CW-90/90X, 720i™, 820i®, iQUBE^2®, Counterpart®, LaserLT®

WLAN Installation Instructions

The optional Lantronix® WiPort™ (WLAN – Wireless Local Area Network) wireless networking device can be installed inside the *CW-90/90X*, *720i*, *820i*, *iQUBE^2*, *Counterpart* and *LaserLT* products. This option (PN 108671) is used for real-time data transmission between the indicator and other devices and software over a WLAN. The WiPort supports two separate TCP/IP connections which can be configured to talk to two different RS-232 serial ports in the indicators (only one is available in the *720i* and *820i* indicators).

Note *Before installing this option, contact the IT administrator to obtain the required WLAN information to allow connection to the network. Information includes: WLAN topology, network name (SSID), security protocol and password/keys, and IP address and subnet mask (if not using DHCP).*

An RS-232 communications cable (to attach between J2 on the option card and a PC) is required for initial configuration. This cable will be used with a simple terminal emulation program (such as Windows®[1] HyperTerminal) to perform the initial configuration of the option card which allows it to connect with your wireless network.
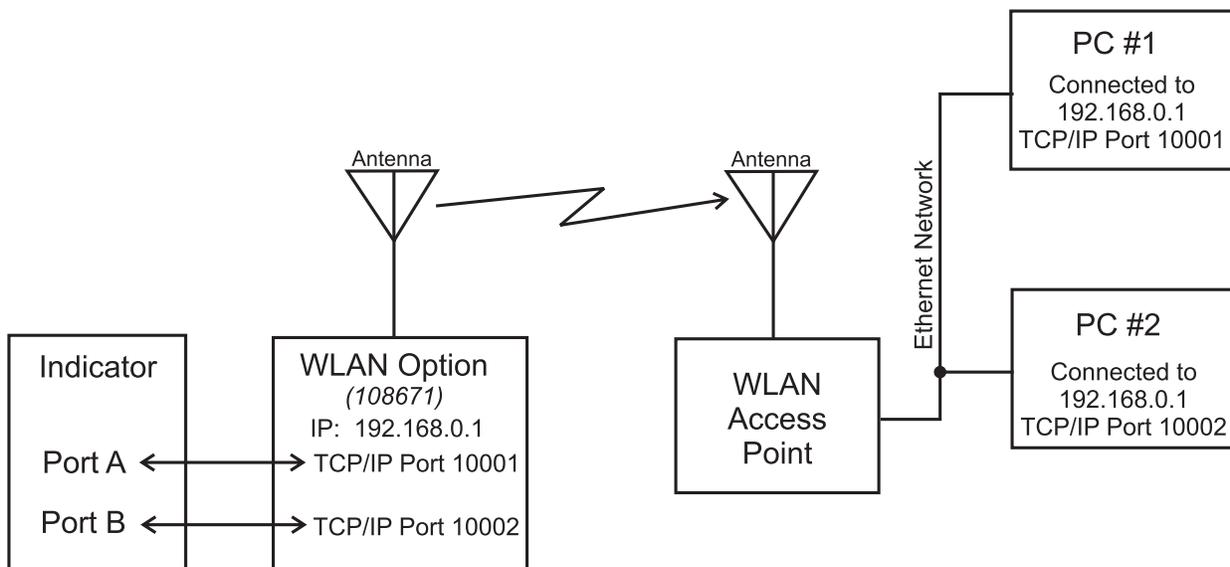
Figure 1. Example of Network Connections

Configuration of the WiPort device is required before it can be used on a WLAN. This is done either via a serial RS-232 connection to a PC running a terminal program such as a HyperTerminal, or once connected to the WLAN, using the Windows-based configuration software, DeviceInstaller™ (available on the CD that comes with the kit). The WLAN option can be factory installed or purchased separately and installed on site.

