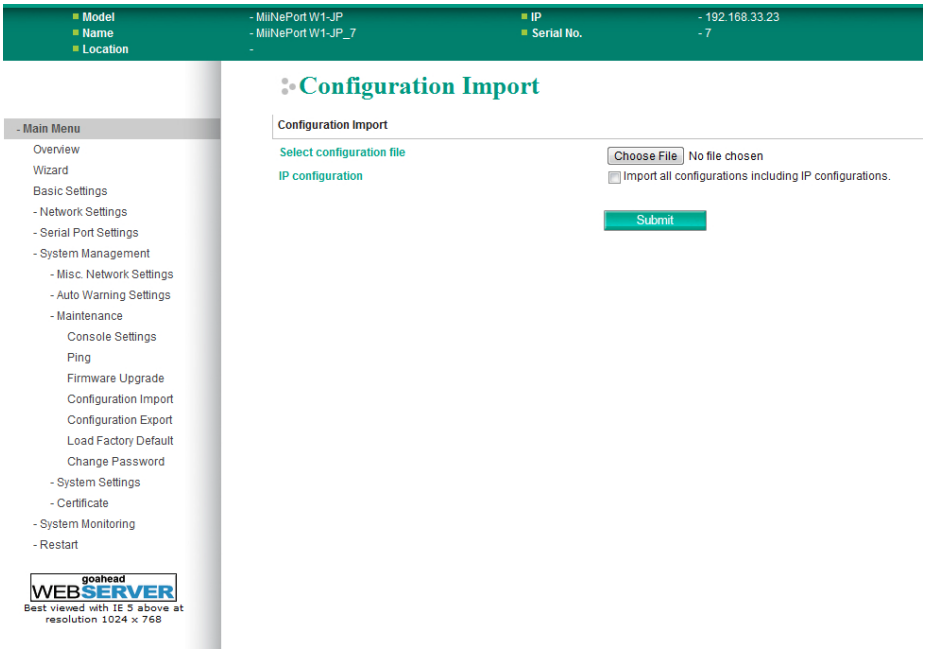
The **Ping** page is located under **Maintenance** in the **System Management** folder. It provides a convenient way to test an Ethernet connection or verify an IP address. Enter the IP address or domain name in the **Destination** field and click **Activate**. The results will be displayed immediately.

Firmware Upgrade



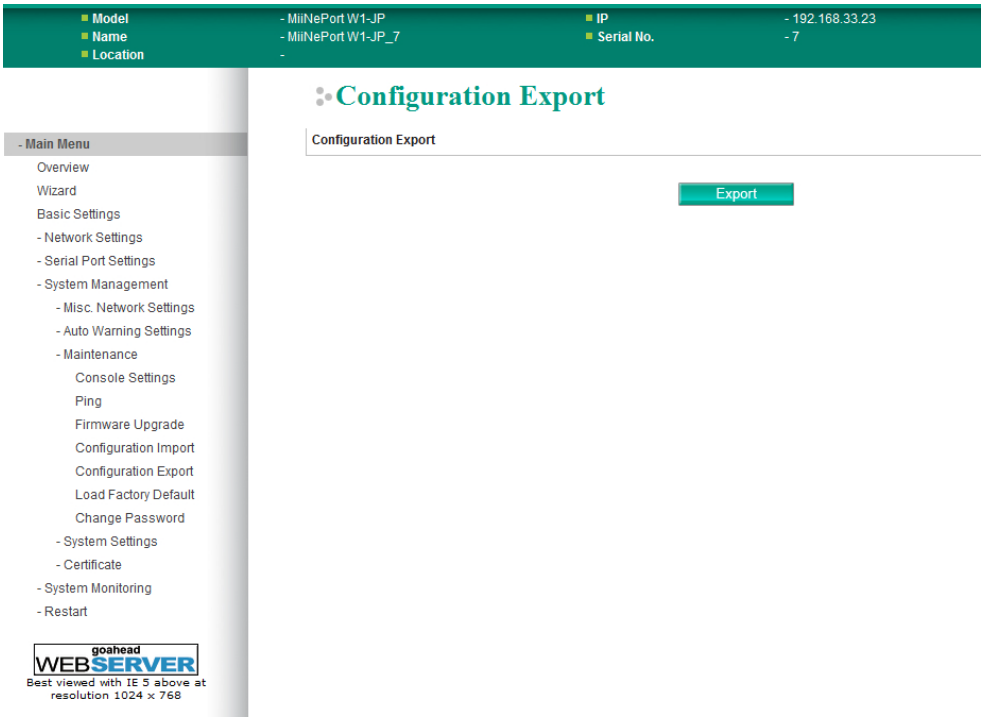
The **Firmware Upgrade** page is located under **Maintenance** in the **System Management** folder. This is where you can update the MiiNePort W1/MiiNePort W1-T's firmware. After obtaining the latest firmware from www.moxa.com, select or browse for the firmware file in the **Select firmware file** field. Before clicking **Submit**, it is a good idea to save the configuration using the **Configuration Export** page, since the firmware upgrade process may cause all settings to revert to factory defaults.

Configuration Import



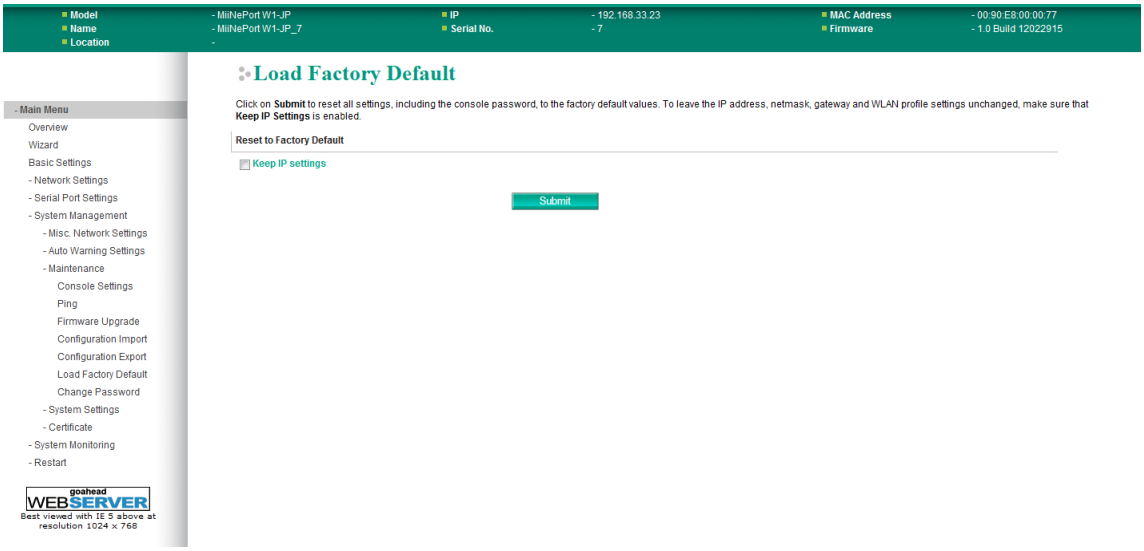
The **Configuration Import** page is located under **Maintenance** in the **System Management** folder. This is where you can load a previously saved or exported configuration. Select or browse for the configuration file in the **Select configuration file** field. If you also wish to import the IP configuration (i.e., IP address, netmask, and gateway), make sure that **Import all configurations including IP configurations** is checked.

Configuration Export



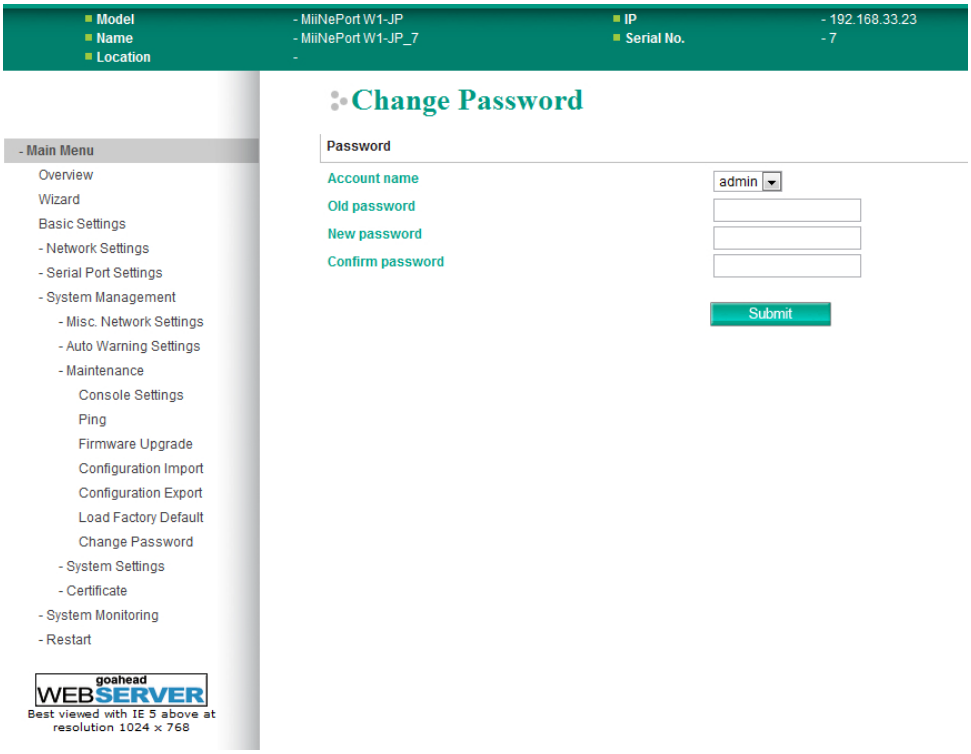
The **Configuration Export** page is located under **Maintenance** in the **System Management** folder. This is where you can save the module's current configuration to a file on the local host. Click **Download** to begin the process. A window should appear asking you to open or save the configuration text file.

Load Factory Default



The **Load Factory Default** page is located under **Maintenance** in the **System Management** folder. Click **Submit** to reset all settings to the factory defaults. You can preserve the module's existing IP settings (i.e., IP address, netmask, gateway, WLAN profile, and all certificates) by making sure **Keep IP settings** is checked before clicking **Submit**.

Change Password



The **Change Password** page is located under **Maintenance** in the **System Management** folder. To change the password, first enter the old password in the **Old password** field. Leave this blank if the module is not currently password-protected. Enter the new password twice, once in the **New password** field and once in the **Confirm password** field. Leave these fields blank to remove password protection.

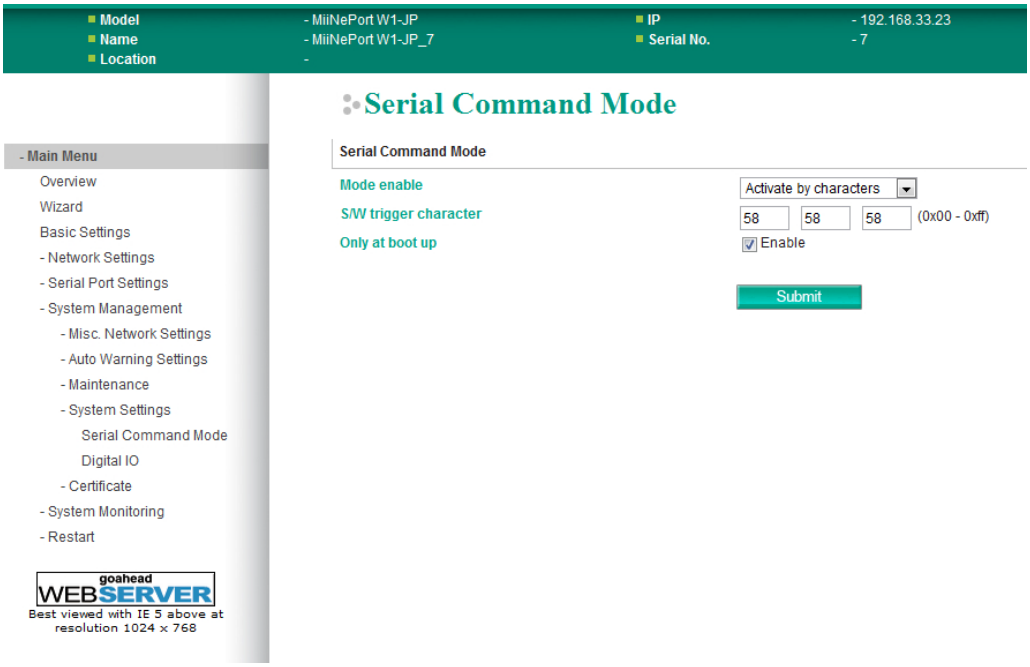
ATTENTION

If you forget the password, the ONLY way to configure the module is by loading the factory defaults with the reset button on the evaluation board. All settings will be lost.

Before setting the password, you may want to first export the configuration to a file. Your configuration can then be easily imported back into the module if necessary.

System Settings

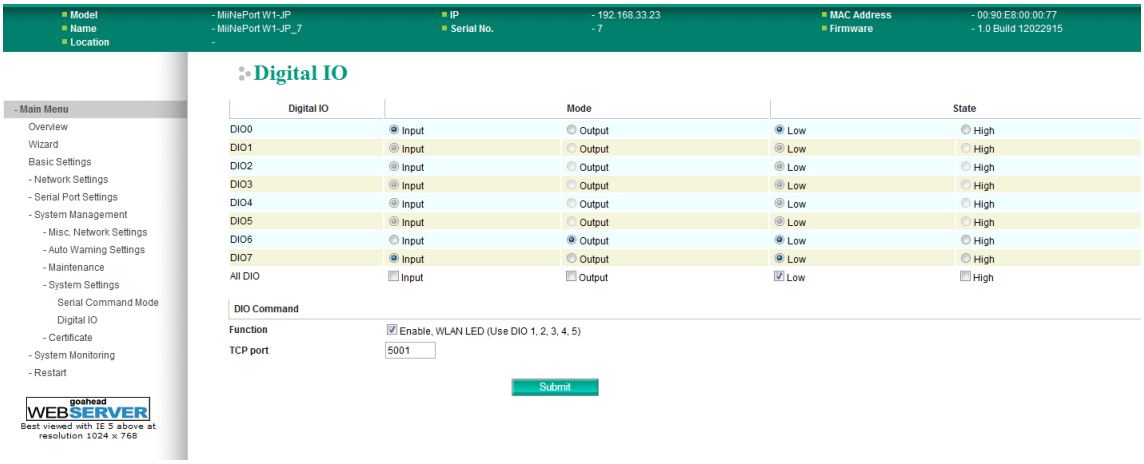
Serial Command Mode



The **Serial Command Mode** page is located under **System Settings** in the **System Management** folder. This is where you specify how Serial Command Mode will be enabled. For details on Serial Command Mode, please refer to Appendix C.

Default	Activate by characters
Options	Disable, H/W control pin DI7, Activate by characters, Activate by break signal
Description	This field specifies how to enter Serial Command Mode on the module. Disable: Serial Command Mode will be disabled on the module. H/W control pin (DIO7): Serial Command Mode will be activated according to the signal received on DIO channel 7. This is used to set up a hardware trigger through a switch connected to DIO 7. Activate by characters: Serial Command Mode will be entered when three trigger characters are received in rapid sequence. The trigger characters are specified by **S/W trigger character**.

Digital IO



The **Digital IO** page is located under **System Settings** in the **System Management** folder. This is where you configure the 8 built-in DIO channels.

