

Ethernet TCP/IP Interface

For Rice Lake Indicators

Installation and Configuration Manual



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Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.ricelake.com/training or obtained by calling 715-234-9171 and asking for the training department.

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About this Manual

This manual is intended for use by service technicians responsible for installing the Ethernet card option in Rice Lake indicators.



Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.ricelake.com.

1.0 Introduction

The Ethernet card option comes in two sizes. The larger size (PN 83267; see Figure 2-1 on page 2) can be used in the 920i, 820i, and 720i. The smaller card (PN 77142) can be used in the 820i and 720i. When ordered at the same time as the indicator, the Ethernet card can be factory installed by Rice Lake Weighing Systems if requested. Once the Ethernet option is installed, you are ready to begin configuring the scale's IP address, gateway IP address, netmask, and Telnet configuration password.



Important *You cannot use a TCP/IP card if you are interfacing to a PLC. A PLC requires an IP card.*

Rice Lake uses Lantronix Technology for most TCP/IP converters. Ensure you have the latest version of DeviceInstaller configuration software from www.lantronix.com.

General Terms and Information

ARP (Address Resolution Protocol) can be run from the Command Prompt if the MAC is known. This will assign an address to an Ethernet I/P device.

IPCONFIG from any bus will assign an IP address to an Ethernet I/P device. When entered in the Command Prompt, it will display the PC's IP address and MAC address.

MAC (Media Access Control) is a unique number assigned by the vendor for all Ethernet devices.

Hub broadcasts all traffic to all ports, and only the correct address responds.

Switch sends data to only the correct device, keeping traffic at a minimum.

Subnet Mask is a way of splitting networks.

Class A 255.0.0.0

Class B 255.255.0.0

Class C 255.255.255.0

255 Host 0 Client

2.0 Installation



Warning

Rice Lake indicators have no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

The Ethernet card should NOT be used to communicate between buildings. The Ethernet port is not suitable for connection to circuits used outside the building and is subject to lightning or power faults.



Caution

Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator enclosure.

This unit uses double pole/neutral fusing which could create an electric shock hazard. Procedures requiring work inside the indicators must be performed by qualified service personnel only.

The indicator enclosure must be opened to install the Ethernet card.

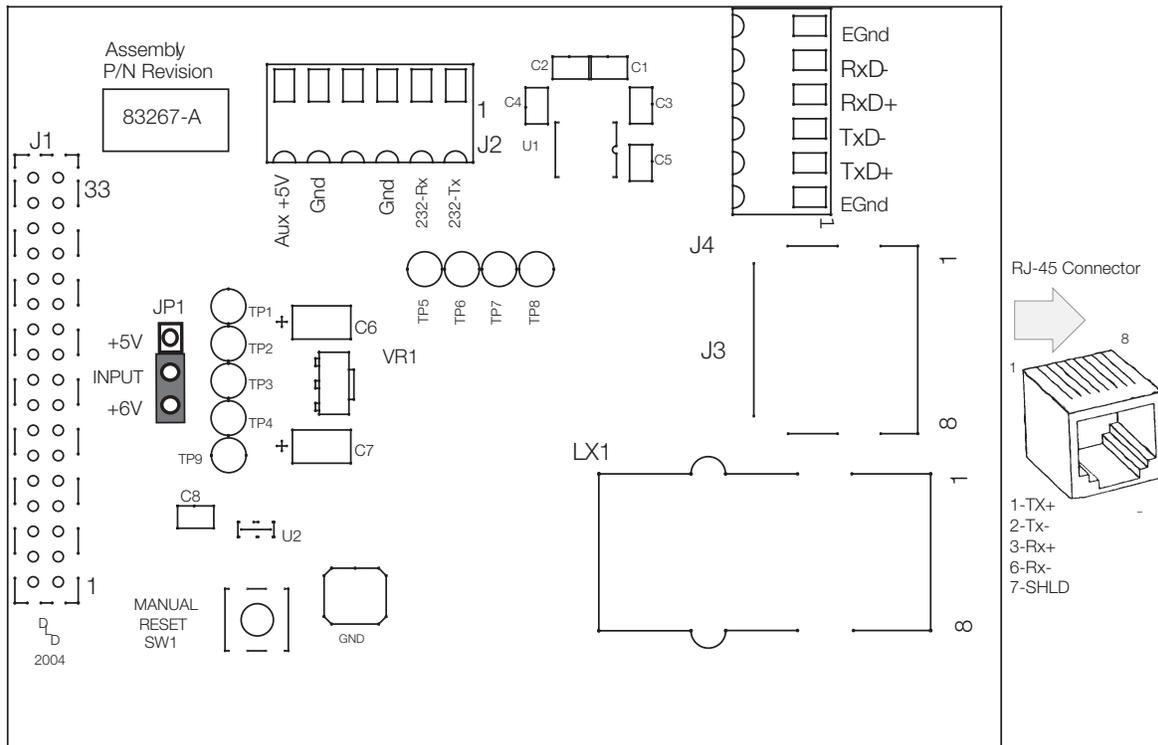


Figure 2-1. Ethernet Interface Card

2.1 Ethernet Card Installation

1. Disconnect the indicator from power source.
2. Place indicator on an antistatic work mat. Remove screws that hold the cover to the enclosure body, then lift the cover away from the enclosure and set it aside.
3. Remove plug from cord grip on the indicator that will be used to run the Ethernet cabling.
4. Carefully align the option card connector with the connector on the indicator's CPU board. Press down to seat the option card in the CPU connector.



Note Refer to the indicator manual for exact pin locations.

5. Use the screws provided in the option kit to secure the other end of the option card to the threaded standoffs on the indicator's CPU board.
6. Ensure jumper JP1 on the Ethernet card is in the +6V position for installation.

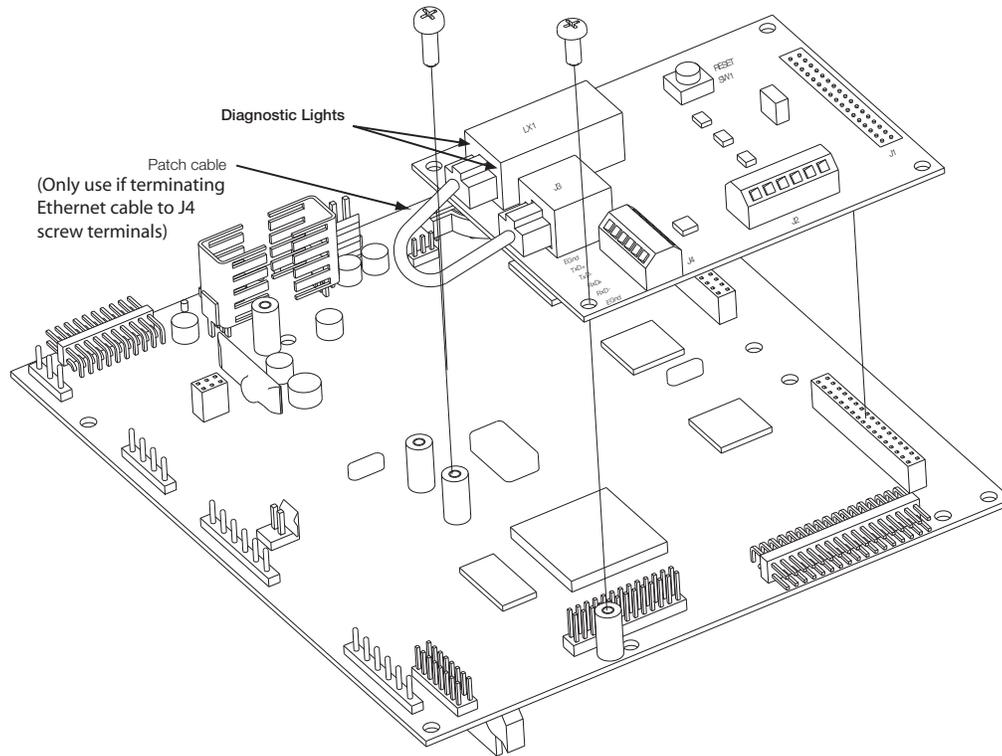


Figure 2-2. Ethernet Card Installation onto 920 CPU Board

2.1.1 Ethernet Card Serial Port Wiring

The Ethernet card requires an RS-232 communications connection to the Rice Lake indicator. The indicator and Ethernet card must be set to the same baud rate (Rice Lake indicators' default serial baud rate is 9600.) To change the Ethernet card baud rates, refer to the *Lantronix User's Guide*.

1. To attach the 6-inch, unshielded cable directly to the *920i*, remove the serial connector from the CPU board (port 1, 3, or 4).
2. Use the supplied 60-inch, unshielded cable to run from J2 on the Ethernet board to the connector of choice. Refer to the tables on the following page for pin assignments.
3. Once cables are attached, plug the connector into the header on the board. Table 2-1 shows the Ethernet card serial port pin assignments.

