



# WiPort® NR

## Embedded Device Server

## User Guide

---

## Intellectual Property

© 2017 Lantronix, Inc. All rights reserved. No part of the contents of this publication may be transmitted or reproduced in any form or by any means without the written permission of Lantronix.

*Lantronix* and *WiPort* are registered trademarks of Lantronix, Inc. in the United States and other countries. *Evolution OS* is a registered trademark of Lantronix, Inc. in the United States. *DeviceInstaller* is a trademark of Lantronix, Inc.

Patented: <http://patents.lantronix.com>; additional patents pending.

*Windows* and *Internet Explorer* are registered trademark of Microsoft Corporation. *Mozilla* and *Firefox* are registered trademarks of the Mozilla Foundation. *Chrome* is a trademark of Google Inc. All other trademarks and trade names are the property of their respective holders.

## Export of Encryption Items

The products described in this user guide contain encryption technology. Technology, hardware and software containing encryption technologies are subject to the U.S. Export Administration Regulations. Each OEM is responsible to ensure that its use and/or distribution of the products is in compliance with applicable export regulations.

## Warranty

For details on the Lantronix warranty replacement policy, please go to our web site at <http://www.lantronix.com/support/warranty/index.html>.

## Contacts

### **Lantronix, Inc. Corporate Headquarters**

7535 Irvine Center Drive  
Suite 100  
Irvine, CA 92618, USA

Toll Free: 800-526-8766  
Phone: 949-453-3990  
Fax: 949-453-3995

Technical Support Online: [www.lantronix.com/support](http://www.lantronix.com/support)

### **Sales Offices**

For a current list of our domestic and international sales offices, go to the Lantronix web site at <http://www.lantronix.com/about/contact/>

---

## Disclaimer

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device is intended only for OEM Integrators. The OEM integrator should be aware of the following important issues.

## Revision History

Date	Rev.	Comments
March 2006	A	Initial draft; firmware version 6.1.0.2.
January 2010	B	Updated for firmware version 6.7.0.0 and minor corrections.
November 2013	C	Updated for firmware version 6.9.0.4.
December 2017	D	Updated enhanced password information.

---

## Table of Contents

Intellectual Property _____	2
Export of Encryption Items _____	2
Warranty _____	2
Contacts _____	2
Disclaimer _____	3
Revision History _____	3
<b>1: Using This Guide</b> _____	<b>7</b>
Purpose and Audience _____	7
Chapter Summary _____	7
Additional Documentation _____	8
<b>2: Introduction</b> _____	<b>9</b>
Capabilities _____	9
Applications _____	9
Protocol Support _____	10
Configuration Methods _____	10
Addresses and Port Numbers _____	10
Hardware Address _____	10
IP Address _____	10
Port Numbers _____	11
<b>3: Using DeviceInstaller</b> _____	<b>12</b>
Accessing WiPort NR Embedded Device Server Using DeviceInstaller Utility _____	12
Viewing the WiPort NR Current Configuration _____	12
<b>4: Configuration Using Web Manager</b> _____	<b>15</b>
Accessing WiPort NR Web Manager Using DeviceInstaller Application _____	15
Network Configuration _____	16
Automatic IP Address Configuration _____	16
Static IP Address Configuration _____	17
Ethernet Configuration _____	17
Server Configuration _____	18
Host List Configuration _____	19
Channel 1 and Channel 2 Configuration _____	20
Serial Settings _____	20
Connection Settings - TCP _____	23
Connection Settings - UDP _____	25
Email Configuration _____	27
Trigger Configuration _____	28
Configurable Pin Settings _____	29
Applying Settings _____	30
Applying Factory Defaults _____	30

<b>5: Configuration via Serial Mode or Telnet Port</b>	<b>31</b>
Accessing Setup Mode	31
Telnet Access	31
Serial Port Access	32
Server Configuration	33
Set the IP Address	33
Set the Gateway IP Address	33
Set the Netmask	33
Set DNS Server IP Address	34
Change Telnet/Web Manager Password	34
DHCP Name	34
Channel 1 and Channel 2 Configuration	35
Baudrate	35
I/F (Interface) Mode	35
Flow	36
Port Number	37
Connect Mode	37
Send the Escape Sequence (+++) in Modem Mode	44
Show IP Address After RING	45
Auto Increment Source Port	45
Remote IP Address	45
Remote Port	45
DisConnMode	45
Flush Mode	46
DisConnTime (Inactivity Timeout)	48
SendChar 1 and SendChar 2	48
Telnet Terminal Type	48
Channel (Port) Password	48
Email Configuration	48
Mail Server	49
Domain Name	49
Recipient 1	49
Recipient 2	50
Trigger 1	50
Trigger 2	50
Trigger 3	50
Expert Settings	51
TCP Keepalive Time	51
ARP Cache Timeout	51
CPU Performance	51
Disable Monitor Mode	51
HTTP Port Number	51
SMTP Port Number	51
MTU Size	51

TCP Re-transmission Timeout	52
Alternate MAC Address	52
Ethernet Connection Type	52
Security Settings	52
Disable SNMP	52
SNMP Community Name	52
Disable Telnet Setup	52
Disable TFTP Firmware Upgrade	53
Disable Port 77FE (Hex)	53
Disable Web Server	53
Disable Web Setup	53
Disable ECHO Ports	53
Enable Encryption	53
Enable Enhanced Password	54
Disable Port 77F0 (Hex)	54
Default Settings	54
Channel 1 Configuration	55
Channel 2 Configuration	55
Expert Settings	55
Security Settings	56
Email Settings	56
Exit Configuration Mode	56
<b>6: Configurable Pins</b>	<b>57</b>
Defaults Settings	57
Features	57
Control Protocol	57
Guidelines	57
Commands	58
<b>7: Monitor Mode</b>	<b>62</b>
Entering Monitor Mode via the Serial Port	62
Entering Monitor Mode via the Network Port	62
Monitor Mode Commands	62
<b>8: Updating Firmware</b>	<b>65</b>
Obtaining Firmware	65
Reloading Firmware	65
Using TFTP: Graphical User Interface	65
Using TFTP: Command Line Interface	66
Recovering the Firmware Using the Serial Port	66
<b>9: AES Encryption</b>	<b>67</b>
<b>10: Troubleshooting</b>	<b>68</b>
Diagnostic LED States	68
Problems and Error Messages	69
Technical Support	72

# 1: Using This Guide

## Purpose and Audience

This guide provides the information needed to configure, use and update the WiPort® NR embedded device server and is intended for software developers and system integrators who are embedding the WiPort NR module in their designs.

## Chapter Summary

The remaining chapters in this guide include:

Chapter	Description
<b>2: Introduction</b>	Describes the main features of the WiPort NR embedded device server and the protocols it supports.
<b>3: Using DeviceInstaller</b>	Provides information for viewing the WiPort NR configuration using DeviceInstaller.
<b>4: Configuration Using Web Manager</b>	Details configuration using the Web Manager to set parameters such as port and server properties.
<b>5: Configuration via Serial Mode or Telnet Port</b>	Provides instructions for accessing Setup Mode (command line interface) using a Telnet connection through the network or a terminal or terminal emulation program through the serial port. Details the parameters that you must configure.
<b>6: Configurable Pins</b>	Provides instructions for configuring the eleven General Purpose I/O pins.
<b>7: Monitor Mode</b>	Provides instructions for accessing and using the command line interface for monitoring the network and diagnosing problems.
<b>8: Updating Firmware</b>	Provides instructions for obtaining the latest firmware and updating the WiPort NR embedded device server.
<b>9: AES Encryption</b>	Describes the encryption available on the WiPort NR embedded device server.
<b>10: Troubleshooting</b>	Describes common problems and error messages and how to contact Lantronix Technical Support. Also provides information on diagnostic LEDs.

## Additional Documentation

Visit the Lantronix web site at [www.lantronix.com/support/documentation](http://www.lantronix.com/support/documentation) for the latest documentation and the following additional documentation:

- ◆ **WiPort NR Evaluation Kit Quick Start Guide** - Briefly explains the basics to get the WiPort NR module up and running.
- ◆ **WiPort NR Embedded Device Server Integration Guide** - Provides information about the WiPort NR hardware and integrating the WiPort NR device server into another product.

## 2: Introduction

The Lantronix® WiPort® NR is an embedded device server that provides a network-enabling solution.

The WiPort NR embedded device server functions independently of a PC, providing a fully integrated solution that combines a processor, memory, and dual high-speed serial ports into a single compact module. It includes an operating system, an embedded Web server, and a full TCP/IP protocol stack. In addition, the WiPort NR module sends email alerts and supports numerous other network communication protocols, including ARP, UDP, TCP, ICMP, Telnet, AutoIP, DHCP, HTTP, SNMP, and SMTP.

For OEMs who wish to customize the user interface by employing common and familiar tools, the WiPort NR embedded device server serves applets to a Web browser, resulting in interactive Web pages. This customization of HTML Web pages and configuration screens tailors the WiPort NR module to fit unique requirements.

### Capabilities

The WiPort NR device server has the following capabilities:

- ◆ Communication between TCP and UDP to serial.
- ◆ Ethernet interface.
- ◆ Email notification of configurable alarms and events.
- ◆ Upgradeable firmware.
- ◆ SNMP monitoring.
- ◆ Connects devices through a TCP or UDP data channel to computers or to another device server.
- ◆ Contains a web server allowing presentation of custom content and easy configuration through the browser.
- ◆ Contains eleven programmable I/O pins used to monitor or control attached devices.

### Applications

The WiPort NR device server connects serial devices such as those listed below to Ethernet networks using the IP protocol family.

- ◆ Remote sensing
- ◆ CNC controllers
- ◆ Data collection devices
- ◆ Telecommunications equipment
- ◆ Data display devices
- ◆ Security alarms and access control devices
- ◆ Time clocks and terminals

## Protocol Support

The WiPort NR device server uses the TCP/IP protocol stack for network communications. Other supported protocols include:

- ◆ ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, and SNMP for network communications and management.
- ◆ TCP, UDP, and Telnet for connections to the serial port.
- ◆ TFTP for firmware and web page updates.
- ◆ IP for addressing, routing, and data block handling over the network.
- ◆ User Datagram Protocol (UDP) for typical datagram applications in which devices interact with other devices without maintaining a point-to-point connection.
- ◆ SMTP for e-mail transmission.

## Configuration Methods

For the unit to operate correctly on a network, it must have a unique IP address on the network. There are three basic methods for logging into the device server:

**DeviceInstaller:** View the current WiPort NR configuration using a Graphical User Interface (GUI) on a PC attached to a network. (See [3:Using DeviceInstaller.](#))

**Web Manager:** Through a web interface, configure the WiPort NR embedded device server and its settings using the WiPort NR Web Manager. (See [4:Configuration Using Web Manager.](#))

**Serial & Telnet Ports:** There are two approaches to accessing Serial Mode. Make a Telnet connection to the network port (9999) or connect a terminal (or a PC running a terminal emulation program) to the unit's serial port. (See [5: Configuration via Serial Mode or Telnet Port.](#))

## Addresses and Port Numbers

### Hardware Address

The hardware address is also referred to as the Ethernet address or the MAC address. The first three bytes of the Ethernet address are fixed and read 00-20-4A, identifying the unit as a Lantronix product. The fourth, fifth, and sixth bytes are unique numbers assigned to each unit.

**Example:** 00-20-4A-14-01-18

**Note:** Make note of the MAC address. It is needed to locate the WiPort NR embedded device server using the DeviceInstaller™ utility.

### IP Address

Every device connected to an IP network must have a unique IP address. This address is used to reference the specific unit. The WiPort NR embedded device server is automatically assigned an IP address on DHCP-enabled networks as it is DHCP-enabled by default.

## Port Numbers

Every TCP connection and every UDP datagram is defined by a destination IP address and a port number. For example, a Telnet application commonly uses port number 23. A port number is similar to an extension on a phone system.

The unit's serial channel (port) can be associated with a specific TCP/UDP port number. Port number 9999 is reserved for access to the unit's Setup (configuration) Mode window. Ports 0-1024 are reserved as well. For more information on reserved port numbers, refer to [Table 5-7. Reserved Port Numbers](#).

## 3: Using DeviceInstaller

This chapter covers the steps for viewing the WiPort NR device server properties and device details.

The WiPort NR default configuration is as follows:

- ◆ BOOTP, DHCP, and AutoIP enabled.

**Note:** AutoIP generates a random IP address in the range 169.254.0.1 to 169.254.255.254 if no BOOTP or DHCP server is found.

### Accessing WiPort NR Embedded Device Server Using DeviceInstaller Utility

**Note:** Make note of the MAC address. You will need it to locate the WiPort NR embedded device server using DeviceInstaller application. For more information on the hardware address, see [Hardware Address](#) on page 10.

To use the DeviceInstaller utility, first install the latest version from the downloads page on the Lantronix web site [www.lantronix.com/downloads](http://www.lantronix.com/downloads).

1. Run the executable to start the installation process and respond to the installation wizard prompts. (If prompted to select an installation type, select Typical.) Click **Start→All Programs → Lantronix → DeviceInstaller → DeviceInstaller**.
2. The list of Lantronix devices available displays.
3. Expand the list of WiPort NR devices by clicking the + symbol next to the WiPort NR icon. Select the WiPort NR unit by clicking on its IP address to view its configuration.

