



Where Automation Connects.

  
**RadioLinx®**  
**RLXIB-IHA**

802.11a

RadioLinx® 802.11a Industrial Hotspot



October 19, 2009

SETUP GUIDE

## United States FCC & Industry Canada rules



**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

**CAUTION:** Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### Antenna spacing requirements for user safety

It is important to keep the radio's antenna a safe distance from the user. To meet the requirements of FCC part 2.1091 for radio frequency radiation exposure, this radio must be used in such a way as to guarantee at least 20 cm between the antenna and users. Greater distances are required for high-gain antennas. The FCC requires a minimum distance of  $1 \text{ mW} \cdot \text{cm}^2$  power density from the user (or 20 cm, whichever is greater).

If a specific application requires proximity of less than 20 cm, the application must be approved through the FCC for compliance to part 2.1093.

The installer of this radio equipment must ensure that the antenna is located or pointed in such a way that it does not emit RF fields in excess of Health Canada limits for the general population; refer to Safety Code 6, obtainable from Health Canada.

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.

### RLXIB-IHA, RLXIB-IHG: CSA C22.2 213-M1987 and N. American Standard ANSI/ISA 12.12.01 listing

In accordance with Canadian Standard CSA C22.2 213-M1987 and ANSI Standard ISA 12.12.01, the RLXIB-IHA and RLXIB-IHG series radios have been UL listed for operation in Class I, Division 2, Groups A, B, C, and D Locations.

THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C, AND D, HAZARDOUS LOCATIONS ONLY IF INSTALLED IN AN APPROVED ENCLOSURE AND POWERED BY A CLASS 2 POWER SUPPLY."Limited Power Source".

WARNING: EXPLOSION HAZARD! SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.

WARNING: EXPLOSION HAZARD! DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON HAZARDOUS.

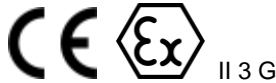
AVERTISSEMENT - RISQUE D'EXPLOSION - AVANT DE DECONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGERUEX.

The following label is applied to the radio to indicate that it is listed under ANSI/ISA standard 12.12.01 and CSA standard C22.2 213-M1987.

This Device contains a Radio Transmitter Module  
FCC ID: OQ7IHW Canada IC: 5265-IHW  
Conforms to ANSI/ISA Std. 12.12.01 – Certified to CSA Std. C22.2 No. 213-M1987  
Class I Division 2 10-24 Volts DC 6 Watts  
48 Volts DC using the PoE Injector  
Groups A, B, C & D  
Max. Ambient: 75°C Temp Code T6

**Note:** The Temp. Code (Temperature Code) refers to the temperature of the rating of the RLXIB-IHA and RLXIB-IHG radios. The T6 code means that the maximum temperature of the unit did not exceed 135°C.

## RLXIB-IHA and RLXIB-IHG: ATEX Approval



II 3 G  
Ex nA nL IIC T6 X  
-40°C ≤ Ta ≤ 75°C  
ProSoft Technology, Inc., Bakersfield, CA USA  
Model: RLXIB  
S/N: XXXXXXXXXXX

### Caution:

Read instructions before operating in Hazardous Areas  
N. America

The Radio must be installed inside an IP54 enclosure which requires a special tool for access.

Product name: RLXIB-IHA, RLXIB-IHG

### Safety Warning Statements

#### Explosive Atmosphere

Power, Input, and Output (I/O) wiring must be in accordance with the authority having jurisdiction

- A** Warning – Explosion Hazard – Do not make or break connections in an explosive atmosphere.
- B** Caution – Use only approved recommended power supply.
- C** Warning - Power supply should be installed in a non-hazardous area.
- D** Warning – DO NOT OPEN WHEN ENERGIZED.
- E** These products are intended to be mounted in an IP54 enclosure. The devices shall provide external means to prevent the rated voltage being exceeded by transient disturbances of more than 40%. This device must be used only with ATEX certified backplanes.

## European CE certification

The radio modem has been approved for operation under the RTT&E directive, passing the following tests: ETS300-826 (EMC), ETS300-328 (Functionality), and EN60950 (Safety).

The following is the appropriate label that is applied to the radio modem product line to indicate the unit is approved to operate with CE certification:



The following is the appropriate label that is applied to the radio modem product line shipping package to indicate the unit is approved to operate with CE certification:

AUS	B	DK	FIN
F	D	GR	IRE
I	LUX	NL	P
E	S	UK	

**Note:** Member states in the EU with restrictive use for this device are crossed out. This device is also authorized for use in all EFTA member states (CH, ICE, LI, and NOR).

