



Arcadia Central Station

Arcadia Central Station

Intercom System Core

Key Features and Benefits

Arcadia Central Station

- Combined Wired and Wireless Intercom
- Keypanels with Essential feature set
- I.V. Direct Clear-Com Global Interfacing
 - LQ
 - Eclipse E-IPA
 - Arcadia
- Local Dante and Analog Interfacing
- CCM™ browser setup, configuration & monitoring
- Scalable Licensed Port capacity
- Front panel color touch screen with encoders for control and configuration
- Plug-and-go central discovery and pairing

Capacity

- FreeSpeak Wireless Intercom
 - (10) E1 Transceivers (1.9¹, 2.4 GHz)
 - (32) IP Transceivers (1.9¹, 5 GHz)
 - (64) Beltpacks² (1.9¹, 2.4, 5 GHz)
- HelixNet Wired Intercom
 - (≤24) Enabled Channels^{2,3}
 - (24) Powerline Devices
 - (128) User Stations (Beltpack, Speaker- & Remote)
- V-Series⁴ Keypanel Essential Features
 - (32) AES67 Connected^{2,4,5}
 - (≤32) I.V. Connected^{2,3}
- I.V. Direct Clear-Com Interface
 - (≤32) I.V. Direct Ports^{2,3}
- Dante Audio Network Interfaces
 - (64) Dante Ports²

Configuration

- (200) Licensed Ports²
 - FreeSpeak Beltpack
 - HelixNet Enabled Channel
 - V-Series Keypanel
 - I.V. Direct Port
 - Dante Port
- (100) Channels
- (100) Groups
- (100) IFB⁵
- (300⁵) Roles: FreeSpeak, HelixNet & V-Series

Connectivity

- (8) 4-Wire - 1 for PGM/SA
- (4) 2-Wire - 560mA per pair
- (2) GPI Optically Isolated
- (4) GPO Relay
- (2) FreeSpeak E1 - RJ45/SFP switchable
- (4) LAN - (2) RJ45, (2) SFP;
Assignability to management (with HelixNet & I.V. Connectivity), AES67/AoIP, Dante Primary & Secondary

Arcadia® Central Station is a scalable intercom system core with FreeSpeak® wireless, HelixNet® wired, and V-Series IrisX keypanel user stations along with I.V. Direct, Dante, 2-Wire, 4-Wire and GPIO interfaces in 1RU.

Description

Arcadia Central Station is an intercom system core supporting all types of intercom user stations from FreeSpeak Wireless Beltpacks, HelixNet Wired Stations, V-Series Keypanels, to 2-wire analog partyline. Coupled with Clear-Com's LQ, I.V. Direct, Dante and analog interfacing of audio and control, Arcadia fits infrastructure, locally and globally. Arcadia's CCM browser configured Essential features are optimized for efficient intercom deployments, right sized with licensing & field upgrades as needs grow.

Technical Specifications

Licenses

Delivery: License Ticket, may include multiple licenses

License Host: Arcadia

Activation: Via CCM, Online (recommended) or Offline

Transferable: No, fixed to Arcadia

Recovery: Yes, by Clear-Com Support or Service Center

Permanent Licenses

Part number: ARCADIA-8P-LIC, ARCADIA-16P-LIC

Capability: Additional 8 or 16 Licensed Port Upgrade Option

Validity: Perpetuity. Does not expire

Note: Licensed Port capacity is ordered with Arcadia. ARCADIA-8P-LIC and ARCADIA-16P-LIC allow upgrade of Arcadia capacity in the field.

Connectors

Headset: 4-pin XLR-M (X4), 5-pin XLR-F (X5)

Gooseneck Microphone: ¼" TRS 7/16UNF-2A Threaded

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.

¹1.9 GHz E1 and IPT transceivers should not overlap on the same system. Beltpacks will not roam between E1 and IPT Transceivers.

