

Solid State Logic

O X F O R D • E N G L A N D

Live

Installation Guide

Part no. 82BL5G01J

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Maintenance: Dust Guards

Your Live Console may be fitted with dust guards covering the air vents beneath the faders. It is recommended that the filter foam should be regularly inspected for particular buildup.

Unscrew the M3 screws that secure the dust guards in place and inspect both sides of the guard. If necessary, vacuum clean. Extremely dirty filters may be cleaned with water and replaced when dry.

Filter pads may last several years before needing replacement. Please contact SSL for replacement filter pads.

Live Console Synchronisation & Clocking

The Live console and associated stageboxes are connected digitally and thus must share a common digital clock (sync) source. This section describes how to set up a Live system with multiple stageboxes and multiple consoles successfully, using both internal and external clock sources.

Clocking in General

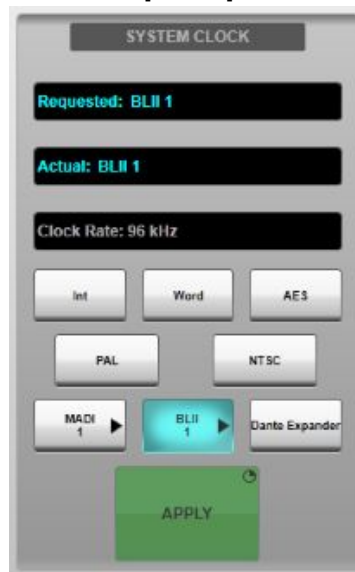
The Live console has a very high quality internal clock that can be used to clock an entire system with multiple Live consoles and stageboxes connected, so no external clock source is needed unless a specific application requires it. If there is a specific requirement for external clocking of a Live system, the external clock **must** match the sample rate at which the Live console is running (or PAL 25/NTSC 29.97 video sync).

Note: It is also important that, if an external clock is used, only the Live console should be connected to the clock source. SSL Live stageboxes will receive their clock via the MADI stream from the console. We do not recommend connecting external clocks to each of the stageboxes in this configuration.

ALL AES/EBU connections on the console and D32.32 stageboxes have sample rate converters and can accommodate digital devices at alternative sample rates, or those running in a different clock domain. The AES/EBU connection options and set up are detailed below.

Selecting a Clock Source

The console can be clocked internally, or externally via video, AES, wordclock, MADI, Blacklight II or Dante Expander. This is set from **MENU > Setup > Options > SYSTEM** tab:



Select the required clock source (if MADI or Blacklight II, press the button again and select which MADI/Blacklight port to use from the drop down menu) then press & hold the APPLY button. Ensure that the "Requested" and "Actual" sources match.

If the clock source is lost, the console will try other clock sources in this sequence: BLII, MADI, video, AES, wordclock, internal, until it finds a valid clock. The original but lost source will need to be manually re-selected and applied once it has been reconnected - it will not switch clocks back and forth automatically in case of an intermittent clock source.

The status bar at the top of the main screen will show a clock source change to warn the operator.

Clocking via a Blacklight II Concentrator

Two consoles may be connected to a Blacklight II Concentrator for sharing a set of stageboxes. The 'Master' console (designated as such by connecting to the Blacklight Concentrator's A ports) will distribute its clock to the Blacklight system and any stageboxes and consoles connected to it. The 'Slave' console (designated by connecting to the Blacklight Concentrator's B ports) should therefore set its clock source to the corresponding **BLII** port on the rear of the console.

The Master console should distribute either its internal clock over Blacklight II (by selecting the **Int** option), or one of the external clock source options listed above, with the exception of any Blacklight port of which it is the Master. Selecting the **BLII** clock source button will reveal a subset of buttons. The Slave console should use the **Blacklight II** option. However, the Master console may use one of the MADI options if an external MADI source is connected to the corresponding MADI input on the Blacklight Concentrator. This could be a MADI feed from a third party device providing clock, or wordlock via a stagebox set to its external wordclock input.

Clocking over Dante

Before proceeding, ensure that the console's Dante Expander Module, and BLII/X-Light Bridge if applicable, and any stageboxes or other Dante devices appear in black text in Dante Controller. If the devices are not visible or visible in red text please see livehelp.solidstatelogic.com/Help/DanteSetup.html in the SSL Live Help System.

Dante uses its own "Clock Election" process to determine the most appropriate Clock Master for the Dante network and a Clock Master will be chosen automatically. For more information on the Dante Clock Election process please see the Audinate website:

dev.audinate.com/GA/dante-controller/userguide/webhelp/#clock_synchronization.htm

To choose a Clock Master manually, set this device to be the "Preferred Master". To do this, open Dante Controller and click on the **Clock Status** tab. Check the "Preferred Master" checkbox for your chosen Clock Master. This device will become the Clock Master.

If multiple devices on the network are "Preferred Masters", the Dante Clock Election process will automatically choose a Clock Master from the multiple "Preferred Masters".

If the Clock Master's status changes, or a more suitable Clock Master comes online, the Dante network will go through the Clock Election steps again to determine the most suitable Clock Master for the network.

If you are not using Dante network redundancy, please use the primary connection (rather than the secondary) to ensure accurate synchronisation.

SSL Recommends: SSL recommends that the console is set to clock from the Dante network to benefit from the Dante clock election process.

Setting up the Console as a Slave of the Dante Network

In this configuration, a Dante device other than the console is the Clock Master. The console and all other devices on the network will clock to this master.

In Dante Controller, go to the **Clock Status** tab. Check the "Preferred Master" checkbox for the Clock Master device(s) if you wish to set one. Dante has its own clock election process, so it is not necessary to set a Preferred Master. For this example ensure that "Preferred Master" and "Sync to External" are unchecked for all devices on the network (including the console's Dante Expander).

On the console, go to **MENU > Setup > Options > SYSTEM** tab. In the "SYSTEM CLOCK" section, select **Dante Expander** and press and hold **Apply**. Check that both the "Requested" and "Actual" fields above list "Dante Expander".

The chosen "Preferred Master" (if set) is now the Clock Master of the network, including the console. The console is now clocking from its Dante Expander module. The Dante Expander module is clocking from the "Preferred Master" on the Dante network. All other devices on the network are clocking from the "Preferred Master" on the Dante network.

Note that if selecting Dante as a clock source on the console, the console's internal clock source will not drop back to another clock source if the Dante network clock is lost. The Dante Expander module incorporates an internal clock which will become the Clock Master of the Dante network in this instance until another device on the network is identified as the most suitable Clock Master from the Clock Election process.

Important: It is not recommended to clock from Dante if the Dante **SRC In** is engaged. Consoles clocked from stageboxes via MADI or Wordclock are not recommended to be used as Dante network Clock Master sources.

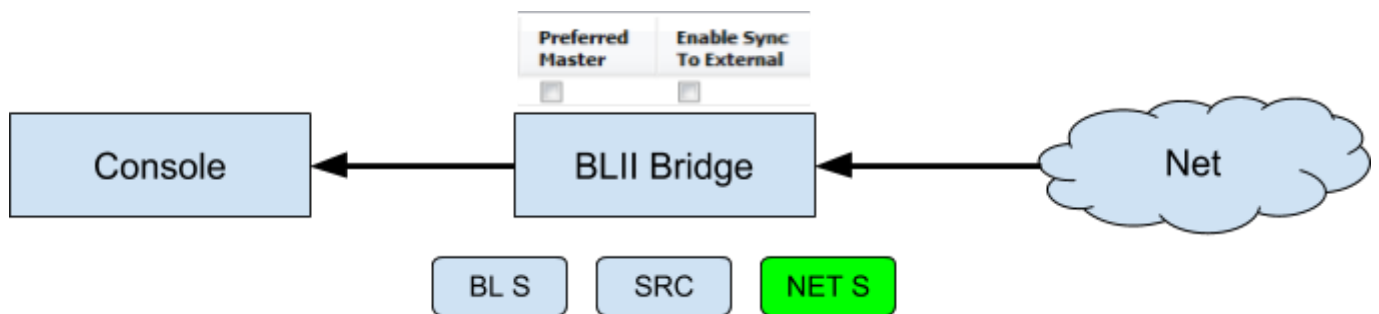
Clocking over a BLII/X-Light Bridge

The console can be the Master or the Slave of the Dante Network through the BLII/X-Light Bridge.

Setting up the Console as a Slave of the Dante Network

For the most reliable clocking scheme, SSL recommends that the console is set to be a slave of the Dante network when using a BLII/X-Light Bridge.

In this configuration, a Dante device other than the console is the Clock Master. The BLII/X-Light Bridge is set to clock from the Dante Network, and the console clocks from the Bridge.



In Dante Controller, go to the **Clock Status** tab. Check the "Preferred Master" checkbox for the Clock Master device.

On the console, go to **MENU > Setup > Options > SYSTEM** tab. In the "SYSTEM CLOCK" section, select **BLII 1** and press and hold **Apply**. Check that both the "Requested" and "Actual" fields above list the correct port.

On an L500 Plus or L550 with two pairs of BLII/X-Light ports fitted, select either port **1** or **2** depending on which port has been used to connect to the BLII/X-Light Bridge (On L550 BLII is port 1, X-Light is port 2). To select port **2**, tap the **BLII/X-Light 1** button twice and a drop down menu will appear. Tap **2**, then tap **Blacklight II** if using a BLII Bridge. Check that both the "Requested" and "Actual" fields above list the correct port.

