

## CODA LINUS Platform

### Prerequisite knowledge

*Please read before using the software & hardware for the first time. Herein is discussed important & useful information for the effective deployment of CODA Systems. Known issues, system concepts & factors affecting system stability are presented.*

## LINUS Prerequisite Knowledge

It is recommended to control CODA systems with the latest release of LINUS Live. The LINUS Amplifiers facilitate bespoke control, processing and amplification suitable for use with CODA Loudspeakers. Use of CODA Loudspeakers with alternative amplification & signal processing is not supported. It will void any Loudspeaker warranty and may result in damage to the Loudspeakers.

### Let's keep in touch

For the latest CODA information please visit:

<http://codaaudio.com/news/>

Document resources – (datasheets, GLL files, CAD drawings), system recommendations & warranty information can be found at:

<http://codaaudio.com/support/>

For contact information pertinent to your geographic area, please visit:

<http://codaaudio.com/contact-us/>

CODA Audio International can be contacted at:



CODA Audio International – Boulevard der EU 6, 30539 Hannover (Expo-Park) Germany.



+49 (0) 511 866 55 888



[contact@codaaudio.com](mailto:contact@codaaudio.com)



## First Time Usage

Prior to using LINUS Live for the first time, please read this whole document, it contains information that will be helpful to even the most seasoned of users & will help you get the most out of your system.

## Network & Control background information

CODA Audio recommends a dedicated Mac OSX 10.11+ or Windows 10 computer to control the system. The computer should be dedicated for the use of LINUS Live, to guarantee system stability and reliability of operation. To minimise the possibility of any issues surrounding system operation, it would be considered best practice to have the computer running the control software isolated from the internet.

Wireless networking should not be used to connect the control computer to the LINUS Amplifiers. Wireless networking is fine however for connecting another computer running VNC software to the main control computer.

Firmware & Preset Libraries should NEVER be uploaded to LINUS Amplifiers over WiFi.

Gigabit networking infrastructure should be used wherever possible.

The use of VDSL links / Ethernet Extenders between nodes should be avoided if possible, due to increases in latency / ping times & the limited bandwidth they offer.

Generally speaking, if cable lengths over 10m are used, these should be shielded. It is acceptable to use short link cables for ethernet that are not shielded, however ALL LiNET cabling needs to be shielded, for grounding purposes.

CAT5 / CAT5e should not be used on lengths over 80m, instead CAT6A or Fibre should be used. Foil screened cable is fine for installation purposes, but can crack and be damaged with repeated movement. For touring or mobile use, CAT6A with an overall braided screen should be selected instead.

Most networking issues encountered with a LINUS system spur from poor quality cabling or connectors. Use of Neutrik EtherCONN connectors is recommended, in particular the newer all-metal CAT6A connector.

LINUS Amplifiers operate in the 192.168.x.y subnet. It is therefore important to bear this in mind with any other networking apparatus that is co-existent on the network.



## IP Addresses & Amplifier IDs

All LINUS Amplifiers have an individual ID number, shown in the top-right of the screen.

Linus10	Master	#01
P 14:ViRAY-A		G
I 1_LF	1_HF	
G 0.0	0.0	

Module ID = 1

This ID number has two purposes:

- ☞ To identify to you, the user, which amplifier is which.
- ☞ To identify to the network, the IPV4 address of the amplifier.

*Note – LINUS 10 Amplifiers (not LINUS 10C) operate in a Master / Slave relationship. A LINUS 10 is a 2 Channel Amplifier. Two of them are grouped together electronically and can then be thought of as a 4U, 4-Channel amplifier in the system. There is a 'Master' unit and a 'Slave' unit. The Master unit connects to the network, through its "PRI" RJ45 socket. The 'Slave' unit connects to the 'Master' unit. Use an RJ45 patch cable to bridge the "SEC" port of the 'Master' to the 'PRI' port of the Slave.*

