



Arcadia Central Station

Integrated Platform

Key Features and Benefits

Arcadia Central Station

- Combined Wired and Wireless Intercom
- 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 Channels²
 (24) Powerline Devices
 (128) User Stations (Beltpack, Speaker-& Remote)
- I.V. Direct Clear-Com Interface (16) I.V. Direct Ports²
- Dante Audio Network Interfaces
 (64) Dante Ports²

Configuration

- (168) Licensed Ports²
- FreeSpeak Beltpack
- HelixNet Enabled Channel
- I.V. Direct Port
- Dante Port
- (100) Channels
- (100) Groups
- (200) Roles for FreeSpeak & HelixNet

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 (with HelixNet & I.V. Direct), AES67, Dante Primary & Secondary

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

Description

Arcadia Central Station is the centerpiece of a scalable IP networked intercom platform with support for more than 192 wired and wireless intercom user stations of various form factors, frequencies and connectivity. Coupled with Clear-Com's I.V. Direct, Dante and analog interfacing of audio and control, Arcadia is suitable for any infrastructure locally and globally. Arcadia's compact 1RU form factor is capable of mixing 285 audio signals, features front panel intercom user station, fast and easy setup, configuration and monitoring. With the ability to grow in capacity and features over time, Arcadia is the ideal intercom system.

Technical Specifications

Capacity

FreeSpeak Wireless Intercom (10) E1 Transceivers (1.9¹, 2.4 GHz) (32) IP Transceivers (1.9¹, 5GHz) (64) Beltpacks² (1.9, 2.4, 5GHz)

HelixNet Wired Intercom

(24) Enabled Channels²
(24) Powerline Devices
(128) User Station (Remote Stations, Speaker Stations, Beltpacks)

I.V. Direct Clear-Com Interfaces (16) I.V. Direct Ports²

Dante Audio Network Interfaces (64) Dante Ports²

- Configuration
- (168) Licensed Ports²FreeSpeak Beltpack
- Freespeak Beilpack
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- HelixNet Enabled Channel, accessible by multiple HelixNet User Stations
- I.V. Direct Interface Port
- Dante Interface Port
- (100) Channels (100) Groups
- (200) Roles for FreeSpeak & HelixNet

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.

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.

Technical Specifications (Continued)

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)
FreeSpeakII 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 <u>SFP Compatibility Chart</u> for compatible SFP transceivers.

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 ±3dB Mic Limiter Threshold: -35dBu ±3dB Mic Limiter Range: ≥ 20dB

Loudspeaker and Amplifier

Speaker: 1.6×2.8 " Load: 4Ω Max Speaker Level: $87dB \pm 2dB$ SPL A at 3ft/1mFrequency Response: 100Hz - 10kHzMax Output Level before 1% Distortion: $18dBu \pm 2dB$ Total Harmonic Distortion (THD): < 0.5% THD at 1kHz

4-Wire Line Level Interfaces:

Transformer balanced input and output Input: Nominal Level: OdBu (adjustable -12dB to +12dB) Maximum Level: ± 18 dBu Frequency Response: 80Hz to 20kHz ± 3 dB Impedance: $\geq = 10$ K Ω Output: Nominal Level: 0dBu (adjustable ± 12 dB to ± 12 dB) Maximum Level: ± 18 dBu Frequency Response: 80Hz to 20kHz ± 3 dB Impedance: 200 Ω $\pm 10\%$

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 <u>Encore Partyline Power Calculator</u> 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: 200Hz to 7.1kHz HelixNet: 200Hz to 10kHz 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: >=1.2mA 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

Integrated Platform

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 ± 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)

Integrated Platform

Network Specifications | Firmware Release 3+

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 mDNS–Multicast Device Discovery HTTP–Management HTTPS–Secured Management NTP-Network Time Protocol

Network Ports

Unicast:

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 - Layer 3

- 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 3 routable with limitations 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: 32

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

Sync Rate: 8/s 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 <u>AES67 Network Recommendations</u> for further information, for network performance and use on converged networks.

Network Specifications | Firmware Release 3+ (Continued)

HelixNet

For Networked Partyline Intercom

Network Protocols

Ethernet IPv4-Unicast Audio & Control 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:

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 HRM 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: <= 128ms 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 <u>HelixNet Network Guide</u> for further information

I.V. Direct

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

Network Protocols

Ethernet IPv4-Unicast Audio & Control 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 6001 (configurable as caller) TCP-System Management Port 6001 (configurable as caller) UDP-IVP Audio Streams Ports 6002 (fixed) TCP-System Management incoming from LQ Port 6002 (fixed) UDP-IVP Audio Streams incoming from LQ

Multicast:

No multicast ports are used for I.V. Direct

Audio

Audio Encoding: G.722 Fixed Wideband 7kHz within 64kbit/s Frequency Response: 50Hz-7kHz

 $\ensuremath{\textbf{Signaling:}}\xspace$ Call Signal & Virtual GPIO (Control Events) when connecting to LQ

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: <=12ms WAN: <= 120ms Internet: <=200ms

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.

Integrated Platform

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, 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.

Integrated Platform



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

Includes:

Four-Wire PGM/SA Breakout
 Cable (CAB-RJ45-PGM-SA)
 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-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

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-X4-168P



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-X5-128P ARCADIA-X5-160P ARCADIA-X5-168P

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

WARNING: Cancer and Reproductive Harm - www.P65Warnings.CA.Gov