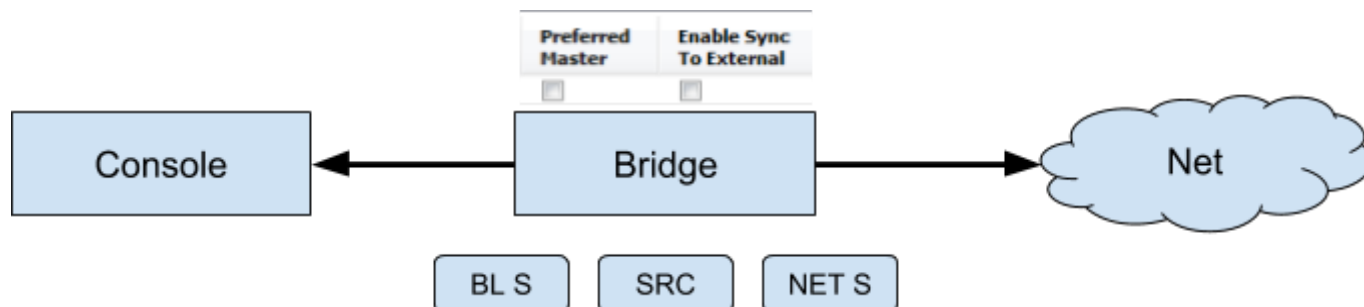
If configured correctly the following LEDs will be seen on the BLII/X-Light Bridge:

| LED | If configured correctly will light |
|-----------------------|---|
| BL S | Off |
| NET S | Redundant system: Solid Green Non-redundant system: Flashing Green & Red |
| GM (BLII Bridge only) | Off |

If colours differ from the above please consult the full tables in the SSL Live Help System livehelp.solidstatellogic.com/Help/DanteBridges.html.

When the BLII/X-Light Bridge becomes the Clock Master

If the BL S and NET S LEDs are off and the GM LED is Solid Green (BLII Bridge only), the BLII/X-Light Bridge has become the master of the network. This could occur if the console and BLII/X-Light Bridge were set to clock from a Dante device on the network, but this Clock Master loses connection to the network. The BLII/X-Light Bridge could then be chosen by the Dante network as the Clock Master of the Dante network.



This is a perfectly valid clocking scheme. The BLII/X-Light Bridge will now clock the console and the network from its internal clock. The console's clock source will remain as Dante.

To manually set the BLII/X-Light Bridge to be the clock master, follow the same steps as configuring the console to clock from the Dante network, but check the "Preferred Master" box beside the BLII/X-Light Bridge in Dante Controller.

Setting the Sample Rate

The Live system can run at 96 kHz (recommended) or 48 kHz sample rates. Use the **96 kHz** and **48 kHz** buttons in the System page (**MENU > Setup > SYSTEM**) to change the console's sample rate. The stageboxes must also be changed to match the console's sample rate; see below.

Aside from the FX Loop and optional Dante module interfaces, decreasing the sample rate to 48 kHz does not increase the total input/output count; each MADI port carries 64 channels at 48 kHz but odd-even MADI port pairs are always redundant (even-numbered ports on twin card Blacklight Concentrator are disabled).

Important: Changing the console's sample rate will interrupt audio and cause routes to be dropped as stagebox configurations will need to be changed. Muting all outputs to switch sample rate and for a further 30 seconds is recommended.

Important: The console must be rebooted following a change in Sample Rate.

Clocking MADI Stageboxes

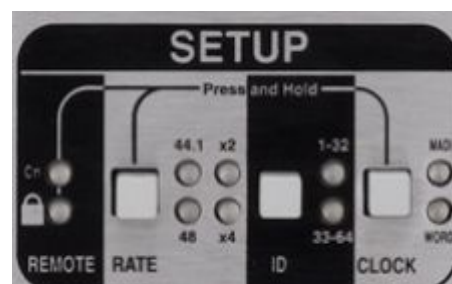
By default stageboxes are set to clock from the incoming MADI stream. **This is the recommended setting.** Other stagebox clock sync options are internal or external wordclock.

The clock source and sample rate can be set from the physical setup controls on the rear of each stagebox. The current clock source is displayed to the right of the SETUP area: if neither clock LED is lit, the stagebox is running on its own internal clock.

Note: The wordclock output transmits the clock signal currently in use by the stagebox (i.e. it is not a loop thru), depending on the stagebox's clock source setting.

To change the clock source, press & hold **REMOTE** and **CLOCK** simultaneously until the padlock flashes green. Press **CLOCK** until **MADI** is lit. The colour shows the following:

- Red: no MADI from master console detected.
- Red/green flashing: a single master MADI port is locked (non-redundant cabling).



- Green: both master MADI ports 1 & 2 are locked (redundant cabling).

To change the sample rate of the stagebox, unlock the controls as described above then use the **RATE** button to cycle through the available options.

Note: Only 48 x1 and 48 x2 (96 kHz) clock rates are currently supported.

Note: If running at 96 kHz sample rate (**48 x2**), the ID field must be set to **1-32**.

The controls will return to their locked state after a few seconds.

Daisy-Chaining MADI Stageboxes

Stageboxes running at 48 kHz sample rate can be daisy-chained on a single MADI stream, allowing all 64 channels of the MADI protocol to be utilised. With the controls unlocked, use the **ID** button to toggle between channels **1-32** and **33-64**.

- Connect the MADI **Out** from the console or Blacklight Concentrator to the MADI **In** of the first stagebox (ID **1-32**).
- Connect the MADI **Out** from the first stagebox to the MADI **In** of the second stagebox (ID **33-64**).
- Connect the MADI **Out** from the second stagebox to the MADI **In** of the console or Blacklight Concentrator.
- Repeat the above steps for the second set of MADI ports if connecting redundantly.

Daisy chaining MADI Stageboxes is only possible at 48 kHz.
Refer to the System Examples section below for further information.

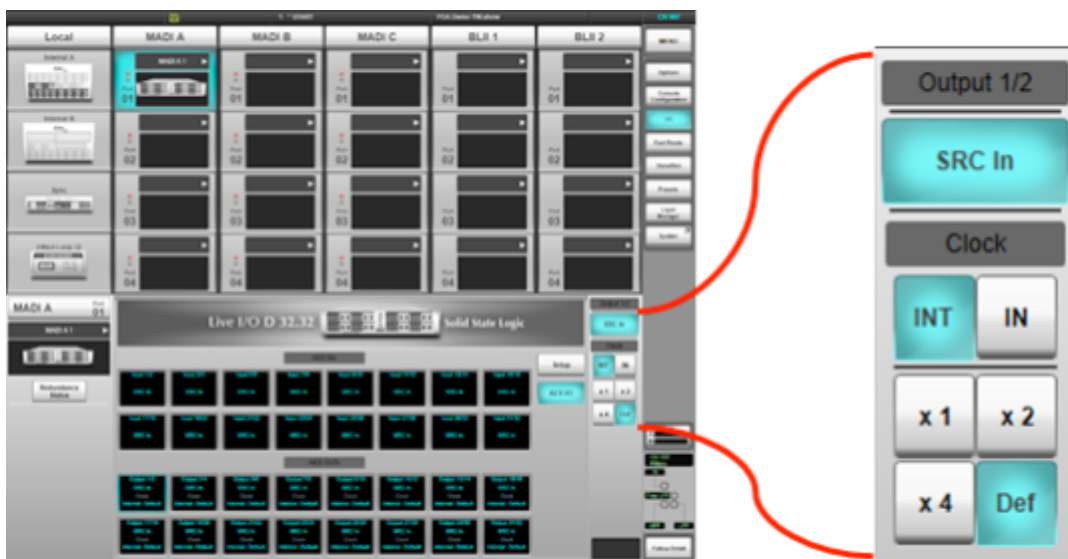
Please note: When daisy-chaining two MADI stageboxes, MIDI is not supported on the second stagebox in the chain.

AES/EBU Connections

All AES/EBU connections on the Live console's local I/O and D32.32 stageboxes have sample rate converters (SRC's) available. These are enabled via the console's local/MADI I/O menu (**MENU > Setup > I/O > Local/MADI Configuration**).

Select the local I/O or D32.32 stagebox in the I/O page and select the specific AES/EBU input or output you wish to sample rate convert from the lower section of the screen.

For inputs, you will be presented with a single **SRC In** button to the right middle of the screen for the selected port. The console supports the input rates listed in the Input fs column in the table below and will convert the incoming audio to 96 kHz (or 48 kHz).



The table below also shows the sample rates available for AES/EBU outputs. There are some additional controls for output ports, as shown above.

Supported Sample Rates at 96 kHz

| SRC Clock Source | AES/EBU Corresponding Input fs | AES/EBU Output fs: SRC Out | AES/EBU Output fs: SRC In x1 | AES/EBU Output fs: SRC In x2 | AES/EBU Output fs: SRC In x4 | AES/EBU Output fs: SRC In Def |
|--|--------------------------------|----------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|
| INT (Console) | - | 96 kHz | 48 kHz | 96 kHz | 192 kHz | 96 kHz |
| IN (Corresponding Input AES Pair) | 44.1 kHz | 96 kHz | 44.1 kHz | 88.2 kHz | 176.4 kHz | 88.2 kHz |
| | 48 kHz | 96 kHz | 48 kHz | 96 kHz | 192 kHz | 96 kHz |
| | 88.2 kHz | 96 kHz | 44.1 kHz | 88.2 kHz | 176.4 kHz | 88.2 kHz |
| | 96 kHz | 96 kHz | 48 kHz | 96 kHz | 192 kHz | 96 kHz |
| | 176.4 kHz | 96 kHz | 44.1 kHz | 88.2 kHz | 176.4 kHz | 88.2 kHz |
| | 192 kHz | 96 kHz | 48 kHz | 96 kHz | 192 kHz | 96 kHz |

Supported Samples Rates at 48 kHz

| SRC Clock Source | AES/EBU Corresponding Input fs | AES/EBU Output fs: SRC Out | AES/EBU Output fs: SRC In x1 | AES/EBU Output fs: SRC In x2 | AES/EBU Output fs: SRC In x4 | AES/EBU Output fs: SRC In Def |
|--|--------------------------------|----------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|
| INT (Console) | - | 48 kHz | 48 kHz | 96 kHz | 192 kHz | 48 kHz |
| IN (Corresponding Input AES Pair) | 44.1 kHz | 48 kHz | 44.1 kHz | 88.2 kHz | 176.4 kHz | 44.1 kHz |
| | 48 kHz | 48 kHz | 48 kHz | 96 kHz | 192 kHz | 48 kHz |
| | 88.2 kHz | 48 kHz | 44.1 kHz | 88.2 kHz | 176.4 kHz | 44.1 kHz |
| | 96 kHz | 48 kHz | 48 kHz | 96 kHz | 192 kHz | 48 kHz |
| | 176.4 kHz | 48 kHz | Not Supported | Not Supported | Not Supported | Not Supported |
| | 192 kHz | 48 kHz | Not Supported | Not Supported | Not Supported | Not Supported |

Note: The multiplier controls (**x1**, **x2** and **x4**) are relative to a base sample rate (lowest common denominator) of 44.1 or 48k, not the operating rate of the console (48 or 96k).