The WLAN option comes in a kit containing the following items:

- Pluggable wireless board (PN 106103)
- Antenna (PN 98357)
- Two standoffs (PN 95356)
- CD containing Lantronix information (PN 72763)

1. Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

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W E I G H I N G   S Y S T E M S
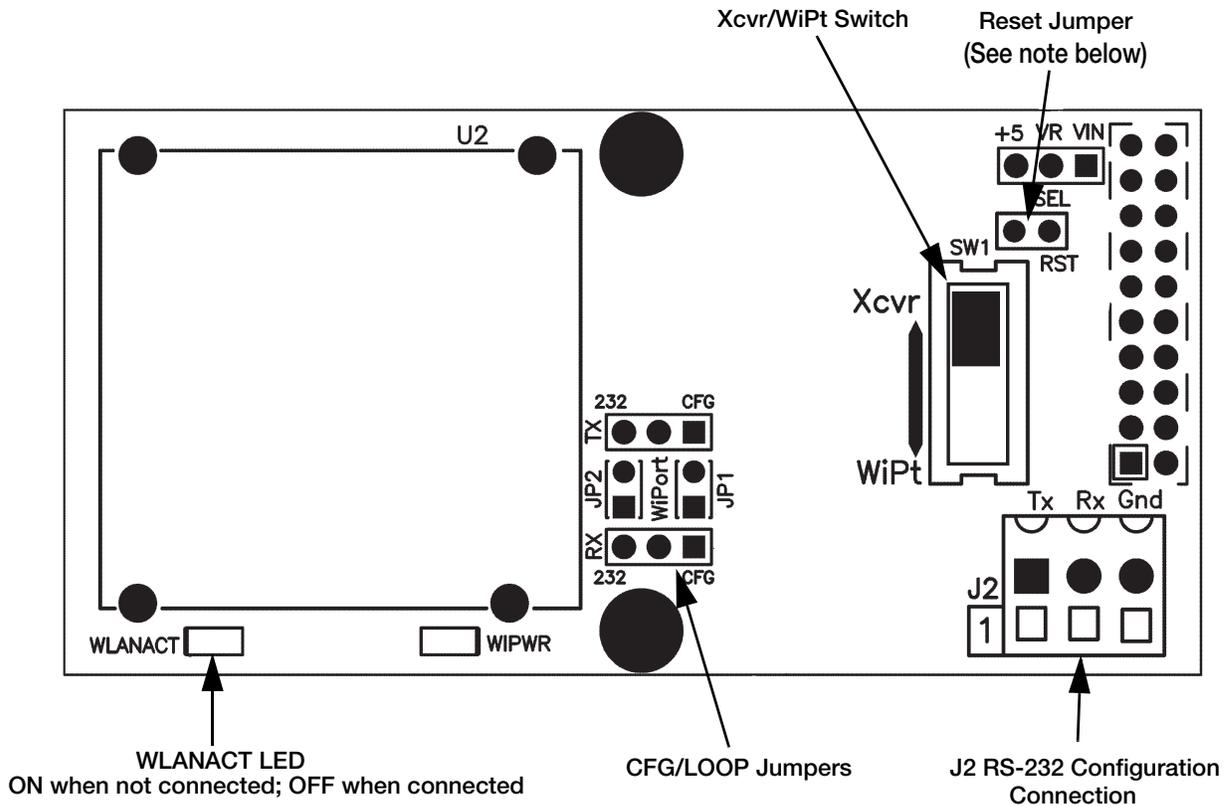
Figure 2. WLAN Option Card

Note This jumper is used to reboot the option board by momentarily shorting it out.
It is not used to reset the option board's configuration.

Enclosure Disassembly and Option Card Installation

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

WARNING Electric Shock Hazard – the card is not hot-pluggable.
Before opening the unit, ensure the power cord is disconnected from the power outlet.

1. Disconnect indicator power cord from AC outlet.

2. Place the indicator face-down on an anti-static work mat.

3. Remove the backplate from the enclosure and set it aside (see the indicator manual).

4. If installing the card in a *CW-90/90X*, *820i*, *720i*, *Counterpart* or *LaserLT*, set the Xcvr/WiPt switch to the Xcvr position. If installing the card in an *iQUBE^2*, set the switch to the WiPt position.