DIO0 through DIO7

Default	Input (Mode), Low (State)
Options	Input, Output (for Mode) Low, High (for State)
Description	This field specifies the mode and state of the DIO channel. In "Input" mode, the DIO channel will operate as a digital input (DI) channel, and the State setting will be disregarded. The channel state will be controlled by the digital input device that is connected to the channel, such as a switch or a button. In "Output" mode, the DIO channel will operate as a digital output (DO) channel. The State setting will control the channel's state, allowing on/off control of a connected device such as an LED or alarm.

All DIO

Default	Input (Mode), Low (State)
Options	Input, Output (for Mode) Low, High (for State)
Description	This field specifies the mode and state of all DIO channels, if desired. Any setting that is selected will be applied to all DIO channels at once.

DIO Command Function

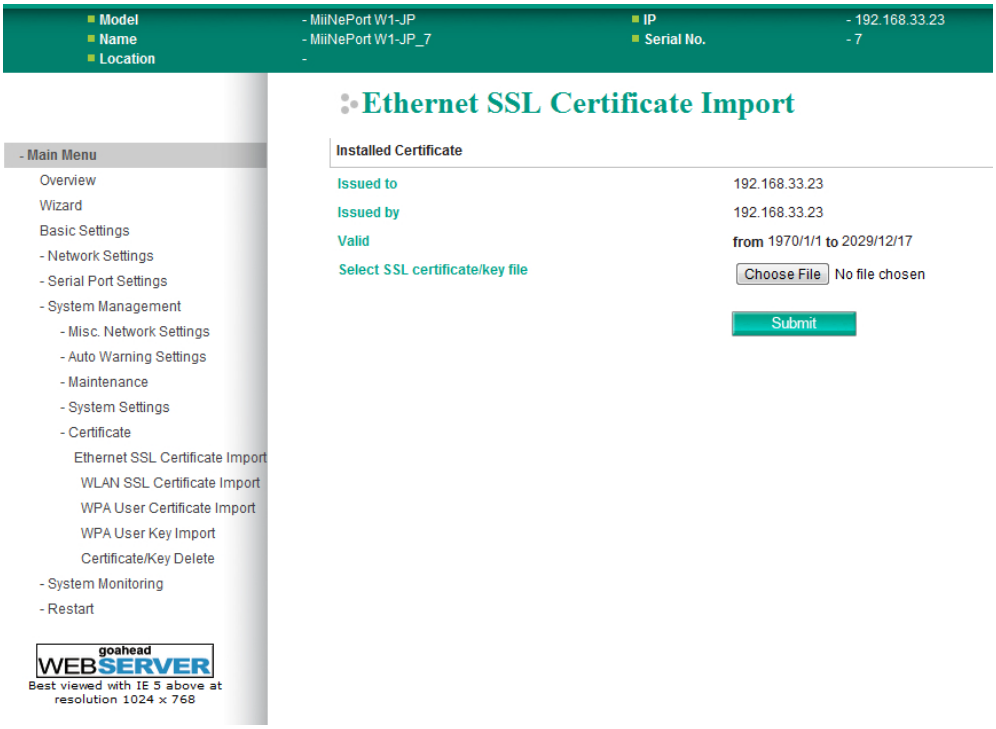
Default	Enable WLAN LED
Options	Enable/Disable WLAN LED
Description	This specifies whether the WLAN LEDs strength will be used. If enabled, DIO 1 through 5 will be reserved for use as WLAN LEDs strength. Manual settings for those DIO channels will thus be ignored.

TCP Port

Default	5001
Options	0 to 9999
Description	This specifies the TCP port number that will be reserved for DIO commands. DIO commands may be used to control and obtain data from the module's DIO channels. Please refer to Appendix C for additional information on DIO commands.

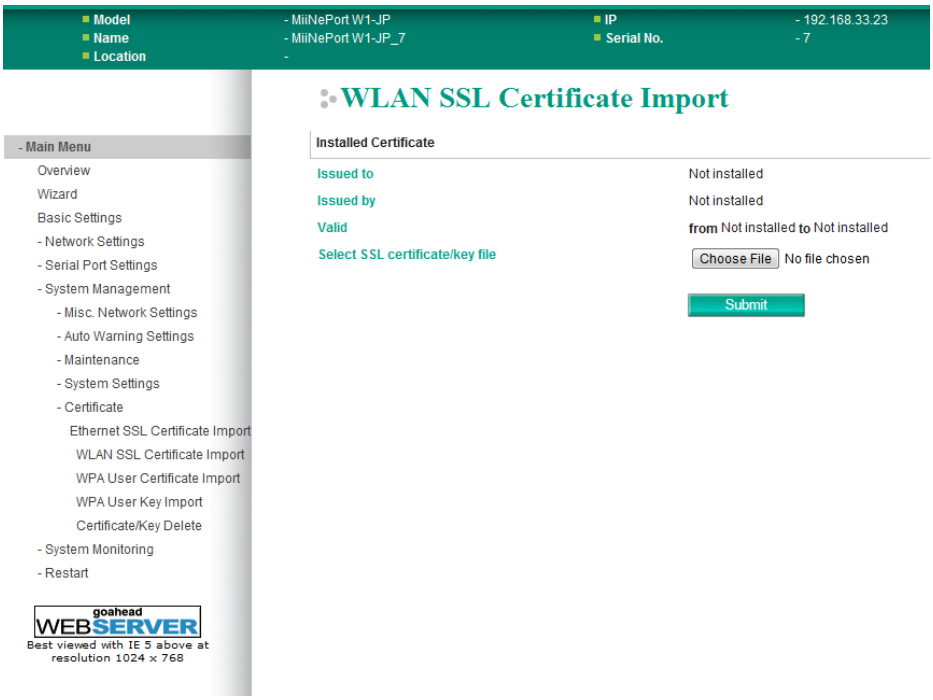
Certificate

Ethernet SSL Certificate Import



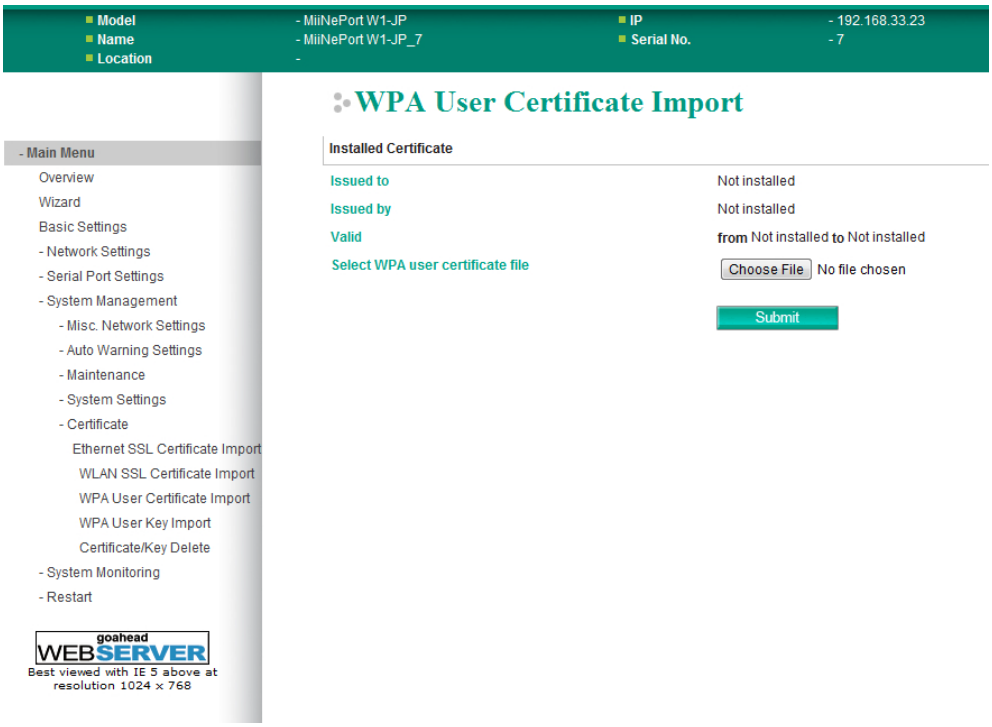
The **Ethernet SSL Certificate Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the Ethernet SSL certificate. Select or browse for the certificate file in the **Select SSL certificate/key file** field.

WLAN SSL Certificate Import



The **WLAN SSL Certificate Import** page is located under **Certificate** in the **System Management** folder. By default, the WLAN SSL certificate is automatically generated by the MiiNePort W1/MiiNePort W1-T based on the IP address of the wireless interface. You can also import a certificate. Select or browse for the certificate file in the **Select SSL certificate/key file** field.

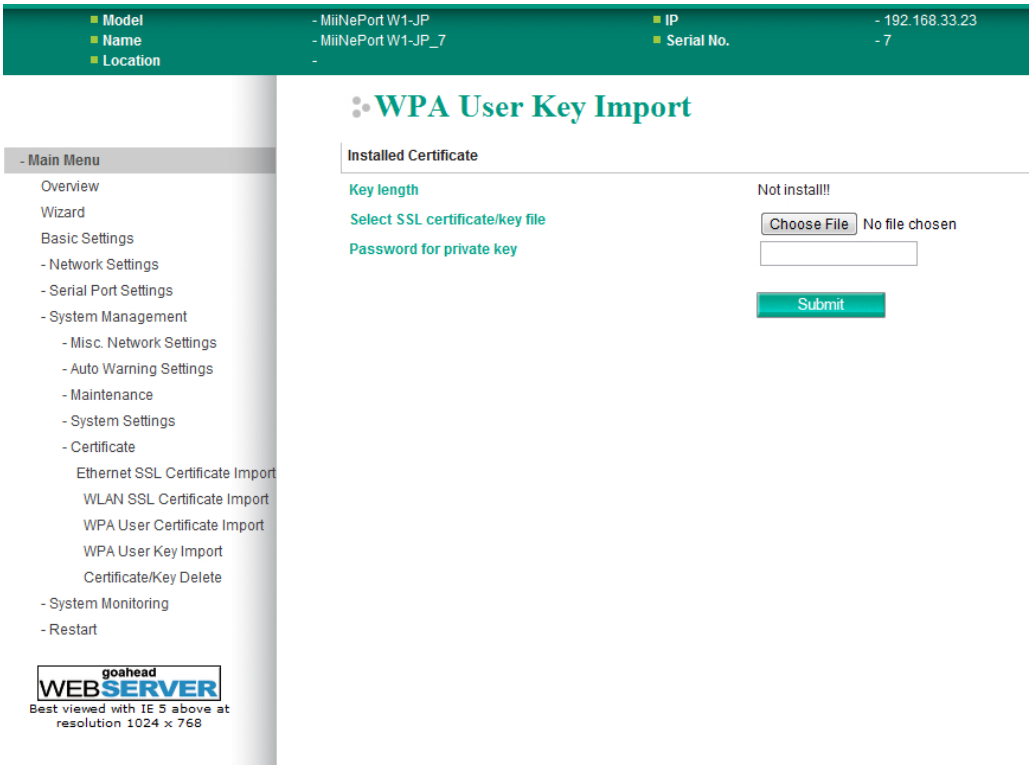
WPA User Certificate Import



The **WPA User Certificate Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the WPA user certificate. Select or browse for the certificate file in the **Select WPA user certificate file** field.

The user certificate of the MiiNePort W1/MiiNePort W1-T must be installed in the RADIUS server when the MiiNePort W1/MiiNePort W1-T uses WPA (WPA2)/TLS. The trusted server certificate of the RADIUS server must also be installed in the MiiNePort W1/MiiNePort W1-T.

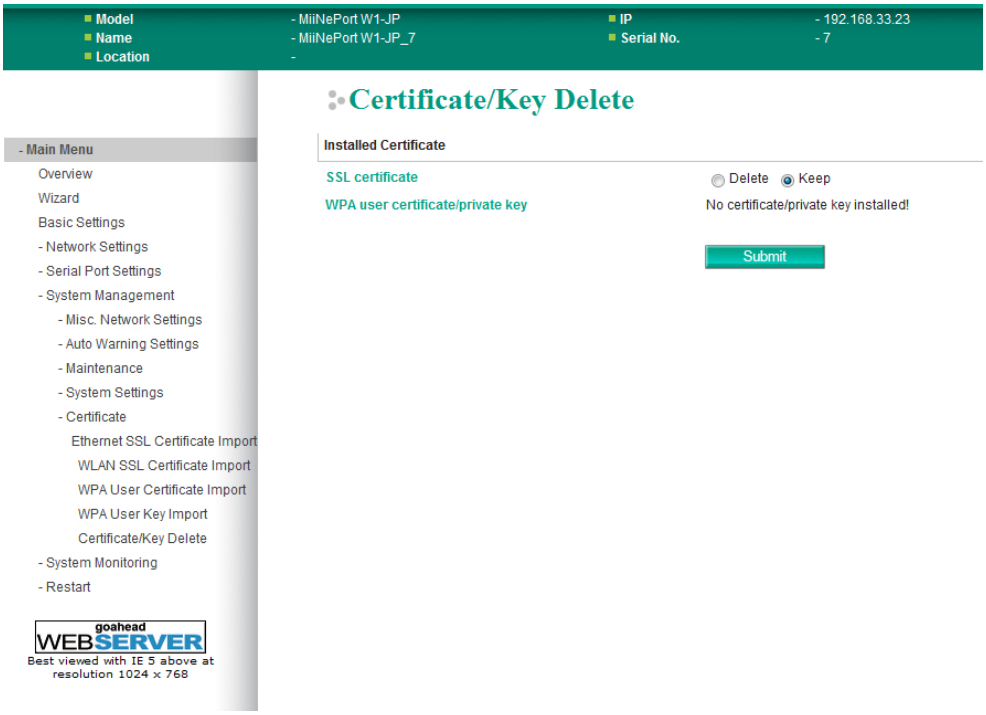
WPA User Key Import



The **WPA User Key Import** page is located under **Certificate** in the **System Management** folder. This is where you can load the WPA user key. Select or browse for the user private key file in the **Select WPA user privacy key file** field and enter the **Password for the private key**.

The user private key of the MiiNePort W1/MiiNePort W1-T must be installed in the RADIUS server when the MiiNePort W1/MiiNePort W1-T uses WPA(WPA2)//TLS. The trusted server certificate of RADIUS server must also be installed on the MiiNePort W1/MiiNePort W1-T.

Certificate/Key Delete

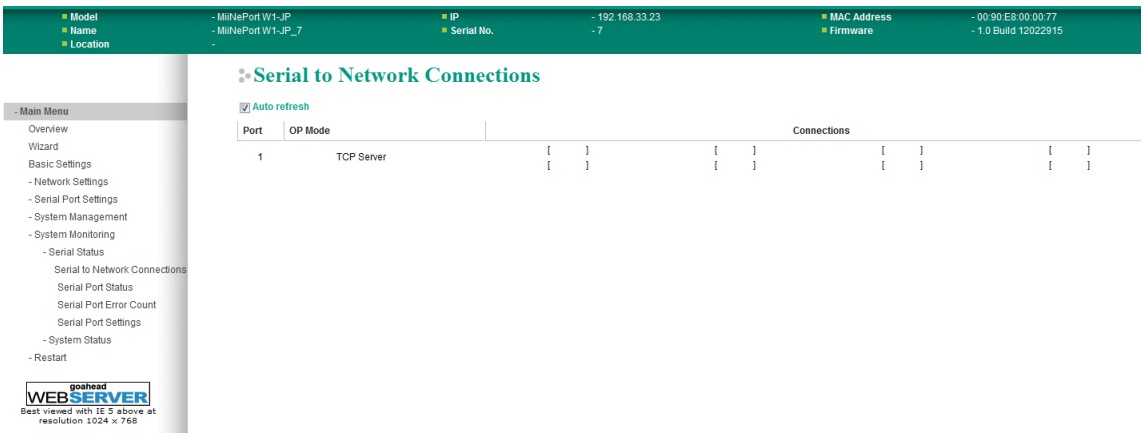


The **Certificate/Key Delete** page is located under **Certificate** in the **System Management** folder. This page is where you can delete certificates or WPA keys that have been installed on the MiiNePort W1/MiiNePort W1-T. When you click **Submit**, any certificate or key that has been set to "Delete" will be deleted from the module.