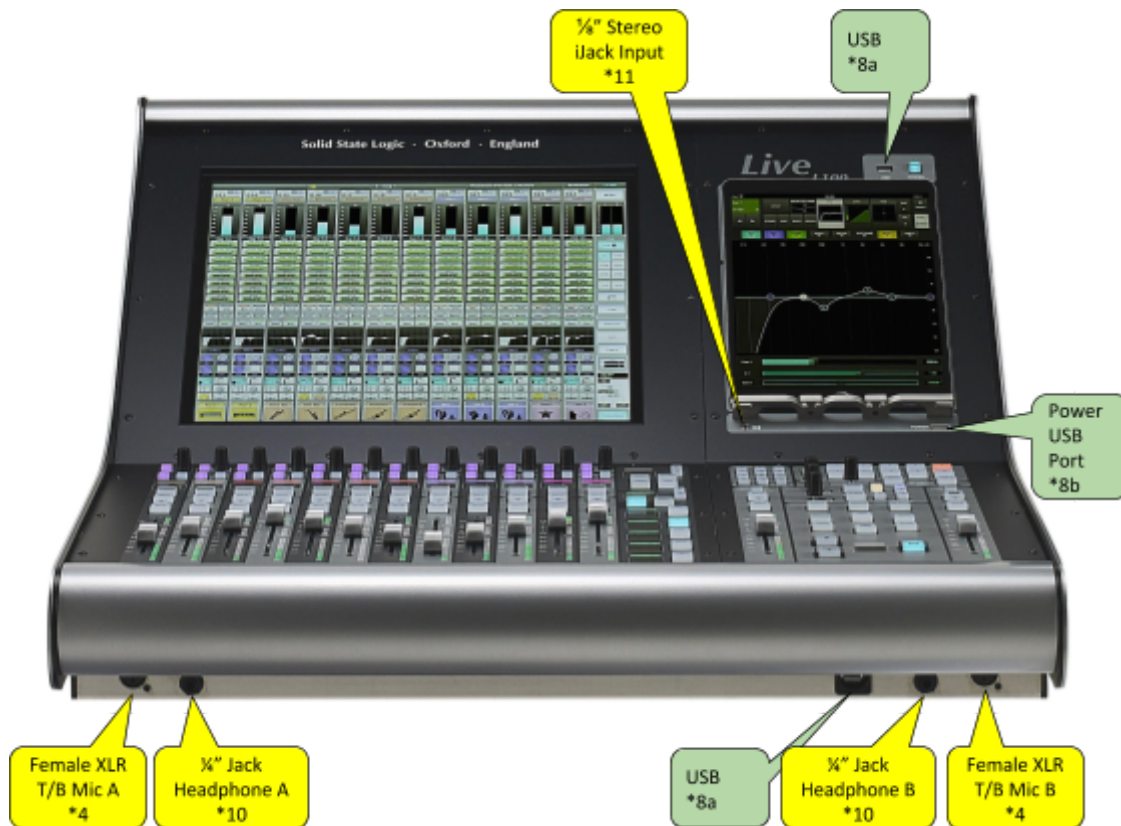
Engaging **SRC In** and setting the output clock to **IN** will clock the AES output from the corresponding AES input, at 1, 2, or 4 times the base rate (44.1 or 48k).

Setting the output clock to **INT** will use the console as the clock source. This can also be set to **x1**, **x2**, or **x4** of this base sample rate (48k).

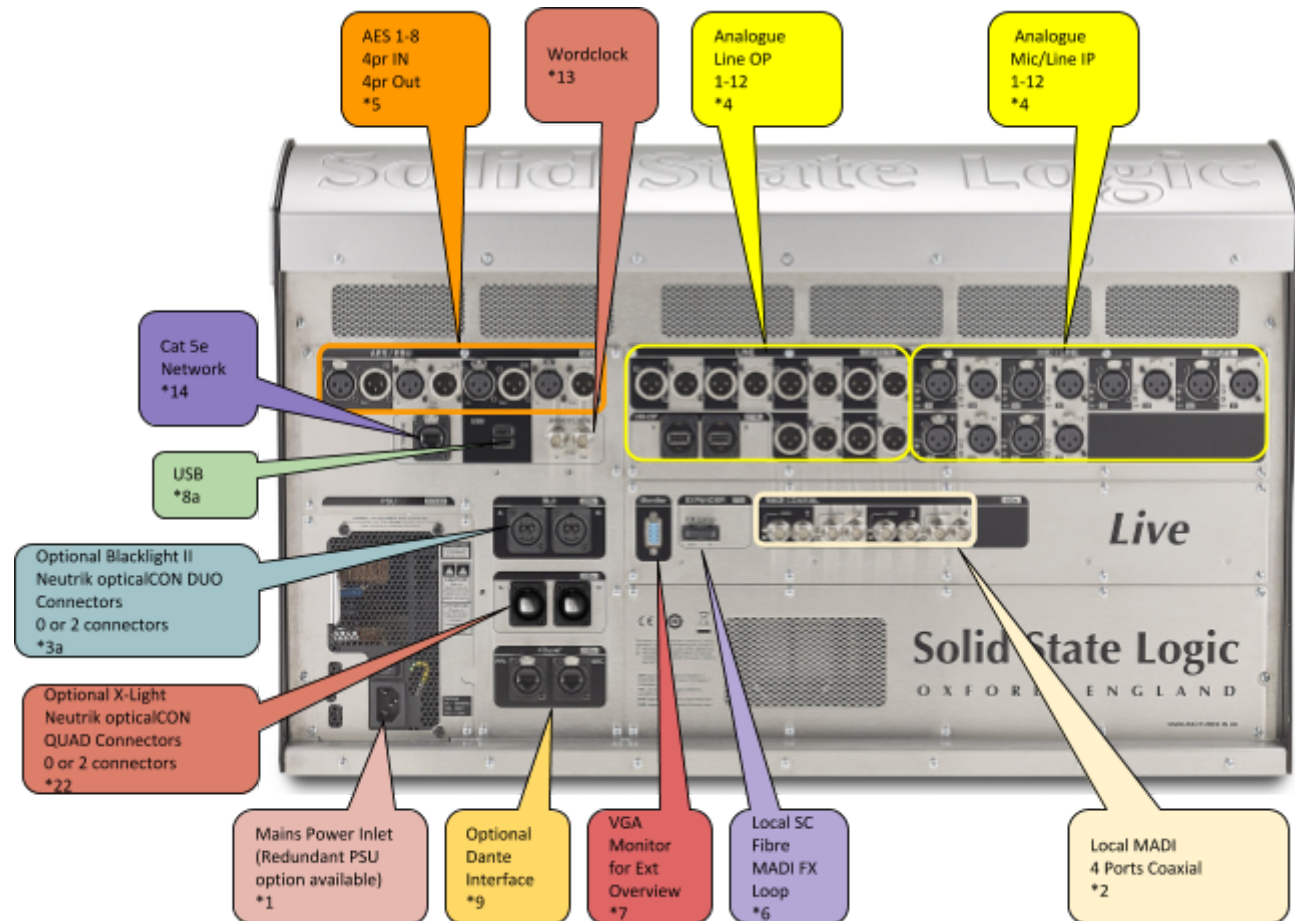
Tip: Setting the output SRC to **IN** will set this AES port's output to clock from the corresponding input rather than the console clock. This is useful if the external device has issues clocking to an external clock. This setting will allow the external device to use its internal clock, with the Live console's AES SRC locked to the external device, allowing the device to clock itself thus avoiding clocking errors. For example, if using a 96 kHz reverb, set it to internal clock and set the console's SRC settings to SRC In for both input and output AES/EBU ports. For the output port, select In and x2 (for 96k).

L100 Console

L100 Connections - Front



L100 Console Connections - Rear



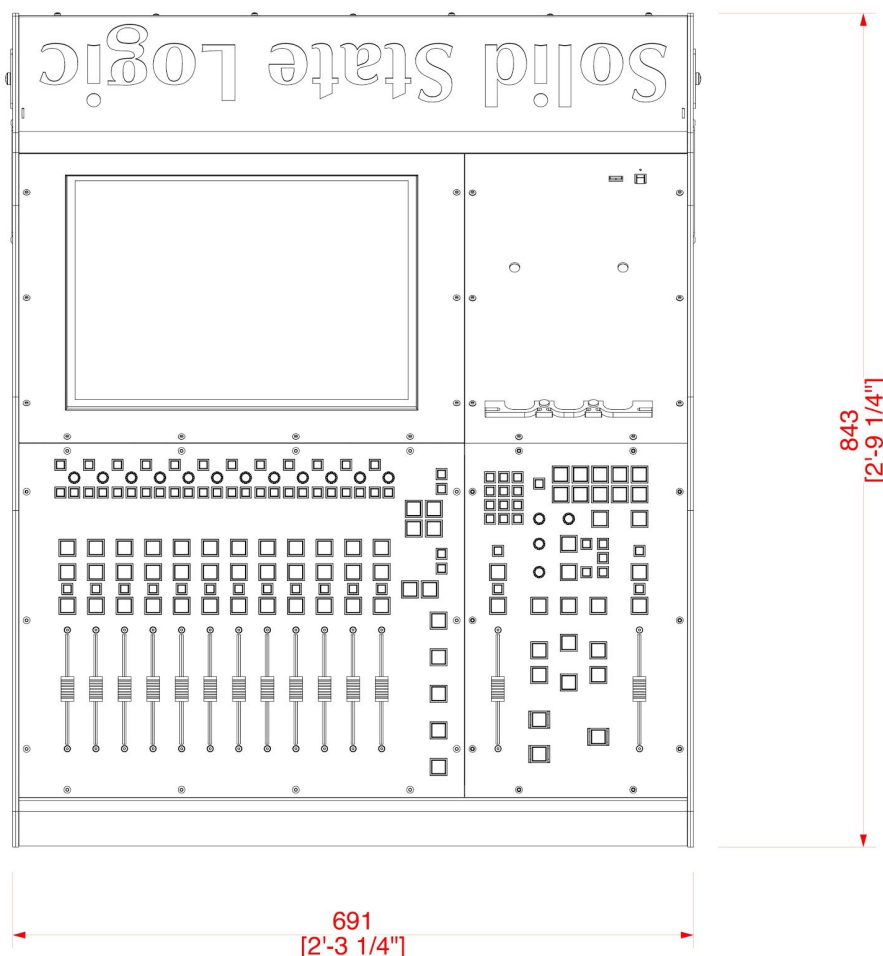
[Connections Key](#)

