FreeSpeak Edge Base Station

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FreeSpeak Wireless Intercom

Key Features and Benefits

FreeSpeak Edge Base Station
- Wireless Intercom Base Station
- Partyline 2-Wire Integration
- Line-Level 4-Wire Interfacing
- Dante Audio Interfacing
- Headset User Station
- CCM™ browser setup, configuration & monitoring
- Front panel color touch screen with encoders for control and configuration
- Plug-and-go central discovery and pairing

Capacity
- FreeSpeak Wireless Intercom
  (10) FSII E1 Transceivers (1.9[1], 2.4 GHz)
  (6) FSII IP Transceivers (1.9[1], 5 GHz)
  (16) FSII, Icon & FSE Beltpacks[2] (1.9[1], 2.4, & 5 GHz)
- Dante Audio Network Interfaces
  (8) Dante Ports

Configuration
- (100) Channels
- (100) Groups
- (200) Roles for FreeSpeak

Connectivity
- (8) 4-Wire – 1 for PGM/SA
- (4) 2-Wire – 550mA per pair
- (2) GPI Optically Isolated
- (4) GPO Relay
- (2) FreeSpeak E1 – RJ45/SFP switchable
- (4) LAN-(2) RJ45, (2) SFP;
  Assignable to management, AES67, Dante Primary & Secondary

FreeSpeak Edge Base Station is a standalone wireless base station for FreeSpeak® wireless with Dante, 2-Wire, 4-Wire and GPIO interfaces.

Description
FreeSpeak Edge Base Station is the foundation of a wireless intercom system with support for up to 16 wireless intercom beltpacks of various frequencies and connectivity. Coupled with Dante and analog interfacing of audio and control, the FSE-BASE is suitable for any infrastructure. The base's compact 1RU form factor features front panel intercom headset station, fast and easy setup, configuration and monitoring.

Technical Specifications

Capacity
FreeSpeak Wireless Intercom
(10) FSII E1 Transceivers (1.9[1], 2.4 GHz)
(6) FSII IP Transceivers (1.9[1], 5GHz)
(16) FSII, Icon & FSE Beltpacks[2] (1.9[1], 2.4, & 5 GHz)

Dante Audio Network Interfaces
(8) Dante Ports

Configuration
(100) Channels
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(200) Roles for FreeSpeak

Connectors
Headset: 4-pin XLR-M
2-Wire I/O: (4) XLR-3F
4-Wire I/O: (8) RJ45
  Audio Crossover Mode: Software selectable Special use of Port #8 using provided cable;
  Program Audio Input/ Stage Announce Output: XLR-3F, XLR-3M
GPIO: (2) DB9F (1 GPI, 2 GPO, 12V – each connector)
FSII E1 TCVR/SPL Ports: (2) RJ45, (2) SFP (RJ45 or SFP)
FSII DECT Synchronization: (2) RJ45 (Input and Output)
LAN: (2) RJ45, (2) SFP (Function assignable)
AC Power Connector: IEC-C14
DC Power Connector: KPJX-4S-S
Grounding Screw: Terminal

Note: While mechanically identical, SFPs are designed with different properties for data rates, power and fiber cable type. Please refer to the Clear-Com SFP Compatibility Chart for compatible SFP transceivers.

Controls and Indicators
Front Panel:
(2) Color Touch Screen Displays
(2) Power Supply Status LED
(1) Mic button
(1) Menu Access Button
(4) Encoders for Menu & Level Control
(1) Reset button – For service use
(1) Main Listen Level LEDs

Rear Panel:
(2) LAN RJ45 Link/Activity LEDs
(2) FSII E1 TCVR RJ45 Link/Activity LEDs
(4) 2-Wire Power/Configuration Indicator LEDs

Microphone Input
Input Type: Dynamic/Electret – Selectable
Headset Mic Voltage: 5V
Input Level (nominal): -45dBu
Input Level (max): -10dBu
Frequency Response: 200Hz to 12kHz ±3dB
Mic Limiter Threshold: -35dBu ±3dB
Mic Limiter Range: ≥ 20dB

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[1]1.9 GHz E1 and IPT transceivers should not overlap on the same system. Beltpacks will not roam between E1 and IPT Transceivers.

