DIGITAL WIRELESS INTERCOM SYSTEM (DECT 1.89-1.93 GHZ)

FreeSpeak II™

High Performance, Standalone and Integrated Wireless Solution for Large-Scale Communications

Clear-Com®
AN HME COMPANY

FREESPEAK II WIRELESS INTERCOM SYSTEM

FreeSpeak II™ is the next generation DECT-based distributed wireless solution that operates in multiple license-free frequency bands: 1.897-1.933GHz. This high performance wireless intercom system was designed for extensive communication in large-scale operations. Its ability to maintain a strong and continuous wireless connection across an expansive coverage area while providing crystal-clear digital audio makes FreeSpeak II the ideal wireless roaming solution for live event, broadcast, sport production, industrial, military and government applications. FreeSpeak II combines innovative intercom features with a robust design to offer the optimal user experience.

FreeSpeak II is **highly flexible**, capable of being a standalone wireless system or an integrated wireless solution with the advanced Eclipse HX Matrix System. As a standalone system, the robust 1RU base station can support up to 20 digital wireless beltpacks. Alternatively, FreeSpeak II wireless beltpacks can seamlessly integrate into Clear-Com's Eclipse HX Matrix System, providing up to 50 wireless user connections per E-Que-HX cellular card. This approach extends the intercom functions offered by the Matrix system to mobile users.

Unsurpassed, crystal-clear digital "Clear-Com Sound" gives users full-duplex (talk and listen) 7kHz "commentator" audio bandwidth from a whisper to a shout. This level of sound quality delivers ultimate audio comfort after extended usage and clear intelligibility to FreeSpeak II users.

Expansive wireless coverage can be achieved by strategically placing up to 10 remote antennas. Each Active Antenna can be positioned as far as 3,200 feet away from the base station or Matrix, and each powered Antenna can create a coverage zone of up to 1,475 feet.

Flexible cellular roaming technologies allow users to move freely about in large, multi-site environments without the worry of fading or losing connection. With the latest DECT (Digital Enhanced Cordless Telecommunications) technology at its core, FreeSpeak II continuously scans, selects, and connects with the best Active Antenna for uninterrupted communication.

DECT CARRIER FREQUENCY CHART

RFC	Carrier Frequency	RFC	Carrier Frequency
0	1897.344	17	1911.168
1	1895.616	18	1912.896
2	1893.888	19	1914.624
3	1892.160	20	1916.352
4	1890.432	21	1918.080
5	1888.704	22	1919.808
6	1886.976	**23***	**1921.536**
7	1885.248	**24***	**1923.264**
8	1883.520	**25***	**1924.992**
9	1881.972	**26***	**1926.720**
10	1899.072	**27***	**1928.448**
11	1900.800	28*	1930.176
12	1902.528	29*	1931.904
13	1904.256	30*	1933.632
14	1905.984	31*	
15	1907.712	32*	
16	1909.440		

*Carriers 23 through 27 are those used in the USA.
Worldwide Frequency Bands: Each region uses approved 5 or 10 bands.

FreeSpeak II DECT bands are selected for regions. However, DECT is not approved for use in all regions.

WIRELESS BELTPACK

The all-new five-channel, full-duplex FreeSpeak II digital beltpack was uniquely designed for the rigorous demands of large-scale operations and continuous communication use. Ergonomic form factor, intuitive operation, and a rugged housing make the beltpack ideal for extended use.

Drop-in battery and beltpack charger

USB Port for local DC powering

18+ hours of battery operation (door shown open)

BELTPACK FEATURES

- Up to five communication routes per beltpack, each with a 5 or 10 character label
- Four programmable pushbuttons, two rotary encoders and a reply button
- Menu driven display, which can be partially or completely restricted
- Secure system – beltpacks are registered to a particular base station or Matrix
- Internal antenna – no antenna breakage or damage
- Long battery usage – typically 18 hours of continuous talk time
- Two battery options – rechargeable Li-Ion cells or disposable Alkaline AA Batteries
- Drop-in charging port with built-in USB battery and beltpack charging capability
- Strong metallic beltclip and shoulder strap points
- Over-the-air beltpack easy registration and regionalization
- Real-time monitoring of battery per beltpack
- "Listen Again" audio memory to replay last 15 seconds of audio
- Technician's flash light on rear

**Exact frequency range depends upon country, and is preset e.g. Transceiver for Japan: 1.893GHz-1.906GHz.

Full-duplex 7kHz bandwidth offers high audio quality and reduces the strain on the user's ears after extended usage.

Four push-to-talk one reply key and two rotary encoders allow up to five communication routes to be assigned to each beltpack. These can be any desired combination of group and point-to-point communication assignments.

Large OLED backlit display provides extensive information, including the names of beltpacks, assigned users and groups of each beltpack, battery level, and signal strength.