System Monitoring

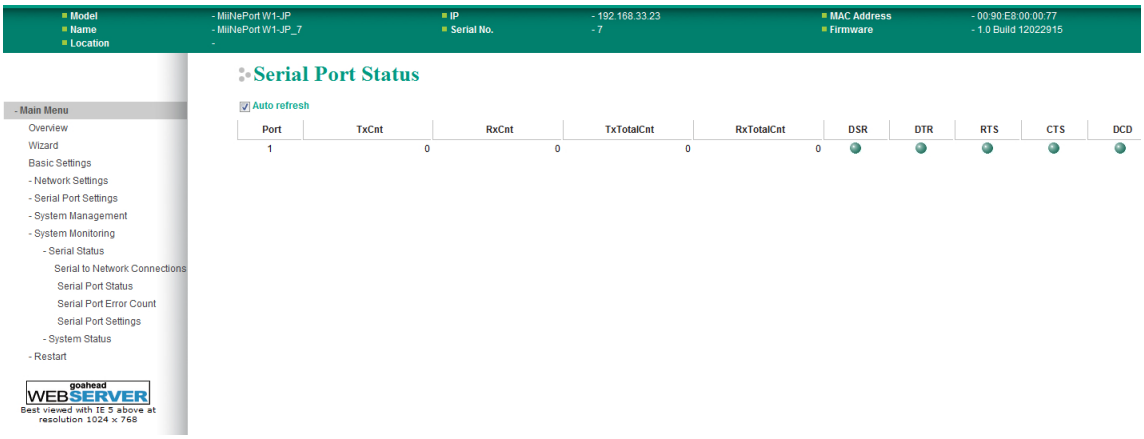
Serial Status

Serial to Network Connections



The **Serial to Network Connections** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can monitor the serial port's operation mode and host connection status.

Serial Port Status



The **Serial Port Status** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can monitor the serial signal and data transmission status.

TxCnt: number of Tx packets (to device) for the current connection

RxCnt: number of Rx packets (from device) for the current connection

TxTotalCnt: number of Tx packets since the module was powered on

RxTotalCnt: number of Rx packets since the module was powered on

DSR: status of DSR signal

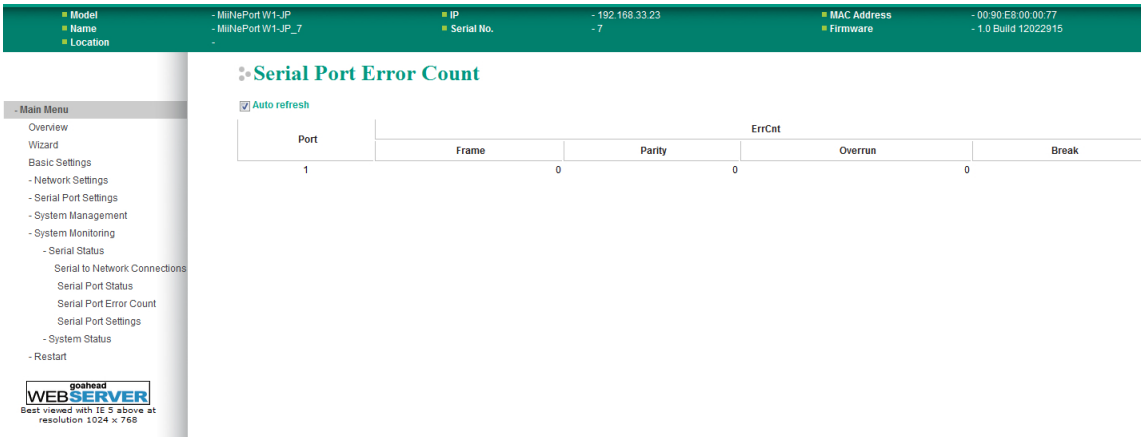
DTR: status of DTR signal

RTS: status of RTS signal

CTS: status of CTS signal

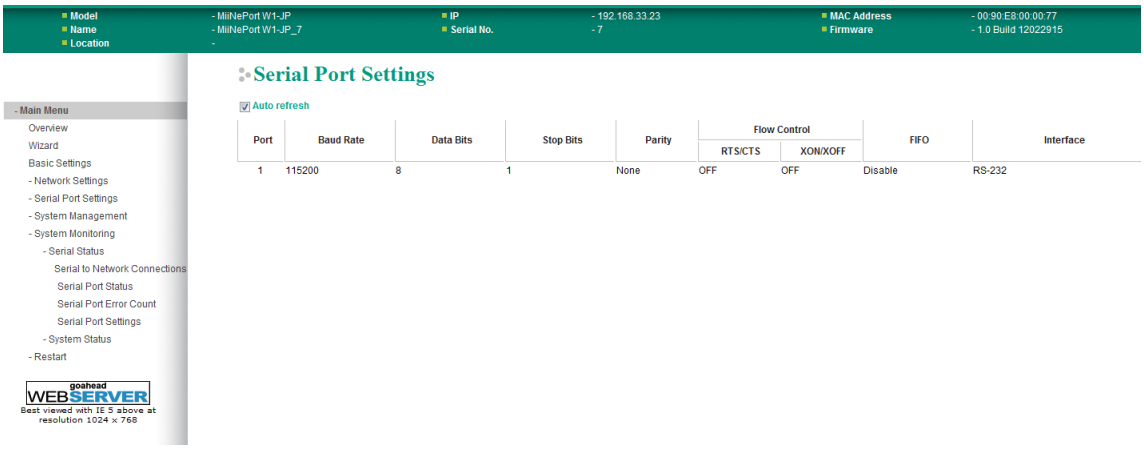
DCD: status of DCD signal

Serial Port Error Count



The **Serial Port Error Count** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can view the current number of frame, parity, overrun and break errors.

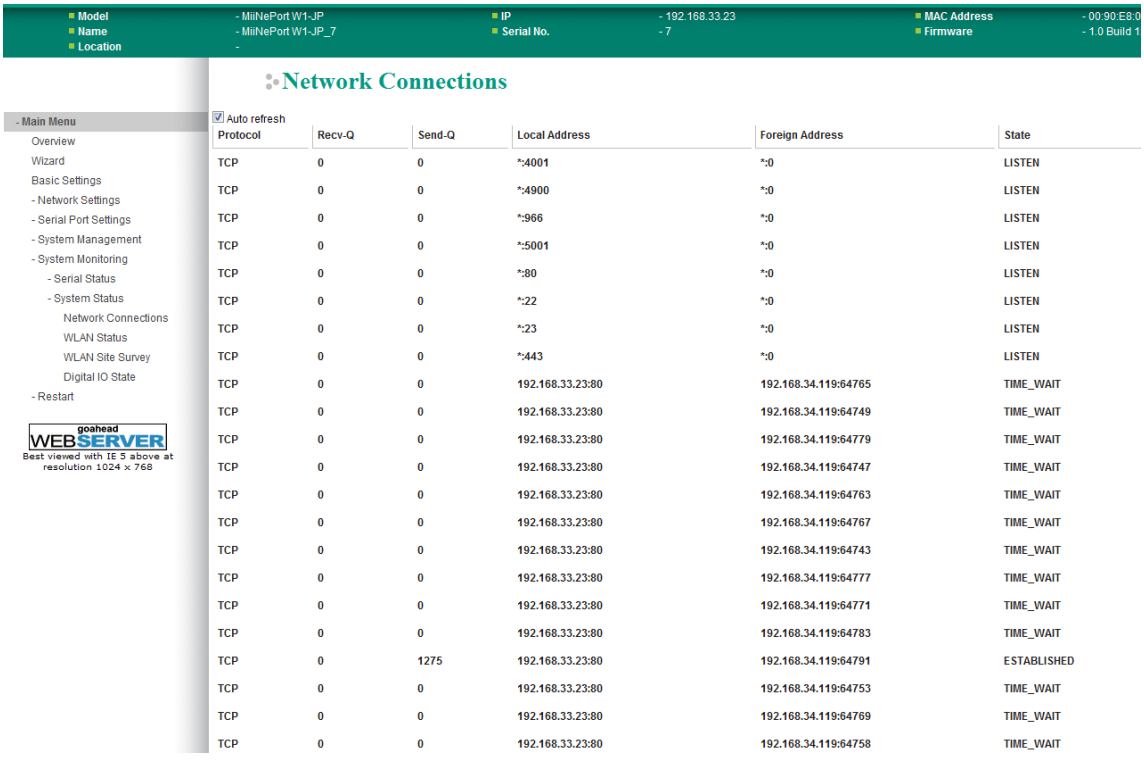
Serial Port Settings



The **Serial Port Settings** page is located under **Serial Status** in the **System Monitoring** folder. On this page, you can view the current serial communication settings.

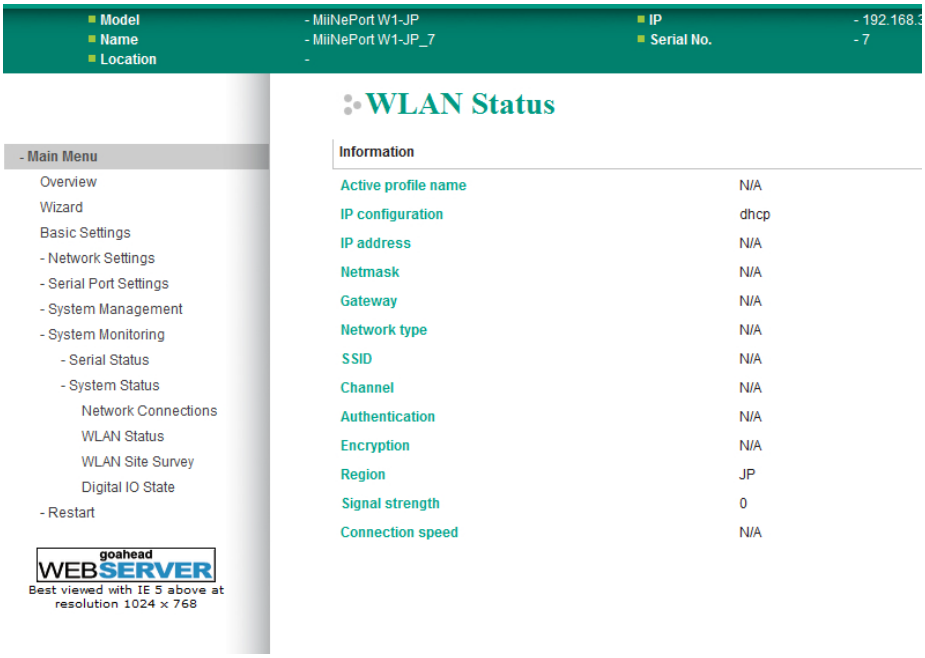
System Status

Network Connections



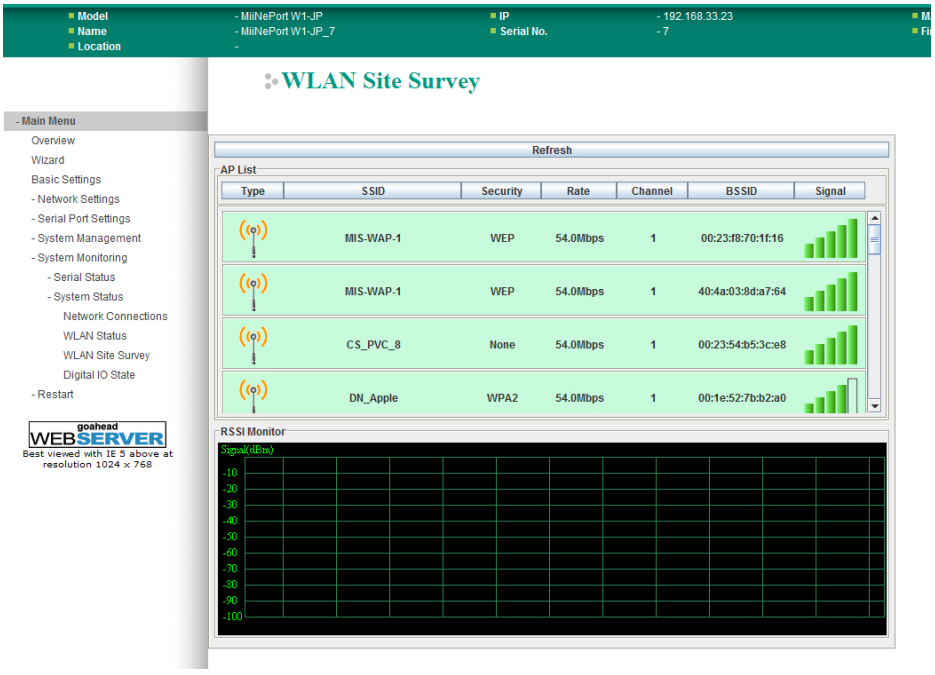
The **Network Connections** page is located under **System Status** in the **System Monitoring** folder. On this page, you can view the current status of any network connection to the MiiNePort W1/MiiNePort W1-T.

WLAN Status



The **WLAN Status** page is located under **System Status** in the **System Monitoring** folder. This is where you can view the current WLAN settings and status.

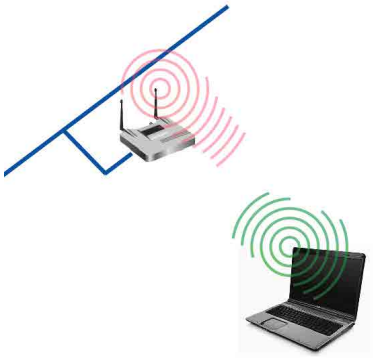
WLAN Site Survey



The **WLAN Site Survey** page is located under **System Status** in the **System Monitoring** folder. This is where you can view live data on wireless signal strength and characteristics. It is a useful tool to help you complete a wireless site survey without installing additional software.

The goal of a WLAN site survey is to determine the number and placement of access points to provide enough coverage to the facility. For most implementations, "enough coverage" means that the data rate at all locations does not fall below a certain threshold. For most wireless sites, it is necessary to perform a WLAN site survey before access point installation in order to determine the behavior of radio waves at the site.

Typical WLAN Site Survey



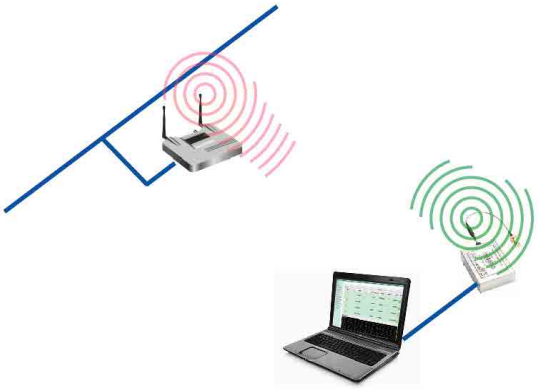
Procedure

1. Download/install site survey software.
2. Run software on laptop.
3. Measure AP signal strength using software on laptop.