FreeSpeak Edge Base Station

Technical Specifications (Continued)

4-Wire Line Level Interfaces
Transformer balanced input and output
Input:
Nominal Level: 0dBu (adjustable -12dB to +12dB)
Maximum Level: +18dBu
Frequency Response: 80Hz to 20kHz ±3dB
Impedance: >= 10KΩ

Output:
Nominal Level: 0dBu (adjustable -12dB to +12dB)
Maximum Level: +18dBu
Frequency Response: 80Hz to 20kHz ±3dB
Impedance: 200Ω + 10%

2-Wire Partyline Interfaces
Unbalanced High-Impedance bridging
Compatibility: Clear-Com, RTS-TW with Call and Remote Mic Kill
Termination: Optional per pair (A/B or C/D)
Nulling: User initiated Auto-Calibration
Null Depth: >60dB at 1kHz
Nominal Level: CC: -18dBu, RTS-TW: -12dBu (adjustable -3dB to +3dB)

Headroom: 18dB
Frequency Response: 200Hz to 12kHz ± 3dB
Impedance: >= 10KΩ bridging
Total Harmonic Distortion (THD): < 0.1% THD @ 1 kHz

Power: 560mA optional per pair (A/B or C/D)
Voltage: 25-28V DC

Use Encore Partyline Power Calculator to validate power requirements of the analog partyline intercom system.

Frequency Response
Headset Mic: 200Hz to 12kHz
Freespeak Edge: 200Hz to 12kHz
Freespeak II: 200Hz to 7.1kHz
Dante: 20Hz to 20kHz
4-Wire: 80Hz to 20kHz
2-Wire: 200Hz to 12kHz

Logic Power Output
To power Logic Inputs
Output Voltage: 12V, separate pin
Current (Max): 2mA

Logic Inputs – GPI
Assignable to activation of audio crosspoints or call
Input: 2
Style: Optically isolated
Input Voltage Range: 4 - 30V DC or AC
Input Current: >=1.2mA required

Logic Outputs – GPO/Relay
Assignable to talk, call keys and audio crosspoints or call
Outputs: 4
Style: SPDT/Power Relay
Normalized: Open or Closed, separate pins
Switching Voltage (Max): 30V DC
Switching Current (Max): 1A

Power
AC Internal Power Supply:
Input Frequency Range: 100-240V AC
Input Frequency Range: 50-60Hz
Input Power (Max): 160W
BTU (Max): 545BTU/h
Input Power Connector: IEC-C14

DC Power Input:
Voltage: 12V DC ± 5%
Current (Max): 12A
Power (Max): 144W
BTU (Max): 491BTU/hr
Input Power Connector: KPJX-4S-S

This unit can be powered via DC input using:

AC Adapter - Inline:
Type: PSU-EXT-001 (supplied)
Mounting Bracket: 272G048-SP (optional)
Input Voltage Range: 100-240V AC
Input Frequency Range: 50-60Hz
Input Power Connector: IEC-C14
Output Voltage: 12V DC ± 5%
Output Current (Max): 12.5A
Output Power (Max): 150W
Output Power Connector: KPPX-4-P

Environmental
Operating: 32° to 113°F (0° to 45°C)
Storage: -22° to 158°F (-30° to 70°C)
Humidity: 20-90% Non-Condensing

Dimensions
1RU
19 x 1.7 x 13.9in (WxHxD)
(482.6 x 43.2 x 353.1mm)

Weight
7.3lbs (3.3kg)

FreeSpeak Edge Base Station

Network Specifications | Firmware Release 3+

The FSE-BASE includes 4 physical LAN connections (2 x RJ45, 2 x SFP) which can be assigned to different functions. This allows various network setups, from converged to having physically separate network per function.

