

# WLAN Installation Instructions



**Note** Before installing this option, contact the IT administrator to obtain network communication information, such as SSID and security parameters, and have an RS-232 communications cable to run between the PC and the WLAN option card during initial wireless network setup of the option card.

The 420 WLAN option card offers a way to communicate with one or both of the serial ports in a 420 indicator (including the CLS-420 Cargo Lift Scale) through a Wireless Local Area Network, or WLAN.

The option uses a Lantronix<sup>®1</sup> MatchPort<sup>®2</sup> WLAN device server to handle all of the serial to WLAN protocol requirements. The MatchPort module can be configured using a terminal program, such as Hyperterminal<sup>®3</sup>, via an RS-232 connection. Additionally, once connected to the network, its configuration can be accessed and modified through a web browser, such as Internet Explorer<sup>®4</sup>, or through the Lantronix provided DeviceInstaller<sup>™5</sup> PC program.

In addition to providing a WLAN interface, this card is also capable of providing a wired Ethernet interface via an RJ-45 connection found on the board.

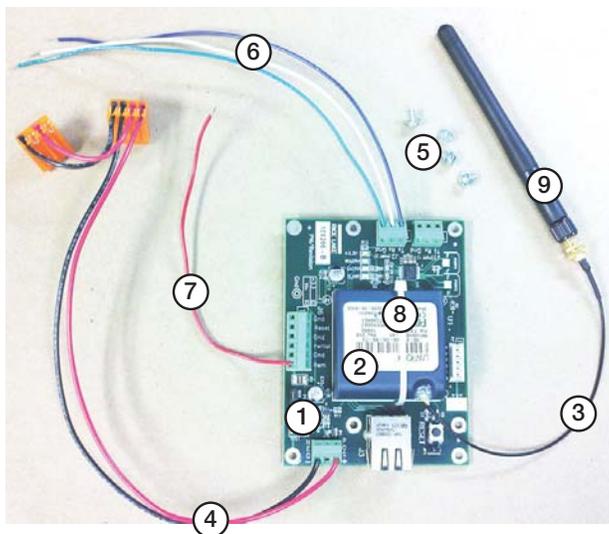


Figure 1. CLS-420/420Plus WLAN Option Kit

Item No	Part No	Description	Qty
1	109266	Board Assy, Universal	1
2	112227	Module Wifi Matchport	1
3	112228	Cable RF UFL to RSMA 6in	1
4	118877	Cable Assy, Power Supply	1
6	14822	Screw, Mach 4-40NC x 1/4	4
	15441	Wire, 20AWG Blue Stranded	1
	15461	Wire, 20AWG White	1
	15471	Wire, 20AWG Green Stranded	1
7	34181	Wire, 20AWG Red Stranded	1
8	58579	Strap, Tie 8 in Length	1
9	98357	Antenna, 2.4GHz 802.11B/G	1
	21896	Label, Anti-Static Warning	1
	72763	CD, Ethernet	1

Table 1. CLS-420/420Plus WLAN Option Kit Parts List



To be the best by every measure<sup>®</sup>

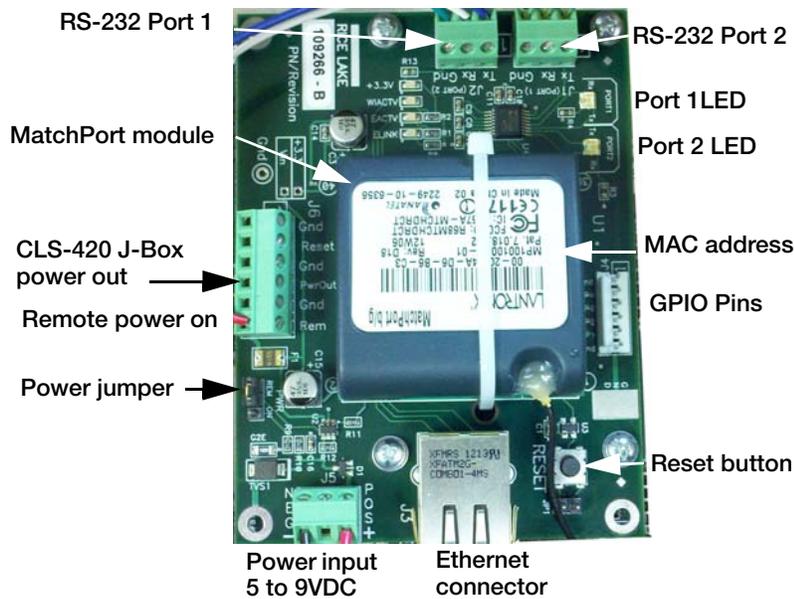


Figure 2. Universal MatchPort Option Card

## Enclosure Disassembly

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



**WARNING** Before opening the unit, ensure the power cord is disconnected from the power source.

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

## Installing the Option Card

Installing the WLAN card as follows:

1. If installed, remove the plastic cover over the power supply (AC units).
2. Remove the two-wire cable that connects the power supply to the CPU board (discard).