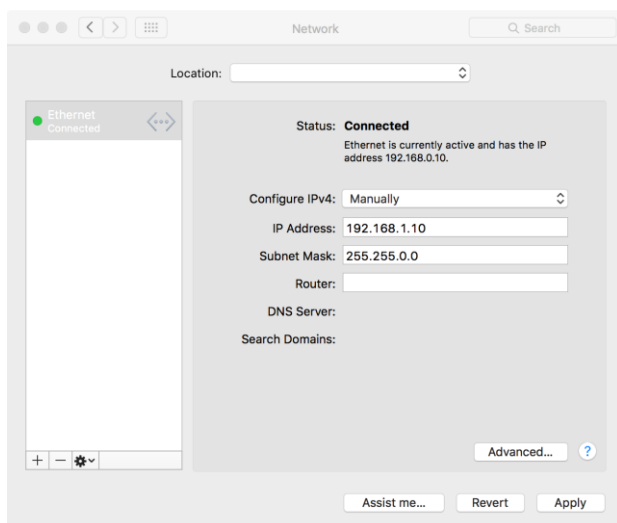
The IP schema of the LINUS Amplifiers can be described as follows:

For a subnet of 192.168.1.x

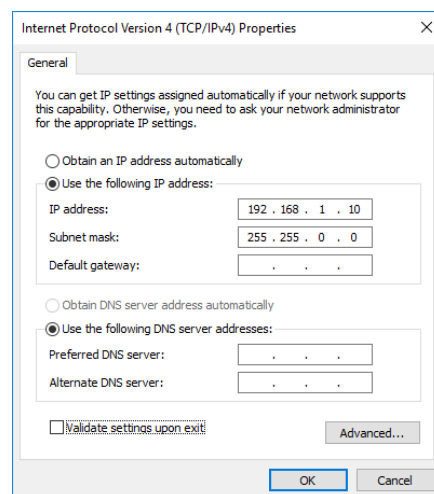
- ☞ If x = 1
  - LINUS 5C
  - LINUS 10C
  - LINUS 10 – Master Unit
  - LINUS 14 / 14D
  - LINUSCON
- ☞ If x = 2
  - LINUS 10 – Slave Unit
- ☞ If x = 10 / 20 / 30 etc ... 250
  - IP Address of LINUS Live control computer.

In other words, the IP Address of the controlling computer running LINUS Live needs to end in 0.

We would suggest 192.168.1.10 with a subnet mask of 255.255.0.0 as shown in the pictures below:



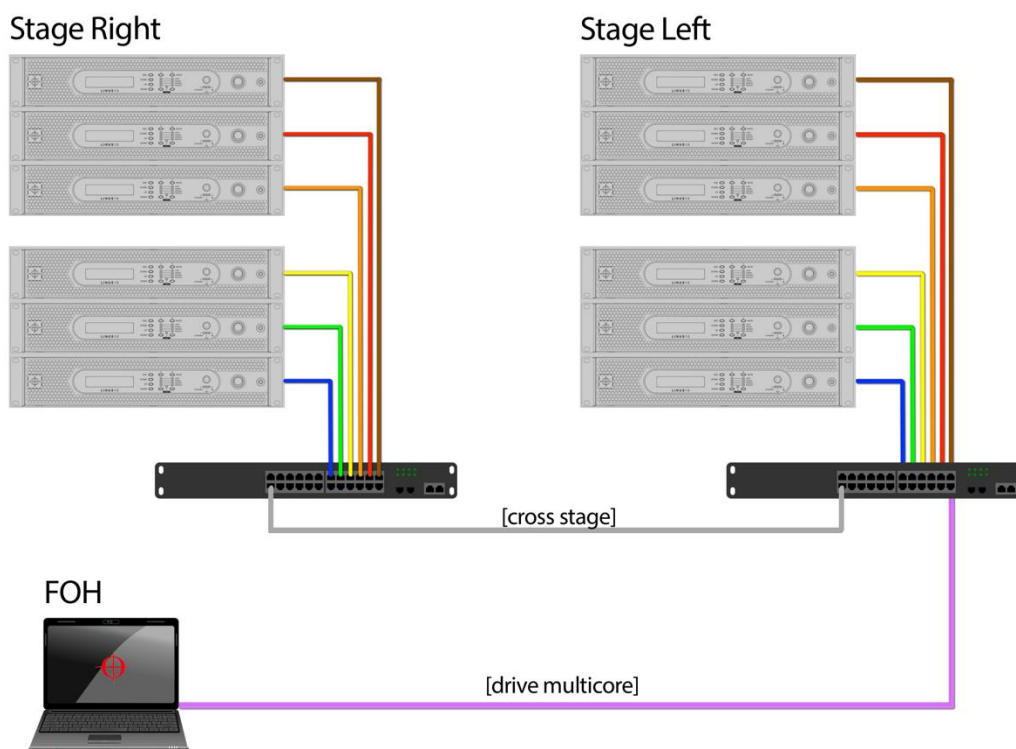
Mac OSX Network Dialog



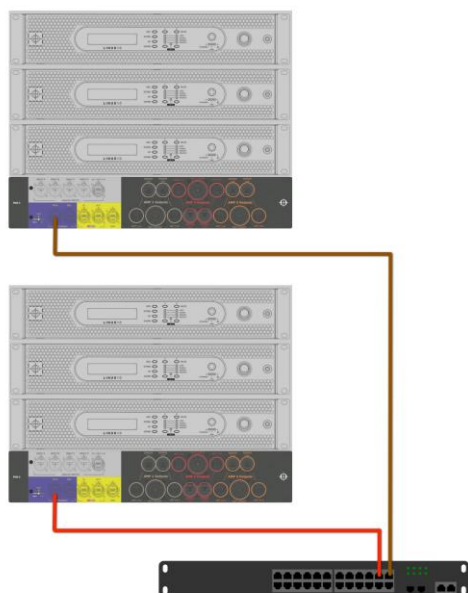
Win10 IPv4 Properties

## Network Topology

A distributed star network topology is recommended for most applications. Switch hops should be kept to a minimum. Take care not to create any loops in the network, which will hamper reliability. It is possible to operate control data simultaneously to Dante audio and other services, using properly configured managed switches, the detail of which is out of scope of this document. It should be noted however that for the sake of simplicity and reliability, using unmanaged switches or managed switches in their default state will perform perfectly well for the standard network configuration that will be most likely encountered. Reliability can be compromised by a poorly configured managed switch.



## Linking Amplifiers

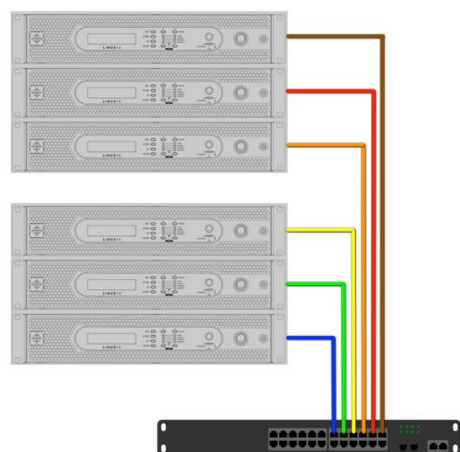


### Recommended Setup

*Amplifiers are mounted in T-Racks and are each home-run to the PAN-T.*

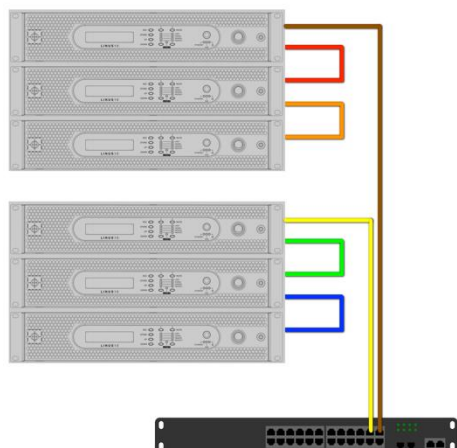
*The PAN-Ts are powered units that contain a network switch, which has a home-run to every amplifier in the rack.*

*The PAN-T's are home-run with shielded CAT5-E to a network switch in each amplifier world.*



