



Lode Audio Servers
Technical Documentation & Installation Guide

TOC

<u>LA4 TECHNICAL OVERVIEW</u>	4
DIMENSIONS	4
POWER AND HEAT	4
OUTPUTS	4
<u>LA4D TECHNICAL OVERVIEW</u>	5
DIMENSIONS	5
POWER AND HEAT	5
OUTPUTS	5
<u>LA2D TECHNICAL OVERVIEW</u>	6
DIMENSIONS	6
POWER AND HEAT	6
OUTPUTS	6
<u>LA1 TECHNICAL OVERVIEW</u>	7
DIMENSIONS	7
POWER AND HEAT	7
OUTPUTS	7
<u>STREAMING AND LOCAL MEDIA</u>	8
SUPPORTED STREAMING SERVICES	8
SUPPORTED FILE FORMATS	8
<u>CONTROL SYSTEM INTEGRATIONS</u>	8
<u>NATIVE CONTROL APPLICATIONS</u>	8
<u>INSTALLATION GUIDE</u>	10
WEB CONFIGURATION	10
CHANGE NETWORK SETTINGS.....	11
LODENET PROTOCOL CONFIGURATION	11
ENABLING MUSIC SERVICES.....	12
CUSTOM ROOT MENUS	13
CONFIGURING STREAM LINKS	13
INDEXING A NETWORK SHARE	14
PLAYER SETTINGS.....	16
AIRPLAY CONFIGURATION.....	17
DISABLE TRACK PROGRESS.....	17
<u>PORTS AND ENCODING</u>	18
CHARACTER ENCODING	18
BROADCAST DISCOVERY.....	18
LODE MESH	18
LODENET STREAMING.....	18
<u>PRODUCT SUPPORT</u>	19

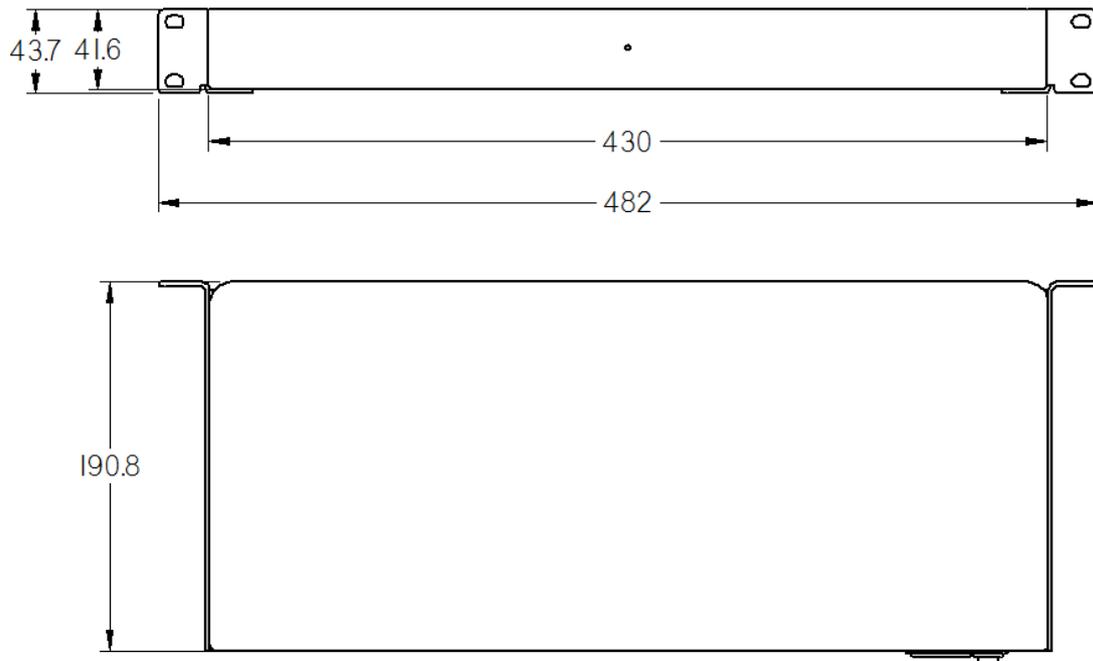
FACTORY RESET	19
REQUESTING SUPPORT	19

LA4 Technical Overview

Overview

1U rack mount 4 zone analogue output audio server.