### Viewing the WiPort NR Current Configuration

1. In the right window, click the **Device Details** tab. The current WiPort NR configuration displays:

<b>Name</b>	Configurable field. Enter a <b>name</b> to identify the WiPort NR embedded device server. Double-click on the field, type in the value, and press <b>Enter</b> to complete. This name is not visible on other PCs or laptops using DeviceInstaller utility.
<b>DHCP Device Name</b>	Shows the configured name of the DHCP device, if any.
<b>Group</b>	Configurable field. Enter a <b>group</b> to categorize the WiPort NR module. Double-click on the field, type in the value, and press <b>Enter</b> to complete. This group name is not visible on other PCs or laptops using DeviceInstaller utility.

<b>Comments</b>	Configurable field. Enter <b>comments</b> for the WiPort NR embedded device server. Double-click on the field, type in the value, and press <b>Enter</b> to complete. This description or comment is not visible on other PCs or laptops using DeviceInstaller.
<b>Device Family</b>	Non-configurable field. Displays the WiPort NR device family type as <b>Wireless</b> .
<b>Type</b>	Non-configurable field. Displays the device type as <b>WiPort NR</b> .
<b>ID</b>	Non-configurable field. Displays the WiPort NR ID embedded within the box.
<b>Hardware Address</b>	Non-configurable field. Displays the WiPort NR hardware (or MAC) address.
<b>Firmware Version</b>	Non-configurable field. Displays the firmware currently installed on the WiPort NR embedded device server.
<b>Extended Firmware Version</b>	Non-configurable field. Displays the full version nomenclature of the firmware.
<b>Online Status</b>	Non-configurable field. Displays the WiPort NR status as online, offline, unreachable (the WiPort NR module is on a different subnet), or busy (the WiPort NR module is currently performing a task).
<b>IP Address</b>	Non-configurable field. Displays the WiPort NR current IP address. To change the IP address, see <a href="#">4:Configuration Using Web Manager</a> or <a href="#">5:Configuration via Serial Mode or Telnet Port</a> .
<b>IP Address was Obtained</b>	Displays “Dynamically” if the device automatically received an IP address (e.g., from DHCP). Displays “Statically” if the IP address was configured manually. If the IP address was assigned dynamically, the following fields appear: <ul style="list-style-type: none"> <li>◆ <b>Obtain via DHCP</b> with value of True or False.</li> <li>◆ <b>Obtain via BOOTP</b> with value of True or False.</li> <li>◆ <b>Obtain via RARP</b> with value of True or False</li> <li>◆ <b>Obtain via Auto IP</b> with value of True or False</li> </ul>
<b>Subnet Mask</b>	Non-configurable field. Displays the WiPort NR current subnet mask. To change the subnet mask, see <a href="#">4:Configuration Using Web Manager</a> or <a href="#">5:Configuration via Serial Mode or Telnet Port</a> .
<b>Gateway</b>	Non-configurable field. Displays the WiPort NR current gateway. To change the gateway, see <a href="#">4:Configuration Using Web Manager</a> or <a href="#">5:Configuration via Serial Mode or Telnet Port</a> .
<b>Number of COB partitions supported</b>	Non-configurable field. Displays the number of COB partitions supported.
<b>Number of Serial Ports</b>	Non-configurable field. Displays the number of ports on the WiPort NR embedded device server.
<b>TCP Keepalive</b>	Non-configurable field. Displays <b>1-65s</b> , the WiPort NR TCP keepalive range.

<b>Telnet Supported</b>	Non-configurable field. Permits Telnet sessions. Displays <b>True</b> .
<b>Telnet Port</b>	Non-configurable field. Displays the WiPort NR port for telnet sessions.
<b>Web Port</b>	Non-configurable field. Displays the WiPort NR port for Web Manager configuration.
<b>Maximum Baud Rate Supported</b>	Non-configurable field. Displays the WiPort NR maximum baud rate. <i>Note: The WiPort NR embedded device server may not currently be running at this rate.</i>
<b>Firmware Upgradeable</b>	Non-configurable field. Displays <b>True</b> , indicating the WiPort NR firmware is upgradeable as newer version become available.
<b>Support Configurable Pins</b>	Non-configurable field. The WiPort NR embedded device server supports configurable pins.
<b>Supports Email Triggers</b>	Non-configurable field. WiPort NR device supports email triggers.
<b>Supports AES Data Stream</b>	Non-configurable field. Displays <b>True</b> if the WiPort NR unit supports AES encryption.
<b>Supports 485</b>	Non-configurable field. WiPort NR embedded device server supports the RS-485 protocol.
<b>Supports 921K Baud Rate</b>	Non-configurable field. WiPort NR module supports baud rates up to 920K.
<b>Supports HTTP Server</b>	Non-configurable field. Displays <b>True</b> .
<b>Supports HTTP Setup</b>	Non-configurable field. WiPort NR module supports HTTP setup.
<b>Supports 230K Baudrate</b>	Non-configurable field. WiPort NR embedded device server supports a baud rate of 230K.
<b>Supports GPIO</b>	Non-configurable field. WiPort NR module supports communication via General Purpose Input Output (GPIO).

## 4: Configuration Using Web Manager

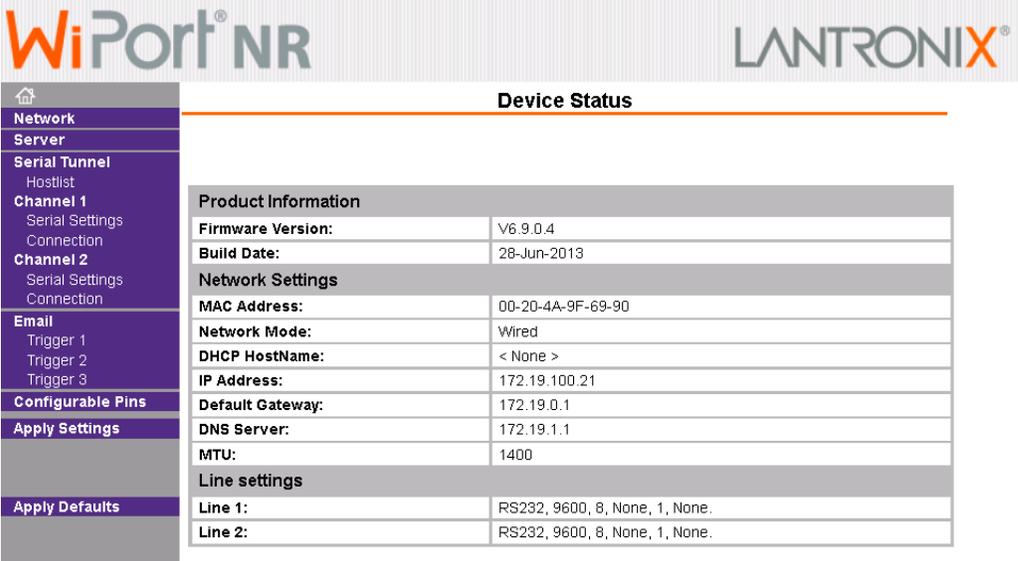
This chapter describes how to configure the WiPort NR embedded device server using Web Manager, Lantronix's browser-based configuration tool. The unit configuration is stored in nonvolatile memory and is retained without power (see [Applying Settings](#) on page 30). The unit performs a reset after the configuration is changed and stored.

### Accessing WiPort NR Web Manager Using DeviceInstaller Application

**Note:** For more information on DeviceInstaller, see [3:Using DeviceInstaller](#).

1. Run DeviceInstaller and search for the list of available Lantronix device servers.
2. Select the WiPort NR unit by clicking on its IP address.
3. In the right window, click the **Web Configuration** tab.
4. To view the WiPort NR's Web Manager in the current DeviceInstaller window, click the  button in the upper right corner of the DeviceInstaller application.
5. To open the Web Manager in a web browser, click the  button in the upper right corner of the DeviceInstaller application.

Figure 4-1. Device Status



The screenshot shows the WiPort NR Web Manager interface. The top header includes the 'WiPort NR' logo on the left and the 'LANTRONIX' logo on the right. Below the header is a navigation sidebar on the left with the following menu items: Home, Network, Server, Serial Tunnel, Hostlist, Channel 1, Serial Settings, Connection, Channel 2, Serial Settings, Connection, Email, Trigger 1, Trigger 2, Trigger 3, Configurable Pins, Apply Settings, and Apply Defaults. The main content area is titled 'Device Status' and contains a table of device information.

Product Information	
Firmware Version:	V6.9.0.4
Build Date:	28-Jun-2013
Network Settings	
MAC Address:	00-20-4A-9F-69-90
Network Mode:	Wired
DHCP HostName:	< None >
IP Address:	172.19.100.21
Default Gateway:	172.19.0.1
DNS Server:	172.19.1.1
MTU:	1400
Line settings	
Line 1:	RS232, 9600, 8, None, 1, None.
Line 2:	RS232, 9600, 8, None, 1, None.

The main menu is in the left side of the Web Manager window.

**Note:** Alternatively, access the WiPort NR Web Manager if it is connected to the network by entering its IP address in a web browser.

## Network Configuration

The unit's network values display upon selecting **Network** from the main menu. The following sections describe the configurable parameters within the Network configuration menu.

**Note:** The IP address is assigned via DHCP (on DHCP-enabled networks). Assign a static IP address if preferred.

Figure 4-2. Network Settings

**Network Settings**

Network Mode:  ▼

**IP Configuration**

Obtain IP address automatically

Auto Configuration Methods

BOOTP:  Enable  Disable

DHCP:  Enable  Disable

AutoIP:  Enable  Disable

DHCP Host Name:

Use the following IP configuration:

IP Address:

Subnet Mask:

Default Gateway:

DNS Server:

---

**Ethernet Configuration**

Auto Negotiate

Speed:  100 Mbps  10 Mbps

Duplex:  Full  Half

### Automatic IP Address Configuration

To assign an IP address and its network configuration automatically:

1. Click **Network** from the main menu.
2. Select **Obtain IP address automatically**.
3. Enter the following (as necessary):

<b>BOOTP</b>	Select <b>Enable</b> to permit the Bootstrap Protocol (BOOTP). The BOOTP server automatically assigns the IP address from a pool of addresses.
<b>DHCP</b>	Select <b>Enable</b> to permit Dynamic Host Configuration Protocol (DHCP). DHCP automatically assigns a leased IP address to the WiPort NR unit.

<b>Auto-IP</b>	The WiPort NR embedded device server generates an IP in the 169.254.x.x address range with a Class B subnet. Select the <b>Enable</b> checkbox to enable this feature.
<b>DHCP Host Name</b>	Enter the name of the host on the network providing the IP address.

**Note:** Disabling BOOTP, DHCP, and Auto-IP (i.e. all three checkboxes) is not advised as the only available IP assignment method will then be ARP or serial port.

- Click the **OK** button when finished.
- On the main menu, click **Apply Settings**.

### Static IP Address Configuration

To assign an IP address and its network configuration manually:

- Click **Network** from the main menu.
- Select **Use the following IP configuration**.
- Enter the following (as necessary):

<b>IP Address</b>	If DHCP is not used to assign IP addresses, enter it manually. The IP address must be set to a unique value in the network.
<b>Subnet Mask</b>	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
<b>Default Gateway</b>	The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network.
<b>DNS Server</b>	The DNS server allows the name of a remote machine to be resolved automatically. Enter the IP address of the DNS server. If the device is DHCP enabled, the DHCP server provides the DNS server IP address, which will override this configured value. <b>Note:</b> This setting is applicable only in Manual Connection mode.

- Click the **OK** button when finished.
- On the main menu, click **Apply Settings**.

### Ethernet Configuration

You must specify the speed and direction of data transmission.

To specify how data will be transmitted:

- On the main menu, click **Network**.
- Enter the following (as necessary):

<b>Auto Negotiate</b>	With this option, the Ethernet port auto-negotiates the speed and duplex with the hardware endpoint to which it is connected. This is the default. If this option is not selected, then complete the fields that become available: <ul style="list-style-type: none"> <li><b>Speed:</b> The speed of data transmission. The default is <b>100 Mbps</b>.</li> <li><b>Duplex:</b> The direction of data transmission. The default is <b>Full</b>.</li> </ul>
-----------------------	---

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

## Server Configuration

The unit's server values display upon selecting **Server** from the main menu. The following sections describe the configurable parameters within the Server configuration menu.

**Figure 4-3. Server Settings**

**Server Settings**

---

**Server Configuration**

Enhanced Password:  Enable  Disable

Telnet/Web Manager Password:

Retype Password:

**Advanced**

ARP Cache Timeout (secs):

TCP Keepalive (secs):

Monitor Mode @ Bootup:  Enable  Disable

CPU Performance Mode:  Low  Regular  High

HTTP Server Port:

Config Server Port:

MTU Size:

TCP Re-transmission timeout (ms):

To configure the WiPort NR device server settings:

1. Click **Server** from the main menu.
2. Configure or modify the following fields:

### Server Configuration

<p><b>Enhanced Password</b></p> <p><i>Note: We recommend that you always enable the enhanced password setting, and create a strong 16 character password.</i></p>	<p>Select whether to enable enhanced password:</p> <ul style="list-style-type: none"> <li>◆ <b>Enable:</b> selecting this option enables advanced password creation, allowing you to create passwords up to 16 bytes in length.</li> <li>◆ <b>Disable:</b> selecting this option disables advanced password creation, allowing you to create basic passwords up to 4 bytes in length.</li> </ul>
<p><b>Telnet/Web Manager Password</b></p>	<p>Enter the password required for Telnet configuration and Web Manager access.</p>

<b>Retype Password</b>	Re-enter the password required for Telnet configuration and Web Manager access.
------------------------	---

**Advanced**

<b>ARP Cache Timeout</b>	When the unit communicates with another device on the network, it adds an entry into its ARP table. ARP Cache timeout defines the number of seconds (1-600) before it refreshes this table.
<b>TCP Keepalive</b>	TCP Keepalive time defines how many seconds the unit waits during an inactive connection before checking its status. If the unit does not receive a response, it drops that connection. Enter a value between <b>0</b> and <b>65</b> seconds. <b>0</b> disables keepalive.
<b>Monitor Mode @ Bootup</b>	Select <b>Disable</b> to disable the entry into the monitor mode via the <b>yyy</b> or <b>xx1</b> key sequence at startup. This command prevents the unit from entering monitor mode by interpreting the stream of characters that are received during the device server's initialization at startup.
<b>CPU Performance Mode</b>	Select the performance mode for the WiPort NR embedded device server. Higher performance settings require more energy. <b>Low</b> is 26 Mhz. <b>Regular</b> is 48 Mhz; <b>High</b> is 88 Mhz. The default is <b>Regular</b> .
<b>HTTP Server Port</b>	This option allows the configuration of the web server port number. The valid range is <b>1-65535</b> . The default HTTP server port number is <b>80</b> .
<b>Config Server Port</b>	Not applicable for this product.
<b>MTU Size</b>	The Maximum Transmission Unit (MTU) is the largest physical packet size a network can transmit for TCP and UDP. Enter between <b>512</b> and <b>1400</b> bytes. The default is <b>1400</b> bytes.
<b>TCP Re-transmission timeout (ms)</b>	The desired TCP re-transmission timeout value. If the ACK is not received for a packet sent from the WiPort NR device server, then the unit will retransmit the data. The valid range is 500-4000 msec.