Pin	Signal
1	Txd
2	Rxd
3	Gnd
4, 5, or 6	Not used

Table 2-1. Ethernet Card J2 Pin Assignment

920i			
Connector	Pin	Signal	Port
J11	1	Gnd	1
	2	RS-232 RxD	
	3	RS-232 TxD	
J9	1	GnD	3
	2	RS-232 RxD	
	3	Rs-232 TxD	
J10	1	GnD	4
	2	RS-232 RxD	
	3	RS-232 TxD	
820i			
Connector	Pin	Signal	Port
J9	1	CLK	1
	2	+5V	
	3	GND	
	4	DATA	
J10	1	GND	2
	2	RS-232 RxD	
	3	RS-232 TxD	
	4	RS-232 RTS	
	5	RS-232 CTS	
	6	GND	
J11	1	GND	4
	2	N/C	
	3	N/C	
	4	RS-485 A	
	5	RS-485 B	
	6	+20mA OUT	
	7	-20mA OUT	
	8	GND	
	9	RS-232 RxD	
	10	RS-232 TxD	

Table 2-2. 920 and 820 Serial Port Pin Assignments

720i			
Connector	Pin	Signal	Port
J3	1	CLK	1
	2	+5V	
	3	GND	
	4	DATA	
J2	1	GND	2
	2	RS-232 RxD	
	3	RS-232 TxD	
	4	RS-232 RTS	
	5	RS-232 CTS	
	6	GND	
J4	1	RS-422/485 Y	3
	2	RS-422/485 Z	
	3	RS-422/485 B	
	4	RS-422/485 A	
	5	+6V	
	6	GND	
J5	1	GND	4
	2	RS-232 RxD	
	3	RS-232 TxD	
	4	20mA OUT	

Table 2-3. 720 Serial Port Pin Assignments

Connector	Pin	Signal
J5	1	EDP TxD
	2	GND
	3	EDP RxD
	4	Printer TxD
	5	Printer RxD
	6	-20 mA TxD
	7	+20 mA TxD
	8	RS-485A
	9	RS-485B
	10	GND

Table 2-4. 520 Serial Port Pin Assignments

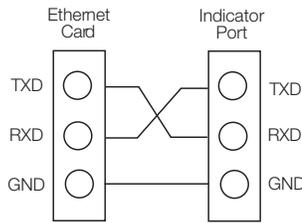


Figure 2-3. Ethernet Card Serial Wiring

- Use cable ties to secure loose cables inside the enclosure away from high voltage circuits

2.1.2 External Ethernet Cabling

Configure external Ethernet cabling using either the RJ-45 connector (LX1) or the hardwire connection to J4 on the Ethernet card. When using an external RJ-45 connector, we recommend using a DNET 1 network surge suppressor (PN 72682) wired through a cord grip with the RJ-45 socket left outside of the enclosure.

Pin	Signal
1	Gnd
2	TxD+
3	TxD-
4	RxD+
5	RxD-
6	Gnd

Table 2-5. Ethernet Card J4 Pin Assignment

2.1.3 Reassembling The Enclosure

- Once cabling is complete, position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern provided in the indicator's installation manual to prevent distorting the backplate gasket.
- Ensure no excess cable is left inside the enclosure and tighten the cord grips.
- Reconnect power to the indicator.



Note Contact factory for washdown option.

2.1.4 Ethernet Option Parts Kit Contents

Table 5-4 shows the parts kit contents for PN 71986.

PN	Description
14822	Screws, 4-40NCx1/4 (2)
15631	Cable tie, 3 in nylon (2)
54325	Unshielded cable, grey 60 in (1)
78269	RJ-45 cable, 5 in (1)
83267	Ethernet card, RS-232/Ethernet (1)
72763	Ethernet CD (1)

Table 2-6. PN 71986 Parts Kit Contents

shows the parts kit contents for PN 77205.

PN	Description
14822	Screws, 4-40NCx1/4 (2)
15631	Cable tie, 3 in nylon (2)
54325	Unshielded cable, grey 60 in (1)
78269	RJ-45 cable, 5 in (1)
72696	Cable, 3-pin to blunt 3-wire (1)
83267	Ethernet card, RS-232/Ethernet (1)
72763	Ethernet CD (1)

Table 2-7. PN 77205 Parts Kit Contents

3.0 Assigning an IP Address

The following section covers the steps required to assign an IP address. The IP address must be assigned and configured before a network connection is available. There are four methods, any one of which can be used:

- Lantronix® DeviceInstaller™
- Network port login
- Command Prompt
- Web Configuration

Both of these installer tools are located on the Ethernet Configuration CD, PN 72763.



Note

Refer to www.lantronix.com to ensure you have the most up-to-date version of DeviceInstaller.

If connecting from a PC to the Ethernet card, use a crossover cable. Otherwise, use a straight through cable if connecting via a network.

Refer to the *Lantronix User's Guide* found on the Ethernet Configuration CD for further information on the Ethernet configuration procedures.

3.1 DeviceInstaller

DeviceInstaller provides the preferred method for setting up an IP address for the Ethernet card with *Rice Lake indicators*. Depending on firewall restrictions and other network variables, however, DeviceInstaller may not be able to find the Ethernet card. If you encounter troubles in using the instructions listed in this section, use the Windows Command Prompt (Section 3.3 on page 7), which will always work regardless of network variables.

The DeviceInstaller runs on a personal computer to help assign an IP address. To use the DeviceInstaller, use the following steps:

1. Insert the Ethernet Configuration CD into the hard drive of your PC running Windows® 95, 98, ME, 2000, or XP.
2. Install DeviceInstaller per on-screen instructions.
3. Start the DeviceInstaller program and follow the on screen instructions.

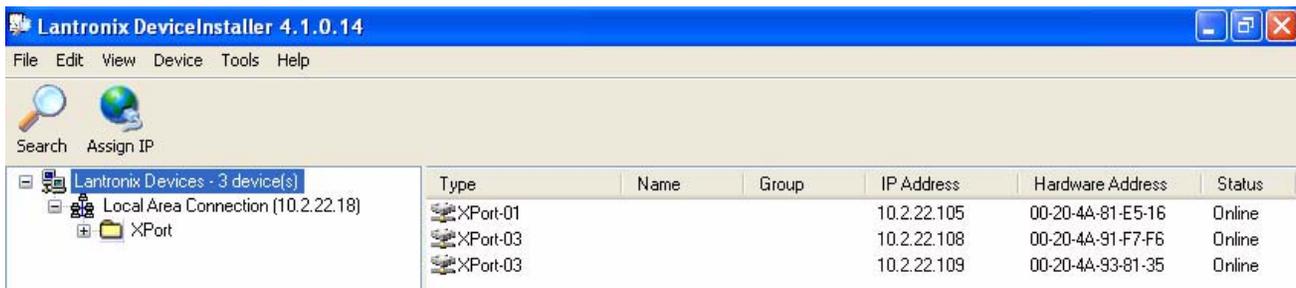


Figure 3-1. DeviceInstaller Main Menu Screen

Rice Lake indicators come supplied with a pre-configured IP address which automatically enables Dynamic Host Control Protocol (DHCP)—It is recommended that you assign a static IP address to your card for use in the field.



Note

The web connection to the Ethernet card requires the original JAVA by Sun Microsystems. For a free download, go to www.JAVA.com

4. Click Action / Assign IP Address to assign a new IP address.
5. Enter the hardware address found on LX1.
6. It is recommended that you assign your own IP address to the card. Enter a chosen IP address in the Enter IP field. Record the configured IP address for future reference.
7. Press Set IP to assign a new IP address.



Note

The DeviceInstaller will search the network to see if the proposed IP address is already being used. If it is already in use, on the network, the operation will fail.

3.2 Network Port Login

The network port login provides a way to make a telnet connection to the network port (9999). This ARP method is available under UNIX and Windows-based systems.

1. Set a static ARP with the desired IP address using the hardware address of the scale. The address is printed on a label attached to the Ethernet card.



Note

In order for the ARP command to work in Windows®, the ARP table on the PC must have at least one IP address defined other than its own. Type “ARP - A” at the DOS prompt (or from Run) to verify that there is at least one entry in the ARP table. If there is no entry other than the local machine, ping another IP machine on your network to build the ARP table. This has to be a host other than the machine on which you are working. Once there is at least one entry in the ARP

table, use the following commands to ARP an IP address to the scale.

```
arp -s 128.1.123.123.00.20-4a-xx-xx-xx
```

2. Open a Telnet connection to port 1 by clicking the Telnet icon on the Toolbar. The connection will fail quickly but the device server temporarily changes its IP address to the one designated in this step and sets all required parameters.

```
Telnet 128.1.123.123.1
```

3. Open a Telnet connection to port 9999 and press the ENTER key within three seconds to go into the Setup mode. If you wait longer than three seconds, the unit will reboot. Set all required parameters.

```
Telnet 128.1.123.123.9999
```



Note

The IP address you just entered is temporary and will revert to the default when the unit's power is reset unless you log into the unit and store the changes permanently.

3.3 Command Prompt

As an alternative to DeviceInstaller, you can use the Windows Command Prompt to set the IP address of the Ethernet card. Command Prompt can be opened by selecting Start » Run and typing cmd.

It is also located in Start » Programs » Accessories » Command Prompt.

1. From Command Prompt, type arp and press Enter to see a list of available commands.

```
C:\>arp

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr]

-a          Displays current ARP entries by interrogating the current
           protocol data. If inet_addr is specified, the IP and Physical
           addresses for only the specified computer are displayed. If
           more than one network interface uses ARP, entries for each ARP
           table are displayed.

-g          Same as -a.
inet_addr  Specifies an internet address.
-N if_addr Displays the ARP entries for the network interface specified
           by if_addr.

-d          Deletes the host specified by inet_addr. inet_addr may be
           wildcarded with * to delete all hosts.

-s          Adds the host and associates the Internet address inet_addr
           with the Physical address eth_addr. The Physical address is
           given as 6 hexadecimal bytes separated by hyphens. The entry
           is permanent.

eth_addr   Specifies a physical address.
if_addr    If present, this specifies the Internet address of the
           interface whose address translation table should be modified.
           If not present, the first applicable interface will be used.

Example:
> arp -s 157.55.85.212 00-aa-00-62-c6-09 .... Adds a static entry.
> arp -a          .... Displays the arp table.

C:\>_
```

Figure 3-2. Available ARP Commands.

2. To statically enter the IP address, type arp-s (your IP address) (mac address shown on the card). Refer to the first example shown in Figure 3-2 7.
3. Use a telnet session to activate the address by typing telnet (your IP address) 1. The telnet connection will time out and fail, but the address will be activated.
4. You can view the address in your arp table by typing arp -a. This will list the arp table and you will see your IP address and its mac address, and it will be listed as a static entry.
5. You should now be connected and can test connectivity by pinging your address. To ping your address, type ping (your IP address).
6. Now that you have statically established communication on your local machine, you will be able to search and find the card with DeviceInstaller to set the permanent IP address of the card.



Note

If you are having connection issues, there may be network variables preventing communication. Make sure to turn off all firewalls, anti-virus software, and be logged in as a user with administrator privileges.

Other methods of configuring the settings on the card are via the web or a telnet session. You can see the card's settings through your web browser by typing its IP address in the address bar of Internet Explorer.

