

920i® and 820i®

WLAN Installation Instructions

Option PN 98057

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 920i and 820i while installing and setting up the wireless network.

The 920i and 820i programmable HMI indicators offer an optional Lantronix® WiPort™ (WLAN - Wireless Local Area Network) wireless networking device which is installed inside the 920i and 820i indicator. This option can be used for real-time data transmission to warehouse management systems. The Windows®-based configuration software, DeviceInstaller™ is required for installation and setup and is available on the CD that comes with the kit. The WLAN option can be factory installed upon request when purchasing the 920i or 820i, or can be purchased separately and installed on site.

The wireless LAN option comes in a kit containing the following items:

- Pluggable wireless board (PN 97789)
- Antenna (PN 98357)
- CD containing Lantronix information (PN 72763)
- This manual (PN 101995)

The following photo shows the WLAN card and antenna inside the 920i enclosure.

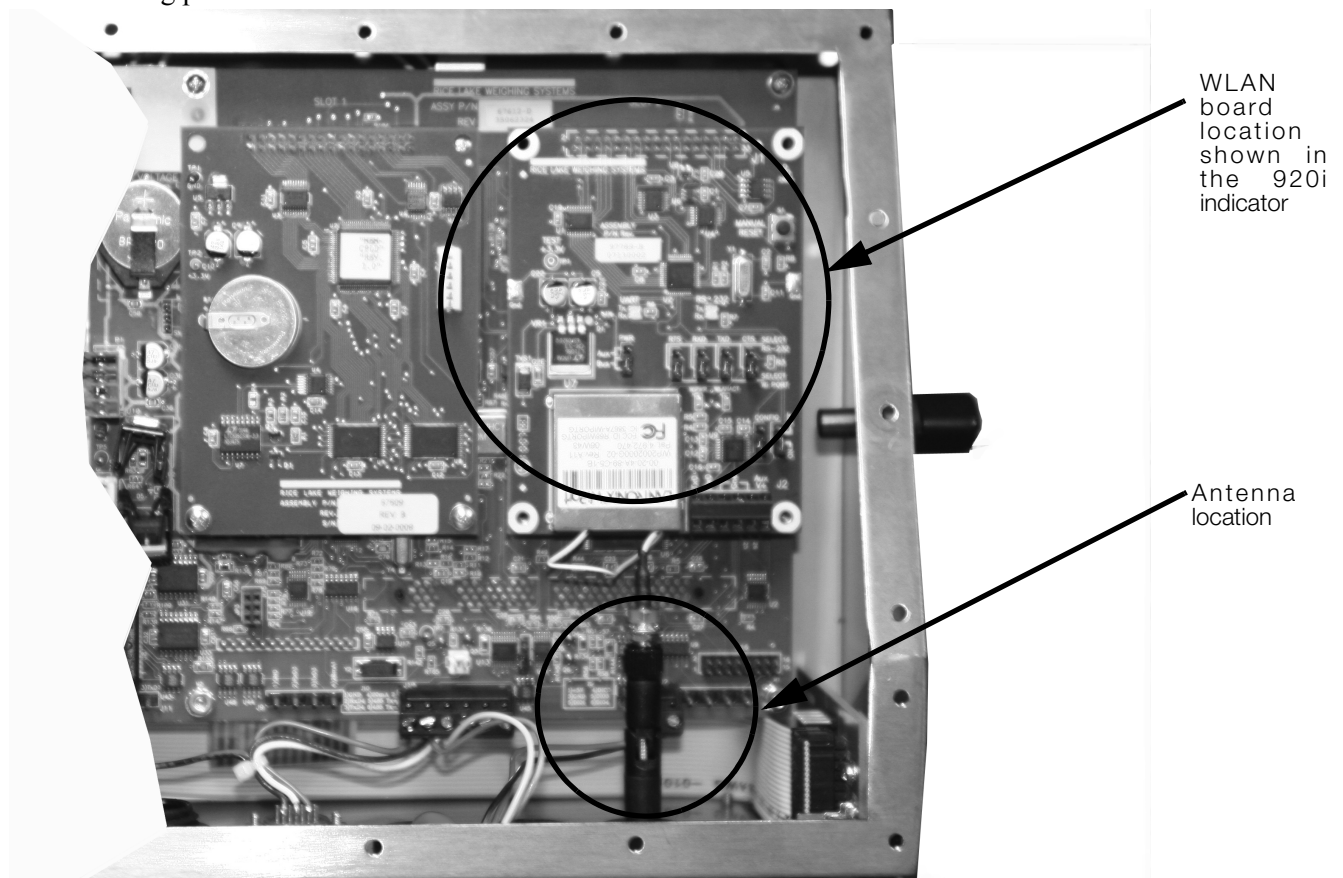


Figure 1. WLAN Board and Antenna Location Inside the 920i Enclosure

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

The 920i and 820i has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.