RX JP2 TX 232 232 CFG CFG WiPort JP1
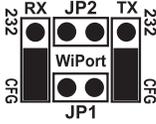
**For configuration of WiPort Module
(WiPort TCP/IP Port 1 to J2)**

RX JP2 TX 232 232 CFG CFG WiPort JP1
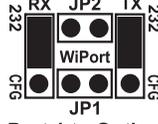
Indicator Port 1 to Option Board J2

RX JP2 TX 232 232 CFG CFG WiPort JP1
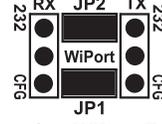
**Indicator Port 1 to WiPort TCP/IP Port 1
(See chart below)**

Indicator	**WiPort TCP/IP Port 1** *Indicator Port A* *(Jumpers JP1 & JP2 ON)*	**WiPort TCP/IP Port 2** *Indicator Port B*	SW1	*SEL* *Jumper*
LaserLT	Port 3 CPU JP3 in COM-OPT Position	Port 4	Xcvr	+5 VR Vin ● SEL
CW-90	Port 3	Port 2	Xcvr	+5 VR Vin ● SEL
720i	Do Not Use* WiPort JP1 & JP2 OFF	Port 2 CPU Port 2/OPT1 Jumper ON	Xcvr	+5 VR Vin ● SEL
820i	Do Not Use* WiPort JP1 & JP2 OFF	Port 2 CPU Port 2/OPT3 Jumper ON	Xcvr	+5 VR Vin ● SEL
iQube^2	Port 3	Port 2	WiPt	+5 VR Vin ● SEL
Counterpart	Port 3	Port 2	Xcvr	+5 VR Vin ● SEL

* For the 720i and 820i indicators, only the configuration for communication between WiPort TCP/IP
Port 2 and indicator RS-232 Port 2 should be used. WiPort Jumpers JP1 and JP2 should
not be installed (place both jumpers in the 232 or CFG positions).

Figure 3. Jumper Settings

5.   Install the two provided standoffs in the two holes on the WLAN option card. The standoffs should protrude from the bottom of the card, opposite the side with the switch.

6.   Carefully align the WLAN option card onto the proper connector on the CPU board (see the respective product's installation manual). Ensure the two standoffs are also aligned with the corresponding holes on the CPU board.

CW-90/90X	**J5**
720i	**J9**
820i	**J1**
iQUBE^2	**J9**
Counterpart	**J5**
LaserLT	**J7**

7.   Firmly press down to seat the option card in the CPU board connector.

8.   Screw the antenna to the small white wire coming from the WiPort box on the option card.

⚠ **Important**   *The white RF cable with RP-SMA connector coming from the WLAN option card is very fragile; handle it with care.*

RF cable is fragile.
Handle with care.
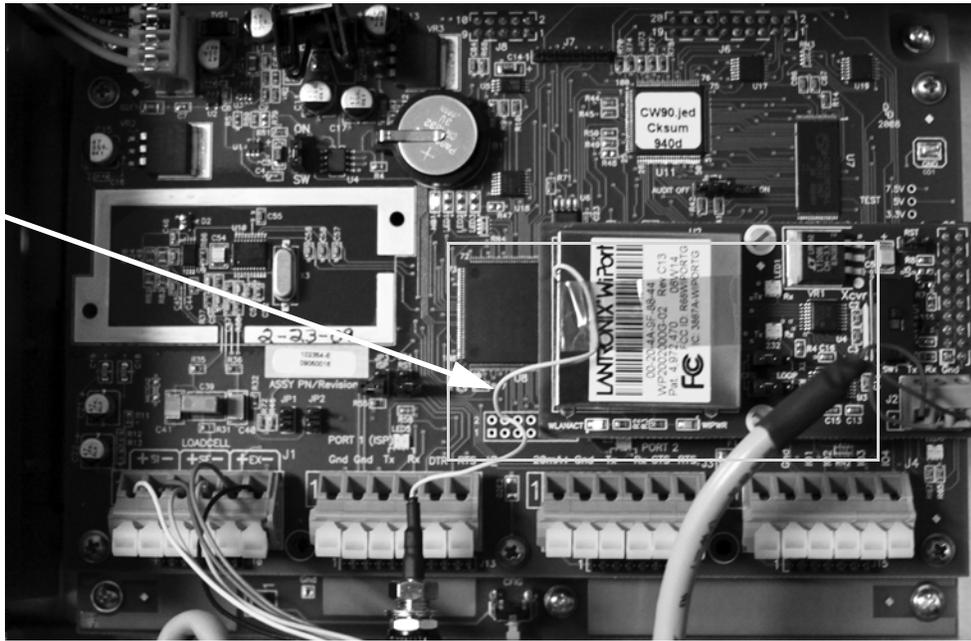
Figure 4. WLAN Card Installed on CPU Board (shown on CW-90)

