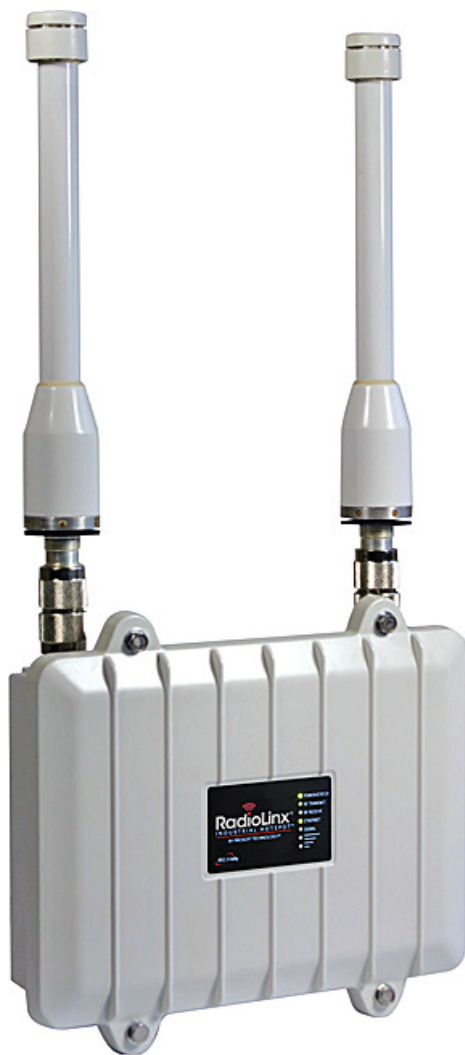




Where Automation Connects.




RadioLinx[®]
RLXIB-IHW-66C
802.11a,b,g
RadioLinx[®] Industrial Hotspot

November 12, 2010

SETUP GUIDE

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 our products, documentation, or support, please write or call us.

How to Contact Us

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RLXIB-IHW-66C Setup Guide

November 12, 2010

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ProSoft Technology[®] 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

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

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Asia Pacific: +603.7724.2080

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Latin America: +1.281.298.9109

Important Safety Information

The following Information and warnings pertaining to the radio module must be heeded.

WARNING – EXPLOSION HAZARD – DO NOT REPLACE ANTENNAS UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

"THIS DEVICE CONTAINS A TRANSMITTER MODULE, FCC ID: OQ7IHW. PLEASE SEE FCC ID LABEL ON BACK OF DEVICE."

"THIS DEVICE USES AN INTERNAL COMPACT FLASH RADIO MODULE AS THE PRIMARY RADIO COMPONENT. THE COMPACT FLASH RADIO MODULE DOES NOT HAVE AN FCC ID LABEL. THE COMPACT FLASH RADIO MODULE HAS NO USER SERVICEABLE PARTS."

"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 UNDESIRE OPERATION."

"CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT."

Industry Canada Requirements

"THIS DEVICE HAS BEEN DESIGNED TO OPERATE WITH AN ANTENNA HAVING A MAXIMUM GAIN OF 24 dB. AN ANTENNA HAVING A HIGHER GAIN IS STRICTLY PROHIBITED PER REGULATIONS OF INDUSTRY CANADA. THE REQUIRED ANTENNA IMPEDANCE IS 50 OHMS."

"TO REDUCE POTENTIAL RADIO INTERFERENCE TO OTHER USERS, THE ANTENNA TYPE AND ITS GAIN SHOULD BE CHOSEN SUCH THAT THE EQUIVALENT ISOTROPICALLY RADIATED POWER (EIRP) IS NOT MORE THAN THAT REQUIRED FOR SUCCESSFUL COMMUNICATION."

"THE INSTALLER OF THIS RADIO EQUIPMENT MUST INSURE THAT THE ANTENNA IS LOCATED OR POINTED SUCH THAT IT DOES NOT EMIT RF FIELD IN EXCESS OF HEALTH CANADA LIMITS FOR THE GENERAL POPULATION; CONSULT SAFETY CODE 6, OBTAINABLE FROM HEALTH CANADA."

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.