²Requires Arcadia with sufficient number of Licensed Ports

³Dependent on Device Allocation

⁴V-Series Iris and IrisX keypanels fully support all Arcadia features while original V-Series has limited support using I.V. ports. Non-Iris desktop panels can be configured using the 12 key 1RU Role layout. Non-Iris cannot be upgraded from Arcadia, requiring alternative methods. Expansion panels are not supported on Arcadia.

⁵Available in Arcadia R4.1

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Technical Specifications (Continued)

Controls and Indicators

Front Panel:

- (2) Color Touch Screen Displays
- (2) Power Supply Status LED
- (1) Mic mute button
- (1) Headset/Gooseneck Mic Input Select button
- (1) Menu Access Button
- (1) FN Button – For future use
- (4) Encoders for Menu & Level Control
- (1) Reset button - For service use
- (1) Speaker Mute LED
- (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 ± 3 dB

Mic Limiter Threshold: -35dBu ± 3 dB

Mic Limiter Range: ≥ 20 dB

Loudspeaker and Amplifier

Speaker: 1.6 x 2.8"

Load: 4 Ω

Max Speaker Level: 87dB ± 2 dB SPL A at 3ft/1m

Frequency Response: 100Hz - 10kHz

Max Output Level before 1% Distortion: 18dBu ± 2 dB

Total Harmonic Distortion (THD): $< 0.5\%$ THD at 1kHz

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 ± 3 dB

Impedance: ≥ 10 K Ω

Output:

Nominal Level: 0dBu (adjustable -12dB to +12dB)

Maximum Level: +18dBu

Frequency Response: 80Hz to 20kHz ± 3 dB

Impedance: 200 Ω + 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: > 60 dB at 1kHz

Nominal Level: CC: -18dBu, RTS-TW: -12dBu (adjustable -3dB to +3dB)

Headroom: 18dB

Frequency Response: 200Hz to 12kHz. ± 3 dB

Impedance: ≥ 10 K Ω 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 [Encode Partyline Power Calculator](#) to validate power requirements of the analog partyline intercom system

Frequency Response

Headset Mic: 200Hz to 12kHz

Gooseneck Mic: 200Hz to 12kHz

Speaker: 100Hz to 10kHz

FreeSpeak Edge: 200Hz to 12kHz

FreeSpeak II & Icon: 200Hz to 7.1kHz

HelixNet: 200Hz to 10kHz

V-Series (AES67): 20Hz-20kHz

V-Series (I.V. Port): 50Hz-7.1kHz

I.V. Direct: 50Hz 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: ≥ 1.2 mA 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

Technical Specifications (Continued)

Power

AC Internal Power Supply:

Input Voltage 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 \pm 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 \pm 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)

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Network Specifications | Firmware Release 4+

Arcadia 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 and License Activation

Network Protocols

Ethernet IPv4–Unicast Control
DCHP–Dynamic IP Addressing
mDNS–Multicast Device Discovery
HTTP–Management
HTTPS–Secured Management
NTP–Network Time Protocol

Network Ports

Unicast:

Ports 67, 68 UDP–Dynamic IP Addressing
Port 80 TCP–Web Interface, System Management
Port 123 UDP–Time Stamps for Service Logs
Port 443 TCP - Secured Web interface, System Management
Port 22350 TCP – Online License Activation

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 Arcadia 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

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Network Specifications | Firmware Release 4+

Arcadia 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.

AES67

For FreeSpeak IP Transceivers and V-Series Iris Keypanels

Network Protocols

Ethernet IPv4 – Unicast Audio & Control
DCHP – Dynamic IP Addressing
mDNS – Multicast Device Discovery
Layer 2 Non-Routable
HTTP – Management
PCM – Audio Codec to Transceivers and Keypanels
DiffServ – QoS
IGMPv3 – Multicast Management
PTPv2 – Synchronization
SAP – Session Announce Protocol
RTSP – Real Time Streaming Protocol
SDP – Session Description Protocol
RTP – Real Time Protocol

Network Ports

Unicast:

Ports 67, 68 UDP – Dynamic IP Addressing
Port 6001 TCP – System Connection
Port 9875 UDP – SAP/SDP advertisement
Port 15000-15525 UDP – Audio Media

Multicast:

IP 224.0.1.129 Ports 319, 320 – PTP Synchronization
IP 224.0.0.251 Port 5353 UDP – mDNS, Names, Discovery, Pairing

Network Parameters

FS IP Transceiver Support: 32

V-Series Iris Keypanel Support: 32

PTP Leader: 20 PTP Followers. Use external PTP Leader for larger systems.

