RT 1000

Deployment Guide

September 14, 2011

R03.d

Part Number: 90-0004

wireless SEISMIC

When Real-time Matters

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1 Overview

1.1 About this Guide

This document provides information on how to deploy the RT 1000 in the field.

1.2 Who Should Use this Guide

The following table describes the typical seismic data acquisition users. The expected users of this document are as follows:

- Crew (Layout/Troubleshooters)
- Technician (LTU)
- Bosses (Line Crew)

1.3 Related Documents

RT 1000-related documents are as follows:

- **"RT 1000 Documents Guide"** – Lists all of the RT 1000 documents with a brief description of each.
- **"RT 1000 Glossary"** – Lists and defines RT 1000 terms and acronyms. Includes some general seismic and geologic terms and acronyms.

1.4 Getting Help

To get help on the RT 1000 Central Recording System, consult the online help. You can find the help documents by clicking the help icon in the user interface, or by navigating to the following directory:

- Directory Path TBD

To get help on the RT 1000 deployment, consult this document.

If you cannot find the answers you need, please contact Wireless Seismic, Inc. Technical Support at:

- 361 Centennial Parkway, Suite 230
  Louisville, CO 80027
  (720) 242-9916
- 13100 Southwest Freeway, Suite 150
  Sugar Land, TX 77478
  (832) 532-5080
- support@wirelessseismic.com

2 Layout

This chapter describes how to prepare (mobilization) and layout (install) the ground electronics.

2.1 Prerequisites

In preparation for mobilization, define the following:

- Survey
- Backhaul plan
- TBD

2.2 Getting Ready

Collect all of the following:

NOTE

Please refer to "Antenna Specifications" on page 85 for the list of supported antennas. Use of accessories other than those specified in this document is not supported or warrantied.

- RT 1000 ground equipment:
  - WRUs
  - LTUs (see *"Backhaul" on page 27*)

NOTE

The LTU includes the Base Station Unit (BSU), the Power over Ethernet (PoE), the battery, the backhaul, and the mast.

  - One of the following antennas:
    - 9 dBi antenna
    - 7 dBi antenna

  - 5 dBi antenna
  - 2 dBi antenna
- Geophones
- Batteries
- Dummy Batteries
- Battery Charging System
- Battery Charger Shelf (optional)
- Antenna Extenders
- Fiber Backhaul
- Tools
- Manuals
- Consumables
- Spares
  - Mast Parts
  - Base Parts
  - Guy Lines
  - Antennas
  - Batteries
  - Cables
  - Connectors

NOTE

The batteries (when fully discharged) require 8 hours of continuous charging in the battery charger connected to an AC source; therefore, the battery charger will be located at the staging area or in town.

♦ Non-RT 1000 ground equipment:

- Recording truck:
  - Power source (diesel, benzene or other type of fueled generator)
  - Heating, cooling and ventilation system
  - Antenna masts for voice radio, Data telemetry, source control, and possibly satellite phone and/or internet
  - Shock-mounted rack for PC, displays, servers, network devices, output devices, and so on
  - Thermal plotter or equivalent
  - Desk, chairs, small refrigerator, and coffeepot
  - Computer, monitors, keyboard, mice, and so on
  - External interfaces for installing and testing
- Safety equipment (vests, hard hats, and so on)
- Source controllers/Source Interface Unit (SIU)
- Any other third-party equipment

- Any other shot-related equipment
- Two-way radios

2.3 Preparing the Equipment

Ensure that the central recording system has the latest software available installed (see in the *RT 1000 Release Notes*).

Ensure that the ground equipment has the latest firmware available installed (see in the *RT 1000 Release Notes*).

Ensure that the industry standard best practices are followed for securing the equipment for transport.

2.4 Setting Up the Central Recording System

You can prepare the central recording system hardware and software while the ground equipment is being placed in the field.

Set up the computer and peripheral equipment in the central recording system truck or trailer.

2.4.1 Setting up the Computer

TBD

2.4.2 Connecting to the Source Controller

This section describes how to connect a source controller or Source Interface Unit (SIU) to the CSS computer.

TBD

The following figures and tables show the signals on each pin for the three possible cables used to connect an SIU to the CSS computer:

Table 2–1 BSU DATA-POWER Cable Pin List

Signal Name	Wire Color	27-Pin Connector	RJ45 Connector	16-Pin Connector	2-Pin Connector	Twisted Pair
TX+	WHT/ORG * (WHT/GRN)	R	1	—	—	Twisted Pair
TX-	ORG * (GRN)	P	2	—	—	

Table 2–1 BSU DATA-POWER Cable Pin List (cont.)

Signal Name	Wire Color	27-Pin Connector	RJ45 Connector	16-Pin Connector	2-Pin Connector	Twisted Pair
RX+	WHT/GRN * (WHT/ORG)	N	3	—	—	Twisted Pair
RX-	GRN * (ORG)	M	6	—	—	
5V EXTERNAL NON ISO START	RED	B	—	1	—	Twisted Pair
EXTERNAL START RETURN	BLK	A	—	2	—	
EXT START ISO OUT	BLU	E	—	7	—	Twisted Pair
EXT START ISO RETURN	BLK	U	—	8	—	
5V TRIGGER IN 1	RED	K	—	15	—	Twisted Pair
TRIGGER 1 RETURN	WHT	X	—	16	—	
PWR	RED	b	—	—	1	
PWR	RED	c	—	—	1	
GND	BLK	a	—	—	2	
GND	BLK	d	—	—	2	

WHT = White, ORG = Orange, GRN = Green, BLU = Blue, BRN = Brown, BLK= Black, YEL = Yellow
* Connect per Pin Numbers
Wire colors in parenthesis are for Ethernet cable wired per T-586A standard.

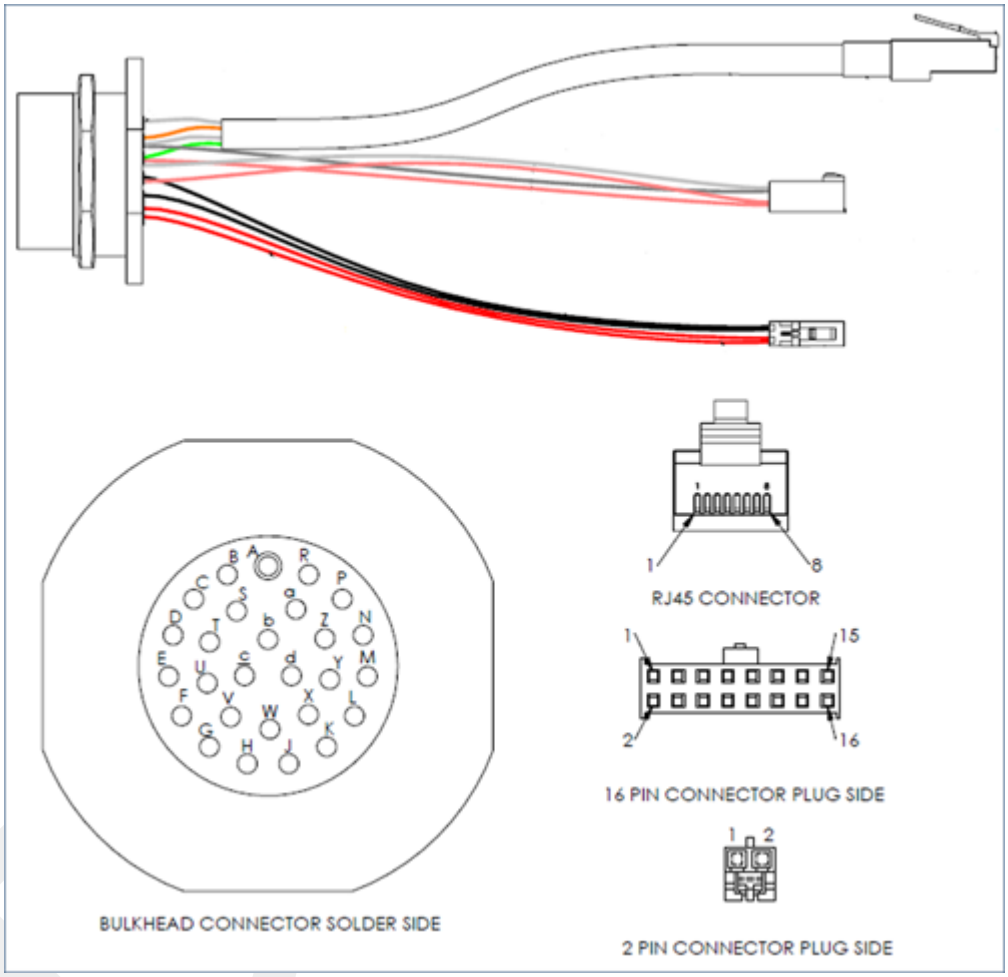

Figure 2–1 BSU DATA-POWER Cable

The following cable has not yet been implemented.

Table 2–2 SIU Source Control Cable Pin List

Signal Name	Wire Color	27-Pin Connector	16-Pin Connector
5V0 EXTERNAL START	RED	B	1
EXT. START RETURN	BLK	A	2
RS232 TX OUT	WHT	C	3
RX/TX RETURNS	BLK	S	6
RS232 RX IN	GRN	D	5
RX/TX RETURNS	BLK	T	4
EXT START ISO OUT	BLU	E	7
EXT START ISO RETURN	BLK	U	8
GND DIG (JUMPTRACK NO)	YEL	F	9
GND DIG (JUMPTRACK NO)	BLK	G	10
5V0 TRIGGER IN 3	BRN	H	11
TRIGGER RETURN	BLK	V	12
5V0 TRIGGER IN 2	ORG	J	13
TRIGGER RETURN	BLK	W	14
5V0 TRIGGER IN 1	RED	K	15
TRIGGER RETURN	WHT	X	16
—	—	L	—
TX+	WHT/ORG* (WHT/GRN)	R	1
TXN	ORG* (GRN/WHT)	P	2

Table 2–2 SIU Source Control Cable Pin List (cont.)