9. Slide the antenna partway through the largest cord grip.

> **Note** *In washdown environments, we recommend the antenna joint not be exposed to the environment as the product may become trapped in the joint. In non-washdown applications, the joint should be exposed and positioned to follow the travel of the indicator's tilt direction.*

10. Tighten the cord grip.

Non-Washdown Environment   *Washdown Environment*

Figure 5. Antenna Installed Through Cord Grip

WLAN Card Configuration via Serial Mode

The WLAN card must be configured via a serial connection before it can communicate with your network. After initial serial configuration, more detailed configuration can be performed using the Windows-based DeviceInstaller program included on the CD. Initial configuration is performed using a PC connected via a serial cable to the J2 connector on the card (see Table 6) and a terminal program (e.g., HyperTerminal, Procomm, Putty).

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WLAN J2	Connects to PC's DB9
Tx (Pin 1)	Rx (Pin 2)
Rx (Pin 2)	Tx (Pin 3)
Gnd (Pin 3)	Gnd (Pin 5)

Table 6. J2 to PC Serial Port Connections

Jumpers

The WiPort jumpers must both be in the CFG position to configure the WLAN card.

Note *Not all PC terminal programs will display information in the same manner. Depending on your software choice for configuration, the screens displayed in this section may be different.*

Example Using Hyperterminal

1. Launch the program from Start » All Programs » Accessories » Communications » Hyperterminal.

2. Name the connected device and choose an icon for the connection. Click OK.

Figure 7. HyperTerminal "Connection Description" Dialog Box

3. In the *Connect To* dialog box, use the *Connect using* drop-down menu to select the PC comm port your serial cable is connected to and click OK.

Figure 8. "Connect To" Dialog Box

4. Comm port properties must be set to 9600 bits per second; 8 data bits; parity: none; stop bits: 1; and flow control: none (as shown in Figure 9).
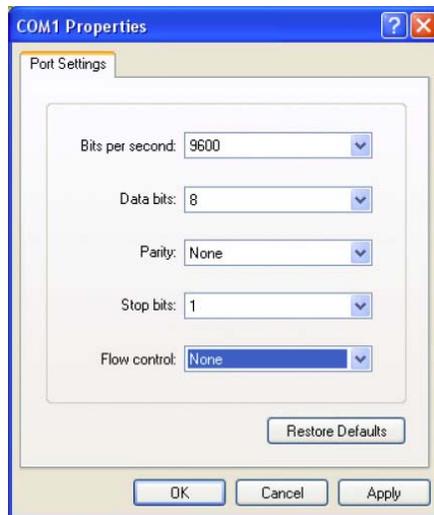
Figure 9. "COM1 Properties" Dialog Box