**IMPORTANT:** This device is a 2.4-GHz, low-power RF device intended for office and home use in all EU and EFTA member states, except in France where restrictive use applies.

## EU Requirements

1. For outdoor use, France has a frequency restriction of 2.4GHz - 2.454GHz for an output power greater than 10mW and below 100mW.
2. For outdoor use in France, the output power is restricted to 10mW in the frequency range of 2.454GHz – 2.4835GHz.
3. 5.15GHz – 5.35GHz is restricted to 200mW EIRP throughout the European Union.

## RLXIB: Power over Ethernet Injector and Accessories "Warning"

The PoE Injector was not a part of the hazardous location or ATEX certification. Therefore, if an injector is used to power any of the radios, the PoE injector must be installed/located outside of any area that could be known to be hazardous. The AC power adaptor was not a part of the haz loc certification.

The RLXIB series were tested and certified to hazardous location and ATEX without any accessories included in this certification. Therefore, any accessory added to the RLXIB series radios must be used in an area known to be non-hazardous as they have not been subjected to hazardous location and ATEX certifications.

The preferred method of powering the radios is using the supplied power adaptor but If the PoE injector is used in an ordinary location "only", the PoE injector must be Listed. If the PoE injector is used instead of the supplied power adaptor, all of the wiring to and from the injector must be routed/installed inside building/plant and never routed/installed outside of the building/plant.

## Your Feedback Please

We always want you to feel that you made the right decision to use our products. If you have suggestions, comments, compliments or complaints about the product, documentation, or support, please write or call us.

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RLXIB-IHA Setup Guide  
October 19, 2009

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## ProSoft Technology<sup>®</sup> Product Documentation

In an effort to conserve paper, ProSoft Technology no longer includes printed manuals with our product shipments. User Manuals, Datasheets, Sample Ladder Files, and Configuration Files are provided on the enclosed CD-ROM, and are available at no charge from our web site: [www.prosoft-technology.com](http://www.prosoft-technology.com)

Printed documentation is available for purchase. Contact ProSoft Technology for pricing and availability.

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# 1 Before You Begin

## *In This Chapter*

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The following components are included with your RLXIB-IHA radio, and are all required for installation and configuration.

**Important:** Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	RLXIB-IHA Radio	RLXIB-IHA	RadioLinx® 802.11a Industrial Hotspot
1	Cable	085-1007	6 foot RS232 serial cable
1	Cable	RL-CBL025	5 foot Ethernet Straight-Thru Cable (Gray)
1	Antenna	A2502S-OA	2 dBi Omni RP-SMA articulating, 2.4/5GHz
1	Power Supply	RL-PS005-2	AC Power Adapter, 12V1.25A w/2 pin & 4 plug Set
1	ProSoft Solutions CD		Contains sample programs, utilities and documentation for the RLXIB-IHA module.

If any of these components are missing, please contact ProSoft Technology Support for replacement parts.

In addition, you will need:

- A personal computer equipped with an Ethernet port
- Static IP address, Subnet Mask and Gateway information for each RLX device you plan to install. You can obtain this information from your system administrator.

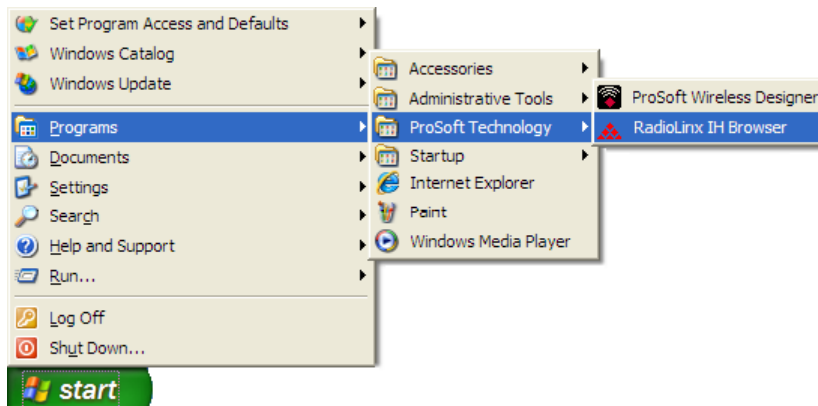
**Note:** This Startup Guide is designed for use with two RLXIB-IHA radios. One radio will be setup as a Master (AP) while the other radio will be set up as a remote repeater.