A variety of **beltpack menus are accessible via the OLED display** including headset levels, microphone levels, audible alert at low battery level, and adjustable local sidetone.

BELTPACK TECHNICAL SPECIFICATIONS	
Audio Bandwidth	100Hz-7.1KHz (G.722)
No. of Full-Duplex Audio Paths	Up to 5 with individual level control (2 pairs) 2 controls and a main volume
Mode of Operation	Full-duplex on all routes
Level/Talk Controls	4 pushbuttons, a reply button and 2 rotary controls
Enter/Answer-Back Button	1
Frequency Spectrum	1.88GHz-193GHz* DECT Cellular auto-roaming technology
RF Output	200mW Burst, 17mW average**
Range	Up to 1475ft (450m) to beltpack in good conditions, 800 feet typical
Battery	Li-Ion Battery (BAT60) or 3 AA cells
Battery Charging	Drop-in charger (AC60) or local USB
Battery Life	18+ hours with Li-Ion – also accepts 3 x Alkaline AA cells
Headset Connector	4-pin male, Clear-Com standard
Microphone Type	Electret and Dynamic, selectable in beltpack menu
Microphone Level and Headset Limiter	Selectable in beltpack menu
Headset Limiter	Selectable from beltpack menu
Environmental	IP-65 water and dust resistance -67°F to +158°F (-55°C to +70°C)
Dimensions	Tapered design at largest points approx. 5 x 1.5 x 3.75 in (130 x45 x 97mm) (WxDxH)
Weight	9.0oz (0.4kg) including batteries

*Japan: 8mW average

ACTIVE ANTENNA AND ANTENNA SPLITTER

FreeSpeak II users can roam thousands of feet from the base station while staying connected. This is achieved through the Cellular Roaming capability between distributed Active Antennas. The Antenna Splitter extends the base station to create an expansive coverage area with multiple antennas, which provide connections to the wireless beltpacks.

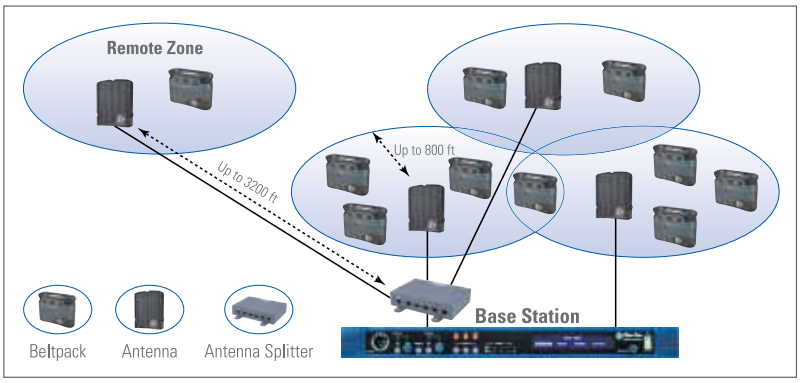
Active Antenna

Antenna Splitter

Locally-powered Antennas may be located up to 3,200ft (1,000m) away or 800ft (250m) when centrally powered from the base station.

The **omni-directional coverage area** may be up to 800ft (50 to 150m typical) in radius, although typical distances in production environments range from approximately 160 to 640ft (50 to 200m).

Each Active Antenna supports up to **five full-duplex beltpacks in one coverage area**. By co-locating additional Active Antennas, more than five beltpacks can be supported in a particular area.



ACTIVE ANTENNA TECHNICAL SPECIFICATIONS	
Beltpacks Supported per Active Antenna	5
Active Antenna Transmission Range	Up to 1475ft (450m) to beltpack in good conditions, 800 feet typical
Active Antenna Output	200mW burst, 80mW average*
Maximum Distance, Base to Antenna Via Transceiver Port	3,200ft (1,000m) on 4-pair CAT5 or better cable
Maximum Distance, Antenna Powered by Base	975ft (300m) on CAT5 or better cable
Local Powering	24VDC power supply
Connection to FreeSpeak II Base	RJ-45
Mounting	Integral screw mounts or standard microphone mounting
Dimensions	6.9 x 5.4 x 2.1in (175 x 135 x 50mm) (HxWxD)
Weight	11.9oz (0.45kg)

*Japan: 8mW average

ANTENNA SPLITTER TECHNICAL SPECIFICATIONS	
No. of Antennas	5
No. of Splitters per Base	2
Connection Between Base and Splitter	CAT5 or better cable with RJ-45
Connection Between Splitter and Antennas	CAT5 or better cable with RJ-45
Powering of Splitter	Locally powered via supplied external power supply
Weight	16oz (0.45kg)

TRANSMISSION METHOD TECHNICAL SPECIFICATIONS	
Method of RF Operation	Uses two slots per beltpack for wider frequency response
Modulation	GFSK
Frequencies of Operation	from 1.8-1.93GHz** (restricted by software)
RF Output	250mW burst, average as new FCC level 2 – 4mW

**Exact frequency range depends upon country, and is preset e.g. Transceiver for Japan: 1.893GHz-1.906GHz.

BASE STATION

The FreeSpeak II Base Station serves as the heart of the standalone wireless communications system for all digital wireless beltpack users. The base station supports up to 20 full-duplex wireless beltpacks. FreeSpeak II cellular auto-roaming technology enables beltpacks to continuously detect and automatically select the best connection. Even in the most crowded RF environments, FreeSpeak II remains highly secure and free from interference.