5. Verify all settings are correct and click **OK**.

6. For *720i*, *820i*, *iQUBE²*, *LaserLT*: Unplug the indicator's main power. On the PC keyboard, press and hold the **X** key while reconnecting indicator power. When the screen shown in Figure 10 displays, press **Enter** on the PC keyboard within 5 seconds.
For *CW-90/90X*, *Counterpart*: With AC power connected, power the unit off using the front panel button. On the PC keyboard, press and hold the **X** key while powering the unit back on using the front panel button. When the screen shown in Figure 10 displays, press **Enter** on the PC keyboard within 5 seconds.
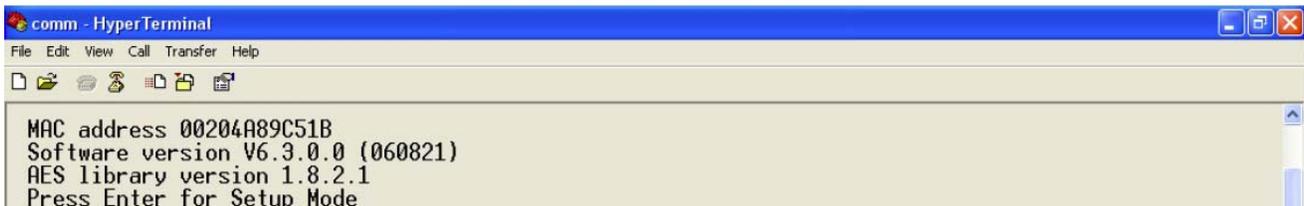
Figure 10. Display Information for Setup Mode

7. Select a change setup value (0-9) from the menu by entering the number in the *Your Choice?* field and press **Enter**. In this example, WLAN options are being set up, so press **4** and **Enter** as shown in Figure 11.
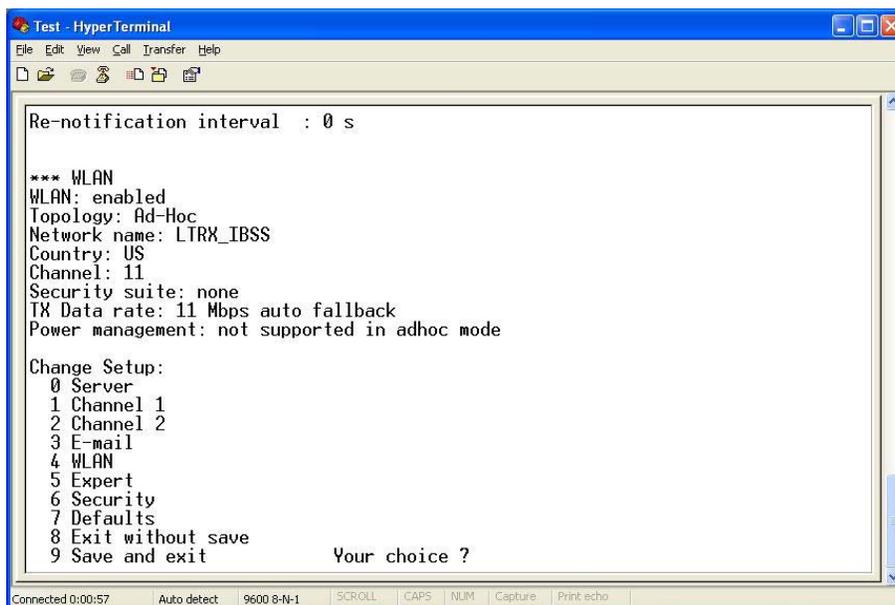
Figure 11. "Change Setup" Screen

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8. Enter the desired Topology for the WLAN option (see Table 12 for topology choices and descriptions).

Note *The present setting for each parameter is shown in parentheses. To accept this value, press Enter. Enter a new value and press Enter to change the setting.*

Topology Choice	Description
0=Infrastructure	Communicating to an access point for a large network (i.e., indicator to company/office network)
1=AdHoc	Point-to-point connection (i.e., computer to indicator)

Table 12. Topology Choices and Descriptions

Note *Steps 9 to 15 show an example of an AdHoc configuration with no security. Your configuration may vary.*