## 1.1 Install the IH Browser Configuration Tool

- 1 Insert the ProSoft Solutions CD in your CD-ROM drive. On most computers, a menu screen will open automatically. If you do not see a menu within a few seconds, follow these steps:
  - a Click the Start button, and then choose Run.
  - b In the Run dialog box, click the Browse button.
  - c In the Browse dialog box, click "My Computer". In the list of drives, choose the CD-ROM drive where you inserted the ProSoft Solutions CD.
  - d Select the file **prosoft.exe**, and then click Open.
  - e On the Run dialog box, click OK.
- 2 On the CD-ROM menu, select IH Browser for the RLX-IHx and RLXIB-x Products. This action opens the Setup Wizard for IH Browser.
- 3 Follow the instructions on the installation wizard to install the program with its default location and settings.
- 4 Follow the instructions on the installation wizard to install the program with its default location and settings.
- 5 When the installation finishes, you may be prompted to restart your computer if certain files were in use during installation. The updated files will be installed during the restart process.

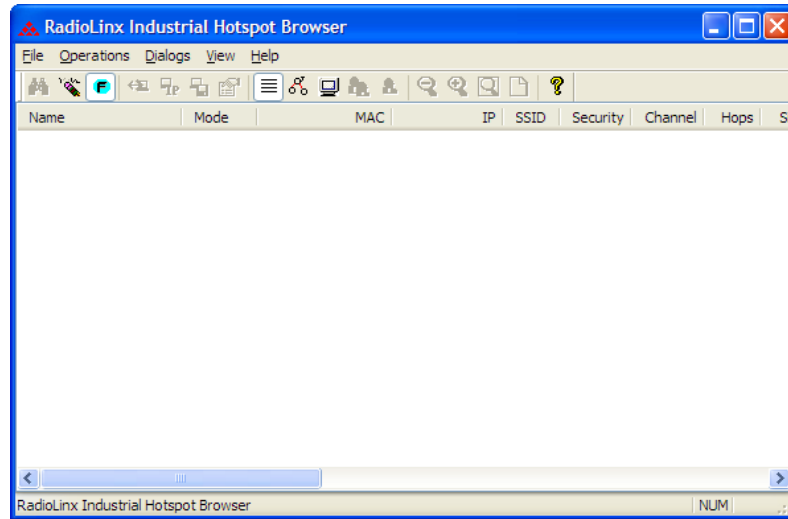
## 1.2 Start IH Browser

- 1 Click the **START** button, and then navigate to **PROGRAMS / PROSOFT TECHNOLOGY**





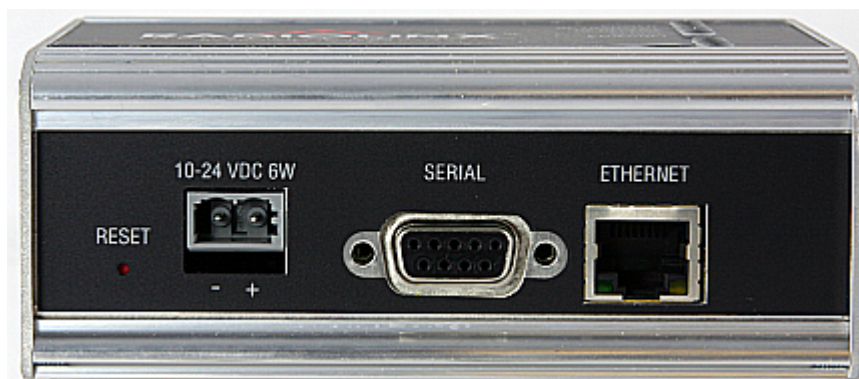
**2 Click to start RADIOLINX IH BROWSER.**



The window lists all the radios your computer can access. The MAC ID number is essentially the serial number of the radio; this number is also printed on the side of the radio. If a radio listing does not appear in the window, select Scan from the File menu. If you still do not see a radio listing, see Troubleshooting.

**1.3 Plug In the Cables**

You can configure the RLXIB-IHA using the Ethernet port on the radio. On the underside are three ports; Ethernet, Serial and Power (10 to 24 VDC 6 W).



From left to right: Power connector, Serial port and Ethernet port.

Use the Ethernet cable to configure the radio for the first time.