L100 Console Weight, Power & Dimensions

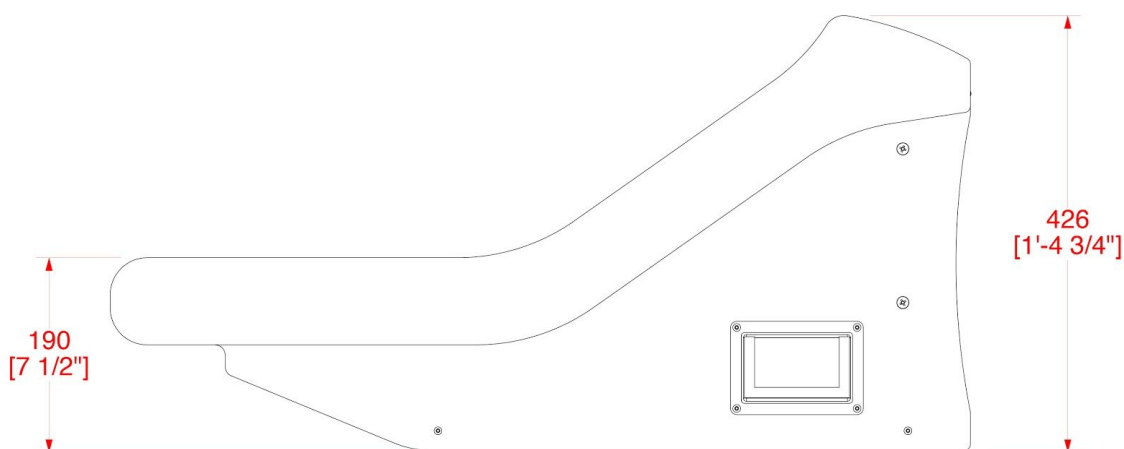
| | |
|------------------------------|---|
| Weight (without flight case) | 52 kg (114.7 lbs) |
| Weight (with flight case) | 130 kg (286.6 lbs) |
| Acoustic Noise | With non-redundant PSU: = NR23 With redundant PSUs: = NR25 |
| Power | <360 W |

Console Dimensions: (upper figures in millimeters, lower figures, inches) - A DXF drawing is available from SSL