9. The next menu choice is *Network Name (SSID)* as shown in Figure 13. Enter your desired wireless network name and press **Enter**. This identifies the network the wireless option will connect to.
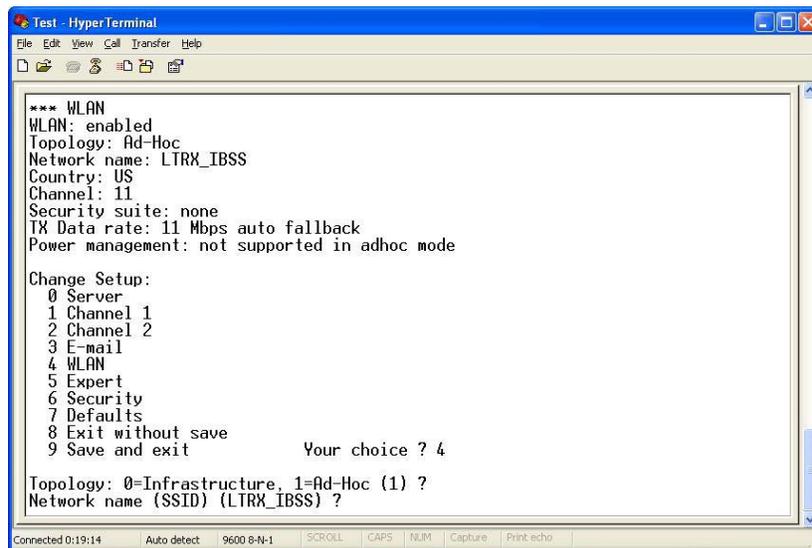
Figure 13. "Network Name" Screen

10. Enter your wireless network channel and press **Enter**.
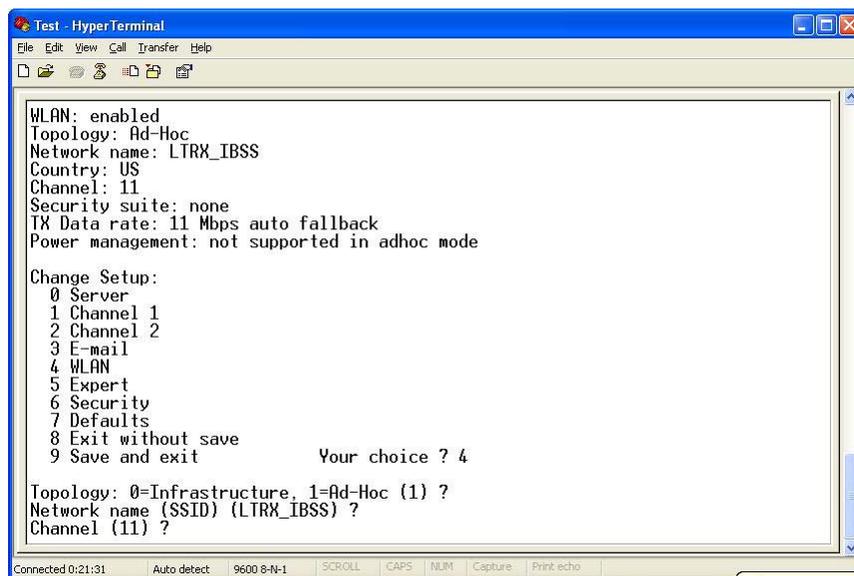
Figure 14. "Wireless Network Channel" Screen

11.

12. Select 0 to set level of security to none, press **Enter**.

Security Level
0=None
1=WEP (Wired Equivalent Privacy)

Table 15. Available Security Levels
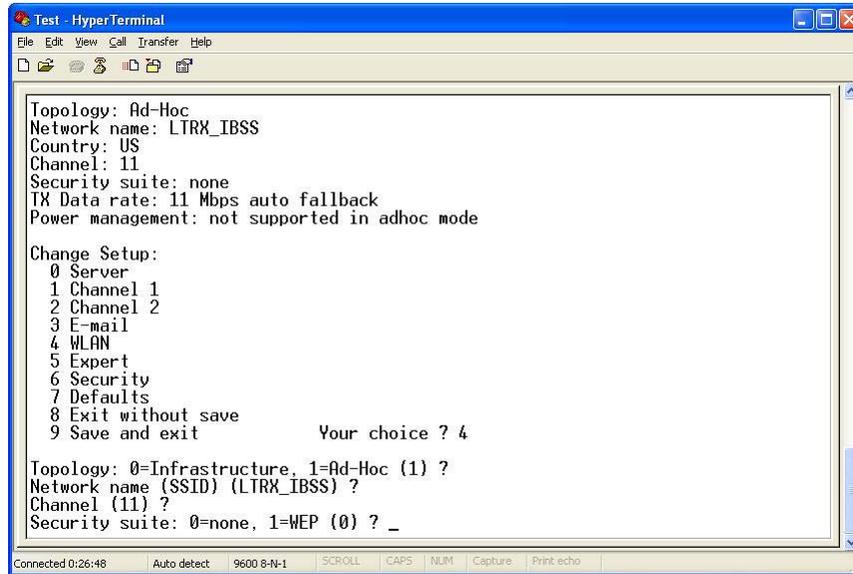
Figure 16. "Security Level Selection" Screen