The card be configured via telnet by typing telnet (your IP address) 9999.

When using telnet, the numbers after the IP address stand for the port number. Port 9999 "talks" to the card (used for configuring the card only). Port 10001 "talks" through the card to the indicator (used for communicating with iRev, Revolution, HyperTerminal, etc.).

3.4 Configuration Parameters

Web configuration of the card can be done by entering the IP address in your web browser and clicking GO (or pressing Enter). This allows changing any or all setup in the Ethernet option card.

The screenshot shows the LANTRONIX web configuration interface. At the top, it displays the LANTRONIX logo, Firmware Version: V6.1.0.0, and MAC Address: 00-20-4A-93-81-35. The main heading is "Connection Settings". On the left is a navigation menu with options: Network, Server, Serial Tunnel, Hostlist, Channel 1, Serial Settings, Connection, Email, Trigger 1, Trigger 2, Trigger 3, Configurable Pins, Apply Settings, and Apply Factory Defaults. The "Connection" section is active. Under "Channel 1", the "Connect Protocol" is set to "TCP". The "Connect Mode" section has "Passive Connection" and "Active Connection" sub-sections. "Passive Connection" includes "Accept Incoming" (Yes), "Password Required" (No), and a "Password" field. "Active Connection" includes "Active Connect" (None), "Start Character" (0x0D), "Modem Mode" (None), and "Mdm Esc Seq Pass Thru" (Yes). The "Endpoint Configuration" section includes "Local Port" (10001), "Remote Port" (0), "Remote Host" (0.0.0.0), and an "Auto increment for active connect" checkbox. The "Common Options" section includes "Telnet Mode" (Disable), "Connect Response" (None), "Terminal Name" field, "Use Hostlist" (No), and "LED" (Blink). The "Disconnect Mode" section includes "On Mdm_Ctrl_In Drop" (No), "Hard Disconnect" (Yes), "Check EOT(Ctrl-D)" (No), and "Inactivity Timeout" (0 mins, 0 secs). An "OK" button is at the bottom.

Figure 3-3. Web Configuration Connection Settings



Firmware Version: V6.1.0.0
 MAC Address: 00-20-4A-93-81-35

Home

Network

Server

Serial Tunnel

Hostlist

Channel 1

Serial Settings

Connection

Email

Trigger 1

Trigger 2

Trigger 3

Configurable Pins

Apply Settings

Apply Factory Defaults

Serial Settings

Channel 1

Disable Serial Port

Port Settings

Protocol: RS232 Flow Control: None

Baud Rate: 115200 Data Bits: 8 Parity: None Stop Bits: 1

Pack Control

Enable Packing

Idle Gap Time: 12 msec

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

Match Bytes: 0x00 0x00 Send Trailing Bytes: None One Two

Flush Mode

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

OK

Figure 3-4. Web Configuration Serial Settings

Refer to the *Lantronix User's Guide* for further instructions on Ethernet configuration by Telnet.



Note *Rice Lake indicators can act as an Ethernet – TCP/IP to RS-232 converter. The converter can act as a server and accept an incoming connection, or, through a special serial command prepended to a serial transmission, it can connect to remote servers. Once a connection is established, Rice Lake indicators can send commands and handle responses using the internal serial API.*

To terminate a connection from the indicator, set a transmission idle time out on the Ethernet card. After “X” amount of time without transmission from the indicator, the card terminates the connection.

4.0 WLAN Installation and Configuration



Note

Before installing this option, you must contact your IT administrator to obtain network communication protocol codes and have a RS-232 communications cable or regular comm port cable available to run between your PC and the indicator while installing and setting up the wireless network.

The optional Lantronix® WiPort™ (WLAN - Wireless Local Area Network) wireless networking device comes in two sizes. The larger size card (PN 98057) can be installed in the 920i, 820i, 720i, and 520 indicators. The smaller size card (PN 108671) can be installed inside the 820i, 720i, CW-90/90X, iQube, and iQube 2 products. Both options can be used for real-time data transmission to warehouse management systems. The Windows®-based configuration software, DeviceInstaller™ is required for installation/setup and is available on the CD that comes with the kit. The WLAN option can be factory installed or can be purchased separately and installed on site.

PN	Description (quantity)
14822	Screw, MACH 4-40NCx1/4 (2)
52342	Label Roll, 4.00x1.25 (1)
72763	CD, Ethernet (1)
97789	Card, Dual Wireless/RS-232 (1)
98357	Antenna, 2.4GHz 802.11b/g (1)

Table 4-1. PN 98057 Parts Kit

PN	Description (quantity)
106103	Board Assy, Wi-port option (1)
72763	CD, Ethernet (1)
95356	Post, PCB Support 1/2" (2)
98357	Antenna, 2.4GHz 802.11b/g (1)

Table 4-2. PN 108671 Parts Kit

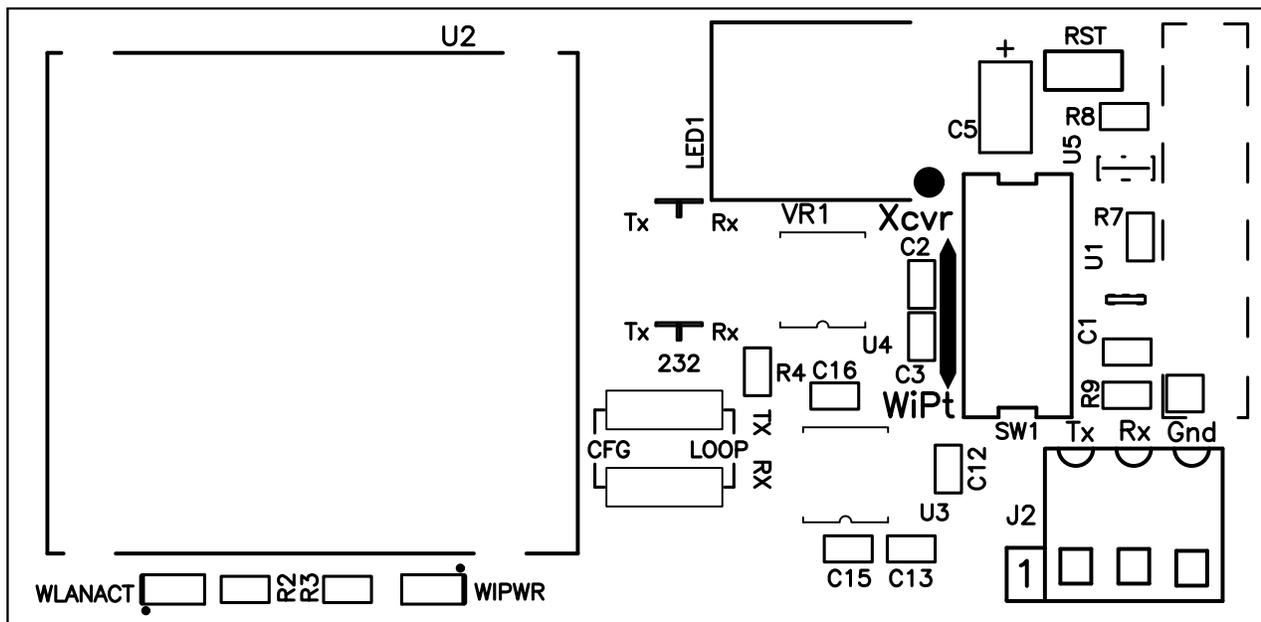


Figure 4-1. WLAN board

4.1 Enclosure Disassembly

The indicator enclosure must be opened to install the WLAN option card and antenna and to connect cables for installed option card.



Warning Before opening the unit, ensure the power cord is disconnected from the power outlet.

1. Disconnect power to the indicator.
2. Place the indicator face-down on an antistatic work mat.
3. Remove the screws that hold the backplate to the enclosure body, then lift the backplate away from the enclosure and set it aside.

4.2 Installing the WLAN Option Card



Caution Option cards are not hot-pluggable. Disconnect power to the unit before installing the WLAN option card.

1. Ensure that power has been disconnected to the indicator. Remove backplate as described in the previous section.
2. Carefully align the WLAN option card onto the proper connector on the CPU board (see the respective product's installation manual).
3. Press down firmly to seat the option card in the CPU board connector.
4. Use the standoffs provided in the option kit to secure the option card to the mounting holes on the CPU board.
5. Set up the WLAN configuration parameters as explained on Section 4.6 on page 13.
6. Make connections to the option card as required. Use cable ties to secure loose cables inside the enclosure. When installation and configuration is complete, reassemble the enclosure.

4.3 Mounting the Antenna

1. If the antenna is not already connected, screw it in place as shown in Figure 4-2.



Figure 4-2. Antenna installed on card

2. Place the antenna through the large cord grip, closest to the option card. It is recommended for the antenna's tip to extend out of the cord grip approximately one inch (1") as shown in Figure 4-3.

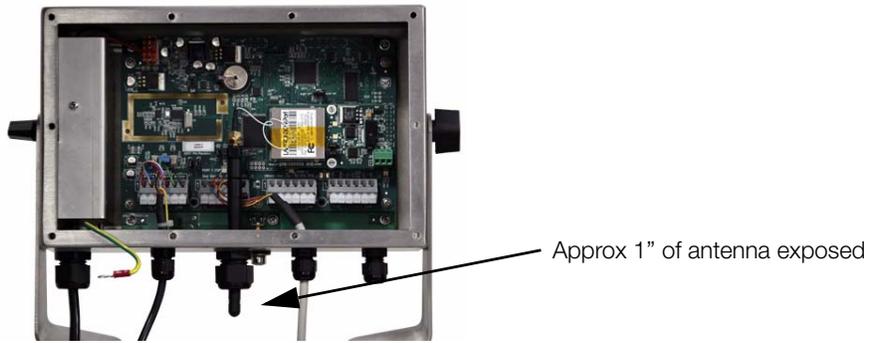


Figure 4-3. Location of WLAN antenna

3. Tighten the cord grip. Option cards are recognized when the unit is powered on.

4.4 Wireless Configuration via Serial Mode

You must configure the WLAN card so that it can communicate on your network. WiPort (WLAN) is configurable using a PC and a terminal program (like Windows XP HyperTerminal) to access the device serial port locally. To configure the WiPort (WLAN option), connect a serial cable from the J2 connector of the installed WLAN option card to a PC.