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

Installing Option Cards

The general procedure for installing the WLAN option card is as follows:



Caution

Option cards are not hot-pluggable. Disconnect power to the 920i or 820i 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 a slot connector on the CPU board. Press down to seat the option card in the CPU board connector.
3. Use the screws provided in the option kit to secure the other end of the option card to the threaded standoffs on the CPU board.
4. Set up the WLAN configuration parameters as explained on page 4.
5. Make connections to the option card as required. Use cable ties to secure loose cables inside the enclosure as shown in Figure 2. When installation and configuration is complete, reassemble the enclosure as shown on page 9.

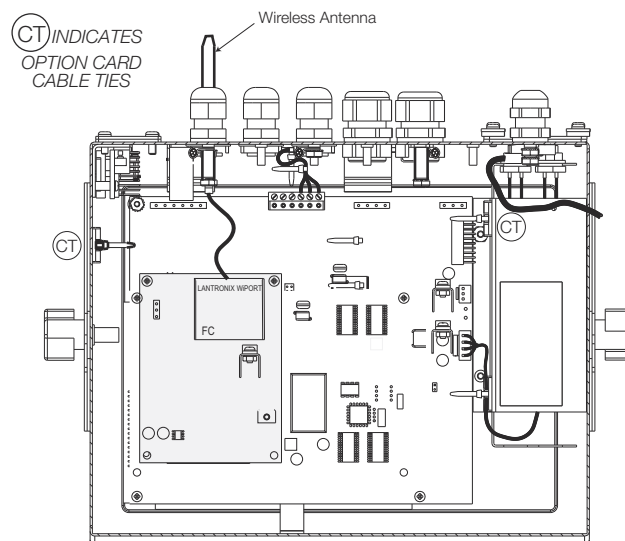


Figure 2. Installed Option Cards, Showing Secured Cables

Mounting the Antenna

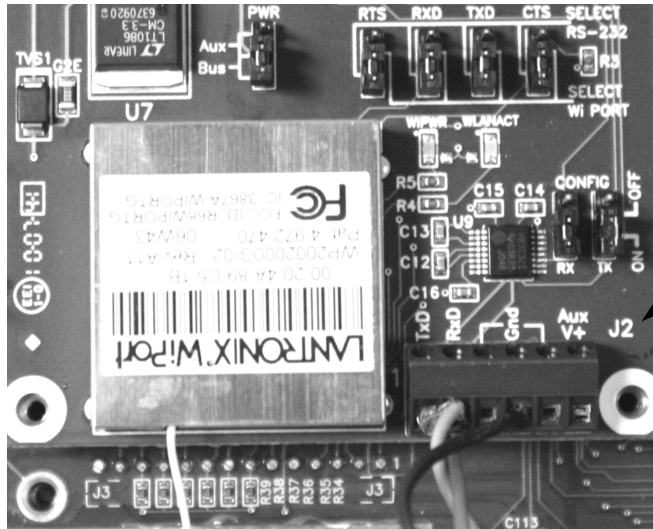
The antenna is already wired to the WLAN board. Place the antenna through the smallest cord grip. Tighten the antenna once its been pushed through the hole.

The 920i and 820i automatically recognizes all installed option cards when the unit is powered on.

Wireless Configuration via Serial Mode

You must configure the 920i or 820i 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.



Connect a cable into the J2 connector of the installed WLAN option to a PC
Wiring is as follows:
TxD = J2, Pin 1
RxD = J2, Pin 2
Gnd = J2, Pin 3 or 4

