Linking People Together

HMS-4X

HelixNet® is a networked partyline intercom with up to 24 channels and Program Audio over XLR, LAN or WAN.

Description
The HelixNets HMS-4X** main station is a combination of a system host and an intercom user station with XLR Powerline connections to user stations. HMS-4X** hosts up to three HLI interface modules for external connectivity including Ethernet and Fiber.

System Architecture
HMS-4X** manages all endpoint connections and Ethernet routing of incoming audio to all listening user stations and interfaces where the audio is locally mixed. HelixNet's 12 channels of partyline intercom and Program Audio are available at any HelixNet user station or interface port regardless of where they connect to the system. Optional license expands HMS-4X** to 24 channels.

Main Station
HMS-4X** features two XLR Powerlines each capable of supporting up to 10 user stations. Powerline allows digital connection using standard XLR cables and supports various cabling topologies and passive splitting, similar to analog partyline cabling. HMS-4X** also supports endpoint connectivity over mix of Powerline and Ethernet with the optional HLI-ET2 Ethernet module. HelixNet supports up to 64 endpoints, user stations or interface ports. User stations may be added and removed dynamically without configuration and assigned to any channel without restrictions. HMS-4X** hosts firmware for endpoints and automatically matches versions upon endpoint connection.

Linking
Up to five additional HMS-4X** main stations can be linked to the system host HMS-4X** over Ethernet networks or fiber for a total of six linked HMS-4X.** Link groups of multiple HMS-4X** seamlessly form a distributed HelixNet system, allowing local connectivity using HLI interface modules and XLR Powerlines to user stations.

*CCM requires HLI-ET2
**HMS-4X is a legacy product as of 2022

Note: HMS-4X and HLI modules are not used in Arcadia® hosted HelixNet systems. HMS-4X and HLI Modules are legacy products as of 2022 and not recommended for new system designs and specifications, existing HMS-4X units and HLI modules are supported under Clear-Com's Warranty Terms.

Key Features and Benefits

HelixNet System Operation
- 6 HMS** can link over LAN & WAN
- Supports up to 64 endpoints on HelixNet system
- 12 partyline channels; expandable to 24 channels via optional license

Main Station
- Easy to use CCM™ browser configuration
- Fast front panel control & configuration
- Plug-and-go with auto discovery
- Central upgrades from main station
- 4 Keysets assignable to channels
- All Talk, Stage Announce, RMK & Program Audio level controls

Connectivity
- 2 Powerlines for distribution of Ethernet to HelixNet user stations via XLR cables
- 3 Expansion slots for HLI modules
- Program Audio input
- Stage Announce output
- 4 Contact closure inputs & outputs

LQ Integration Options
- LQ® linking for high density 2-wire, 4-wire and GPIO expansion
- Station-IC™ and Agent-IC® as integrated via optional licenses
- SIP/VoIP integrated via optionally licensed LQ

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User Station and System Configuration

HMS-4X** front panel provides four keysets assignable to any intercom channel. The user station comes with a headset connection, gooseneck mic connector and a loudspeaker in addition to All Call, Stage Announce, Remote Mic Kill and Program Audio level controls. Expansion mode allows up to six HMS** or HRM user stations to be combined, with each expanded station having up to 24 channels.

The keysets form unique waterfall menus allowing tactile system management. Browser-based Core Configuration Manager™ (CCM) allows networked system management using the optional HLI-ET2 Ethernet module.

HLI Interface Modules

HMS-4X** can host three HLI interface modules for external analog audio and intercom connectivity, Ethernet linking and system control. HLI-modules include: HLI-ET2 network interface for system control, HMS-4X** and LQ linking and user station connectivity, HLI-FBS 100Mb SFP for fiber networking, HLI-4W2 dual 4-wire analog line-level interfacing, and HLI-2W2 dual 2-wire interface for analog partyline cabling.

LQ Integration

Clear-Com's LQ Series IP interfaces can be added to HelixNet Link Groups. Up to three LQ devices may be linked to a HelixNet system for a maximum total of six combined HMS** and LQ in Link Group. LQ provides the system with 2-wire, 4-wire and GPIO interfaces, in addition to Eclipse® HX E-IPA/IVC linking, optionally licensed Station-IC and Agent-IC virtual clients and SIP/VoIP telephone clients.

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Technical Specifications

Linking

HMS** is required as the HelixNet Host. Link Group may include five additional HMS members, including up to three LQ devices for a maximum of six HMS**/LQ in Link Group. HMS** link using HLI-ET2 or HLI-FBS modules over LAN/WAN connections. Link Group supports up to 64 endpoints (station/port).

Note: HMS** does not link to Arcadia.