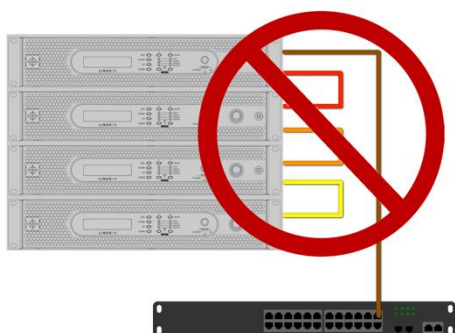
### Recommended Setup

*Each amplifier has a shielded CAT5E cable home-run to an individual port on a gigabit network switch.*



### Acceptable Setup

*Amplifiers are linked in 3's. Each block of 3 amplifiers is ran to a gigabit network switch.*



### Not Recommended

*Amplifiers should not be linked in multiples of 4 or more. See background knowledge in paragraph below.*

Note – the network ports on the amplifier are IEEE 802.3u – 100Mbps capable. This is more than capable for the amount of bandwidth required for all systems when the amplifiers are linked in no more than 3's. If amplifiers are linked in 4's or more, a few aspects of unreliable operation may be witnessed, relating to responsiveness of the LINUS Live software.

## Setting Amplifier IDs

All amplifiers on a network require a unique ID. As discussed previously, the ID is what the amplifier uses to determine its IP address. If there are one or more amplifiers with duplicate IDs on the network, network instability will certainly occur. If two amplifiers have been found to have the same ID on the same physical network, you should change them so there is no longer a conflict. It will then be necessary to reboot all the switch apparatus on the network to clear the routing tables within them. Without doing this, there is no guarantee that data will be routed to the correct host.

If instability is discovered on the network, IE LINUS Live cannot reliably connect to a one or more amplifiers:

1. Check all amplifiers are turned on.
2. Check that there are not two or more amplifiers with the same ID number.
3. Check all network cabling is correctly patched.. no Loops, no air gaps.
4. Check control computer IP is set to 192.168.1.10 / 255.255.0.0.
5. Check only one interface is present in the 192.168.X.Y subnet on the PC.
6. Check all network switches are powered up & have had time to boot.
7. Check all CODA PAN-M and PAN-T have power.
8. If using LINUS 10:
  - a. Check Master / Slave settings
  - b. Reset IDs on Master units to ensure relationship exists
9. Ping amplifiers on the network to see if there is a timely route to them.
10. Clear the ARP table in the control computer – see note below.
11. Check for error codes on the front of LINUS Amplifiers.

## Clearing the ARP Table

Note that if network cable patching is frequently changed when the network is powered up, it may be necessary to clear the ARP table in the controlling computer. This will tell the Operating System that it needs to forget all it knows about the routes to the devices on the network & it needs to relearn the 'map' of where all the devices are. To do this follow the steps below:

### Mac OSX

- ④ Launch Terminal (⌘ + Space ) then type 'Terminal'
- ④ Type the following into the command line:  
**sudo arp -a -d**
- ④ Enter your password, then press Enter.

This will now clear and refresh the list of 'memorised' routes in the computer.

### Windows

- ④ Press the Start button & type 'cmd'
- ④ Right Click the words "Command Prompt"
- ④ Choose "Run as administrator"
- ④ Type **C:\WINDOWS\system32>arp -a -d** and press Enter.

This will now clear and refresh the list of 'memorised' routes in the computer.