4.5 Jumpers

There are two configuration jumpers located on the WLAN option board. See Figure 4-4 below. These jumpers must be set to the CFG position to configure the WLAN option.

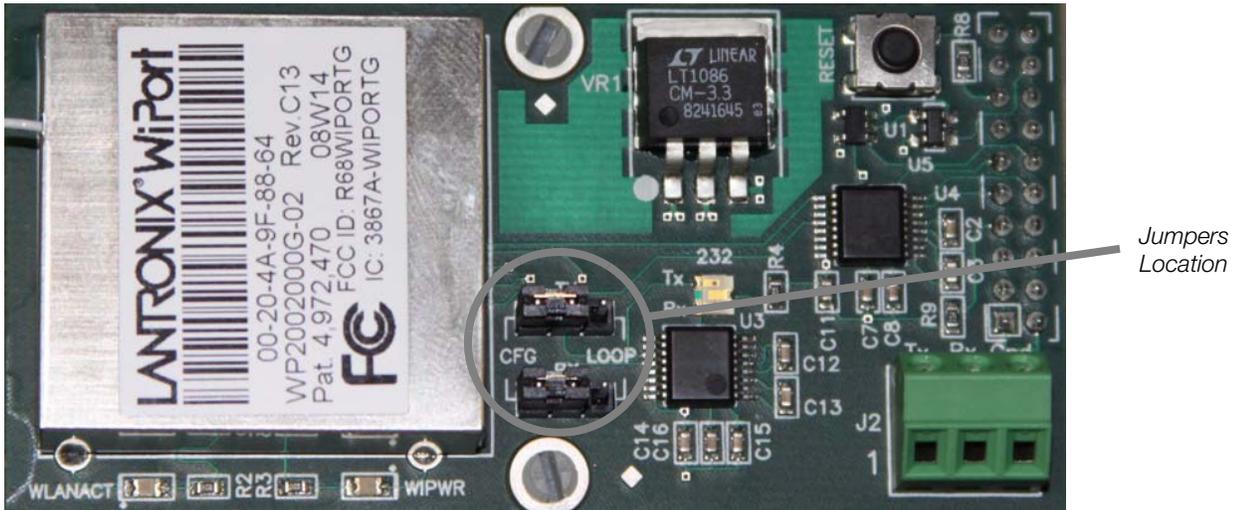


Figure 4-4. Jumpers location

Once the configuration jumpers are in the CFG position, continue with WLAN Card Configuration to make the necessary settings for the WLAN option.



Note *Not all devices display information in the same manner and depending on your IT department's software choice for configuring the WLAN option, the screens displayed may be different.*

If using Lantronix DeviceInstaller, you may access additional information from their web site at: www.lantronix.com.

4.6 WLAN Card Configuration

1. Select the HyperTerminal program on the PC.
2. Enter a name and choose an icon for the connection, then click OK.

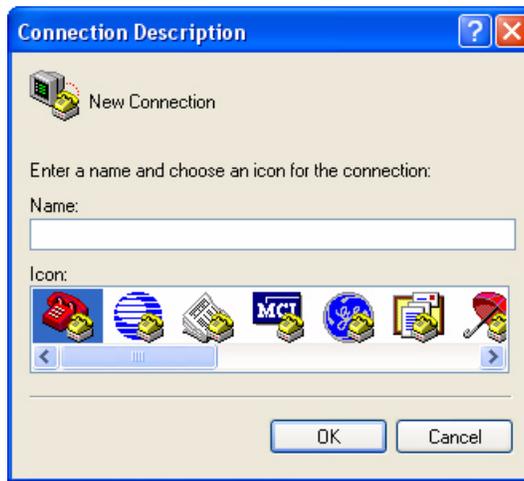


Figure 4-5. HyperTerminal connection description screen

3. Select a *Connect To* option. Select the comm port you have connected your serial cable to and click OK.



Figure 4-6. Connect To screen

4. Comm port properties must be set as shown in the following screen.

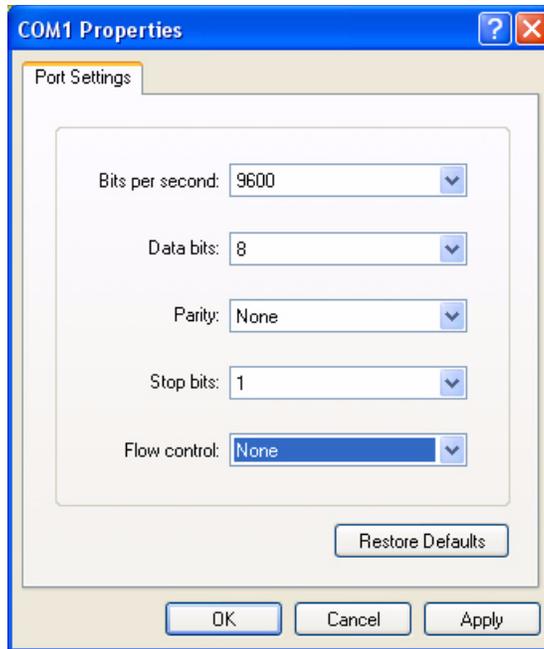


Figure 4-7. Comm Port Properties screen

The WLAN configuration port uses the following settings:

- Baud Rate: 9600
- 8 Bits
- No parity
- 1 Stop Bit
- No Flow Control

5. Make the changes and click OK to save the changes.
6. Reset the WLAN option card by pressing the manual reset button shown in Figure 4-8, and immediately upon release, enter three lowercase x characters (xxx) at the same time.

Manual Reset Button

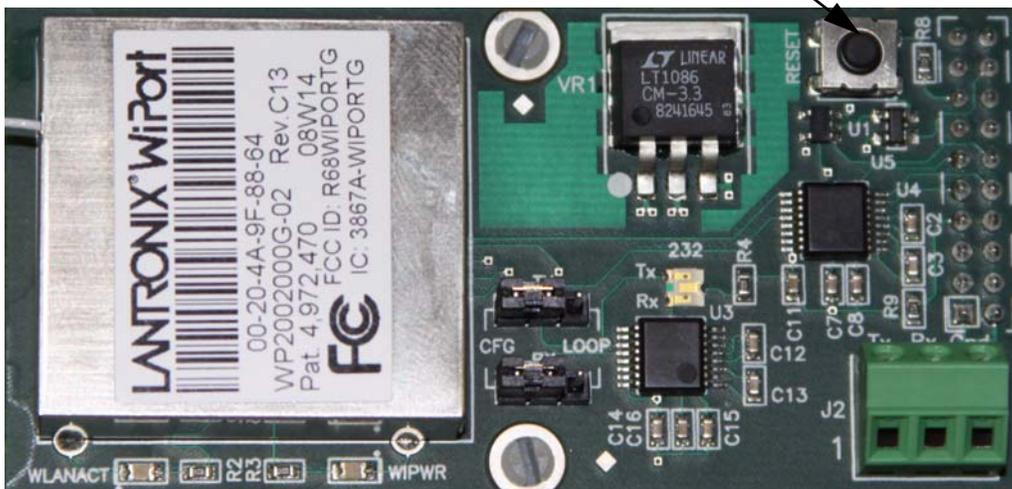


Figure 4-8. Manual Reset Button location on WLAN option card



Note The easiest way to connect is to hold down the x key on the PC's keyboard until the manual reset button is released and the PC screen displays the MAC address and software version as shown in Figure 9. This must be done within three seconds of resetting the WLAN option.

Upon a successful connection, the following information is displayed.

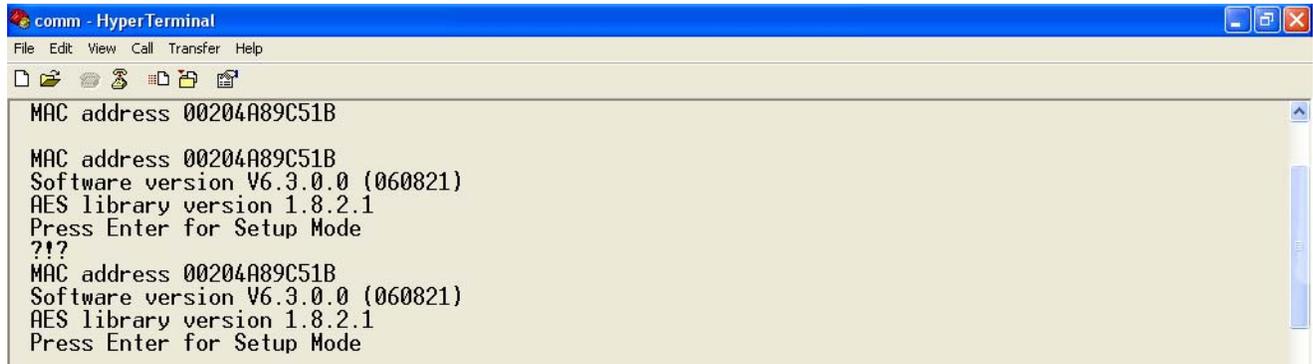


Figure 4-9. Display Information for Setup Mode

7. To enter Setup Mode, press **Enter** within *five* seconds. Note that the connection will fail if **Enter** is not pressed within the *five* second time limit. The configuration settings display, followed by the setup menu options. If this happens, repeat Step 5.
8. Select an option on the menu by entering the number of the option in *Your Choice?* field and press **Enter**. In this case, we're setting up the WLAN options so press 4 and press **Enter** as shown in Figure 12.