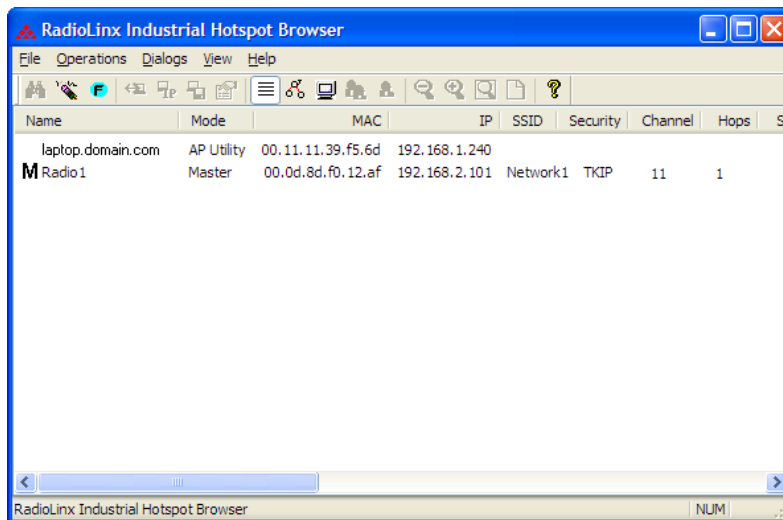
Note: After you plug in the power cable and Ethernet cable, the radio performs a startup procedure that includes a self-test, loading the main program, and initializing the radio. The front panel LEDs will illuminate after approximately two seconds. The entire startup procedure can take up to 30 seconds.

After the startup procedure has completed successfully, the Power LED should be green, meaning that the radio has power. The Ethernet LED should also be green, meaning that the Ethernet connection is working. The RF Transmit and RF Receive LEDs should blink.

For information on making connections, see Radio Power Requirements and Cable Specifications.

### 1.4 Detecting the Radio

After the radio has completed its startup procedure, the radio will appear in the IH Browser window.



The window lists all the radios your computer can access. The MAC ID number is essentially the serial number of the radio; this number is also printed on the side of the radio. If a radio listing does not appear in the window, select Scan from the File menu.

Tip: If a radio listing does not appear in the window, open the File menu and choose Scan. If you still do not see a radio listing, refer to Diagnostics and Troubleshooting in the RLXIB-IHA User Manual.

## 1.5 Assign a Temporary IP Address

You need the IP address to log into the Radio Configuration/Diagnostic Utility and configure the radio settings. If the radio is connected to a network with a DHCP server, the radio may already have an IP address assigned to it.

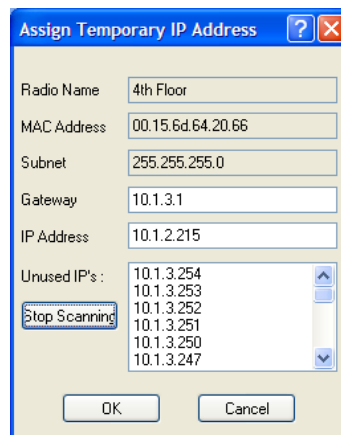
If a DHCP server is not available, or if you prefer to assign a static IP address, you can enter a temporary IP here. You will use the Radio Configuration / Diagnostic Utility to assign a permanent IP address.

### To assign a temporary IP Address

- 1 In IH Browser, click to select the radio.

**Tip:** If a radio listing does not appear in the window, open the File menu and choose Scan. If you still do not see a radio listing, refer to Diagnostics and troubleshooting in the RLXIB-IHA User Manual.

- 2 Open the Operations menu, and choose Assign IP. This action opens the Assign Temporary IP Address dialog box.



- 3 Select one of the unused IP addresses, and then click OK.  
For information, see Radio Access settings.

## 1.6 Set Up the Master Radio

To configure the radio, double click on the radio (Radio1) in the IH Browser window. This action opens a web browser (for example Microsoft Internet Explorer or Firefox) and loads the IH Radio's web configuration interface.



**Important:** The radio configuration is protected by a login password. The default password for the radio is "password" (lower case, no quotes). To prevent unauthorized access to the radio configuration, you should change the password when you have finished the initial configuration.  
**Note:** The master is the "root" or top-level radio in a network. You must have at least one master radio per network. For redundancy, you can assign more than one master to a network.