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

## Host List Configuration

The WiPort NR embedded device server scrolls through the host list until it connects to a device listed in the host list table. After a successful connection, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until the next successful connection.

The host list supports a minimum of 1 and a maximum of 12 entries. Each entry contains an IP address and a port number.

**Note:** The host list is disabled for Manual and Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled.

To configure the WiPort NR host list:

1. From the main menu, click the **Hostlist** tab.

Figure 4-4. Hostlist Settings

**Hostlist Settings**

---

**Retry Settings**

Retry Counter:       Retry Timeout:

**Host Information**

No.	Host Address	Port	No.	Host Address	Port
1	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	2	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
3	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	4	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
5	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	6	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
7	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	8	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
9	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	10	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
11	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	12	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>

2. Enter or modify the following fields from the Hostlist Settings window:

**Retry Settings**

<b>Retry Counter</b>	Enter the value for the number of times the WiPort NR device should attempt to retry connecting to the host list.
<b>Retry Timeout</b>	Enter the duration (in seconds) the WiPort NR module should abandon attempting a connection to the host list.

**Host Information**

<b>Host Address</b>	Enter or modify the host IP address.
<b>Port</b>	Enter the target port number.

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

## Channel 1 and Channel 2 Configuration

Channel 1 and Channel 2 configurations define how the serial ports respond to network and serial communication.

**Serial Settings**

To configure a channel's serial settings:

1. From the main menu, click **Serial Settings** for either Channel 1 or Channel 2 to display the Serial Settings page for the selected channel.

Figure 4-5. Channel Serial Settings

**Serial Settings**

---

**Channel 1**

Disable Serial Port

**Port Settings**

Protocol:  Flow Control:

Baud Rate:  Data Bits:  Parity:  Stop Bits:

---

**Pack Control**

Enable Packing

Idle Gap Time:

Match 2 Byte Sequence:  Yes  No      Send Frame Immediate:  Yes  No

Match Bytes:        Send Trailing Bytes:  None  One  Two  
(Hex)

---

**Flush Mode**

<b>Flush Input Buffer</b>	<b>Flush Output Buffer</b>
With Active Connect: <input type="radio"/> Yes <input checked="" type="radio"/> No	With Active Connect: <input type="radio"/> Yes <input checked="" type="radio"/> No
With Passive Connect: <input type="radio"/> Yes <input checked="" type="radio"/> No	With Passive Connect: <input type="radio"/> Yes <input checked="" type="radio"/> No
At Time of Disconnect: <input type="radio"/> Yes <input checked="" type="radio"/> No	At Time of Disconnect: <input type="radio"/> Yes <input checked="" type="radio"/> No

---

2. In the available fields, enter the following information:

**Channel 1**

<b>Disable Serial Port</b>	Available on Channel 2 settings only. When selected, disables communication through the serial port. <b>Note:</b> Using a telnet session you may enter a baud rate of 00 in channel settings to disable the serial port.
----------------------------	---

**Port Settings**

<b>Protocol</b>	Select the protocol type from the pull down menu for the selected channel.
<b>Flow Control</b>	Flow control manages data flow between devices in a network to ensure it is processed efficiently. Too much data arriving before a device is prepared to manage it causes lost or retransmitted data.
<b>Baud Rate</b>	The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200, 230400, 460800, or 921600. <b>Note:</b> Baud rates 460800 and 921600 are available for selection only when CPU performance mode is set to High.
<b>Data Bits</b>	Indicates the number of bits in a transmitted data package.

<b>Parity</b>	Checks for the parity bit. The default is <b>None</b> .
<b>Stop Bits</b>	The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission.

**Pack Control**

<b>Enable Packing</b>	Select the checkbox to enable packing on the WiPort NR embedded device server. Two firmware-selectable packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream.
<b>Idle Gap Time</b>	Select the maximum time for inactivity. The default time is 12 milliseconds.
<b>Match 2 Byte Sequence</b>	Use to indicate the end of a series of data to be sent as one group. The sequence must occur sequentially to indicate to the WiPort NR module, the end of the data collection.
<b>Match Bytes</b>	Use to indicate the end of a series of data to be sent as one group. Set this value to 00 if specific functions are not needed.
<b>Send Frame Immediate</b>	After the detection of the byte sequence, indicates whether to send the data frame or the entire buffer. Select <b>Yes</b> to send only the data frame.
<b>Send Trailing Bytes</b>	Select the number of bytes to send after the end-of-sequence characters.

**Flush Input Buffer (Serial to Network)**

<b>With Active Connect</b>	Select <b>Yes</b> to clear the input buffer with a connection that is initiated from the device to the network.
<b>With Passive Connect</b>	Select <b>Yes</b> to clear the input buffer with a connection initiated from the network to the device.
<b>At Time of Disconnect</b>	Select <b>Yes</b> to clear the input buffer when the network connection to or from the device is disconnected.

**Flush Output Buffer (Network to Serial)**

<b>With Active Connect</b>	Select <b>Yes</b> to clear the output buffer with a connection that is initiated from the device to the network.
<b>With Passive Connect</b>	Select <b>Yes</b> to clear the output buffer with a connection initiated from the network to the device.
<b>At Time of Disconnect</b>	Select <b>Yes</b> to clear the output buffer when the network connection to or from the device is disconnected.

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

## Connection Settings - TCP

To configure a channel's TCP settings:

1. From the main menu, click **Connection** for either Channel 1 or Channel 2 to display the Connection Settings page for the selected channel.
2. In the available fields, enter the following information:

### Connect Protocol

<b>Protocol</b>	Select <b>TCP</b> from the pull down menu.
-----------------	--

Figure 4-6. TCP Connection Settings

**Connection Settings**

**Channel 1**

**Connect Protocol**  
Protocol:

**Connect Mode**

<p><b>Passive Connection:</b></p> <p>Accept Incoming: <input type="text" value="Yes"/></p> <p>Password Required: <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Password: <input type="text"/></p> <p>Modem Escape Sequence Pass Through: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p><b>Active Connection:</b></p> <p>Active Connect: <input type="text" value="None"/></p> <p>Start Character: 0x <input type="text" value="0D"/> (in Hex)</p> <p>Modem Mode: <input type="text" value="None"/></p> <p>Show IP Address After RING: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>
---	---

---

**Endpoint Configuration:**

Local Port: <input type="text" value="10001"/>	<input type="checkbox"/> Auto increment for active connect
Remote Port: <input type="text" value="0"/>	Remote Host: <input type="text" value="0.0.0.0"/>

---

**Common Options:**

Telnet Com Port Cntrl: <input type="text" value="Disable"/>	Connect Response: <input type="text" value="None"/>
Terminal Name: <input type="text"/>	Use Hostlist: <input type="radio"/> Yes <input checked="" type="radio"/> No
	LED: <input type="text" value="Blink"/>

---

**Disconnect Mode**

On Mdm_Ctrl_In Drop: <input type="radio"/> Yes <input checked="" type="radio"/> No	Hard Disconnect: <input checked="" type="radio"/> Yes <input type="radio"/> No
Check EOT(Ctrl-D): <input type="radio"/> Yes <input checked="" type="radio"/> No	Inactivity Timeout: <input type="text" value="0"/> : <input type="text" value="0"/> (mins : secs)

### Connect Mode: Passive Connection

<b>Accept Incoming</b>	Select <b>Yes</b> to accept incoming connections.
<b>Password Required</b>	Determines whether a password is required for an incoming passive connection. Field is not available when a password is set for Telnet mode.

<b>Password</b>	If Password Required was set to <b>Yes</b> , enter the password for passive connections.
<b>Modem Escape Sequence Pass Through</b>	Click Yes to enable pass through or No to disable. The default setting is Yes.

### Connect Mode: Active Connection

<b>Active Connect</b>	Select <b>None</b> to disable <b>Active Connect</b> . Otherwise, indicate the connection type from the drop-down list: <b>With Any Character:</b> Attempts to connect when any character is received from the serial port. <b>With Active Mdm Ctrl In:</b> Accepts external connection requests only when the <b>modem_control_in</b> input is asserted. <b>With Start Character:</b> Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return. <b>Manual Connection:</b> Attempts to connect when directed by a command string received from the serial port. <b>Auto Start:</b> Automatically connects to the remote IP address and port after booting up.
<b>Start Character</b>	If Active Connect is set to <b>With Start Character</b> , enter the start character in this field.
<b>Modem Mode</b>	Indicates the on-screen response type when in Modem Mode (if <b>Modem Mode</b> is enabled).
<b>Show IP After RING</b>	Indicates whether to display the remote IP address upon connection. The default setting is Yes.

### Endpoint Configuration

<b>Local Port</b>	Enter the local port number.
<b>Auto increment for active connect</b>	Select to auto-increment the local port number for new outgoing connections. The range of auto-incremented port numbers is 50,000 to 59,999 and loops back to the beginning when the maximum range is reached.
<b>Remote Port</b>	Enter the remote port number.
<b>Remote Host</b>	Enter the IP address of the remote device.

### Common Options

<b>Telnet Com Port Cntrl</b>	This field is available for configuration only when Active Connection is set to <b>None</b> . Select <b>Enable</b> to permit Telnet communication to the WiPort NR unit.
<b>Terminal Name</b>	This field is available for configuration only when Telnet Mode is set to <b>Enable</b> . Use the terminal name for the Telnet terminal type. Enter only one name. When this option is enabled, the unit also reacts to the EOR (end of record) and binary options, which can be used for applications such as terminal emulation to IBM hosts.
<b>Connect Response</b>	A single character is transmitted to the serial port when there is a change in connection state. Default setting is <b>None</b> .

<b>Use Hostlist</b>	<p>If this option is set to <b>True</b>, the device server scrolls through the host list until it connects to a device listed in the host list table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is able to connect to another IP in the host list.</p> <p>The host list is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the host list option is enabled.</p> <p>For information on configuring the host list, see <a href="#">Host List Configuration</a> on page 19.</p>
<b>LED</b>	Select <b>Blink</b> for the status LEDs to blink upon connection or <b>None</b> for no LED output.

### Disconnect Mode

<b>On Mdm_Ctrl_In Drop</b>	Set to <b>Yes</b> for the network connection to or from the serial port to drop when modem_control_in transitions from a high state to a low state.
<b>Hard Disconnect</b>	When set to <b>Yes</b> , the TCP connection closes even if the remote site does not acknowledge the disconnect request.
<b>Check EOT (Ctrl-D)</b>	Choose <b>Yes</b> to drop the connection when Ctrl-D or Hex 04 is detected. Both Telnet mode and Disconnect with EOT must be enabled for Disconnect with EOT to function properly. Ctrl D is only detected going from the serial port to the network.
<b>Inactivity Timeout</b>	<p>Use this parameter to set an inactivity timeout. The unit drops the TCP connection to port 10001/10002 if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds. To disable the inactivity timeout, enter 00:00.</p> <p><b>Note:</b> The default port number for Port 1 is 10001 and 10002 for Port 2. However, port numbers may be set to a different value.</p>

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

### Connection Settings - UDP

To configure a channel's UDP settings:

1. From the main menu, click **Connection** for either Channel 1 or Channel 2 to display the Connection Settings page for the selected channel.
2. In the available fields, enter the following information:

#### Connect Protocol

<b>Protocol</b>	Select <b>UDP</b> from the pull down menu.
-----------------	--

Figure 4-7. UDP Connection Settings

**Connection Settings**

---

**Channel 1**

**Connect Protocol**  
Protocol:

**Datagram Mode:**  
Datagram Type:  Accept Incoming:

**Endpoint Configuration:**  
Local Port:  Remote Port:   
Remote Host:   Use Broadcast

**Device Address Table:**

No.	Dev Addr						
0	<input type="text" value="0"/>	1	<input type="text" value="0"/>	2	<input type="text" value="0"/>	3	<input type="text" value="0"/>
4	<input type="text" value="0"/>	5	<input type="text" value="0"/>	6	<input type="text" value="0"/>	7	<input type="text" value="0"/>
8	<input type="text" value="0"/>	9	<input type="text" value="0"/>	10	<input type="text" value="0"/>	11	<input type="text" value="0"/>
12	<input type="text" value="0"/>	13	<input type="text" value="0"/>	14	<input type="text" value="0"/>	15	<input type="text" value="0"/>

**Datagram Mode**

<b>Datagram Type</b>	Configures remote IP or network broadcast address and the remote port. Enter <b>01</b> for directed or broadcast UDP.
<b>Accept Incoming</b>	Select <b>Yes</b> to accept incoming UDP datagrams.