**Note** If this is a CLS-420 installation, cut the red and black wires that lead to the 10-position connector on the bottom of the enclosure as close as possible to the tap-and-run connectors. These two wires will later be attached to the option card. These wires are shown in Figure 3.



Figure 3. CLS-420 Installation Red and Black Wire Location

3. Place the option card, with the silver RJ-45 jack nearest to the indicator's cord grips, on the four standoffs located on the right side of the CPU board.
4. Line up the appropriate four holes and secure the board with the included 4 x 40 screws.

5. Route the power cable, which is already attached to the option card, to the power supply.
6. Attach the orange connector with only two wires to the CPU board J7.
7. Attach the other orange connector (with four wires), to the 4-pin connector on the power supply.
8. Re-install the plastic cover on the power supply, if applicable.



**Note** *If this is a CLS-420 installation, strip about a 1/4" of insulation from the red and black wires that were cut earlier.*

*Attach the red wire to PWOUT connection of J6 on the option card and the black wire to the GND connection next to the red wire. This will provide power to the CLS junction box.*

9. Attach the free end of the red wire coming from the option card to Pin 4 (+5V) of J6, using the 4-position connector included in the parts kit that was supplied with the indicator. Verify PWR jumper on the option board is in the REM position.
10. Decide which of the two 420 communication ports to attach to the WLAN option. If using the EDP port (not available on the CLS-420), then connect the white, blue and green wires from the option card to pins 1, 2, and 3 (TxD, RxD, and Gnd), respectively on J3. If using the PRN, or printer port, connect like above except to J4.



**Important** *Optionally, with the addition of three additional wires (not provided) connected to J1 (Port 1) of the WLAN option, both the EDP and PRN ports can be connected to the WLAN option board. Do not make this connection at this time as Port 1 is needed to perform the initial configuration of the option card.*



**Note** *For CLS-420 installations, if the 420 includes a 802.15 wireless load cell kit mounted to the rear of the enclosure cover, to comply with FCC regulations, the antenna must be placed as far away as possible from the 802.15 wireless load cell kit module. Ensure the antenna is installed in the cord grip closest to the setup switch access screw.*



Figure 4. WLAN Option Installed in 420 Indicator

## Initial Configuration

Initial configuration must be performed using an RS-232 connection to a PC, and a terminal program, such as Hyperterminal. After getting the option card to communicate with the network, Internet Explorer or DeviceInstaller can be used for a more intuitive, graphical method of configuration to set the remainder of the card's settings.



**Note** *The configuration information should be all that is needed to establish a simple connection to most common wireless networks. However, the MatchPort Device Server is powerful, and there are many settings not covered in this manual. For more detailed information regarding all the card's settings and configuration methods, please refer to the full MatchPort or WiPort™ 6 User Guides on the CD that is included with this kit.*

1. Connect a 3-wire RS-232 cable from the PC to J1 (Port 1) of the option card (shown in Figure 4). If using a DB-9 connection on the PC, PC pin 2 will go to TX, pin 3 will go to RX, and pin 5 will go to GND.
2. Apply power to the 420 and turn it on. Verify the +3.3V LED lights on the WLAN option board. On the PC, start the terminal program and set it for 9600 baud, 8 data bits, and no parity.

3. To initialize the configuration mode of the WLAN option card, press the **x** key on the keyboard three times within three to five seconds after the option card's power is applied, or it is reset. The easiest way to do this is to:
  - Press and hold the **x** key on the PC's keyboard
  - Then press and release the **RESET** button on the option card.
  - If done correctly, within a few seconds the option card will respond with its MAC address, its software version, and a message stating **Press Enter for Setup Mode**.
  - Release the **x** key and press the **enter** key within five seconds to enter setup mode.



Figure 5. Connect Three Wires to Configure the Unit

#### Example:

MAC address 00204A04F598

Software version V6.8.0.2 (120903)

Press Enter for Setup Mode

After pressing **enter**, the option card will list all of its present settings, then display a list of up to nine options that can be chosen.

At a minimum, the parameters in #0 (Server) and #4 (WLAN) will have to set.