Weakness

- Signal strength is read from the laptop NIC rather than from the module

WLAN Site Survey with MiiNePort W1/MiiNePort W1-T



Procedure

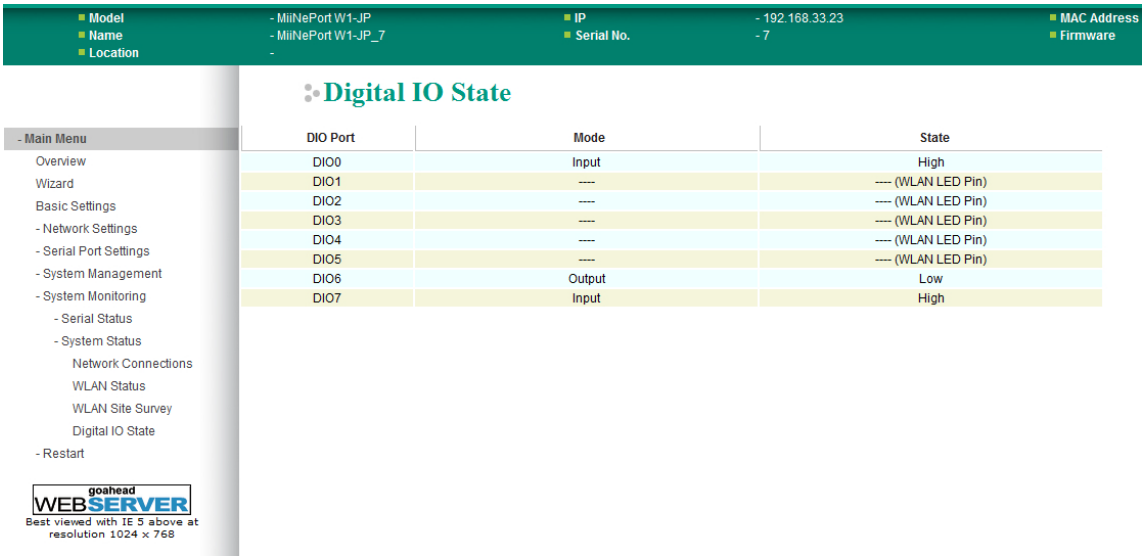
1. Open web browser
2. Measure AP signal from web console.

Advantages

- Signal strength is read from module
- Additional software not required

Please note that Java must be enabled in your web browser for the **WLAN Site Survey** page to display properly.

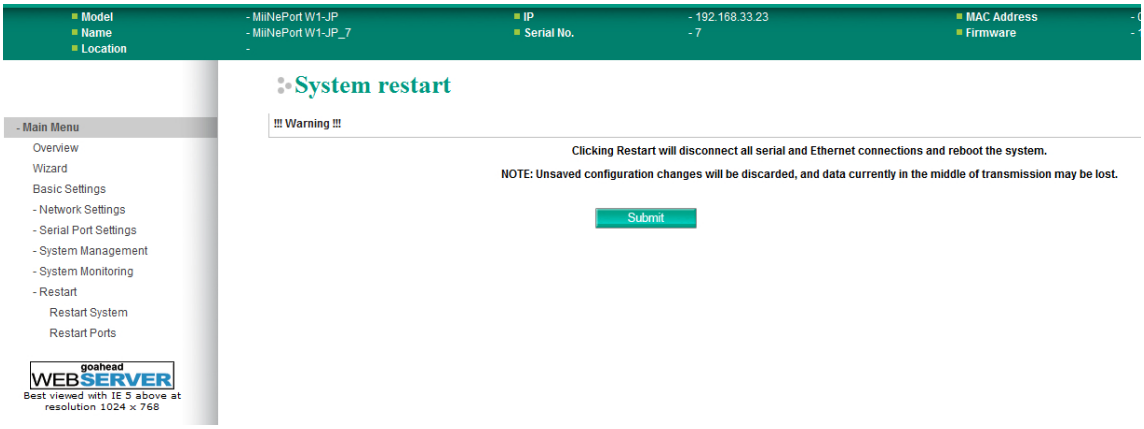
Digital IO State



The **Digital IO State** page is located under **System Status** in the **System Monitoring** folder. This is where you can view the current settings and status for all DIO channels.

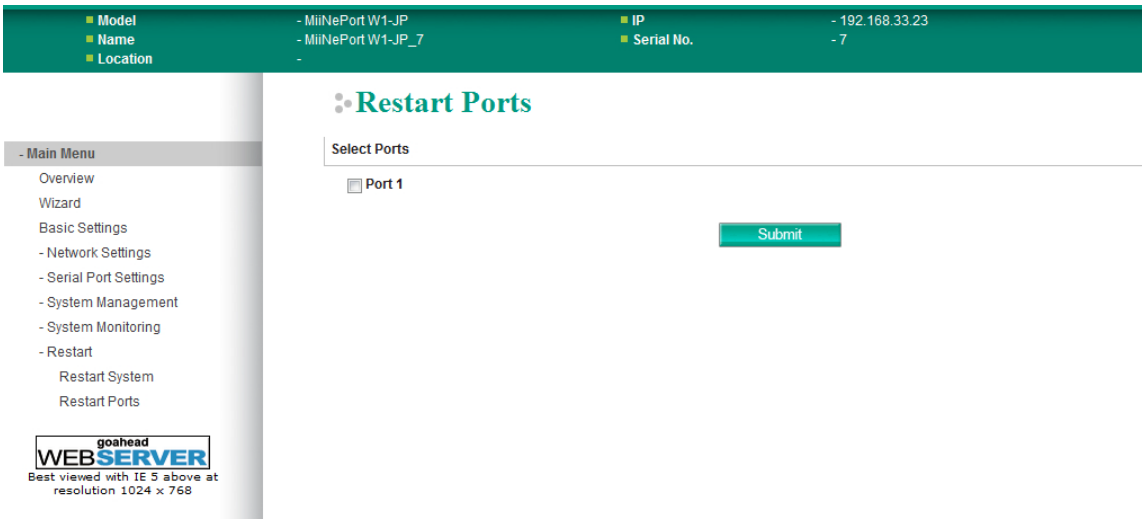
Restart

Restart System



The **Restart System** page is located in the **Restart** folder. Click **Submit** to restart the MiiNePort W1 Series. Before restarting, be sure to save the configuration so the new settings will take effect upon restart. Configuration changes that have not been saved will be discarded when the MiiNePort W1 Series is restarted.

Restart Ports



The **Restart Ports** page is located in the **Restart** folder. Select port 1 and click **Submit** to restart the serial port.

A

Well-Known Port Numbers

This appendix is included for your reference. Listed below are Well Known Port Numbers that may cause network problems if you configure MiiNePort W1/MiiNePort W1-T for the same port. Refer to RFC 1700 for Well Know Port Numbers or refer to the following introduction from IANA.

The port numbers are divided into three ranges: the Well Known Ports, the Registered Ports, and the Dynamic and/or Private Ports.

- The Well Known Ports are those from 0 through 1023.
- The Registered Ports are those from 1024 through 49151.
- The Dynamic and/or Private Ports are those from 49152 through 65535.

The Well Known Ports are assigned by IANA, and on most systems, can only be used by system processes or by programs executed by privileged users. Some of the most widely used ports are shown below. For more details, please visit the IANA website at http://www.iana.org/assignments/port-numbers.

TCP Socket	Application Service
0	reserved
1	TCP Port Service Multiplexor
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
15	Netstat
20	FTP data port
21	FTP CONTROL port
23	Telnet
25	SMTP (Simple Mail Transfer Protocol)
37	Time (Time Server)
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
79	Finger protocol (Finger)
80	World Wibe Web HTTP
119	Netword news Transfer Protocol (NNTP)
123	Network Time Protocol
213	IPX
160 – 223	Reserved for future use

UDP Socket	Application Service
0	reserved
2	Management Utility
7	Echo
9	Discard
11	Active Users (systat)
13	Daytime
35	Any private printer server
39	Resource Location Protocol
42	Host name server (names server)
43	Whois (nickname)
49	(Login Host Protocol) (Login)
53	Domain Name Server (domain)
69	Trivial Transfer Protocol (TETP)
70	Gopher Protocol
79	Finger Protocol
80	World Wide Web HTTP
107	Remote Telnet Service
111	Sun Remote Procedure Call (Sunrpc)
119	Network news Tcanster Protocol (NNTP)
123	Network Time protocol (nnp)
161	SNMP (Simple Network Mail Protocol)
162	SNMP Traps
213	IPX (Used for IP Tunneling)

B

DIO Commands

In this appendix, we present the DIO commands used to access the Digital I/O status of the MiiNePort W1/MiiNePort W1-T from an Ethernet network. The Digital I/O status can be accessed by a specific TCP port (default 5001) on the MiiNePort W1/MiiNePort W1-T.

Command Packet Format

Length (Bytes)	4	1 – 255
Format	*Header	Data

Send the Command packet to the MiiNePort W1/MiiNePort W1-T. The "Data" field is command specific.

ACK Packet Format

Length (Bytes)	4	1 -255
Format	*Header	Data

The MiiNePort W1/MiiNePort W1-T returns by ACK packet. You can determine a DIO channel's status and mode by checking the "Data" field of the packet.

*Header Format

Length (Bytes)	1	1	1	1
Format	Command	Version (must be 2)	Command Status	Length (for data)

Check the "Command Status" to obtain the result after sending a Command packet.

Command: This field specifies the command code. For example, 1 (hex) represents "read single D I/O." Command codes are listed later in this appendix.

Command Status: This field returns the status of the command.

0 – OK
1 – Command error; may be unknown
2 – Version error; not supported by this version
3 – Length error; the length member does not match the attached data
4 – Operation error; you cannot set the DIO mode to input mode, and set the DO status at the same time
5 – "Packet too short" error
6 – DIO number error; might not support request DIO number
0xFF – other unknown error

Data Structure Definition:

C code example:

```
//define DIO Header format
typedef struct _DIO_Header_Struct {
    char   command;
```

```
    char   version;   /* This specification is version 2 */
    char   status;
    char   length;
} DIOHeaderStruct, *pDIOHeaderStruct;

//define DIO Packet format
//Used for Command and ACK packet
typedef struct _DIO_Packet_Struct {
    DIOHeaderStruct      header;
    char   data[255];
} DIOPacketStruct, *pDIOPacketStruct;
```

Command Code Usage

1. Reading Single DIO

Parameters:

Command code: 1(hex)
Version: 2(hex)
Command Status: doesn't matter
Length of data: 1(hex), represents one byte.
data[0]: Fill in the number of the DIO you wish to access. The DIO number starts from 0(hex).

Return:

Command Status: Check the Command Status code on the previous page.
Length of data: 3(hex). Must be 3 bytes of return code in this mode.
data[0]: The number of the DIO you wish to access.
data[1]: DIO mode(hex), 0 for IN, 1 for OUT
data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

C code example:

```
BOOL   ReadSingleDIO(int port, int *mode, int *status)
{
      DIOPacketStruct packet;

      packet.header.command = 1;        // read single DIO command
      packet.header.version = 2;        // DIO protocol version
      packet.header.length = 1;         // data length
      packet.data[0] = (char)port;      // Number of the DIO
      send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+1, 0); //Send TCP Packet
      // Process the returned data here.
      return TRUE;
}
```

2. Writing a Single DIO

Parameters:

Command code: 2(hex)
Version: 2(hex)
Command Status: doesn't matter
Length of data: 3(hex); represents three bytes.
data[0]: The number of the DIO you wish to access.
data[1]: DIO mode(hex), 0 for IN, 1 for OUT
data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

Return:

Command Status: Check the Command Status code on the previous page.
Length of data: 3(hex). Must be 3 bytes of return code in this mode.
data[0]: The number of the DIO you wish to access.
data[1]: DIO mode(hex), 0 for IN, 1 for OUT
data[2]: DIO status(hex), 0 for LOW, 1 for HIGH

C code example:

```
void    WriteSingleDIO(int port, int mode, int status)
{
       DIOPacketStruct packet;

       packet.header.command = 2;        // write single DIO command
       packet.header.version = 2;        // DIO protocol version
       packet.header.length = 3;         // data length
       packet.data[0] = (char)port;      // number of the DIO
       packet.data[1] = (char)mode;      // DIO mode
       packet.data[2] = (char)status;    // DIO status;
       send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+3, 0); //Send TCP packet
       //Process the returned data here
}
```

3. Reading Multiple DIOs

Parameter:
Command code: 5(hex)
Version: 2(hex)
Command status: doesn't matter
Length of data: 2(hex); represents two bytes.
data[0]: Number of the DIO you wish to access first.
data[1]: The last number of the DIO you wish to access.
Return:
Command Status : Check the Command Status code on the previous page.
Length of data: (end-start+1)*2
data[0]: mode of start DIO
data[1]: status of start DIO
data[2]: mode of (start+1) DIO
data[3]: status of (start+1) DIO
….
data[(end-start)*2]: mode of end DIO
data[(end-start)*2+1]: status of end DIO

C code example:

```
BOOL     ReadMultipleDIO(int start, int end, int *mode, int *status)
{
DIOPacketStruct packet;

       packet.header.command = 5;        // Read Multiple DIO Commands
       packet.header.version = 2;        // DIO protocol command version
       packet.header.length = 2;         // data length
       packet.data[0] = start;           // start of the DIO number
       packet.data[1] = end;             // end of the DIO number
       send(SocketFd, (char *)&packet, sizeof(DIOHeaderStruct)+2, 0); //Send TCP packet
       //Process the returned data here
       return TRUE;
}
```

4. Writing Multiple DIOs

Parameters:
Command code: 6(hex)
Version: 2(hex)
Command status: doesn't matter
Length of data: (end-start+1)*2 + 2
data[0]: Number of the DIO you wish to access first.

data[1]: The last number of the DIO you wish to access
data[2]: mode of start DIO
data[3]: status of start DIO
data[4]: mode of (start+1) DIO
data[5]: status of (start+1) DIO
….
data[(end-start)*2+2]: mode of end DIO
data[(end-start)*2+3]: status of end DIO

Return:

Command Status: Check the Command Status code on the previous page.
Length of data : (end-start+1)*2
data[0]: mode of start DIO
data[1]: status of start DIO
data[2]: mode of (start+1) DIO
data[3]: status of (start+1) DIO
….
data[(end-start)*2]: mode of end DIO
data[(end-start)*2+1]: status of end DIO

C code example:

```
void     WriteMultipleDIO(int start, int end, int* mode, int* status)
{
       DIOPacketStruct packet;

       packet.header.command = 6;        // Write Multiple DIO Command Codes
       packet.header.version = 2;        // DIO protocol version
       packet.header.length = (end-start+1)*2+2; // data length
       packet.data[0] = start;           // start DIO number
       packet.data[1] = end;             // end DIO number
       int      i, len;
       for ( i=0; i<(end-start+1);i++ ) {
              packet.data[i+2] = mode[i];
              packet.data[i+3] = status[i];
       }
send(SocketFd, )(char*)&packet,( end-start+1)*2+2+sizeof(DIOHeaderStruct), 0); //Send TCP packet
//Process the returned data here
}
```

A utility for testing DIO access commands is provided on the Document and Software CD-ROM.