To configure a Master radio, make the following changes to the web configuration form:

**Radio Network Settings**

- **Radio Name:** Enter a unique name for the radio.
- Select **Master** as the radio mode.
- **Network SSID:** Assign a network name (SSID) of up to 32 characters. The radio uses this name in all network references. All radios in a network must have the same SSID.
- **Channel:** Select a channel and frequency range for the network or accept the default value. Network channels allow radios to avoid sharing a frequency with other networks in the same location. The channel list indicates the channel number as well as the frequency.

**Important:** The RLXIB-IHA radio is supplied with a dual-band antenna that supports both frequency ranges. If you use a different antenna with the RLXIB-IHA radio, you must choose a channel and frequency range supported by the antenna.

### Security Settings

- **Encryption Type:** Encryption scrambles data so that only intended viewers can decipher and understand it. Although "none" is an available encryption type, ProSoft Technology strongly recommends encrypting all data sent and received from every radio on your network, to help prevent your data from being intercepted and decoded.
- **WPA phrase:** To use WPA encryption on packets sent between the radios, select WPA in the Encryption Type field. Next, in the WPA phrase field, enter a pass phrase of between eight and 63 normal keyboard characters. This phrase automatically generates an encryption key of 128 hexadecimal characters. The default pass phrase is "passphrase" (lower case, no quotes). For more information on encryption, see Security settings.

Because you must assign the same Network SSID and WPA phrase to the repeater radios later in this procedure, you should write down the settings.

Note: Network SSID and WPA phrase are both case-sensitive.

Network SSID: \_\_\_\_\_

WPA phrase: \_\_\_\_\_

### Radio Access Settings

**Radio Access Settings**

Obtain IP address - DHCP

Use the following IP address

IP Address: 192.168.10.180

Subnet Mask: 255.255.255.0

Def. Gateway: 192.168.10.23

Primary DNS: 10.10.1.10

Secondary DNS: 50.0.0.0

SNMP

Login Password

If a DHCP (Dynamic Host Control Protocol) server is configured on your local area network, the DHCP server can assign IP addresses automatically.

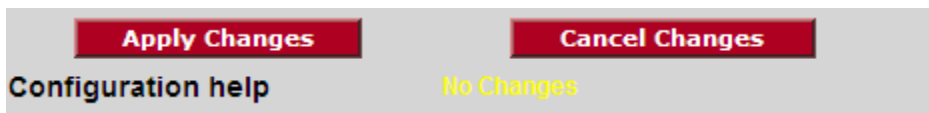
If you prefer to assign a Static (Fixed) IP address, select "Use the following IP address", and then enter the IP Address, Subnet Mask and Default Gateway in the Radio Access Settings area of the IH Radio web configuration form.

**Important:** If you intend to assign IP addresses manually, you must not duplicate an IP address that is already in use on your network. If you are not sure what IP addresses are available, ask your network administrator for assistance.

## 1.7 Save the Radio Configuration

Before closing the Radio Configuration window, you must apply your changes. Click Apply Changes to save your configuration and restart the radio.

Note: To discard your changes and start over, click Cancel Changes.

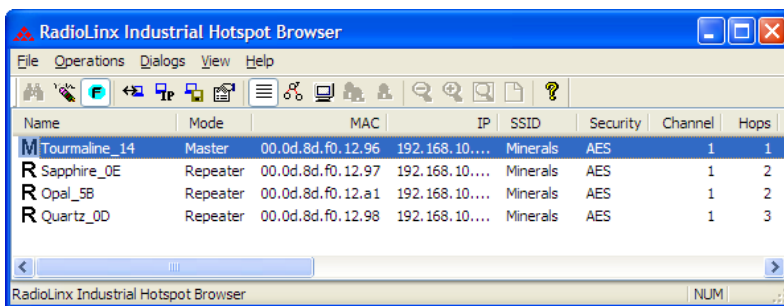


## 2 Adding and Configuring Additional Radios

At this point you should attach and configure any additional IHA radios you will be using. Ensure that any new radios use a unique name, but the same Network SSID as your master. The only difference in procedure will be in setting up each additional radio. Instead of setting your additional radios as Masters, they should be set as Repeaters or, more rarely, Clients, depending on their intended purpose.

### 3 Verify Communication

When configured, the name of each radio is preceded by an M (for Master), an R (for Repeater), or a C (for Client) in the IH Browser window.



Look at the LEDs to ensure good link quality, as explained in LED display (page 17). After a repeater is configured, you can unplug the Ethernet cable from it.