13. Select the Tx data rate by entering *1 (auto fallback)* and press **Enter**.
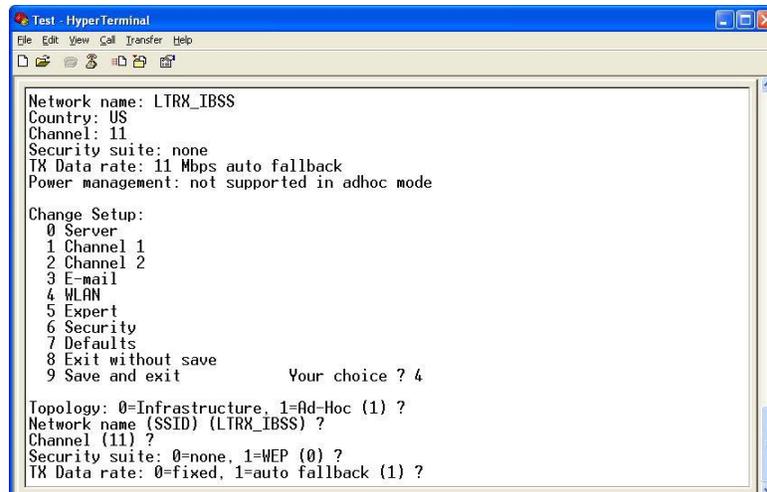
Figure 17. Tx Data Rate (Auto Fallback)

14. Specify the Tx data rate by entering *7 (54 Mbps)* and press **Enter**.

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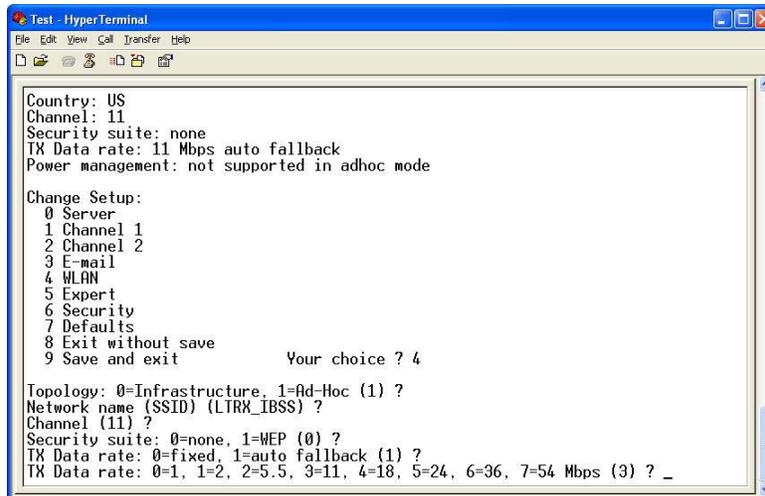
Figure 18. Tx Data Rate (54 Mbps)

15. When you have gone through all the settings in the WLAN section, the screen will again show the list of sections that can be changed.

16. Set up the server settings, including the IP address. Do so by selecting *0* at the *Your Choice?* prompt.

17. Select *1* for the Network Mode to select Wireless Only.

18. Next, set the IP address. Entering the IP address is done one three-number group at a time. To enter a static IP address, enter the first three numbers of the address and press **Enter**. Then, enter the second three numbers and press **Enter**. Continue with the next two groups of three; if the card will be obtaining its IP address dynamically from a DHCP server, the IP address will need to be set to 000.000.000.000.