C

Serial Command Mode

Command/Reply Format

Single Line Command Format

Head	Op	Cmd	Parameters	Tail
1 byte	1 byte	2 bytes	0 to n bytes	1 or 2 bytes

Single Line Reply Format

Head	Op	Cmd	Parameters	Tail
1 byte	1 byte	2 bytes	0 to n bytes	1 or 2 bytes

Head and Tail

	Head 1 byte	Tail 1 or 2 bytes
Command	?	CR LF CR-LF
Reply	!	LF

Operation Code

Operation Code	Meaning
G	Get configuration from MiiNePort's RAM
S	Set configuration to MiiNePort's RAM
R	Retrieve running configuration
V	View status
C	Control

Status Codes

Status Code	Meaning
E	Enter Serial Command Mode
0	Command was executed successfully
1	Unrecognized format
2	Operation is not valid
3	Command is not valid
4	Parameter is incorrect
5	Parameter is too long

Restriction

The total number of parameters in a single command cannot exceed 1024 characters.

Overview Commands

Name	OP Code	Command Code	Parameter	Example	Description
View Serial Number	G/R	@S	N/A	?G@S	System requests MiiNePort's serial number.
				!G@S0168	MiiNePort reports serial number is 168.
View Firmware Version	G/R	@V	N/A	?G@V	System requests MiiNePort's firmware version.
			MiiNePort's firmware version. Version parts are separated by a single dot, with at least two parts (major.minor) and at most three parts (major.minor.rev).	!G@V01.0	MiiNePort's firmware version is v1.0.
View Firmware Build Time	G/R	@B	N/A	?G@B	System requests MiiNePort's firmware build number.
			MiiNePort's firmware build number, eight digits.	!G@B01203 1615	MiiNePort reports build number is 12031615.
View LAN MAC Address	G/R	@M	N/A	?G@M	System requests MiiNePort's LAN MAC address.
				!G@M000:9 0:E8:71:00: 10	MiiNePort reports LAN MAC address is 00:90:E8:71:00:10.
View WLAN MAC Address	G/R	@W	N/A	?G@W	System requests MiiNePort's WLAN MAC address.
				!G@W000:9 0:E8:71:00: 11	MiiNePort reports WLAN MAC address is 00:90:E8:71:00:11.

Basic Commands

Name	OP Code	Command Code	Parameter	Example	Description
Device Name	G/R	BN	N/A	?GBN	System requests configured device name for this MiiNePort
				!GBN0MiiNePort_W1_Office	MiiNePort reports device name as 'MiiNePort_W1_Office'.
	S		(character string, max. 40 bytes)	?SBNMiiNePort_W1_Office	System sets the device name as 'MiiNePort_W1_Office'.
				!SBN0	MiiNePort reports command executed successfully.
Time Zone	G/R	BZ	N/A	?GBZ	System requests the device time zone
				!GBZ050	MiiNePort reports device time zone as '(GMT+08:00)Taipei'.
	S		0~63 (index)	?SBZ49	System sets the device time zone as '(GMT+08:00)Singapore'.
				!SBZ0	MiiNePort reports command executed successfully.
Local Time	G/R	BL	N/A	?GBL	System requests the device time
				!GBL02012/3/1 9:30:12	MiiNePort reports device time as '2012/3/1 9:30:12'.
	S		"(character string) year;month;day;hour;minute;second"	?SBL2012;03;03;12;34;56	System sets the device time as '2012/3/3 12:34:56'.
				!SBL0	MiiNePort reports command executed successfully.
Time Server	G/R	BS	N/A	?GBS	System requests the time server
				!GBS064.147.116.229	MiiNePort reports the time server as '64.147.116.229'.
	S		This parameter can be IP address or domain name address. (character string, max. 40 bytes)"	?SBSnist1-ny.ustiming.org	System sets the time server as 'nist1-ny.ustiming.org'.
			N/A	!SBS0	MiiNePort reports command executed successfully.
Admin Password	G/R	BP	N/A	?GBP	System requests admin's console password for this MiiNePort.
				!GBP0123456	MiiNePort reports admin's console password as '123456'.
	S		(character string, max. 16 bytes)	?SBP654321	System sets admin's console password as '654321' for this MiiNePort.
				!SBP	MiiNePort reports command executed successfully.
User Password	G/R	BR	N/A	?GBR	System requests user's console password for this MiiNePort.
				!GBR0abcdef	MiiNePort reports admin's console password as 'abcdef'.
	S		(character string, max. 16 bytes)	?SBRfedcba	System sets user's console password as 'fedcba' for this MiiNePort.
				!SBR0	MiiNePort reports command executed successfully.

Network Commands

Name	OP Code	Command Code	Parameter	Example	Description
DNS Server IP Address	G/R	ND	The index (1 or 2) of DNS server.	?GND1	System requests DNS server 1 address for this MiiNePort.
				!GND0192.168.1.2	MiiNePort reports DNS server 1 address as '192.168.1.2'.
	S		The index (1, 2) and DNS server address, separated by a semicolon (;).	?SND1;192.168.1.123	System sets DNS1 as '192.168.1.123'.
				?SND0	MiiNePort reports command executed successfully.
LAN IP Configuration	G/R	NC	N/A	?GNC	System requests LAN IP configuration for this MiiNePort.
			"MiiNePort's LAN IP configuration index as shown in the following table: 0: Static 1: DHCP 3: BOOTP"	!GNC00	MiiNePort reports LAN IP configuration as 'Static'.
	S		"MiiNePort's LAN IP configuration index as shown in the following table: 0: Static 1: DHCP 3: BOOTP"	?SNC0	System sets LAN IP configuration as 'Static'.
			N/A	!SNC0	MiiNePort reports command executed successfully.
LAN IP Address	G/R	NI	N/A	?GNI	System requests LAN IP address for this MiiNePort.
				!GNI0192.168.127.254	MiiNePort reports LAN IP address as '192.168.127.254'.
	S		MiiNePort's LAN IP address.	?SNI192.168.1.2	System sets LAN IP address as '192.168.1.2'.
				!SNI0	MiiNePort reports command executed successfully.
LAN Netmask	G/R	NM	N/A	?GNM	System requests LAN netmask address for this MiiNePort.
				!GNM0255.255.255.0	MiiNePort reports LAN netmask as '255.255.255.0'.
	S		MiiNePort's LAN Netmask address.	?SNM255.255.255.0	System sets LAN Netmask as '255.255.255.0'.
				!SNM0	MiiNePort reports command executed successfully.
LAN Gateway	G/R	NG	N/A	?GNG	System requests LAN gateway address for this MiiNePort.
				!GNG00.0.0.0	MiiNePort reports LAN gateway address as '0.0.0.0'.
	S		MiiNePort's LAN Gateway address.	?SNG192.168.1.254	System sets LAN Gateway as '192.168.1.254'.

Name	OP Code	Command Code	Parameter	Example	Description
				!SNG0	MiiNePort reports command executed successfully.
WLAN IP Configuration	G/R	WC	N/A	?GWC	System requests WLAN IP configuration for this MiiNePort.
			"MiiNePort's WLAN IP configuration index as shown in the following table: 0: Static 1: DHCP 3: BOOTP"	!GWC00	MiiNePort reports WLAN IP configuration as 'Static'.
	S		"MiiNePort's WLAN IP configuration index as shown in the following table: 0: Static 1: DHCP 3: BOOTP"	?SWC1	System sets WLAN IP configuration as 'DHCP'.
			N/A	!SWC0	MiiNePort reports command executed successfully.
WLAN IP Address	G/R	WI	N/A	?GWI	System requests WLAN IP address for this MiiNePort.
				!GWI0192.168.126.254	MiiNePort reports WLAN IP address as '192.168.126.254'.
	S		MiiNePort's WLAN IP address.	?SWI192.168.1.3	System sets WLAN IP address as '192.168.1.3'.
				!SWI0	MiiNePort reports command executed successfully.
WLAN Netmask	G/R	WM	N/A	?GWM	System requests WLAN netmask address for this MiiNePort.
				!GWM0255.255.255.0	MiiNePort reports WLAN netmask as '255.255.255.0'.
	S		MiiNePort's WLAN Netmask address.	?SWM255.255.255.0	System sets WLAN Netmask as '255.255.255.0'.
				!SWM0	MiiNePort reports command executed successfully.
WLAN Gateway	G/R	WG	N/A	?GWG	System requests WLAN gateway address for this MiiNePort.
				!GWG00.0.0.0	MiiNePort reports WLAN gateway address as '0.0.0.0'.
	S		MiiNePort's WLAN Gateway address.	?SWG192.168.2.254	System sets WLAN Gateway as '192.168.2.254'.
				!SWG0	MiiNePort reports command executed successfully.

WLAN Profile Commands

Name	OP Code	Command Code	Parameter	Example	Description
Network Type	G/R	PN	N/A	?GPN	System requests WLAN profile network type.
			"MiiNePort's WLAN network type index as shown in the following table: 0: Ad-hoc Mode 1: Infrastructure Mode"	!GPN01	This WLAN profile network type is 'Infrastructure Mode'.
	S		"MiiNePort's WLAN network type index as shown in the following table: 0: Ad-hoc Mode 1: Infrastructure Mode"	?SPN1	System sets WLAN profile network type to 'Infrastructure Mode'.
			N/A	!SPN0	MiiNePort reports write command executed successfully.
Profile Name	G/R	PP	0 (adhoc) or 1 (infrastructure) MiiNePort's network type.	?GPP0	System requests WLAN adhoc mode's profile name.
			N/A	!GPP0Adhoc	The Adhoc mode profile name is 'Adhoc'.
	S		adhoc/infra, profile name string. Parameters are separated by a semicolon (;).	?SPP0;Adhoc	System sets the adhoc mode's profile name to 'Adhoc'.
			N/A	!SPP0	MiiNePort reports write command executed successfully.
Profile WLAN SSID	G/R	PD	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GPD1	System requests WLAN infrastructure mode's SSID
			N/A	!GPD0infra_ssid	The infrastructure mode SSID is 'infra_ssid'.
	S		adhoc/infra, profile SSID string. Parameters are separated by a semicolon (;).	?SPD0adhoc_ssid	System sets the adhoc mode's SSID to 'adhoc_ssid'.
			N/A	!SPD0	MiiNePort reports write command executed successfully.
Fast Roaming Setting	G/R	TB	N/A	?GTB	System requests the fast roaming setting.
			0 (Disable) or 1 (Enable) MiiNePort's fast roaming.	!GTB01	The fast roaming setting is 'Enable'.
	S		0 (Disable) or 1 (Enable) MiiNePort's fast roaming.	?STB0	System sets the fast roaming setting to 'Disable'.
			N/A	!STB0	MiiNePort reports write command executed successfully.
Fast Roaming Scan Channel	G/R	TH	The index (1 ~ 3) of fast roaming scan channels.	?GTH1	System requests the fast roaming scan channel 1.
				!GTH01	The fast roaming scan channel 1 is '1'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		The index (1 ~ 3) and fast roaming scan channels(0~14), separated by a semicolon (;).	?STH1;10	System sets the fast roaming scan channel 1 to '10'.
			N/A	!STH0	MiiNePort reports write command executed successfully.

WLAN Security Commands

Name	OP Code	Command Code	Parameter	Example	Description
Authentication	G/R	QA	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQA0	System requests the adhoc mode's authentication setting.
			"The index of authentication as shown in the following: 1: Open System 2: Shared Key 3: WPA 4: WPA-PSK 5: WPA2 6: WPA2-PSK	!GQA01	The adhoc mode's authentication setting is 'Open System'.
	S		"(0)adhoc/(1)infra, authentication index. Parameters are separated by a semicolon (;). 1: Open System 2: Shared Key 3: WPA 4: WPA-PSK 5: WPA2 6: WPA2-PSK	?SQA0;1	System sets the adhoc mode's authenticaiton setting to 'Shared Key'.
			N/A	!SQA0	MiiNePort reports write command executed successfully.
Encryption	G/R	QE	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQE0	System requests the adhoc mode's encryption.
			"The index of encryption as shown in the following: 1: Disable 2: WEP 3: TKIP 4: AES-CCMP	!GQE01	The adhoc mode's encryption is 'Disable'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		"(0)adhoc/(1)infra, encryption index. Parameters are separated by a semicolon (;). 1: Disable 2: WEP 3: TKIP 4: AES-CCMP	?SQE0;2	System sets the adhoc mode's encryption to 'WEP'
			N/A	!SQE0	MiiNePort reports write command executed successfully.
WEP Key Length	G/R	QL	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQL0	System requests the adhoc mode's key length.
			"The index of key length as shown in the following: 1: 64-bits 2: 128-bits"	!GQL01	The adhoc mode's key length is '64-bits'.
	S		"(0)adhoc/(1)infra, key length index. Parameters are separated by a semicolon (;). 1: 64-bits 2: 128-bits"	?SQL1;2	System sets the infrastructure mode's key length to '128-bits'.
			N/A	!SQL0	MiiNePort reports write command executed successfully.
WEP Key Index	G/R	QI	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQI0	System requests the adhoc mode's key index setting.
			The key index: (1 ~ 4)	!GQI01	The adhoc mode's key index is '1'.
	S		(0)adhoc/(1)infra, key index. Parameters are separated by a semicolon (;).	?SQI1;1	System sets the infrastructure mode's key index to '1'.
			N/A	!SQI0	MiiNePort reports write command executed successfully.
WEP Key Passphrase	G/R	QR	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQR0	System requests the adhoc mode's key passphrase.
			Key passphrase string	!GQR0adhocphrase	The adhoc mode's key passphrase is 'adhocphrase'.
	S		(0)adhoc/(1)infra, key passphrase string. Parameters are separated by a semicolon (;).	?SQR0;adhocphrase	System sets the adhoc mode's key passphrase to 'adhocphrase'.
			N/A	!SQR0	MiiNePort reports write command executed successfully.
WEP Key Format	G/R	QF	0 (adhoc) or 1 (infrastructure) MiiNePort's network type .	?GQF0	System requests the adhoc mode's key format.
			"The index of Key format: 1: ASCII 2: HEX"	!GQF01	The adhoc mode's key format is 'ASCII'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		"(0)adhoc/(1)infra, key format index. Parameters are separated by a semicolon (;). 1: ASCII 2: HEX"	?SQF0;1	System sets the adhoc mode's key format to 'ASCII'.
			N/A	!SQF0	MiiNePort reports write command executed successfully.
WEP Key	G/R	QK	0 (adhoc) or 1 (infrastructure) MiiNePort's network type, the WEP key index (1 ~ 4). Parameters are separated by a semicolon (;)	?GQK0;1	System requests the adhoc mode's WEP key 1.
			The WEP key string.	!GQK0wep_key_1	The adhoc mode's WEP key 1 is 'wep_key_1'.
	S		(0)adhoc/(1)infra, WEP key index (1 ~ 4), WEP key string. Parameters are separated by a semicolon (;).	?SQK0;1;wep_key_1	System sets the adhoc mode's WEP key 1 to 'wep_key_1'.
			N/A	!SQK0	MiiNePort reports write command executed successfully.
PSK Passphrase	G/R	QS	Only support 1 (infrastructure) MiiNePort's network type.	?GQS1	System requests the infrastructure mode's PSK passphrase.
			The PSK Passphrase string.	!GQS0psk_phrase	The infrastructure mode's PSK passphrase is 'psk_phrase'.
	S		(1)infra, PSK passphrase string. Parameters are separated by a semicolon (;). Note the max. lenth:8~63 Bytes for ASCII, 8~64 Bytes for HEX	?SQS1;psk_phrase	System sets the infrastructure mode's PSK passphrase to 'psk_phrase'.
			N/A	!SQS0	MiiNePort reports write command executed successfully.
EAP Method	G/R	QP	Only support 1 (infrastructure) MiiNePort's network type.	?GQP1	System requests the infrastructure mode's EAP method.
			"The index of EAP method: 1: TLS 2: PEAP 3: TTLS 4: LEAP	!GQP01	The infrastructure mode's EAP method is 'TLS'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		"(1)infra, EAP method index. Parameters are separated by a semicolon (;). 1: TLS 2: PEAP 3: TTLS 4: LEAP	?SQP1;2	System sets the infrastructure mode's EAP method to 'PEAP'.
			N/A	!SQP0	MiiNePort reports write command executed successfully.
Tunneled Authentication	G/R	QT	Only support 1 (infrastructure) MiiNePort's network type.	?GQT1	System requests the infrastructure mode's tunneled authentication.
			"The index of tunneled authentication: 1: GTC 2: MD5 3: MSCHAPV2 4: PAP 5: CHAP 6: MSCHAP 7: MSCHAPV2 8: EAP_GTC 9: EAP_MD5 A: EAP-MSCHAPV2	!GQT01	The infrastructure mode's tunneled authentication is 'GTC'.
	S		"(1)infra, tunneled authentication index. Parameters are separated by a semicolon (;). 1: GTC 2: MD5 3: MSCHAPV2 4: PAP 5: CHAP 6: MSCHAP 7: MSCHAPV2 8: EAP_GTC 9: EAP_MD5 A: EAP-MSCHAPV2	?SQT1;1	System sets the infrastructure mode's tunneled authentication to 'GTC'.
			N/A	!SQT0	MiiNePort reports write command executed successfully.
WPA Username	G/R	QU	Only support 1 (infrastructure) MiiNePort's network type and (1)user name/(2)anonymous username. Parameters are separated by a semicolon (;).	?GQU1;1	System requests the infrastructure mode's user name.
			MiiNePort's WPA username string	!GQU0wpa_user	The infrastructure mode's user name is 'wpa_user'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		(1)infra, (1)user name/(2)anonymous username, WPA username string. Parameters are separated by a semicolon (;).	?SQU1;2;wpa_anony_user	System sets the infrastructure mode's anonymous user name to 'wpa_anony_user'.
			N/A	!SQU0	MiiNePort reports write command executed successfully.
WPA Password	G/R	QW	Only support 1 (infrastructure) MiiNePort's network type.	?GQW1	System requests the infrastructure mode's WPA password
			MiiNePort's WPA password	!GQW0wpa_password	The infrastructure mode's WPA password is 'wpa_password'.
	S		(1)infra, WPA password string. Parameters are separated by a semicolon (;).	?SQW1;wpa_password	System sets the infrastructure mode's WPA password to 'wpa_password'.
			N/A	!SQW0	MiiNePort reports write command executed successfully.
Verify Server Certificate	G/R	QV	Only support 1 (infrastructure) MiiNePort's network type.	?GQV1	System requests the infrastructure mode's server certificate setting.
			0 (Disable) / 1 (Enable) the server certificate.	!GQV00	The infrastructure mode's server certificate is 'Disable'.
	S		(1)infra, certificate disable(0)/enable(1). Parameters are separated by a semicolon (;).	?SQV1;1	System sets the infrastructure mode's server certificate to 'Enable'.
			N/A	!SQV0	MiiNePort reports write command executed successfully.