Dimensions



Weight: 5KG

Power and Heat

Power Consumption: 35W
Current: 5amp
BTU/HR: 180(max)
120-230v IEC power supply

Outputs

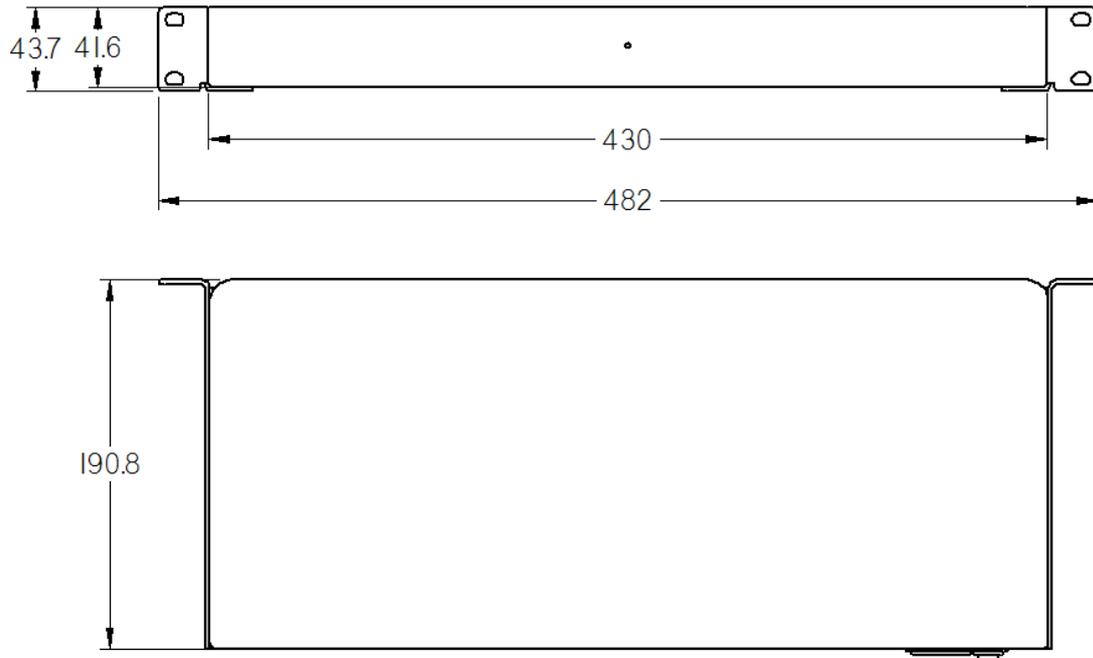
1 X Stereo RCA output per zone, 4 in total.

LA4D Technical Overview

Overview

1U rack mount 4 zone analogue and digital output audio server.