19. For most installations, the Gateway Address can be left as not set (N). For some installations that use a router, the Gateway Address may need to be set (check with the IT department for this scenario).

20. Next, set the NetMask bits. This number should be set to *0* for a DHCP network, *24* for a Class A network (255.0.0.0), *16* for a Class B network (255.255.0.0), or *8* for a Class C network (255.255.255.0).

21. Select *N* for "No" to change *telnet config* password.

22. Select *N* for "No" to change the *Enable Power Management* setting.

23. When you have gone through all settings in the *Server* section, the screen will again show the list of sections that can be changed. To save the changes you made, enter *9* and press **Enter**.

24. The PC terminal program can now be closed and your PC serial cable disconnected from the WLAN card.

25. After changing the settings, you must reconfigure the WiPort jumpers as required for normal operation. (See Figure 3.)

26. The WLAN option card should now connect to the wireless network. This can be verified by viewing the WLANACT LED on the option card.
   • If the LED is **OFF**, the connection is good.
   • If the LED is **ON** or **flashing,** there is a problem with the connection.

27. With the WLAN option card connected to your network, further configuration can be accomplished using the *Lantronix DeviceInstaller* software, included on the CD, from any PC on the same network. This method provides a user-friendly GUI interface. (See Section Lantronix DeviceInstaller).

   Configuration may also be accomplished by using the WiPort's built in Web Server and a web browser program, such as Windows Internet Explorer, by entering the option card's IP address in the address bar.

Lantronix DeviceInstaller
1. Insert the CD provided (Ethernet Configuration, PN 72763).
2. Click **Lantronix DeviceInstaller.**

Figure 19. Ethernet Configuration CD Screen

3. If you have not previously installed .NET framework, you will be prompted to do so before continuing. This requires an Internet connection. Once .NET framework has been installed, select Lantronix DeviceInstaller a second time. Follow the steps to install and when done select Quit.

4. DeviceInstaller is now ready to use. It can configure all settings on any WLAN card connected to the same network as the PC. For further instructions regarding the use of DeviceInstaller, or for detailed information on the various settings in the WLAN card, refer to the Lantronix Technical Manuals included on the CD or visit www.lantronix.com.

Enclosure Reassembly

Once the card is installed and initially configured, the enclosure cover can be reinstalled. Refer to the indicator's instruction manual for the proper method of installation.

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
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, 11 Mbps (802.11b) 6, 9, 12, 18, 24, 36, 48, 54 Mbps (802.11g)
Firmware	Upgradeable via TFTP and serial port
Serial Line Formats	7 or 8 data bits, 1-2 stop bits, parity: odd, even, non
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
Frequency Range	2.412-2.484 GHz
Range	Up to 328 feet (100 m) line of sight
Maximum Receive Level	-10 dBm (with PER < 8%)

Table 20. WiPort Technical Data

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Category	Description
Receiver Sensitivity	-72 dBm for 54 Mbps -87 dBm for 11 Mbps -89 dBm for 5.5 Mbps -90 dBm for 2.0 Mbps -92 dBm for 1.0 Mbps
Modulation Techniques	OFDM DSSS CCK DQPSK DBPSK 64 QAM 16 QAM
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
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
Temperature	Operating range: -30º C to +70º C (-22º F - 158º F) Storage range: 30º C to +70º C (-22º F - 158º F)
Included Software	Windows-based DeviceInstaller configuration software and Windows-based Comm Port Redirector, DeviceInstaller, Web Manager Lantronix web site: http://www.lantronix.com

Table 20. WiPort Technical Data

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 chosen so that the equivalent insotropically 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. Therefore, 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, and so on).

> **Note** *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 you must obtain a separate FCC authorization.*
>
> *Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.*

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230 W. Coleman St. • Rice Lake, WI 54868 • USA
U.S. 800-472-6703 • Canada/Mexico 800-321-6703 • International 715-234-9171 • Europe +31 (0)26 472 1319

www.ricelake.com www.ricelake.mx www.ricelake.eu www.ricelake.co.in m.ricelake.com