Advanced Commands

Name	OP Code	Command Code	Parameter	Example	Description
Gratuitous ARP	G/R	VA	N/A	?GVA	System requests gratuitous ARP status for alert mail server.
			Reply parameters: 1 and send period if gratuitous ARP is enabled; otherwise, reply 0.	!GVA01;300	MiiNePort reports gratuitous ARP as 'Enable' and send period as '300' sec.
	S		1 and send period if gratuitous ARP is enable; otherwise, 0.	?SVA1;300	System sets gratuitous ARP as 'Enable' and send period as '300' sec for this MiiNePort.
			N/A	!SVA0	MiiNePort reports command executed successfully.
Active Interface	G/R	VI	N/A	?GVI	System requests active interface.
			"Reply parameters: MiiNePort's active interface index as shown in the following table: 0: Auto Detect 1: Select by DI6 2: Force Wired Ethernet 3: Force Wireless LAN Note that active interface is only active when boot up. (DI6: Low is for Ethernet, High is for WLAN)	!GVI00	MiiNePort reports active interface as 'Auto Detect'.
	S		"Active interface index as shown in the following table: Note that active interface is only active when boot up. (DI6: Low is for Ethernet, High is for WLAN) 0: Auto Detect 1: Select by DI6 2: Force Wired Ethernet 3: Force Wireless LAN	?SVI1	System sets active interface as 'Select by DI6'
			N/A	!SVI0	MiiNePort reports command executed successfully.

OPMode Commands

Name	OP Code	Command Code	Parameter	Example	Description
Port Mode	G/R	OM	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For the port itself, channel index is 0.	?GOM1;0	System requests for port 1's Operation Mode for this MiiNePort. In this product, the second number always is 0.
			"Reply parameters: MiiNePort's operation mode index as shown in the following table: 0: Disable 1: Real COM 2: RFC2217 3: TCP Server 4: TCP Client 5: UDP	!GOM04	MiiNePort reports Operation Mode is 'TCP client'.
	S		"Port index, MCSC channel index, and operation mode to set. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0. The operation mode is as following: 0: Disable 1: Real COM 2: RFC2217 3: TCP Server 4: TCP Client 5: UDP	?SOM1;0;2	System sets port 1's operation mode as 'RFC2217'.
			N/A	!SOM0	MiiNePort reports command executed successfully.
RealCOM TCP Alive Check Time	G/R	RA	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GRA1;0	System requests port 1's TCP alive check time for port 1.
			Reply parameters: MiiNePort's TCP alive check time.	!GRA05	MiiNePort reports TCP alive check time as '5' min.
	S		Port index, MCSC channel index, and TCP alive check time. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SRA1;0;5	System sets port 1's TCP alive check time as '5' for port 1.
			N/A	!SRA0	MiiNePort reports command executed successfully.
RealCOM Max Connection	G/R	RM	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GRM1;0	System requests maximum connection number for port 1.

Name	OP Code	Command Code	Parameter	Example	Description
			Reply parameters: MiiNePort's TCP maximum connection number.	!GRM04	MiiNePort reports maximum connection number as '4'.
	S		Port index, MCSC channel index, and maximum connection number. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SRM1;0;4	System sets maximum connection number as '4' for port 1.
			N/A	!SRM0	MiiNePort reports command executed successfully.
RealCOM Ignore Jammed IP	G/R	RJ	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GRJ1;0	System requests jammed IP policy for port 1.
			Reply parameters: 1 (Enable) or 0 (Disable)	!GRJ01	MiiNePort reports ignore jammed IP as 'Enable'.
	S		Port index, MCSC channel index, and ignore jammed IP setting. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0. Ignore jammed IP setting is 1 (Enable) or 0 (Disable).	?SRJ1;2;0	System sets ignore jammed IP policy as 'Disable' for port 1.
			N/A	!SRJ0	MiiNePort reports command executed successfully.
RealCOM Allow Driver Control	G/R	RD	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GRD1;0	System requests allow driver control policy for port1.
			Reply parameters: 1 (Enable) or 0 (Disable)	!GRD01	MiiNePort reports allow driver control as 'Enable'.
	S		Port index, MCSC channel index, and match bytes. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0. Allow driver control is 1 (Enable) or 0 (Disable).	?SRD1;0;0	System sets allow driver control policy as 'Disable' for port 1.
			N/A	!SRD0	MiiNePort reports command executed successfully.
RFC2217 TCP Alive Check Time	G/R	FA	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GFA1;0	System requests for alive check time for port1.
			Reply parameters: 1 (Enable) or 0 (Disable)	!GFA07	MiiNePort reports alive check time is '7'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		Port index, and MCSC channel index. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0.	?SFA1;0;5	System sets port 1's TCP alive check time as '5' for port 1.
			N/A	!SFA0	MiiNePort reports command executed successfully.
RFC2217 Local Listen Port	G/R	FP	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GFP1;0	System requests for RFC2217 local listen port for port 1.
			Reply parameters: local listen port	!GFP01234	MiiNePort reports RFC2217 local listen port is '1234'.
	S		Port index, MCSC channel index, and TCP local port. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0.	?SFP1;0;4100	System sets TCP port as '4100' for port 1.
			N/A	!SFP0	MiiNePort reports command executed successfully.
TCP Server TCP Alive Check Time	G/R	TA	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GTA1;0	System requests TCP alive check time for port 1.
			Reply parameters: TCP alive check time	!GTA05	MiiNePort reports TCP alive check time as '5' minutes.
	S		Port index, MCSC channel index, and TCP alive check time. Parameters are separated by a semicolon (;).	?STA1;0;5	System sets port 1's TCP alive check time to `5' minutes.
			N/A	!STA0	MiiNePort reports command executed successfully.
TCP Server Inactivity Time	G/R	TV	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GTV1;0	System requests inactivity time for port 1.
			Reply parameters: TCP inactivity time.	!GTV00	MiiNePort reports inactivity time as '0'.
	S		Port index, MCSC channel index, and inactivity timeout setting. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?STV1;0;10	System sets inactivity time as '10' ms for port 1.
			N/A	!STV0	MiiNePort reports command executed successfully.

Name	OP Code	Command Code	Parameter	Example	Description
TCP Server Max Connection	G/R	TM	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GTM1;0	System requests maximum connection number for port 1.
			Reply parameters: MiiNePort's TCP maximum connection number.	!GTM04	MiiNePort reports maximum connection number as '4'.
	S		Port index, MCSC channel index, and maximum connection number. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?STM1;0;3	System sets maximum connection number as '3' for port 1 and channel 1.
			N/A	!STM0	MiiNePort reports command executed successfully.
TCP Server Ignore Jammed IP	G/R	TJ	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GTJ1;0	System requests jammed IP policy for port 1.
			Reply parameters: 1 (Enable) or 0 (Disable)	!GTJ01	MiiNePort reports ignore jammed IP as 'Enable'.
	S		Port index, MCSC channel index, and ignore jammed IP setting (0 for disable and 1 for enable). Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?STJ1;0;0	System sets ignore jammed IP policy as 'Disable' for port 1.
			N/A	!STJ0	MiiNePort reports command executed successfully.
TCP Server Allow Driver Control	G/R	TD	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GTD1;0	System requests for allow driver control policy for port1.
			Reply parameters: 1 (Enable) or 0 (Disable)	!GTD01	MiiNePort reports allow driver control is 'Enable'.
	S		Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?STD1;0;1	System sets allow driver control policy as 'enable' for port1.
			N/A	!STD0	MiiNePort reports command executed successfully.
TCP Server TCP Port	G/R	TP	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GTP1;0	System requests TCP port for port 1.

Name	OP Code	Command Code	Parameter	Example	Description
			Reply parameters: TCP port	!GTP04001	MiiNePort reports TCP port as '4100'.
	S		Port index, MCSC channel index, and TCP local port. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0.	?STP1;0;4100	System sets TCP port as '4100' for port 1.
			N/A	!STP0	MiiNePort reports command executed successfully.
TCP Server Cmd Port	G/R	TO	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GTO1;0	System requests for TCP command port for port 1.
			Reply parameters: Command port	!GTO0966	MiiNePort reports TCP command port is '966'.
	S		Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?STO1;0;966	System sets TCP command port as '966' for port 1.
			N/A	!STO0	MiiNePort reports command executed successfully.
TCP Client Destination Address	G/R	TI	"Three numbers separated by a semicolon (;) denote port index, MCSC channel index, and destination address index. For an MCSC-disabled port, the channel index is 0. The destination address index is as follows: 0: Destination address 1: Alternated address 1 2: Alternated address 2 3: Alternated address 3	?GTI1;0;0	System requests destination address for port 1.
			Reply parameters: TCP destination address and port	!GTI0192.168.1.2:4001	MiiNePort reports destination address as '192.168.1.2' and port as '4001'.
	S		Port index, MCSC channel index, destination address index (0 for destination address and 1 to 3 for alternated addresses). Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?STI1;0;0;192.168.1.2:4001	System sets destination address as '192.168.1.2' and port as '4001' for port 1.
			N/A	!STI0	MiiNePort reports command executed successfully.

Name	OP Code	Command Code	Parameter	Example	Description
TCP Client Destination Port	G/R	TL	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GTL1;0	System requests for TCP client local port setting for port 1.
			Reply parameters: TCP port.	!GTL05002	MiiNePort reports TCP client local port is 5002.
	S		Port index, MCSC channel index, and TCP local port. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0.	?STL1;0;5002	System sets TCP client local port as '5002' for port 1.
			N/A	!STL0	MiiNePort reports command executed successfully.
TCP Client Connection Control	G/R	TC	Two numbers separated by a semicolon (;) denotes port index and MCSC channel index. For MCSC-disabled port, channel index shall be 0.	?GTC1;0	System requests TCP client connection control for port 1.
			"Reply parameters: TCP client connection control index as shown in the following table: 0: Start up / None 1: Any character / None 2: Any character / Inactivity time 3: DSR On / DSR OFF 4: DSR On / None 5: DCD On / DCF OFF 6: DCD On / None	!GTC01	MiiNePort for TCP client connection control as 'Any character / None'.
	S		"Port index, MCSC channel index, and client connection control setting. Every parameter is separated by semicolon (;). For MCSC-disabled port, channel index shall be 0. 0: Start up / None 1: Any character / None 2: Any character / Inactivity time 3: DSR On / DSR OFF 4: DSR On / None 5: DCD On / DCF OFF 6: DCD On / None	?STC1;0;1	System sets TCP client connection control as 'Any character / None' for port 1.
			N/A	!STC0	MiiNePort reports command executed successfully.
UDP Destination Address	G/R	UD	Three numbers separated by a semicolon (;) denote port index, MCSC channel index, and destination address index from 1 to 4. For an MCSC-disabled port, the channel index is 0.	?GUD1;0;3	System requests UDP destination address 3 for port 1.

Name	OP Code	Command Code	Parameter	Example	Description
			Reply parameters: Begin address – End address: port	!GUD0192.168.1.3-192.168.1.8:4001	MiiNePort reports UDP destination address is from '192.168.1.3' to '192.168.1.8' and port as '4001'.
	S		Port index, MCSC channel index, destination address index (1 to 4), and destination addresses. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0. The destination addresses is formatted as Begin address – End address: UDP port.	?SUD1;0;3;192.168.1.3-192.168.1.8:4001	System sets UDP destination address 3 is from '192.168.1.3' to '192.168.1.8' and port as '4001' for port 1.
			N/A	!SUD0	MiiNePort reports command executed successfully.
UDP Local Listen Port	G/R	UP	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GUP1;0	System requests UDP local listen port for port 1.
			Reply parameters: local listen port	!GUP04001	MiiNePort reports UDP local listen port as '4001'.
	S		Port index, MCSC channel index, and local UDP port. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SUP1;0;4001	System sets UDP local listen port as '4001' for port 1.
			N/A	!SUP0	MiiNePort reports command executed successfully.

Data Packing Commands

Name	OP Code	Command Code	Parameter	Example	Description
Port Packet Length	G/R	OL	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GOL1;0	System requests port 1's data packing length for this MiiNePort.
			Reply parameters: MiiNePort's data packing length as follows.	!GOL0256	MiiNePort reports data packing length as '256'.
	S		Port index, MCSC channel index, and data packing length to set. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SOL1;0;256	System sets port 1's data packing length as '256'.
			N/A	!SOL0	MiiNePort reports command executed successfully.