**Endpoint Configuration**

<b>Local Port</b>	Enter the local port number.
<b>Remote Port</b>	Enter the port number of the remote device.
<b>Remote Host</b>	Enter the IP address of the remote device.
<b>Use Broadcast</b>	Select to broadcast the UDP datagram. Datagrams of type 01 can be sent as a broadcast by enabling this option. The default is not to broadcast. <b>Note:</b> Datagrams are sent as subnet-directed broadcasts.
<b>Device Address Table</b>	Fields are enabled when Datagram Type is set to <b>FD</b> . Enter values between 1 and 255 to identify units on the local network of device servers.

## Email Configuration

The unit sends an Email to multiple recipients when a specific trigger event occurs. There are three separate triggers, based on any combination of the configurable pins when selected as user I/O functions. Optionally, use a two-byte serial string to initiate a trigger. Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit will send the Email.

To configure the WiPort NR email settings:

1. From the main menu, select **Email** to open the Email Settings window.

**Figure 4-8. Email Settings**

**Email Settings**

Server IP Address: <input style="width: 100%;" type="text" value="0.0.0.0"/>	Server Port: <input style="width: 100%;" type="text" value="25"/>
Domain Name: <input style="width: 100%;" type="text"/>	
Unit Name: <input style="width: 100%;" type="text"/>	

---

**Recipients**

Recipient 1:  
Email Address:

Recipient 2:  
Email Address:

2. Configure the following fields:

<b>Server IP Address</b>	Enter the IP address of the mail server.
<b>Server Port</b>	Enter the port number on the email server.
<b>Domain Name</b>	Enter the Email server's domain name.
<b>Unit Name</b>	Enter the username used by the WiPort NR embedded device server to send Email messages. <i>Note: Do not use spaces in the name.</i>

### Recipients

<b>Recipient 1: Email Address</b>	Enter the email address designated to receive email notifications.
<b>Recipient 2: Email Address</b>	Enter an additional email address designated to receive email notifications.

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

## Trigger Configuration

A trigger event occurs when the unit receives either one or two bytes of a specified sequence on the serial port, or because of a specified combination of conditions on the configurable pins.

Set the configurable pins to Active, Inactive, or None. The configurable pins are disabled if they are all set to None. If both the serial sequence and the configurable pins are disabled, the trigger is disabled.

To configure the WiPort NR email trigger settings:

- From the main menu, select **Trigger 1**, **Trigger 2**, or **Trigger 3** to configure the desired Trigger settings. The **Email Trigger Settings** page opens.

Figure 4-9. Email Trigger Settings

### Email Trigger Settings

**Trigger 1**

**Conditions**

**Configurable Pins**

Trigger Input 1:

Trigger Input 2:

Trigger Input 3:

**Serial Trigger**

Enable Serial Trigger Input

Channel:

Data Size:

Match Data:   (in Hex)

**Message Properties**

Message:

Priority:

Min. Notification Interval:  (secs)      Re-notification Interval:  (secs)

- Configure the following fields:

#### Conditions

<b>Configurable Pins</b>	Select the condition from the pull down menu for the configurable pins. Repeat for each <b>Trigger Input</b> field.
<b>Enable Serial Trigger Input</b>	When selected, specified serial communications count as a trigger input.
<b>Channel</b>	Select the channel prompting the trigger.
<b>Data Size</b>	Select the data size prompting the trigger.
<b>Match Data</b>	Enter the data which, when appears in the communication stream, prompts a trigger.

**Note:** All of the conditions must match for an email notification to be sent.

#### Message Properties

<b>Message</b>	The subject line of the trigger event email to the specified recipient(s).
----------------	--

<b>Priority</b>	The priority level for the e-mail.
<b>Min. Notification Interval</b>	The notification interval is the minimum time allowed between individual triggers. If a trigger event occurs within the minimum interval since the last trigger, it is ignored.
<b>Re-notification Interval</b>	Indicates the time interval in which a new email message is sent to the recipient(s) when a single trigger event remains active.

- Click the **OK** button when finished.
- On the main menu, click **Apply Settings**.

## Configurable Pin Settings

There are 11 configurable hardware pins on the WiPort NR unit. For each pin, configure the pin function, communication direction, and its activity level. For more information, see [Configurable Pins](#) on page 57.

To configure the WiPort NR OEM Configurable Pins:

- Click **Configurable Pins** from the main menu to open the Configurable Pins window.

Figure 4-10. Configurable Pins Settings

CP	Function	Direction	Trigger Input	Active Level
0	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
1	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
2	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
3	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
4	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
5	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
6	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
7	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
8	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
9	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High
10	General Purpose I/O	<input type="radio"/> Input <input checked="" type="radio"/> Output	<input type="checkbox"/>	<input type="radio"/> Low <input checked="" type="radio"/> High

OK

- Configure or modify the following fields for each pin:

<b>Function</b>	From the pull down menu, select the purpose of the specified pin. See <a href="#">Configurable Pin Functions</a> for a description of each available function.
-----------------	--

<b>Direction</b>	Select whether the pin inputs or outputs.
<b>Active Level</b>	Select the signal active level ( <b>Low</b> or <b>High</b> ).

### Configurable Pin Functions

<b>General Purpose I/O</b>	Monitors input via the 77F0 port or controls output by the 77F0 port.
<b>Modem Ctrl Channel 1 in</b>	Allows for control of the connection (and disconnection) of channel 1.
<b>Modem Ctrl Channel 1 out</b>	Indicates a connection is established on channel 1.
<b>Modem Ctrl Channel 2 in</b>	Allows for control of the connection (and disconnection) on channel 2.
<b>Modem Ctrl Channel 2 out</b>	Indicates a connection is established on channel 2.
<b>Serial Channel 1 Status LED</b>	Indicates channel 1 status and extended diagnostics when the Diagnostics LED is lit.
<b>Serial Channel 2 Status LED</b>	Indicates channel 2 status.
<b>Diagnostics LED</b>	Indicates errors and configurations.
<b>RS485 Select</b>	Selects between RS-232 and RS-485 line drivers.
<b>RS485 2-Wire</b>	Selects 2-wire line drivers. Usable as a half/full duplex selector.
<b>RS485 4-Wire</b>	Selects 4-wire line drivers.
<b>Reset to Defaults (Ethernet)</b>	Asserting during bootup for at least 7 seconds resets the configuration back to factory default. Used when network access is impossible because of improper configuration.

3. Click the **OK** button when finished.
4. On the main menu, click **Apply Settings**.

## Applying Settings

Click the **Apply Settings** button from the main menu to save and apply the configuration changes.

**Note:** Clicking **OK** on each page does not change the configuration on the device. **OK** tells the WiPort NR serial-to-Ethernet device server what changes to use; **Apply Settings** makes the changes permanent and reboots the WiPort NR device.

## Applying Factory Defaults

Click the **Apply Defaults** button from the main menu to apply the factory settings to the WiPort NR embedded device server. For a list of the default settings, refer to [Default Settings](#) on page 54.

## 5: Configuration via Serial Mode or Telnet Port

Configure the unit so that it can communicate on a network with your serial device. As an alternative to Web Manager, the WiPort NR unit is configurable using a terminal program to access the serial port locally. Using this terminal program to respond to prompts is referred to as the **Setup Mode**. A Telnet connection may also be used to configure the unit over the network.

The unit's configuration is stored in nonvolatile memory and is retained without power. You can change the configuration at any time. The unit performs a reset after the configuration has been changed and stored.

**Note:** The menus in this section show a typical device. Not all devices display information in the same manner.

### Accessing Setup Mode

#### Telnet Access

**Note:** Alternatively, use *DeviceInstaller* to access Telnet. Select the device from the main window list, and click the **Telnet Configuration** tab in the right window. If using **Telnet** from the *DeviceInstaller* toolbar, skip steps 1 through 3.

To configure the unit over the network, establish a Telnet connection to port 9999:

1. From the Windows **Start** menu, click **Run**.
2. From the Run dialogue box, type the following command (where x.x.x.x is the IP address and 9999 is the unit's fixed network configuration port number):

```
Windows: telnet x.x.x.x 9999
UNIX: telnet x.x.x.x:9999
```

3. Click **OK**. The following information displays:

**Figure 5-1. MAC Address**

```
MAC address 00204AFFFF30
Software version V6.9.0.4 (130628)

Press Enter for Setup Mode
```

4. To enter the Setup Mode, press **Enter** within 5 seconds.

**Note:** Connection fails if **Enter** is not pressed within 5 seconds.

- The configuration settings display, followed by the setup menu options:

**Figure 5-2. Setup Menu Options**

```
Change Setup:
 0 Server
 1 Channel 1
 2 Channel 2
 3 E-mail
 5 Expert
 6 Security
 7 Defaults
 8 Exit without save
 9 Save and exit

Your choice ?
```

- Select an option on the menu by entering the number of the option in the **Your choice ?** field and pressing **Enter**.
- View the current configuration by pressing **Enter** from the Change Setup menu.
- To enter a value for a parameter, type the value and press **Enter**. To confirm a current value, press **Enter** (without inputted parameters).
- When finished, save the new configurations (**9 Save and exit**). The unit reboots.

### Serial Port Access

To configure the unit through a serial connection:

- Connect a console terminal or PC running a terminal emulation program to your unit's serial port. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.
- Reset the WiPort NR unit by cycling the unit's power (turning the power off and back on). Immediately upon resetting the device, enter three lowercase **x** characters (**xxx**).

**Note:** The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while resetting the unit. This must be done within three seconds of resetting the WiPort NR embedded device server.

- Upon connection, the following information displays:

**Figure 5-3. MAC Address**

```
MAC address 00204AFFFF30
Software version V6.9.0.4 (130628)

Press Enter to go into Setup Mode
```

- To enter the Setup Mode, press **Enter** within 5 seconds.

**Note:** Connection fails if **Enter** is not pressed within 5 seconds.

- The configuration settings display, followed by the setup menu options:

Figure 5-4. Setup Menu Options

```
Change Setup:
 0 Server
 1 Channel 1
 2 Channel 2
 3 E-mail
 5 Expert
 6 Security
 7 Defaults
 8 Exit without save
 9 Save and exit
                                Your choice ?
```

- Select an option on the menu by entering the number of the option in the **Your choice ?** field and pressing **Enter**.
- View the current configuration by pressing **Enter** from the Change Setup menu.
- To enter a value for a parameter, type the value and press **Enter**. To confirm a current value, press **Enter** (without inputted parameters).
- When finished, save the new configurations (**9 Save and exit**). The unit reboots.

## Server Configuration

The unit's basic server (i.e. network) values display upon selecting **Server** (option **0** from the Change Setup menu). The following sections describe the configurable parameters within the Server configuration menu.

### Set the IP Address

If DHCP is not used to assign IP addresses, enter it manually. The IP address must be set to a unique value in the network. Enter each octet and press **Enter** between each section inputted. The current value is displayed in parentheses.

```
IP Address : (000) (000) (000) (000) _
```

### Set the Gateway IP Address

The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network.

The default is **N** (No), indicating the gateway address has not been set. To set the gateway address, type **Y**. At the prompt, enter the gateway address.

```
Set Gateway IP Address (N) ? Y
Gateway IP addr (000) (000) (000) (000) _
```

### Set the Netmask

A netmask defines the number of bits taken from the IP address that are assigned for the host part.

```
Netmask: Number of Bits for Host Part (0=default) (0) _
```

The unit prompts for the number of host bits to be entered, then calculates the netmask, which displays in standard decimal-dot notation when the saved parameters are displayed (for example, 255.255.255.0).

Table 5-1. Standard IP Network Netmasks Representing Host Bits

Network Class	Host Bits	Netmask
A	24	255.0.0.0
B	16	255.255.0.0
C	8	255.255.255.0

### Set DNS Server IP Address

The DNS server allows the name of a remote machine to be resolved automatically. The default is N (No), indicating the DNS server address has not been set. To set the DNS server address, type Y. At the prompt, enter the DNS server address. If the device is DHCP enabled, the DHCP server provides the DNS server IP address, which will override this configured value.

**Note:** This setting is applicable only in Manual Connection mode.

```
Set DNS Server IP addr (N) ?
```

### Change Telnet/Web Manager Password

Setting the Telnet configuration password prevents unauthorized access to the setup menu via a Telnet connection to port 9999 or via web pages.

Please protect your device from unauthorized access and follow the instructions below:

- ◆ Always select **Y** to enable Telnet/Web Manager password
- ◆ Enable the enhanced password setting and create a strong 16-character password. For details, see [Security Settings](#) on page 51.

**Note:** We do not recommend that you only use the 4-character basic password as it does not offer sufficient security. Using no password is very dangerous.

```
Change Telnet/Web Manager password (N) ? _
```

### DHCP Name

If a DHCP server has automatically assigned the IP address and network settings, discover the unit by using the DeviceInstaller network search feature.

There are three methods for assigning DHCP names to the unit.