## OSX Disabling App Nap

**IMPORTANT**

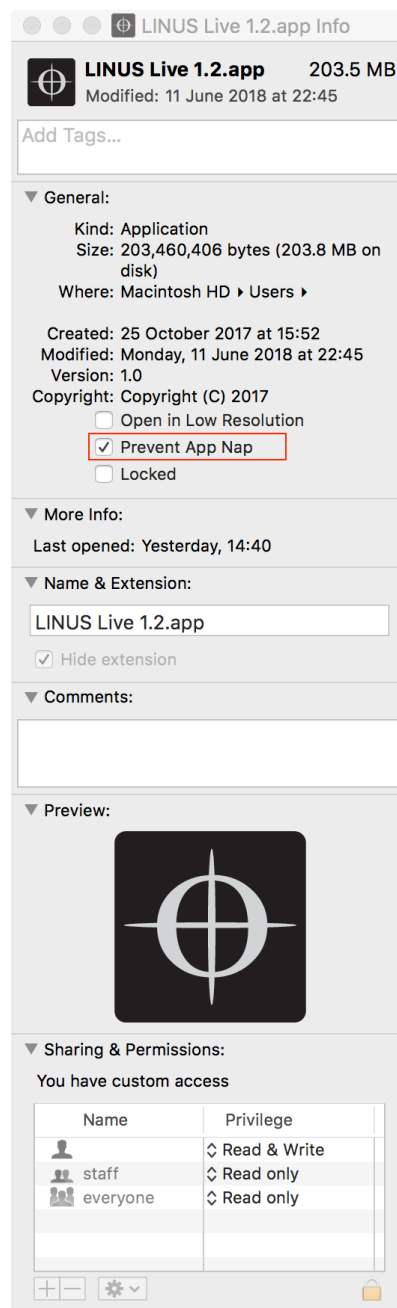
If you are running LINUS Live on Mac OSX it is important to disable App Nap for LINUS Live.

Ever since OSX Mavericks, Apple introduced a feature to save energy on applications that are not in the foreground of the screen. It was introduced to allow for longer battery life in MacBooks and for better power efficiency in desktop Macs.

If App Nap is not disabled in LINUS Live & the window is hidden behind other windows, or minimized for 60 seconds, OSX will put LINUS Live in a state of suspension, as it thinks the program is only performing menial tasks. The result will be amplifiers that turn red (disconnected state) in LINUS Live, as OSX will have closed down the sockets & LINUS Live will not be able to connect to them.

To prevent this from happening:

- ④ Open a Finder window
- ④ Navigate to the Applications Directory - (Command Shift A) ⌘ - ⇧ - A
- ④ Right-Click on LINUS Live
- ④ Click 'Get Info' under the General area
- ④ Click "Prevent App Nap"
- ④ Restart LINUS Live if it is already running.



## Updating Firmware

The firmware is the software that runs within the amplifier. If when LINUS Live loads & you take the system online, you get a red error message – “Update FW”, you will need to update the Firmware to be able to continue. If you feel the message is in error, check you have loaded the correct version of LINUS Live, you could have an old version on your computer which you have loaded accidentally.

Note – updating firmware on devices is a pretty invasive procedure. The decision to do so should not be taken lightly, for if the process fails for any reason, the amplifiers will be put into safe mode. Certainly don’t update firmware in the middle of a tour, just in case you can’t recover the amplifiers from safe mode for any reason. See the note below on recovering from safe mode.

To update the Firmware for the units, from the network discovery & scanning dialog, click “Add”. The discovered units will then be added to the workspace. Click and drag the mouse to select up to twelve (12) units. Do not select more than 12 units at a time!

Click “Firmware” in the title-bar, then “Update Firmware”. The update process will begin, then the software will close. Repeat the process for all connected amplifiers, ensuring never to select more than twelve at a time.

## Updating Library

The Library is what contains the parameters that describe the speakers, together with routing and grouping possibilities. The library comprises of two parts, the factory presets and the user presets. The factory presets are recall-safe from the end user, so parameters cannot be overwritten. The user presets can be modified and a custom structure set, using the Preset Builder tool. Creation of custom user presets will be discussed below.

If when you go online, you see amplifiers with either orange cautions: “Mixed User Library” or “Update Library”, you will have to do the following. Click “Add” to add the discovered units to the workspace. Click and drag the mouse to select up to twelve (12) units. Much the same as with uploading Firmware, do not select more than 12 units at a time!

Now in the title-bar select “Library” then “Upload Library”. The upload process will now begin, then the software will close. Repeat the process for all connected amplifiers that display either of the two cautions mentioned above, remembering never to select more than twelve at a time.

## Recovering from Safe Mode

If you find there are Amplifiers on the network whose front panel LED's flash "S M S M S M" in Morse code (... -- ... -- ... --) repeatedly, these amplifiers are in safe mode and need firmware re-installed one at a time.