The base station can individually address each beltpack, allowing multiple combinations of beltpack to-beltpack (point-to-point) and small-group (partyline)conversations to happen simultaneously.

FreeSpeak II can be programmed through either the software menus on the base station or via the PC-based software. All setup and management of the beltpacks and beltpack audio levels, communication routes and groups, and input and output levels for the wired connections are also under software control.

The base station can power two Active Antennas or up to 10 using optional Antenna Splitters with local power.

FREESPEAK II BASE SYSTEM FEATURES

- License-free 1.897-1.933GHz DECT operations
- Supports up to 20 wireless beltpacks per base
- Point-to-point and small group wireless communications
- User-defined coverage zones, with up to 10 remote antennas
- 10 LED Active Antenna indicators
- Position Active Antennas up to 3,200ft (1,000m) from base station
- Create, name, and assign groups with 5 character labels
- Two 2-wire and four 4-wire connectors
- Frequency and channel-hopping technology automatically finds clear spectrum
- Interrupted fold-back (IFB) functionality for on-screen talents
- Five wireless partyline groups
- Partyline call alert functionality

The Rear panel offers four 4-wire and two 2-wire intercom connections for communication with other wired intercom systems. Program feed input, Stage Announce output and Stage Announce relay output are also available as connections at the back of the Base Station.

FREESPEAK II BASE STATION TECHNICAL SPECIFICATIONS	
Base-to-Beltpack Frequency Response	100Hz-7.1kHz
No. of Beltpacks Per Base Station	20 when all 10 bands are available; or 10-12 in certain regions
No. of Transceiver/Antennas Supported by Base, Basic Base	10
No. of Active Antenna Ports	2
PC Programming Port	DB9
Relay Port	DB9
Partyline Intercom A and Intercom B (each)	XLR-3F with XLR-3M loop through, on/off termination switch (via software)
Four-Wire/Matrix Connection	4 RJ-45 (Intercom 3 – 6)
Program Input	XLR-3F, transformer isolated, line-level input
Stage Announce Output	XLR-3M, transformer isolated, line-level output
Front-Panel Headset	4-pin male connector with 2-channel capability and individual talks and listens
Front-Panel Display	254 x 32 dot-graphic VFD
Front-Panel Indicators	2 Talk LEDs for front-panel headset, CH A and CH B partyline enable LEDs, Program Input enable LED, 10 individual antenna LEDs
Base Station Programming/Editing	Push-to-enter rotary encoder
Dimensions	1RU unit, 1.75 x 19.0 x 12.5in (44 x 483 x 312mm) (HxWxD)
Weight	10.8lbs (4.9kg)

FREESPEAK II INTEGRA MATRIX SOLUTION

FreeSpeak II is the only wireless system on the market that can seamlessly integrate its wireless beltpacks with Clear-Com's Eclipse HX Digital Matrix Intercom Systems. This solution is known as FreeSpeak II Integra.

With FreeSpeak II Integra, wireless beltpack users can communicate with any Eclipse HX panel users on a one-to-one or group basis. This unique capability is achieved with the E-Que-HX cellular controller card which fits directly in the matrix frames.

The E-Que-HX card connects with up to 10 Antennas to provide beltpack connections to any number of ports within the Matrix System.

Up to **50 wireless beltpacks** per E-Que-HX card (depending on environment) can roam between 40 Active Antennas and communicate on a Matrix System. Up to four E-Que-HX cards can be used in one Matrix frame.

FreeSpeak II Integra has the ability to **individually address each beltpack** and then connect that beltpack to one or many users on the Matrix. Up to 1475ft (450m) can be achieved under good radio frequency conditions – adding more Active Antennas can extend the range.

Patented Dynamic Port Allocation technology allows the beltpacks to roam between Active Antennas without breaking connections.

Standard CAT5 cabling connects beltpacks to the Matrix via a network of Active Antennas and antenna splitter. Simply add additional Active Antennas to expand the number of users.