Name	OP Code	Command Code	Parameter	Example	Description
Port Delimiter Enable	G/R	OD	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GOD1;0	System requests port 1's delimiter setting for this MiiNePort.
			Reply parameters: MiiNePort's delimiter setting. (delimiter1 enable/disable; hex1; delimiter2 enable/disable; hex2)	!GOD01;10;1;13	MiiNePort reports delimiter 1 as 'Enable' and hex code as '10', delimiter 2 as 'Enable' and hex code as '13'.
	S		Port index, MCSC channel index, delimiter1 enable/disable, delimiter character 1 by hex, delimiter 2 enable/disable, and delimiter character 2 by hex. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SOD1;0;1;10;1;13	System sets port 1's delimiter 1 as 'Enable' and hex code as '10'. Delimiter 2 as 'Enable' and hex code as '13'.
			N/A	!SOD0	MiiNePort reports command executed successfully.
Port Delimiter Process	G/R	OT	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GOT1;0	System requests port 1's delimiter process for this MiiNePort.
			"Reply parameters: MiiNePort's delimiter process. 0: Do nothing 1: Delimiter+1 2: Delimiter+2 3: Strip Delimiter	!GOT02	MiiNePort reports delimiter process as 'Delimiter+2'.
	S		Port index, MCSC channel index, and delimiter process. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SOT1;0;2	System sets port 1's delimiter process as 'Delimiter+2'.
			N/A	!SOT0	MiiNePort reports command executed successfully.
Port Force Transmit	G/R	OF	Two numbers separated by a semicolon (;) denote port index and MCSC channel index. For an MCSC-disabled port, the channel index is 0.	?GOF1;0	System requests port 1's force transmit timeout for this MiiNePort.
			Reply parameters: MiiNePort's force transmit timeout.	!GOF00	MiiNePort reports force transmit timeout as '0' sec.
	S		Port index, MCSC channel index, and force transmit timeout. Parameters are separated by a semicolon (;). For an MCSC-disabled port, the channel index is 0.	?SOF1;0;5	System sets port 1's force transmit timeout as '5' (ms).
			N/A	!SOF0	MiiNePort reports command executed successfully.

Port Parameter Commands

Name	OP Code	Command Code	Parameter	Example	Description
Port Alias	G/R	SA	Port index.	?GSA1	System requests port 1's alias for this MiiNePort.
				!GSA0port1	MiiNePort reports Port alias as 'port1'.
	S		Port index and port alias, separated by a semicolon (;).	?SSA1;port 1	System sets port 1's alias name as 'port 1'.
				!SSA0	MiiNePort reports command executed successfully.
Port Interface	G/R	SI	Port index.	?GSI1	System requests port 1's Interface for this MiiNePort.
			0 (RS232) or 1 (RS422/RS485) MiiNePort's Interface.	!GSI00	MiiNePort reports Interface as 'RS232'.
	S		"Port index and interface separated by a semicolon (;). MiiNePort's interface index as shown in the following table: 0: RS232 1: RS422/RS485"	?SSI1;0	System sets port1's interface as 'RS232'.
			N/A	!SSI0	MiiNePort reports command executed successfully.
Port BaudRate	G/R	SB	Port index.	?GSB1	System requests port 1's Baudrate for this MiiNePort.
				!GSB0115200	MiiNePort reports Baudrate as '115200'.
	S		Port index and baudrate separated by a semicolon (;).	?SSB1;115200	System sets port 1's baudrate as '115200'.
				!SSB0	MiiNePort reports command executed successfully.
Port Data Bits	G/R	SD	Port index.	?GSD1	System requests port 1's Data bits for this MiiNePort.
				!GSD08	MiiNePort reports Data bits as '8'.
	S		Port index and data bits separated by a semicolon (;).	?SSD1;8	System sets port 1's data bits as '8'.
				!SSD0	MiiNePort reports command executed successfully.
Port Stop Bits	G/R	SS	Port index.	?GSS1	System requests port 1's Stop bits for this MiiNePort.
				!GSS00	MiiNePort reports Stop bits as '1'.
			"Port index and stop bits separated by a semicolon (;). MiiNePort's Stop bits index as shown in the following table: 0: Stop bits is 1 2: Stop bits is 2"	?SSS1;0	System sets port 1's stop bits as '1'.
			N/A	!SSS0	MiiNePort reports command executed successfully.

Name	OP Code	Command Code	Parameter	Example	Description
Port Parity	G/R	SP	Port index.	?GSP1	System requests port 1's Parity for this MiiNePort.
				!GSP00	MiiNePort reports Parity as 'None'.
	S		"Port index and parity separated by a semicolon (;). MiiNePort's Parity index as shown in the following table: 0: None 1: Odd 2: Even	?SSP1;0	System sets port 1's parity bit as 'None'.
			N/A	!SSP0	MiiNePort reports command executed successfully.
Port Flow Control	G/R	SL	Port index.	?GSL1	System requests port 1's Flow control for this MiiNePort.
				!GSL01	MiiNePort reports Flow control as 'RTS/CTS'.
	S		"Port index and flow control separated by a semicolon (;). MiiNePort's Flow control index as shown in the following table: 0: None 1: RTS/CTS 2: XON/XOFF	?SSL1;1	System sets port 1's flow control as 'RTS/CTS'.
			N/A	!SSL0	MiiNePort reports command executed successfully.
Port FIFO	G/R	SF	Port index.	?GSF1	System requests port 1's FIFO for this MiiNePort.
			1 (Enable) or 0 (Disable) MiiNePort's FIFO.	!GSF01	MiiNePort reports FIFO as 'Enable'.
	S		Port index and FIFO setting separated by a semicolon (;). FIFO setting is 1 (Enable) or 0 (Disable).	?SSF1;1	System sets port 1's FIFO as 'Enable'.
			N/A	!SSF0	MiiNePort reports command executed successfully.

MISC Network Commands

Name	OP Code	Command Code	Parameter	Example	Description
Enable/Disable Accessible IP List	G/R	AS	N/A	?GAS	System requests Enable/Disable accessible IP list for this MiiNePort.
				!GAS01	MiiNePort reports accessible IP list as 'Enable'.
	S		Enable (1) or Disable (0) MiiNePort's accessible IP list.	?SAS1	System sets accessible IP list as 'Enable'.
				!SAS0	MiiNePort reports command executed successfully.
Accessible IP List Address	G/R	AI	The index of accessible IP list (from 1 to 16)	?GAI1	System requests 1st accessible IP list for this MiiNePort.
			Reply parameters: Return format Mode;IP;Netmask in the accessible IP list. If mode equals to 1, it is active, otherwise it is inactive.	!GAI01;192.168.1.2;255.255.255.0	MiiNePort reports 1st accessible IP list as 'Active', IP address as '192.167.1.2', and Netmask as '255.255.255.0'.
	S		format is "index;mode;IP;Netmask", where index ranges from 1 to 16, mode is 1 if activated and 0 if not activated.	?SAI1;1;192.168.1.2;255.255.255.0	System sets accessible IP 1 as 'active', IP address as '192.168.1.2' and netmask as '255.255.255.0'.
			N/A	!SAI0	MiiNePort reports command executed successfully.
SNMP Enable	G/R	MS	N/A	?GMS	System requests Enable/Disable SNMP agent for this MiiNePort.
				!GMS01	MiiNePort reports SNMP agent as 'Enable'.
	S		1 (Enable) or 0 (Disable) MiiNePort's SNMP agent.	?SMS1	System sets SNMP agent as 'Enable'.
				!SMS0	MiiNePort reports command executed successfully.
SNMP Contact Name	G/R	MN	N/A	?GMN	System requests SNMP contact name for this MiiNePort.
				!GMN0s_name	MiiNePort reports SNMP contact name as 's_name'.
	S		MiiNePort's SNMP contact name.	?SMNcontact	System sets SNMP contact name as 'contatct'.
				!SMN0	MiiNePort reports command executed successfully.
SNMP Location	G/R	ML	N/A	?GML	System requests SNMP location for this MiiNePort.
				!GML0s_location	MiiNePort reports SNMP location as 's_location'.
	S		MiiNePort's SNMP location.	?SMLlocation	System sets SNMP contact name as 'location'.
				!SML0	MiiNePort reports command executed successfully.

Name	OP Code	Command Code	Parameter	Example	Description
SNMP Read Community String	G/R	MU	N/A	?GMU	System requests SNMP read community string for this MiiNePort.
				!GMU0public	MiiNePort reports SNMP read community string as 'public'.
	S		MiiNePort's SNMP Community string.	?SMUpublic	System sets SNMP read community string as 'public'.
				!SMU0	MiiNePort reports read command executed successfully.
SNMP Write Community String	G/R	MW	N/A	?GMW	System requests SNMP write community string for this MiiNePort.
				!GMW0private	MiiNePort reports SNMP write community string as 'private'.
	S		MiiNePort's SNMP Community string.	?SMWprivate	System sets SNMP write community string as 'public'.
				!SMW0	MiiNePort reports write command executed successfully.
SNMP Agent Version	G/R	MV	N/A	?GMV	System requests SNMP agent version
			"MiiNePort's SNMP agent version index as shown in the following: 0: V1, V2c, V3 1: V1, V2c 2: V3 only"	!GMV00	MiiNePort reports SNMP agent version as 'V1, V2c, V3'.
	S		"MiiNePort's SNMP agent version index as shown in the following: 0: V1, V2c, V3 1: V1, V2c 2: V3 only"	?SMV1	System sets SNMP agent version as 'V1, V2c'.
			N/A	?SMV0	MiiNePort reports write command executed successfully.
SNMP Read Only or R/W User Name	G/R	ME	"The index of this command as shown in the following: 0: read only user name 1: r/w user name"	?GME0	System requests SNMP read only user name
			The user name string	!GME0rouser	The read only user name is 'rouser'.
	S		"MiiNePort's SNMP read only or R/W user index and name string separated by a semicolon (;). The index of this command as shown in the following: 0: read only user name 1: r/w user name"	?SME1;rwuser	System sets the r/w user name to 'rwuser'.

Name	OP Code	Command Code	Parameter	Example	Description
			N/A	!SME0	MiiNePort reports write command executed successfully.
SNMP Read Only or R/W Authentication Mode	G/R	MA	"The index of this command as shown in the following: 0: read only authentication mode 1: r/w authentication mode"	?GMA0	System requests read only authentication mode
			"The authentication mode index of this command as shown in the following: 0: Disable 1: MD5 2: SHA"	!GMA00	The read only authentication mode is 'Disable'.
	S		"MiiNePort's SNMP read only or R/W user index and authentication mode separated by a semicolon (;). The authentication mode index of this command as shown in the following: 0: Disable 1: MD5 2: SHA"	?SMA1;1	System sets the read/write authentication mode to 'MD5'.
			N/A	!SMA0	MiiNePort reports write command executed successfully.
SNMP Read Only or R/W Password	G/R	MP	"The index of this command as shown in the following: 0: read only password 1: r/w password"	?GMP0	System requests the read only password.
			N/A	!GMP012345	The read only password is '12345'.
	S		"MiiNePort's SNMP read only or R/W user index and password string separated by a semicolon (;). The index of this command as shown in the following: 0: read only password 1: r/w password"	?SMP0;54321	System sets the read only password to '54321'.
			N/A	!SMP0	MiiNePort reports write command executed successfully.
SNMP Read Only or R/W Privacy Mode	G/R	MM	"The privacy mode index of this command as shown in the following: 0: Disable 1: DES 2: AES	?GMM0	System requests the read only privacy mode.

Name	OP Code	Command Code	Parameter	Example	Description
			N/A	!GMM00	The read only privacy mode is 'Disable'.
	S		"MiiNePort's SNMP read only or R/W user index and privacy mode separated by a semicolon (;). The privacy mode index of this command as shown in the following: 0: Disable 1: DES 2: AES	?SMM0;1	System sets the read only privacy mode to 'DES'.
			N/A	!SMM0	MiiNePort reports write command executed successfully.
SNMP Read Only or R/W Privacy	G/R	MY	"The index of this command as shown in the following: 0: read only privacy 1: r/w privacy"	?GMY0	System requests the read only privacy.
			N/A	!GMY0roprivacy	The read only privacy is 'roprivacy'.
	S		"MiiNePort's SNMP read only or R/W user index and privacy string separated by a semicolon (;). The index of this command as shown in the following: 0: read only privacy 1: r/w user privacy"	?SMY1;rwprivacy	System sets the read/write privacy to 'rwprivacy'.
			N/A	!SMY0	MiiNePort reports write command executed successfully.

Auto Warning Commands

Name	OP Code	Command Code	Parameter	Example	Description
Event Warning Cold Start	G/R	EC	"The index of this command as shown in the following: 0: mail 1: trap"	?GEC0	System requests the mail warning cold start setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GEC00	The mail warning cold start is 'Disable'.
	S		mail/trap, enable/disable. Parameters are separated by a semicolon (;).	?SEC1;0	System sets the trap warning cold start to 'Disable'.
			N/A	!SEC0	MiiNePort reports write command executed successfully.
Event Warning Warm Start	G/R	EW	"The index of this command as shown in the following: 0: mail 1: trap"	?GEW0	System requests the mail warm start setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GEW00	The mail warning warm start is 'Disable'.
	S		mail/trap, enable/disable. Parameters are separated by a semicolon (;).	?SEW1;0	System sets the trap warning warm start to 'Disable'.
			N/A	!SEW0	MiiNePort reports write command executed successfully.
Event Warning Authentication Failure	G/R	EA	"The index of this command as shown in the following: 0: mail 1: trap"	?GEA0	System request the mail authentication failure setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GEA00	The mail warning authentication failure is 'Disable'.
	S		mail/trap, enable/disable. Parameters are separated by a semicolon (;).	?SEA1;0	System sets the trap warning authentication failure to 'Disable'.
			N/A	!SEA0	MiiNePort reports write command executed successfully.
Event Warning IP Changed	G/R	EI	"The index of this command as shown in the following: 0: mail"	?GEI0	System request the mail IP changed setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GEI00	The mail warning IP changed is 'Disable'.
	S		mail, enable/disable. Parameters are separated by a semicolon (;).	?SEI0;1	System sets the mail warning IP changed to 'Enable'.
			N/A	!SEI0	MiiNePort reports write command executed successfully.
Event Warning Password Changed	G/R	EP	"The index of this command as shown in the following: 0: mail"	?GEP0	System request the mail password changed setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GEP00	The mail warning password changed is 'Disable'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		mail, enable/disable. Parameters are separated by a semicolon (;).	?SEP0;1	System sets the mail warning password changed to 'Enable'.
			N/A	!SEP0	MiiNePort reports write command executed successfully.
Event DCD Change	G/R	ED	"The index of this command as shown in the following: 0: mail 1: trap"	?GED0	System requests the mail DCD change setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GED00	The mail warning DCD change is 'Disable'.
	S		mail/trap, enable/disable. Parameters are separated by a semicolon (;).	?SED1;0	System sets the trap warning DCD change to 'Disable'.
			N/A	!SED0	MiiNePort reports write command executed successfully.
Event DSR Change	G/R	ES	"The index of this command as shown in the following: 0: mail 1: trap"	?GES0	System requests the mail DSR change setting.
			Enable (1) or Disable (0) MiiNePort's event warning	!GES00	The mail warning DSR change is 'Disable'.
	S		mail/trap, enable/disable. Parameters are separated by a semicolon (;).	?SES1;0	System sets the trap warning DSR change to 'Disable'.
			N/A	!SES0	MiiNePort reports write command executed successfully.
Email Warning Mail Server	G/R	IS	N/A	?GIS	System requests the email warning mail server address.
			The MiiNePort's email warning mail server address	!GIS0192.168.1.1	The Email warning mail server address is '192.168.1.1'.
	S		The MiiNePort's email warning mail server address	?SIS192.168.1.1	System sets the email warning mail server address to '192.168.1.1'.
			N/A	!SIS0	MiiNePort reports write command executed successfully.
Email Require Authentication	G/R	IA	N/A	?GIA	System request the email require authentication setting.
			Enable (1) or Disable (0) MiiNePort's email require authentication	!GIA00	The Email require authentication is 'Disable'.
	S		Enable (1) or Disable (0) MiiNePort's email require authentication	?SIA1	System sets the email require authentication to 'Enable'.
			N/A	!SIA0	MiiNePort reports write command executed successfully.
Email Warning User Name	G/R	IU	N/A	?GIU	System requests the email warning user name.
				!GIU0warnuser	The Email warning user name is 'warnuser'.
	S		The MiiNePort's email warning user name string	?SIUwarnuser	System sets the email warning user name to 'warnuser'.