Figure 3. WLAN Serial Cable Wiring From the WLAN Option Card

Jumpers

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

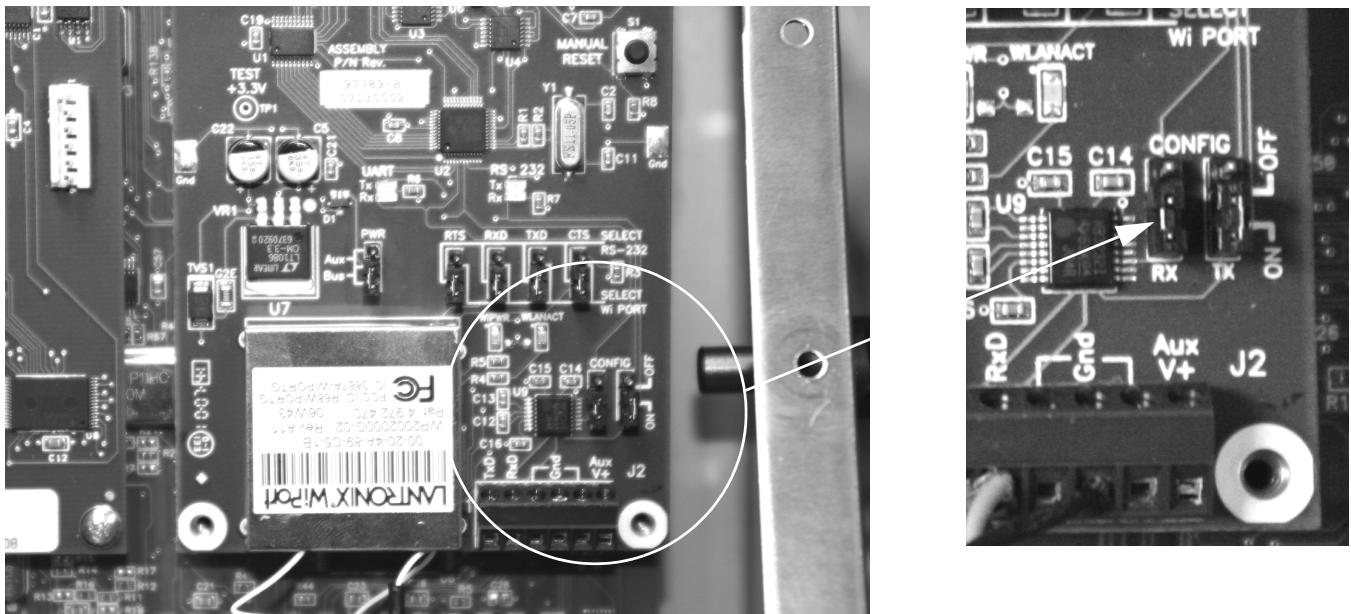


Figure 4. Configuration Jumper Location on WLAN Option Board

Once the configuration jumpers are in the ON position, use the following steps 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.

1. Select the Hyperterminal program on the PC.
2. Enter a name and choose an icon for the connection and press **OK**.



Figure 5. Hyperterminal Connection Description Screen

3. Select a connect to option. Select the comm port you have connected your serial cable to and press **OK**.



Figure 6. Connect To Screen

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

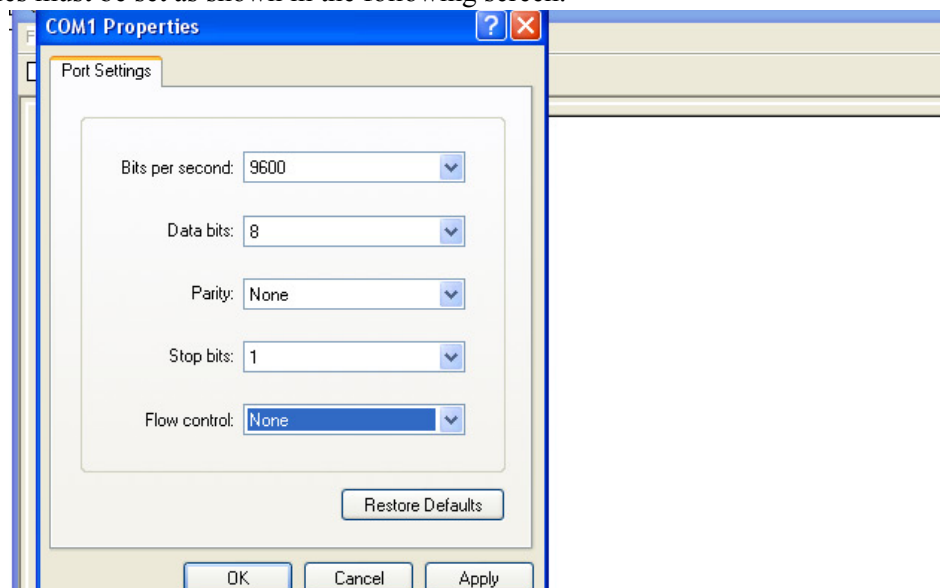


Figure 7. Comm Port Properties Screen

The WLAN configuration port uses the following settings:

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

Make the changes and press **OK** to save those changes.

5. Reset the WLAN option card by pressing the manual reset button, and immediately upon release enter three lowercase x characters (xxx) at the same time. The manual reset button location is shown in Figure 8.