RLXIB-IHW-66C Wireless Approval



II 3 G Ex nA II T6 -40°C ≤ Ta ≤ 75°C (ATEX Only) (UL -30°C to +60°C)

ProSoft Technology, Inc., Bakersfield, CA USA

Model: RLXIB-IHW-66C

S/N: XXXXXXXXXXX

Caution:

Read instructions before operating in Hazardous Areas

Ordinary Locations:

CSA/CB	EN60950 N. America & W. Europe
GOST-R	ME06 (for controllers and radios)
FCC/IECS	Part 15, Class A and ICES-03

Hazardous Locations

ATEX	60079-0 & 60079-15 Category 3, Zone 2
CSA	C22.2 No. 213-M1987
cULus	ISA 12.12.01 Class I Division 2, Groups A, B, C, D T-6



NKRDCA82



243333



ME06



E183151



Industry
Canada



4441A-DCMA82

N136

Outdoor RLX Statement The materials required to make a proper earth ground are defined by local regulations and must be obtained locally to ensure that the correct safety environment is achieved. The earth ground wire run should be kept as short as possible. All field wiring for the installation of the radio shall be in accordance with section 4 of NEC 501.10, suitable for Class I, Div 2 installations.

Product name: RLXIB-IHW-66C 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** Warning – DO NOT OPEN WHEN ENERGIZED.

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 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.

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). LVD directive.

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).

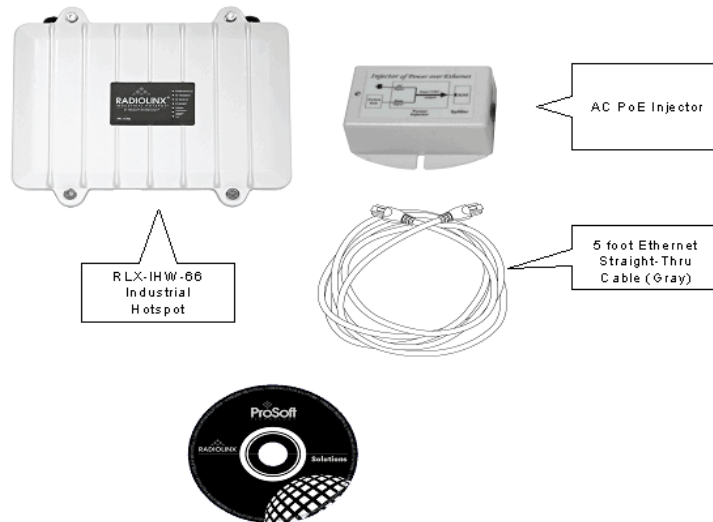
IMPORTANT: This device is a 2.4 GHz, low-power RF device intended for office and home use in all EU and EFTA member states, except in France where restrictive use applies.

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1 Before You Begin

Your RLXIB-IHW-66C Industrial Hotspot is shipped with Ethernet cables, Power over Ethernet (PoE) injector power supply, PoE cable, and a documentation CD-ROM.



In addition to what's shipped with the radio, 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.

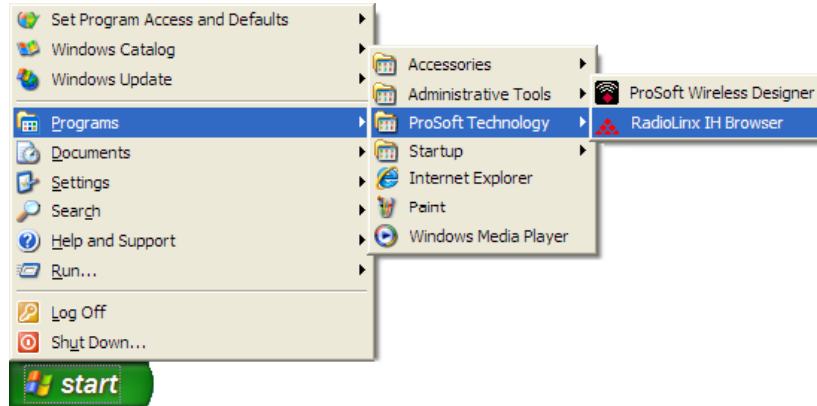
Note: This Setup Guide is designed for use with two RLXIB-IHW-66C radios. One radio will be setup as a Master (AP) while the other radio will be set up as a remote repeater.