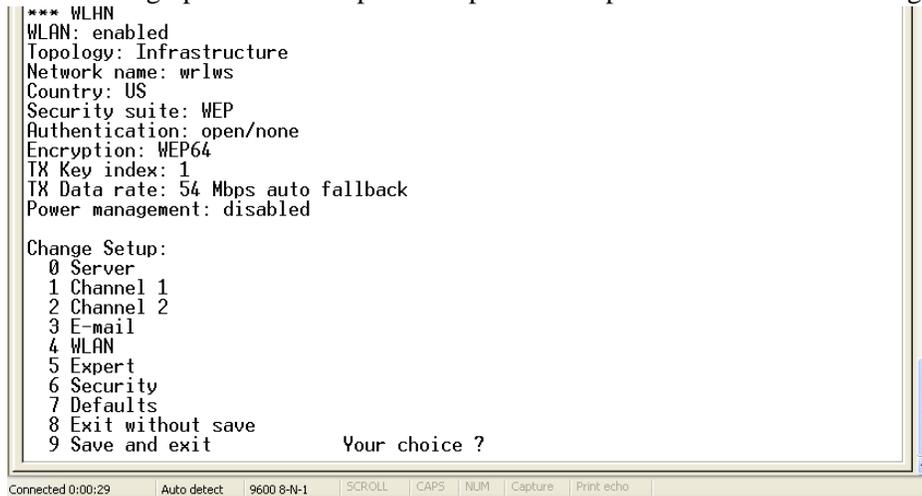


Figure 4-10. Change Setup Screen

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).

9. Enter the desired Topology for the WLAN option.

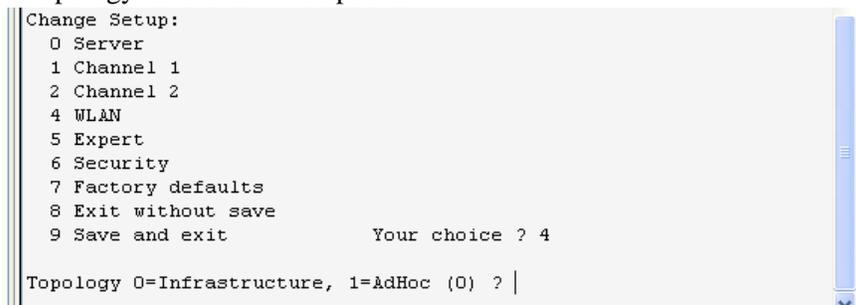


Figure 4-11. Topology Screen

The two choices are:

- 0 = Infrastructure
- 1 = AdHoc.

Select 0 for your choice and press **Enter**.

10. The next menu choice is Network Name as shown below.

```
Change Setup:
 0 Server
 1 Channel 1
 2 Channel 2
 4 WLAN
 5 Expert
 6 Security
 7 Factory defaults
 8 Exit without save
 9 Save and exit          Your choice ? 4

Topology 0=Infrastructure, 1=AdHoc (0) ? 0
Network name (SSID) ( ) ? |
```

Figure 4-12. Network Name Screen

Enter your wireless network name as your menu choice and press **Enter**. This identifies the network that the wireless option will run on.

11. The next step is to select a level of security as shown in Figure 15.

```
Change Setup:
 0 Server
 1 Channel 1
 2 Channel 2
 4 WLAN
 5 Expert
 6 Security
 7 Factory defaults
 8 Exit without save
 9 Save and exit          Your choice ? 4

Topology 0=Infrastructure, 1=AdHoc (0) ? 0
Network name (SSID) ( ) ? ( )
Security 0=none, 1=WEP, 2=WPA (1) ?
```

Figure 4-13. Security Level Select Screen

Security levels include:

- 0 = None
- 1 = WEP (Equivalency Protection)
- 2 = WPA

Select 1 and press **Enter**.

12. The next step is to set the authentication level for the configuration as shown below.

```
Change Setup:
 0 Server
 1 Channel 1
 2 Channel 2
 4 WLAN
 5 Expert
 6 Security
 7 Factory defaults
 8 Exit without save
 9 Save and exit          Your choice ? 4

Topology 0=Infrastructure, 1=AdHoc (0) ? 0
Network name (SSID) ( ) ? ( )
Security 0=none, 1=WEP, 2=WPA (1) ? 1
Authentication 0=open/none, 1=shared (0) ?
```

Figure 4-14. Authentication Screen

Authentication choices are:

- 0 = open/none
- 1 = Shared

Select 0 = open/none and press Enter.

13. Select the correct encryption next. Choices are WEP64 and WEP128 as shown below. Select 1 = WEP64 as the default parameter and press Enter.

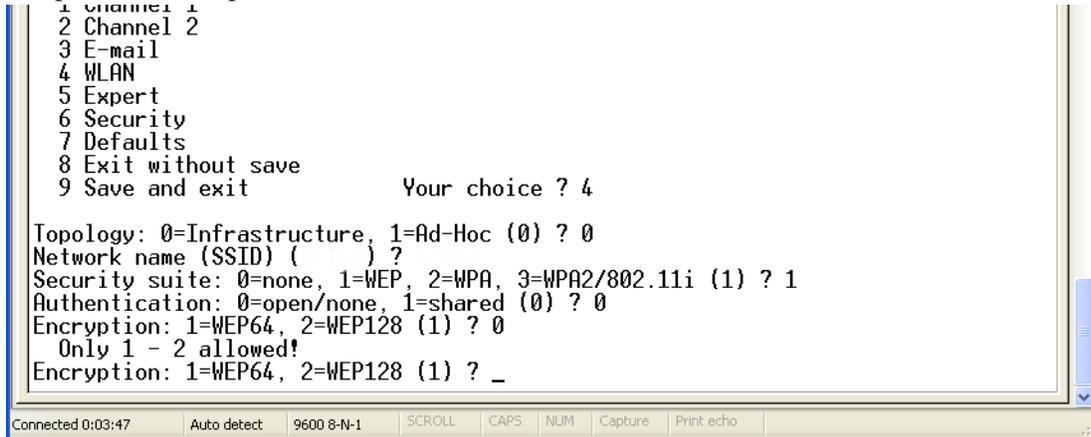


Figure 4-15. Encryption Screen

14. Next, it asks to display current key? Press N and press Enter.

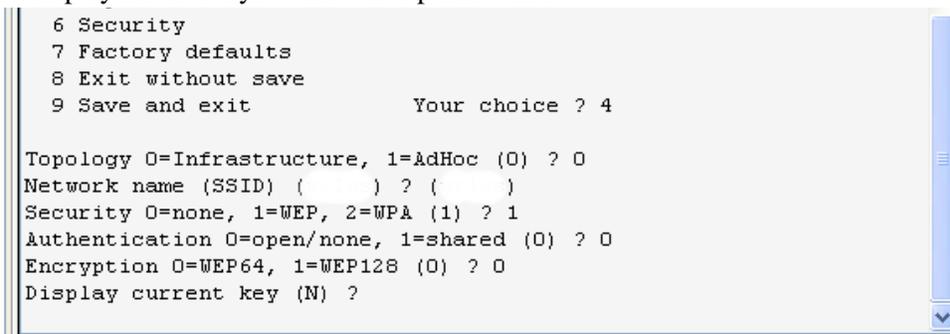


Figure 4-16. Display Current Screen

15. Select Yes (Y) for the “display current key” option. This prompt shows the currently configured key/passphrase.

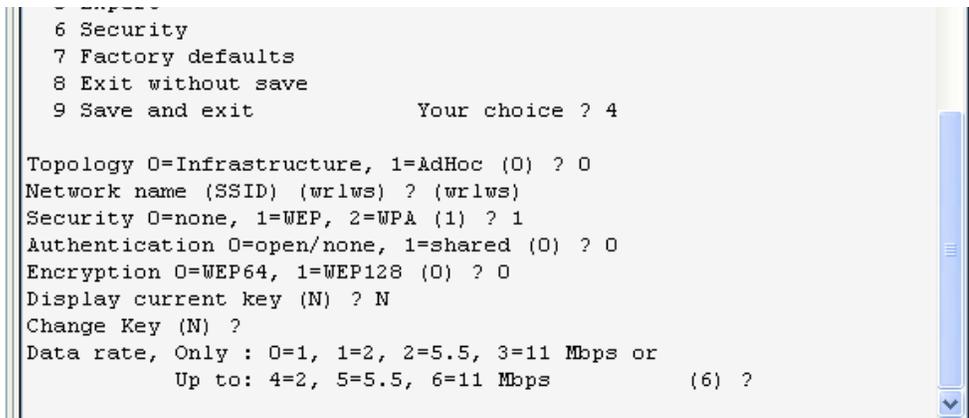


Figure 4-17. Change Key Screen

16. Select the data rate and press Enter.

17. The screen automatically goes to end the screen which gives the choice to Save and Exit (9) and is shown below. By selecting that choice, and pressing **Enter**, the WLAN parameters are saved and the screen becomes grayed out as is shown below.

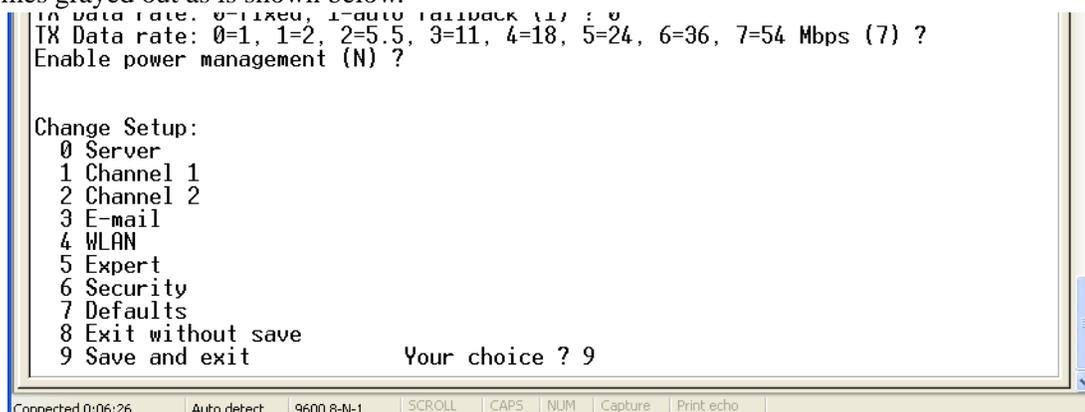


Figure 4-18. Save and Exit Screen

Once all of the data is saved, you must switch the jumpers back to the OFF position (Figure 5) to exit out of the configuration mode.