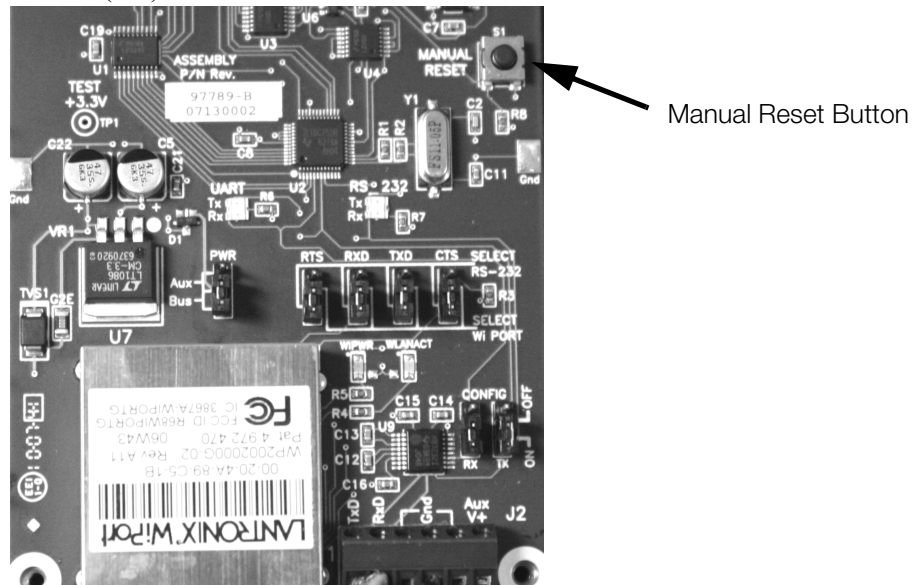


Figure 8. Manual Reset Button Location on WLAN Option Card

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.

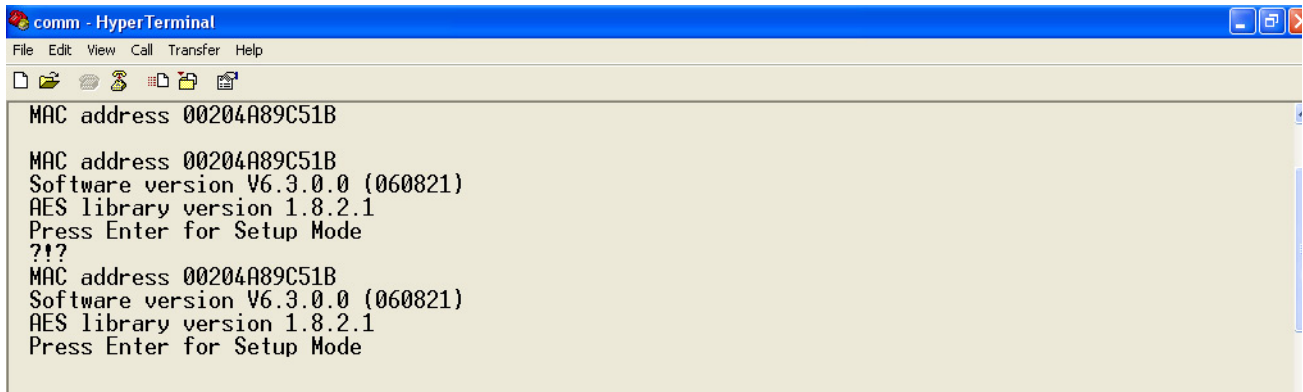


Figure 9. Display Information for Setup Mode

6. 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.
7. 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 10.

```
*** WLAN
WLAN: enabled
Topology: Infrastructure
Network name: wrlws
Country: US
Security suite: WEP
Authentication: open/none
Encryption: WEP64
TX Key index: 1
TX Data rate: 54 Mbps auto fallback
Power management: disabled

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

Your choice ?
```

Figure 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).

8. Enter the desired Topology for the WLAN option.

```
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) ? |
```

Figure 11. Topology Screen

The two choices are:

- 0 = Infrastructure
- 1 = AdHoc.

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

9. 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 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.