- ◆ **Default DHCP Name:** If the DHCP name is not changed and the IP is 0.0.0.0, then the DHCP name defaults to CXXXXXX (XXXXXX is the last 6 digits of the MAC address shown on the label on the bottom/side of the unit). For example, if the MAC address is 00-20-4A-12-34-56, then the default DHCP name is C123456.
- ◆ **Custom DHCP Name:** Create your own DHCP name. If using an IP address of 0.0.0.0, then the last option in Server configuration is **Change DHCP device name**. This option allows you to change the DHCP name to an alphanumeric name (LTX in the example).

```
Change DHCP device name (not set) ? (N) Y
Enter DHCP FQDN option : (N) ?
```

- ◆ **Numeric DHCP Name:** You can change the DHCP name by specifying the last octet of the IP address. When you use this method, the DHCP name is LTXYY where YY is what you chose for the last octet of the IP address. If the IP address you specify is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2-digit numbers (0-99).
- ◆ The third octet of the IP address sets the BootP/DHCP/AutoIP options. To disable an option, set the appropriate bit:

#### 5-2. BootP/DHCP/AutoIP options

Options	Bit
AutoIP	0
DHCP	1
BootP	2

- ◆ For example, if the third octet is 0.0.5.0, the AutoIP and BootP options are disabled; only DHCP is enabled. (The value 5 results from adding the binary equivalents of 0 and 2.) This is the most common setting when using DHCP.

## Channel 1 and Channel 2 Configuration

Select option **1 Channel 1** or **2 Channel 2** from the Change Setup menu to define how the serial port responds to network and serial communications. The following sections describe the configurable parameters within the Channel configuration menu.

**Table 5-3. Serial and Telnet Port Parameters**

```

Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?
Send '+++ ' in Modem Mode (Y) ?
Show IP addr after 'RING' (Y) ?
Auto increment source port (N) ?
Remote IP Address : (000) . (000) . (000) . (000)
Remote Port (0) ?
DisConnMode (00) ?
FlushMode (00) ?
DisConnTime (00:00) ? :
SendChar 1 (00) ?
SendChar 2 (00) ?

```

### Baudrate

The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200, 230400, 460800, or 921600. The current value is displayed in parentheses.

```
Baudrate (9600) ? _
```

### I/F (Interface) Mode

The Interface (I/F) Mode is a bit-coded byte entered in hexadecimal notation. The current value is displayed in parentheses.

```
I/F Mode (4C) ? _
```

**Note:** RS-422 and RS-485 are available on Channel 2 only if the WiPort NR embedded device server is used with the WiPort NR evaluation board. Otherwise, RS-422 and RS-485 functions are available on only one channel; depending on which channel the drivers were added, these functions are available on either channel 1 or channel 2.

The following table displays available I/F Mode options:

**Table 5-4. Interface Mode Options**

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232 <sup>(1)</sup>							0	0
RS-422 4-wire							0	1
RS-485 2-wire							1	1
7 Bit					1	0		
8 Bit					1	1		
No Parity			0	0				
Even Parity			1	1				
Odd Parity			0	1				
1 stop bit	0	1						
2 stop bits <sup>(1)</sup>	1	1						

(1) 2 stop bits are implemented by the software. This might influence performance.

The following table demonstrates some common I/F Mode settings:

**Table 5-5. Common Interface Mode Settings**

Common I/F Mode Setting	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit	0111 1000	78
RS-485 2-wire, 8-bit, No Parity, 1 stop bit	0100 1111	4F
RS-422, 8-bit, Odd Parity, 1 stop bit	0101 1101	5D

## Flow

Flow control sets the local handshaking method for stopping serial input/output. The current value is displayed in parentheses.

```
Flow (0) ? _
```

Use the following table to select flow control options:

Table 5-6. Flow Control Options

Flow Control Option	Hex
No flow control	00
XON/XOFF flow control	01
Hardware handshake with RTS/CTS lines	02
XON/XOFF pass characters to host	05

### Port Number

The **Port No** setting represents the source port number in TCP connections. It is the number that identifies the channel for remote initiating connections. The port number functions as the TCP/UDP source port number for outgoing packets. Packets sent to the unit with this port number are received to this channel. The port number selected is the Incoming TCP/UDP port and Outgoing TCP/UDP source port.

```
Port No (10001) ? _
```

The current value is displayed in parentheses. The default setting for Port 1 is 10001. The range is 1-65535, except for the following reserved port numbers:

Table 5-7. Reserved Port Numbers

Port Numbers	Reserved for
1 – 1024	Reserved
9999	Telnet setup
14000-14009	Reserved for Redirector
30704	Reserved (77F0h)
30718	Reserved (77FEh)

**Note:** It is recommended to not use the reserved port numbers for this setting as incorrect operation may result.

Use Port 0 for the outgoing local port to change with each connection. The port range is 50,000 to 59,999. Each subsequent connection increments the number by 1 (it wraps back around to 50,000).

Only use this automatic port increment feature to initiate a connection using TCP. Set the port to a non-zero value when the unit is in a passive mode or when using UDP instead of TCP.

### Connect Mode

Connect Mode defines the unit's connection method and its reaction to incoming connections over the network. The current value is displayed in parentheses.

```
ConnectMode (C0) ? _
```

Enter Connect Mode options in hexadecimal notation:

Table 5-8. Connect Mode Options

Connect Mode Option	7	6	5	4	3	2	1	0
---------------------	---	---	---	---	---	---	---	---

Connect Mode Option	7	6	5	4	3	2	1	0
<b>a) Incoming Connection</b>								
Never accept incoming	0	0	0					
Accept with modem_control_in Active	0	1	0					
Always Accept	1	1	0					
<b>b) Response</b>								
Nothing (quiet)				0				
Character response (C=connect, D=disconnect, N=unreachable)				1				
<b>c) Active Startup</b>								
No active startup					0	0	0	0
With any character					0	0	0	1
With modem_control_in Active					0	0	1	0
With a specific start character					0	0	1	1
Manual connection					0	1	0	0
Autostart					0	1	0	1
Hostlist	0	0	1	0				
<b>d) Datagram Type</b>								
Directed UDP					1	1	0	0
<b>e) Modem Mode</b>								
No Echo			0	0		1	1	
Echo & Modem Response (Numeric)			0	1		1	1	1
Echo & Modem Response (Verbose)			0	1		1	1	0
Modem Response Only (Numeric)			0	0	1	1	1	1
Modem Response Only (Verbose)			0	0	1	1	1	0

**Incoming Connection**

<b>Never Accept Incoming</b>	Rejects all external connection attempts.
<b>Accept with modem_control_in Active</b>	Accepts external connection requests only when the modem_control_in input is asserted. Cannot be used with Modem Mode.
<b>Always Accept</b>	Accepts any incoming connection when a connection is not already established. Default setting.

<b>Response</b>	
<b>Character Response</b>	A single character is transmitted to the serial port when there is a change in connection state: C = connected, D = disconnected, N = host unreachable. This option is overridden when the Active Start Modem Mode or Active Start Host List is in effect. Default setting is Nothing (quiet).
<b>No Active Startup</b>	Does <i>not</i> attempt to initiate a connection. Default setting.
<b>With Any Character</b>	Attempts to connect when any character is received from the serial port.
<b>Accept with modem_control_in Active</b>	Attempts to connect when the modem_control_in input changes from not asserted to asserted.
<b>With a Specific Start Character</b>	Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return.
<b>Manual Connection</b>	<p>Attempts to connect when directed by a command string received from the serial port. The first character of the command string must be a <b>C</b> (ASCII 0x43), and the last character must be either a carriage return (ASCII 0x0D) or a line feed (0x0A). No blanks or space characters may be in the command string. Between the first and last command string characters must be a full or partial destination IP address and can include a destination port number.</p> <p>The IP address must be in standard dot-decimal notation and may be a partial address, representing the least significant 1, 2, or 3 bytes of the remote IP address. The period is required between each pair of IP address numbers.</p> <p>If present, the port number must follow the IP address, must be presented as a decimal number in the range 1-65535, and must be preceded by a forward slash (ASCII 0x2F). The slash separates the IP address and the port number. If you omit the port number from a command string, the internally stored remote port number starts a connection.</p> <p>If a partial IP address is presented in a command string, it is interpreted to be the least significant bytes of the IP address and uses the internally stored remote IP address to provide the most significant bytes of the IP address. If the IP address entered is 0.0.0.0/0, the device server enters Monitor Mode.</p> <p>For example, if the remote IP address already configured in the unit is 129.1.2.3, then an example command string would be C3/7. (This would connect to 129.1.2.3 and port 7.) You may also use a different ending for the connection string. For example, C50.1/23 would connect you to 129.1.50.1 and port 23.</p>

Table 5-9. Manual Connection Address Example

<b>Command String</b>	<b>Result if remote IP is 129.1.2.3 and remote port is 1234</b>
C121.2.4.5/1	Complete override; connection is started with host 121.2.4.5, port 1

Command String	Result if remote IP is 129.1.2.3 and remote port is 1234
C5	Connects to 129.1.2.5, port 1234
C28.10/12	Connects to 129.1.28.10, port 12
C0.0.0.0/0	Enters Monitor Mode

<b>Autostart (Automatic Connection)</b>	The unit automatically attempts a connection to the remote IP address and port after booting up.
<b>Hostlist</b>	<p>If this option is set to True, the device server scrolls through the host list until it connects to the first available device listed in the host list table. Once it connects, the unit stops further attempts. If this connection fails, the unit continues to scroll through the table until it is able to connect to the next available IP address in the host list.</p> <p>Hostlist supports a minimum of 1 and a maximum of 12 entries. Each entry contains the IP address and the port number.</p> <p>The hostlist is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled.</p>

Figure 5-5. Hostlist Example

```

Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?25

Hostlist :

No Entry !

Change Hostlist ? (N) Y
01. IP address : (000) 172.(000) 19.(000) 0.(000) 1      Port :
(0) ?23
02. IP address : (000) 172.(000) 19.(000) 0.(000) 2      Port :
(0) ?3001
03. IP address : (000) 172.(000) 19.(000) 0.(000) 3      Port :
(0) ?10001
04. IP address : (000) .(000) .(000) .(000)

Hostlist :
01. IP : 172.019.000.001  Port : 00023
02. IP : 172.019.000.002  Port : 03001
03. IP : 172.019.000.003  Port : 10001

Change Hostlist ? (N) N

Hostlist Retrycounter (3) ?
Hostlist Retrytimeout (250) ?
DisConnMode (00) ?
FlushMode (00) ?
DisConnTime (00:00) ?:
SendChar 1 (00) ?
SendChar 2 (00) ?

```

To enable the hostlist:

1. Enter a **Connect Mode** of 0x20. The menu shows a list of current entries already defined in the product.
2. To delete, modify, or add an entry, select **Yes**. If entering an IP address of 0.0.0.0, that entry and all others after it are deleted.

3. After completing the hostlist, repeat the previous step if necessary to edit the hostlist again.
4. For **Retrycounter**, enter the number of times the Lantronix unit should try to make a good network connection to a hostlist entry that it has successfully ARPed. The range is 1-15, with the default set to 3.
5. For **Retrytimeout**, enter the number of milliseconds the unit should wait before failing an attempted connection. The time is stored as units of milliseconds in the range of 10-65535. The default is 250.

### Datagram Type

<b>Directed UDP</b>	<p>When selecting this option, you are prompted for the Datagram type. Enter <b>01</b> for directed or broadcast UDP. Datagrams of type 01 can be sent as a broadcast by enabling the <b>Send as Broadcast</b> option. The default is not to broadcast.</p> <p><b>Note:</b> <i>Datagrams are sent as subnet-directed broadcasts.</i></p> <p>When the UDP option is in effect, the unit never attempts to initiate a TCP connection because it uses UDP datagrams to send and receive data.</p>
---------------------	--

### Modem Mode

In Modem (Emulation) Mode, the unit presents a modem interface to the attached serial device. It accepts AT-style modem commands, and handles the modem signals correctly.

Normally, there is a modem connected to a local PC and a modem connected to a remote machine. A user must dial from the local PC to the remote machine, accumulating phone charges for each connection. Modem Mode allows you to replace modems with WiPort NR embedded device servers, and to use an Ethernet connection instead of a phone call. By not having to change communications applications, you avoid potentially expensive phone calls.

To select Modem Mode, set the Connect Mode to **C6** (no echo), **D6** (echo with full verbose), **D7** (echo with numeric response), **CF** (modem responses only, numeric response), or **CE** (modem responses only, full verbose).

**Note:** *If the unit is in Modem Mode, and the serial port is idle, the unit can still accept network TCP connections to the serial port if Connect Mode is set to **C6** (no echo), **D6** (echo with full verbose), **D7** (echo with numeric response), **CF** (modem responses only, numeric response), or **CE** (modem responses only, full verbose).*

<b>Without Echo</b>	In Modem Mode, echo refers to the echo of all of the characters entered in command mode; it does not mean to echo data that is transferred. Quiet Mode (without echo) refers to the modem not sending an answer to the commands received (or displaying what was typed).
<b>Echo &amp; Modem Response</b>	<p><b>Full Verbose:</b> The unit echoes modem commands and responds to a command with a message string shown in the table below.</p> <p><b>Numeric Response:</b> The unit echoes modem commands and responds to a command with a numeric response.</p>
<b>Modem Responses Only</b>	<b>Full Verbose:</b> The unit responds to a command with a message string shown in the table below.

	<b>Numeric Response:</b> The unit responds to a command with a numeric response.
--	--

Table 5-10. Modem Mode Messages

Message	Meaning
<b>Full Verbose</b>	
OK	Command was executed without error.
CONNECT	A network connection has been established.
NO CARRIER	A network connection has been closed.
RING n.n.n.n.	A remote device, having IP address n.n.n.n, is connecting to this device.
<b>Numeric Response</b>	
0	OK
1	Connected
2	Ring
3	No Carrier
4	Error

Received commands must begin with the two-character sequence **AT** and be terminated with a carriage return character.

The unit ignores any character sequence received *not* starting with **AT**, and only recognizes and processes single **AT**-style commands. The unit treats compound **AT** commands as unrecognized commands.