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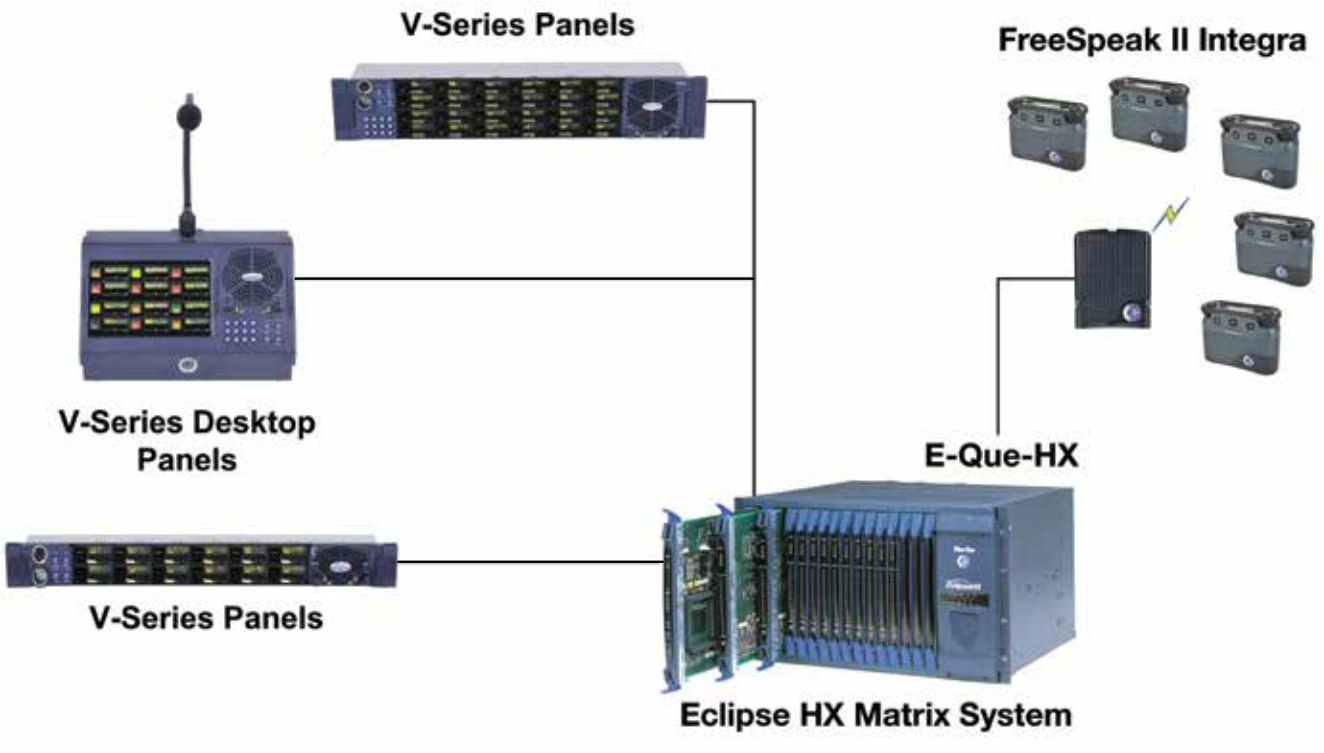
Worldwide Frequency Bands: Each region uses approved 10 or 5 bands.

FreeSpeak II Beltpacks are configured within the EHX (Eclipse HX Configuration Software). They benefit from all the features within the Eclipse HX matrix system.



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SYSTEM (CELL CONTROLLER CARD, ACTIVE ANTENNA & ANTENNA SPLITTER)	
Frequency Spectrum	1.88GHz-1.93GHz** DECT Cellular auto-roaming technology
Size	**Cell Controller Card (in Matrix):** Standard 6RU Eurocard (HxWxD)
Maximum Beltpacks per Cell Controller	50
Maximum Cell Controller Cards per Matrix	4
Maximum Antennas per Cell Controller Card	10
Connection between Cell Controller Card & Active Antenna	2 x RJ45 (CAT5 screened cable) up to 4,800ft (1,500m) from matrix

Clear-Com®
AN HME COMPANY

About Clear-Com®

Clear-Com, an HME company, is a trusted global provider of professional real-time communications solutions and services since 1968. We innovate market proven technologies that link people together through wired and wireless systems.

Clear-Com was first to market portable wired and wireless intercom systems for live performances. Since then, our history of technological advancements and innovations has delivered significant improvements to the way people collaborate in professional settings where real-time communication matters. For the markets we serve – broadcast, live performance, live events, sports, military, aerospace and government, our communication products have consistently met the demands for high quality audio, reliability, scalability and low latency, as well as addressed communication requirements of varying size and complexity. Our reputation in the industry is not only based on our product achievements, but also on our consistent level of customer engagement as well as continuous dedication in delivering the right solution for specialized applications and the expertise to make it work. Around the globe and across markets, Clear-Com innovations and solutions have received numerous awards and recognitions for our ingenuity and impact to customers.

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