Channels

System provides 12 or 24 intercom channels assignable to any user station or port in the system. Four Channels can be assigned to station. Program Audio can be associated with any channel with independent endpoint level control.

Roles

99 Roles for naming and dynamic configuration of user station settings. Role can be applied to multiple user stations

Licenses

Host: HMS-4X**
Activation: Generated to unique HMS-4X** device System ID
Transferable: No, fixed to HMS-4X**
Recovery: Yes, by Clear-Com Support or Service Center

Permanent Licenses

Part numbers: HMS-24-UG
Capability: 24 Channels
Validity: Perpetuity

Connectors

XLR Powerline: (2) 3-pin XLR-M/F
Gooseneck Mic: 3-pin Tuchel
Headset: 4-pin XLR–M
Program Audio: 3-pin XLR–F
Stage Announce: 3-pin XLR–M
Hot Mic/IFB Interface: 1/4" (6.35 mm) TRS Jack
GPIO: 25-pin D-type female (4 GPI, 4 GPO, 5V)
USB: Type A & Micro AB (factory service use)
Input Power Connector: IEC-C14

Microphone Pre-amplifier

Headset Mic Impedance: 200Ω (Dynamic)
Headset Mic Voltage: 1.7V (Electret selectable)
Limiter: +23dB

Route to 4-wire output at 0dBu:
Mic Gain: 60dB (Dynamic), 45dB (Electret)
Frequency Response: 200Hz – 10 kHz ±3dB
Distortion: <0.2% THD @ 1kHz
Noise: <-55dBu (Dynamic), <-65dBu (Electret)

Headphone Amplifier

Load Impedance: >32Ω
Output Level: +12dBu before clipping
Sidetone: -12dB (selectable)

Route from a 4-wire input at 0dBu:
Max Gain: 0dB
Frequency Response: 40Hz - 10kHz ±3dB
Distortion: <0.1% THD @ 1kHz
Noise: <-65dBu
Headphone Limiter: 0dB (selectable)

Loudspeaker Amplifier

Load Impedance: 8Ω
Output Level: +18dBu before clipping

Route from a 4-wire input at 0dBu:
Max Gain: 18dB
Frequency Response: 200Hz - 10kHz ±3dB
Distortion: <0.1% THD @ 1kHz
Noise: <-50dBu

Program Audio Line Input

Maximum Level Before Clipping: +18dBu
Nominal Input Level: 0dBu (selectable)
Input Impedance: >= 10KΩ

Route to 4-wire output at 0dBu:
Frequency Response: 20Hz - 10kHz ±3dB
Distortion: <0.2% THD @ 1kHz
Noise: <-65dBu

Stage Announce Output

Maximum Level Before Clipping: +18dBu
Nominal Output Level: 0dBu (selectable)
Output Impedance: <= 100Ω

Route from a dynamic headset:
Frequency Response: 300Hz - 12kHz ±3dB
Distortion: <0.1% THD @ 1kHz
Noise: <-55dBu

Hot Mic Output

Maximum Level Before Clipping: +12dBu
Nominal Output Level: 0dBu (selectable)
Output Impedance: <= 100Ω

Route from a dynamic headset:
Frequency Response: 300Hz - 12kHz ±3dB
Distortion: <0.2% THD @ 1kHz
Noise: <-55dBu

Powerline

Two independent network XLR Powerlines
Frequency Modulated Ethernet - OFDM
Output Voltage: ±29.5V DC
Output Current (Max): 1.5A per Powerline
Frequency: 100kHz-25MHz
Requires shielding integrity between Powerlines
Support up to 10 beltpacks each
Support up to 3-10 stations each

Use HelixNet Cable Calculator to validate load and cable distance.

Logic Power Output

To power Logic Inputs
Output Voltage: 5V, separate pin
Current (Max): 1mA

Logic Inputs - GPI

Assignable to talk, call, mic and headset keys
Input: 4
Style: Optically isolated
Detection Voltage (Min): 3V
Input Voltage (Max): 5V

Logic Outputs – GPO/Relay

Assignable to talk, call, SA keys and channel events
Outputs: 4
Style: Power Relay
Normalized: Open or Closed, separate pins
Switching Voltage (Max): 30V
Switching Current (Max): 2A

Power

Input Frequency Range: 100 - 240V AC
Input Frequency Range: 50 - 60Hz
Power (Max): 250W
Input Power Connector: IEC-C14

Practical Power Range:
Power (Normal): 80-250W
BTU (Normal): 275-850BTU/hr
Dependent on hosted modules and powerline connected beltpacks

Environmental

32° - +104°F (0 - +40ºC)
90% relative humidity

Dimensions

1RU, 1.75 x 19 x 13in (HxWxD)
(44 x 483 x 320mm)