If the **Full Verbose** option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly (begins with **AT** and ends with carriage return) with the "OK" message and takes no further action.

If the **Numeric Response** option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly with the "OK" message and takes no further action.

When an active connection is in effect, the unit transfers data and does not process commands received from the serial interface.

When a connection is terminated or lost, the unit reverts to command mode.

When an active connection is in effect, the unit terminates the connection if it receives the following sequence from the attached serial device:

- ◆ No serial data is received for one second.
- ◆ The character sequence +++ is received, with no more than one second between each two characters.
- ◆ No serial data is received for one second after the last + character. At this time, the unit responds affirmatively per the selected echo/response mode.

- ◆ The character string **ATH** is received, terminated with a carriage return. The unit responds affirmatively according to the selected echo/response mode and drops the network connection. The serial interface reverts to accepting command strings.

If this sequence is not followed, the unit remains in data transfer mode.

**Table 5-11. Modem Mode Commands**

Modem Mode Command	Function
ATDTx.x.x.x,pppp or ATDTx.x.x.x/pppp	Makes a connection to an IP address (x.x.x.x) and a remote port number (pppp).
ATDTx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATD0.0.0.0	Forces the unit into Monitor Mode. Uses remote IP address and port settings to initiate a connection.
ATD or ATDT	Forces the unit into Monitor Mode. Uses remote IP address and port settings to initiate a connection.
ATDx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATH	Hangs up the connection (Entered as +++ ATH ).
ATS0=n	Enables or disables connections from the network going to the serial port. n=0 disables the ability to make a connection from the network to the serial port. n=1-9 enables the ability to make a connection from the network to the serial port. n>9 is invalid.
ATEn	Enables or disables character echo and responses. n=0 disables character echo and responses. n=1 enables character echo and responses.
ATVn	Enables numeric response or full verbose. n=0 enables numeric response. n=1 enables full verbose.

**Note:** The unit recognizes these AT commands as single commands such as ATE0 or ATV1; it does not recognize compound commands such as ATE0V.

### Send the Escape Sequence (+++) in Modem Mode

Send `+++` in Modem Mode (Y) ? \_

Disable or enable the WiPort NR embedded device server's ability to send the escape sequence. The default is **Y** (Yes) (send the escape sequence).

## Show IP Address After RING

```
Show IP addr after 'RING' <Y> ?
```

Disable or enable the WiPort unit's ability to show the IP address after RING in Modem Mode. The default is Y (Yes) (shows the IP address).

## Auto Increment Source Port

```
Auto increment source port (N) ? _
```

Y (Yes) auto increment the source port. The WiPort NR embedded device server increments the port number used with each new connection.

## Remote IP Address

This is the destination IP address used with an outgoing connection.

```
Remote IP Address : (000) (000) (000) (000)_
```

**Note:** This option is not displayed when Hostlist is enabled from the **ConnectMode** prompt (see page 37 for more information).

## Remote Port

Set the remote TCP port number for the unit to make outgoing connections. This parameter defines the port number on the target host to which a connection is attempted.

```
Remote Port (0) ? _
```

To connect an ASCII terminal to a host using the unit for login purposes, use the remote port number 23 (Internet standard port number for Telnet services).

**Note:** This option is not displayed when Hostlist is enabled from the **ConnectMode** prompt (see page 37 for more information).

## DisConnMode

Disconnect Mode (DisConnMode) determines the conditions under which the unit will cause a network connection to terminate. The current value is displayed in parentheses.

```
DisConnMode (00) ? _
```

In DisConnMode, modem\_control\_in either drops the connection or is ignored. The following table displays the available input options:

**Table 5-12. Disconnect Mode Options**

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with modem_control_in drop <sup>(6)</sup>	1							
Ignore modem_control_in	0							
Telnet mode and terminal type setup <sup>(1)</sup>		1						
Channel (port) password <sup>(2)</sup>				1				

Disconnect Mode Option	7	6	5	4	3	2	1	0
Hard disconnect <sup>(3)</sup>					0			
Disable hard disconnect					1			
State LED off with connection <sup>(4)</sup>								1
Disconnect with EOT (^D) <sup>(5)</sup>			1					

(1) The WiPort NR embedded device server sends the "Terminal Type" upon an outgoing connection.

(2) A password is required for a connection to the serial port from the network.

(3) The TCP connection closes even if the remote site does not acknowledge the disconnection.

(4) When there is a network connection to or from the serial port, the state LED turns off instead of blinking.

(5) When **Ctrl D** or Hex 04 is detected, the connection is dropped. Both Telnet mode and Disconnect with EOT must be enabled for Disconnect with EOT to function properly. **Ctrl D** is only detected going from the serial port to the network.

(6) When modem\_control\_in transitions from a high state to a low state, the network connection to or from the serial port drops.

### Flush Mode

The FlushMode (buffer flushing) parameter controls line handling and network buffers with connection startup and disconnect.

```
FlushMode (00) ? _
```

Select between two different packing algorithms (the current configuration is displayed within the parentheses). Available Flush Mode options are:

Table 5-13. Flush Mode Options

Function	7	6	5	4	3	2	1	0
<b>Input Buffer (Serial to Network)</b>								
Clear with a connection that is initiated from the device to the network				1				
Clear with a connection initiated from the network to the device			1					
Clear when the network connection to or from the device is disconnected		1						
<b>Output Buffer (Network to Serial)</b>								
Clear with a connection that is initiated from the device to the network								1
Clear with a connection initiated from the network to the device							1	
Clear when the network connection to or from the device is disconnected						1		
<b>Alternate Packing Algorithm (Pack Control)</b>								
Enable	1							

**Pack Control**

The packing algorithm defines how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream.

Pack control settings are enabled in Flush Mode. Set this value to 00 if specific functions are not needed.

**Table 5-14. Pack Control Options**

Option	7	6	5	4	3	2	1	0
<b>Packing Interval</b>								
Interval: 12ms							0	0
Interval: 52ms							0	1
Interval: 250ms							1	0
Interval: 5sec							1	1
<b>Trailing Characters</b>								
None					0	0		
One					0	1		
Two					1	0		
<b>Send Characters</b>								
2-Byte Send Character Sequence				1				
Send Immediately After Send chars			1					

**Packing Interval:** Packing Interval defines how long the unit should wait before sending accumulated characters. This wait period is between successive network segments containing data. For alternate packing, the default interval is 12 ms.

**Trailing Characters:** In some applications, CRC, Checksum, or other trailing characters follow the end-of-sequence character; this option helps to adapt frame transmission to the frame boundary.

**Send Characters:**

- ◆ If **2-Byte Send Character Sequence** is enabled, the unit interprets the sendchars as a 2-byte sequence; if this option is not enabled, the unit interprets them independently.
- ◆ If **Send Immediately After Characters** is not set, any characters already in the serial buffer are included in the transmission after a "transmit" condition is found. If this option is set, the unit sends immediately after recognizing the transmit condition (sendchar or timeout).

**Note:** A transmission might occur if status information needs to be exchanged or an acknowledgment needs to be sent.

### DisConnTime (Inactivity Timeout)

Use this parameter to set an inactivity timeout. The unit drops the TCP connection to port 10001/10002\* if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds.

**Note\*:** The default port number for Port 1 is 10001 and 10002 for Port 2. However, port numbers may be set to a different value.

```
DisConnTime (0: 0) ?:
```

To disable the inactivity timeout, enter **00:00**. Range is 0 (disabled) to 5999 seconds (99 minutes, 59 seconds). The default is 0.

### SendChar 1 and SendChar 2

Enter up to two characters in hexadecimal representation.

```
SendChar 1 ( 0) ? _
SendChar 2 ( 0) ? _
```

If the unit receives a character on the serial line that matches one of these characters, it sends the character immediately, along with any awaiting characters, to the TCP connection. This action minimizes the response time for specific protocol characters on the serial line (for example, ETX, EOT). Setting the first SendChar to **00** disables the recognition of the characters. Alternatively, the unit can interpret two characters as a sequence (see [Pack Control](#) on page 47).

### Telnet Terminal Type

This parameter displays only if the terminal type option is enabled in Disconnect Mode. If this option is enabled, use the terminal name for the Telnet terminal type. Enter only one name.

If the terminal type option is enabled, the unit also reacts to the EOR (end of record) and binary options, which can be used for applications such as terminal emulation to UNIX hosts.

### Channel (Port) Password

This parameter appears only if the channel (port) password option is enabled in Disconnect Mode. If the option is enabled, set a password on the serial port.

## Email Configuration

The unit sends an Email to multiple recipients when a specific trigger event occurs. There are three separate triggers, based on any combination of the configurable pins (PIO) when selected as user I/O functions. Optionally, use a two-byte serial string to initiate a trigger. To configure Email configuration settings, select option **3 Email** from the Change Setup menu.

Figure 5-6. Email Settings

```
Mail server (0.0.0.0) ? (000) .(000) .(000) .(000)
Unit name () ?
Domain name () ?
Recipient 1 () ?
Recipient 2 () ?
```

```

- Trigger 1
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?

- Trigger 2
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?

- Trigger 3
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?

```

## Mail Server

Enter the IP address of the mail server. Enter each 3-digit section and press **Enter** between each section inputted. The current value is displayed in parentheses.

```
Mail server (0.0.0.0) ? (000) .(000) .(000) .(000)
```

Enter the username used by the WiPort NR embedded device server to send Email messages. The current value is displayed in parentheses. **Note:** Do not use spaces in the name.

```
Unit name () ?
```

## Domain Name

Enter the Email server's domain name. The current value is displayed in parentheses.

```
Domain name () ? _
```

## Recipient 1

Enter the full Email address of the trigger email recipient. The current value is displayed in parentheses.

```
Recipient 1 () ? _
```

## Recipient 2

Enter the full Email address of the trigger email recipient. The current value is displayed in parentheses.

```
Recipient 2 ( ) ? _
```

## Trigger 1

A trigger event occurs when the unit receives the specified trigger input because of a specified combination of conditions on the configurable pins.

```
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input1 [A/I/X] (X) ?
Trigger input1 [A/I/X] (X) ?
Message ( ) ?
Priority (L) ?
Minimum notification interval (1 s) ?
Re-notification interval (0 s) ?
```

Set the configurable pins to **A** = Active, **I** = Inactive, or **X** = Don't Care. Active can mean Active Low or Active High. If the configurable pins are all set to **X** (Don't Care), then they are disabled. If both the serial sequence and the configurable pins are disabled, the trigger is disabled.

To change the configurable pins' settings, send setup records to Port 77FE.

The **Message** is the subject line of the trigger event Email to the specified recipient(s).

The **Priority** is the priority level for the trigger even Email. Enter **L** for normal priority or **H** for high priority.

The **Minimum notification interval** is the minimum time allowed between individual triggers. If a trigger event occurs within the minimum interval since the last trigger, it is ignored.

The **Re-notification interval** indicates the time interval in which a new Email message is sent to the recipient(s) when a single trigger event remains active.

## Trigger 2

Refer to [Trigger 1](#) for details on completing these fields.

**Note:** Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit will send the Email.

## Trigger 3

Refer to [Trigger 1](#) for details on completing these fields.

**Note:** Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit will send the Email.

## Expert Settings

**Note:** Change these settings via Telnet or serial connections only.

### TCP Keepalive Time

TCP Keepalive time defines how many seconds the unit waits during a silent connection before checking whether the currently connected network device is still on the network. If the unit does not receive a response, it drops that connection.

```
TCP Keepalive time in s (1s - 65s; 0s=disable): (45) ?
```

### ARP Cache Timeout

When the unit communicates with another device on the network, it adds an entry into its ARP table. ARP Cache timeout defines the number of seconds (1-600) the unit waits before timing out this table.

```
ARP Cache timeout in s (1s - 600s) : (600) ?
```

### CPU Performance

Select the WiPort NR performance mode. Higher performance settings require more energy. **Low** is 26 Mhz, **Regular** is 48 Mhz, **High** is 88 Mhz. The default is **Regular**.

```
CPU performance (0=Regular, 1=Low, 2=High): (0) ?
```

### Disable Monitor Mode

Disables entry into Monitor Mode via the **yyy** or **xx1** key sequence at startup. This command prevents the unit from entering Monitor Mode by interpreting the stream of characters that are received during the device server's initialization at startup. The default is **N** (No).

```
Disable Monitor Mode @ bootup (N) ?
```

### HTTP Port Number

This option allows the configuration of the web server port number. The valid range is 1-65535. The default HTTP server port number is 80.

```
HTTP Port Number : (80) ? _
```

### SMTP Port Number

This option allows the configuration of the SMTP port number. The valid range is 1-65535. The default HTTP server port number is 25.

```
SMTP Port Number : (25) ? _
```

### MTU Size

The Maximum Transmission Unit (MTU) is the largest physical packet size a network can transmit for TCP and UDP. Enter between **512** and **1400** bytes. The default is **1400** bytes.

```
MTU Size (512 - 1400): (1400) ?
```

### TCP Re-transmission Timeout

This feature allows the configuration of the desired TCP re-transmission timeout value. If the ACK is not received for a packet sent from the WiPort NR unit, then the unit will retransmit the data. The valid range is 500-4000 msec with 500 msec as default.

```
TCP Re-transmission Timeout (500 - 4000) (ms) : (500) ?
```

### Alternate MAC Address

If necessary, enable the alternate MAC address (if specified in the OEM setup record).

```
Enable alternate MAC (N) ? _
```

### Ethernet Connection Type

The WiPort NR device server allows for the Ethernet speed to be manually configured. Enter **0** for automatic negotiation (default). To select the speed and duplex, enter one of the following: **2** (10Mbit/half duplex), **3** (10Mbit/full duplex), **4** (100Mbit/half duplex), or **5** (100Mbit/full duplex).

```
Ethernet connection type: (0) ? _
```

## Security Settings

Security settings can only be changed via the setup menu (telnet or serial).