Plan View

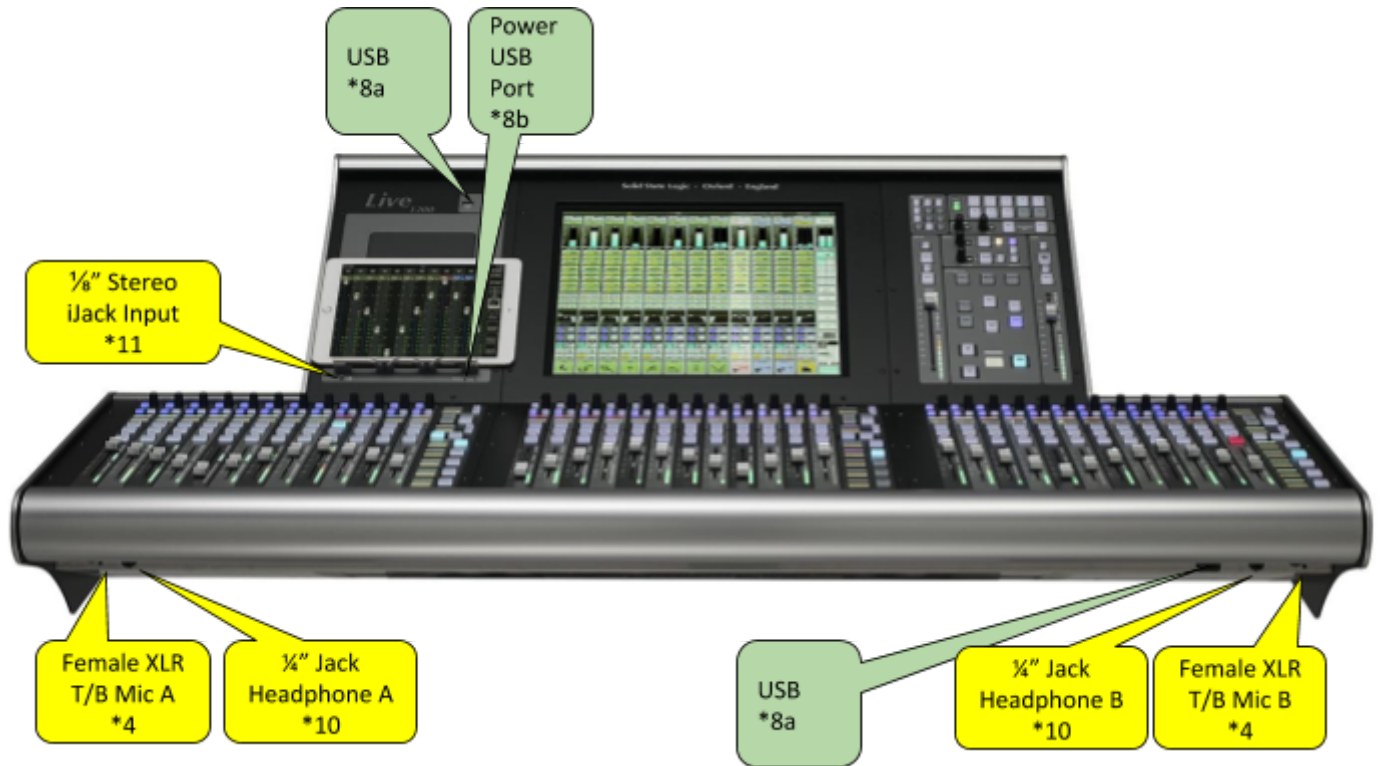


Side View

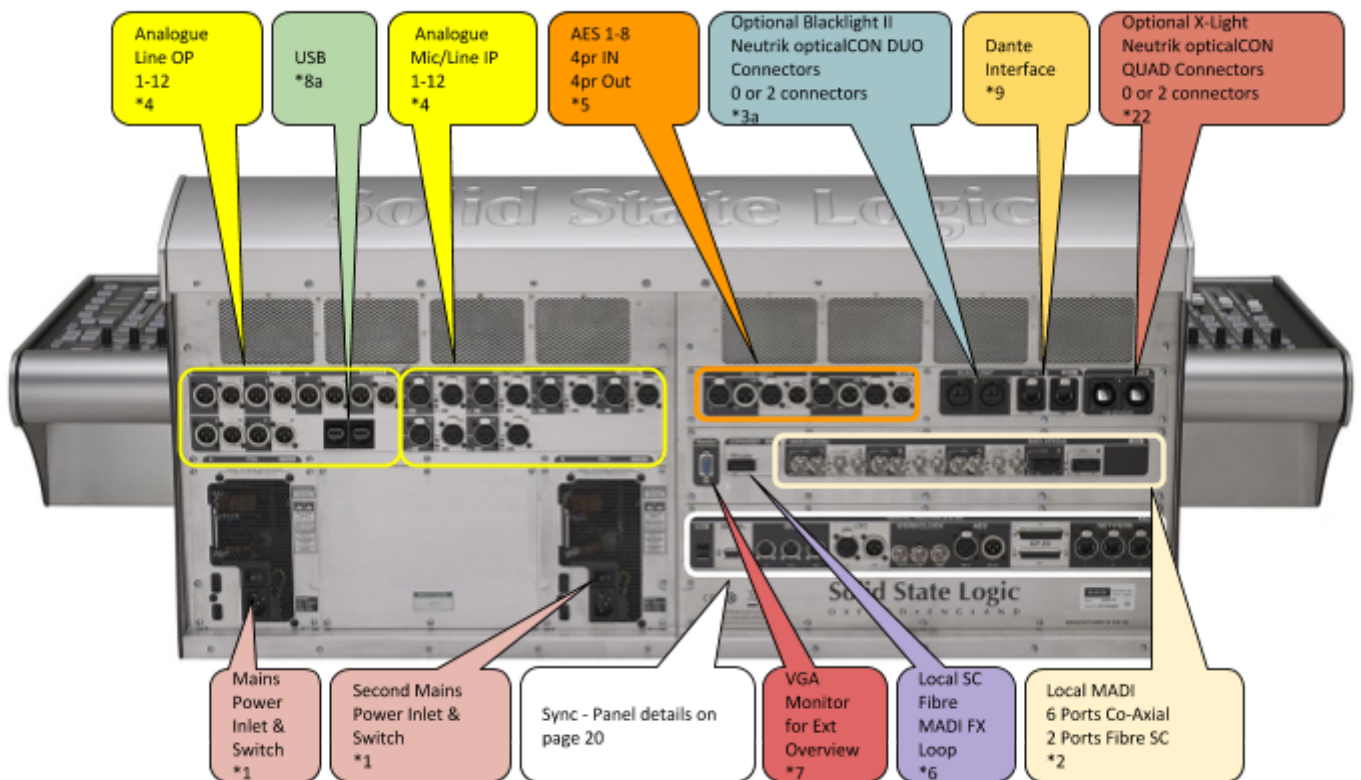


L200 Console

L200 Connections - Front



L200 Console Connections - Rear



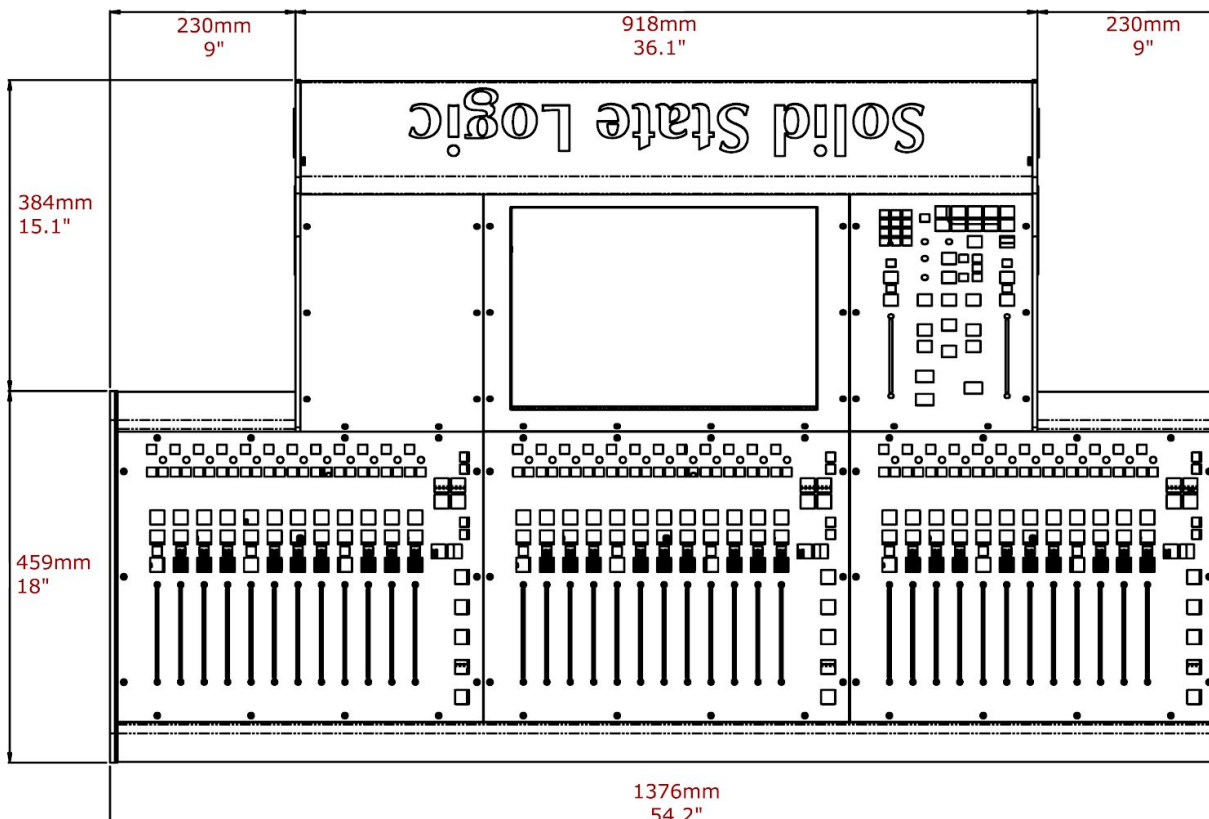
[Connections Key](#)

L200 Console Weight, Power & Dimensions

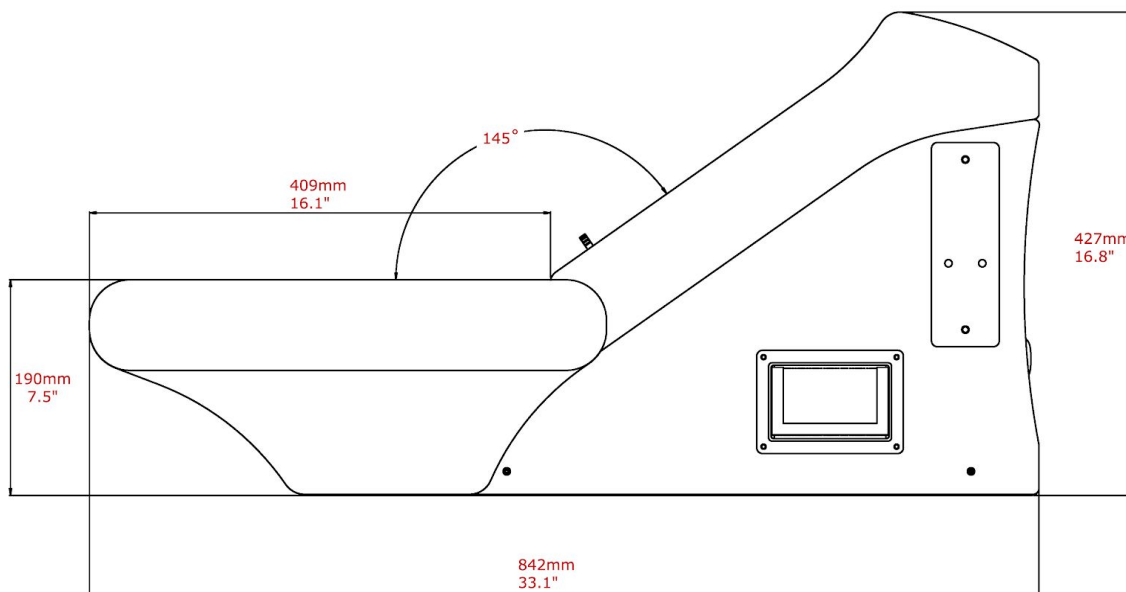
| | |
|------------------------------|------------------|
| Weight (without flight case) | 85 kg (188 lbs) |
| Weight (with flight case) | 210 kg (463 lbs) |
| Acoustic Noise | < NR40 |
| Power | <460 W |

Console Dimensions: (upper figures in millimeters, lower figures, inches) - A DXF drawing is available from SSL