Now you can access and view all wireless data on the PC.

4.7 Enclosure Reassembly

Once cabling is complete, position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern shown in the indicator's manual to prevent distorting the backplate gasket.

4.8 WiPort Wireless Specifications

Category		Description
Network Standards		IEEE 802.11b; IEEE 802.11g
Frequency Range		2.412 - 2.484 GHz
Antenna Connector		1, no diversity supported
Data Rates		1, 2, 5.5, 11Mbps (802.11b) 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11g)
Radio	Number of Selectable Channels	Up to 14 channels. Profiles available will include USA, France, Japan, Spain, Canada and "other" (multiple countries).
	Modulations	OFDM, DSSS, DBPSK, DQPSK, CCK, 16QAM, 64QAM
	Antenna Connector	1
Security		WEP 64/128, WPA-PSK, TKIP, AES end-to-end encryption
Maximum Receive Level		-10 dBm (with PER < 8%)
Receiver Sensitivity		-72 dBm for 54Mbps -87 dBm for 11Mbps -89 dBm for 5.5Mbps -90 dBm for 2.0Mbps -92 dBm for 1.0Mbps
WLAN Power and Link LED Current		Max: 4 mA

Table 4-3. WiPort Wireless Specifications

4.9 WiPort Technical Data

Category	Description
CPU, Memory	Lantronix DSTni-EX 186 CPU, 256 KB zero wait state on chip SRAM, 2048 KB flash, 16 KB Bott ROM
Firmware	Upgradeable via TFTP and serial port
Reset Circuit	Reset In is low active. Minimum reset pulse width is 2 ms at IIL = -500 aA
Serial Interface	CMOS (Asynchronous) 3.3V-level signals Rate is software selectable (300 bps to 921600 bps)
Serial Line Formats	7 or 8 data bits, 1-2 stop bits, parity: odd, even, none
Modem Control	DTR, DCD
Flow Control	XON/XOFF (software), CTS/RTS (hardware), none
Network Interface	Wireless 802.11b, 802.11g and 10/100 Ethernet
Protocols Supported	ARP, UDP, TCP, Telnet, ICMP, SNMP, DHCP, BOOTP, Auto IP, HTTP, SMTP, TFTP
Media Access Control	CSMA/CA with ACK
Frequency Range	2.412-2.484 GHz
Range	Up to 328 feet (100m) line of sight
Modulation Techniques	OFDM DSSS CCK DQPSK DBPSK 64 QAM 16 QAM
Transmit Output Power	14 dBm + 1.5 dBm/-1.0 dBm
Peak Supply Current at 3.3V	650 mA
Management	Internal web server, SNMP (read only) Serial login, Telnet login DeviceInstaller software
Security	Password protection, locking features, 64/128 bit WEP, WPA-PSK, End-to-End AES
Internal Web Server	Serves web pages Storage capacity: 1.2 MB
Weight	29 grams
Material	Metal shell
Temperature	Operating range: -30° C to +70° C (-22° F to 158° F) Storage range: -40° C to +85° C (-40° F to +185° F)
Warranty	2-year limited warranty
Included Software	Windows® 98/NT/2000/XP based DeviceInstaller configuration software and Windows based Comm Port Redirector, DeviceInstaller, Web-Manager Lantronix web site: http://www.lantronix.com/

Table 4-4. WiPort Technical Data

4.10 WiPort 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:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and the 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.

Labeling of the End Product

The label of the end product integrating this module must clearly indicate that the end product contains an FCC approved RF module. The format of such statement could be *Contains Transmitter with FCC ID: R68WIPORTG* or something similar.

RSS-GEN Sections 7.1.4 and 7.1.5 Statement for Devices with Detachable Antennas

This device has been designed to operate with the antennas listed in the certificate, and having a maximum gain of 5 dB. Antennas not included in this list or having a gain greater than 5 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Integration Note

(a) This module is authorized under limited module approval specified to mobile host equipment. So, the antenna must be installed such that 20 cm is maintained between the antenna and the user.

(b) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the two conditions above are met, further transmission testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emission, PC peripheral requirements, etc).

In the event that these conditions cannot be met (for example) certain laptop configurations, general purpose PCMCIA or similar card, or location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product (including the transmitter) and obtaining a separate FCC authorization.



Note

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

5.0 920i/iQube Email Setup

Error conditions generate a displayed error message if the iQube is connected to a 920i which, with an Ethernet card, can be configured to email the alert message to a specified address.

5.1 Configuration

For email to work, both the 920 port (wired to) and the Ethernet serial port (wired to) must be both set to default values or are set to the same baud, bits, parity, etc. Once this is done, follow the steps below:

1. Set or determine the IP address of the Ethernet option (This can be done using DeviceInstaller - see Section 3.1 on page 6).
2. From iRev, select the *Contact Information* tab from System Parameters » Features.
3. Set the SMTP server address that is to be used.



Note *The Ethernet IP address may need to be registered with the server.*

4. Set the email address the iQube alert will be sent to.
5. Select Print Formatting » Print Format Information.
6. Verify the alert format port setting is set properly (same 920 port the Ethernet is wired to).
7. In DeviceInstaller, set the *Startup connect mode* to Manual Connection.
8. Set the *Inactivity timeout* to Enable.
9. Set the *Inactivity timer* to 0:15.



Note *After the SMTP address has been set to other than 0.0.0.0 (in the 920), normal uploading/downloading with iRev (in TCP/IP mode) is not allowed nor will Telnet operate in a bi-directional fashion.*

Baud rate	9600	Remote Port	00000
I/F Mode	4C	DisConn Mode	00
Flow	00	Flush Mode	00
Port No	10001	Disconn Time	15 (enter by 00<CR>15)
Connect Mode	C4	SendChar 1	00
Remote IP	000.000.000.000	SendChar2	00

Table 5-1. Ethernet port 1 settings (bold items need to be changed via Telnet)



Note *The Ethernet option is designed to work in a connection-oriented system. This means that once the setup is done and an iQube error is detected, the Ethernet card will send out a message (looking for the server) with the SMTP IP address (and a port designation). Example: C128.1.25.1/25.*

If no response is forthcoming (from the server), it will go no further. It will not transmit again (from an iQube error) until powered down and powered back up.

If a connection is made with the mail server, then the packet will be sent to the server for forwarding as an email.

This could be tested by connecting to Telnet (Port 10001) and creating an error within iQube. The SMTP address and port designation preceded by a "C" should appear on the screen, but this will only happen one time in this fashion and not again until the system is powered down.

5.2 Troubleshooting 920i/iQube Email

If you are having trouble connecting to your networked 920i, the problem might be caused by IP addressing or network firewall issues. One of the most common problems is a firewall (or multiple firewalls). In many cases, the firewall simply doesn't know the Ethernet address of the 920i. Thus, it is rejected and can't make it past this point. The remedy is a firewall configuration by the company's IT department to add the 920i's address to the device.

Other common problems occur within mail servers. Local email clients use the Post Office Protocol version 3 (POP3), an application-layer Internet standard protocol, to retrieve email from a remote server over a TCP/IP connection. If the 920i's IP address isn't allowed to relay (send) mail, the message could be rejected. The email server needs to be manually configured to allow the 920i to do this.

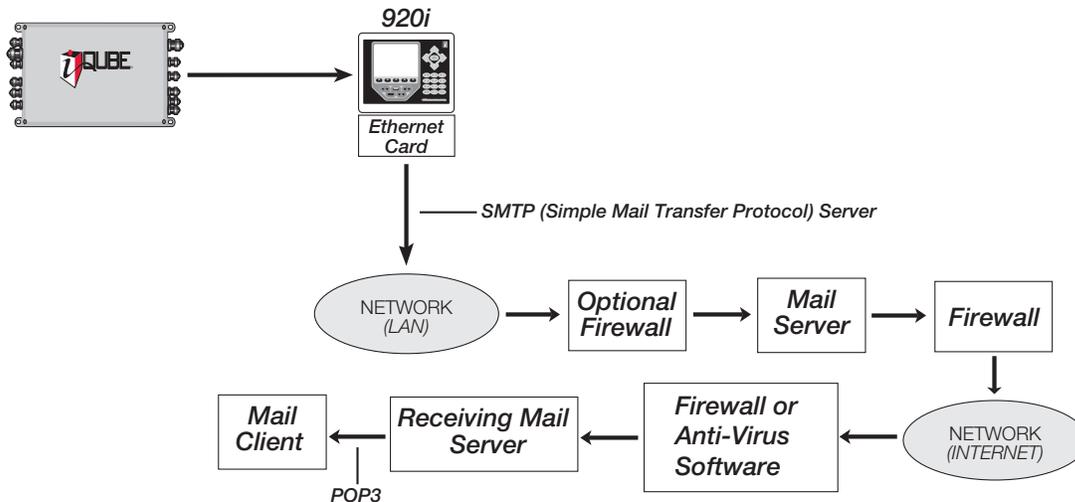


Figure 5-1. Typical network diagram

Additionally, the receiving mail server might get an email from the 920i and go back to ask the network's mail server if it, in fact, sent the message, which would make it allowable. Since the 920i sent the message, the mail server replies with "No, it's not from me" and the email is discarded. Again, a typical IT department is fully capable of correcting this.

There may also be multiple spam filters existing within the network, any one of which could interpret the message as coming from a fictitious address. The address from which the 920i sends an email must be added to the server and added to any third-party spam filters as being a "safe sender." The address will follow the format 920_1@companydomain.com, where "1" could be any number, depending on how many 920s are installed.

Of course, before the 920i can begin to function on a network, it needs to be assigned an IP address and be configured. If this has not been done, refer to Section 3.0.

5.2.1 Troubleshooting Rice Lake Equipment on a Network

Due to a high number of variables, problems typically lie within the company's network. To double-check that all RLWS equipment is set up correctly and functioning properly, you can use Rice Lake's free SMTP Test Server program. This simulates a mail (SMTP) server, isolating the iQube and 920i from the network and making it easy to determine where the problem lies. For example, if you have not been able to receive an email from the 920i but the program shows it is functioning properly, you know there is an issue elsewhere on the network.