Signal Name	Wire Color	27-Pin Connector	16-Pin Connector
RX+	WHT/GRN* (WHT/ORG)	N	3
RXY	GRN* (ORG/WHT)	M	6
—	—	Y	—
—	—	Z	—
PWR	RED	c	1
PWR	RED	b	1
GND	BLK	a	2
GND	BLK	d	2

WHT = White, ORG = Orange, GRN = Green, BLU = Blue, BRN = Brown, BLK= Black, YEL = Yellow

* Connect per Pin Numbers

Wire colors in parenthesis are for Ethernet cable wired per T-586A standard.

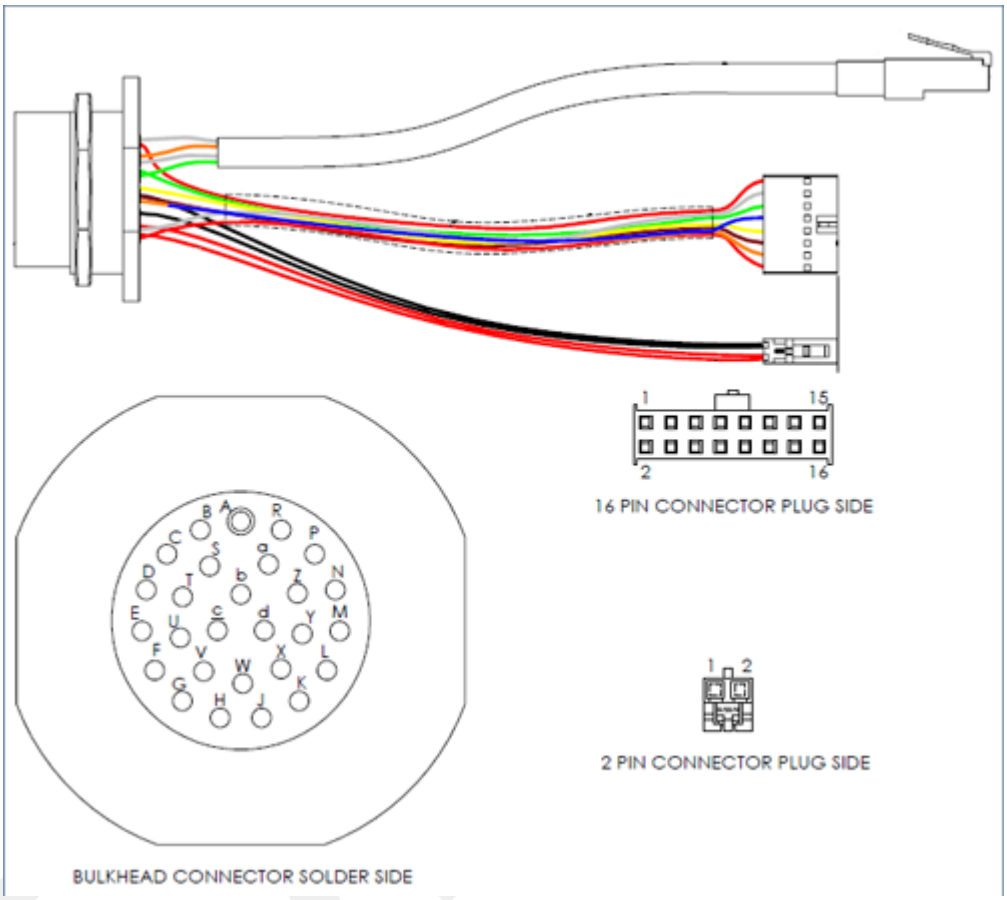

Figure 2–2 SIU Source Control Cable

The following cable has not yet been implemented.

Table 2–3 BSU at Recording Truck Cable Pin List

Signal Name	Wire Color	27-Pin Connector	RJ45 Connector
TX+	WHT/ORG * (WHT/GRN)	R	1
TX-	ORG * (GRN/WHT)	P	2
RX+	WHT/GRN * (WHT/ORG)	N	3

Table 2–3 BSU at Recording Truck Cable Pin List (cont.)

Signal Name	Wire Color	27-Pin Connector	RJ45 Connector
RX-	GRN * (ORG/WHT)	M	6
PWR	WHT/BLU (WHT/BLU)	b	5
PWR	BLU (BLU)	c	4
GND	WHT/BRN (WHT/BRN)	a	7
GND	BRN (BRN)	d	8
Free Leads			
5V EXTERNAL NON ISO START	BLU	B	–
RETURN EXTERNAL NON ISO START	GRN	A	–
5V TRIGGER IN 1	BRN	K	–
TRIGGER 1 RETURN	WHT	X	–

WHT = White, ORG = Orange, GRN = Green, BLU = Blue, BRN = Brown, BLK= Black, YEL = Yellow

* Connect per Pin Numbers

Wire colors in parenthesis are for Ethernet cable wired per T-586A standard.

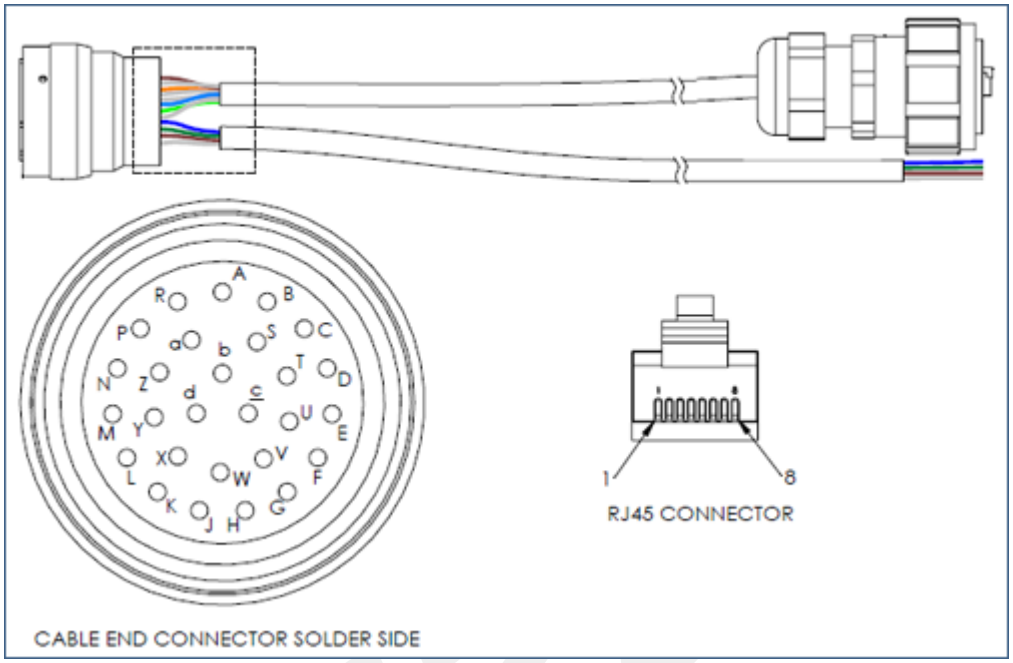

Figure 2–3 BSU at Recording Truck Cable

2.5 Laying Out the Equipment

You can lay out the ground equipment while the central recording system hardware and software is being prepared.

The WRU is shown in the following figure:

Illustration TBD

Figure 2–4 WRU

The BSU is shown in the following figure:

Illustration TBD

Figure 2–5 BSU

An example geophone is shown in the following figure

Illustration TBD

Figure 2–6 Geophone

2.5.1 Prerequisites

You can attach the batteries, antennas, and geophones to the ground equipment prior to going into to the field, or as you place each unit. If you are assembling as you place the units, ensure that you have sufficient quantities for each unit, plus a few spares.

The RT 1000 shall be used with only the supplied antennas (*Table A–1 Antenna Specifications, on page 85*) attached to the WRU with an integrated type N male connector.

- The RT 1000 antennas shall be installed and handled by professionals specifically designated for this purpose.
- Changes or modifications not expressly approved by Wireless Seismic, Inc. can void the users's authority to operate the equipment.

WARNING

In order to comply with FCC radio frequency (RF) exposure requirements, the RT 1000 units must be installed so that a minimum separation distance of 20 cm is maintained between the antenna(s) and all persons at all times during normal operation.

2.5.2 Assembling the Ground Equipment

This section describes the process to assemble the ground equipment prior to deployment.

To assemble the ground equipment:

1. Gather the equipment:
   - WRU or BSU
   - Antenna
   - Geophone
   - Batteries
2. Gather any special tools:
   - Nylon grip pliers
   - Loctite® 222
3. Attach one or more batteries to the WRU or BSU.
   - Press the battery into the connector.
   - Flip the bail over the molded area on the end of the battery.
   - Press the lever until the catch snaps to lock it in place.

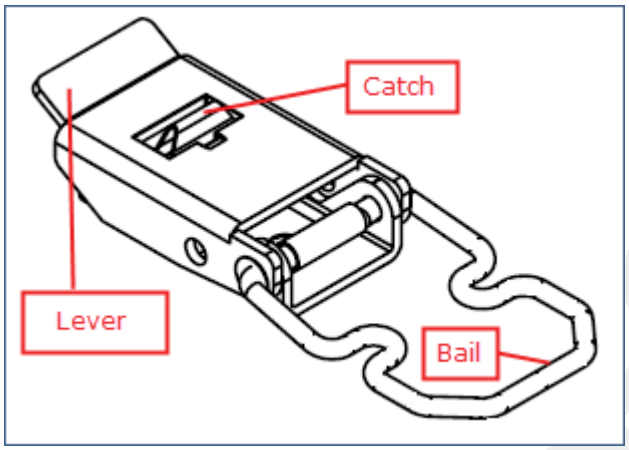

Figure 2–7 Battery Latch

Figure 2–8 Installing the Battery

4 Attach the geophone to the WRU.

Figure 2–9 Installing the Geophone

5 Attach the antenna (use Loctite 222) to the WRU or BSU using nylon grip pliers.

TBD

Figure 2–10 Installing the Antenna

TIP

When determining which antenna to use (5 dBi, 7 dBi, 9dBi), consider the distance between WRUs, and how much vegetation is in the area.

For distances of 10 m to 30 m, use a 5 dBi antenna.

Distances of 30 m or greater, use a 7 dBi or 9dBi antenna.

For sudden elevation changes, such as cliffs, use a 2 dBi or 5 dBi antenna.

2.5.3 Placing the WRU in the Field

This section describes the process to ready the ground equipment for interaction with the central recording system (deployment).

To deploy the WRU:

1 Prerequisites:

- The WRU is assembled with battery, geophone, and antenna

NOTE

If you are using a WRU as a Repeater, the deployment instructions are the same, except a geophone is not required.

If a geophone is not connected, you can skip the geophone test. See "LED Indicators" on page 93 for more information on skipping the test and the relevant LED status indicators.

2 Pick up the WRU and point the geophone connector end towards the ground as shown in the following figure. After a few seconds, all of the LEDs illuminate:

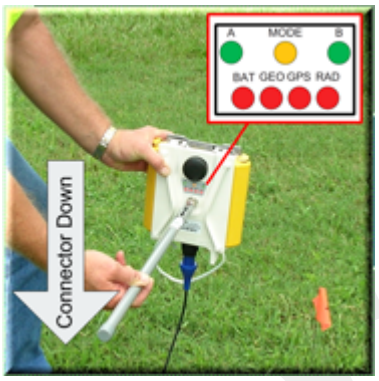

Figure 2–11 Power on the Unit

3 Place the unit flat on the ground as shown in the following figure:

Figure 2–12 Place the Unit

4 The unit will begin a series of internal and external tests. The LEDs on the top of the unit indicate the current test and whether the unit passes or fails each test.

NOTE

See *"LED Indicators" on page 93* for an explanation of the LED status and error conditions.

2.5.4 Placing the BSU in the Field

The BSU is part of the backhaul configuration. See *"Backhaul" on page 27* for more information.

3 Software

3.1 Overview

For this release, your computer hardware and ground electronics comes with all software installed.

3.2 Installing the Software

TBD

3.3 Upgrading the Software

TBD

3.4 Upgrading the Firmware

TBD

4 Backhaul

4.1 Overview

In network communications, the *backhaul* is the part of the network that contains the links and equipment between the core network and the sub networks.

Wireless mesh networking is a method where each radio node in the network captures and disseminates its own data as well as serves as a relay for other radio nodes in the network sending data along a path, *hopping* from one node to the next.

Power over Ethernet (PoE) is a technology that passes electrical power along an Ethernet cable. PoE is used where DC power is not available and USB unsuitable. Power can be supplied at the end of a network span or somewhere in the middle. PoE *switches* supply power at the end of a span. PoE *injectors* supply power somewhere between the PoE switch and the powered device. They inject power and do not affect the data.

The RT 1000 Central Recording System is a fully connected mesh network of Wireless Remote Units (WRUs) that communicate in a routing pattern (bucket-brigade or string-of-pearls) with a Line Tap Unit (LTU) on the 2.4 GHz Industrial, Scientific, and Medical (ISM) radio band.

The LTU is composed of the following:

- Base Station Unit (BSU)
- Power over Ethernet (PoE)
- 24 V Battery or Power Supply
- Cables
- Mast, mast base, and guy-wires
- 5.8 GHz backhaul radios
- Antennas

The LTU communicates by way of the BSU with the Central Software System (CSS) computer in the central recording truck along a backhaul on the 5.8 GHz ISM radio band.

The Central Software System (CSS) communicates with the field units via the backhaul radios. The backhaul radios act as access points for the BSUs.

The following figure illustrates the possible LTU components:

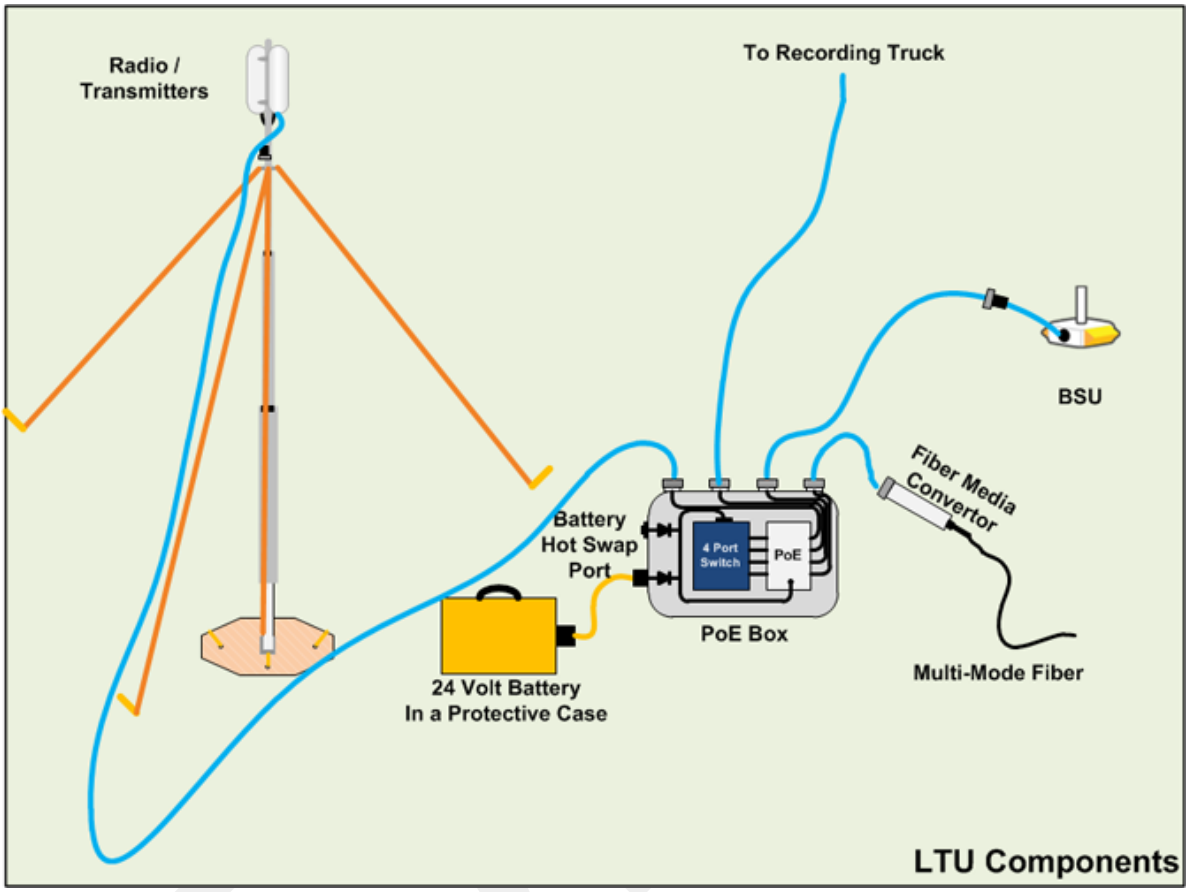

Figure 4–1 Possible LTU Components

The following figure illustrates the central recording truck components:

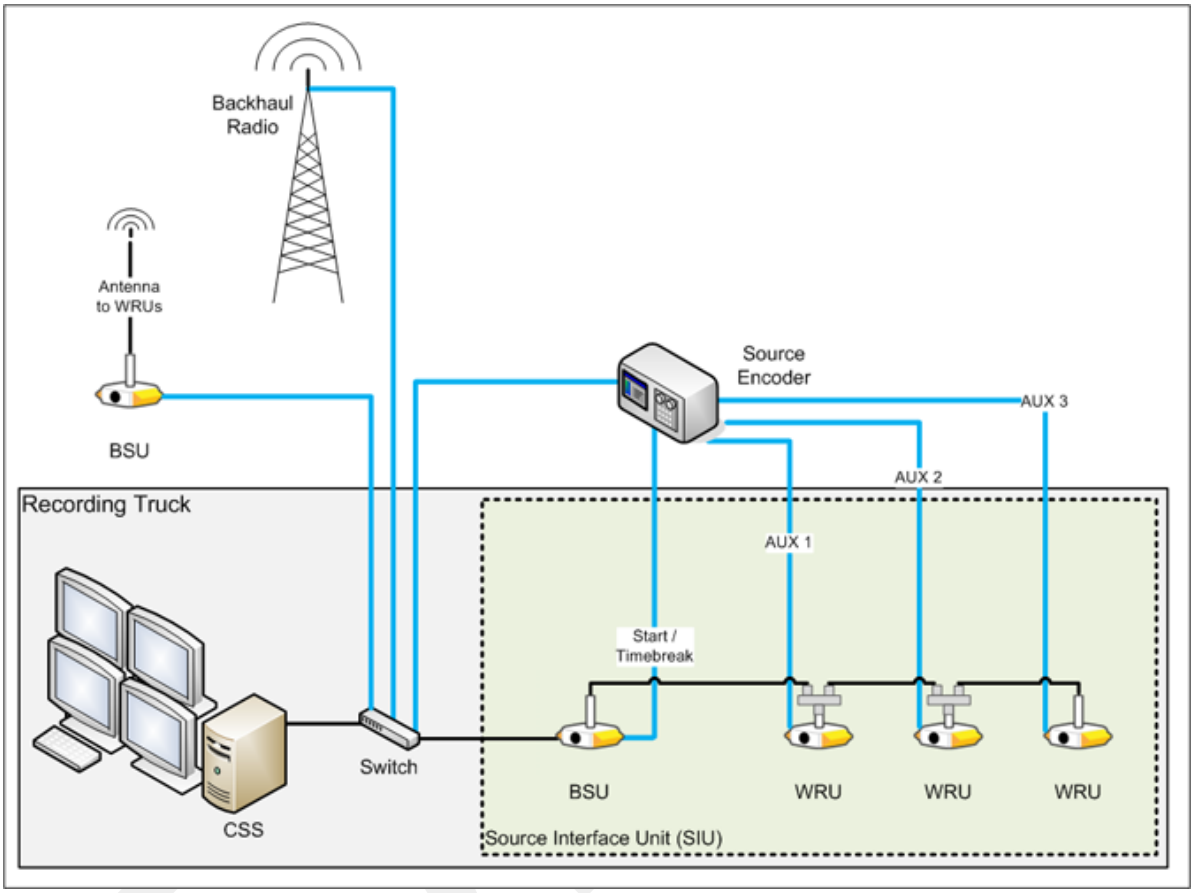

Figure 4–2 Central Recording Truck Components

NOTE

There can be from one to three WRUs in the Recording Truck as part of the SIU.

The following figure illustrates the components and data flow for a four-line, single-backhaul line with two root nodes example:

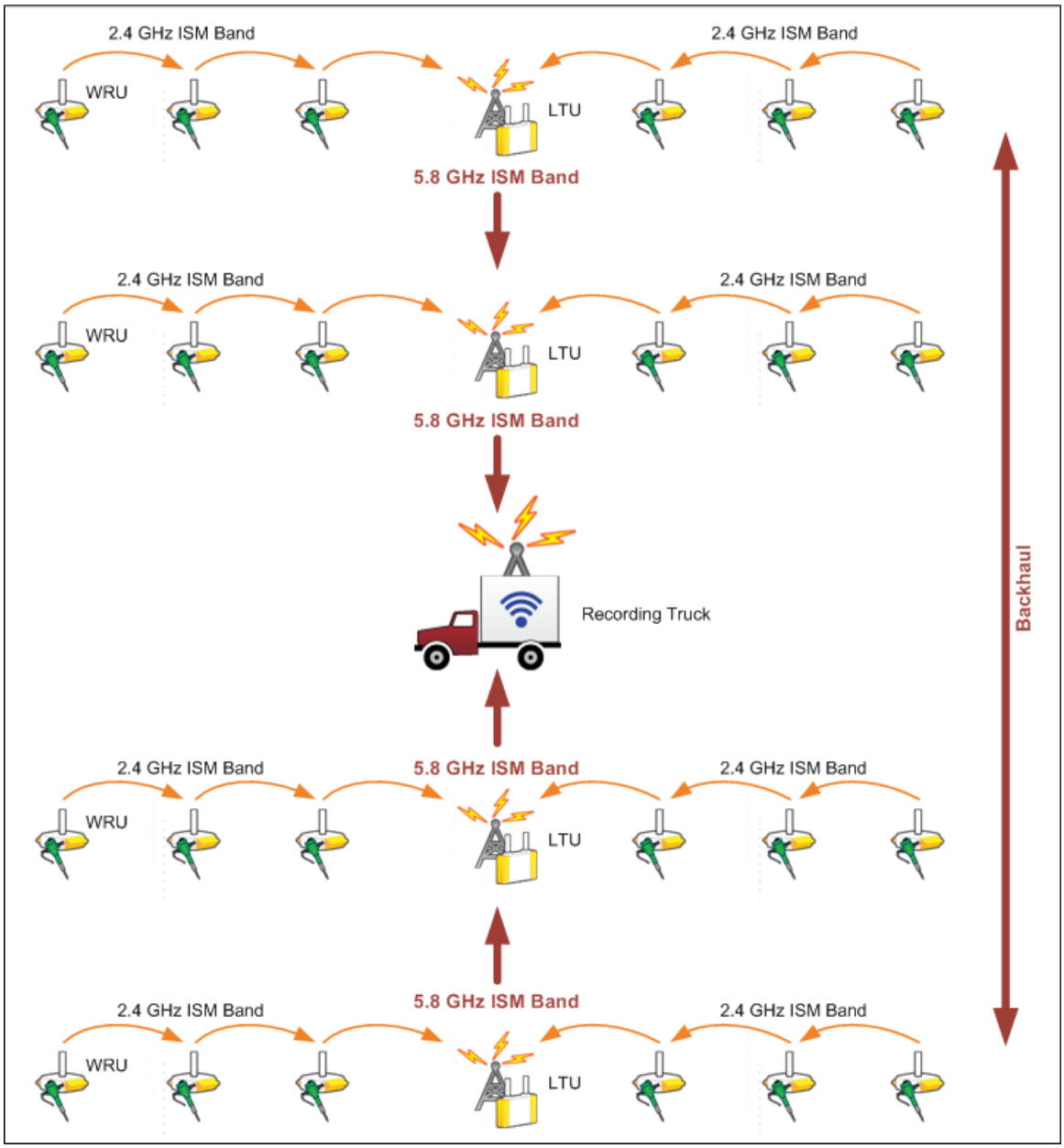

Figure 4–3 Single Backhaul Data Direction

4.2 Backhaul Components

The backhaul components are either *remote* backhaul components or *central* backhaul components. Remote components are the components that are not physically located next to the recording truck. Central components are physically located at the recording truck. Both remote and central backhauls are composed of the following:

- Base Station Unit (BSU) Kit
- Antenna
- Radio Kit
- Mast Kit

The following figure shows the backhaul components packed for transport:

TBD

Figure 4–4 Backhaul Components Packed for Transport

4.2.1 BSU Components

The following table lists the BSU kit components:

Table 4–1 Base Station Unit Kit

Remote Backhaul Components		Central Backhaul Components	
Item	**Reference**	**Item**	**Reference**
BSU	*"BSU" on page 31*	BSU	*"BSU" on page 31*
PoE Switch Unit	*"PoE Switch Unit" on page 32*	PoE Switch Unit	*"PoE Switch Unit" on page 32*
Battery	*"Battery and Power Supply" on page 33*	Power Supply, 24 V	*"Battery and Power Supply" on page 33*
Cable Assembly, BSU-to-PoE Switch	*"Cables" on page 34*	Cable Assembly, BSU at truck	*"Cables" on page 34*
Cable, PoE Switch-to-Battery	*"Cables" on page 34*	Cable, Power Supply-to-PoE	*"Cables" on page 34*
		Ethernet Cable, 25 ft	*"Cables" on page 34*

4.2.1.1 BSU

The Base Station Unit (BSU) is shown in the following figure:

Figure 4–5 Base Station Unit (BSU)

Before the Central Software System can communicate with the BSU, you must set up the backhaul.

NOTE

See “LED Indicators” on page 93 for an explanation of the LED status and error conditions.

4.2.1.2 PoE Switch Unit

Power over Ethernet (PoE) is a technology that passes electrical power along an Ethernet cable. PoE is used where DC power is not available and USB unsuitable.

Power can be supplied at the end of a network span or somewhere in the middle. PoE switches supply power at the end of a span. PoE injectors supply power somewhere between the PoE switch and the powered device. They inject power and do not affect the data.

The PoE is shown in the following figure:

Figure 4–6 PoE

4.2.1.3 Battery and Power Supply

Power is supplied to the LTU components by way of a 24 Ah DC battery or power supply.

TIP

> *The backhaul power requirements vary depending on the hardware in use and period of use. For example, you may be using one or two radios. Supply enough power to ensure there is enough power for the entire duration of the time you are using the backhaul.*
>
> *A 24 Ah battery is adequate if a recharged battery is installed for every 12 hours of use.*

Wireless Seismic, Inc. recommends using a protective battery case as shown in the following figure:

Figure 4–7 Protective Battery Case

4.2.1.4 Cables

The following cables are used in the backhaul:

- BSU-to-PoE Switch 27-pin to RJ45
- BSU at Recording Truck 27-pin to RJ45
- PoE Switch-to-Battery 2-pin to 2-pin
- Power Supply-to-PoE
- Ethernet Cable, 25 ft
- TBD – Fiber Optic Cable

To ensure a protected connection, be sure to use an Ethernet cable with a protective shell when connecting Ethernet cables to the PoE. An example is shown in the following figure:

Figure 4–8 Protective Ethernet Connector

4.2.2 Antennas

The following table lists the supported antennas for the BSUs and the WRUs. The remote and central backhauls use the same antennas:

Table 4–2 Antenna Specifications

Model	Frequency (MHz)	Gain	Vertical Bandwidth	Weight	Dimension (Length x Diameter)
WSI 65-0067	2400-2485	9 dbi	14°	0.8 lbs 0.5 kg	27 x 0.6 in 690 x 15 mm
WSI 6060-001-01	2400-2485	7 dBi	18°	0.6 lbs 0.3 kg	21 x 0.6 in 540 x 15 mm
WSI 65-0023	2400-2485	5 dBi	25°	0.5 lbs 0.2 kg	12 x 0.6 in 355 x 15 mm
WSI 65-0025	2400-2485	2 dBi @ 2.4	120°	1.6 oz 45.4 g	7.6 x 0.5 in 193 x 12.7 mm

The Fluidmesh radios have built-in antennas (see *"Radio Kit Components" on page 35* for details).

There is an *auto-power-leveling* feature built into the firmware. It works in conjunction with the RSSI parameters to keep the power at a defined level.

4.2.3 Radio Kit Components

The following table lists the Radio Kit components:

Table 4–3 Radio Kit

Remote Backhaul Components		Central Backhaul Components	
Item	**Reference**	**Item**	**Reference**
Radio, Fluidmesh® FM1100	*"FM1100 Radio" on page 37*	Radio, Fluidmesh® FM3100	*"FM1100 Radio" on page 37*
Software, Fluidmesh® FM1100-30	*"FM3100 Radio" on page 37*	Software, Fluidmesh® FM3100-30	*"FM3100 Radio" on page 37*

Refer to the Fluidmesh datasheet for FCC information and other technical specifications on the FM1100 and FM3100 radios. See one of the following locations for details:

- http://www.fluidmesh.com/press-room/product-literature/doc_details/160-fluidmesh-mito-series
- *"Fluidmesh Radio Specifications" on page 87*

The Fluidmesh radios can operate on at 4.9 GHz, and 5.1 - 5.8 GHz. The preferred frequency is configured through a user interface (see *"Configure the Radios" on page 43* for instructions).

Each radio is assigned a color that represents the channel assignment, allowing field personnel to quickly orient the radios in the proper direction. An example is shown in the following figure:

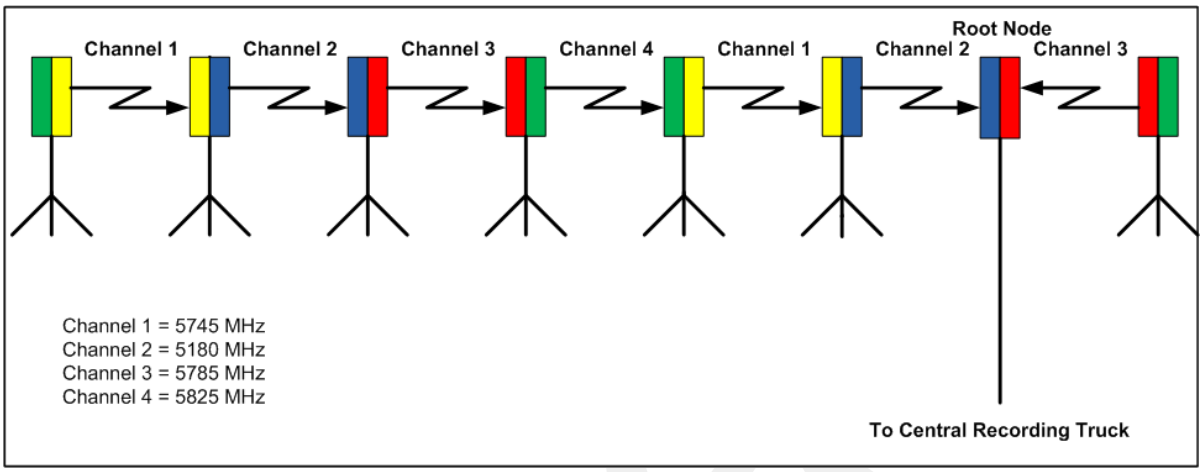

Figure 4–9 Channel Color Example

The Fluidmesh default IP address is 192.168.0.10.

4.2.3.1 FM1100 Radio

The FM1100 radio is used on the masts for the remote backhauls and is shown in the following figure:

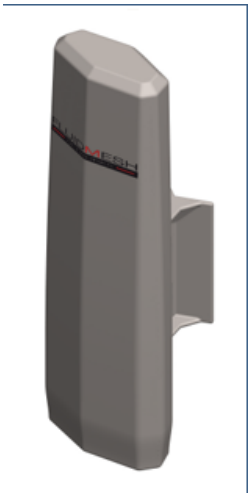

Figure 4–10 FM1100 Radio

4.2.3.2 FM3100 Radio

The FM3100 is used on the masts for the central backhaul unit and is shown in the following figure:

Figure 4–11 FM3100 Radio

4.2.4 Mast Kit Components

The following table lists the Mast Kit components. The remote and central backhauls use the same mast kit components:

Table 4–4 Mast Kit

Remote Backhaul Components	
Item	**Reference**
Mast	*"Mast" on page 39*
Base	*"Base" on page 39*
Base, weighted	*"Base" on page 39*
Bag	*"Bag" on page 42*
Ethernet Cable, 25 ft (2 each)	*"Cables" on page 34*
Backpack Kit	*"Backpack Kit" on page 42*
• 1 each backpack	*"Backpack Kit" on page 42*
• 3 each guy lines, rope, orange, 15.25 meters	*"Backpack Kit" on page 42*
• 3 each tent stake, steel, 12 in (hard ground stakes)	*"Backpack Kit" on page 42*
• 3 each tent stake, plastic, orange, 16 in (soft ground stakes)	*"Backpack Kit" on page 42*
• 5 ea nail, 12 in	*"Backpack Kit" on page 42*
• 3 each guy line holder	*"Backpack Kit" on page 42*
• 1 each hammer, 2.5 lb	*"Backpack Kit" on page 42*
• 1 each pry bar, 15 in	*"Backpack Kit" on page 42*
• 2 each flagging roll, orange	*"Backpack Kit" on page 42*
• 1 each compass sighting	*"Backpack Kit" on page 42*
• 5 each hose clamp, 2 in	*"Backpack Kit" on page 42*
• 1 each electronics carrier	*"Mast" on page 39*

4.2.4.1 Mast

Lightweight, telescoping backhaul masts are used to elevate the backhaul components above obstructions and to enable radio communications to accommodate typical cross-line distances. The mast can be installed by a single person. The following figures show the mast components:

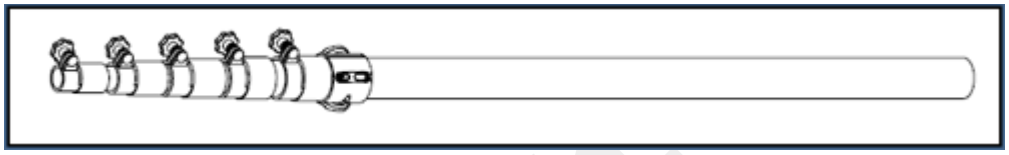

Figure 4–12 Mast

TBD

Figure 4–13 Electronics Carrier

4.2.4.2 Base

There are two base options; one that requires the use of guy wires for stabilization and one that uses weights for stabilization.

The following figures show the base that utilizes guy-wires:

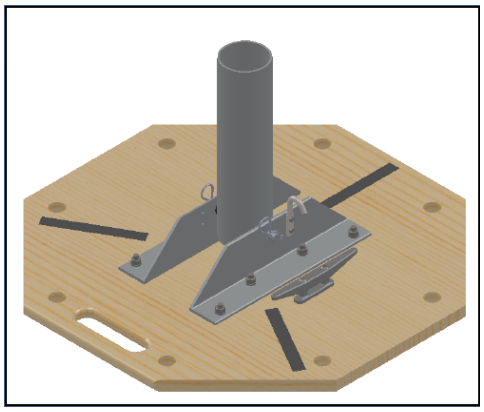

Figure 4–14 Base

The following figure shows the assembled mast with the BSU in the foreground:

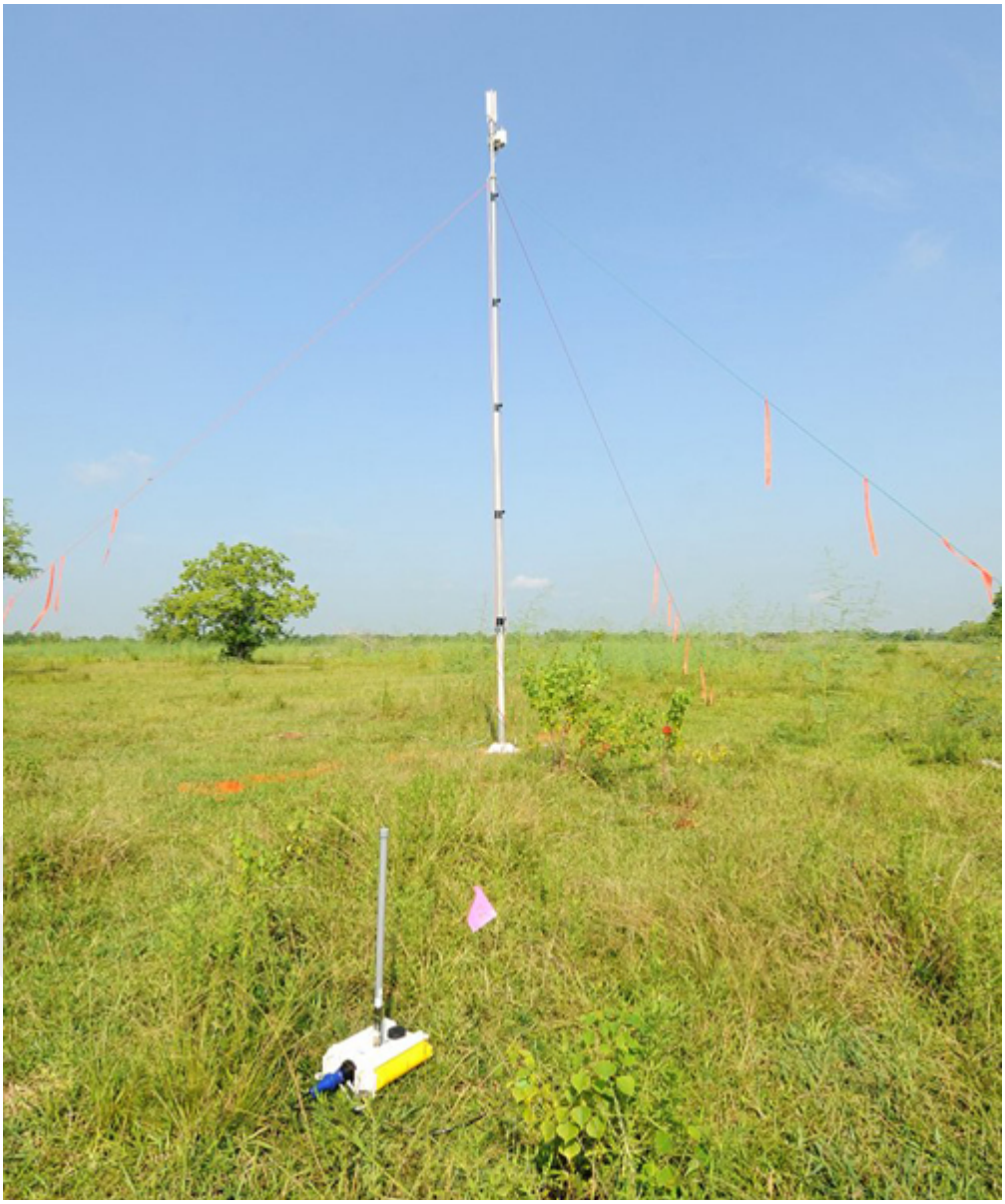

Figure 4–15 Assembled Backhaul Mast

The following figure shows the base that uses a weighted system. This base is optimal in urban or rocky environments:

Figure 4–16 Base (70-0070)

4.2.4.3 Bag

The antenna mast bag is a rip stop nylon yellow bag, 11 inches x 70 inches with a handle and draw string at one end (see *Figure 4–4 Backhaul Components Packed for Transport on page 31*).

4.2.4.4 Backpack Kit

The backpack is used to carry all of the equipment needed to install the mast and radios, and may also be use to carry the BSU. See *"Mast Kit" on page 38* for a list of components (see *Figure 4–4 Backhaul Components Packed for Transport on page 31*).

4.3 Configure the Radios

The FMQuadro™ Web Interface is used to configure the radio channels. The radio licenses are pre-configured by Wireless Seismic, Inc. This section describes how to connect the radios to a computer and configure them.

NOTE

The expected configuration in the RT 1000 system is as follows:

FM1100 = mesh point (remote backhaul)
FM3100 = mesh end (central backhaul)

Check the radios before connecting them to any switch.

4.3.1 Create a Private Network

Create a private network between the computer and the Fluidmesh radio.

NOTE

All Fluidmesh units are preconfigured with an IP address of 192.168.0.10.

1. Prerequisites:
   - Windows computer
   - Browser with Adobe Flash
   - AC Power
   - PoE Injector
   - Two Ethernet Cables
2. Power on the computer.
3. Connect the components (see *Figure 4–17 Fluidmesh Radio Private Network on page 44*):
   - Plug the PoE injector into an AC outlet.
   - Connect the computer to the PoE injector with an Ethernet cable.
   - Connect the Fluidmesh radio to the PoE injector with an Ethernet cable. The radio powers up.
     - FM1100 – Connect to LAN 1
     - FM3100 – There is only one connector

CAUTION

Power up only one radio at a time. Never place two powered-up radios next to each other. It is possible to damage the radio receivers if multiple radios are powered up in close proximity.

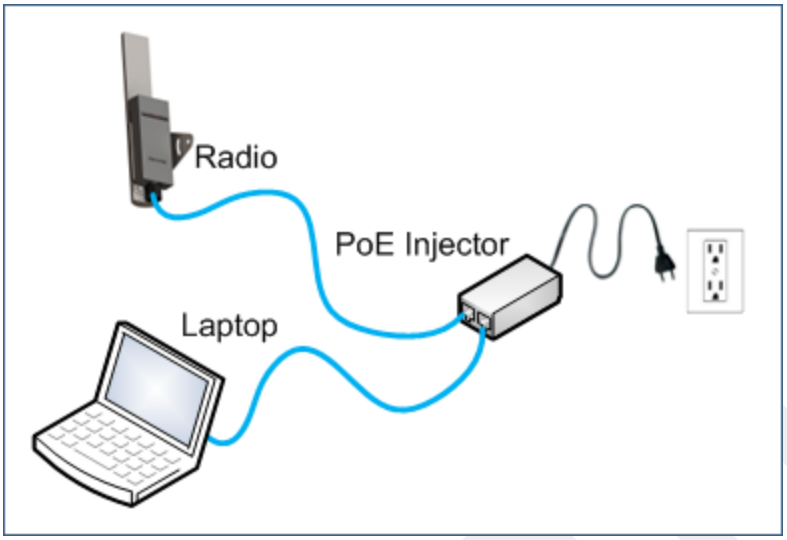

Figure 4–17 Fluidmesh Radio Private Network

4 Verify that the radio powers up. The LED indicators have the following meanings:

Table 4–5 Fluidmesh Radio LEDs

LED	State	Description
Power	On / Green	On whenever the radio has power
LAN	On / Green	On whenever the radio has an Ethernet connection
Signal Strength (1)	On / Red	Booting Core system
Signal Strength (2)	On / Orange	Booting wireless system
Signal Strength (3)	On / Green	Booting routing engine
Signal Strength (4)	On / Green	Booting unit configuration

5 Click the Windows Start icon.

6 Select **Control Panel**. The **Control Panel** window opens.

7 Select **Network and Internet**.

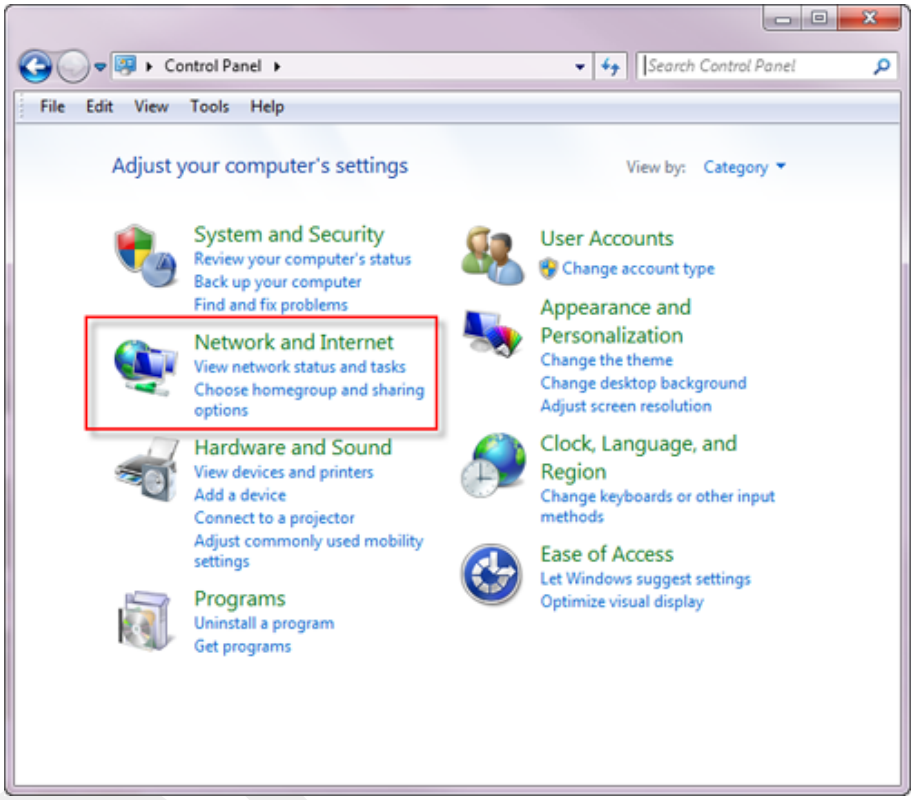

Figure 4–18 Control Panel, Network and Internet

8 Select **Network and Sharing Center**.

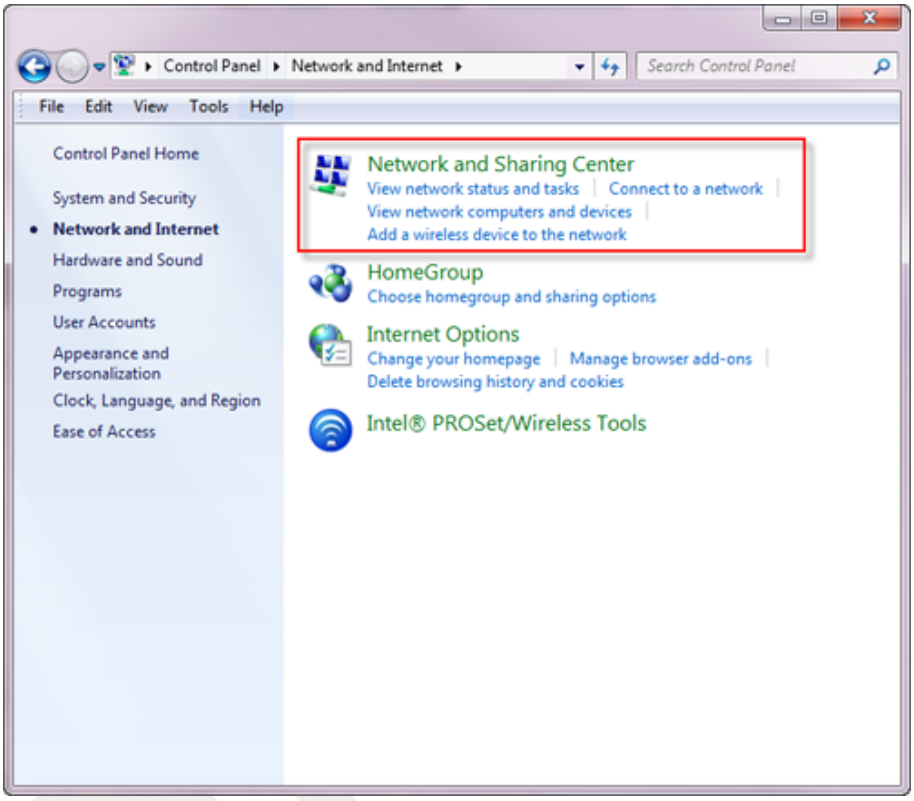

Figure 4–19 Control Panel, Network and Sharing Center

9 In the left pane, select **Change adapter settings**.

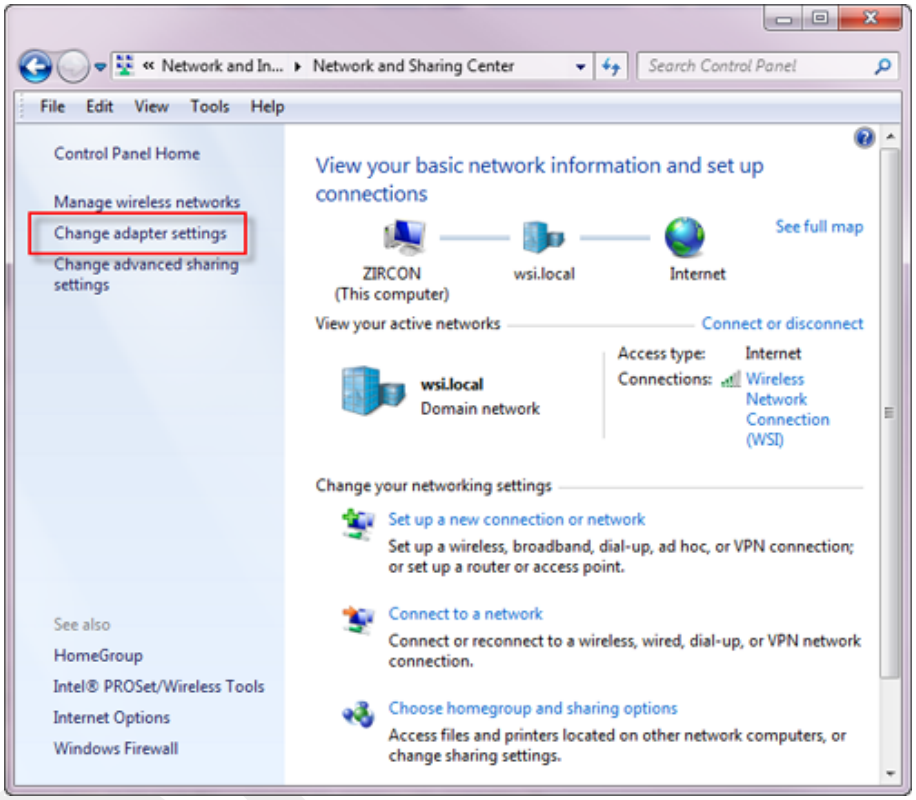

Figure 4–20 Control Panel, Change Adapter Settings

10 Right-click **Local Area Connection** and select **Properties**. The **Properties** window opens.

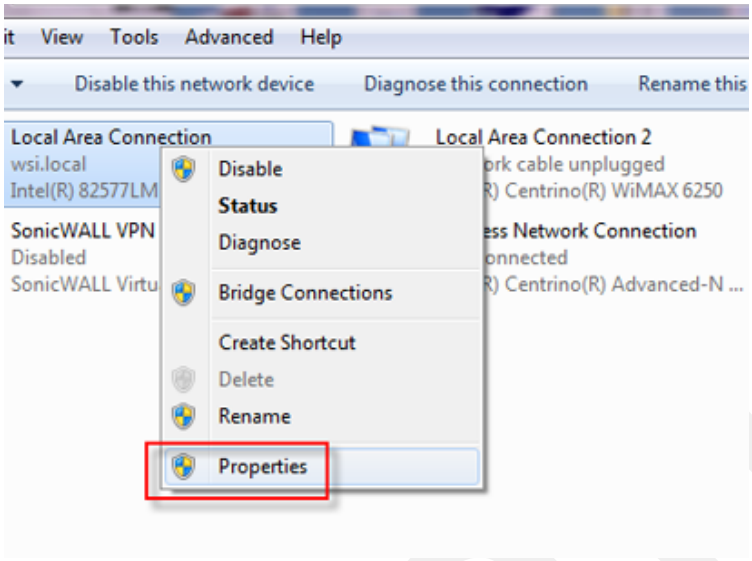

Figure 4–21 Control Panel, LAN Properties

11 Select **Internet Protocol Version 4 (TCP/IP v4)** and click **Properties**.

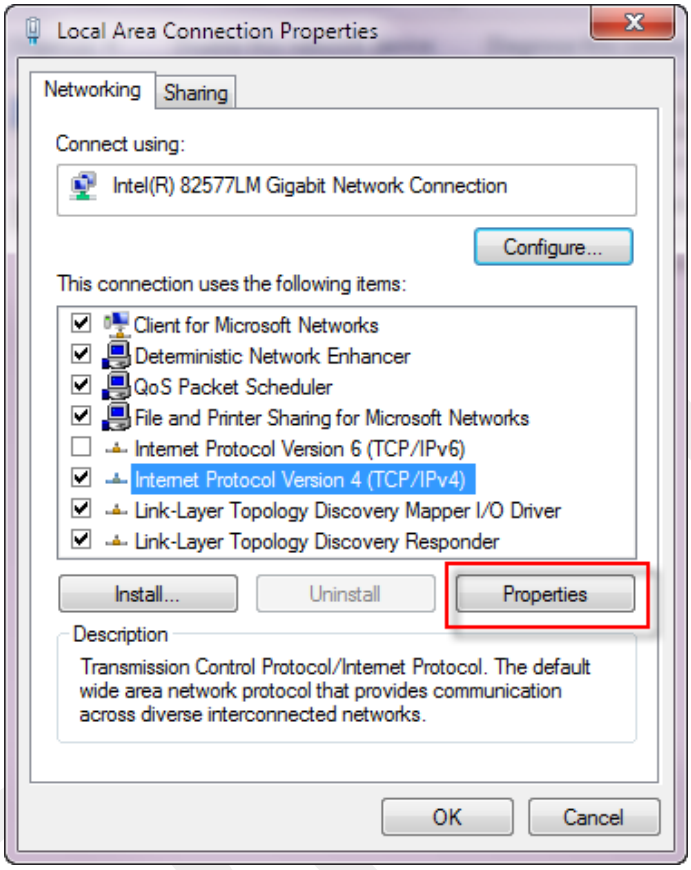

Figure 4–22 Control Panel, Networking Properties

12 Select **Use the following IP address**.

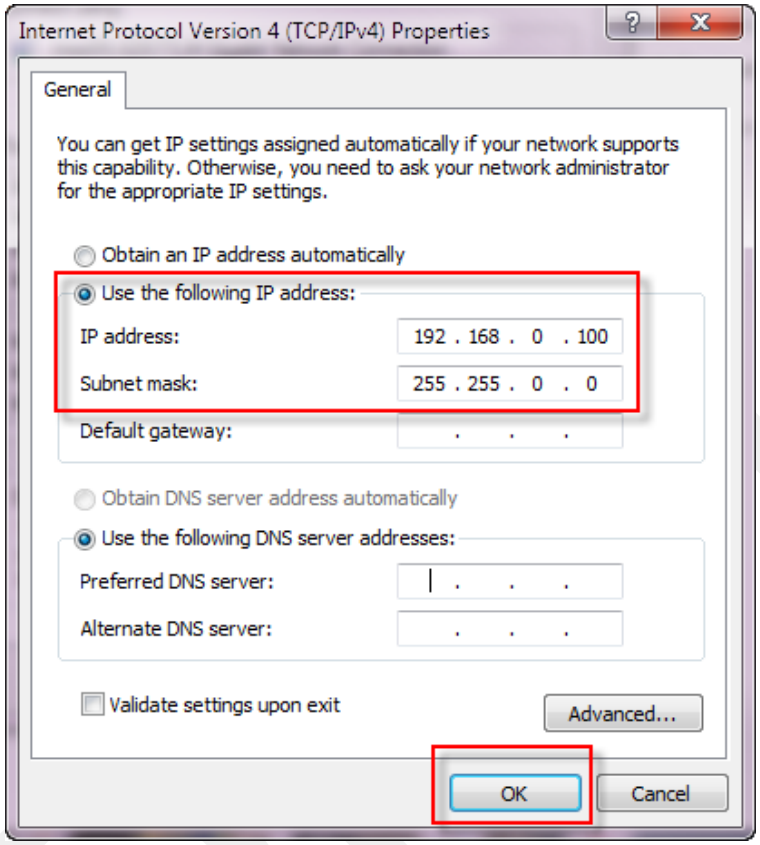

Figure 4–23 Control Panel, IP Address

13 Enter the following:

- IP address: 192.168.0.100 (this number does not have to be 100, just something other than 10, and a number between 1 and 255)
- Netmask:255.255.255.0

NOTE

If the radio already has an IP address, you will need to enter different numbers. For example:

Radio IP address: 10.101.0.22
Computer IP address: 10.168.0.100
Subnet Mask: 255.0.0.0

You may need to disable and enable (right-click) the LAN connection if it displays Network cable unplugged in the Network Connections window.

If the radio gets reset, the default IP address is 192.168.0.10.

14 Click **OK**.

15 Click **Close**.

4.3.2 Setting NIC Priority

If you have more than one network interface card (NIC) in your computer, make sure that the LAN card has the highest priority; the computer attempts to use the NICs in the order listed.

To set NIC priority:

→ **Windows computer**

1 Click the Windows Start icon.

2 Select **Control Panel**. The **Control Panel** window opens.

3 Select **Network and Internet**.

4 Select **Network and Sharing Center**.

5 In the left pane, select **Change adapter settings**.

6 In the toolbar, click **Advanced**, and then **Advanced Settings**.

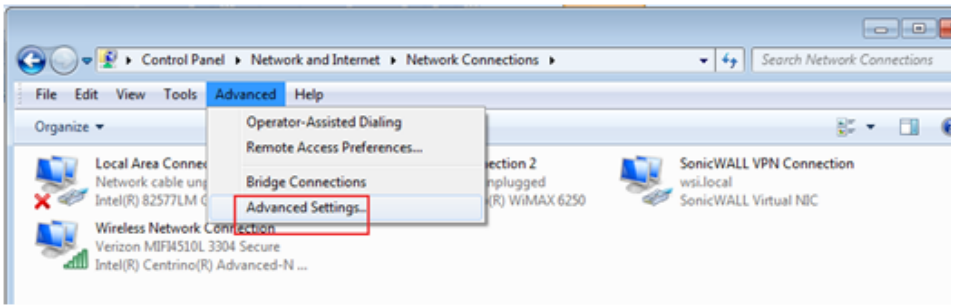

Figure 4–24 Advanced Network Settings Menu

7 Select **Local Area Connection** and then click the up arrow repeatedly until **Local Area Connection** is the first item.

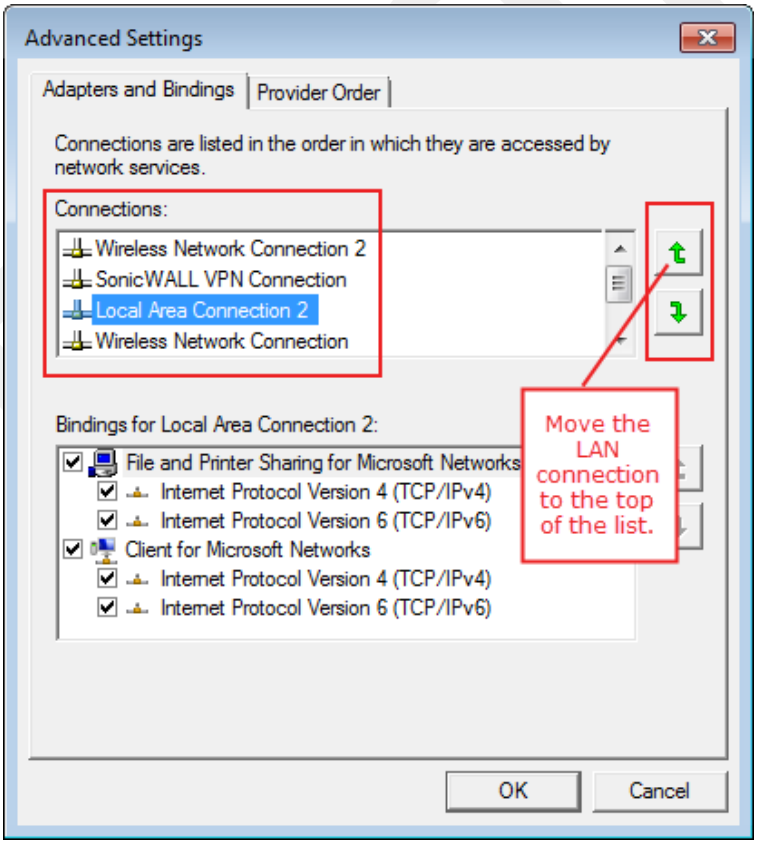

Figure 4–25 LAN Hierarchy

8 Click **OK**.

4.3.3 Configure the Radio

Configure the radios by logging into the software located on the radio. FM1100s are configured as mesh *points*, and FM3100s are configured as mesh *ends*.

To configure the radio:

→ **Windows computer**

1 On the computer, point a browser to the following URL:

http://192.168.0.10

NOTE

If the radio has an IP address other than the default IP address, you will need to enter that number. For example, 10.101.0.22.

2 Log in to the radio Web interface using the following:

- **UserName**: admin
- **Password**: admin

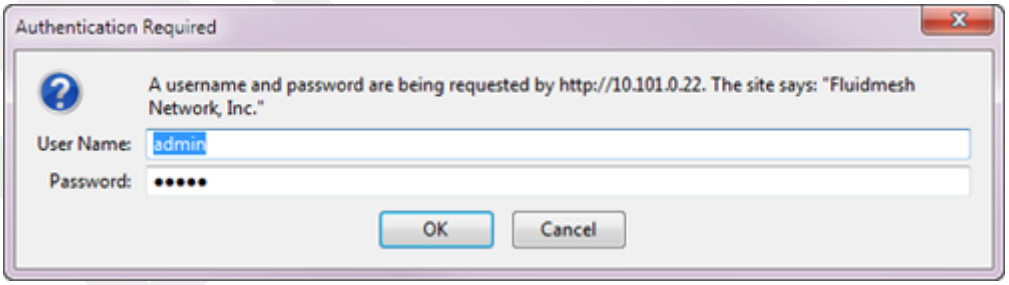

Figure 4–26 Radio Login Window

3 The following figure shows the home window when **mesh end** is selected as the **Mode**. The FM1100 configuration includes an additional left-pane option: **Power Over Ethernet**. Click **MeshWizard™**.

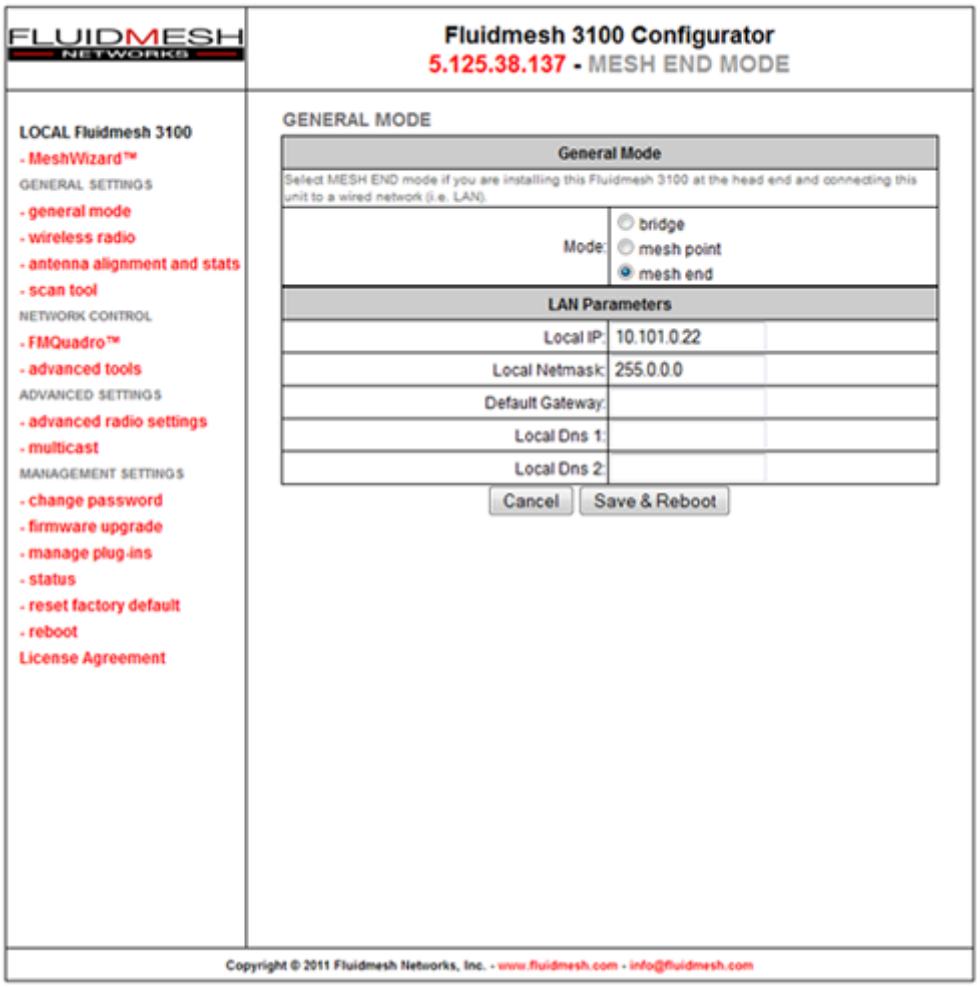

Figure 4–27 Radio Home Window, Mesh End

4 Click **I Agree** to accept the licence agreement if prompted.

5 Click **Wizard**.

6 Select or enter the following:

- **Mode** – Mesh Point (FM1100), Mesh End (FM3100)
- **IP Address** – Use next class A address available (10.2.0.1 - 10.2.0.255)
- **Netmask** – 255.0.0.0
- **Default Gateway** – Leave blank (FM3100), not shown (FM1100)\

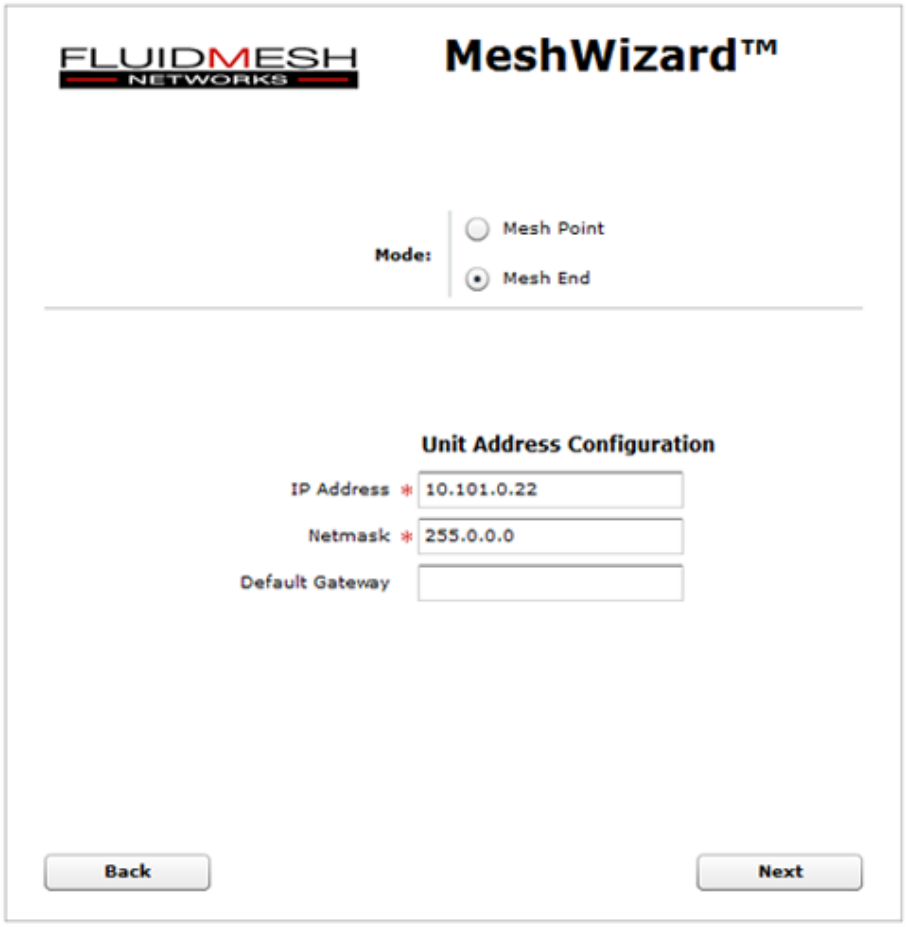

Figure 4–28 Fluidmesh MeshWizard Interface

7 Click **Next**.

8 Select one of the following frequencies (see *Figure 4–9 Channel Color Example on page 36*):

- Channel 1 = 5745 MHz (Yellow label)
- Channel 2 = 5805 MHz (Blue label)
- Channel 3 = 5180 MHz (Red label)
- Channel 4 = 5785 MHz (Green label)

9 Click **Next**.

10 Verify the settings. Click **Save&Reboot**.

11 **FM1100 only**: Click **Power Over Ethernet** in the left pane. This option allows the LAN 2 port on the radio to deliver passive PoE to a second FM1100 on the mast using one short Ethernet cable.

12 **FM1100 only**: Click **Enable**.

4.3.4 Restore your Network Settings

When have finished configuring all of your radios, restore your network settings as described in this section.

To restore network settings:

→ **Windows computer**

1 Click the Windows Start icon.
2 Select **Control Panel**. The **Control Panel** window opens.
3 Select **Network and Internet**.
4 Select **Network and Sharing Center**.
5 In the left pane, select **Change adapter settings**.
6 Right-click **Local Area Connection** and select **Properties**. The **Properties** window opens.
7 Select **Internet Protocol Version 4 (TCP/IP v4)** and click **Properties**.
8 Select **Obtain IP address automatically**.
9 Click **OK**.
10 Click **Close**.

4.4 Setting up the Backhaul Equipment

Use the following procedure to erect and secure the mast that uses guy lines (55-0007).

To install the backhaul components and erect the mast:

1 Prerequisites:
- TBD

2 Refer to the deployment instructions to determine the location and compass heading to the next back haul site closer to central.
3 Use the compass to determine and mark that direction.
4 Locate the base such that the three guy lines and the mast clear obstructions during erection and while in operation.
5 Remove the mast and electronics carrier from the transport bag and empty the backpack.

Figure 4–29 Unpacking the Backhaul Equipment

6 Secure the base with at least 2 nails.

Figure 4–30 Securing the Base

7 Insert the mast into the base collar, extend and secure each section of the mast at the mark on each section.

Figure 4–31 Inserting the Mast into the Base and Extending the Mast

8 Insert the electronics carrier with guy line collar into the top of the mast.

Figure 4–32 Inserting the Electronics Carrier into the Mast

9 Secure each guy line to the mast base at the loop in the guy line. Markings on the ropes indicate the recommended distance for the stakes and the lines on the base show the direction for the guy lines.

Figure 4–33 Securing Guy Line to Base

10 Hammer guy line stakes into ground and secure guy lines at the indicated marks.