## 4 If You Encounter Problems

### *In This Chapter*

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- ❖ LED display ..... 17
- ❖ Retrieve the default password ..... 18
- ❖ Starting Over ..... 18

### 4.1 Check the Ethernet cable

If you connect a radio and the Ethernet LED does not light on the radio, there may be a problem with the Ethernet cable. Verify that the cable is plugged into the radio at one end, and to an Ethernet hub or a 10/100 Base-T Ethernet switch at the other end.

**Note:** The RLXIB-IHA radio auto-detects the Ethernet connection type, and does not require a crossover cable for direct connection to a PC.

### 4.2 LED display

The RLXIB-IHA front panel includes a set of LEDs that indicate the radio's status:

LED	Description
Power	This green LED indicates that the radio has power.
RF Transmit	This yellow LED indicates RF transmission.
RF Receive	This green LED indicates RF reception.
Serial	If this green LED is lit, the serial cable is connected. If this LED is flashing, a serial packet is being transmitted or received (The serial port is not available in the first release of the radio).
Ethernet	If this green LED is lit, the Ethernet cable is connected. If this LED is flashing, an Ethernet packet is being transmitted or received.
Signal Strength	If only one of these three LEDs is lit, then the radio is linked. If two LEDs are lit, the radio's signal strength is fair. If all three LEDs are lit, the signal strength is good.

If a radio is configured as a master, the middle light of the three Signal Strength LEDs will always be on, and the bottom Signal Strength LED will always be off. The top LED on the master will flash if any radios are linked to this master.

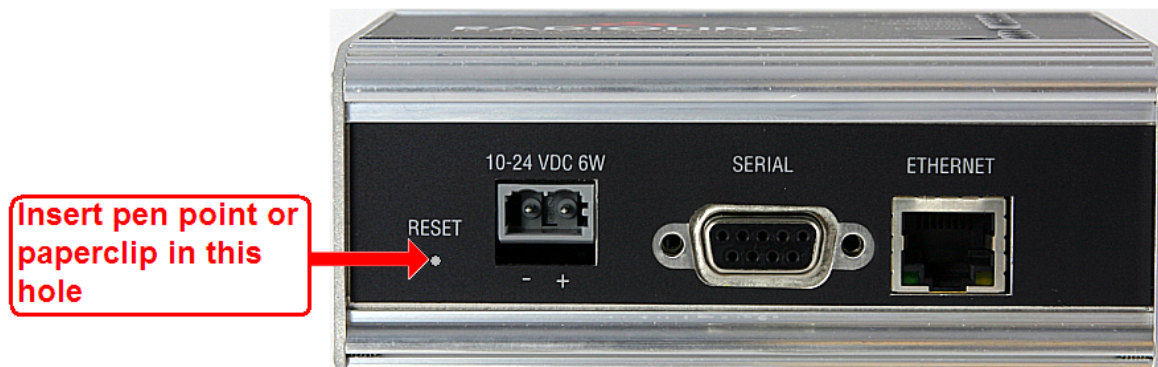
After you first plug in the power cable and Ethernet cable to the radio, the Power/Status LED should be green, meaning that the radio has power. If the Ethernet LED is green, then the Ethernet connection is working. The RF Transmit and RF Receive LEDs should blink.

All three LEDs will blink just after the radio links to the Master's signal but before it has been fully authenticated. Normally you will see this last only a few seconds. If it lasts longer or never turns solid it usually means the encryption keys are not correct.

### 4.3 Retrieve the default password

If you forget your password, you will be unable to change the radio settings. You can retrieve the default password to use the software again, but you will lose all the settings you programmed before. To retrieve the default password and return the radio to its default settings, follow these steps:

- 1 Turn off power to the radio.
- 2 Locate the reset button hole, located to the left of the power connector.



- 3 Insert the end of a paperclip or similar device into the hole to press the reset button.
- 4 Turn on power to the radio, and hold down the reset button for 30 seconds.
- 5 The radio will be reset to its default settings, including the password. You should now be able to log in using the default password, which is "password".

### 4.4 Starting Over

If necessary, you can always restore the default settings that your radio was shipped with by opening the Radio Configuration/Diagnostic Utility, logging into the radio, and clicking on the Factory Defaults button. **This will remove all changes you have made to the radio configuration, including addressing, naming, and security settings.**

## 5 What's Next?

Congratulations! Your wireless network is up and running. You now need to connect your wireless Hotspots to your network devices. ProSoft Technology provides application connection instructions for numerous applications. Refer to the RadioLinx Application Connection Guide located on the RadioLinx Solutions CD.