## Setting the Initial Server Settings

To set the server settings:

1. Type **0**, press **enter**.
2. Choose if the card will be used as a Wired Ethernet (0), or Wireless WLAN (1) interface. The current value is shown in “()” just prior to the “?” prompt.
3. If the current value is OK, press **enter**.  
If not, key in the value, then press **enter**.

Example, if the current value is Wired Only (0), to change to Wireless Only, key in “1” and press **enter**.

4. Set the IP address. If using a Static IP address, enter the address one octet at a time.

Example, to enter 192.168.0.10:

- At the first octet type 192, then **enter**.
- The second octet displays, type 168, then **enter**.
- The third octet displays, type 0, then **enter**.
- The fourth octet displays, type 10, then **enter**.

If r network supports dynamic IP assignment (DHCP), the address to enter is 000.000.000.000 (this turns on the DHCP mode in the Option Card).

- If the value in the “()” is okay, press **enter** to advance.
5. Set the Gateway. This can be set later, or not at all.

6. Set the NetMask. If using DHCP, set this to 0.
  - For 255.255.255.0, enter 8.
  - For 255.255.0.0, enter 16.
  - For 255.0.0.0, enter 24.
7. The next several settings are usually required to be default, unless changes are required, just enter through them until the nine choices reappear.

## Setting the Initial WLAN Settings

1. The WLAN settings need to be set, if **Wireless Only** is selected. Select configuration option 4.
2. Set the Topology. Select the network type and press **enter**.
  - AdHoc – only two devices that talk to each other. Refer to the Lantronix user guides on the CD.
  - Infrastructure – connecting to an Access Point on a larger network.



**Note** *Infrastructure networks are more common, and will be used for this setup example.*

3. Set the Network Name, or SSID. Enter the name and press **enter**. *It is case-sensitive.*
4. Set the Security Suite.
  - If there is an open network, select 0.
  - If there is WEP, WPA, or WPA2 security, select the appropriate type and hit enter.



**Important** *These settings are critical for allowing the Option Card to connect to the network. If any settings are not understood, seek help from the network administrator, or the included User Guides on the CD.*



**Note** *The following parameters vary depending on the choices made. Set all the parameters as needed.*

5. There are several other settings regarding the data rates, power management, and roaming. Default should be acceptable, but they can be changed if needed.
6. Now the option card should be able to establish communications with the WLAN network. Type 9 and **enter** to save the configuration settings and leave setup mode.
7. The option card will save the changes, then re-boot. Watch the WIACTV LED on the card, the LED will blink while it is searching for the network.
  - If finds and successfully connects to the network, the LED will be lit solid.
  - If it cannot find the network, or finds it, but cannot connect due to configuration setting problems, the LED will continue to blink, or go off. If this happens, start over with the RS-232 configuration method, correcting the setting(s) that is causing the problem.

## Other Configuration Settings

The card's configuration settings can be made using the RS-232 method, but it is much easier to use a web browser or DeviceInstaller to do it.

DeviceInstaller is provided on the CD included with this kit. It can be installed on a computer that is part of the network to remotely configure any of the Lantronix Device Servers it finds on the network. When opened, DeviceInstaller will search the network for all available devices. Select the device by MAC or IP. Once selected, configure all the card's settings, as well as upgrade its firmware. More information regarding DeviceInstaller is available on the CD.

The other method to configure the card is using a web browser, such as Internet Explorer or Firefox® 7. Simply enter the option card's IP address in the browser address bar. The browser will open a web server, using port 80, on the option card. From here, using this method is much the same as configuration through DeviceInstaller. Please refer to the CD for more information.

## Establishing Communication With the 420

The option card has two TCP Ports that can be used to communicate. Default is TCP Ports 10001 (Port 1) and 10002 (Port 2). These numbers can be changed in the option card, if needed. Port 1 and Port 2 refer to the physical connection on the option card. If installed as instructed, J2 (Port 2) is connected to either the EDP or PRN port on the 420 indicator. J1 (Port 1) was used for configuration. If using Port 1 to talk to the ‘other’ RS-232 port on the 420, it can be wired it at this time.

The default RS-232 communications settings on the option card are 9600, 8N1, and should match the default settings in the 420. If not, make the necessary changes in the 420, or the option card Channel 1 or 2 (port 1 or 2) so they match.

To open a connection, start the PC Communications software and open a TCP/IP connection to the IP address assigned to the card (with the static IP that was configured, or the DHCP IP assigned by the network), and the port number for the ‘Port’ on the option card to be talked through (by default, this will be 10002, or Port 2).

Once open, communication is established to the 420 the same as if wired to an RS-232 connection.