**Caution:** It is recommended to set security over a dedicated network or over the serial setup, to prevent eavesdropping.

**Note:** To prevent any unauthorized access from the network, disable the Telnet setup, port 77FE, and the Web setup features.

### Disable SNMP

For security purposes, disable SNMP (if required) on the WiPort NR unit. The current setting is displayed in parentheses.

```
Disable SNMP (N) ? _
```

### SNMP Community Name

The SNMP Community Name is a required field for NMS to read or write to a device. Enter a string of 1 to 13 characters.

```
SNMP Community Name (public) : _
```

The default entry is **public**. The current value is displayed in parentheses.

### Disable Telnet Setup

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables access to the Setup menu via Telnet to port 9999.

```
Disable Telnet Setup (N) ? _
```

### Disable TFTP Firmware Upgrade

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables TFTP for network firmware upgrades.

```
Disable TFTP Firmware Update (N) : _
```

### Disable Port 77FE (Hex)

Custom programs use Port 77FE to configure the unit remotely. If required, disable this capability for security purposes.

```
Disable Port 77FEh (N) ? _
```

The default setting is the **N** (No) option, which enables remote configuration.

### Disable Web Server

The **Y** (Yes) option disables the web server. This setting defaults to the **N** (option).

```
Disable Web Server (N) ? _
```

### Disable Web Setup

The **Y** (Yes) option disables configuration via the Web Manager. This setting defaults to the **N** (option).

```
Disable Web Setup (N) ? _
```

### Disable ECHO Ports

This setting controls whether port 7 echoes characters it receives.

```
Disable ECHO ports (Y) ? _
```

### Enable Encryption

Rijndael is the block cipher algorithm chosen by the National Institute of Science and Technology (NIST) as the Advanced Encryption Standard (AES) to be used by the US government. The WiPort NR device supports 128-, 192-, and 256-bit encryption key lengths.

**Note:** Configuring encryption should be done through a local connection to the serial port of the WiPort NR device server, or via a secured network connection. Initial configuration information including the encryption key is sent in clear text over the network.

To configure AES encryption on WiPort NR module:

```
Enable Encryption (N) ?
Enable Enhanced Password (N) ?
Disable Port 77F0h (N) ?
```

Enable Encryption	This option enables AES encryption for tunneling only.
Key Length in bits	Valid options are 128, 192 and 256 bits.

Change key	Select to modify the current AES encryption key. The default is <b>N</b> (No).
Enter key	If you selected <b>Change Key</b> , enter the key (at the <b>Enter Key</b> prompt) in hexadecimal numbers. Enter 32 characters for 128 bits key length, 48 characters for 192 bits key length, or 64 characters for 256 bits key length.

Encryption only applies to the port selected for data tunneling (default 10001), regardless of whether you are using TCP or UDP.

Generally, one of two situations applies:

- ◆ Encrypted WiPort NR to WiPort NR device communication. Be sure to configure both devices with the same encryption key.
- ◆ Third-party application to WiPort NR -encrypted communication: WiPort NR device uses standard AES encryption protocols. To communicate successfully, products and applications on the peer side must use the same protocols and the same encryption key as the WiPort NR serial-to-Ethernet device server.

Lantronix Secure Com Port Redirector provides an encrypted connection from Windows-based applications to the WiPort NR device server. Information about SCPR is at <http://www.lantronix.com/device-networking/utilities-tools/scpr.html>.

### Enable Enhanced Password

The Enhanced Password setting allows you to set a password of up to 16 characters for protecting Telnet and Web Page access. We recommend that you select the **Y** (Yes) option and enable the enhanced password setting.

Avoid using either the 4 character basic password setting or no password at all as they are not secure options.

```
Enable Enhanced Password (N) ?
```

### Disable Port 77F0 (Hex)

Port 77F0 allows a custom application to query or set the eleven WiPort NR configurable pins when they are functioning as general purpose I/O (GPIO). Disable this capability, if desired, for security purposes.

```
Disable Port 77F0h (N) ?
```

The default setting, the **N** (No) option, enables GPIO control. The **Y** (Yes) option disables the GPIO control interface.

## Default Settings

Select **7 Defaults** from the Change Setup menu to reset the unit's Channel 1 configuration, Channel 2 configuration, E-mail settings, and Expert settings to the factory default settings. The server configuration settings for IP address, gateway IP address, and netmask remain unchanged. The configurable pins' settings also remain unchanged. The specific settings this option changes are listed below.

**Note:** Though enhanced password is disabled by default, we recommend that you always enable the enhanced password setting and create a strong 16 character password. See [Security Settings](#) on page 51.

**Channel 1 Configuration**

<b>Baudrate</b>	9600
<b>I/F Mode</b>	4C (1 stop bit, no parity, 8 bit, RS-232C, no flow control)
<b>Port No</b>	10001
<b>Connect Mode</b>	C0 (always accept incoming connection; no active connection startup)
<b>Hostlist Retry Counter</b>	3
<b>Hostlist Retry Timeout</b>	250 (msec)
<b>Send Character</b>	0x0D (CR)
<b>All other parameters</b>	0

**Channel 2 Configuration**

<b>Baudrate</b>	9600
<b>I/F Mode</b>	4C (1 stop bit, no parity, 8 bit, RS-232C, no flow control)
<b>Port No</b>	10002
<b>Connect Mode</b>	C0 (always accept incoming connection; no active connection startup)
<b>Hostlist Retry Counter</b>	3
<b>Hostlist Retry Timeout</b>	250 (msec)
<b>Send Character</b>	0x0D (CR)
<b>All other parameters</b>	0

**Expert Settings**

<b>TCP Keepalive</b>	45 (seconds)
<b>ARP Cache Timeout</b>	600 (seconds)
<b>CPU Performance</b>	0 (Regular)
<b>Disable Monitor Mode</b>	(N) No
<b>HTTP Port Number</b>	80
<b>SMTP Port Number</b>	25
<b>MTU Size</b>	1400
<b>TCP Re-transmission Timeout</b>	500 (milliseconds)
<b>Alternate MAC</b>	Disabled (for OEM use only)

<b>Ethernet Connection Type</b>	0 (auto negotiate)
---------------------------------	--------------------

### Security Settings

<b>Disable SNMP</b>	No
<b>SNMP Community Name</b>	public
<b>Disable Telnet Setup</b>	No
<b>Disable TFTP Firmware Update</b>	No
<b>Disable Port 77FEh</b>	No
<b>Disable Web Server</b>	No
<b>Disable Web Setup</b>	No
<b>Disable ECHO ports</b>	Yes
<b>Enable Encryption</b>	No
<b>Enable Enhanced password</b>	No
<b>Disable Port 77F0h</b>	No

### Email Settings

<b>Trigger Priority</b>	L
<b>Min. notification interval</b>	1 second
<b>All other parameters</b>	0 (e.g. Email notification and triggers are disabled)

## Exit Configuration Mode

To exit setup mode:

- ◆ Select option **9 Save and exit** from the Change Setup menu to save all changes and reboot the device. All values are stored in nonvolatile memory.
- or
- ◆ Select option **8 Exit without save** from the Change Setup menu to exit the configuration mode without saving any changes or rebooting.

## 6: Configurable Pins

The WiPort NR embedded device server has eleven pins configurable for General Purpose I/O (GPIO).

Use these GPIO pins to control devices such as relays, servers, lights, monitor switches, sensors, and even processes such as data transfer.

### Defaults Settings

- ◆ Function: general purpose input/output
- ◆ Direction: input
- ◆ Active Level: low

Set the functions for the eleven pins independently and in any combination. The initial directions (input/output) and active levels (low or high active) at boot up can also be configured through 77FE.

This chapter describes how the directions, active levels, and states can be dynamically controlled and probed through special port 77F0.

### Features

- ◆ TCP and UDP can be used.
- ◆ The protocol supports up to 32 GPIO for future products.
- ◆ Function configuration can be retrieved.
- ◆ Input or output selection can be retrieved and controlled.
- ◆ Active low or high selection can be retrieved and controlled.
- ◆ Active or inactive selection can be retrieved and controlled.
- ◆ 77F0 can be disabled.

Every change of state (active/inactive) requires a command over TCP or UDP, and thus is not very fast. If you use this port for data transfer, the throughput is low, usually up to 1Kbps.

## Control Protocol

The GPIO control protocol is a simple, proprietary protocol, which is described below.

### Guidelines

The GPIO control protocol is described from the PC side. *Send* means from PC to WiPort NR unit. *Response* comes from WiPort NR unit to PC.

The protocol allows for control of up to 11 GPIOs.

The parameters are four bytes long and represent GPIOs 0-31, with GPIO0 in bit 0 of the first byte (Little Endian). Parameter bits for configurable pins not configured as GPIOs are undefined for **Get** commands and ignored on **Set** commands.

Every command consists of nine bytes: one command type of one byte and two parameters of four bytes each.

	Command	Parameter 1								Parameter 2								
Byte	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Pin Number		0	7	8	15	16	23	24	31	0	7	8	15	16	23	24	31	

On some commands, one or all parameters are ignored.

For UDP, command type and parameters need to be in the same datagram.

Responses to valid commands are always five bytes long, consisting of the returned command byte and as parameters in the current or updated values. In case of an invalid command, only one byte with value 0FFh is returned.

	Command	Parameter 1									
Byte	0	1	2	3	4	5	6	7	8	9	10
Pin Number		0	7	8	15	16	23	24	31		

When sending a command (TCP and UDP), wait for the response before sending the next command.

## Commands

### Byte 0 Command Types

10h	Get functions
11h	Get directions (input or output)
12h	Get active levels (high active or low active)
13h	Get current states (active or not active)
19h	Set directions
1Ah	Set active levels
1Bh	Set current states

As you can, see there is no **Set functions** command. Since the pin's function depends on the hardware in which the WiPort NR device server is embedded, that configuration is only allowed via 77FE. Settings changed by any of the **Set** commands are not stored and are lost when the unit is powered down or rebooted.

### Command 10h, Get Functions

<b>Send:</b>	
	No parameters
<b>Response:</b>	
	1 parameter
	Bytes 1-4: Functions
Bit X	1 means general purpose IO available to the user.
	0 means dedicated function (e.g., serial flow control, diagnostics) for configurable pin X.

**Command 11h, Get Directions**

<b>Send:</b>	
	No parameters
<b>Response:</b>	
	1 parameter
	Bytes 1-4: Directions
Bit X	1 means GPIO X is an output.
	0 means it is an input.

**Command 12h, Get Active Levels**

<b>Send:</b>	
	No parameters
<b>Response:</b>	
	1 parameter
	Bytes 1-4: Active levels
Bit X	1 means GPIO X is active low (0V when active, 3.3V when inactive).
	0 means it is active high (3.3V when active, 0V when inactive).

**Command 13h, Get Current States**

<b>Send:</b>	
	No parameters
<b>Response:</b>	
	1 parameter
	Bytes 1-4: States
Bit X	1 means GPIO X is active
	0 means it is inactive.

**Command 19h, Set Directions**

<b>Send:</b>	
	2 parameters
	Bytes 1-4: Mask
Bit X	1 means the direction for GPIO X will be updated with the value in the second parameter.
	0 means the direction for that GPIO will not change.
	Bytes 5-8: New Directions
Bit X	1 means GPIO X will become an output.
	0 means it will become an input.
<b>Response:</b>	
	1 parameter
	Bytes 1-4: The updated directions

**Command 1Ah, Set Active Levels**

Send:	
	2 parameters
	Bytes 1-4: Mask
Bit X	1 means the direction for GPIO X will be updated with the value in the second parameter.
	0 means the active type for that GPIO will not change.
	Bytes 5-8: New Active Levels
Bit X	1 means GPIO X will become active low.
	0 means it will become active high.
Response:	
	1 parameter
	Bytes 1-4: Updated active levels

**Command 1Bh, Set States**

Send:	
	2 parameters
	Bytes 1-4: Mask
Bit X	1 means the state for GPIO X will be updated with the value in the second parameter.
	0 means the state for that GPIO will not change.
	Bytes 5-8: New States
Bit X	1 means GPIO X will become active.
	0 means it will become inactive.
Response:	
	1 parameter
	Bytes 1-4: Updated states

**Examples****Example 1: PC sends command 10h to find out which configurable pins are available as GPIO.**

PC -> WiPort NR: 10h, 00h, 00h, 00h, 00h, 00h, 00h, 00h, 00h

WiPort NR -> PC: 10h, 03h, 02h, 00h, 00h

**Command details:**

10h = command 10h

00h, 00h, 00h, 00h = ignored

00h, 00h, 00h, 00h = ignored

**Response details:**

10h = response to command 10h

03h, 02h, 00h, 00h =

bits 0, 1, and 9 are 0 → CP0, CP1, and CP9 are configured as GPIOs (i.e. GPIO0, GPIO1, GPIO9).

bits 2 to 8 and 10 are 0 → configured for a special function and are unavailable for control or monitoring by the user.

**Example 2: PC sends command 1Bh to change the current states of GPIO 0 and 1 (assuming they are configured as outputs).**

PC -> WiPort NR: 1Bh, 01h, 02h, 00h, 00h, 01h, 00h, 00h, 00h

WiPort NR -> PC: 1Bh, 01h, 00h, 00h, 00h

**Command details:**

1Bh = command 1Bh

01h, 00h, 00h, 00h = the mask that determines which GPIOs will be changed.

bit 0 and 9 are 1 → GPIO0 and GPIO9 will be changed.

bit 1 is 0 → GPIO1 will remain the same.