Plan View

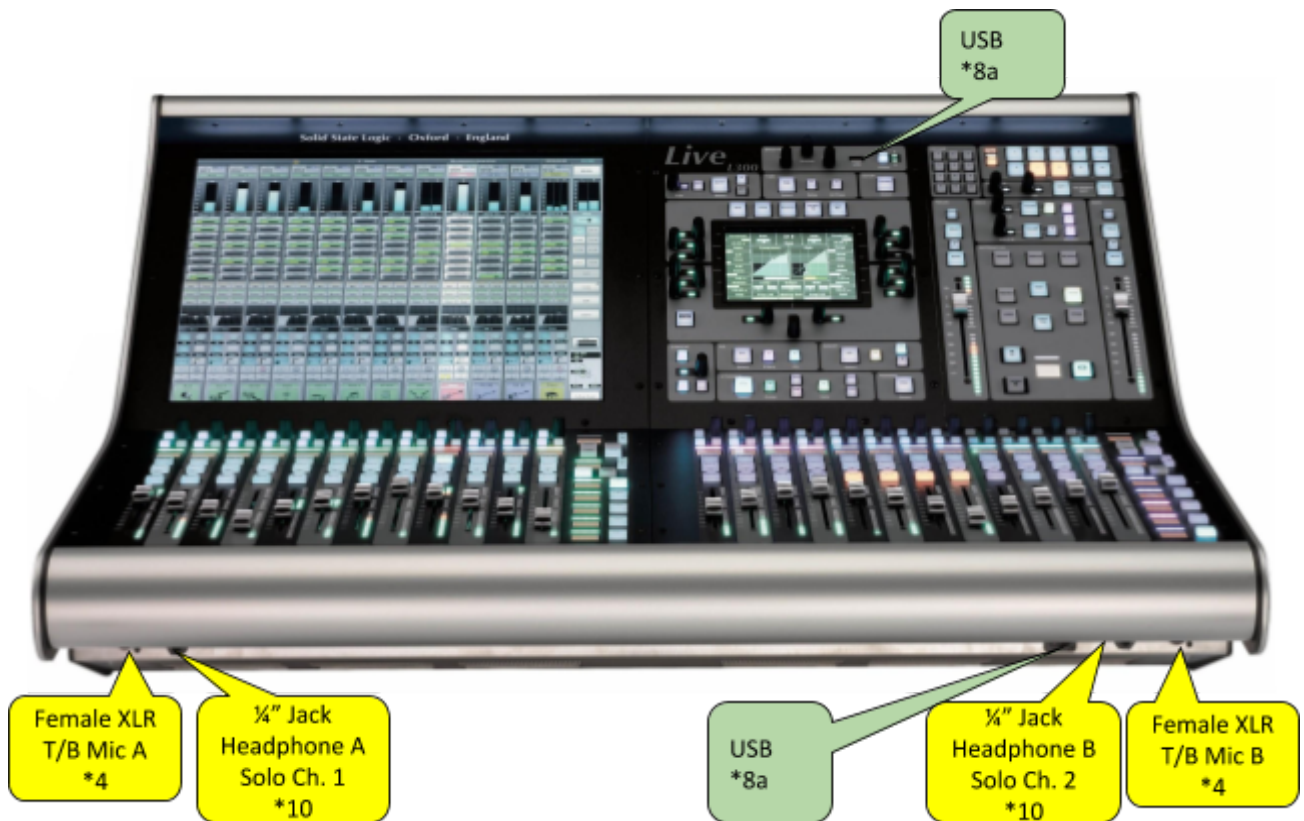


Side View

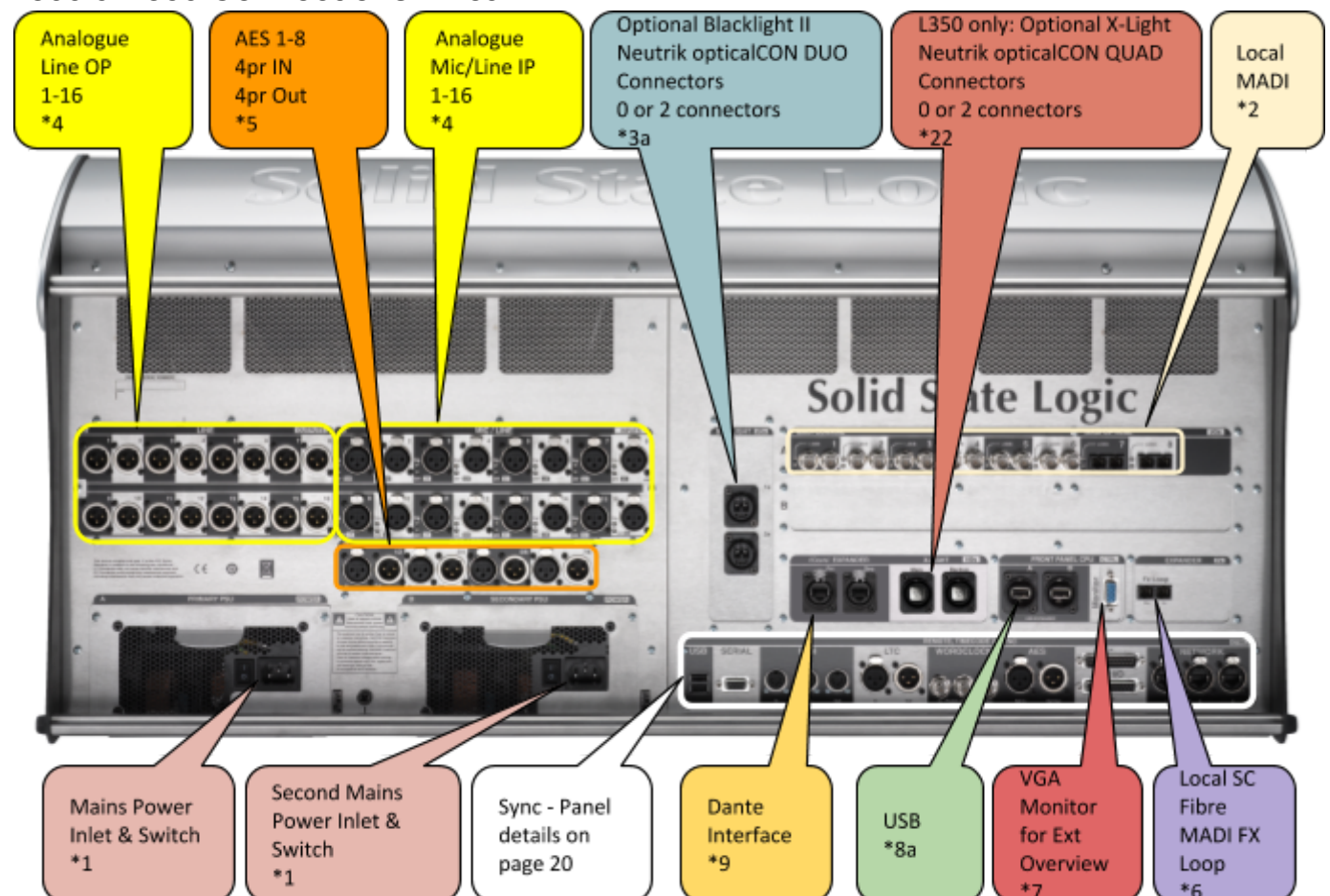


L300 & L350 Consoles

L300 & L350 Connections - Front



L300 & L350 Connections - Rear



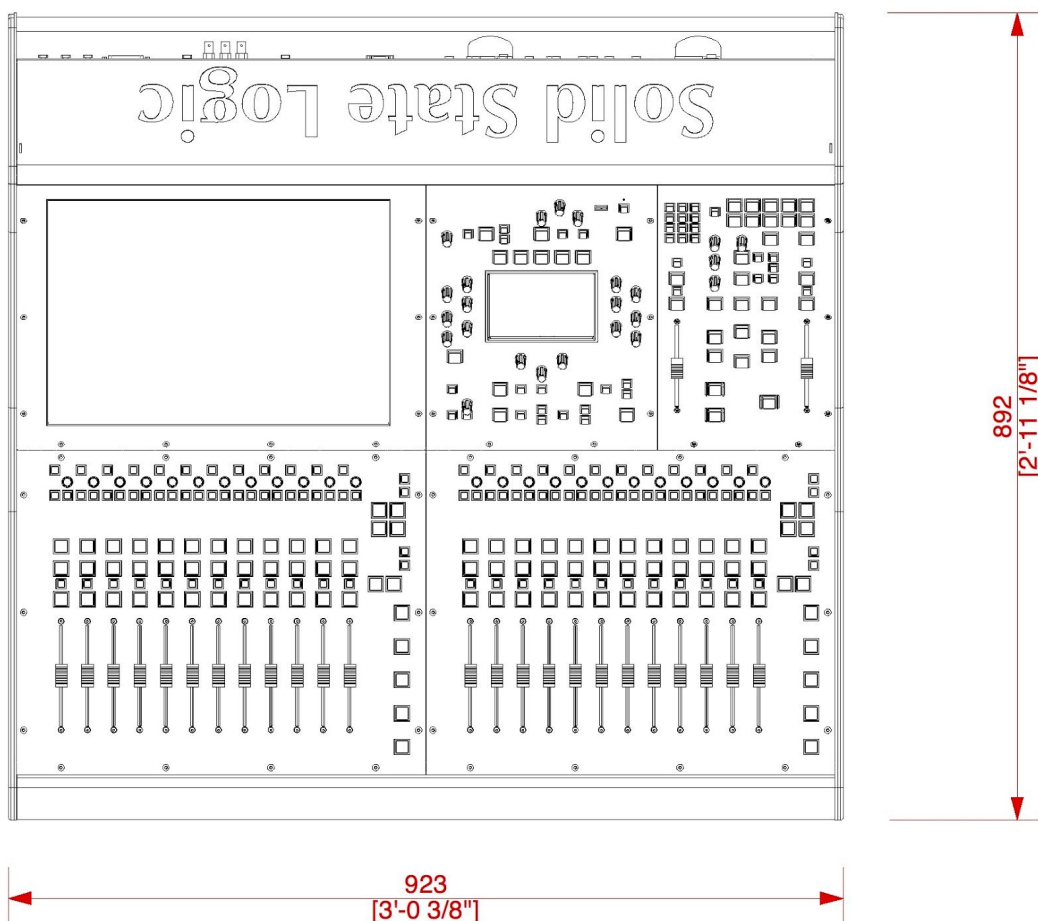
[Connections Key](#)

L300 & L350 Console Weight, Power & Dimensions

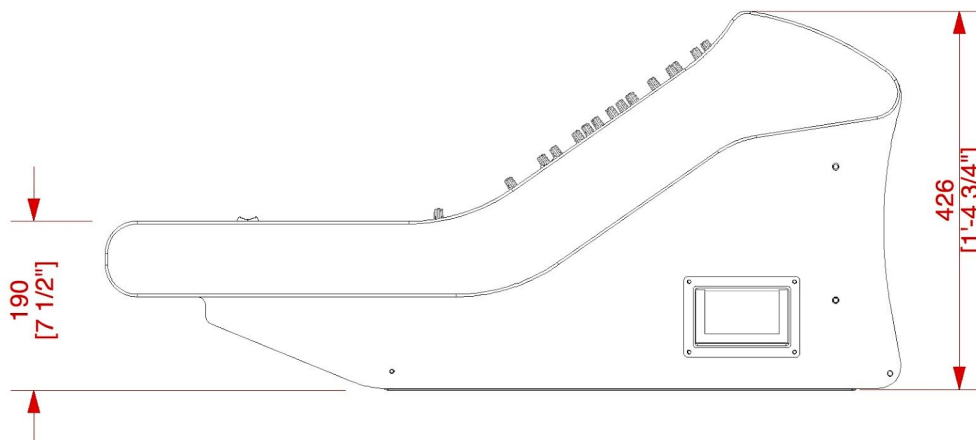
| | L300 | L350 |
|------------------------------|------------------|------------------|
| Weight (without flight case) | 81 kg (179 lbs) | 86 kg (190 lbs) |
| Weight (with flight case) | 171 kg (377 lbs) | 176 kg (388 lbs) |
| Acoustic Noise | < NR30 | |
| Power | <450 W | |

Console Dimensions: (upper figures in millimeters, lower figures feet & inches) - A DXF drawing is available from SSL