## Other Options

By default, it will take an external device or program to establish a communications connection to the option card in the 420. However, the option card is also capable of initiating the connection to another device or PC listening on a port.

In the serial settings for the RS-232 channel are using, there are settings to open an active connection. By default, this is off. To use the 420 to open a connection, the active connection parameter can be set to something other than None, such as “With Any Character,” the remote host IP and Port values will have to be set. This setting will open a connection to a remote host as soon as any character is sent from the 420 to the option card. This could be useful for printing to a remote printer, streaming to a remote display, or sending data to a PC program.

There is wide variety of possible configuration settings, refer to the user guides include on the CD, or call our technical or sales support staff with the particular application and questions.

## Enclosure Reassembly

Once installation of the option card is complete:

1. Position the backplate over the enclosure and
2. Reinstall the backplate screws.



**Important**

*Use the torque pattern shown in Figure 5 to prevent distorting the backplate gasket. Torque screws to 15 in-lb. (1.7 N-m).*

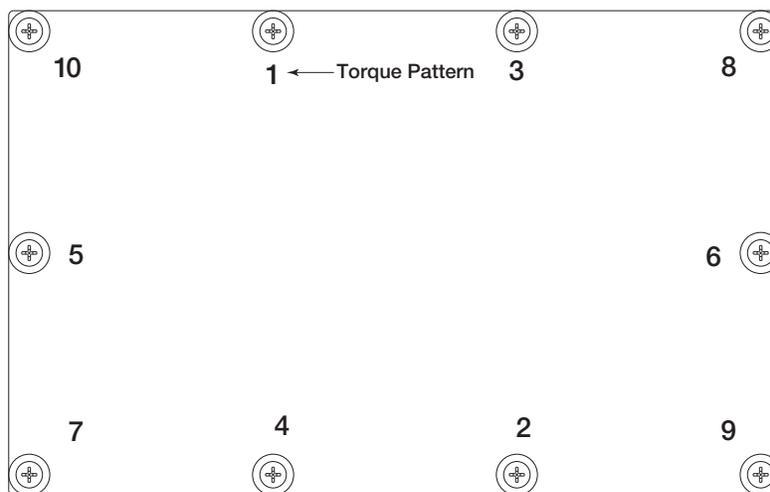


Figure 6. 420 Enclosure Backplate



**Important**

*Torqued screws may become less tight as the gasket is compressed during torque pattern, therefore a second torque is required using the same pattern and torque value.*

## MatchPort Wireless Specifications

Category		IEEE 802.11b/g
Frequency Range		2.400 - 2.484 GHz
Output Power		14 +2.0/-1.5 dBm 1, 2, 5.5, 11 Mbps 12 +/- 1.5 dBm 6, 9, > 12 Mbps
Antenna Connector		1
Data Rates		1, 2, 5.5, 11, 6, 9, 12, 18, 24, 36, 48, 54 Mbps
Radio	Number of selectable subchannels	US 1-11 CA 1-11 JP 1-14 FR 10-13 SP 10-13 OT 1-13 (OT = others)
	Modulation	DSSS, DBPSK, DQPSK, CCK, OFDM, 16QAM, 64QAM
	Antenna connector	1
Security		WEP 64/128, WPA, WPA2/802, 11i
Maximum Receive Level		-10 dBm (with PER < 8%)
Receiver Sensitivity		-69 dBm for 54 Mbps -88 dBm for 11 Mbps -85 dBm for 6 Mbps -91 dBm for 1.0 Mbps
WLAN Current		Max: 10 mA

Table 2. Wireless Specifications

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1. Lantronix® is a registered trademark of Lantronix, Inc.
  2. MatchPort® is a registered trademark of Lantronix, Inc.
  3. HyperTerminal is a registered trademark of Hilgraeve, Inc.
  4. Internet Explorer® is a registered trademark of Microsoft Corporation
  5. DeviceInstaller™ is a trademark of Lantronix, Inc.
  6. WiPort® is a registered trademark of Lantronix, Inc.
  7. Firefox® is a registered trademark of Mozilla Foundation

## Disclaimer

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

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

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

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

### Labeling of the End Product

The label on the end product incorporating the MatchPort b/g module must clearly state that it contains an FCC-approved RF module. For example, This product contains an RF transmitter ID# R68MTCHDRCT.

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 dBi. Antennas not included in this list or having a gain greater than 5 dBi are strictly prohibited for use with this device, unless system-level FCC approval is gained. 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

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

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

As long as the two conditions above are met, further transmitter 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 cards, or co-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.*



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