Administration
For CCM Management & Control

Network Protocols
Ethernet IPv4 – Unicast Control
mDNS – Multicast Device Discovery
HTTP – Management
HTTPS – Secured Management
NTP – Network Time Protocol

Network Ports
Unicast:
Port 80 TCP – Web Interface, System Management
Port 443 TCP – Secured Web interface, System Management

Network Parameters
MAC Address Prefix: 00:0e:98:....

Link-Local Default IP Address Range: 169.254.0.0/16
System Reserved IP Ranges:
10.0.0.0-7 Internal Systems
127.0.0.0/8 Local Host
169.254.0.0/16 Link Local
172.23.0.0/16 Link Group
224 -239.0.0.0/8 Multicast

Above addresses cannot be assigned.

Restrictions: Do not plug any two physical LAN ports on FSE-BASE into the same network/VLAN. This can create a network loop affecting IP stability.

Recommended Ethernet Switches:
• Managed Ethernet Switch
• 100/1000 Base-T Ports
• 1000 Base IP Switch Trunks
• QoS Configuration
• Energy Efficient Ethernet bypass option
• GMP Snooping options

AES67
For FreeSpeak IP Transceivers

Network Protocols
Ethernet IPv4 – Unicast Audio & Control
mDNS – Multicast Device Discovery
Layer 2 Non-Routable
HTTP – Management
PCM – Audio Codec to TCVR
DiffServ – QoS
PTPv2 – Synchronization
SAP – Session Announce Protocol
RTSP – Real Time Streaming Protocol

Network Ports
Unicast:
Port 80 TCP – Web Interface for service
Port 6001 UDP – Control

Multicast:
Port 15000 – 15256 UDP – Audio
Port 5353 UDP – mDNS, Names, Discovery, Pairing

Network Parameters
FS IP TCVR Support: 6

Bandwidth:
FS II IPT TCVR: ~7 Mbps (max) each
FS Edge TCVR: ~ 9.6Mbps (max) each

Network Jitter Tolerance: < 1µs required for RF Synchronization

QoS Tags:
Clock: DSCP=46, Expedited Forwarding (EF)
Media: DSCP=34, Assured Forwarding (AF41)
Management: DSCP=0, Best Effort (DF)

PTP Parameters: (Device hard coded)
PTP domain: 0
Priority 1: 127
Priority 2: 128
Announce interval: +1 (2s) (1/2s)
Sync Rate: -3 (125ms) (1/8s)

IGMP: Enabled

Multicast: Enabled

MAC Address Prefix: 00:0e:98:....

Link-Local Default IP Address Range: 169.254.0.0/16

System Reserved IP Ranges:
10.0.0.0-7 Internal Systems
127.0.0.0/8 Local Host
169.254.0.0/16 Link Local
172.23.0.0/16 Link Group
224 -239.0.0.0/8 Multicast
Above addresses cannot be assigned.

Restrictions: Cannot be combined with Dante. Recommended use with assigned IP addresses. Cannot be on Management subnet unless on same physical LAN port. Static or DHCP assigned IP addresses are recommended for FreeSpeak IP Transceivers.

Further Details: Refer to the AES67 Network Recommendations for further information, for network performance and use on converged networks.

Network Specifications | Firmware Release 3+ (Continued)

Dante (Firmware Version 4.2)
For 3rd Party Audio Networking

Network Protocols
Ethernet IPv4 – Unicast/Multicast Audio & Control
mDNS – Multicast Device Discovery
PCM – Audio Codec
DiffServ – QoS
PTPv1 – Synchronization
SAP – Session Announce Protocol
RTP – Real Time Protocol for AES67

Network Ports
Unicast:
Ports 14336-14591 UDP-Audio
Port 4440 UDP-Audio Control
Port 4444 UDP-Audio Control
Port 4455 UDP-Audio Control
Port 8751 UDP-Dante Controller
Port 8800 UDP-Control & Monitoring