2 Install the IH Browser Configuration Tool

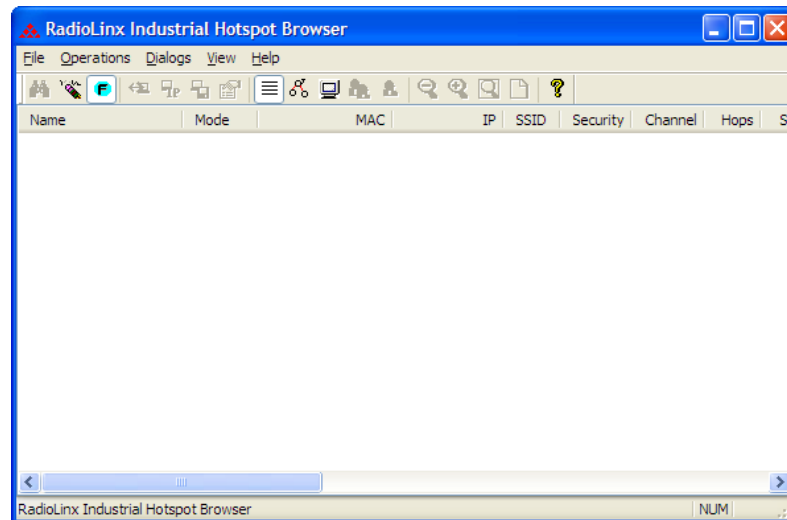
- 1 Insert the ProSoft Solutions CD in your CD-ROM drive. On most computers, a menu screen will open automatically. If you do not see a menu within a few seconds, follow these steps:
 - a Click the **START** button, and then choose **RUN**.
 - b In the *Run* dialog box, click the **BROWSE** button.
 - 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 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.

3 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.

4 Plug In the Cables

You can configure the RLXIB-IHW-66C using the Ethernet port on the underside of the radio.

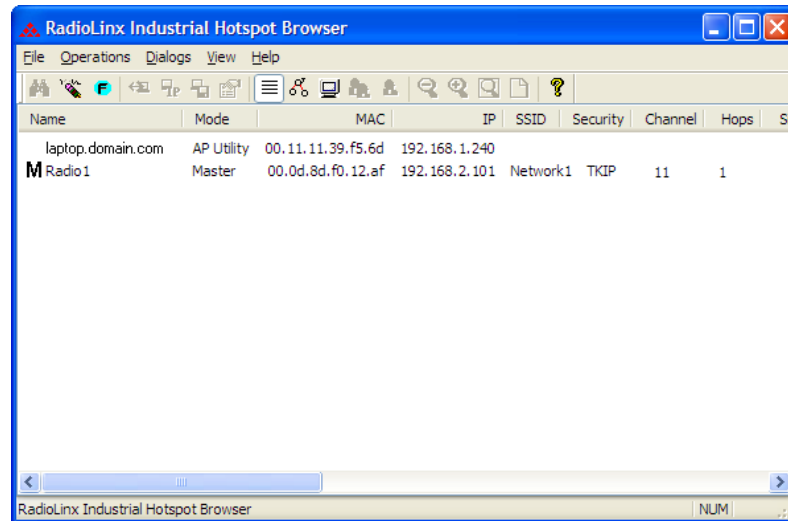
The RLXIB-IHW-66C is powered using PoE over the Cat5 Ethernet cable. You can access the RJ45 port by removing the 4 socket head cap screws that hold the cover on.

- 1** Remove the cover carefully to prevent damage to the ribbon cable connecting the cover to the PC board.
- 2** Attach the desired conduit fitting in the ½" NPT hole on the bottom of the enclosure and feed Cat5 cable through the fitting.
- 3** Connect the cable to the RJ45 connector.
- 4** Replace the cover and make sure the gasket is seated properly.
- 5** Replace the screws and tighten.
- 6** Connect the Ethernet cable (which supplies both power and connectivity) to the PoE injector.

The radio then performs a startup procedure that includes a self-test, loading the main program, and initializing the radio. This startup procedure can take up to two minutes. After the startup procedure has completed successfully, the Power/Status 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.

5 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-IHW-66C User Manual.

6 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.

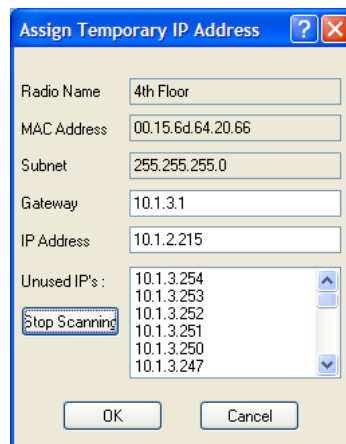
If a DHCP server is not available, or if you prefer to assign a static IP address, you can enter a temporary IP here. You will use the Radio Configuration / Diagnostic Utility to assign a permanent IP address.