Dimensions



Weight: 4.6 KG

Power and Heat

Power Consumption: 20W
Current: 5amp
BTU/HR: 80(max)
120-230v IEC power supply

Outputs

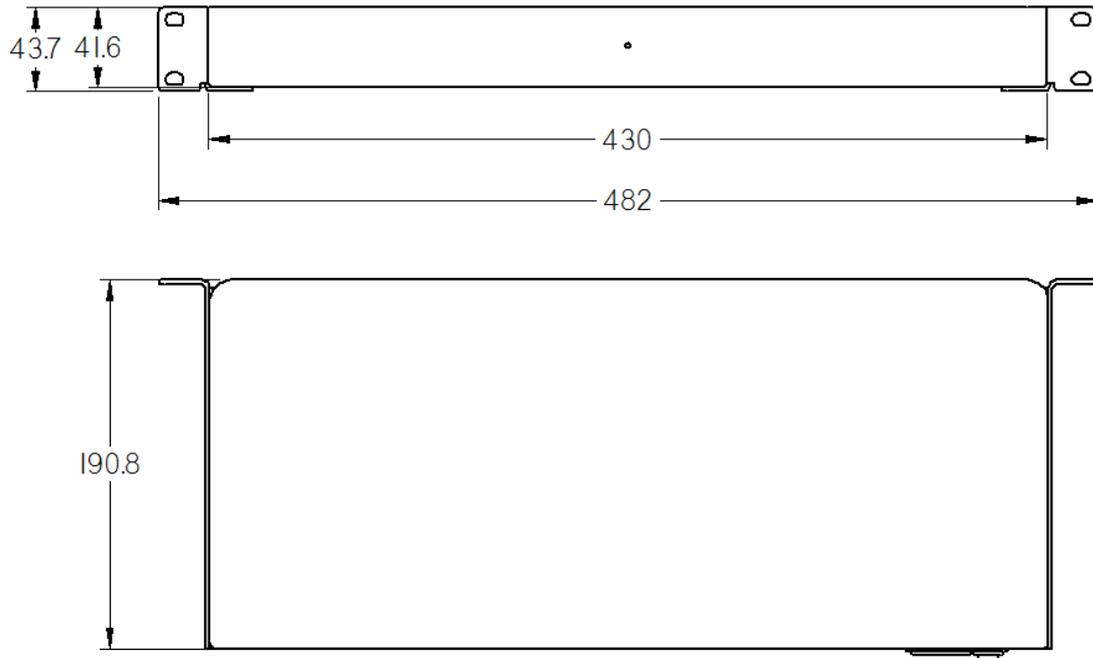
1 X Stereo RCA, Optical and Coaxial output per zone.

LA2D Technical Overview

Overview

1U rack mount 2 zone analogue and digital output audio server.

Dimensions



Weight: 4.4 KG

Power and Heat

Power Consumption: 20W
Current: 5amp
BTU/HR: 80(max)
120-230v IEC power supply

Outputs

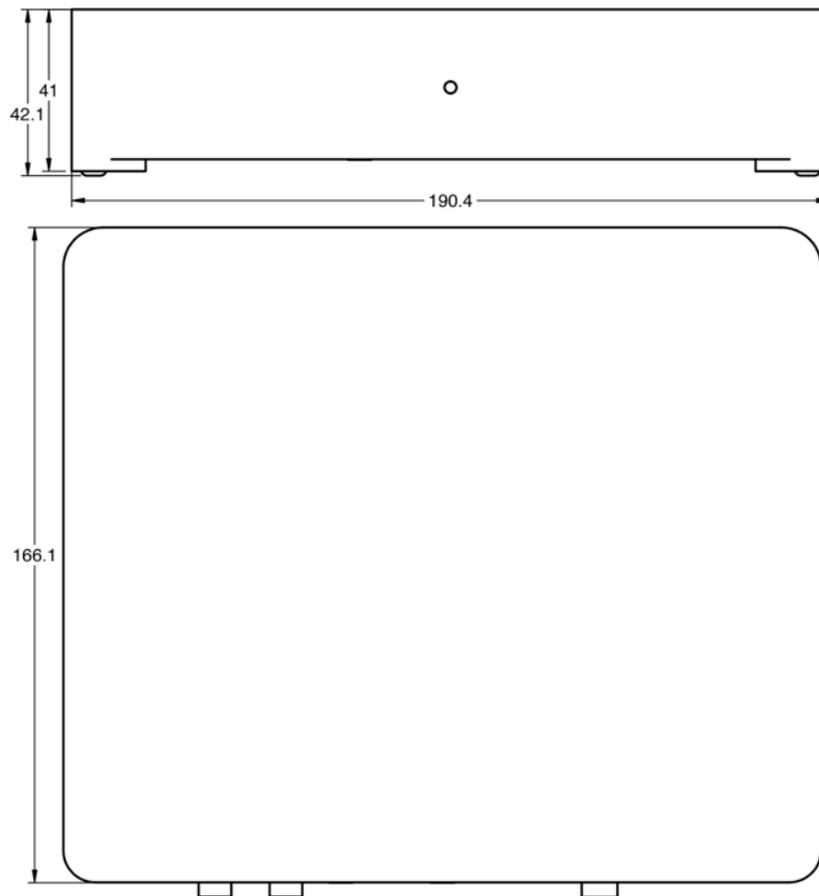
1 X Stereo RCA, Optical and Coaxial output per zone.