Name	OP Code	Command Code	Parameter	Example	Description
				!SIU0	MiiNePort reports write command executed successfully.
Email Warning Password	G/R	IP	N/A	?GIP	System requests the email warning password.
				!GIP0warn password	The Email warning password is 'warnpassword'.
	S		The MiiNePort's email warning password string	?SIPwarnp assword	System sets the email warning password to 'warnpassword'.
				!SIP0	MiiNePort reports write command executed successfully.
Email Warning From Email Address	G/R	IF	N/A	?GIF	System requests the email warning from email address.
				!GIF0from @mail.com	The Email warning from email address is 'from@mail.com'.
	S		The MiiNePort's email warning from email address	?SIFfrom@ mail.com	System sets the email warning from email address to 'from@mail.com'.
				!SIF0	MiiNePort reports write command executed successfully.
Email Warning To Email Address	G/R	IT	The index (1 or 4) of To Email Address.	?GIT1	System requests the email warning to email address 1.
			N/A	!GIT0to1@ mail.com	The Email warning to email address 1 is 'to1@mail.com'.
	S		The index (1 or 4) of To Email Address and mail address string. Parameters are separated by a semicolon (;).	?SIT2;to2 @mail.com	System sets the email warning to email address 2 to 'to2@mail.com'.
			N/A	!SIT0	MiiNePort reports write command executed successfully.
SNMP Trap Receive IP	G/R	MI	N/A	?GMI	System requests the SNMP trap receive IP address.
			The MiiNePort's SNMP trap receive IP address or domain name	!GMI0192. 168.10.10	The SNMP trap receive IP address is '192.168.10.10'.
	S		The MiiNePort's SNMP trap receive IP address or domain name	?SMI192.1 68.10.11	System sets the SNMP trap receive IP address to '192.168.10.11'.
			N/A	!SMI0	MiiNePort reports write command executed successfully.
Trap Version	G/R	MO	N/A	?GMO	System requests the trap version.
			V2c (1) or V1 (0) MiiNePort's trap version	!GMO00	The Trap version is 'V1'.
	S		V2c (1) or V1 (0) MiiNePort's trap version	?SMO1	System sets the trap version to 'V2c'.
			N/A	!SMO0	MiiNePort reports write command executed successfully.
Trap Community	G/R	MC	N/A	?GMC	System requests the trap community.
			The MiiNePort's trap community string	!GMCtrapc om	The trap community is 'trapcom'.
	S		The MiiNePort's trap community string	?SMCtrapc om	System sets the trap community to 'trapcom'.

Name	OP Code	Command Code	Parameter	Example	Description
			N/A	!SMC0	MiiNePort reports write command executed successfully.

System Commands

Name	OP Code	Command Code	Parameter	Example	Description
SCM Trigger Mode	G/R	CT	N/A	?GCT	System requests serial command mode trigger method for this MiiNePort.
			"Reply parameters: serial command mode trigger index as shown in the following table. 0: Disable 1: H/W control pin(DIO1) 2: Activated by characters 3: Activated by break signal	!GCT01	MiiNePort reports serial command mode is triggered by DIO1.
	S		"serial command mode trigger index as shown in the following table Note that this configuration is valid only if port 1's operation mode is not set to MCSC. 0: Disable 1: H/W control pin(DIO1) 2: Activated by characters 3: Activated by break signal	?SCT2	System sets serial command mode as 'Activate by characters'.
			N/A	!SCT0	MiiNePort reports command executed successfully.
SCM Trigger Char	G/R	CC	N/A	?GCC	System requests serial command mode trigger characters for this MiiNePort.
			Reply parameters: serial command mode trigger characters, in hex, separated by a semicolon (;).	!GCC058;58;58	MiiNePort reports serial command mode triggered by `XXX' (0x585858).
	S		"serial command mode trigger characters, in hex, separated by a semicolon (;). Note that this configuration is valid only if serial command mode trigger method is set to `Activated by characters'."	?SCC45;66;67	System sets serial command mode trigger characters as `ABC' (0x656667).
			N/A	!SCC0	MiiNePort reports command executed successfully.
SCM Only Boot	G/R	CB	N/A	?GCB	System requests serial command mode for this MiiNePort.
			Reply parameters: 0 if serial command mode can be triggered at any time, or 1 if it can only be triggered at boot up.	!GCB01	MiiNePort reports serial command mode can only be triggered by characters at boot up.

Name	OP Code	Command Code	Parameter	Example	Description
	S		"0 if serial command mode can be triggered at any time, or 1 if it can only be triggered at boot up. Note that this configuration is valid only if serial command mode trigger method is set to `Activated by characters'."	?SCB1	System sets serial command mode can only be triggered by characters at boot up.
			N/A	!SCB0	MiiNePort reports command executed successfully.
Digital IO Mode	G/R/C/V	PM	"DIO port index. For the MiiNePort, the index is as follows: 0: DIO 0 (PIN 1) 1: DIO 1 (PIN 2) 2: DIO 2 (PIN 3) 3: DIO 3 (PIN 4) 4: DIO 4 (PIN 5) 5: DIO 5 (PIN 6) 6: DIO 6 (PIN 7) 7: DIO 7 (PIN 8)	?GPM1	System requests DIO1's initial mode for this MiiNePort.
			Reply parameters: 1 (output) or 0 (input); note that for the MiiNePort, this configuration is available if a specific PIN function is set to DIO.	!GPM01	MiiNePort reports DIO1's initial mode as 'output'.
	S		"DIO port index and initial mode (0 for input and 1 for output), separated by semicolon (;). For MiiNePort W1, the index is as following: 0: DIO 0 (PIN 1) 1: DIO 1 (PIN 2) 2: DIO 2 (PIN 3) 3: DIO 3 (PIN 4) 4: DIO 4 (PIN 5) 5: DIO 5 (PIN 6) 6: DIO 6 (PIN 7) 7: DIO 7 (PIN 8) Note that this configuration is valid only if related PIN function is set to DIO.	?SPM0;1	System sets dio0 mode as 'output' for this MiiNePort.
			N/A	!SPM0	MiiNePort reports command executed successfully.
Digital IO State	G/R/C/V	PS	"DIO port index. For the MiiNePort, the index is as follows: 0: DIO0 (PIN15) 1: DIO1 (PIN16) 2: DIO2 (PIN17) 3: DIO3 (PIN18)	?GPS0	System requests DIO0's initial state for this MiiNePort.
			Reply parameters: 1 (high) or 0 (low), note that this function is configuration only if specific DIO port is set to initial output.	!GPS00	MiiNePort reports DIO0's initial state is 'low'.

Name	OP Code	Command Code	Parameter	Example	Description
	S		"DIO port index and initial output state (0 for low and 1 for high). Note that this configuration is valid only if DIO initial mode is set to output."	?SPS0;1	System sets dio0 state as 'high' for this MiiNePort.
			N/A	!SPS0	MiiNePort reports command executed successfully.
Web Console	G/R	BH	N/A	?GBH	System requests http console setting for this MiiNePort.
			Reply parameters: 1 and web console TCP port separated by a semicolon (;) if web console is enabled, or a 0 if it is disabled.	!GBH01;80	MiiNePort reports http console as 'Enable' and http port as '80'.
	S		1 and web console TCP port to enable web console, or 0 to disable it.	?SBH1;80	System sets http console as 'Enable' and http port as '80' for this MiiNePort.
				!SBH0	MiiNePort reports command executed successfully.
Telnet Console	G/R	BT	N/A	?GBT	System requests telnet console setting for this MiiNePort.
			Reply parameters: 1 and telnet console TCP port separated by a semicolon (;) if telnet console is enabled, or a 0 if it is disabled.	!GBT01;23	MiiNePort reports telnet console as 'Enable' and telnet port as '23'.
	S		1 and telnet console TCP port to enable telnet console, or 0 to disable it.	?SBT1;23	System sets telnet console as 'Enable' and telnet port as '23' for this MiiNePort.
				!SBT0	MiiNePort reports command executed successfully.
Load Factory Default	C	LD	"Note that this command is not applied to the configuration until you save & restart the MiiNePort. Command parameters: '1' for "All setting", '0' for "Keep IP setting"."	?CLD0	System requests to load factory default.
			N/A	!CLD0	System loads factory default successfully.
Do Active	C	SR	1' for "Do Active & Restart", '0' for "Do Active"	?CSR1	System requests to active configuration and restart
			N/A	!CSR0	Your configuration is saved, actived and restart MiiNePort server now.
Ping	C	NP	Target host name or IP address.	?CNPwww.moxa.com	System requests to PING www.moxa.com.
			N/A	!CNP010	Target host replies in 10 milliseconds.
			A single minus symbol indicates the target host did not reply in 1000 milliseconds. Otherwise, one decimal number indicating the reply latency in milliseconds is returned.	?CNP192.168.1.1	System requests to PING 192.168.1.1.

Name	OP Code	Command Code	Parameter	Example	Description
			N/A	!CNP0-	Target host did not reply in 1000 milliseconds.

D

MiiNePort W1 MIB

overview	basicSetting	networkSetting
modelName	serverName	dnsServer1IpAddr
serialNumber	serverLocation	dnsServer2IpAddr
firmwareVersion	timeZone	ethIpConfiguration
ethIPAddress	localTime	ethIpAddress
ethMacAddress	timeServer	ethNetMask
wlanIPAddress		ethDefaultGateway
wlanMacAddress		wlanIpConfiguration
wlanSSID		wlanIpAddress
wlanNetworkType		wlanNetMask
wlanSecurityMode		wlanDefaultGateway
activeNetworkPort		gratuitousArp
upTime		gratuitousArpSendPeriod
serialCmdMode		activeInterface
serialPort1		

profileSetting	adhocProfile	infrastructureProfile
networkType	adhocProfileName	profileIndex
	adhocWlanSSID	profileName
	adhocChannel	profileWlanSSID
	adhocAuthentication	authentication
	adhocEncryption	encryption
	adhocWepKeyLength	wepKeyLength
	adhocWepKeyIndex	wepKeyIndex
	adhocWepKeyPassphrase	wepKeyPassphrase
	adhocWepKeyFormat	wepKeyFormat
	adhocWepKey1	wepKey1
	adhocWepKey2	wepKey2
	adhocWepKey3	wepKey3
	adhocWepKey4	wepKey4
		pskPassphrase
		eapMethod
		tunneledAuth
		wpaUsername
		wpaPassword
		wpaAnonymousUsername
		trustedServerCert
		userCert
		userPrivateKey
		fastRoamingSetting
		fastRoamingScanChannels1
		fastRoamingScanChannels2
		fastRoamingScanChannels3

dataPacking	**sysStatus**	**sysManagement**
portPacketLength	remoteIpIndex	enableAccessibleIpList
portDelimiter1Enable	monitorRemoteIp	accessibleIpListIndex
portDelimiter1	monitorTxCount	activeAccessibleIpList
portDelimiter2Enable	monitorRxCount	accessibleIpListAddress
portDelimiter2	monitorTxTotalCount	accessibleIpListNetmask
portDelimiterProcess	monitorRxTotalCount	snmpEnable
portForceTransmit	monitorDSR	snmpContactName
	monitorDTR	snmpLocation
comParamSetting	monitorRTS	mailWarningColdStart
portAlias	monitorCTS	mailWarningWarmStart
portInterface	monitorDCD	mailWarningAuthFailure
portBaudRate	monitorErrorCountFrame	mailWarningIpChanged
portDataBits	monitorErrorCountParity	mailWarningPasswordChanged
portStopBits	monitorErrorCountOverrun	trapServerColdStart
portParity	monitorErrorCountBreak	trapServerWarmStart
portFlowControl	monitorBaudRate	trapServerAuthFailure
portFIFO	monitorDataBits	mailDCDchange
	monitorStopBits	trapDCDchange
activeSettings	monitorParity	mailDSRchange
doActive	monitorRTSCTSFlowControl	trapDSRchange
	monitorXONXOFFFlowControl	emailWarningMailServer
restart	monitorFIFO	emailRequiresAuthentication
restartPorts	monitorInterface	emailWarningUserName
restartSystem	wlanStatusActiveProfileName	emailWarningPassword
	wlanStatusIpConfiguration	emailWarningFromEmail
	wlanStatusIpAddress	emailWarningFirstEmailAddr
	wlanStatusNetMask	emailWarningSecondEmailAddr
	wlanStatusDefaultGateway	emailWarningThirdEmailAddr
	wlanStatusNetworkType	emailWarningFourthEmailAddr
	wlanStatusSSID	snmpTrapReceiveIp
	wlanStatusChannel	trapVersion
	wlanStatusAuthentication	scmTriggerMode
	wlanStatusEncryption	scmTriggerCh1
	wlanStatusRegion	scmTriggerCh2
	wlanStatusSignalStrength	scmTriggerCh3
	wlanStatusConnectionSpeed	scmOnlyBoot
	monitorDIOMode	digitalIOMode
	monitorDIOState	digitalIOState
		digitalIOFunctionWLANLedSetting
		digitalIOCommandTCPPort
		httpConsole
		httpsConsole
		telnetConsole
		sshConsole
		loadFactoryDefaultSetting

opModeSetting	realCOM Mode	rfc2217 Mode
portIndex	realCOMTcpAliveCheck	rfc2217TcpAliveCheck
portMode	realCOMMaxConnection	rfc2217TcpPort
	realCOMIgnoreJammedIp	
	realCOMAllowDriverControl	
	realCOMConnectionDownRTS	
	realCOMConnectionDownDTR	

tcpServer	tcpClient	udp
tcpServerTcpAliveCheck	tcpClientTcpAliveCheck	udpDestinationAddress1Begin
tcpServerInactivityTime	tcpClientInactivityTime	udpDestinationAddress1End
tcpServerMaxConnection	tcpClientIgnoreJammedIp	udpDestinationPort1
tcpServerIgnoreJammedIp	tcpClientDestinationAddress1	udpDestinationAddress2Begin
tcpServerAllowDriverControl	tcpClientDestinationPort1	udpDestinationAddress2End
tcpServerTcpPort	tcpClientDestinationAddress2	udpDestinationPort2
tcpServerCmdPort	tcpClientDestinationPort2	udpDestinationAddress3Begin
tcpServerConnectionDownRTS	tcpClientDestinationAddress3	udpDestinationAddress3End
tcpServerConnectionDownDTR	tcpClientDestinationPort3	udpDestinationPort3
	tcpClientDestinationAddress4	udpDestinationAddress4Begin
	tcpClientDestinationPort4	udpDestinationAddress4End
	tcpClientDesignatedLocalPort1	udpDestinationPort4
	tcpClientDesignatedLocalPort2	udpLocalListenPort
	tcpClientDesignatedLocalPort3	
	tcpClientDesignatedLocalPort4	
	tcpClientConnectionControl	