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-IHW-66C User Manual.

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



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

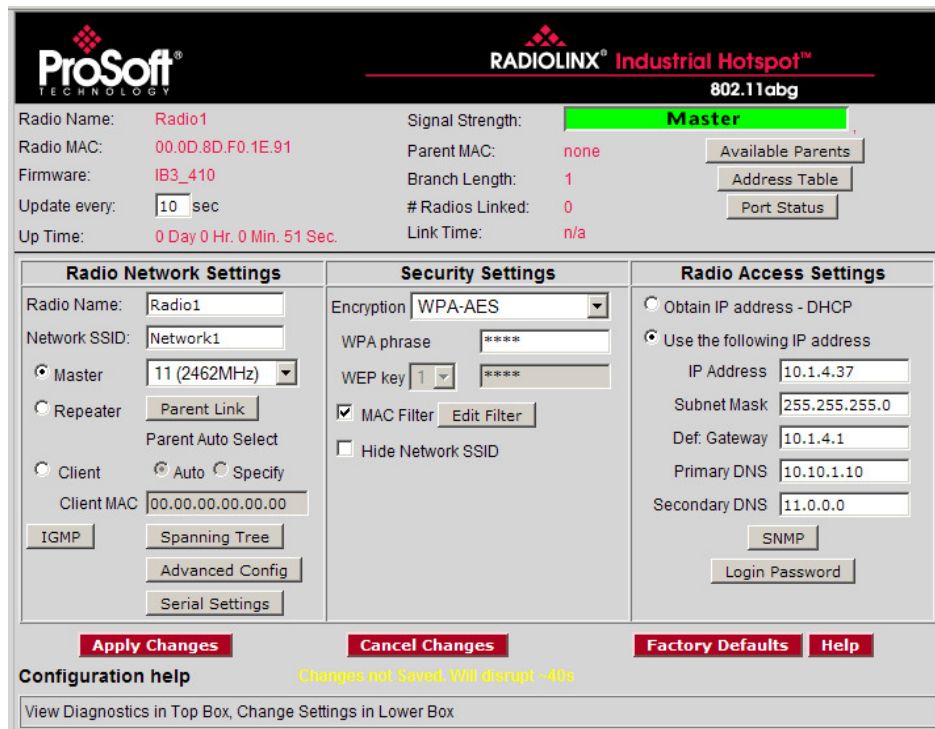
7 Set Up the Master Radio

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.



Radio Network Settings		Security Settings		Radio Access Settings	
Radio Name:	Radio1	Encryption:	WPA-AES	<input type="radio"/> Obtain IP address - DHCP	
Radio MAC:	00.0D.8D.F0.1E.91	WPA phrase:	****	<input checked="" type="radio"/> Use the following IP address	
Firmware:	IB3_410	WEP key:	****	IP Address:	10.1.4.37
Update every:	10 sec	<input checked="" type="checkbox"/> MAC Filter	<input type="button" value="Edit Filter"/>	Subnet Mask:	255.255.255.0
Up Time:	0 Day 0 Hr. 0 Min. 51 Sec.	<input type="checkbox"/> Hide Network SSID		Def. Gateway:	10.1.4.1
				Primary DNS:	10.10.1.10
				Secondary DNS:	11.0.0.0
				<input type="button" value="SNMP"/>	
				<input type="button" value="Login Password"/>	

Configuration help Changes not Saved. Will disrupt ~40s

View Diagnostics in Top Box, Change Settings in Lower Box

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 (2.4 GHz or 5 GHz).

Important: The RLXIB-IHW-66C radio is not supplied with an antenna. When choosing an antenna, you must choose one that supports the frequency range chosen in the radio configuration.

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.

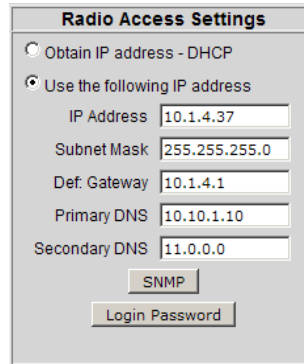
Because you must assign the same Network SSID and WPA phrase to the repeater radios later in this procedure, you should write down the settings.