LA1 Technical Overview

Overview

Half U 1 zone analogue output audio server.

Dimensions



Weight: 1.4 KG

Power and Heat

Power Consumption: 20W
Current: 5amp
BTU/HR: 80(max)
120-230v IEC power supply

Outputs

1 X Stereo RCA output per zone, 4 in total.

Streaming and Local Media

Supported Streaming Services

As of the 1st March 2017.

- TIDAL™
- Tunein™ Internet radio
- SoundCloud™
- Soundmachine™
- Hotel Radio FM™
- Deezer™
- Napster™
- Local music library integration - multiple libraries
- iTunes playlists importing
- AirPlay per zone *includes extended functionality
- Spotify™ (Connect coming soon)
- Custom HTTP and HTTPS stream urls

Supported file formats

- Playback of MP3, M4P, M4A, Flac, WAV, AAC

Control System Integrations

As of the 1st March 2017. Please check our website for updates to this guide and updated integration list.

- Crestron - Media Player and Standard Driver
- AMX
- Control4
- RTI
- Command Fusion
- Elan

Native Control Applications

- iOS
- Android
- Windows Desktop
- OSX Desktop

About LODENET™

All Lode Servers are powered by LODENET™.

Lode's proprietary LODENET™ protocol enables synchronised, high-definition & low latency audio-over-IP playback.

LODENET™ works as an audio matrix over the network, allowing users to group zones for synchronized playback of content (party mode) and conveniently control volume for the main and also individual zones, without the need of an external matrix.

Lode can be scaled up to 64 zones on a network without the need for a hardware audio matrix. Synchronisation of playback is guaranteed; there can be no drift over time.

Installation Guide

Lode servers are machined from aluminium, which acts as the heat sink, eliminating noisy fans and so increasing performance and reliability. This also means that the unit **MUST HAVE** airflow both above and beneath for optimum cooling levels. Failure to provide may result in the unit overheating and degrading performance.

On Boot, Lode servers will perform a number of checks over the internet to configure itself and check for updates. **Please allow a couple of minutes** for unit/s to complete checks prior to playing audio streams otherwise it may result in playback of multiple zones being out of sync.

Check “system maintenance” section of the web console and apply any pending updates to the server/s.

Web Configuration

All Lode Server settings are configured via the Admin Web Console. To access the web console, you will need to know the IP address of the Lode unit.

By default the unit ships with DHCP enabled.

Lode units can be discovered on the network using the Lode admin tool downloaded from <http://www.lodeaudio.com>.

If you don't have admin tool installed, you will need to ascertain it's IP address via the DHCP sever.

Click on listed sever to access the web console.

Example: <http://192.168.10.100> where 192.168.10.100 is the address provided to the Lode server.

It is recommended that each unit is set-up fully before adding others to the network

Change Network Settings

To change network settings, simply visit the “Network Settings” section of the web console.

Here you can set the unit’s IP address or confirm it’s configuration for DHCP.

If you are using a control system to control Lode, then you must either statically assign an IP address to the unit or use IP allocation rules within the DHCP server to ensure that the unit has a static IP address. This is required, as the set-up of the driver requires pointing the module at the IP address of the Lode Server.

The screenshot shows the 'Network Configuration' page in a web console. At the top, there is a navigation bar with tabs: Status Page, Network Settings (highlighted), Media Library, Player Settings, Advanced Settings, System Maintenance, and Diagnostics. Below the navigation bar, the page title 'Network Configuration' is displayed. The main content area contains a DHCP configuration section with a checkbox for 'DHCP' which is currently unchecked. Below this, there are input fields for 'IP Address' (192.168.0.221), 'Subnet' (255.255.255.0), 'Gateway' (192.168.0.1), 'DNS1' (8.8.8.8), and 'DNS2' (8.8.4.4). A 'Submit' button is located at the bottom right of the form.