Reasons for entering Safe Mode:

- ⦿ More than 12 amplifiers were asked to update Firmware at a time.
- ⦿ The Network Configuration has an error, mismatch or IP/ID clash
- ⦿ The Firmware update process failed
- ⦿ Wi-Fi was used to update Firmware
- ⦿ Power was interrupted during the Firmware Update process

To recover from Safe Mode, launch LINUS Live & do not go online. Instead, plug a CAT5 cable between the computer and the PRI port of the amplifier that is in Safe Mode. You can only do one amplifier at a time.

Click "Firmware" in the title-bar, then "Upload Firmware". A message dialog will then appear instructing you how to put the amplifier into Safe (Hardware Update) Mode. If you click OK, LINUS Live will scan for the device that is in Safe Mode and begin the update process. When it is complete, LINUS Live will close. You can then proceed to update the next amplifier.

Note – if for any reason you ever need to place an amplifier in Safe Mode, simply remove AC power from the unit, wait 3 minutes for the PSU to completely drain, press and hold the rotary encoder, then apply power. When the LEDs flash SMSMSM in Morse Code repeatedly, release the encoder.

## LINUS Amplifier Input Voltage

LINUS 10C and 5C have an internal jumper for setting the input voltage. Be sure to set this correctly prior to energising the amplifier.

LINUS 14 / LINUS 14D are auto sensing regarding the input voltage. The power supply is tuned for two voltage ranges, HIGH and LOW. In the US / Canada it can be common practice to run amplifiers between phases – 208V – to try to provide for higher power at the amplifier inlet.

This will actually be less efficient in LINUS 14 / LINUS 14D (and with certain other manufacturers amplifiers). The reason for this that 208V sits in the HIGH tuning range within the PSU. It could however be considered an under-voltage situation in this HIGH range. Instead, run the amplifiers in the 115V (LOW) range, and higher efficiency will result.



## Known Issues

### LINUS Live loses connections on Mac OSX when App Nap is enabled

If App Nap is enabled on LINUS Live and the window is covered up by other applications, or LINUS Live is minimised, connections to the amplifiers will be suspended by the operating system. To work around this, see the section in the document “LINUS Prerequisite Knowledge” regarding disabling App Nap for LINUS Live on OSX.

### LINUS Amplifiers can't select LiNET Input on front panel under certain circumstances

If Fallover is enabled on a LINUS Amplifier in standalone operation (LINUS Live is not used, only front panel control) and LiNET signal is lost, the amplifier falls over to Analog correctly. If however the LiNET signal is restored, there is no way to force the amplifier to take this signal again, as there is not currently the front panel implementation of the Fallover control. You will need to use LINUS Live to tell the amplifiers to go back and accept the LiNET signal.

### LINUS Live incorrectly reports Firmware mismatch

If a show file is loaded in LINUS Live & amplifiers are not present on the network that are present in the show file, LINUS Live may report this as a “Firmware Mismatch” or “Firmware Error” when the show file is taken online and synchronised. This is an erroneous error message. To work around this, go offline, reload the show file, check all the amplifiers are present on the network that are in the show file and go online again. If you are not planning on using all the amplifiers that are in the show file, simply remove them from the workspace so LINUS Live isn't looking for them.

### LINUS Live cannot select modules if preset libraries mismatch

If modules are added to the workspace and the library in the software does not match the library in the amplifier, if you then click the orange SYNC flag to try to sync the modules, an error will appear stating that the Library needs to be uploaded to the modules. You will now not be able to select the modules with the lasso tool, or the mouse click. To re-enable the mouse click, in the taskbar, select “Library” then “Upload Library” then click “Cancel”. The mouse click will now be restored.

### Password required to unlock LINUS Live from monitor mode Lock

If the lock button is pressed on the Monitor page in LINUS Live, it will lock the system with a default password. The default password to unlock LINUS Live is (all capitals):

**VFHPD**

### Signal Meters draw at half-speed with LINUS 14s in LINUS Live.

LINUS 14s do not draw their meters at the correct speed in the Monitor Mode output meters page. The data is correct, however it is a half the speed of all other amplifiers and appears to 'lag'.