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

Network SSID: _____

WPA phrase: _____

Radio Access Settings



The screenshot shows a web form titled "Radio Access Settings". It has two radio buttons at the top: "Obtain IP address - DHCP" (which is unselected) and "Use the following IP address" (which is selected). Below the selected option are five text input fields: "IP Address" with the value "10.1.4.37", "Subnet Mask" with "255.255.255.0", "Def. Gateway" with "10.1.4.1", "Primary DNS" with "10.10.1.10", and "Secondary DNS" with "11.0.0.0". At the bottom of the form are two buttons: "SNMP" and "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.

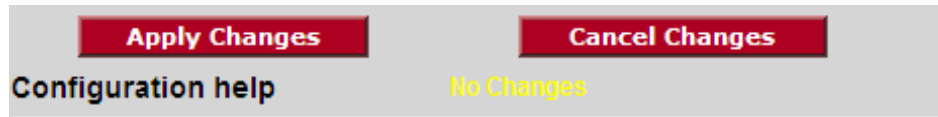
If you prefer to assign a Static (Fixed) IP address, select **USE THE FOLLOWING IP ADDRESS**, and then enter the IP Address, Subnet Mask and Default Gateway in the Radio Access Settings area of the IH Radio web configuration form.

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.

8 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**.

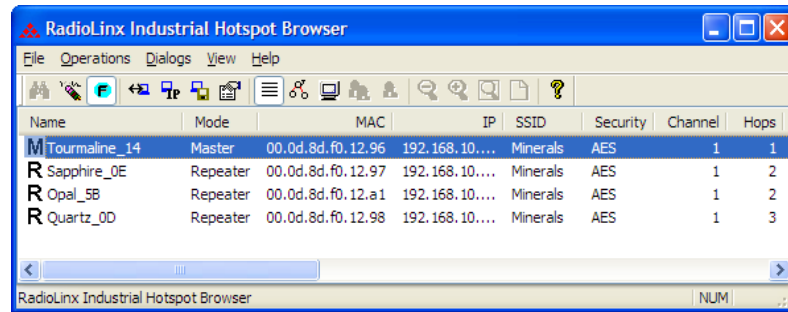


9 Adding and Configuring Additional Radios

At this point you should attach and configure any additional 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.

10 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.



The screenshot shows the RadioLinx Industrial Hotspot Browser window. The window title is "RadioLinx Industrial Hotspot Browser". The menu bar includes "File", "Operations", "Dialogs", "View", and "Help". The toolbar contains various icons for navigation and actions. The main area displays a table with the following columns: Name, Mode, MAC, IP, SSID, Security, Channel, and Hops. The table contains four rows of data:

Name	Mode	MAC	IP	SSID	Security	Channel	Hops
M Tourmaline_14	Master	00.0d.8d.f0.12.96	192.168.10....	Minerals	AES	1	1
R Sapphire_OE	Repeater	00.0d.8d.f0.12.97	192.168.10....	Minerals	AES	1	2
R Opal_5B	Repeater	00.0d.8d.f0.12.a1	192.168.10....	Minerals	AES	1	2
R Quartz_0D	Repeater	00.0d.8d.f0.12.98	192.168.10....	Minerals	AES	1	3

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

11 If You Encounter Problems

In This Chapter

❖ Check the Ethernet cable	32
❖ LED display	33
❖ Retrieve the default password.....	34
❖ Starting Over	35

11.1 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. If using the PoE injector, verify that the M12 to RJ45 cable is connected between the radio and the injector and also that the Ethernet patch cable is connected between the injector and switch.

Note: The RLXIB-IHW-66C radio auto-detects the Ethernet connection type, and does not require a crossover cable for direct connection to a PC.

11.2 LED display

The RLXIB-IHW-66C front panel includes a set of LEDs that indicate the radio's status:

LED	Description
Power/Status	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.
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.

11.3 Retrieve the default password

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

- 1 Hold down the reset switch by pressing down on the diamond shape above the word RADIOLINX and apply power to the radio. Continue holding down the reset switch for approximately 10 seconds until the radio initializes.
- 2 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".

11.3.1 Encryption Keys

The radio ships preset using WPA-AES security. If you need to change the security settings, refer to the IH Browser help file.

The default WPA-AES Phrase when a module ships is *passphrase*.

11.4 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.

Note: This will remove all changes you have made to the radio configuration, including addressing, naming, and security settings.