Plan View



Side View

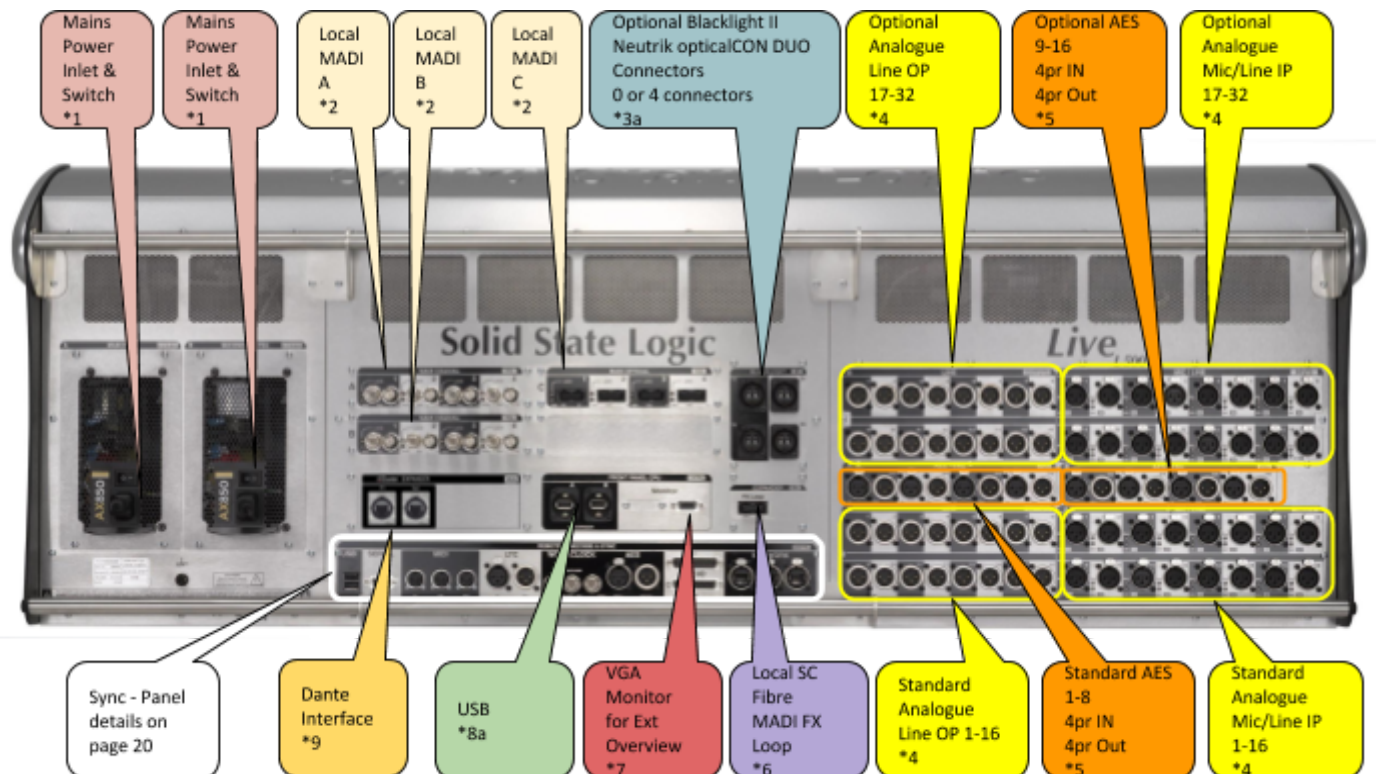


L500 Plus Console

L500 Plus Connections - Front



L500 Plus Connections - Rear



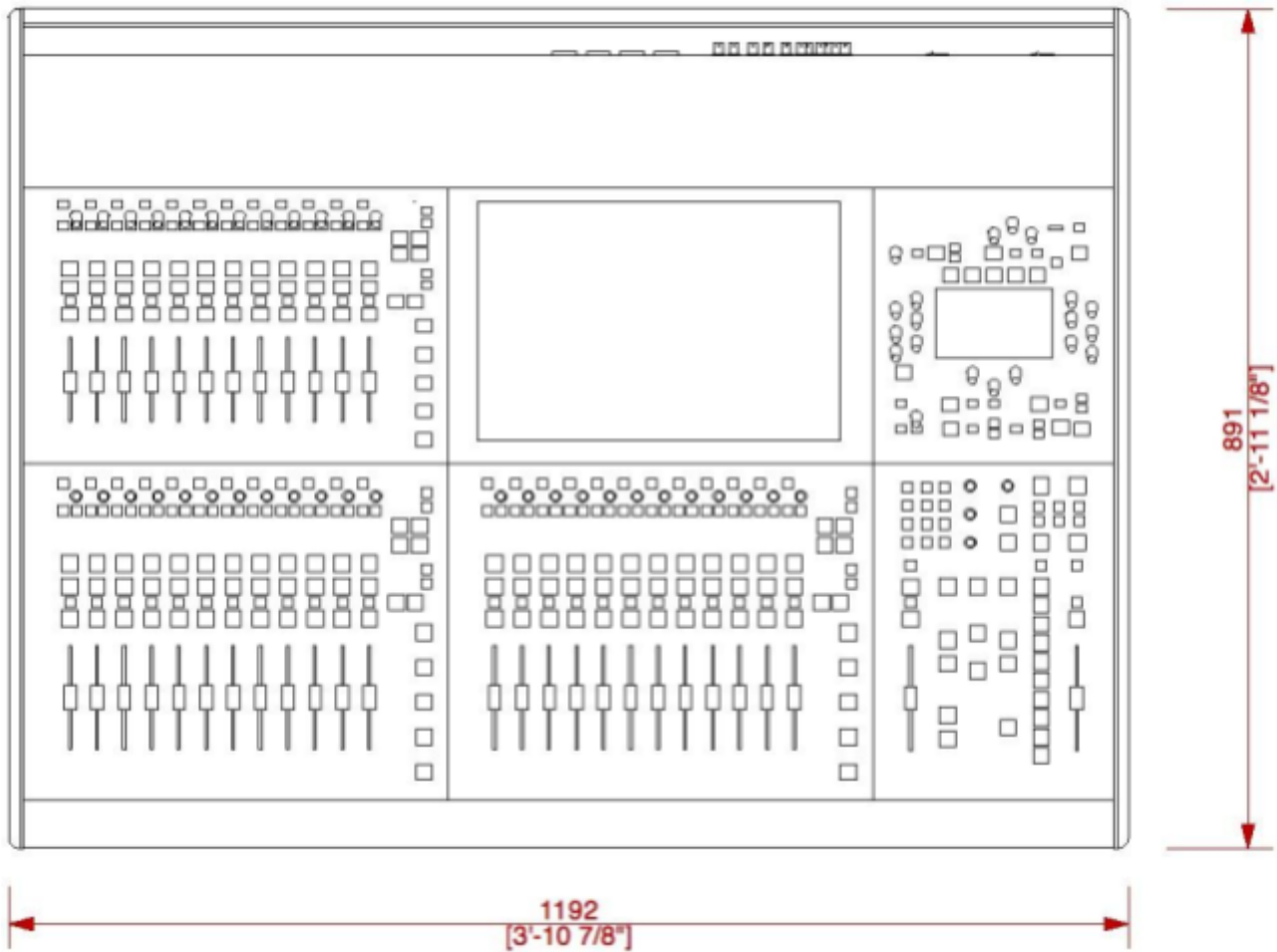
[Connections Key](#)

L500 Plus Console Weight, Power & Dimensions

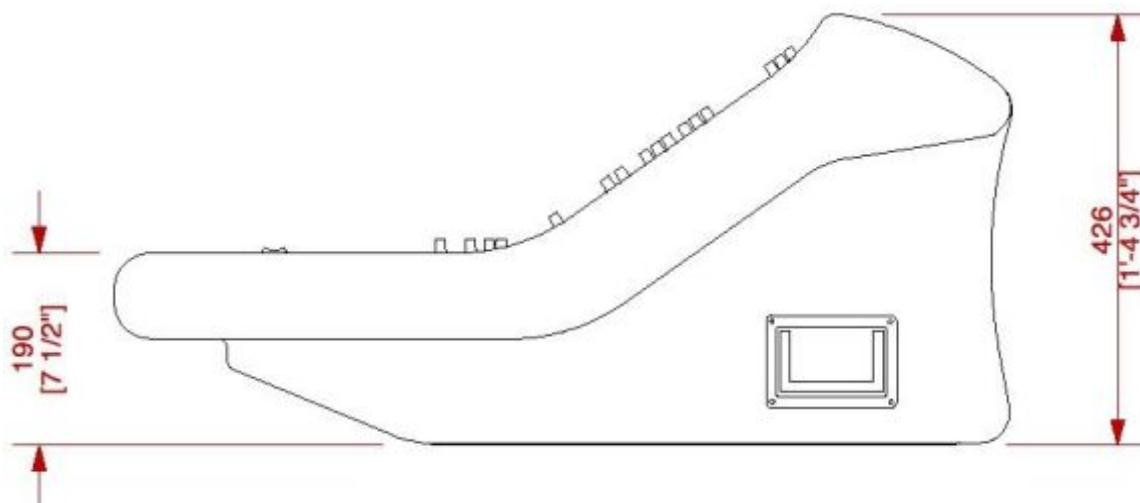
| | |
|------------------------------|------------------|
| Weight (without flight case) | 85 kg (188 lbs) |
| Weight (with flight case) | 190 kg (419 lbs) |
| Acoustic Noise | < NR40 |
| Power | <460 W |

Console Dimensions: (upper figures in millimeters, lower figures feet & inches) - A DXF drawing is available from SSL