Note

When an error occurs, the 920i makes one attempt to contact the mail server. There is a 15 second timeout when unsuccessful. Before further troubleshooting, you should ensure the Ethernet card has blinking lights. If the lights are not, there is a problem with the card and/or cable.

Common Problems

- Incorrect wiring the card
- Port settings
- Using crossover cable rather than patch cable (e.g., if you are connecting a computer directly to the card, use crossover cable between the card and the computer--and you must use a static IP address; if you are using a computer connected to a local area network, use a patch cable)
- Server address (must be set last)

Using the Email Test Server

1. Visit <http://www.ricelake.com/downloads> to download the SMTP Test Server program.
2. Once the Email Test Server program is installed, set the appropriate server address on the 920i.
3. Intentionally generate an error.
4. The Email Test Server program will show data sent from the 920i, confirming whether the email is sent successfully.

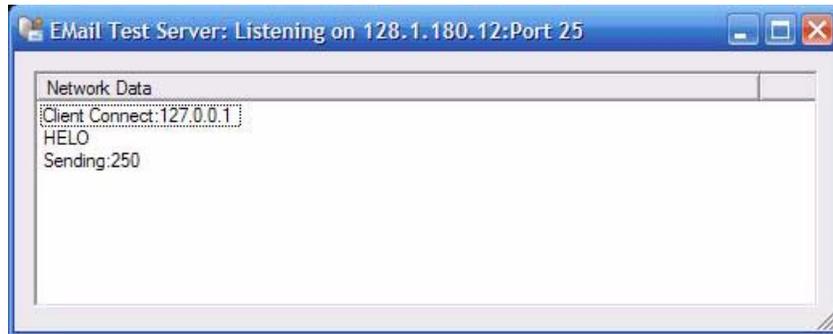


Figure 5-2. SMTP Test Server

Alternatively, you can follow these steps:

1. Ping the 920i to ensure you have network connectivity.
2. Telnet to Port 10001 at the IP address of the card. Press Enter and see if question marks are returned. If they are, the 920i is communicating properly with the card.



Note Question marks will not be returned after the SMTP server address is set to a value other than zero.

3. Ensure the port is set up for command.

5.2.2 Using iRev to Upload/Download with a 920i

These parameters need to be set using the Web Configuration so the dumpall used by iRev will be transmitted smoothly and continuously.

1. Set the baud rate to match the 920i serial port.
2. Turn on the Packing Algorithm with a 12ms delay.
3. Set SendCharacter to 0D.
4. Update the settings.
5. Connect to the 920i using iRev TCP/IP on port 10001.

6.0 Streaming with Ethernet

When using a Lantronix TCP/IP module in Rice Lake indicators which are capable of streaming, stream data can be sent to a 920i as a serial scale using a corporate Ethernet backbone. This is referred to as serial tunneling. This section provides a brief overview of how to use serial tunneling. For more extensive information, refer to the following link:

- http://ts.lantronix.com/tutorials/serial-tunnel/Serial_Tunneling.html



Note *Make sure you consult with your network administrator prior to setting up any streaming functionality.*

6.1 Serial Tunneling

The principle of tunneling is to set up the source scale (in this example, a 720i is used) to stream a LFT Condec format to a receiving unit (920i). These units should be set up and calibrated using RS-232. Data will be sent from the 720i, so it is noted as the sender. Data is received by the 920i, so it is noted as the listener.

1. If not already installed, install an Ethernet TCP/IP card inside each unit. Refer to Section 2.0.
2. Using DeviceInstaller, set the connected mode of the sender to 05 and of the listener to 30.



Note *The sender will initiate a connection immediately upon going to weigh mode. This will be an autostart mode of the Ethernet card. The listener then is set to open a connection with no other contingencies upon detecting a packet directed to its local port.*

3. Using Lantronix Device Installer, set the local port of the listener to 3032 and the remote port of the sender to 3032.
4. Find the listener's remote IP address and enter it in the sender using DeviceInstaller. In the following screen captures, IP address 128.1.1.122 was the sender and IP address 128.1.1.123 was the listener.