Multicast:
IP 224.0.0.251 Port 5353 UDP–mDNS, Names, Discovery
IP 224.0.1.129-132 Ports 319-320 UDP–PTP
IP 239.254.3.3 Port 9998 UDP-PTP
IP 239.255.0.0/16 Port 4321 UDP-Audio
IP 224.0.0.230-233 Ports 8700-8708 UDP-Control
IP 239.69/16 Port 5004 UDP (default) -RTP/AES67 Audio
IP 239.255.255.255 Port 9875 UDP-AES67 Discovery

Network Parameters
Audio: 24 bit, Linear, 48kHz

Bandwidth:
6 Mbps per 4 channel unicast flow
1.5 Mbps per multicast channel

Network Jitter Tolerance: Dependent on Dante latency configuration

QoS Tags:
Clock: DSCP=56, AControl (CS7)
Media/Clock: DSCP=46, Expedited Forwarding (EF)
Other: DSCP=0, Best Effort (DF)

IGMP: Enabled for multicast use

Multicast: Enabled for multicast use

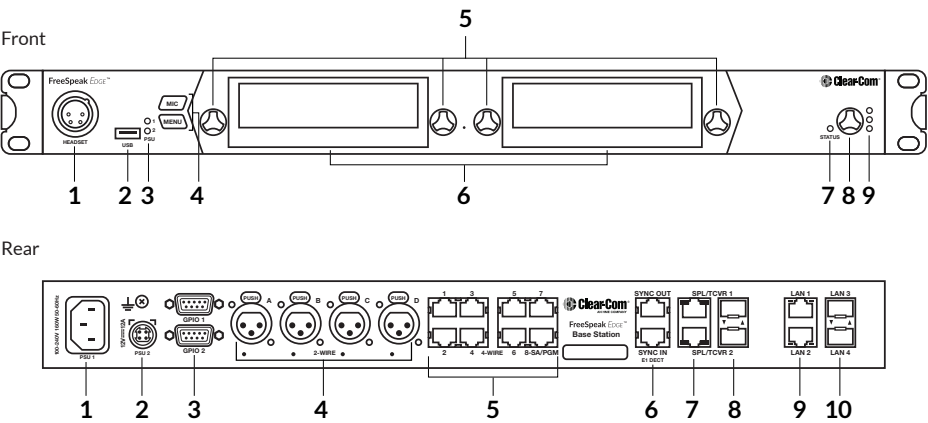**Link-Local Default IP Address Range:**
169.254.0.0/16 Primary
172.32.0.0/16 Secondary

Restrictions: Cannot be combined with AES67. Primary and Secondary cannot be assigned to same physical LAN port.

Further Details: Refer to documentation from Audinate for further information.

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Front

Rear

Legend

Front

1. XLR Headset Connector
   - 4-pin XLR-M
2. USB A
3. PSU LED indicators
4. Microphone & Menu keys
5. Rotary encoders
6. Touchscreen displays
7. Speaker LED
8. Main volume encoder
9. Main volume level LEDs

Rear

1. Power Input - AC
2. Power Input - DC
3. GPIO
4. 2-Wire ports
5. 4-Wire ports
6. DECT sync in & out
7. FSII E1 TCVR/SPL RJ45
8. FSII E1 SPL Fiber SFP
9. LAN ports
10. LAN SFP ports

Order Codes

FSE-BASE

Includes
(1) Four-Wire PGM/SA Breakout Cable (CAB-RJ45-PGM-SA)
(1) External PSU (PSU-EXT-001)

Optional Parts
SFP-MMFO-1G-SX: Multi-mode LAN SFP
SFP-SMFO-1G-LX: Single-mode LAN SFP
SFP-RJ45-1G: RJ45 LAN SFP
SFP-MMFO-100M-FX: Multi-mode E1 SFP
SFP-SMFO-100M-LX: Single-mode E1 SFP
HLI-MMFO: Multi-mode E1 SFP - Legacy
HLI-SMFO: Single-mode E1 SFP - Legacy
272G048-SP: PSU Mounting Bracket

Clear-Com
AN HME COMPANY