10. The next step is to select a level of security as shown in Figure 13.

```
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 13. Security Level Select Screen

Security levels include:

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

Select 1 and press Enter.

11. 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 14. Authentication Screen

Authentication choices are:

- 0 = open/none
- 1 = Shared

Select 0 = open/none and press Enter.

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

```
1 Channel 1
2 Channel 2
3 E-mail
4 WLAN
5 Expert
6 Security
7 Defaults
8 Exit without save
9 Save and exit
Your choice ? 4

Topology: 0=Infrastructure, 1=Ad-Hoc (0) ? 0
Network name (SSID) ( ) ?
Security suite: 0=none, 1=WEP, 2=WPA, 3=WPA2/802.11i (1) ? 1
Authentication: 0=open/none, 1=shared (0) ? 0
Encryption: 1=WEP64, 2=WEP128 (1) ? 0
Only 1 - 2 allowed!
Encryption: 1=WEP64, 2=WEP128 (1) ? _
```

Figure 15. Encryption Screen

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

```
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) ? 0
Encryption 0=WEP64, 1=WEP128 (0) ? 0
Display current key (N) ?
```

Figure 16. Display Current Screen

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

```
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) (wrlws) ? (wrlws)
Security 0=none, 1=WEP, 2=WPA (1) ? 1
Authentication 0=open/none, 1=shared (0) ? 0
Encryption 0=WEP64, 1=WEP128 (0) ? 0
Display current key (N) ? Y
Change Key (N) ?
Data rate, Only : 0=1, 1=2, 2=5.5, 3=11 Mbps or
Up to: 4=2, 5=5.5, 6=11 Mbps (6) ?
```

Figure 17. Change Key Screen

Select the data rate and press Enter.

14. 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 greyed out as is shown below.

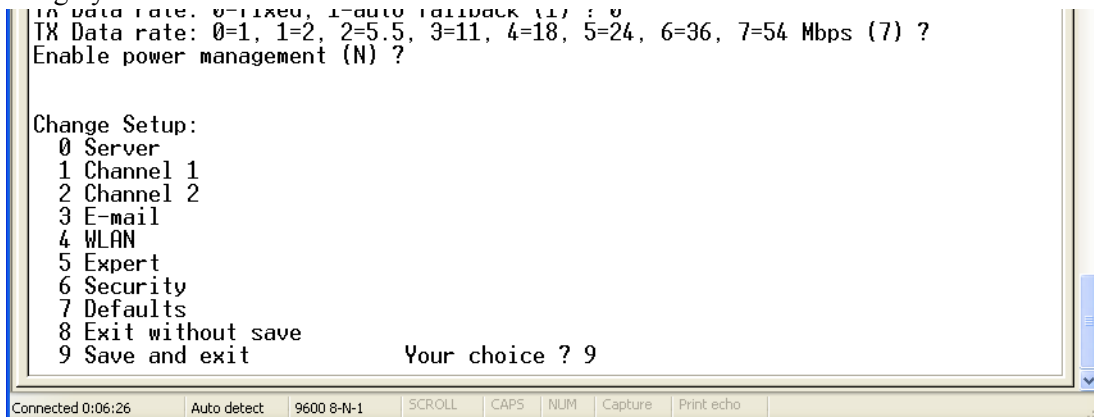


Figure 18. Save and Exit Screen

Once all of the data is saved, you must switch the jumpers back to the OFF position (Figure 4) to exit out of the configuration mode.

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

Enclosure Reassembly

Once cabling is complete, position the backplate over the enclosure and reinstall the backplate screws. Use the torque pattern shown in Figure 19 to prevent distorting the backplate gasket. Torque screws to 15 in-lb. (1.7 N-m).

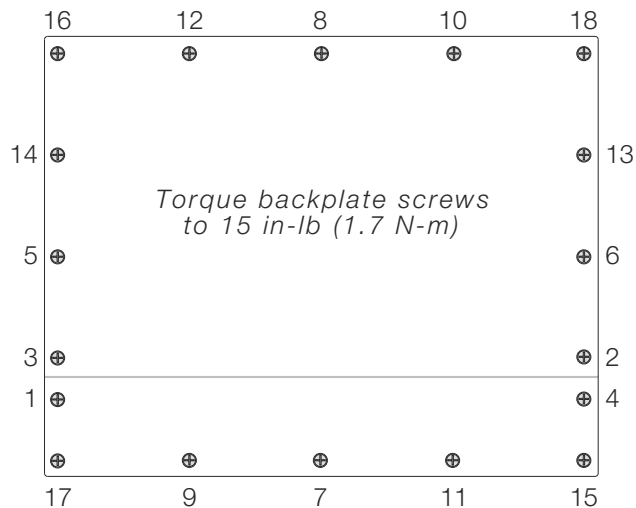


Figure 19. 920i Enclosure Backplate (shown)

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 1. WiPort Wireless Specifications

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 2. 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 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).

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 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.