Bandwidth:

FS II IPT Transceiver: ~7 Mbps (max) each

FS Edge Transceiver: ~ 9.6Mbps (max) each

V-Series Iris Keypanel: ~ 5 Mbs (max) each

Network Jitter Tolerance

FS IP Tranceivers: < 1μs required for RF Synchronization

V-Series Iris Keypanel: < 2ms @ 125μs package

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)

Sync: PTP v2 (IEEE 1588-2) (target offset ±100 ns)

PTP domain: 0

Priority 1: 127

Priority 2: 128

Announce interval: +1 (2s) (1/2s)

Sync Rate: -3 (125ms) (1/8s)

Package Size: 125μs

MTU: Jumbo frames ≥ 9000 bytes (recommended)

Media Profile: AES67

IGMP: Snooping Enabled & Querier on Network

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.

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Network Specifications | Firmware Release 4+ (Continued)

HelixNet

For Networked Partyline Intercom

Network Protocols

Ethernet IPv4–Unicast Audio & Control

DCHP–Dynamic IP Addressing

mDNS–Multicast Device Discovery

Layer 3 routable with mDNS function limitations

HTTP–Management

TFTP–File Transport Protocol

NTP–Network Time Protocol

I.V. Core–Decentralized Network Routing & Mixing

IVP–Proprietary intercom Audio and Control

WavPack–Audio Codec

Network Ports

Unicast:

Ports 67, 68 UDP–Dynamic IP Addressing

Port 69 UDP–Firmware File Server

Port 80 TCP–Web Interface, System Management, Expansion

Port 123 UDP–Time Stamps for Service Logs

Port 6001 TCP–System Management

Port 6001 UDP–Audio Streams

Multicast:

Port 5353 UDP–mDNS, Names, Discovery, Pairing, Expansion

Optional for device names and pairing; Mandatory for RM Expansion

Network Parameters

HelixNet User Station Support: 128

Bandwidth:

300–600 (max) kbps from each HelixNet User Station

1200–2400 (max) kbps from Arcadia to each HelixNet User Station

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

QoS Tags: DSCP=34, Assured Forwarding (AF41)

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: Fixed to Management LAN port. Possible combinations on physical LAN ports is pending a future Arcadia release. Contact Clear-Com.

Further Details: Refer to the [HelixNet Network Guide](#) for further information

I.V. Port

For Clear-Com Device Interconnectivity over LAN/WAN/Internet

Network Protocols

Ethernet IPv4–Unicast Audio & Control

DCHP–Dynamic IP Addressing

Layer 3–IP Routable

DNS–Domain Name Server

IVP–Proprietary intercom Audio and Control

G722–Audio Codec

AES-128–Audio and Control Encryption

Network Connectivity: Ethernet, Wi-Fi, 3G, 4G, LTE (as available on 3rd-party infrastructure)

Network Ports

Unicast:

Ports 67, 68 UDP–Dynamic IP Addressing

Ports 6001 (configurable as caller) TCP–System Management

Port 6001 (configurable as caller) UDP–IVP Audio Streams

Ports 6002 (fixed) TCP–System from LQ, V-Series, E-IPA, Arcadia

Port 6002 (fixed) UDP–IVP Audio from LQ, V-Series, E-IPA, Arcadia

Multicast:

No multicast ports are used for I.V. Port

Audio

Audio Encoding: G.722 Fixed Wideband 7kHz within 64kbit/s

Frequency Response: 50Hz–7kHz

Silence Suppression: Optional in LAN & WAN modes. Enabled in Internet mode.