Weight

5.83lbs (2.65kg)

Network Specifications

(Firmware Version 4.2+)

Network Protocols

Ethernet IPv4–Unicast Audio and Control
mDNS–Multicast Device Discovery
Layer 3 routable with mDNS function
limitations
HTTP–Management
TFTP–File Transport Protocol
NTP-Network Time Protocol
RTP–Audio Transport
WavPack–Audio Codec

Network Ports

Unicast:
Port 69 UDP–Firmware File Server
Port 80 TCP–Web Interface, System
Management, Expansion
Port 123 UDP–Time Stamps for Service Logs
Port 655 TCP–Link Group Audio/Database
Port 6001 TCP–System Management
Port 6001 UDP–Audio Streams

Multicast:
Port 5353 UDP–mDNS, Names, Discovery,
Linking, Expansion
Optional for device names and linking
Mandatory for HMS/HRM Expansion

Network Parameters

HMS-4X/Link Group Endpoint Support:** 64
Endpoints are user stations, active Interface
ports, Program Audio inputs and LQ accounts.

Bandwidth:
300 kbps each audio input linking between
HMS**/LQ
Link Group audio sent dynamically between
members
300-600 (max) kbps from each endpoint audio
input to HMS**
1200-2400 (max) kbps from HMS to each
endpoint audio output

Network Jitter Tolerance:
<= 128ms jitter buffer per audio stream receiver
automatically adjusted to network performance

QoS Tags:
DSCP=41, Assured Forwarding (AF)

Link-Local Default IP Address Range:
169.254.0.0/16

System Reserved IP Ranges:
10.0.0.0/8 for endpoints
172.23.0.0/16 for Link Group

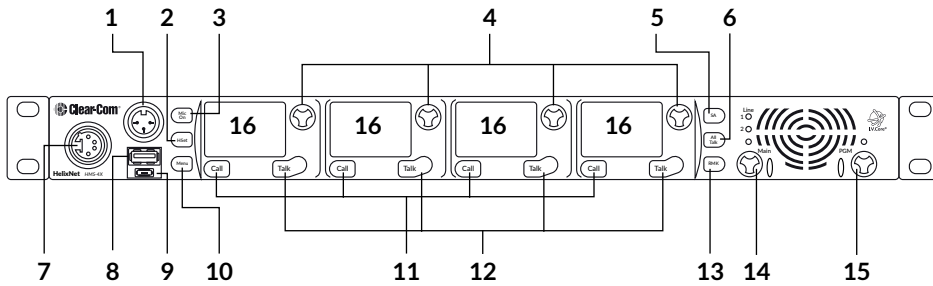### Recommended Ethernet Switches

- Managed Ethernet Switch – Layer 3
- 100/1000 Base-T ports for endpoints
- 1000 Base IP Trunks between switches
- QoS Configuration
- Energy Efficient Ethernet bypass option
- IGMP Snooping bypass option

Please refer to the Clear-Com HelixNet
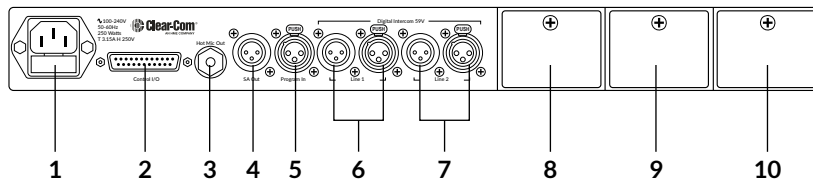Network Guide for additional switch settings
and network characteristics

![Clear-Com logo](AN HME COMPANY)

Front

Back

Legend

Front
1. Microphone connector
2. Headset Mic enabled
3. Mic Key enabled
4. Rotary Level/menu key
5. Stage Announce
6. All Talk
7. Headset connector
8. USB 2.0 connector
9. Micro USB 2.0 connector
10. Menu key
11. Call key
12. Talk key
13. Remote Mic Kill
14. Speaker/Headphone volume control
15. Program volume control
16. Menu keyset display

Back
1. Universal Power Socket (fused)
2. GPIO DB25, control inputs and outputs
3. Hot Mic output - 1/4" TRS
4. Stage Announce line out
5. Program input
6. XLR Powerline 1
7. XLR Powerline 2
8. Option Module Slot 1
9. Option Module Slot 2
10. Option Module Slot 3

Order Code

HMS-4X**

HMS-24-UG: 24-channel license

Optional Interface Modules and SFPs (Sold Separately):
HLI-2W2: 2-wire module
HLI-4W2: 4-wire module
HLI-ET2: Ethernet module
HLI-FBS: Fiber module
HLI-MMFO: Single-mode SFP
HLI-SMFO: Multi-mode SFP

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