01h, 00h, 00h, 00h = the new states

bit 0 is 1 → GPIO0 will become 1.

bit 1 is ignored since it is masked out.

bit 0 is 0 → GPIO9 will become 0.

**Response details:**

1Bh = response to command 1Bh

01h, 00h, 00h, 00h =

bit 0 is 1 → GPIO0 = 1

bit 1 is 1 → GPIO1 = 1

bit 9 is 0 → GPIO9 = 0

## 7: Monitor Mode

Monitor Mode is a command-line interface used for diagnostic purposes.

There are two ways to enter Monitor Mode: locally via the serial port or remotely via the network.

### Entering Monitor Mode via the Serial Port

To enter Monitor Mode locally:

1. Follow the same steps used for setting the serial configuration parameters (see [Serial Port Access](#) on page 32).
  2. Instead of typing three **x** keys, however:
  3. Type **zzz** to enter Monitor Mode with network connections.
  4. Type **yyy** to enter Monitor Mode without network connections.
- A **0>** prompt indicates that you have successfully entered Monitor Mode.

### Entering Monitor Mode via the Network Port

To enter Monitor Mode using a Telnet connection:

1. Establish a Telnet session to the configuration port (9999). The following message appears:

```
MAC address 00204AFFFF30
Software version V6.9.0.4 (130628)

Press Enter for Setup Mode
```

2. Type M (upper case).

A **0>** prompt indicates that you have successfully entered Monitor Mode.

### Monitor Mode Commands

The following commands are available in Monitor Mode.

**Note:** All commands must be in capital letters.

Table 7-1. Monitor Mode Commands

Command	Command Name	Function
<b>VS</b>	Version	Queries software header record (16 bytes) of unit.
<b>GC</b>	Get Configuration	Gets configuration of unit as hex records (120 bytes).

Command	Command Name	Function
<b>SC</b>	Send Configuration	Sets configuration of unit from hex records.
<b>PI x.x.x.x</b>	Ping	Pings unit with IP address x.x.x.x to check device status.
<b>AT</b>	ARP Table	Shows the unit's ARP table entries.
<b>TT</b>	TCP Connection Table	Shows all incoming and outgoing TCP connections.
<b>NC</b>	Network Connection	Shows the unit's current IP address.
<b>RS</b>	Reset	Resets the unit.
<b>QU</b>	Quit	Exits diagnostics mode.
<b>G0, G1, Ge, Gf</b>	Get configuration from memory page	Gets a memory page of configuration information from the device.
<b>S0, S1, Se, Sf</b>	Set configuration to memory page	Sets a memory page of configuration information on the device.
<b>GM</b>	Get MAC address	Shows the unit's 6-byte MAC.
<b>SS</b>	Set Security record	Sets the Security record without the encryption key and length parameters. The entire record must still be written, but the encryption-specific bytes do not need to be provided (they can be null since they are not overwritten).
<b>NS</b>	Network Status	Reports the network interfaces' statuses. Includes potentially negotiated parameters like speed/duplex for Ethernet or BSSID, encryption, authentication for wireless interfaces.
<b>co</b>	Set IP address, host bits, gateway , and DNS server IP	<p><b>Example:</b>  co 192.168.0.10 8 192.168.0.1 10001 192.168.1.10  with  192.168.0.10 = IP address of the WiPort NR device  8 = number of host bits  192.168.0.1 = gateway IP address  10001 = port number of the WiPort NR device  192.168.1.10 = IP address of the DNS Server</p> <p>The WiPort NR device stores the setup and performs a reset. It sends an <b>X</b> before the reset if the command was OK.</p>

Responses to some of the commands are given in Intel Hex format.

**Note:** Entering any of the commands listed in Table 7-1 generates one of the following command response codes:

**Table 7-2. Command Response Codes**

<b>Response</b>	<b>Meaning</b>
0>	OK; no error
1>	No answer from remote device
2>	Cannot reach remote device or no answer
8>	Wrong parameter(s)
9>	Invalid command

## 8: Updating Firmware

This chapter explains how to obtain and update the unit's firmware.

### Obtaining Firmware

Obtain the most up-to-date firmware and release notes for the unit from the Lantronix web site (<http://www.lantronix.com/support/downloads.html>) or by using anonymous FTP (<ftp.lantronix.com/pub>).

### Reloading Firmware

There are several ways to update the unit's internal operational code (\*.ROM): via DeviceInstaller (the preferred way), via TFTP, or via the serial port. You can also update the unit's internal Web interface (\*.COB) via TFTP or DeviceInstaller.

Here are typical names for those files. Check the Lantronix web site for the latest versions and release notes.

Table 8-1. Firmware Files

ROM File	COB
fpt_6904.rom	fpt_webm_2004.cob

Please refer to the DeviceInstaller Online Help for information about reloading firmware using DeviceInstaller. The other methods are discussed below.

### Using TFTP: Graphical User Interface

To download new firmware from a computer:

1. Use a TFTP client to put a binary file to the unit (\*.ROM to upgrade the unit's internal operational code and \*.COB to upgrade its internal Web interface).  
*Note: TFTP requires the .ROM (binary) version of the unit's internal operational code.*
2. In the **TFTP server** field, enter the IP address of the unit being upgraded.
3. Select **Upload** operation and **Binary** format.
4. Enter the full path of the firmware file in the **Local file name** field.
5. In the **Remote file name** field, enter the current internal operational code (**FX**) or **WEB1** to **WEB19** for the internal Web interface.
6. Click the **Upload Now** button to transfer the file to the unit. The unit performs a power reset after the firmware has been loaded and stored.

## Using TFTP: Command Line Interface

To download new firmware from a computer, enter the following from a TFTP command line interface:

```
tftp -i <ip address> put <local filename> <destination file name>
```

The following examples demonstrate the TFTP command sequence to download the .rom file, the .fwx file, and the .cob file:

```
tftp -i 192.168.1.111 put fpt_6904.rom FX
tftp -i 192.168.1.111 put fpt_webm_2004.cob WEB1
```

## Recovering the Firmware Using the Serial Port

If for some reason the firmware is damaged, you can recover the firmware file by using the serial port to download the \*.ROM file.

1. Start DeviceInstaller.
2. From the **Tools** menu, select **Advanced/Recover Firmware**. The Recover Firmware window displays.
3. Enter the com port on your PC and the location of the firmware file. The Device Model should indicate **WiPort NR**.
4. Click **OK** to download the file.

**Note:** See also *Recovering Firmware in the DeviceInstaller User Guide*.

## 9: AES Encryption

AES encryption is standard on WiPort NR embedded device server. A configuration setting is available to enable or disable (default) Rijndael encryption. If you enable encryption, you must select the key length (128, 192, or 256 bits) and enter the encryption key in hexadecimal.

Rijndael is the block cipher algorithm chosen by the National Institute of Science and Technology (NIST) as the Advanced Encryption Standard (AES) to be used by the US government.

## 10: Troubleshooting

This chapter discusses how you can diagnose and fix errors quickly without having to contact a dealer or Lantronix. The WiPort NR diagnostic LEDs indicate the unit's status. It helps to connect a terminal to the serial port while diagnosing an error to view summary messages that may be displayed. When troubleshooting, always ensure that the physical connections (power cable, network cable, and serial cable) are secure.

**Note:** Some unexplained errors might be caused by duplicate IP addresses on the network. Make sure that your unit's IP address is unique.

When troubleshooting the following problems, make sure that the WiPort NR embedded device server is powered up. Confirm that you are using a good network connection.

### Diagnostic LED States

Condition	Diagnostic LED	Channel 1 Status LED
No Errors	OFF	N/A
Firmware storage checksum error	ON	Blink 1x/4 seconds
RAM error	ON	Blink 2x/4 seconds
Network controller error	ON	Blink 3x/4 seconds
Serial number storage checksum error	ON	Blink 4x/4 seconds
Duplicate IP address present	ON	Blink 5x/4 seconds
Firmware and hardware mismatch	ON	Blink 6x/4 seconds
Faulty network connection	Blink 2x/second	Blink 4x/4 seconds
No DHCP response	Blink 2x/second	Blink 5x/4 seconds
Setup menu active	Blink 2x/second	Follow Diagnostic LED for 2 seconds, off for 2 seconds

## Problems and Error Messages

Problem/Message	Reason	Solution
When you issue the <b>ARP -S</b> command in Windows, <i>The ARP entry addition failed: 5</i> message displays.	Your currently logged-in user does not have the right to use this command on this PC.	Have someone from your IT department log you in with sufficient rights.
When you attempt to assign an IP address to the unit by the ARP method and Telnet to the device server through port 1, the connection fails.	When you Telnet to port 1 on the device server, you are only assigning a temporary IP address. When you Telnet into port 9999 and do not press <b>Enter</b> quickly, the device server reboots, causing it to lose the IP address.	Telnet back to Port 1. Wait for it to fail, then Telnet to port 9999 again. Make sure you press <b>Enter</b> within 5 seconds.
When you Telnet to port 9999, the <b>Press Enter to go into Setup Mode</b> message displays. However, nothing happens when you press <b>Enter</b> , or your connection is closed.	You did not press <b>Enter</b> quickly enough. You only have 5 seconds to press <b>Enter</b> before the connection is closed.	Telnet to port 9999 again, but press <b>Enter</b> as soon as you see the <i>Press Enter to go into Setup Mode</i> message.
When you Telnet to port 1 to assign an IP address to the device server, the Telnet window does not respond for a long time.	You may have entered the Ethernet address incorrectly with the ARP command.	Confirm that the Ethernet address that you entered with the ARP command is correct. The Ethernet address may only include numbers 0-9 and letters A-F. In Windows and usually in Unix, the segments of the Ethernet address are separated by dashes. In some forms of Unix, the Ethernet address is segmented with colons.
	The IP address you are trying to assign is not on your logical subnet.	Confirm that your PC has an IP address and that it is in the same logical subnet that you are trying to assign to the device server.
	The device server may not be plugged into the network properly.	Make sure that the Link LED is lit. If the Link LED is not lit, then the device server is not properly plugged into the network.
When you try to assign an IP with DeviceInstaller, you get the following message:  <i>No response from device! Verify the IP, Hardware Address and Network Class. Please try again.</i>	The cause is most likely one of the following:  The Hardware address you specified is incorrect.  The IP address you are trying to assign is not a valid IP for your	Double-check the parameters that you specified.  <b>Note:</b> <i>You cannot assign an IP address to a device server through a router.</i>

Problem/Message	Reason	Solution
	<p>logical subnet.</p> <p>You did not choose the correct subnet mask.</p>	
<p>The device server is not communicating with the serial device to which it is attached.</p>	<p>The most likely reason is the wrong serial settings were chosen.</p>	<p>The serial settings for the serial device and the device server must match. The default serial settings for the device server are RS-232, 9600 baud, 8 character bits, no parity, 1 stop bit, no flow control.</p>
<p>When you try to enter the setup mode on the device server via the serial port, you get no response.</p>	<p>The issue is most likely something covered in the previous problem, or possibly, you have <b>Caps Lock</b> on.</p>	<p>Double-check everything in the problem above. Confirm that <b>Caps Lock</b> is not on.</p>
<p>You can ping the device server, but not Telnet to the device server on port 9999.</p>	<p>There may be an IP address conflict on your network</p> <p>You are not Telnetting to port 9999.</p> <p>The Telnet configuration port (9999) is disabled within the device server security settings.</p>	<p>Turn the device server off and then issue the following commands at the DOS prompt of your computer:</p> <p>ARP -D X.X.X.X (X.X.X.X is the IP of the device server).</p> <p>PING X.X.X.X (X.X.X.X is the IP of the device server).</p> <p>If you get a response, then there is a duplicate IP address on the network. If you do not get a response, use the serial port to verify that Telnet is not disabled.</p>

Problem/Message	Reason	Solution
<p>The device server appears to be set up correctly, but you are not communicating with your device attached to the device server across the network.</p>	<p>If you are sure that the serial port setting is correct, then you may not be connecting to the correct socket of the device server.</p> <p>Another possibility is that the device server is not set up correctly to make a good socket connection to the network.</p>	<p>You can check to see whether there is a socket connection to or from the device server by checking the state of CP1, if it has been configured for LED1 functionality.</p> <p>If the state of CP1 is blinking consistently, or is completely off, then there is a good socket connection.</p> <p>If the state of CP1 is low, use the Connect Mode option <b>C0</b> for making a connection to the device server from the network. Use Connect Mode option <b>C1</b> or <b>C5</b> for a connection to the network from the device server. See the full list of Connect Mode options in <a href="#">Connect Mode</a> on page 37.</p>
<p>When connecting to the Web Manager within the device server, the <i>No Connection With The Device Server</i> message displays.</p>	<p>Your computer is not able to connect to port 30718 (77FEh) on the device server.</p>	<p>Make sure that port 30718 (77FEh) is not blocked with any router that you are using on the network. Also, make sure that port 77FEh is not disabled within the Security settings of the device server.</p>

## Technical Support

Lantronix offers many resources to support our customers and products at <http://www.lantronix.com/support>. For instance, ask a question, find firmware downloads, access the FTP site and search through tutorials, FAQs, bulletins, warranty information, extended support services, and product documentation.

To contact technical support or sales, look up your local office at <http://www.lantronix.com/about/contact.html>. When you report a problem, please provide the following information:

- ◆ Your name, company name, address, and phone number
- ◆ Lantronix product and model number
- ◆ Lantronix MAC number or serial number
- ◆ Firmware version and current configuration
- ◆ Description of the problem
- ◆ Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem).