User Guide

FreeSpeak II® Integra

Eclipse HX 8.5.2 Version

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Clear-Com® AN HME COMPANY

Document Reference

Clear-Com FreeSpeak II User Guide

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Contents

1 Important Safety instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do **not** use this apparatus near water.
- Clean only with dry cloth.
- Do **not** block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do **not** install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do **not** defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-cord supply or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Use only chargers provided by HME/Clear-Com to charge the battery packs or beltpacks. These include:
    - BAT60 Battery pack and beltpack charger manufactured by HME/Clear-Com

  - USB Charger model PA1015-050SIB200/PA1015-1SI/ PA1015-1SI050200 provided by HME/Clear-Com with your beltpack.
- This product uses Lithium Ion Batteries which can be a fire hazard, if used improperly. Use only HME/Clear-Com supplied BAT60 or equivalent battery packs to ensure safe operation of the beltpack.
- When using AA Batteries follow all safety instructions from manufacturer. Do not mix different battery chemistries. When depleted, replace all batteries.
- The in-beltpack USB charging feature has only been tested utilizing USB2.0 port.

Warning: To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.

1.1 Safety symbols

Familiarize yourself with the safety symbols in **Figure 1: Safety symbols**. These symbols are displayed on the apparatus and warn you of the potential danger of electric shock if the system is used improperly.

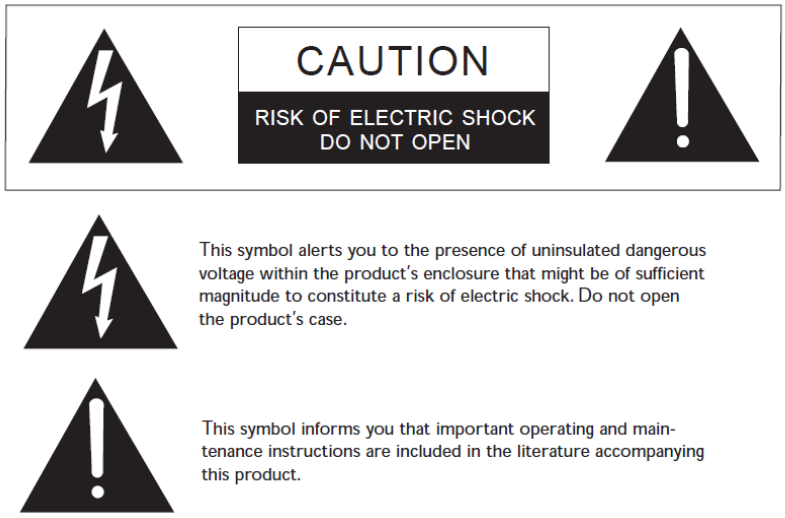


Figure 1-1: Safety symbols

Note: For compliance notices, see **9 Compliance**.

2 Introduction to FreeSpeak II®

This chapter provides an overview of the FreeSpeak II digital wireless beltpack system.

With a FreeSpeak II (FS II) wireless beltpack you can roam freely around a site or facility while talking and listening to all, or selected, members of the production team. With its four communication routes, the beltpack gives you the flexibility to communicate quickly and seamlessly with individuals or groups, and to change communication routes as often as needed.

The system operates in the unlicensed 1.90 and 2.4 GHz bands. With its unique and innovative digital technology, which continually searches for unused radio frequency (RF) channels, FS II avoids the noise and interference issues associated with traditional wireless systems using congested UHF and VHF bands.

With FS II you can set up a wireless system specifically tailored to local needs by locating transceiver antennas and beltpacks in areas where they are needed most. And because the beltpacks operate in the unlicensed 1.90 and 2.4 GHz frequency spectrum, there is no interference with existing wireless systems, even those located in the same area.

You can use FS II stand-alone or connected with partyline, digital matrix intercom systems or both. This manual covers the use of FS II with a matrix connection. With FreeSpeak II Integra, wireless beltpack users can communicate with any Eclipse HX panel users on a one-to-one or group basis.

Note: This manual covers the use of FS II with a matrix only (FS II Integra). For more information on running an FS II system with a Base station, please see FreeSpeak II User Guide, Base Station Version.

To use FreeSpeak with a matrix, the matrix must be equipped with E-Que cards in antenna or splitter mode. The system must be configured via the Eclipse HX Configuration software. See **3.1 Adding an E-Que card to the matrix** below. For more detail, please refer to the ***Eclipse HX Configuration Software User Guide***, section ***5.34 E-Que antenna/E-Que FS II antenna***.

Note: You cannot configure FreeSpeak and FreeSpeak II on the same Eclipse matrix. If you attempt to do so, the Eclipse HX Configuration Software displays a warning.

2.1 An FS II communication system

An FS II system consists of three main elements:

- The wireless beltpacks.
- An Eclipse HX matrix (Omega, Median or Delta) with an E-Que card.

- The transceiver network that provide custom coverage zones in which beltpacks can operate. Beltpacks can roam freely between coverage zones.

FS II also includes a drop-in battery charger for the beltpack Li-Ion batteries. You can conveniently charge the battery by placing the whole beltpack into the charger, or by placing individual batteries into the charger.

FS II operates using a cellular network of antennas located around a working environment. The antennas connect to the matrix using CAT5/5e/6 cable via an E-Que card installed on the matrix. Each antenna provides an area or cell in which three to five full-duplex beltpacks can operate. Figure 2-1 shows an example configuration.

Beltpacks can roam among and between cells without disconnecting because each beltpack continually signals an antenna as to the strongest available signal. When the signal from an antenna starts to diminish due to the distance from a beltpack, the beltpack automatically "hands off" its signal to the nearest antenna, ensuring smooth transfer.

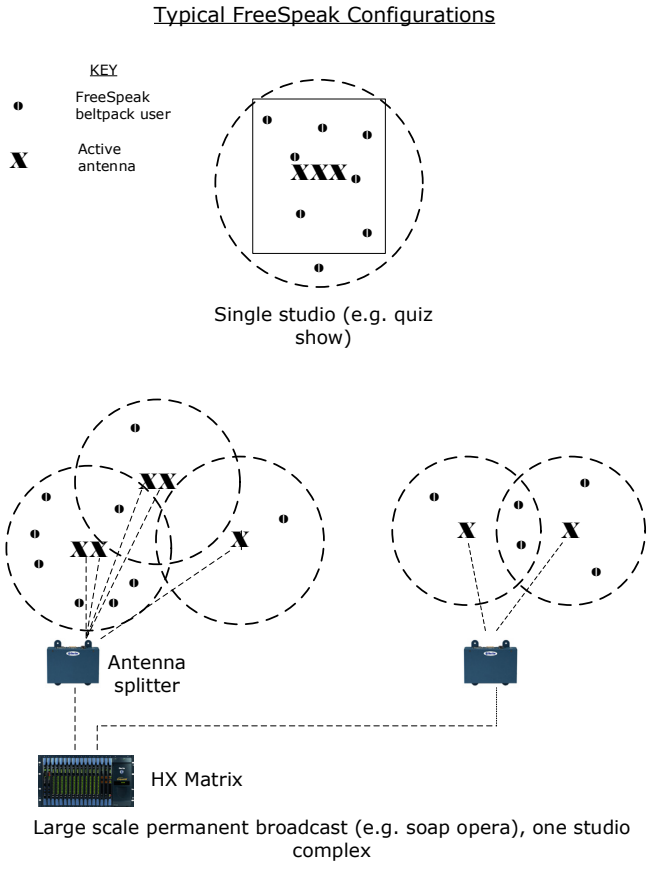


Figure 2-1 Configurations for a studio and large-scale broadcast facility

2.1.1 FreeSpeak II system capacity

Using an antenna splitter allows up to five antennas to be connected to each antenna port. Each E-Que card can connect to two splitters and so support up to 10 antennas. Each antenna supports up to five beltpacks. This means that up to 50 beltpacks can be present, giving a great deal of flexibility in placing beltpacks where they are needed most, and providing wireless reliability. 2-1 illustrates how an FS II system can be set up to operate in a single studio or in a large-scale permanent broadcast facility.

If an antenna card is selected in the configuration software, this supports 8 antennas.

Each matrix can support up to four E-Que cards, allowing for further expansion and coverage.

Note: Each antenna is designed to handle five beltpacks in the 1.9 GHz range and four in the 2.4 GHz range, simultaneously and in good conditions. However, if interference or propagation problems occur in an area, to ensure proper operation and reliability, it may be more practical to install one less beltpack for each antenna.

For zones which are likely to need coverage for up to five or more beltpacks simultaneously you must install a second antenna. Similarly, for good coverage for nine or more beltpacks simultaneously, a third antenna may be required.

Radio Frequency (RF) Band	Minimum number. of Antennas in one RF cell	Maximum number of beltpacks supported in one RF cell
1.9 GHz	1	4 - 5
	2	8 - 10
	3	12 - 15
	4	16 - 20
2.4 GHz	1	3 - 4
	2	4 - 6
	3	7 - 9
	4	10 - 12

Figure 2-2 Antenna/beltpack capacity

2.1.2 National Radio Carrier Frequencies

The carrier frequencies allocated for a radio space vary according to location. This affects the amount of belt packs that can be supported in one RF area.

Location	Number of carrier frequencies	Maximum belt packs in one RF cell
United States	5	25 belt packs
European Union and elsewhere	10	50 beltpacks

Figure 2-3 National Radio Carrier Frequencies

Note: If necessary, using two RF bands (1.9 GHz and 2.4 GHz) will increase the amount of beltpacks that can be used in one area or cell.

2.1.3 FSII 1.9 GHz/FSII 2.4 GHz

3 Installing a system

This chapter explains how to install a FreeSpeak II system, including cable connections, registering beltpacks and performing a site survey to optimize system performance. It contains the following sections:

- *Adding the E-Que card for an FS II antenna or splitter to the matrix*
- *Placing the antennas and splitters*
- *Connecting to transceiver/antennas*
- *Determining coverage areas*
- *Doing a site survey to determine coverage areas*
- *Registering beltpacks*

A FreeSpeak II system can be used with an Omega, Median or Delta matrix.

3.1 Adding the E-Que card for an FS II antenna or splitter to the matrix

The E-Que card is designed to allow Eclipse HX matrices to connect to FreeSpeak and FreeSpeak II wireless antennas/beltpacks or connect together using E1 or T1 protocol. You will need an E-Que card and a rear port. You will need to make sure the E-Que card is physically connected to the matrix and configured for communication in the Eclipse software. See 3.1.1 and 3.1.2. below.

3.1.1 Installing and removing an E-Que card.

To install an E-Que card:

1) Carefully place the card in the appropriate slot. Make sure the card is aligned with the top and bottom precision guides.

2) Push the card toward the backplane connectors.

3) When the card has almost reached the backplane connectors, open the two ejector tabs, allowing them to clear the edges of the matrix. Gently insert the card further until it touches the backplane connector guides.

4) Gently close both ejector tabs at the same time, to propel the card into the backplane connectors.

To remove an E-Que card from the matrix:

1) Hold the card in place in the matrix.

2) The two card ejector tabs are located at the top and bottom of the card. To remove a card, open the two ejector tabs at the same time until the card unseats from its backplane connectors.

3) Pull the card out of the matrix.

3.1.2 Adding an E-Que card to the software

To add and E-Que card to the software:

1) In the EHX configuration software go to:

2) **Hardware > Cards and Ports**, navigate to an available slot number (marked **Empty**). Do either of the following:

3) Double click the slot.

4) Right click the slot and select **Set Card Type**.

5) A drop-down menu is displayed, listing the available card types. Select an FS II antenna or splitter from the drop-down menu.

You cannot have both E-Que Antenna/Splitter and E-Que FS II Antenna/Splitters configured on the same matrix.

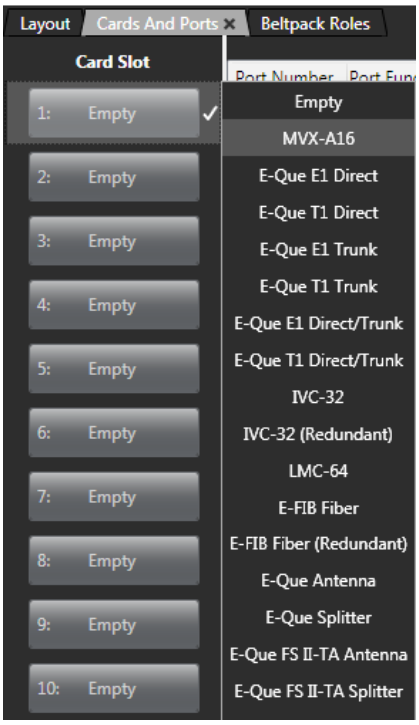


Figure 3-1 E-Que Card Selection

3.1.2.1 Selecting an FS II-TA antenna card type

Selecting an FS II-TA antenna card type automatically configures an E-Que card with eight antenna ports (1 to 8 on the rear card). Each of those antenna ports provides five user ports and one control port.

3.1.2.2 Selecting an FS II-TA splitter card type

Selecting an FS II-TA splitter card type automatically adds an E-Que card with two splitter ports (1 and 5 on the rear card) configured. Each splitter can support up to five antennas and each antenna provides five beltpack ports.

Note: At this stage you might choose to register all of the beltpacks with the matrix, or at least register one or two for system setup and testing. See *Eclipse HX Software Configuration User Guide, 5.59 FreeSpeak II Beltpacks.*

3.2 Placing the antennas and splitters

The next step is to begin placing antennas and splitters to provide the necessary coverage areas for all of the beltpacks. The first placements of antennas and splitters will be experimental and temporary. After placing the antennas, walk through the coverage areas to check for gaps and then re-locate the antennas accordingly.

More information on checking coverage areas is given later in this chapter, in sections:

- **3.4 Determining coverage areas**
- **3.5 Doing a site survey to determine coverage areas**

Consider the following:

- What areas will have more than five active beltpack users in them at any time? Co-locate a second antenna there.
- Is there a central place to locate an antenna so that it will provide omnidirectional (all directions / circular) coverage?
- Are there balcony areas, corridors, or other rooms or areas that will require coverage with antennas?

For systems with up to eight transceiver/antennas, the cable runs will go directly from the transceiver ports on the rear of the E-Que card. If you need more transceiver/antennas you will need to decide where the splitters that feed these will be located.

The E-Que card supports two splitters. Each splitter supports up to 5 antenna/transceivers which in turn support up to 5 beltpacks.

For antenna coverage options see ***3.4 Determining coverage areas*** in this chapter.

3.2.1 Wiring the antennas and splitters

To wire antennas and splitters:

1) Make sure that the local power supplies are plugged into the antennas and splitters.

2) Run 4-pair shielded Ethernet cable from the matrix (the E-Que card) to the antenna or splitter, and determine that the antenna or splitter is showing both power (green) and signal (amber) LEDs. If the amber data LED flashes, a data link is established, and if the LED is solid, DECT synchronization is established and the system is ready to use.

The E-Que card will not provide power to the antennas or splitters.

During the initial system setup, before walking through the system with a beltpack to check for gaps in coverage, it is wise to avoid "permanently" installing the transceiver/antennas. Hold them in place in some temporary way until their optimal position is determined.

Note: 4-pair shielded Ethernet cable (CAT-5/5e/6) with RJ-45 connectors on each end is specified for connection between the matrix and the transceiver/antennas. Use of

other cable can result in markedly shorter distances of cable runs and other possibly other performance problems.

3.3 Connecting to transceiver/antennas

3.3.1 Connecting one transceiver/antenna directly to a transceiver port

A transceiver/antenna connects to the transceiver port on the E-Que card using a standard 4-pair CAT-5 data cable with RJ-45 connectors. It may be located up to 1,000 metres from the matrix if 24AWG cable is used or for 500 metres if 26AWG cable is used creating a coverage area for five FS-BP wireless beltpacks in that location.

Note: It is recommended that shielded CAT-5 cable or better is used.

To know that a transceiver/antenna is active, observe the green power LED and the yellow signal LED on the face of the unit where the RJ-45 connector is connected. Both must be lit. Also, wireless beltpacks in the vicinity of the active transceiver/antenna will be connected to the system and their displays will show labels and other information.

For the best, most reliable coverage, it is advisable to use a minimum of two transceiver/antennas in any installation, positioned in different locations in the coverage area. When more antennas are required to support a larger coverage area or more wireless beltpacks, an antenna splitter will need to be introduced.

In some situations, particularly in outdoor venues, interference from non-DECT sources can severely reduce the range of the system. In these cases we recommend a site survey as described in Chapter 8, “Installing a System”.

3.3.2 Connecting transceiver/antennas with a splitter (PD2203)

A splitter (PD2203) will connect up to five transceiver/antennas to one of the transceiver ports on the E-Que card, creating up to five coverage zones that can be overlapped to make large areas where beltpacks can have continuous coverage. The use of the splitter also extends the distance that the transceiver antennas can be located from the matrix to 2,000 metres (6,400 feet) if 24AWG cable is used or 1.000 metres (3,200 feet) if 26AWG cable is used (assuming the same cable type is used to connect the antenna to the splitter and the splitter to the matrix).

Note: It is recommended that shielded CAT-5 cable or better is used.

For example, a splitter can be used to connect to a matrix that is located in a production truck outside an arena or stadium, with a single CAT-5 cable going to the splitter which is then located just inside the stadium. From that splitter, up to

five transceiver/antennas are distributed throughout the stadium to create wide coverage – each with a run of CAT-5 cable back to the splitter. A similar arrangement may be used in a large theatre or performing arts facility.

The connection between a transceiver port on the E-Que card and a PD2203 splitter is accomplished with standard 4-pair CAT-5 data cable with RJ-45 connectors. It is connected to the port labeled MATRIX on the splitter. The splitter must be locally powered via its DC IN connector, using the in-line external universal power supply.

The RJ-45 ports on the splitter labeled "1" through "5" are the connections to the FS-TA transceiver/antennas.

Ports 1 and 5 on the E-Que card are connections to the PD2203 splitter.

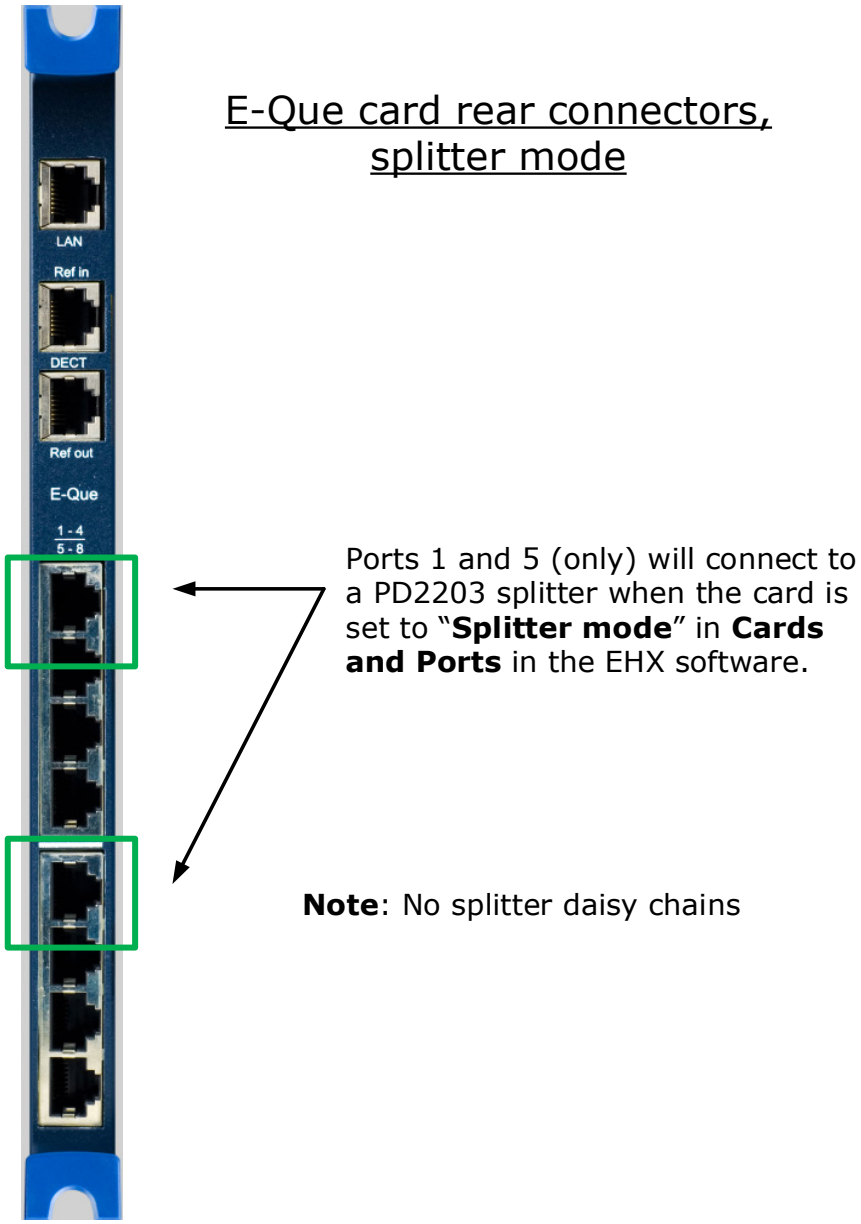


Figure 3-2 E-Que card rear connectors, splitter mode

Note: You will need to set the card type to "**Splitter mode**" in **Cards and Ports** in the EHX software interface before connecting the devices. See section 3.1.2. for more detail.

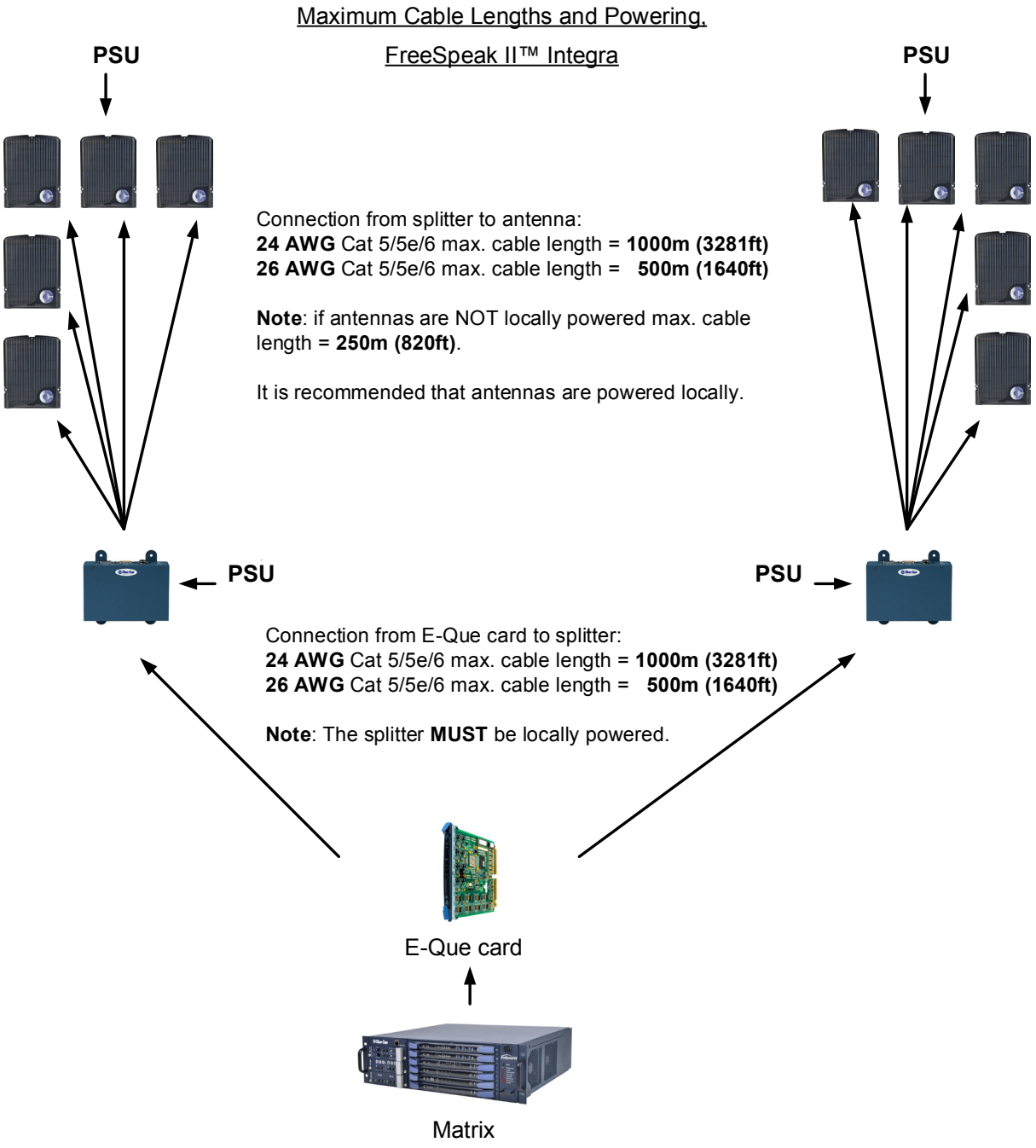


Figure 3-3 Recommended cabling lengths and powering, FreeSpeak™ Integra

3.3.3 Powering an antenna or antenna splitter

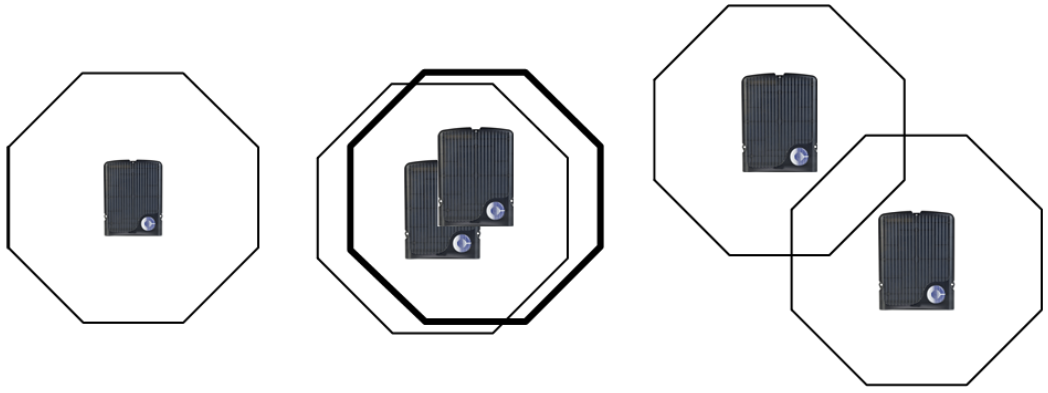
Provision of 24 VDC power to an FS II antenna is done as follows:

- Connect the antenna to a 453G023 power supply unit through the 4-pin DIN connector at the antenna.

3.4 Determining coverage areas

After the transceiver/antennas and splitters have been initially set up proceed to test the coverage areas and re-locate antennas and splitters, if necessary, for optimal coverage.

The following figure illustrates some FreeSpeak II coverage scenarios.



- Each antenna covers a certain range or cell size.
- Maximum line of sight range: up to 500m (1640ft).
- Typical range: 50 - 150m (160 - 490ft).
- Each antenna covers up to 5 full duplex users (beltpacks).

- If two or more antennas are placed in the same area the cell size is the same.
- However, cell density has increased to handle up to 8-10 users in the same area.

- If antennas are placed across the site then this increases radio coverage area.
- Beltpacks can roam from one antenna to another and stay in constant communication.

Figure 3-4 Coverage areas for FS II TAs

Note: Cells can be completely overlapped for density (by co-locating multiple antennas). Cells can be overlapped at boundaries (increases radio coverage).
For most working systems Clear-Com uses a ratio of 3-4 (1.9GHz) or 2-3 (2.4GHz) users per antenna. This is due to system losses.

Note: Under ideal conditions, the maximum range between an FS II beltpack and a transceiver/antenna is 500 metres. Typical distances are between approximately 50 metres (about 160 feet) and 150 metres (about 490 feet), depending on the particular environment.

To determine coverage areas:

1) When the matrix, splitter(s), and transceiver/antennas have been placed and wired, turn on an FS II beltpack (assuming that it has been registered with the system) and walk the coverage area.

Alternatively, use the **Site Survey** mode on the beltpack (see **3.5 Doing a site survey to determine coverage areas** below). It is often best to begin with one antenna in place, and then place additional units to enhance coverage.

2) Walk through all of the areas where beltpack users will typically be moving, and note any areas of weak signal, dropout, or disconnection from the system. Pay special attention to the overlap areas between antenna coverage zones, making sure sufficient signal strength is there from each of the transceiver/antennas to make a clean handoff between them for the beltpack.

3.5 Doing a site survey to determine coverage areas

You might want to test coverage areas more extensively before setting up a complete system. Testing a system in the setting in which it will be located helps to meet operational needs. Factors in the local setting may affect the areas a system can cover, so it is important to plan a site setup accordingly.

Doing a complete site survey, as described below, helps to set up an optimal system. You can do a site survey using a beltpack that is connected to the system or one that is not connected to the system.

3.5.1 Doing a site survey with a beltpack

1) Link one beltpack to the matrix.

2) Place one connected antenna in the center of the coverage area.

3) Put the beltpack into **Site Survey** mode using the beltpack menu. See **4 Operating the wireless beltpack.** The following figures show the information that the Site Survey mode displays for connected and unconnected beltpacks.

Figure 3-4 An unconnected beltpack site survey screen

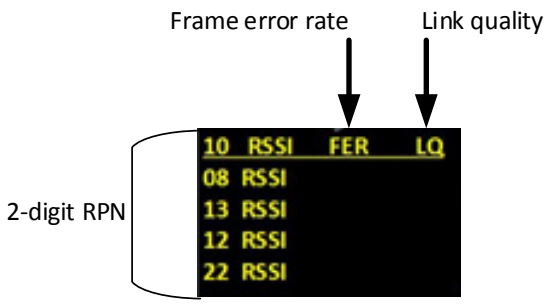


Figure 3-5 A connected beltpack site survey screen

Parameter	Meaning
Received Signal Strength Indication (RSSI)	A measure of the signal strength in a wireless environment. The higher the value, the stronger the signal.
Frame Error Rate (FER)	A measure of the signal connection quality. The lower the FER, the better the signal connection.
Link Quality (LQ)	A combined quality metric ranging from 1 (poor) to 5 (high).

Table 3-1 Key to site survey terms

4) Walk around the antenna with the beltpack, monitoring the beltpack signal strength and quality metrics.

The *signal strength* is shown in the Received Signal Strength Indication (RSSI) field.

- The signal strength number will fluctuate, ranging between 0 - 59 as you walk through the coverage area, and may even fluctuate as you stand still. As a rule-of-thumb the best system performance will be obtained when the signal strength remains at 30 or above. If the signal strength falls below 30 the beltpack may start losing audio. This is the limit of the coverage zone.
- A high Received Signal strength indication and a high Error rate may indicate that there is another RF system causing interference.

A beltpack can transmit to an antenna at a range of approximately 500m in good conditions.

5) Draw a map of the coverage zone for the antenna. The coverage zone is the area where the signal strength, as a rule-of-thumb, is 30 or above and the Line Quality is 3-5.

6) Repeat this process for as many antennas as necessary to cover the required area. Overlap coverage zones so that there is no area where the signal strength is below 30, and no area where the error rate is above a few percent.

7) The antenna placement will need to be adjusted to get the best coverage.

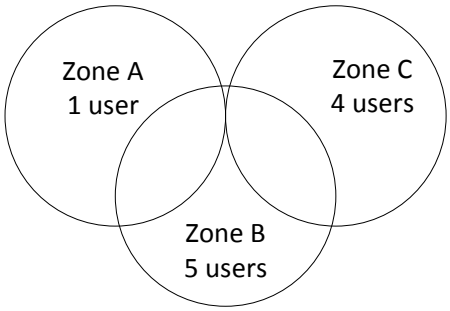


Figure 3-6 Mapping overlapping coverage zones

In some environments you might observe that despite having a high signal strength, the beltpack consistently reports a high error rate.

This could be due to two things:

- In-band interference from an RF source broadcasting in the DECT area of the spectrum. This can be verified using a DECT band monitor or by using a Spectrum Analyzer.
- Long Delay Spread Multipath, where the signal is bounced off a number of reflective surfaces, such as metal ceilings, gantries, walkways or other large structures. This problem is greatest where the reflective surface is large and exists at a range of distances from the antenna. To reduce the problem, consider siting the antenna where it cannot "see" the reflective surface or installing a reflector close to the antenna between it and the reflective surface.

3.5.2 Testing antenna handoff

After testing the coverage areas for individual antennas, test the handoff between the antennas. When you walk through a coverage area with the beltpack, the beltpack searches to find the antenna with the best signal strength, and switches transmission to that antenna. Therefore the beltpack continually hands off transmission among antennas as you move through the coverage area. You can determine which antenna the beltpack is connected to using the EHX configuration.

To test antenna handoff, connect any additional antennas in the installation and walk through the coverage areas to ensure that the coverage is continuous and complete, without audio breakups. Reposition antennas if necessary.

3.5.3 Assigning beltpacks to coverage areas

Antennas that operate in the 1.9 GHz band will handle up to 5 antennas at any one time. Antennas that operate in the 2.4 GHz band will handle up to 4 antennas.

Although they can achieve this in good conditions, this may not always be possible for a number of reasons. First, interference or propagation problems may mean that not all antenna slots are available all the time. Second, a beltpack constantly searches for the best antenna signal, and may frequently switch antennas. To make this transmission seamless, a beltpack maintains the connection to its current antenna until it is confident that the new antenna is functioning well. Therefore, for a short period of time during this transition, a single beltpack can occupy slots on more than one antenna.

This means that for zones likely to need coverage for five or more beltpacks simultaneously it is recommended that a second antenna is installed. Similarly, for good coverage for nine or more beltpacks simultaneously, a third antenna may be required (remember that the 2.4 band will support one less beltpack per antenna).

3.5.4 Conditions affecting coverage areas

The environment in which a system is located affects the coverage area for any particular beltpack/antenna combination. The presence of walls, floors, ceilings, trees, shrubbery, people, and numerous other items may affect the coverage zone. Metallic objects, safety doors, lighting equipment, and bodies of water may possibly block transmission. These factors must be taken into consideration when planning the installation.

3.5.5 Surveying a site in standalone (rigging) mode

You might need to scope a site (check the range and performance of an antenna) without connecting to a matrix. To do this, a beltpack and antenna can be put into standalone or rigging mode.

To put a beltpack and antenna into standalone mode:

Make sure you have to hand:

- A beltpack
- A transceiver/antenna
- A power connector for the antenna.
- Access to a power socket.

8) Connect the power to the transceiver/antenna and **at the same time** press the black **mode** button on the base of the antenna.

This puts the antenna in standalone mode, and opens it for pairing to a beltpack.

9) The amber LED flashes continuously to show that the antenna is open for pairing with a beltpack in standalone mode.

10) From the beltpack, press the **menu** key (3 second press) and navigate to **System Connect** using the right hand rotary controller on the beltpack.

11) Press button **D** to see local systems available for connection.

Note: In menu mode the **D** key on the beltpack operates as SELECT and the **C** key exits the menu level and cancels the selection.

12) Scroll through available systems using the right hand rotary controller.

13) When you have found the antenna to pair to (it will be showing a 'P' to indicate that it is ready to be paired to the beltpack) press button **D** to select the antenna and connect the beltpack to it.

14) When the beltpack is successfully connected to the antenna, navigate to **Site Survey** in the beltpack menu and monitor the range and performance of the antenna. For more information on Site Survey functionality see **3.5.1** Doing a site survey with a beltpack.

Figure 3-7 Using an antenna and beltpack in standalone mode

3.6 Registering beltpacks

Before you can use a beltpack, you must first register it with the FreeSpeak II system. The beltpacks can be registered to an Eclipse matrix (Omega, Median or Delta) using Eclipse HX software (EHX).

You can register the beltpacks using a USB cable or over the air (OTA).

To register FreeSpeak beltpacks with the system see the *Eclipse HX Software Configuration User Guide, 5.59 FreeSpeak II Beltpacks.*

4 Operating the wireless beltpack

This chapter explains how to operate the FS II beltpack. It contains the following sections:

- *Overview of the wireless beltpack*
- *Beltpack user controls*
- *Using the beltpack*

4.1 Overview of the wireless beltpack

Figure 4-1 FreeSpeak II beltpack

An FS II wireless beltpack gives you simultaneous access to up to five channels of talk/listen communication, with the ability to switch among them as desired. Any or all of these routes may be kept open during use. You can adjust Incoming volume levels ("listen levels") using the two rotary level controls, so that one conversation can be monitored in the background while a primary conversation is held.

The panel display contains the role (label) of the beltpack user, identifies up to four talk/listen labels currently selected, and gives other information such as signal strength and battery level. You can choose between two display modes:

- Intercom display mode – displays key labels, role name, signal strengths, battery level and volume levels.

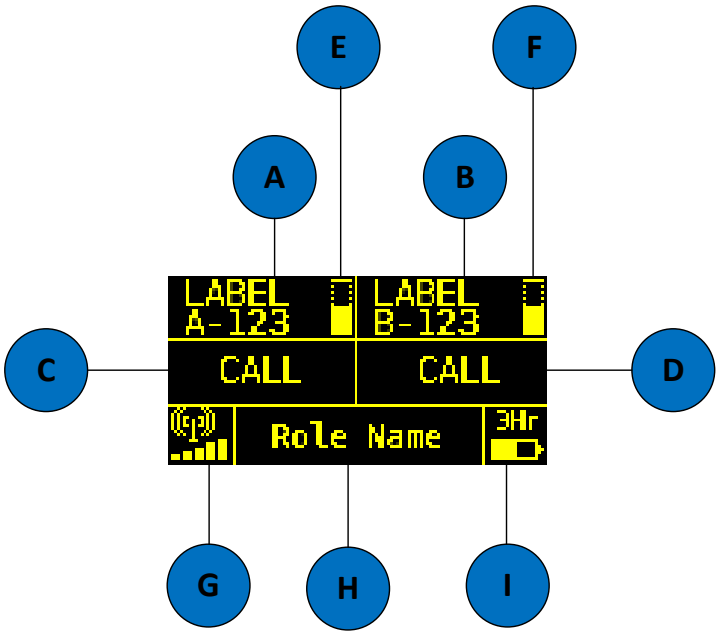


Figure 4-2 Intercom display mode

- Partyline display mode – displays role name, signal strength, battery level and volume levels for channel A and channel B.

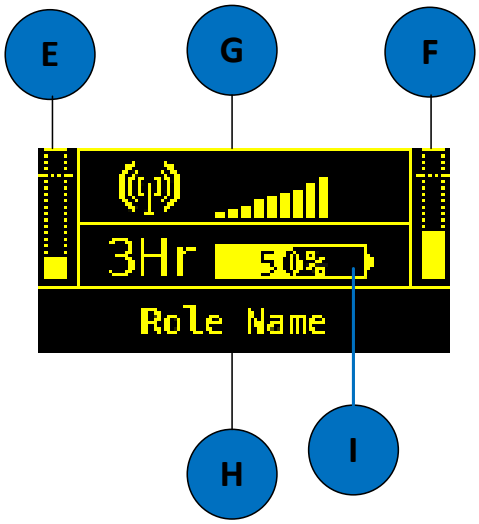


Figure 4-3 Partyline display mode

Key to display layout	
Feature	Description
	Label for key A assignment.
	Label for key B assignment.
	Label for Key C Assignment or CALL key for Key A if not assigned.
	Label for Key D Assignment or CALL key for Key B if not assigned.
E	Volume level for Key A assignment.
F	Volume level for Key B assignment.
G	Signal strength.
H	Role name for the role assigned to the Beltpack.
I	Battery life remaining (in hours for Li-Ion, in % for AA battery).

Table 4-1 Key to display layout

A 4-pin male headset connector is provided for connection with a standard Clear-Com headset or similar device. The FS II beltpack will operate for approximately 18 hours using a rechargeable Li-Ion battery. Real operational times depend on usage and quality of batteries used. You can also use AA batteries, but you must not attempt to recharge them.

On the bottom of the beltpack, there is an LED torch with a latching key that provides a quick and convenient source of illumination when working in poorly lit areas.

4.2 Beltpack user controls

4.2.1 Top controls

Figure 4-4 View of top of beltpack

Key to beltpack top controls	
Feature	Description
	Talk key A and B. Press to talk or listen on channel A and channel B.
	Talk key C. Press to talk or listen on channel C. In menu mode, press to cancel menu.
	Talk key D. Press to talk or listen on channel D. In menu mode, press to select menu.
	Display. When the beltpack is not in menu mode, information about each of the four channels supported by the beltpack is displayed on

Key to beltpack top controls	
Feature	Description
	screen. Exactly what is present on the screen depends on the display mode (intercom or partyline).

Table 4-2 Key to beltpack top controls

4.2.2 Beltpack display

The following table lists the beltpack display icons and indicators.

Beltpack display icons and indicators		
Name	**Icon**	**Description**
Key label		A descriptive name for the channel. The maximum length is 10 characters.
Role name		A descriptive name for the beltpack role.
Channel listen volume level		The volume of the channel audio.
Signal strength		Bars that indicate the strength of the signal from the Main Station.
Battery level		Indicates the battery time remaining.

Table 4-3 Beltpack display icons and indicators

4.2.3 Beltpack headset tones/alerts

Note: To change call signal, low battery or out-of-range alerts go to **Menu** (press and hold) **-> Settings -> Alarm options** on your beltpack. Choose from **Vibrate & audio**/**Vibrate only**/**Audio only**/**Off**.

Beltpack headset tones/alerts	
Event	**Tone**
Call signal	Mid to high beep, as long as call is active Mid on 200ms, mid off 0ms, high on 200ms, high off 400ms. Repeat if key held.

Low battery	High beep, long then short. High, on 400ms, off 100ms, on 100ms. Repeats intermittently.
Out-of-range	High beep, long then short (as above). Repeats as long as beltpack is out of range.
Menu button	Mid beep. Mid, on 100ms, off 100ms. Triggers on entering menu mode.
Power button	Mid beep. Mid, on 100ms, off 100ms, repeated while power button pressed.
Listen again	Low beep. Low, on 100ms, off 100ms.

Figure 4-5 Beltpack headset tones/alerts

4.2.4 Front controls

Figure 4-6 Beltpack front controls

Key to beltpack front controls	
Feature	Description
	Right rotary level control. Turn clockwise or counter-clockwise to adjust volume. In menu mode, turn clockwise or counter-clockwise to navigate the menus.
	Power button. Press to power up or power down the beltpack.
	Reply key. Reply key can be configured as an extra fifth channel using the Configuration Editor or EHX software.
	Menu key. Press firmly for about two seconds to enter menu mode To exit menu mode, press the menu key again. If you tap the Menu

Key to beltpack front controls	
Feature	Description
	key, the Listen Again feature is activated. See **5.9 Setting the listen again option.**
●	**Left rotary level control**. Turn clockwise or counter-clockwise to adjust volume. In menu mode, turn clockwise or counter-clockwise to navigate the menus.

Table 4-4 Key to beltpack front controls

4.2.5 Beltpack bottom connectors

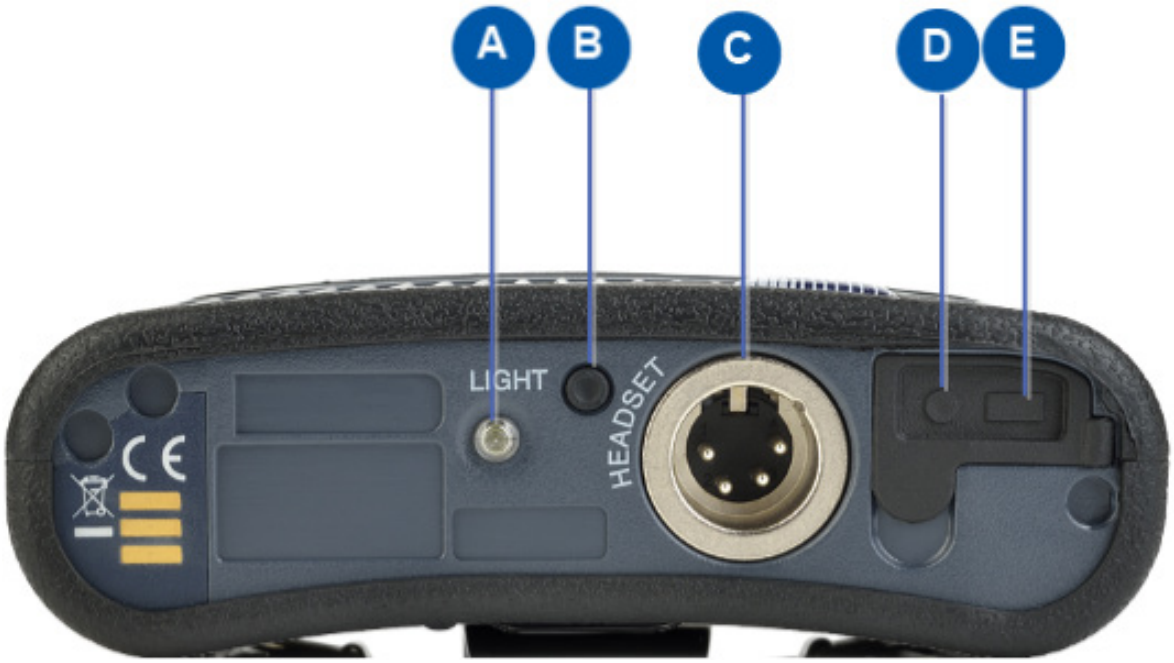


Figure 4-7 Beltpack bottom connectors

Key to beltpack bottom connectors	
Feature	Description
●	**LED torch**

<table>
<tr><th colspan="2">Key to beltpack bottom connectors</th></tr>
<tr><td>Feature</td><td>Description</td></tr>
<tr><td></td><td>LED torch control</td></tr>
<tr><td></td><td>Headset socket (4-pin XLR–M)

<table><tr><th>Pin</th><th>Function</th></tr><tr><td>1</td><td>Mic ground</td></tr><tr><td>2</td><td>Mic +</td></tr><tr><td>3</td><td>Earphone ground</td></tr><tr><td>4</td><td>Earphone</td></tr></table>Table 4-5: Headset socket pin out
Headset socket (7-pin XLR–M)

<table><tr><th>Pin</th><th>Function</th></tr><tr><td>1</td><td>Mic ground</td></tr><tr><td>2</td><td>Mic +</td></tr><tr><td>3</td><td>Ground</td></tr><tr><td>4</td><td>Left Headphone Output</td></tr><tr><td>5</td><td>Right Headphone Output</td></tr><tr><td>6</td><td>PTT1</td></tr><tr><td>7</td><td>PTT2/Headset detect</td></tr></table>Table 4-6: Headset socket pin out</td></tr>
<tr><td></td><td>3.5 mm stereo jack.</td></tr>
<tr><td></td><td>Micro USB connector.</td></tr>
</table>

Table 4-7 Key to beltpack bottom connectors

4.2.6 Beltpack rear panel

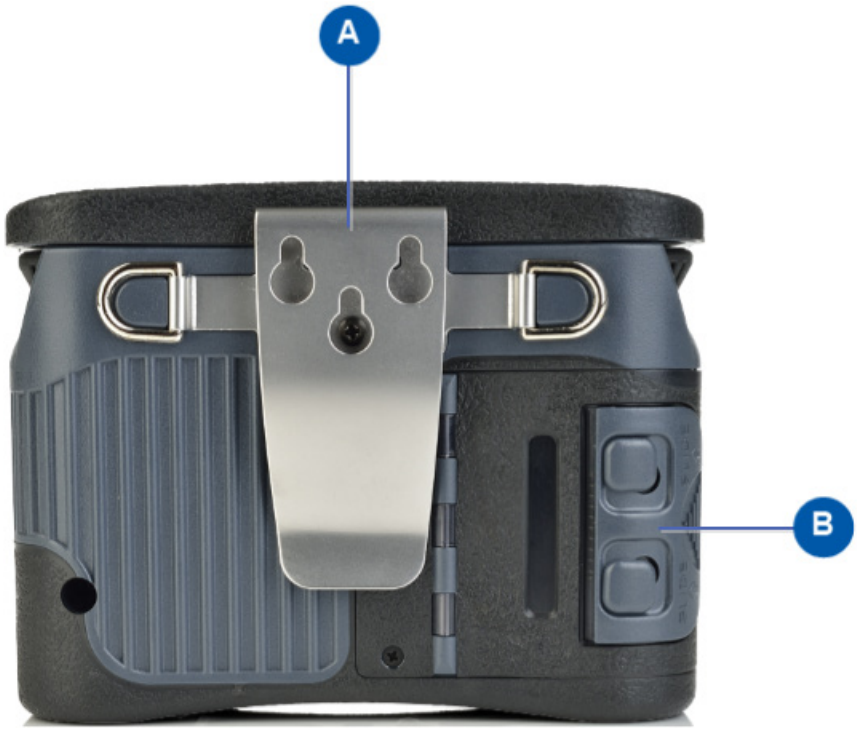


Figure 4-8 Beltpack rear panel

Key to beltpack rear panel	
Feature	Description
	Beltpack clip
	Beltpack battery compartment

Table 4-8 Key to beltpack rear panel

4.3 Using the beltpack

4.3.1 Registering the beltpack

Before you can use a beltpack, you must first register it with the FreeSpeak II system. For more information, see the *Eclipse HX Software Configuration User Guide, 5.59 FreeSpeak II Beltpacks.*

4.3.2 Charging the beltpack

The beltpack batteries are located inside the beltpack battery compartment. The beltpack can use a Clear-Com rechargeable Li-Ion battery or AA batteries. A dedicated battery charger can charge up to five batteries simultaneously.

You can also recharge batteries by using the supplied USB charger. Do not use any other USB charger.

To recharge the beltpack battery:

1) Insert either the beltpack containing the battery, or the battery itself into one of the recharging bays on the battery charger. A red LED indicates that the battery is recharging.

   If you are recharging the battery while it is still in the beltpack battery compartment, an illuminated beltpack key (Talk key A) indicates the charging status. The beltpack charging sequence depends on whether you insert a powered on unpowered beltpack into the charger. The table below shows the charging status conditions.

Talk key A red	Talk key A green	RF component	Beltpack screen
Battery charging	Battery fully recharged	Disabled	Displays current percentage charge and software version

   Note: If a beltpack is powered on when placed in the charger, on removal the RF component is re-enabled and the beltpack attempts to reconnect to its previous connection.

   Note: If a beltpack is powered off when placed in the charger, on removal it will power off.

2) Wait until the recharging LED turns from red to green. The battery is now fully recharged.

Figure 4-9 FreeSpeak II battery charger

4.3.3 How to set AA battery type: Nickel-metal hydride (NiMHi) or Alkaline for wireless beltpacks

FreeSpeak II wireless beltpacks are supplied with Li-ion batteries and battery charger. However, in some cases you may wish to use AA batteries. You may need to use standard, AA Alkaline batteries, or, in a high atmospheric pressure (hyperbaric) environment you can't use Li-ion batteries and need to use NiMHi batteries.

When using AA batteries of either kind, it is helpful to set battery type so that battery capacity can be monitored accurately. NiMHi batteries and alkaline batteries have different discharge patterns and setting this option will allow for that.

AA Battery type must be set in the EHX software.

3) Open the EHX configuration software and navigate to **Preferences/Wireless Beltpacks/Battery type**.

4) Select required battery type, NiMHi or Alkaline.

Note: the default setting for AA battery type is **Alkaline**

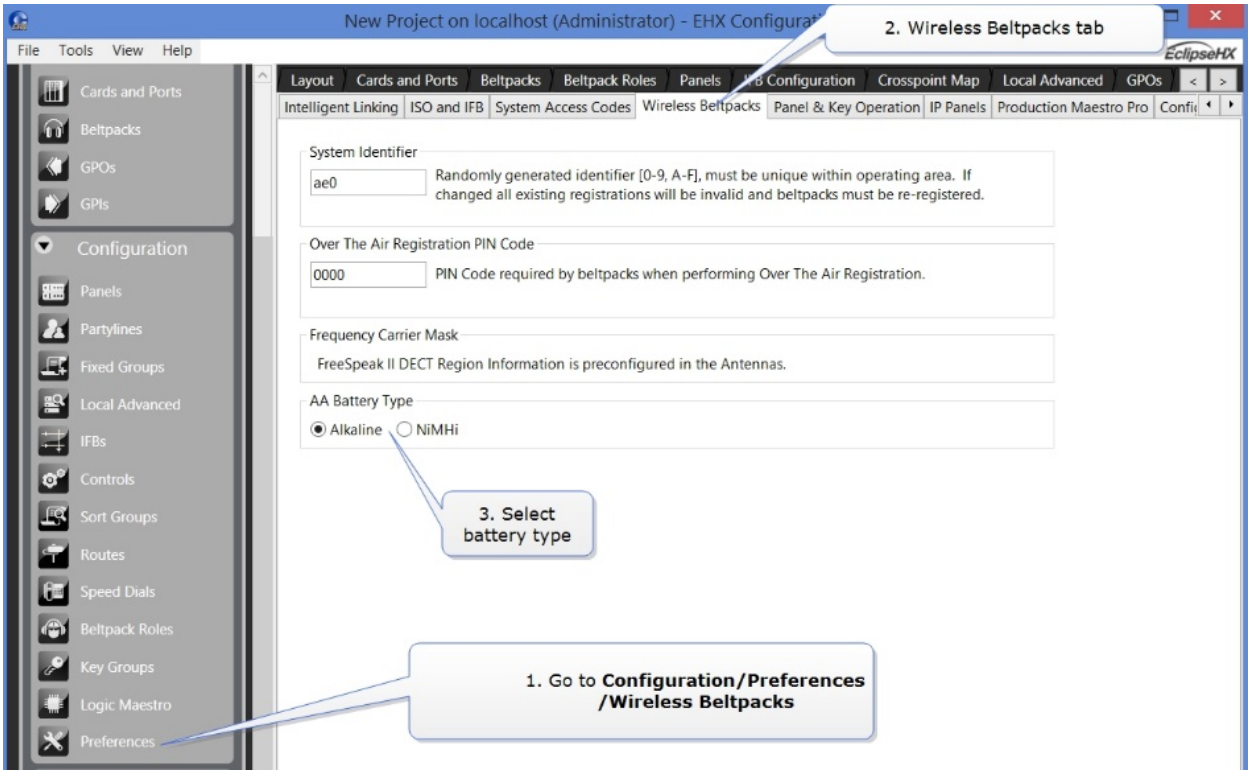


Figure 5-10 Set Battery type

4.3.4 Powering on the beltpack

The recessed power button is used to turn the FS II beltpack on and off. Press and hold the button for about three seconds to turn the beltpack on. To turn it off, press and hold the button for about three seconds.

4.3.5 Using the beltpack to communicate

The beltpack has four keys labelled A, B, C, D and Reply. You can program each of these keys to determine their communication destinations, and the type of communication possible. For example, a key could be programmed to call a partyline channel, with both talk and listen enabled. You can program the beltpack keys by using:

- The Eclipse HX software. For more information, see the **Eclipse HX Configuration Software User Guide**.

To **talk** to all the devices connected to the channel:

5) Connect a headset, using the 4-pin XLR–M connector on the base / rear of the beltpack.

6) Press the appropriate key.

   While the key is held down audio transmits on that channel. When the key is released audio no longer transmits. To latch a key on for hands-free use, quickly tap the key. Another quick tap releases the latch.

7) Speak into the headset microphone.

   To adjust the volume of incoming audio for a channel, turn the appropriate side-mounted **rotary control.** Turn the rotary control clockwise to increase the volume, and counter-clockwise to decrease volume. The current volume level for the channel is shown on screen.

4.3.6 Entering and exiting Menu mode

Use **Menu mode** to:

- Configure the settings for the beltpack.
- Read beltpack information such as software version
- Perform a site survey to maximize signal strength and coverage.

To enter Menu mode, press and hold the **Menu key** for three seconds. To exit Menu mode, press the **Menu** key again.

For more information about using Menu mode on the beltpack, see 5.1 Introduction to programming on the beltpack.

.

4.3.7 Setting and Adjusting Listen Levels

You can adjust a beltpack's incoming audio volume in two ways:

- The master volume level for the beltpack can be set by using the beltpack menu options. See **5.2 Configuring the beltpack volume settings**.
- The incoming audio level can be adjusted during talk or listen on the beltpack using the beltpack's rotary level controls.

To adjust the listen level during talk or listen from the beltpack:

- During talk and listen, use the rotary level control to increase or decrease the incoming volume level ("listen level") for that assignment.

Note: You can also configure the incoming audio volume using the EHX software.

4.3.8 Upgrading beltpack firmware

You can upgrade the FreeSpeak II beltpack firmware by:

- Using a USB connection
- Using an Over The Air upgrade.

4.3.8.1 Upgrading by USB connection

1) Connect the beltpack to a USB port on the computer running the EHX software.

2) Select **Tools > Apply Wireless Firmware Via USB**.

3) Browse to the location of the upgrade file, and then select **Update Firmware**.

   The upgrade file is downloaded to the beltpack or antenna.

Note: You can connect more than one beltpack to the computer if you have multiple USB ports. The units will be upgraded sequentially.

4.3.8.2 Upgrading beltpack firmware by Over The Air Upgrade

1) Right-click on the Frame in the Layout window, and then select **Firmware > Update Firmware**. The Update Firmware Wizard appears.

2) Select **Next**. The following screen appears:

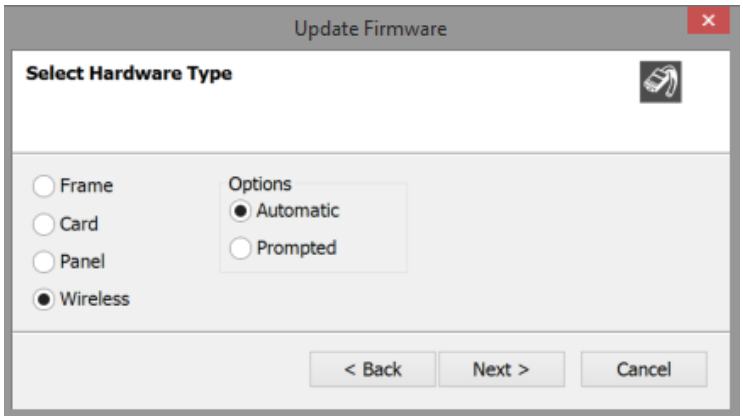


Figure 4-11 The Update Firmware screen

3) Select the **Wireless** radio button. There are two further options:

   - Automatic – select this option to automatically upgrade the beltpack when it is switched on.

- Prompted – select this option to allow the beltpack user to confirm the upgrade.

4) Select **Next**, and then browse to the upgrade file (**.fww**) and select **Open**. The upgrade file is loaded to the antenna. The upgrade file is downloaded to all the connected beltpacks, and the beltpacks automatically restart.

Note: The antennas store the beltpack upgrade files until they are power cycled or there is a black reset.

Note: You can track the status of the download in the EHX Event Log, and for beltpack upgrades the upgrade status is also shown on the beltpack display.

5 Programming on the beltpack

This chapter explains how to program the beltpack using the beltpack's menu system. It contains the following sections:

5.1 Introduction to programming on the beltpack

You can access the beltpack menu by pressing and holding the **menu** key. The Master Menu screen is displayed. This consists of the following submenus:

- Volume Level Control
- Volume Operation
- Line In Volume Level
- Settings
- Information
- Display Mode
- System Connect
- Site Survey

Note: The menus that appear depend on the menu access level. See **5.8.2 Setting** full menu access.

To select a submenu turn either of the two rotary dials clockwise. This will scroll down the submenu options. If you turn the rotary dials counter-clockwise, you will scroll upwards.

To select a submenu, press the **Menu Select** key (D).

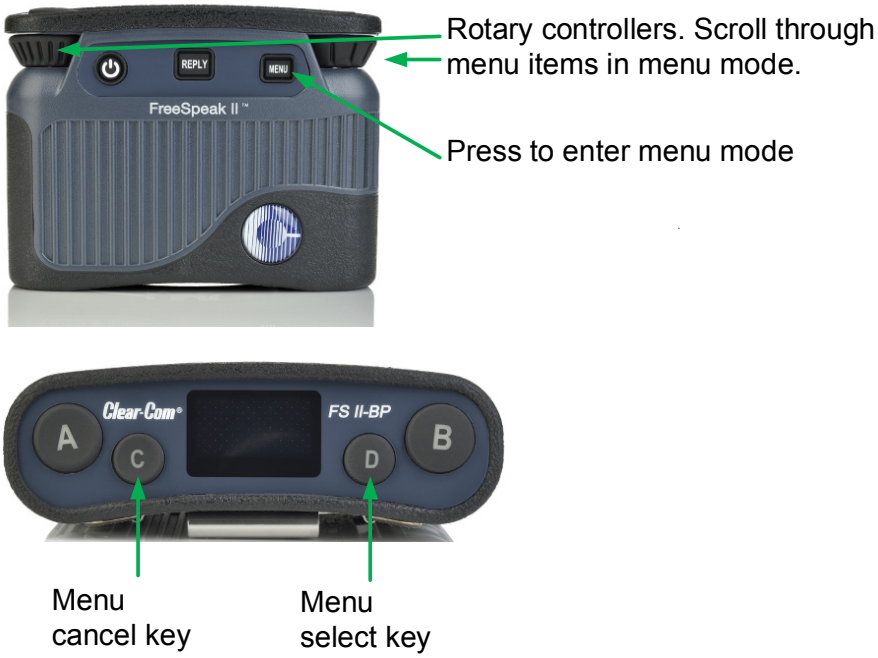
To return to the previous screen, press the **Menu Cancel** key (C). You can also return to the previous screen by pressing the **Menu** key.

Each menu screen on the beltpack has the following structure:

- Header - this displays the menu title
- Body - this displays a scrollable list of menu items
- Footer - this displays the current value of the current menu selection

To exit the beltpack menus, press the **Menu** key.

Beltpack menu controls



5.2 Configuring the beltpack volume settings

You can configure the following:

- The volume on each of the four channels
- The beltpack master volume
- The volume of the line-in feed.

5.2.1 Configuring the beltpack channel volumes and master volume

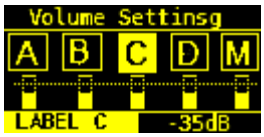
Each of the four beltpack channel volume levels is configurable separately.

Note: You can only change volume levels on keys that have been configured.

To configure a channel volume:

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Turn either rotary control clockwise to highlight **Vol Level Ctrl**, and press the **Menu Select** key (D). The Volume Level Control screen appears:



3) Use the left-hand rotary control to select the required channel, or select M for the master volume

4) Use the right-hand rotary control to adjust the volume level. The default is 0dB for channel audio, and -9.6dB for master volume.

   Note: The volume level appears in the footer.

5) To confirm the selection, press the **Menu Select** key (D).

5.2.2 Configuring the volume level of the line input

You can configure the volume of an audio line input:

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Turn either rotary control clockwise to highlight **Line In Vol Lvl**, and press the **Menu Select** key (D).

3) Use either rotary control to select between -15 dB to 6dB

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.2.3 Configuring the rotary controls

You can configure the rotary controls on the beltpack to either:

- Control the volume of the audio on keys A and B

- Control the master volume of the beltpack audio.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Turn either rotary control clockwise to highlight **Vol Operation**, and press the **Menu Select** key (D).

3) Use either rotary control to select between:
    - Talk Key
    - Master

4) To confirm the selection and exit the menu screen, press the **Menu Select** key.

5.3 Configuring the beltpack headset

You can configure the following headset settings:

- Headset autodetect
- Headset sidetone level
- Headset limiter

The menus that appear depend on the menu access level. See **5.8.2 Setting** full menu access.

5.3.1 Setting headset autodetect

Use this setting to allow the beltpack to automatically detect when you plug in a headset, and route the audio to the headset.

Note: To use this feature, first set **Mic Type** to **Auto**. See **5.4.1 Setting the microphone type**.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Headset Options > Auto Detect**.

3) Use either rotary control to select between:
    - On
    - Off

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.3.2 Setting the sidetone level

Use this setting to set the level of the sidetone. You can either set the sidetone to a fixed level, or choose to have the sidetone track the master volume level. To set sidetone to a fixed level:

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Headset Options > Sidetone > Sidetone Level**.

3) Use either rotary control to select the sidetone level between -70dB and 0dB.

4) To confirm the selection and exit the menu screen, press the **Menu Select** key.

5.3.3 Setting the headset limiter

Use this setting to limit the incoming headset audio level to prevent excessive sound levels.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Headset Options > Limiter**.

3) Use either rotary key to select the limiter level between -12 and 8dB. The default is 0dB.

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.4 Configuring the beltpack microphone

You can configure the following microphone settings:

- Microphone type
- Microphone echo cancellation

The menus that appear depend on the menu access level. See **5.8.2 Setting** full menu access.

5.4.1 Setting the microphone type

Use this setting to specify the type of microphone you are using. You can also allow the beltpack to automatically detect what kind of microphone is present.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Mic Options > Mic Type**.

3) Use either rotary control to select between:
   - Automatic (default)
   - Electret
   - Dynamic Unbalanced

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

Note: If automatic headset detection is ON:
- Dynamic headset is detected if microphone impedance is between 90 – 320 Ohms
- Electret headset is detected if microphone impedance is between 1.3 – 6.5 kOhms.

5.4.2 Setting the microphone echo cancellation

Use this setting to improve the microphone audio quality.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Mic Options > Echo Cancellation**.

3) Use either rotary control to select between:
   - On
   - Off (default)

4) To confirm the selection and exit the menu screen, press the **Menu Select** key.

5.5 Configuring the beltpack display and LEDs

You can configure the following display options:

- Display brightness level
- Display dim timeout
- Display off timeout

5.5.1 Setting the display and LED brightness

Use this setting to control the brightness of the display. The beltpack automatically dims after a timeout period if no key is used or there is no incoming call or call alert. You can adjust the timeout period.

When the beltpack is dimmed, the display goes off after a timeout period if no key is used or there is no incoming call or call alert. You can adjust the timeout period.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Display Options > Brightness Level**

3) Use either rotary control to select the dim level between 1 and 5 (default).

4) To confirm the selection and exit the menu screen, press the **Menu Select** key.

5.5.2 Setting the display dim timeout

Use this setting to determine when the beltpack display will dim if no key is used or there is no incoming call or call alert.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Display Options > Dim Timeout**

3) Use either rotary control to select the dim level between Off and 120 seconds (default).

   Note: Setting the dim timeout to Off disables the timeout function.

4) To confirm the selection and exit the menu screen, press the **Menu Select** key.

5.5.3 Setting the display off timeout

Use this setting to determine when a dimmed beltpack display will switch off.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Display Options > Off Timeout**

3) Use either rotary control to select the dim level between Off and 120 seconds (35 second default).

   Note: Setting the display off timeout to Off disables the timeout function.

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.6 Configuring the beltpack alarm options

You can configure the following alarm options:

- Low battery alarm
- Low battery alarm threshold
- Out of range alarm
- Call alert mode

Note: See **4.2.3 Beltpack headset tones/alerts** for a description of tones and alerts.

5.6.1 Setting the low battery alarm

Use this setting to determine how the beltpack behaves when battery power is low. You can set the following types of alarm:

- Audio warning
- Vibrate
- Audio warning and vibrate
- Off

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Alarm Options > Alarm Mode.**

3) Use either rotary control to select between:

- Vibrate & Audio (default)
- Vibrate Only
- Audio Only
- Off

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.6.2 Setting the low battery alarm threshold

Use this setting to determine the battery power level that triggers the low battery alarm.

1) To enter the beltpack menu, press and hold the **Menu** key (D).

2) Use the rotary and **Menu Select** keys to select **Settings > Alarm Options > Low Battery Threshold.**

3) Use either rotary control to select a value between 0 and 100%.

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.6.3 Setting the out of range alarm

Use this setting to determine what kind of alarm the beltpack issues when it moves out or range of an antenna. You can set the following alarms:

- Audio on
- Off

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Alarm Options > Out of Range Alarm.**

3) Use either rotary control to select between:
    - Audio only
    - Off

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.6.4 Setting the call alert

Use this setting to determine what kind of alert the beltpack issues when it receives an incoming call. You can set the following alerts:

- Audio warning
- Vibrate
- Audio warning and vibrate
- Off

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Alarm Options > Call Alert Mode.**

3) Use either rotary control to select between:
    - Vibrate & Audio (default)
    - Vibrate Only
    - Audio Only
    - Off

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.7 Selecting the beltpack role default set

Use this setting to set the beltpack configuration to the default settings defined in the EHX configuration map for that role.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Role Default Set.**

3) Use either rotary control to select between:
    - On (default)
    - Off

4) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.8 Selecting the beltpack administration

You can select the following administration settings:

- System pairing mode
- Full menu access
- System sync mode

5.8.1 Enabling OTA registration mode

Use this setting to enable or disable system pairing mode. Enable this mode if you want to register a beltpack over the air.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Admin Options.** You will be prompted to enter a four digit code. The default code is 4632.

3) Select **Enable Pair Mode.**

4) Use either rotary control to select between:
    - Disable
    - Enable

5) To confirm the selection and exit the menu screen, press the **Menu Select** key (D).

5.8.2 Setting full menu access

Use this setting to override the menu access for the beltpack role. The following menu access levels apply:

- None
- Basic
- Normal
- Advanced

If this setting is not enabled, the menu access is set in the EHX software to one of the above four levels. When it is enabled, the beltpack has full menu access.

Note: If you change this setting, it will apply until the beltpack role changes, or the beltpack is power cycled.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Admin Options.** You will be prompted to enter a four digit code. The default code is 4632.

3) Select **Full Menu Access.**

4) Use either rotary control to select between:
   - Disable (default)
   - Enable

5.8.3 Setting system sync mode (not currently available)

Use this setting to make antenna synchronization readings.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Admin Options.** You will be prompted to enter a four digit code. The default code is 4632.

3) Select **System Sync.**

4) Use either rotary control to select the antenna group to synchronize.

5.9 Setting the listen again option

Use this setting to configure an option to allow you to play back an incoming message. When Listen Again is active, if you tap the Menu key on the beltpack, the last received message is played back. You can select the length of the recorded message, and also how long the message is stored on the beltpack before automatic deletion. To play back a recorded message, press the **Menu** button.

To select the length of the recording:

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Listen Again Opt > Recording Time.**

3) Use either rotary control to select a value between Off and 15 seconds.

To determine how long the message is stored:

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Settings > Listen Again Opt > Auto Delete Time.**

3) Use either rotary control to select a value between Off and 240 minutes.

5.10 Control audio on keys C & D (beltpack)(advanced menu option only)

Pressing the **menu** button on your beltpack can trigger Listen Again, as described in 8.9. However, a quick tap on the **menu** button can also be configured to allow volume on keys C & D to be adjusted by the rotary controllers.

The default setting for this option is **Listen Again**.

How to control volume on keys C & D using **menu** keytap:

4) Press and hold the **menu** button to enter menu mode.

5) Navigate to **Settings/Menu key oper** using the rotary controllers

6) Press key **D** to select menu key operation option

7) Scroll down to **Switch to Vol Ctrl** using rotary controllers

8) Press key D to select option.

You can now control audio volume on keys C & D using the rotary controllers (the same as you do on keys A & B) by giving the **menu** key on the beltpack a quick tap, instead of using this action to trigger Listen Again. This **menu** key behavior option can also be set in the EHX software.

Note: This mode has a 5 second inactive time-out, after which time the rotary controllers will revert to controlling volume on keys A & B. To re-activate this mode in order to adjust C & D, use another quick tap of the menu key. To switch quickly between A & B and C & D, tap the menu key to toggle.

5.11 Accessing beltpack information

You can access a list of beltpack information, including battery and fault-finding information.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Information**.

You can read the following information:

Item	Value
Beltpack role	Role name
SW (software)	Version number
Beltpack. ID (beltpack identity)	ID number
RFP (Remote Fixed Part – antenna/receiver)	ID number
Regional (DECT frequency area)	DECT region. For example, US_DECT.
Battery Level	Percentage charge, hours of use

Table 5-1 Beltpack information

5.12 Setting display mode

You can select between two display modes: Intercom mode and Partyline mode.

Note: You can only access this option if you have advanced menu access.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Display Mode.**

3) Use either rotary control to select between:
   - Intercom mode
   - Partyline mode

5.13 Setting system connect

Use this option to connect to an antenna.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **System Connect.**
   A list of available systems appears on the beltpack screen.

3) Use the rotary control to select a system.

5.14 Enabling over the air (OTA) registration mode from a beltpack

In some circumstances you may need to enable registration of beltpacks without having access to a matrix or computer. In this case it can be done from a beltpack.

The beltpack needs to be previously registered and connected. You need the Menu Access code, available from Eclipse EHX. (The default code is 4632). To view or change the Menu Access code select **Configuration > Preferences**. The following screen appears:

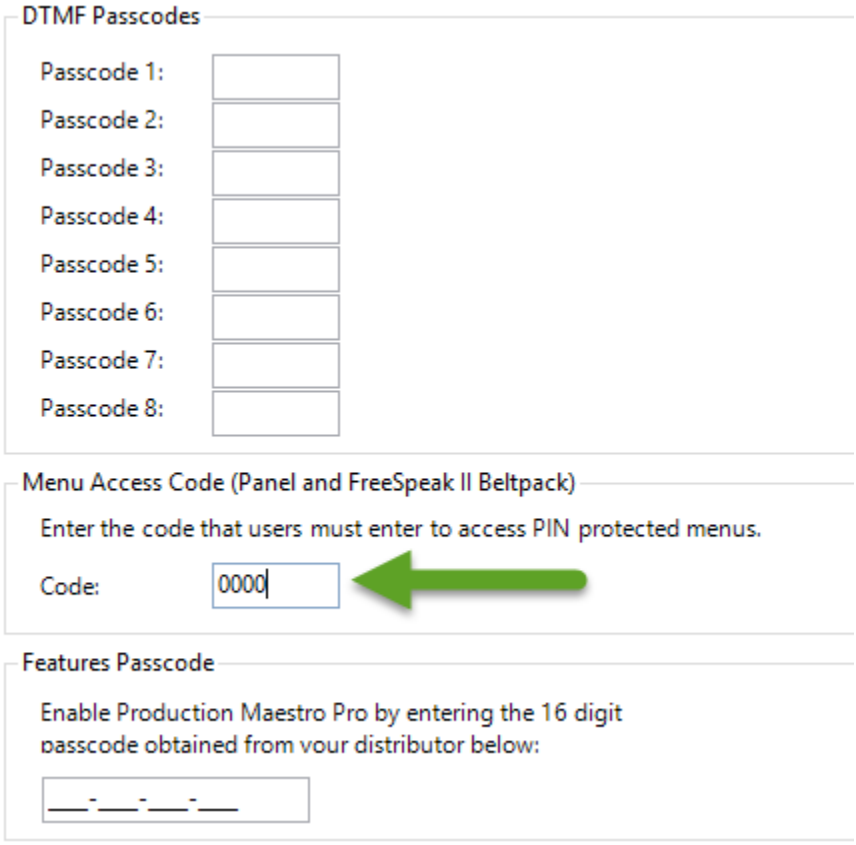


Figure 5-1 EHX Preferences screen

1) From the registered, connected beltpack press and hold the MENU button for 2 seconds to enter the menu options.

2) Go to **Settings > Admin Options**.

3) Enter the Menu Access code using the left and right hand rotary controllers on the beltpack.

4) If the Menu Access code is successful, the beltpack will display the 'Enable Pair Mode' screen.

5) Press the D key on the beltpack to select this option.

6) A confirmation screen will appear. Select Y to confirm.

   The system will now be open for registration for 2 minutes.

7) From the beltpack to be registered, follow the registration procedure. See **3.6 Registering beltpacks**.

5.15 Performing a site survey

Note: You can only access this option if you have advanced menu access.

You can survey an intercom installation to determine how may FreeSpeak II antennas are present. You can do this in two ways:

- Connecting to a system and detecting all FreeSpeak II antennas connected to that system
- Performing a survey with no system connection. All FreeSpeak II antennas are detected regardless of which system they are connected to.

1) To enter the beltpack menu, press and hold the **Menu** key.

2) Use the rotary and **Menu Select** keys to select **Site Survey.**

6 Operating the transceiver/antenna

This chapter describes how to use the FreeSpeak II transceiver/antenna. It contains the following sections:

- *Transceiver/antenna*
- *Transceiver/antenna splitter (PD2203)*

6.1 Transceiver/antenna

The FS II transceiver/antennas form the transmission link between the FS II beltpacks and the matrix. It has internal omnidirectional (all directions/circular coverage) antennas. Multiple units are used to support the beltpacks and to create larger, customized coverage areas. Each transceiver/antenna is connected to the E-Que card on the matrix, either directly or via a PD2203 splitter.

The unit has two methods of fixing:

- Three screw points for mounting on a flat surface.
- Two microphone stand connectors, 3/8 in and 5/8 in.

Figure 6-1 FS II Transceiver/Antenna

6.1.1 IP rating (International Protection Marking)

The transceiver/antenna has an IP rating of 65 so it can be mounted outside and will be resistant to weather conditions.

6.1.2 FS II transceiver/antenna connector panel

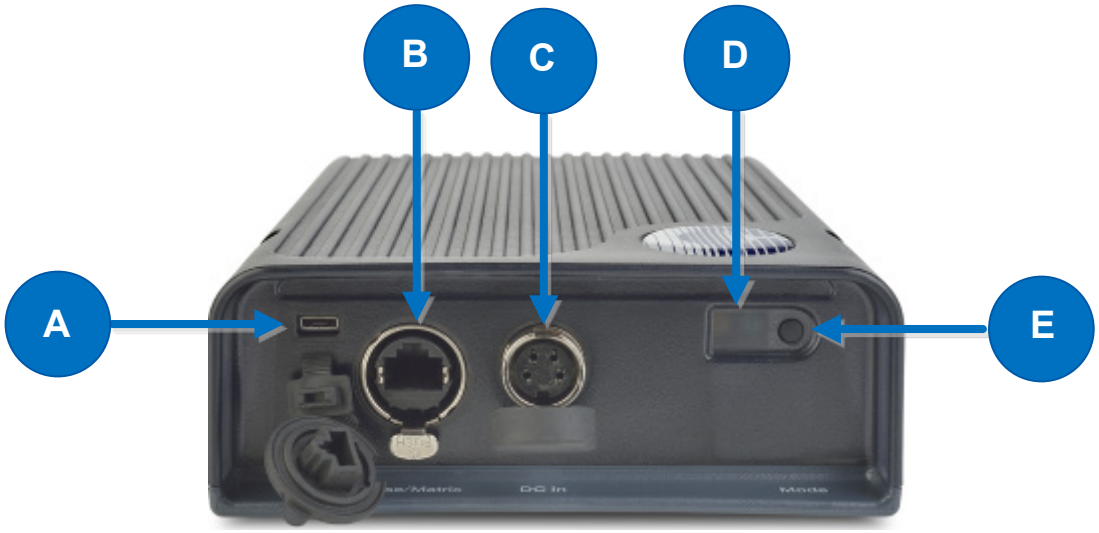


Figure 6-2 FS II Transceiver/Antenna Connector Panel

Key to transceiver/antennas	
Feature	Description
	USB connector. Used to upgrade the firmware in the FS II-TA.
	Matrix connector. This RJ-45/etherCON connector is used to connect the bi-directional signal from the matrix, directly or via the splitter. Up to 1,000 metres (3,200 feet) of 4-pair 24AWG shielded Ethernet cable (CAT5/5e/6) can be used for this connection between matrix and transceiver/antenna. If 26AWG cable is used the maximum distance is 500 metres (1,600 feet).
	DC in power connector. This connector is used to locally power the transceiver/antenna with the supplied universal power supply. Use of local power is required when the transceiver/antenna is located more than 300 metres (925 feet) from the matrix or the splitter, and is recommended even when the transceiver/antenna is closer whenever it is available and convenient.
	Data signal/Power LEDs. This amber LED indicates that a connection has been established between the matrix and the transceiver/antenna, and that it is actively creating a coverage zone within which the beltpacks can operate.

Key to transceiver/antennas	
Feature	Description
	A flashing amber LED indicates that a data connection has been established with the matrix. A solid amber light shows that there is a DECT synchronization lock between the devices. A solid light is required for normal operation of the system.
	Power LED. This LED indicates that the transceiver/antenna is receiving power, either from its local power supply or from the connected CAT-5 cable (distances up to 300 metres, or 925 feet, from the matrix or the splitter) being powered via the FS II Matrix. This light is green for FSII 1.9 GHz devices and blue for FSII 2.4 GHz devices.
E	**Mode button.** The mode button is currently not in use.

6.1.3 Cabling the antennas

The antennas can be cabled in two modes:

- Antenna mode – connect directly to antenna (up to 8 antennas per E-Que card)
- Splitter mode – connect to antenna via splitter (up to 2 splitters; 10 antennas per card).

Note: A matrix system can support up to 4 E-Que-HX cards. This makes the maximum number of antennas per system up to 40.

To select an antenna connection mode, you will need to set the card type in the EHX software, in Cards and Ports, before connecting the devices.

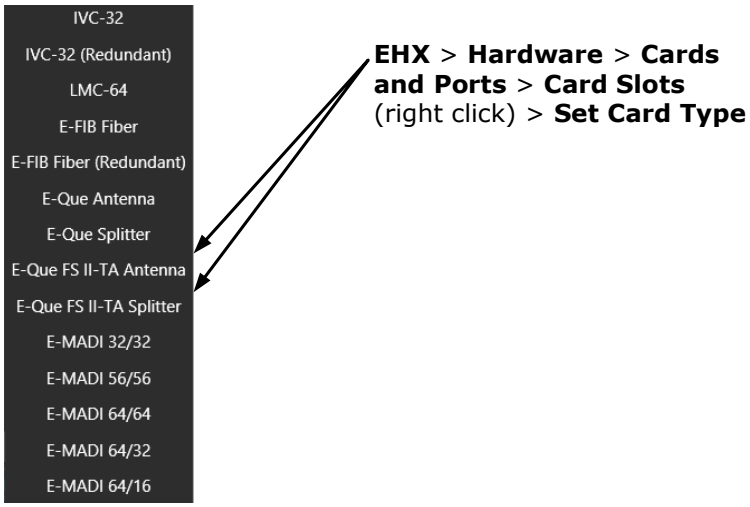
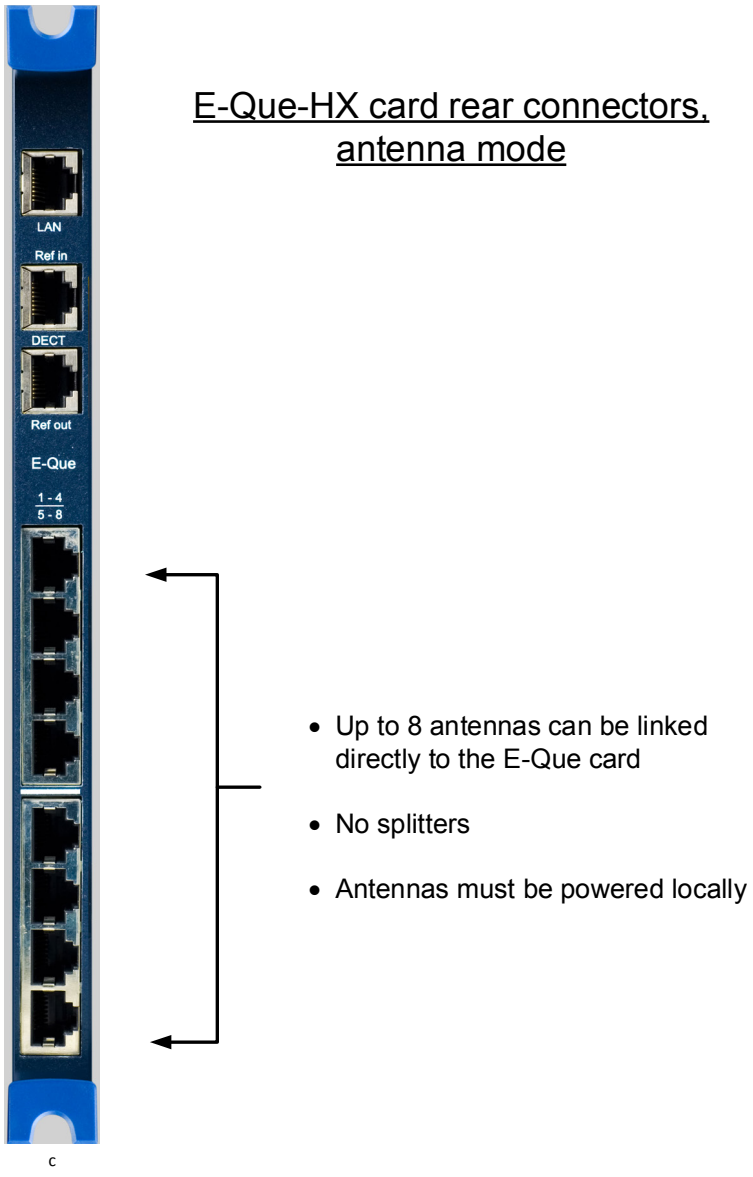


Figure 6-3 Set card type in EHX software

6.1.3.1 Antenna Mode



c

Figure 6-4 E-Que-HX rear connectors, antenna mode

6.1.3.2 Splitter mode

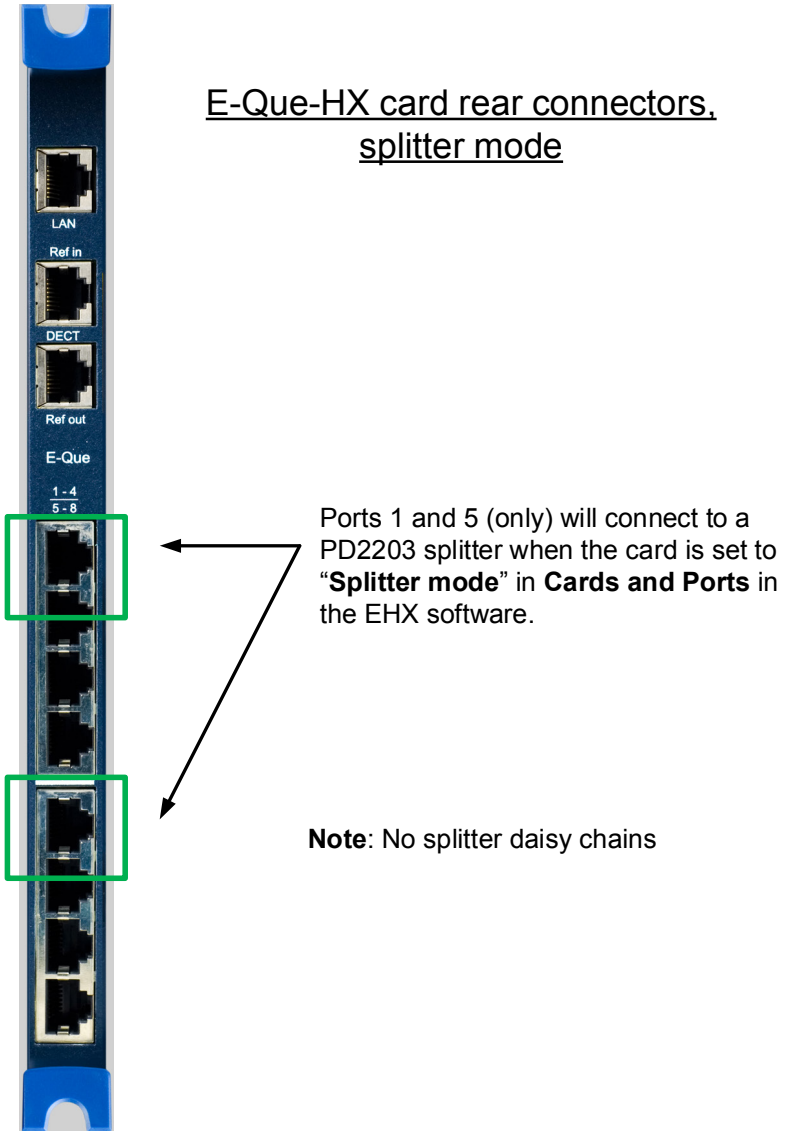


Figure 6-5 E-Que-HX rear connectors, splitter mode

6.1.3.3 Connect matrix to splitter or antennas

Once you have set the card type in EHX, run standard Ethernet cable from the RJ45 connectors on the back of the E-Que card to the ports labeled "Matrix" on the splitter or antenna.

- Antenna: Port labeled Base/Matrix. See Figure 6-2.
- Splitter: Port labeled "Matrix". See Figure 6-8.

6.1.3.4 Connect splitters to antenna

Run standard Ethernet cable from one of the RJ45 connectors on the splitter to the RJ45 connector labelled Base/Matrix on the antenna.

6.1.3.5 Cable lengths, matrix to splitters and antennas

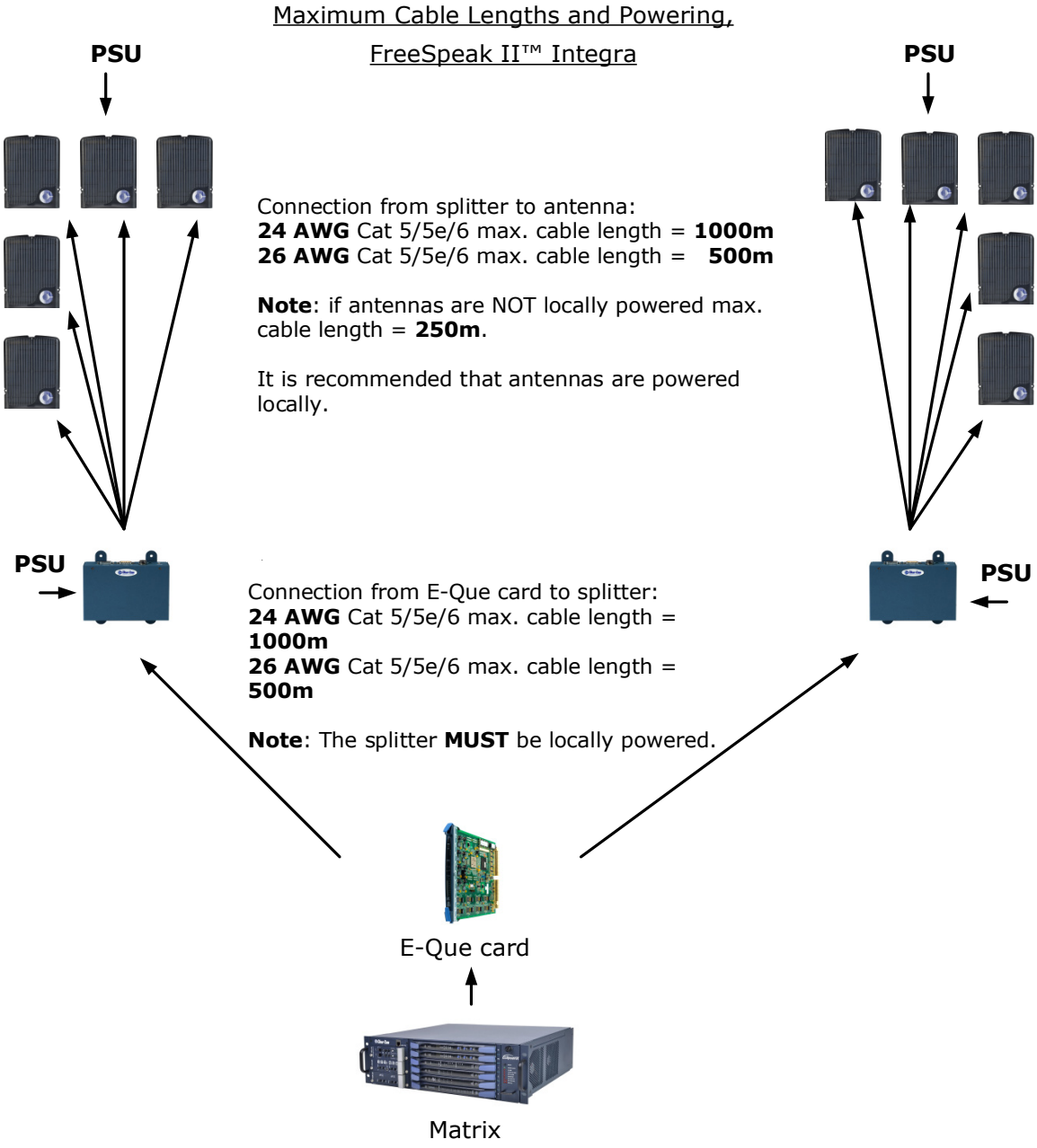


Figure 6-6 Cabling lengths and power supplies to FreeSpeak™ Integra

6.1.4 Beltpack support capacities for transceiver/antennas

FreeSpeak Integra (FS II used with a Matrix) will support up to a maximum 50 beltpacks per E-Que-HX card. As the Matrix can support up to 4 E-Que-HX cards, a maximum of 200 beltpacks can be used, according to conditions.

Each FSII 1.9 GHz transceiver/antenna can support five beltpacks within one coverage zone. Each FSII 2.4 GHz transceiver/antenna can support four beltpacks within one coverage zone. This reduction is due to system losses in the 2.4 GHz frequency range. With the omnidirectional antennas, the coverage pattern is circular, with a maximum range of up to 500 metres. An average range will be 50 – 150 metres from the antenna.

When designing the system, determine how many beltpack users will be in or passing through a given coverage zone. If it will be five or fewer users, then place one transceiver/antenna in the center of that area. If it is between 6 and 10 users, place two transceiver/antennas next to each other, both with a direct connection to the FS II Matrix or splitter. In larger systems – approaching 20 beltpacks – it is wiser to allow one transceiver/antenna for every 2 to 4 users to ensure smooth handoffs between transceiver/antennas. It is good practice to have each beltpack "seeing" two or more antennas, so a minimum of two antennas in any system is to be considered.

If an extra beltpack user goes into a coverage zone with only one transceiver/antenna, and that user is out of range from another transceiver/antenna, it will lose connection with the system. This is because the transceiver/antenna has a maximum capacity of up to five beltpacks at a time. If one of the existing users in that coverage area turns off a beltpack or leaves the area, then the extra beltpack will find an open slot and will be reconnected with the system.

The proprietary technology within FS II permits the beltpack user to go between coverage zones created by different transceiver/antennas connected to the Matrix, and for the system to hand over the communication between beltpack and Matrix from one transceiver/antenna to the next one. Thus, a larger, customizable communications area may be designed.

For more information on the coverage range of the FS II-TA, see ***3.5 Determining coverage areas***.

Note: For most working systems, Clear-Com recommends a ratio of 2-4 users per antenna due to system losses.

6.1.5 Coverage areas under various conditions

Just as with any other product communicating via radio waves, the effective distance between the beltpack and the transceiver/antenna (the range) will differ depending on the particular environment in which it is being used. Radio waves can be attenuated by walls, floors, ceilings, trees, shrubbery, the human body

(such as an audience), and numerous other objects. They can be reflected and/or stopped by metallic objects such as structural beams, safety doors, lighting equipment and truss, bodies of water, and so on.

Under ideal conditions, the maximum range between an FS II beltpack and a transceiver/antenna is 500 metres. Typical distances are between approximately 50 metres (about 160 feet) and 150 metres (about 485 feet), depending on the particular environment.

As the transceiver/antenna requirements for a particular installation are being determined, keep in mind both the number of beltpack users who will be working in a particular area (based on the four to five-beltpack capacity of each transceiver/antenna), and the layout and potential RF attenuating and reflecting items in the location. Be conservative in distance estimates to make sure that enough transceiver/antennas are included to provide the necessary coverage for the installation. Remember that additional transceiver/antennas may be added to a Matrix, up to a maximum of 10.

6.1.6 Transceiver/antenna setup rules and tips

Keep the following general rules and tips in mind:

- Keep antennas high (typically, though lower placements away from interfering objects can at times be beneficial) and line-of-sight.
- Keep them away from larger metallic objects and surfaces, and from lighting truss.
- Antenna coverage is circular so put the transceiver/antennas in the center of the area in which coverage is required.
- When overlapping the coverage zones of transceiver/antennas to create larger continuous coverage areas, test the in-between areas with a beltpack for potential areas of low RF signal; adjust the positioning of the antennas as needed.
- Because of potential body shielding during movement, it is useful to place two transceiver/antennas in different locations within larger working areas to minimize low-level signals and potential signal dropouts.
- Going between a larger area and a corridor via a door, especially a heavy or shielded one, or where the walls are thick, place a second antenna in the corridor near the doorway to assure continuous coverage.

6.1.7 Upgrading antenna firmware

You can upgrade the antenna firmware by:

- Using a USB connection
- Using E1.

6.1.7.1 Upgrading by USB connection

1) Connect the antenna to a USB port on the computer running the EHX software.

2) Select **Tools > Apply Wireless Firmware Via USB**.

3) Browse to the location of the upgrade file, and then select **Update Firmware**.

   The upgrade file is downloaded to the antenna.

Note: You can connect more than one antenna to the computer if you have multiple USB ports. The units will be upgraded sequentially.

6.1.7.2 Upgrading antenna firmware over E1

4) Right-click on the Frame in the Layout window, and then select **Firmware > Update Firmware**. The Update Firmware Wizard appears.

5) Select **Next**. The following screen appears:

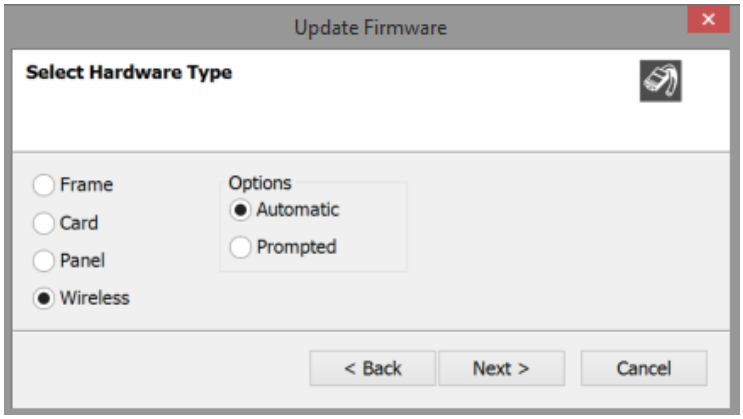


Figure 6-7 The Update Firmware screen

6) Select the **Wireless** radio button.

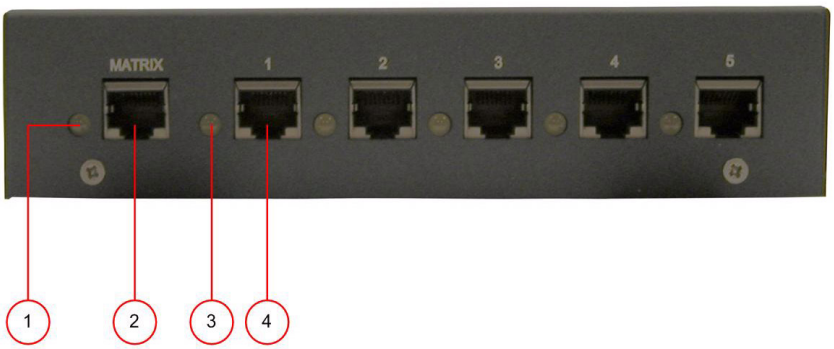
7) Select **Next**, and then browse to the upgrade file (**.fww**) and select **Open**. The upgrade file is loaded to the antenna, and the antenna restarts.

   Note: You can track the status of the download in the EHX Event Log.

6.2 Transceiver/antenna splitter (PD2203)

The PD2203 antenna splitter is the device that connects multiple transceiver/antennas to the matrix. It has an RJ-45 connector that carries the data between an E-Que-HX card transceiver port and the splitter, and five RJ-45 connectors to feed that information to and from up to five antennas. The splitter must be locally powered via the supplied external in-line universal power supply.

6.2.1 PD2203 Front connector panel



1 Base Connection Indicator Light
2 Matrix (Base Station) Connector
3 Splitter-to-Transceiver/Signal Indicator Lights (5)
4 Transceiver/Antenna Connectors (5)

Figure 6-8 FS II Splitter Front Connector Panel

6.2.1.1 Matrix connection indicator light

This yellow light indicates that the PD2203 splitter is receiving data from the matrix.

6.2.1.2 Matrix connector

This RJ-45 connector accepts a 4-pair data cable from the E-Que-HX card on the matrix. This cable can be up to 1,000 metres (3,200 feet) in length if 24AWG cable is used or up to 500 metres (1,600 feet) if 26AWG cable is used.

Note: It is recommended that shielded Ethernet cable (for instance, CAT-5/5e/6) is used.

6.2.1.3 Splitter-to-transceiver/antenna signal indicator light

These yellow lights indicate that a connection from the matrix is available to the particular transceiver connected to that port.

6.2.1.4 Transceiver/antenna connectors

These five RJ-45 connectors are used to connect up to five remote transceiver/antennas to the splitter, and via the splitter to the matrix. Each of these cables can be up to 1,000 metres (3,200 feet) in length if 24AWG cable is used or up to 500 metres (1,600 feet) long if 26AWG cable is used.

Note: It is recommended that shielded Ethernet cable (for instance, CAT-5/5e/6) is used.

6.2.2 PD2203 rear panel

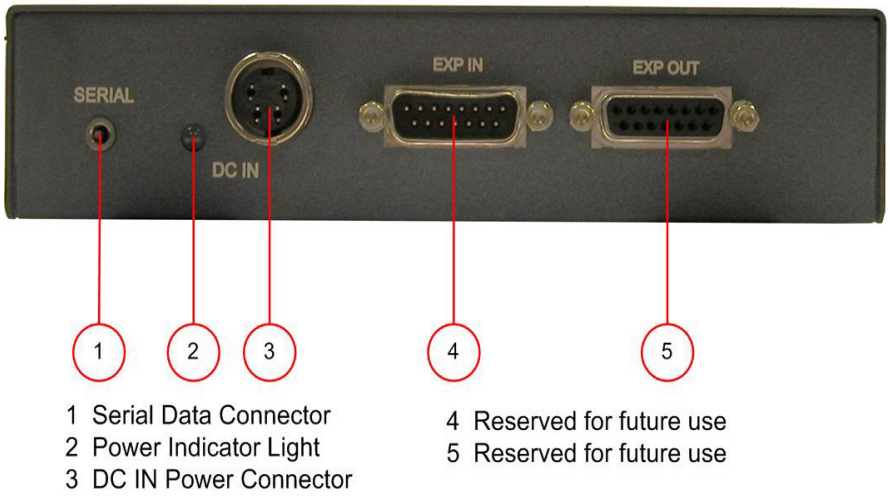


Figure 6-9 FS II Splitter Rear Connector Panel

6.2.2.1 Serial data connector

This 3.5 mm (1/8 inch) tip-ring-sleeve (TRS) connector is used for upgrading the firmware in the PD2203. It will typically be unused.

6.2.2.2 Power Indicator

This green LED indicates that the splitter is receiving power from the external power supply.

6.2.2.3 DC IN power connector

This connector is used to locally power the antenna splitter with the supplied universal power supply. Use of local power is required.

6.2.2.4 EXP IN connector

This male DB-15 connector is reserved for future use.

6.2.2.5 EXP OUT connector

This female DB-15 connector is reserved for future use.

6.2.3 Connecting an antenna splitter to the E-Que-HX card and to transceiver/antennas

After the connections have been made between the splitter and the transceiver/antennas, make sure that the data LED's are lit at the individual ports on the antenna splitter. Also make sure that the both the green power LED and the yellow data LED are lit on each transceiver/antenna. If all are properly lit, then the connection has been successfully made and the coverage zones will be active and will support beltpacks. If the transceiver antennas are not lit, check the connections.

7 Beltpack menus

7.1 Beltpack menu maps

Note: Beltpack menus can be accessed by pressing and holding the **menu** button on the device (3 second press).

FreeSpeak II beltpacks can display different menus, allowing configuration rights according to your need and work context.

When a beltpack is not connected to any systems, it will display an **Offline menu**. Once a beltpack is connected to a matrix or Base station, menu access can be set in the system configuration software (EHX or FreeSpeak Configuration Editor). There are four menu options available in the configuration software:

- **Advanced (see table below for details)**

  In addition to the normal functions, the advanced menu options offers:

  - Volume operation. This allows the beltpack user to change how the device's overall volume settings operate (Toggle Talk Key/Master Volume)
  - Display mode. This allows the user to change the beltpack display (Toggle Partyline/Intercom display)
  - Site survey. This gives access to information on local transceiver/antennas and their performance.

- **Normal**

  Normal menu options allow:

  - Local beltpack volume control
  - Local settings (for instance, headset detect, sidetone, mic echo cancellation, listen again options)

- The ability to connect the beltpack to a system using the admin pin code.

- **Basic**

  Basic menu options allow:

  - Local beltpack volume control
  - Information relating to device

- **None**.

Note: From each menu, the user can enable advanced menu options if they have the admin pin code. The default value for this is 4632.

There is also a **Standalone** or rigging menu which can be used when surveying a site without connecting to a matrix or Base station. To access the Standalone menu see **3.5.5 Surveying a site in standalone (**rigging) mode.

When beltpacks are connected to a matrix or Base station, the beltpacks will take their menu settings from the current configuration map in the Configuration Editor. However, using the admin pin code to obtain access, the beltpack user can reset the menu settings on the beltpack from Basic or Normal to Advanced. The default admin pin code is 4632. This is a temporary measure, and the menu setting from the configuration map will reset if the beltpack is recycled (switched off and on).

See below for details of the advanced menu options. The other menus are subsets of this menu.

Advanced menu rights

Menu 1 (Master)	Menu 2	Menu 3	Menu 4	Menu 5	Menu 6
Volume level control	**Adjust level**				
Volume Operation	**Toggle Talk Key/Master (available in advanced options only)**				
Line in volume level	**Adjust level**				
Settings	**Headset options**	Headset auto detect			
		Sidetone level adjust			
		Headset limiter			
	Mic options	Mic type			
		Mic echo cancellation			
		Display brightness level			

Menu 1 (Master)	Menu 2	Menu 3	Menu 4	Menu 5	Menu 6
	Display	Display dim timeout			
		Display off timeout			
	Alarm	Battery alarm mode			
		Low battery threshold			
		Out of range alarm			
		Call alert mode			
	Role default	Are you sure?			
	Admin Options	Enter admin pin code Default = 4632	Admin – set system in pairing mode Full menu access Set system sync		
			Admin system sync (not currently available)		
	Listen Again	Recording time			
		Auto delete time			
Information	**Role**				
	Version				

Menu 1 (Master)	Menu 2	Menu 3	Menu 4	Menu 5	Menu 6
	Beltpack ID				
	Regional				
	Battery				
Display mode	**Partyline Intercom (advanced menu options only)**				
System connect	**Select available system**				
Site survey	**Select system (if beltpack not connected)** **Site survey screen (if beltpack already connected)**	Site survey terms: X,X,X,X Antenna or system ID Signal strength Frame error rate LQ, a combination of signal and FER.			

8 Specifications

8.1 FreeSpeak II Beltpack

Beltpack Frequency Response 100 Hz – 7.1 kHz

Beltpack Assignment-Select Buttons 2, used to edit beltpack menu options

Number of Full-Duplex Audio Paths 4, with individual level control

Level/Talk Controls	2 top-mounted rotary encoders
Headset Connector	XLR-4M, Clear-Com standard
Headphone Impedance	32 ohm to 2000 ohm
Microphone Type	Dynamic or electret, selectable in beltpack menu
Input Level	-70 to -40 dBu
Electret headphone voltage	2.3V
Microphone and Headset Limiters	Selectable in beltpack menu
Powering	Li-Ion Battery, 3 AA alkaline cells
Battery Charging	In unit, via supplied 5 way AC60 charger
Battery Life	Approximately 18 hours
Range from Single FSII-TCVR-19 Transceiver/Antenna	500 m from transceiver/antenna in line-of-sight conditions; 50 m indoors; use multiple antennas for larger, custom coverage areas
Approx. dimensions	38 x 130 x 100 mm (dwh) (1.5 x 5 x 3.75 inches)
Weight (with batteries)	Approx. 400g (9 oz).

8.2 FreeSpeak II Transceiver/Antenna

Beltpacks Supported Per Transceiver/Antenna	FSII 1.9 GHz devices:5 in one cellular zone FSII 2.4 GHz devices:4 in one cellular zone
Transceiver Antenna Transmission Range	Up to 500 m (1475 ft.), line of sight
Maximum Distance, Matrix to Transceiver Via Matrix Port	1,000 m (3,200 ft.) using shielded 24 AWG cable 500 m (1,600 ft) using shielded 26 AWG cable
Maximum Distance, Transceiver Powered By E-Que-HX	300 m (975 ft.)
Local Powering	Via 24VDC power supply
Connection to matrix	RJ-45
Mounting	3 fixing holes
Dimensions	50 x 140 x 175 mm (dwh) (2.0 x 5.5 x 6.9 inches)
Weight	Approx. 460g (16.1 oz).

8.3 FreeSpeak II Transceiver/Antenna Splitter

Number of Transceiver/Antennas Supported	10
Number of Splitters Per Matrix	2
Connection Between Matrix and Splitter	4-pair shielded CAT5 cable with RJ-45
Connection Between Splitter and Transceiver/Antennas	4-pair shielded CAT5 cable with RJ-45
Powering of Splitter	Locally powered via external power supply

8.4 Transmission Method

Method of RF Operation	DECT and ISM standards, using two DECT bands per beltpack
Modulation	GFSK
Frequencies of Operation	FSII 1.9 GHz 1880–1900 MHz (Europe) 1920 – 1930 MHz (North America) FSII 2.4 GHz 2400–2480 MHz (Europe and North America)
Maximum RF Output	250 mW burst, average level 2 - 4 mW (Europe) 100 mW burst, average level 2 - 4 mW (US)

Theory of Operation

Dynamic allocation of frequencies and handoff of beltpacks among the transceiver/antennas up to their individual limit of 5 connected beltpacks at a time; each beltpack is assigned a "virtual port" within the matrix.

NOTICE ABOUT SPECIFICATIONS

While Clear-Com makes every attempt to maintain the accuracy of the information contained in its product manuals, that information is subject to change without notice. Performance specifications included in this manual are design-center specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

9 Compliance

FCC Notice:

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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 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.

Beltpack FCC/IC RF Exposure Warning:

- This product complies with FCC / IC radiation exposure limits set forth for an uncontrolled environment.

- This product may not be co-located or operated in conjunction with any other antenna or transmitter.

- The beltpack has been tested to comply with FCC / IC RF Exposure requirements in body-worn position. Use of third party clips or holsters with the beltpack may not ensure compliance with FCC / IC RF exposure requirements and should be avoided.

- To comply with FCC / IC RF exposure requirements, the Antenna/Transceiver unit must be installed and operated at least 20 cm (8 inches) from any person.

Avertissement de la FCC / IC sur l'exposition humaine aux radiofréquences de l'appareil :

- Ce produit est conforme aux normes FCC / IC concernant les limites de champ RF définies pour l'utilisation par le grand public

- Ce produit ne peut pas être installé à proximité ou utilisé en conjonction avec une autre antenne ou émetteur.

- Le produit a été testé pour se conformer aux exigences sur l’exposition aux radiofréquences de la FCC / IC pour un appareil porté sur le corps. L'utilisation de pinces ou d’étuis d’un tiers ne peuvent assurer la conformité aux normes FCC / IC sur l’exposition aux radiofréquences et doivent donc être évitée.

- Pour se conformer aux exigences sur l’exposition aux radiofréquences de la FCC / IC, l’antenne émettrice doit être installé et utilisé à plus de 20 cm (8 po) de tout utilisateur.

IC Notice:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

CE

Hereby, HM Electronics, Inc. declares that FreeSpeak II products are in compliance with the essential requirements and other relevant provisions of R&TTE Directive 1999/5/EC.

Waste Electrical And Electronic Equipment (WEEE)

The European Union (EU) WEEE Directive (2002/96/EC) places an obligation on producers (manufacturers, distributors and/or retailers) to take-back electronic products at the end of their useful life. The WEEE Directive covers most Clear-Com products being sold into the EU as of August 13, 2005. Manufacturers, distributors and retailers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging which indicates that this product was put on the market after August 13, 2005 and must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of the user's waste equipment by handing it over to a designated collection point for the recycling of WEEE. The separate collection and recycling of waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local authority, your household waste disposal service or the seller from whom you purchased the product.

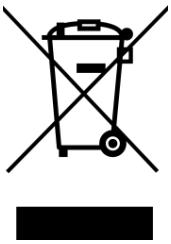


Figure 9-1: WEEE Symbol