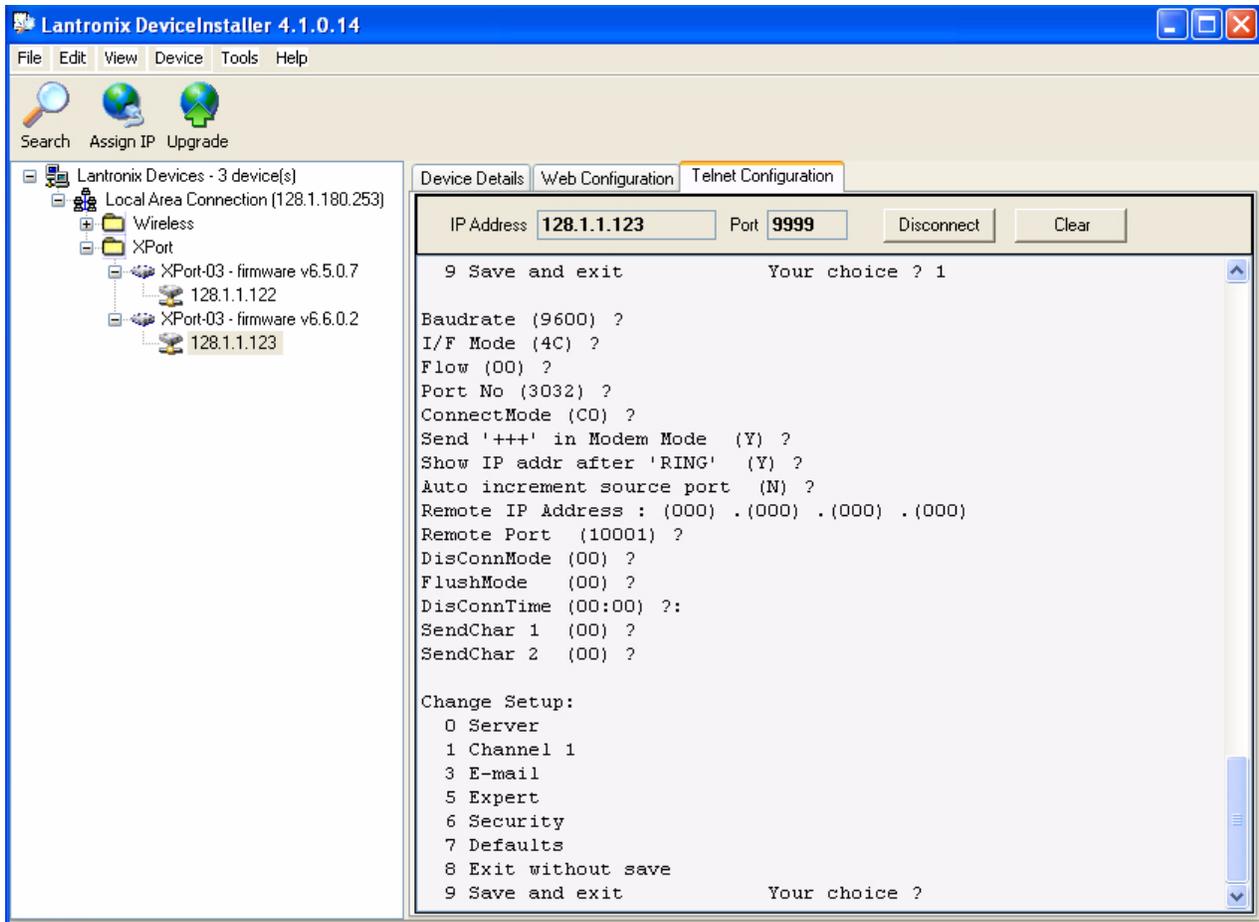


Figure 6-1. Listener setup

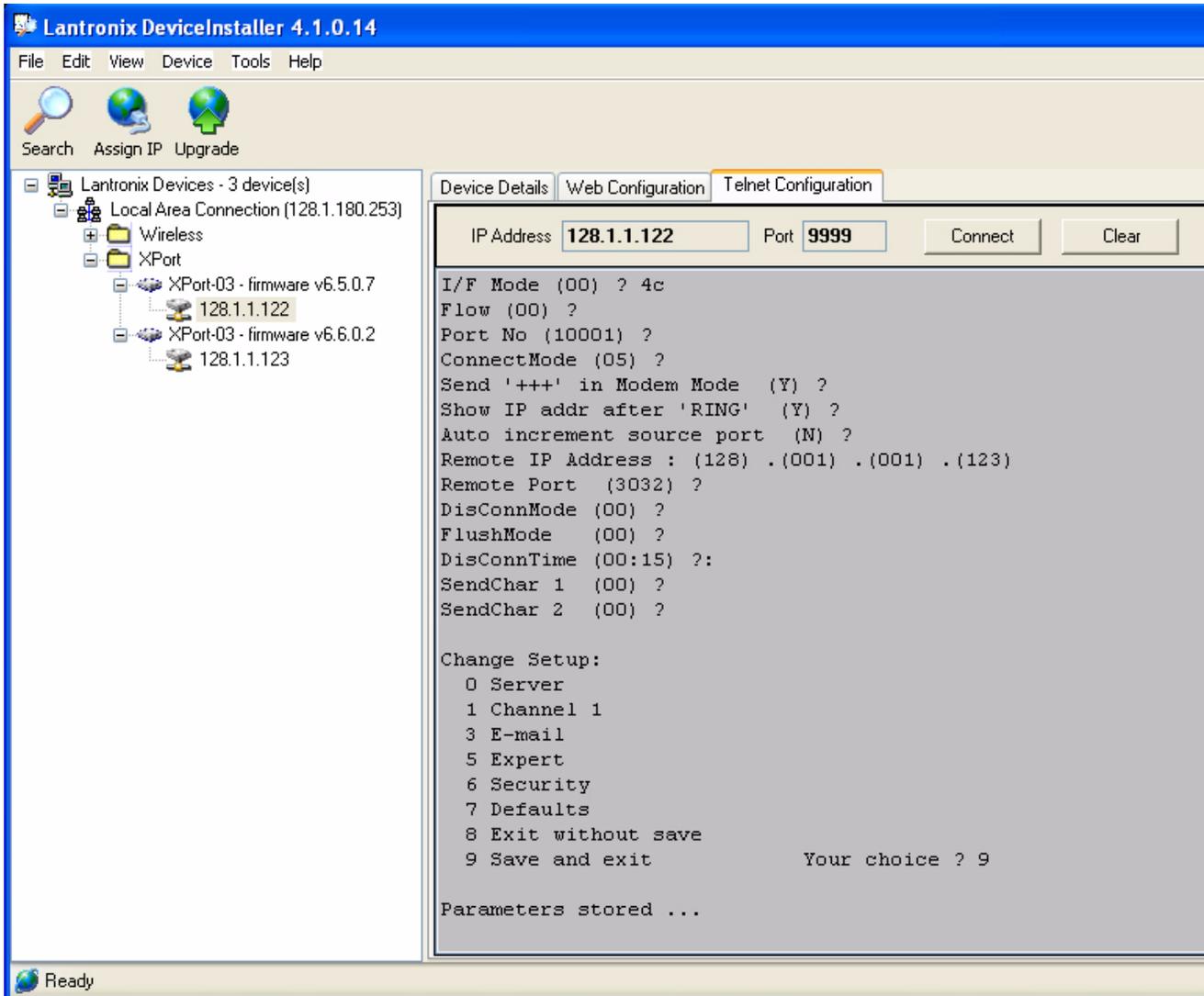


Figure 6-2. Sender setup



Note

The parameters are set using a telnet connection within DeviceInstaller. We can see that the only parameters changed from default (other than baud rate) is the port for the receiver to look for, the ConnectMode to adjust each for its own function, Listen or Sender, and the Remote IP in the sender to direct the packet to the correct IP address.

These units, once set up, will do an auto connect as soon as either they return to weigh mode or after a power cycle.

7.0 Ethernet Specifications

Protocols Supported

Rice Lake indicators: TCP/IP, UDP/IP, ARP, ICMP, SNMP, TFTP, Telnet, DHCP, BOOTP, HTTP, and AutoIP

Device Support

Supports any asynchronous serial device with 7- or 8-bit data, with or without parity requiring Ethernet access

Network Interface

RJ-45 (10/100-Base-T) Ethernet or terminal

Data Rates

Serial speeds 300 bps to 115Kbps

Management

Internal HTTP server
SNMP (read only)
Serial login
Telnet login

Firmware

Flash ROM standard; downloadable from a TCP/IP host (TFTP) or over the serial port

LEDs

Two Bi-Color LEDs

LEFT LED	RIGHT LED	MEANING
Off	Off	No Link
Off	Solid Amber	100 Base-T Half Duplex Link
Off	Blinking Amber	100 Base-T Half Duplex Activity
Off	Solid Green	100 Base-T Full Duplex Link
Off	Blinking Green	100 Base-T Full Duplex Activity
Solid Amber	Off	10 Base-T Half Duplex Link
Blinking Amber	Off	10 Base-T Half Duplex Activity
Solid Green	Off	10 Base-T Full Duplex Link
Blinking Green	Off	10 Base-T Full Duplex Activity

Power Requirements

6v – supplied by indicator

Environmental

Operating Temperature 5 to +50°C (41 to 122°F)
Storage Temperature –40 to +60°C (–40 to 151°F)

Weight

0.8 lb (0.35 kg)

Certifications and Approvals

FCC B
TUV

Warranty

One-year limited warranty

8.0 Appendix A



Figure 8-1. RJ-45 Connector

PIN	Function	Color
1	TX+	White/Orange
2	TX-	Orange
3	RX+	White/Green
4		Blue
5		White/Blue
6	RX-	Green
7		White/Brown
8		Brown

Table 8-1. Pin Assignments

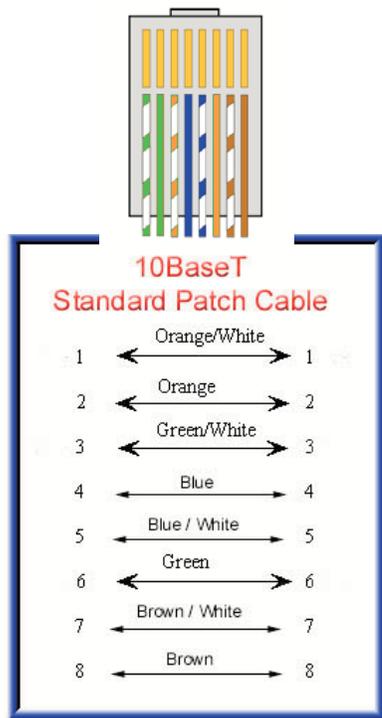


Figure 8-2. Standard Patch Cable

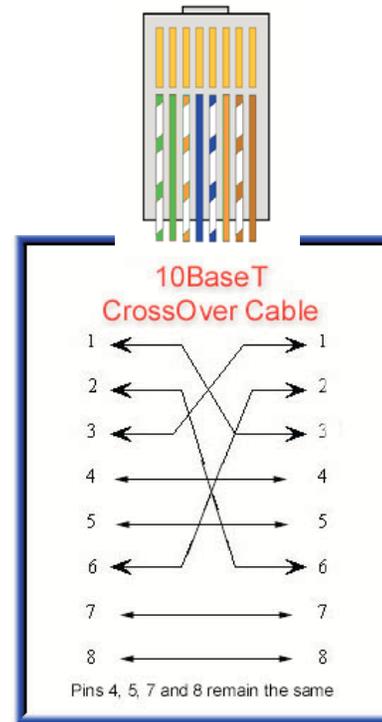


Figure 8-3. CrossOver Cable

9.0 Glossary

100Base-T

Standard for 100 Mbps Ethernet (IEEE 802.3) over unshielded twisted pair (UTP) cable. Commonly known as Fast Ethernet.

10Base-T

Standard for 10 Mbps Ethernet (IEEE 802.3) over unshielded twisted pair (UTP) cable.

ASCII

American Standard Code for Information Interchange - a 7 bit code used to represent text control codes.

CAT-5

Category 5 - UTP cable rated for data rates up to 1000 Mbps.

CAT-6

UTP cabling that is rated for up to 1000 Mbps. Standard is currently under development by the Electrical Industries Alliance/Telecommunications Association (EIA/TIA) organization.

CRC

Cyclic Redundancy Check.

DHCP

Dynamic Host Control Protocol.

Ethernet™

The dominant local area network technology in use today. There are a number of flavors of Ethernet, dependent on the cabling use.

Fast Ethernet

An upgraded version of Ethernet that runs a 1000 Mbps. Also known as 100Base-T and 100Base-FX.

FTP

File Transfer Protocol - allows you to transfer files regardless of type of computer system being used.

Gbps

Gigabit per second - a data transfer rate of 1 billion bits per second.

HDLC

High Level Data Link Control - a bit-oriented framing system used by Modbus+, smart modems and many other systems.

HTTP

Hyper Text Transfer Protocol - the application protocol used to transfer web information between server and browser.

IEEE

Institute of Electronic Engineers - developer of very important physical and data-link standards and networks. These are known as Project 802.

IEEE 802.3

The official designation for networking technology commonly known as Ethernet.

IEEE 802.11

Standards for wireless LAN technology.

IP

Internet Protocol - the networking layer of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol.

LAN

Local Area Network - A communications network designed to connect computers in a limited geographic area (typically under 10 km).

LRC

Longitudinal Redundancy Check.

MAC

Media Access Control - the protocol responsible for controlling which device can talk on the network at any given time.

Mbps

Megabit per second - a data transfer rate of 1 million bits per second.

Manchester Encoding

A digital signaling scheme that uses signal transistors rather than levels to indicate data: (i.e. One = Negative Transition and Zero = Positive Transition).

NIC

Network Interface Card - the computer card responsible for interfacing between the computer and the network.

RJ-45

The standard 8-pin connector for Ethernet.

SDLC

Synchronous Level Data Link Control - a bit-oriented framing system developed by IBM that is a super set of HDLC.

SMB

Server Message Block - a Microsoft application layer protocol for file transfer between Windows servers and workstations.

SMTP

Simple Mail Transfer Protocol - an application protocol used to send e-mails over the Internet.

SNMP

Simple Network Management Protocol - a standard for automatically checking the health of all network equipment and reporting back to a network management system.

SPX/IPX

Sequenced Packet Exchange/Internetwork Packet Exchange - Network and transfer layer protocols (like TCP/IP) that were developed by Novel.

STP

Shielded Twisted Pair.

TCP

Transmission Control Protocol - the transport layer of the TCP/IP protocol.

TCP/IP

Transmission Control Protocol/ Internet Protocol - a pair of protocols that look after getting a message through a complex network (such as the Internet).

TELNET

A protocol that allows your desktop computer to communicate over a network as if it were a dumb terminal attached to a main frame.

TOKEN-RING™

The IBM network system using token passing for access control over ring wiring. Now considered obsolete.

UTP

Unshielded Twisted Pair.

UART

Universal Asynchronous Receiver Transmitter.

VLAN

Virtual Local Area Network - a collection of computers on a LSN that act as a self-contained group.

VPN

Virtual Private Network.

VRC

Virtual Redundancy Check.

WAN

Wide Area Network - a communications network designed to connect computers across the country or world.

Ethernet Interface Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

These warranties exclude all other warranties, expressed or implied, including without limitation warranties of merchantability or fitness for a particular purpose. Neither RLWS nor distributor will, in any event, be liable for incidental or consequential damages.

RLWS and buyer agree that RLWS' sole and exclusive liability hereunder is limited to repair or replacement of such goods. In accepting this warranty, the buyer waives any and all other claims to warranty.

Should the seller be other than RLWS, the buyer agrees to look only to the seller for warranty claims.

No terms, conditions, understanding, or agreements purporting to modify the terms of this warranty shall have any legal effect unless made in writing and signed by a corporate officer of RLWS and the Buyer.

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