LODENET Protocol Configuration

By default LODENET uses UDP Unicast for synchronizing audio streams, which will support up to 64 zones on a network. This can be changed to UDP Multicast mode to enable support for up to 256 zones.

Multicast filtering must be enabled on the VLAN for this to function correctly.

To change the LODENET Protocol, visit the “Network Settings” section of the web console.

The screenshot shows the 'Protocol Configuration' page in a web console. The page title 'Protocol Configuration' is displayed at the top. Below the title, there is a descriptive text: 'Set the transport protocol for Lode's audio distribuion below. Default is unicast, if using multicast, please ensure that multicast filtering is enabled on your network.' Below this text, there is a dropdown menu labeled 'Lodenet Transport Protocol' with 'UDP Unicast' selected. A 'Submit' button is located at the bottom right of the form.

System Boot Delay

If this device is connected to switches that take a few minutes to boot in event of power failure, you can set a boot delay for Lode within the “Network Settings” section of the web console.

System Boot Delay

If this device is connected to switches that take a few minutes to boot in event of power failure, you can set a boot delay for Lode below.

System Boot Delay

- ✓ No Delay
- 30 seconds
- 1 minute
- 2 minutes
- 5 minutes
- 10 minutes

Enabling Music Services

From the “Media Library” section of the web console, simply select to “enable” or “disable” a service. If a service requires authentication, you will be asked for the Login and password.

Once successfully registered, the service will appear in controllers.

Status Page Network Settings **Media Library** Player Settings Advanced Settings System Maintenance Diagnostics

Configure Tidal

This service requires authentication via username and password. Please supply the user credentials for this service and click "Login / Add", if the service can be authenticated it will be added to the list of available services.

Please also ensure that you have the correct type of account for use of this streaming service with third party devices.

Username:

Password:

Custom Root Menus

The Lode Servers offer the ability to create custom menus for users. This is an advanced feature and requires knowledge of the Lode API and should only be used for configuring radio station links and local content links.

To add a custom menu, open the custom menu editor and enter the item name, API link and order it should appear in the menu.

Configure Root Menu

The Custom Root Menu will automatically be enabled if any menu items are specified below. Please ensure that when referencing items from Services that you first enable the service. Please read the documentation before attempting to use this feature.

Name	Link	Order	
Playlists	sire://local/playlists/	1	<input type="button" value="Delete"/>
<input type="text" value="Albums"/>	<input type="text" value="sire://local/albums"/>	<input type="text" value="2"/>	<input type="button" value="Add"/>

Configuring Stream Links

With Lode Servers you can add custom HTTP and HTTPS stream links for playback. This can be especially useful for commercial installs where a brand operates a generic streaming radio station to be played across all stores.

To configure Stream Links, simply go to the Media Library area within the web config for the Lode Server, enable the My Streams service and start adding links by giving them a name and the HTTP / HTTPS address for the stream.

Stream URLs

Name	Link	API Command	Action
BBC Radio One	http://bbcmedia.ic.llnwd.net/stream/bbcmedia_radio1_mf_p	#PLAYNOW,(ZONE),sire://streamlinks/BBC+Radio+One	<input type="button" value="Delete"/>
<input type="text"/>	<input type="text"/>		<input type="button" value="Add"/>

The links will then be browsable via the My Streams service in any connected controllers.

Indexing a Network Share

To index a local network share, you must first enable the Local Music service from the “Media Library” area of the web console.

Once the Local Music service has been enabled, you will be presented with a new input area to add the details of the network share you wish to index.

Media Shares

Name	Path	Username	Password	Message	Actions
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="button" value="Add"/>

The Lode server requires an SMB share for mounting. Please ensure that any NAS or computer share has SMB sharing enabled.

The share only needs read access.

Note. If using a NAS that has a network recycle bin, please ensure that all recycle bin functionality is turned off as this can cause issues when deleting and adding new media.