Network Parameters

Resource Use:

Arcadia: 1 Licensed Port

Eclipse: 1 Port on IPA/IVC card

LQ: 4 (See LQ Resource Estimator)

Bandwidth:

140 kbps to/from Arcadia

With far-end silence suppression & bi-directional forward error correction

Package size:

LAN: 8ms

WAN: 24ms

Internet: 40ms

Network Jitter Tolerance: Rx: Selectable

LAN: ≤ 12 ms

WAN: ≤ 120 ms

Internet: ≤ 200 ms

Forward Error Correction: Enabled in Internet mode

Encryption: AES-128 enabled in WAN & Internet modes

QoS Tags: DSCP=34, Assured Forwarding (AF41)

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: Fixed to Management LAN port. Possible combinations on physical LAN ports is pending a future Arcadia release. Contact Clear-Com.

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Network Specifications | Firmware Release 4+ (Continued)

Dante (Firmware Version 4.2)

For 3rd Party Audio Networking

Network Protocols

Ethernet IPv4-Unicast/Multicast Audio & Control

DCHP-Dynamic IP Addressing

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 67, 68 UDP-Dynamic IP Addressing

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, Control (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.

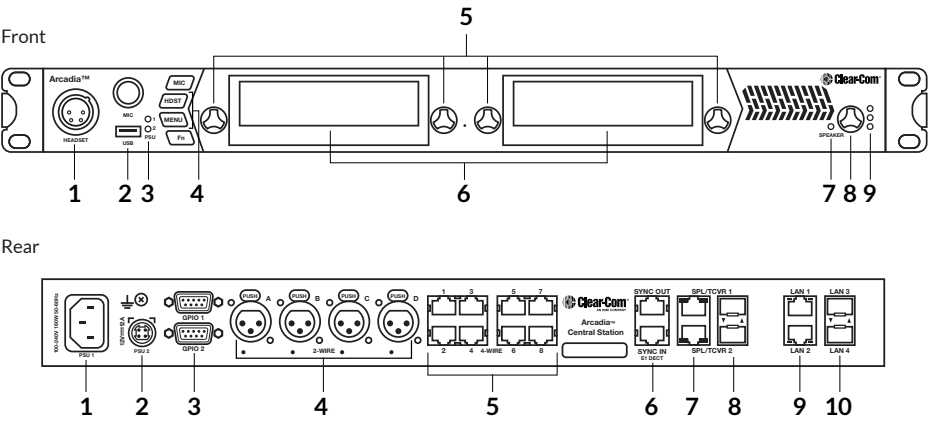
Primary and Secondary cannot be assigned to same physical LAN port.

Further Details:

Refer to documentation from [Audinate](#) for further information.

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Legend

Front

1. XLR Headset Connector
 - 4-pin XLR-M (Arcadia-X4 only)
 - 5-pin XLR-F (Arcadia -X5 only)
2. USB A
3. PSU LED indicators
4. Microphone, Headset, Menu and Function keys
5. Rotary encoders
6. Touchscreen displays
7. Speaker mute 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

With 4-pin Headset Connector

ARCADIA-X4-16P
ARCADIA-X4-32P
ARCADIA-X4-48P
ARCADIA-X4-64P
ARCADIA-X4-80P
ARCADIA-X4-96P
ARCADIA-X4-112P
ARCADIA-X4-128P
ARCADIA-X4-144P
ARCADIA-X4-160P
ARCADIA-X4-176P
ARCADIA-X4-192P
ARCADIA-X4-200P

With 5-pin Headset Connector

ARCADIA-X5-16P
ARCADIA-X5-32P
ARCADIA-X5-48P
ARCADIA-X5-64P
ARCADIA-X5-80P
ARCADIA-X5-96P
ARCADIA-X5-112P
ARCADIA-X5-128P
ARCADIA-X5-144P
ARCADIA-X5-160P
ARCADIA-X5-176P
ARCADIA-X5-192P
ARCADIA-X5-200P

Includes:

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

Licensed Port Upgrades

ARCADIA-8P-LIC
ARCADIA-16P-LIC

Optional Parts

GN-250-TRS: Gooseneck Microphone Short
GN-450-TRS: Gooseneck Microphone Long
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