To add the share to Lode, give the share a name, path and username / password if required.

Paths should be specified as //IP-ADDRESS/SHARE NAME

For example //192.168.0.50/Music where 192.168.0.50 is the IP-ADDRESS and Music is the SHARE-NAME

Media Shares

Name	Path	Username	Password	Message	Actions
<input type="text" value="Music"/>	<input type="text" value="//192.168.0.105/Music"/>	<input type="text" value="lode"/>	<input type="text" value="...."/>		<input type="button" value="Add"/>

Some networks may have DNS or MDNS resolution available for host names. If this is the case you can use “.local” resolution with the following style path for the network share:

//HOST-NAME.local/SHARE NAME

For example //Lode-NAS.local/Music where Lode-NAS is the HOST-NAME and Music is the SHARE-NAME.

Once the share details have been added, click the “Add” button and you should receive a message telling you that the share is now indexing.

Media Shares					
Name	Path	Username	Password	Message	Actions
Music	//192.168.0.105/Music	lode	*****	Indexing...	<input type="button" value="Delete"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		<input type="button" value="Add"/>

The Lode server will re-index the share every 60 seconds.

Player Settings

To change the name of any of the players for the Lode server, visit the “Player Settings” section of the web console.

Here you can give each player a unique name such as “Living Room”, or “Kitchen”, for example.

The screenshot shows the 'Player Settings' section of the Lode web console. The navigation bar includes 'Status Page', 'Network Settings', 'Media Library', 'Player Settings' (highlighted), 'Advanced Settings', 'System Maintenance', and 'Diagnostics'. Below the navigation bar is the 'Zone Setup' section. It contains a table with four columns: 'Zone Names', 'Enabled', 'Fixed Volume', and 'Volume Trim'. There are four rows representing Zone 1 through Zone 4. Zone 1 is named 'Lounge', Zone 2 is 'Bedroom', Zone 3 is 'Kitchen', and Zone 4 is 'Den'. Each row has a checked 'Enabled' checkbox, a 'Fixed Volume' dropdown menu set to 'Normal', and a 'Volume Trim' slider set to 100%. An 'Apply' button is located at the bottom right of the table.

Zone Names	Enabled	Fixed Volume	Volume Trim
Zone 1 Lounge	<input checked="" type="checkbox"/>	Normal	100
Zone 2 Bedroom	<input checked="" type="checkbox"/>	Normal	100
Zone 3 Kitchen	<input checked="" type="checkbox"/>	Normal	100
Zone 4 Den	<input checked="" type="checkbox"/>	Normal	100

Apply

Within the Player Settings area, you can also choose to enable or disable zones as required.

Fixed Volume Settings

There are 3 volume options in Lode:

- Normal – Variable volume controllable by all apps.
- Fixed – The volume of the Lode zone is fixed (can be combined with volume trim). The default fixes the volume to 100% and disables the volume control in apps.
- Passthrough – This fixes the Lode zone volume to 100% (can be combined with volume trim). Only with pass through the volume control is not disabled in Lode apps and Lode will pass the volume control feedback back to a control system. This option could be used to control a local AVR volume that Lode is connected to.

Warning: Setting the volume to fixed or passthrough will set the volume at 100% on the Lode Server. Please make sure that the pre-amp is turned down before changing this setting

Volume Trim

This feature really exists to protect any equipment after Lode in the audio chain. If the Lode zone volume is trimmed to 60%, volume control within Lode will now be between 0% and 60%.

Airplay Configuration

Lode servers have an Airplay per-zone capability. To set-up Airplay as a selectable source, please access the “Media Library” section of the web console and enable Airplay.

If you want to have the ability for customers to play Airplay to any room at anytime, please select the option for “Airplay interrupt” in the “Advanced Settings” section of the web console. Please note that this option will enable any existing stream to be interrupted by another user.

Airplay Interrupt

This will allow Airplay to interrupt the currently playing stream.

Airplay Interrupt

Update

An Airplay password can also be set for each player in the same section of the web console by typing a password in each listed player section. Once the password is set, any user would be prompted for this password via the iOS device before being allowed to play.

Airplay Passwords

Please update the Airplay passwords for each zone below.

Zone	Name	Password
Zone 1:	Player 5	<input type="text"/>
Zone 2:	Player 6	<input type="text"/>
Zone 3:	Player 7	<input type="text"/>
Zone 4:	Player 8	<input type="text"/>

Update

Disable Track Progress

Some control systems (depending on their processing power) struggle with multiple zones sending track progress messages every second. Within the Lode Audio server the track progress messages can be disabled via the Advanced Settings area.

Disable Track Progress

This will disable track progress messages being sent to controllers. This can be useful for control systems with lower performance capabilities.

Disable Track Progress

Update

Ports and Encoding

Character Encoding

The Lode servers by default uses UTF-8 character encoding within its IP control API. This can be changed, if required, when using a control system needing additional character support you can use the following port options for communication:

- 6667 UTF-8
- 6668 UTF-16
- 6669 ASCII

Broadcast Discovery

Lode Desktop, iOS and Android apps use UDP broadcast for device discovery. As such, WiFi attached devices must be in the same subnet as the Lode servers for discovery to work.

PORT = 44466
GROUP = 239.192.0.202
BROADCAST = 255.255.255.255

Lode Mesh

Lode provides it's own mesh for inter unit communication. The mesh enables unit and zone discovery between boxes as well as message broking for the API.

The mesh uses a simple multicast message for discovery communication:

GROUP = 224.2.2.3
PORT = 54327

LODENET Streaming

By default LODENET distributes audio between units using UDP unicast.

PORT = 41000 to 41100

The port numbers will increments for each of zone.

LODENET relies on NTP for initial clock synchronisation, Please ensure NTP requests are allowed out on the network which is UDP over port 123.

Subsequent clock synchronisation is done using PTP domain 101.

Product Support

Factory Reset

The Lode server has a reset button located on the rear of the unit. To reset the unit, press and hold this button for 10 seconds, the unit will then become unresponsive.

Now cycle the power on the unit (turn off the unit for at least 10 seconds before restarting) and once the unit reboots, you will be back to factory default.

Be aware that resetting the unit will delete all playlists and favourites saved to date, so please be sure that it really is a reset that you want. Ideally make a note of each of login credentials BEFORE resetting the unit.

If you are running a cluster of Lode Servers, please follow these steps to reset all units in the cluster:

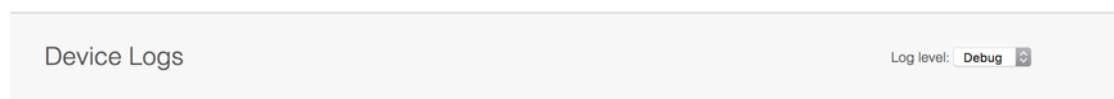
- 1) Press and hold reset button for 10 seconds on each machine.
- 2) Power-off each machine.
- 3) Power-on each machine.

Unless this protocol is followed, the cluster could rebuild its data under certain conditions meaning that no unit is properly reset.

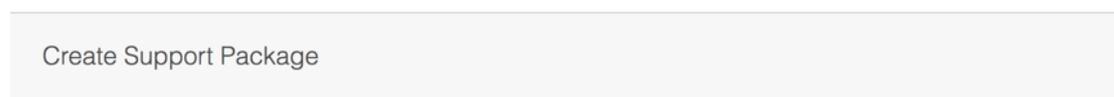
Requesting Support

To raise a support ticket, please e-mail support@lodeaudio.com, a member of our dedicated technical team will be in touch directly to assist.

When requesting support, you can also provide us with the logs of the platform. Please first put the unit into debug mode via the “Diagnostics” area of the Web Console.



Once the unit is debug mode, you should try and re-create any issues you have experienced. Once the issue has been replicated, you can send Lode the logs from the system by simply going to the “System Maintenance” area of the web console and clicking the “Create Support Package” button.



Sending us a support package will allow us to review the log files for your LODE product.