Plan View



Side View

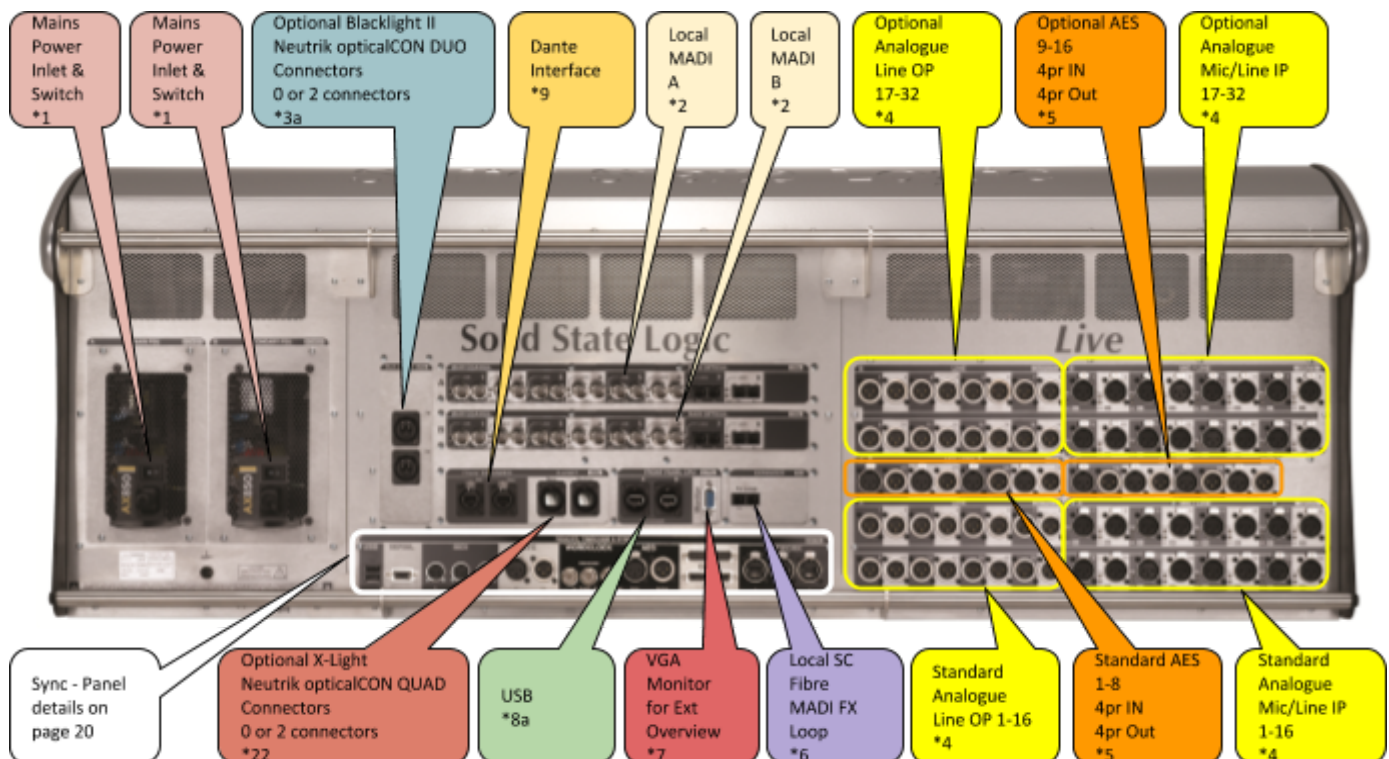


L550 Console

L550 Plus Connections - Front



L550 Plus Connections - Rear



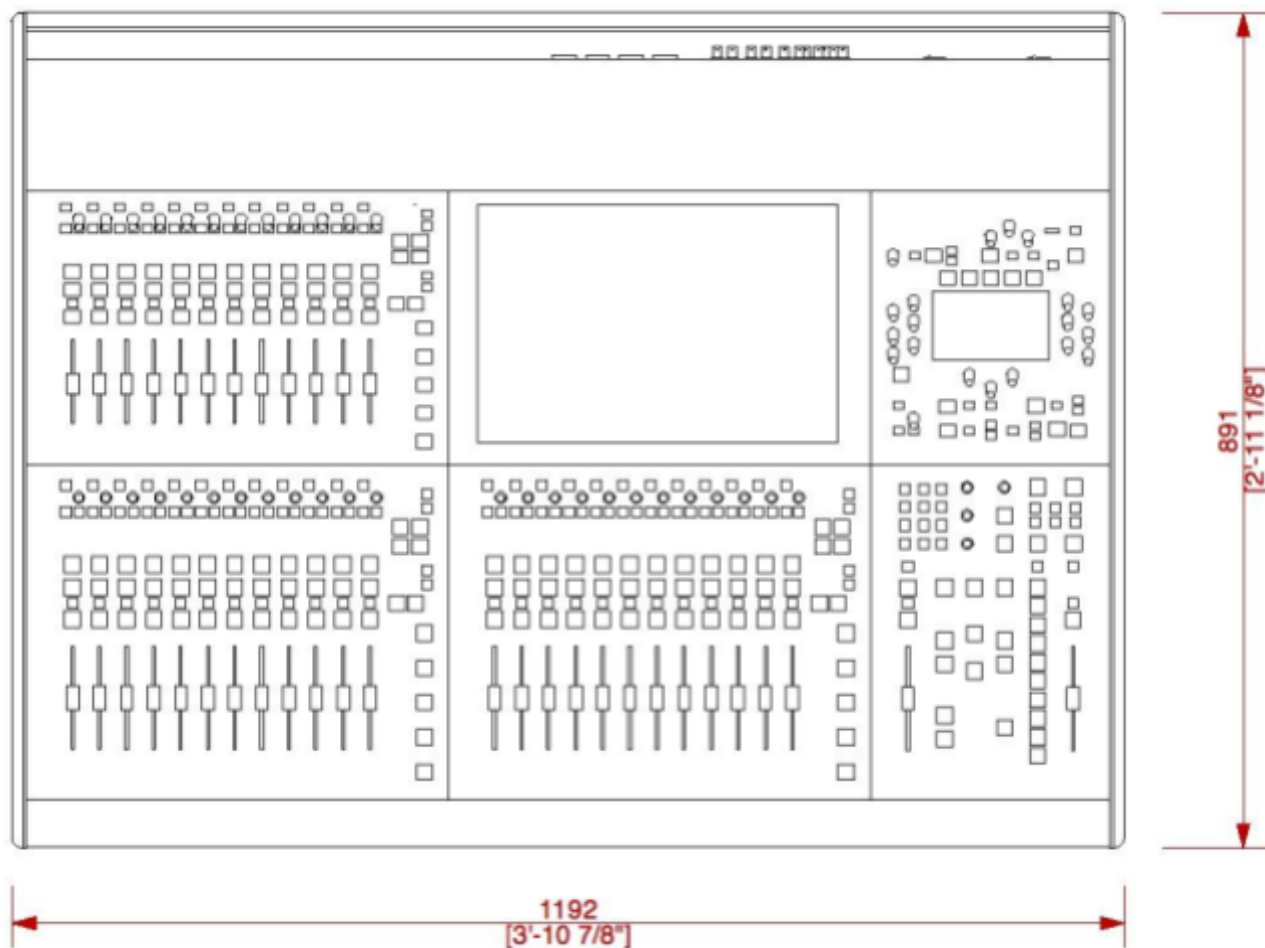
[Connections Key](#)

L550 Console Weight, Power & Dimensions

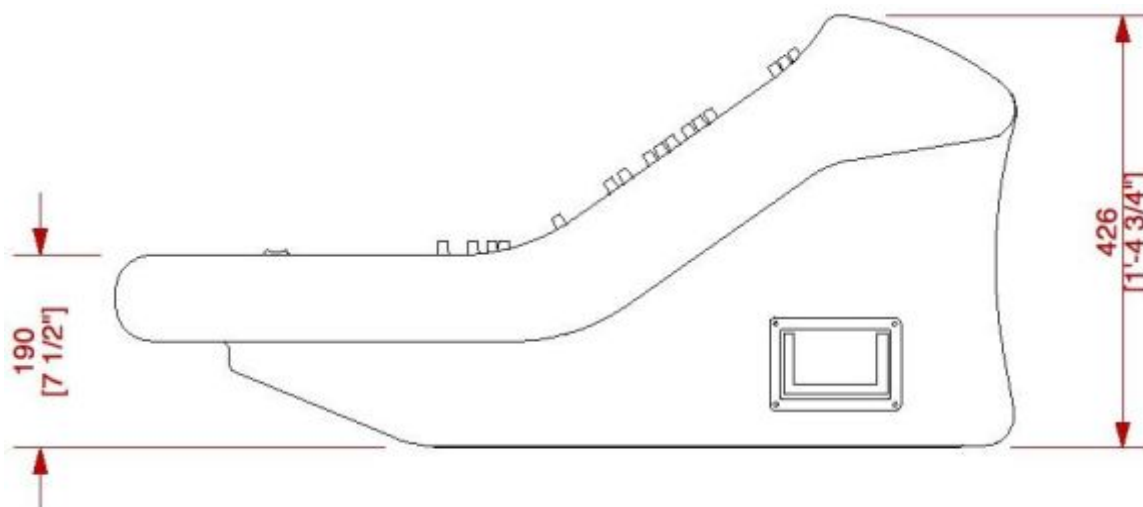
| | |
|------------------------------|------------------|
| Weight (without flight case) | 90 kg (198 lbs) |
| Weight (with flight case) | 195 kg (430 lbs) |
| Acoustic Noise | < NR40 |
| Power | <460 W |

Console Dimensions: (upper figures in millimeters, lower figures feet & inches) - A DXF drawing is available from SSL

Plan View

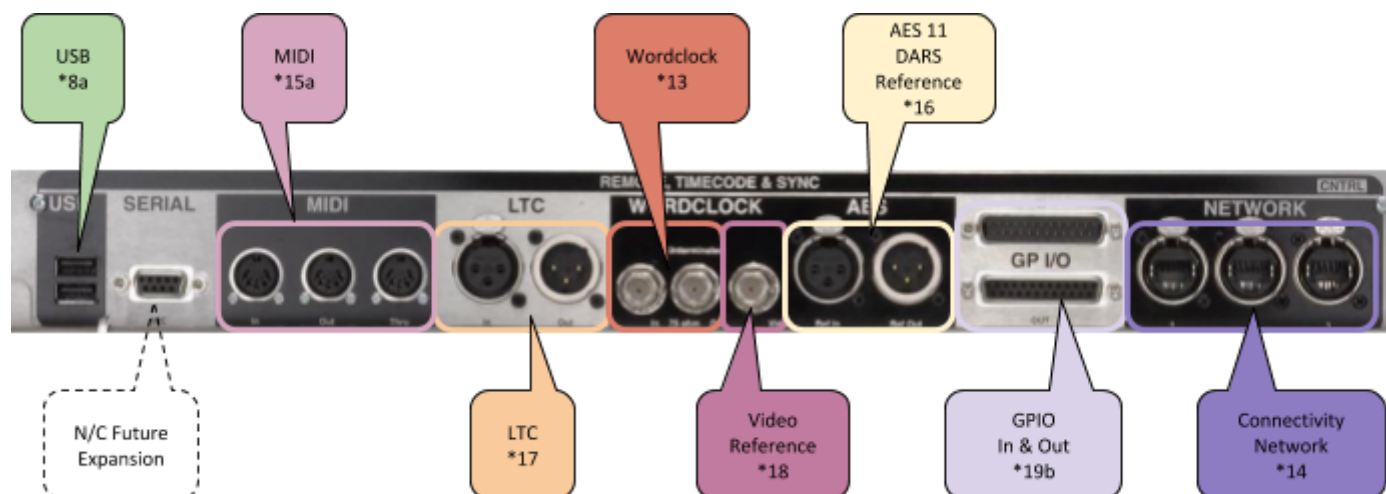


Side View



Console Remote, Timecode & Sync Panel

(L200, L300, L350, L500 Plus, L550)



Remote Tile



Rear Connections

Mains Power Inlet - *1

USB B Connection - *8c

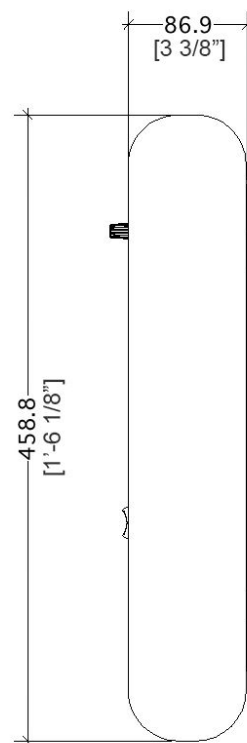
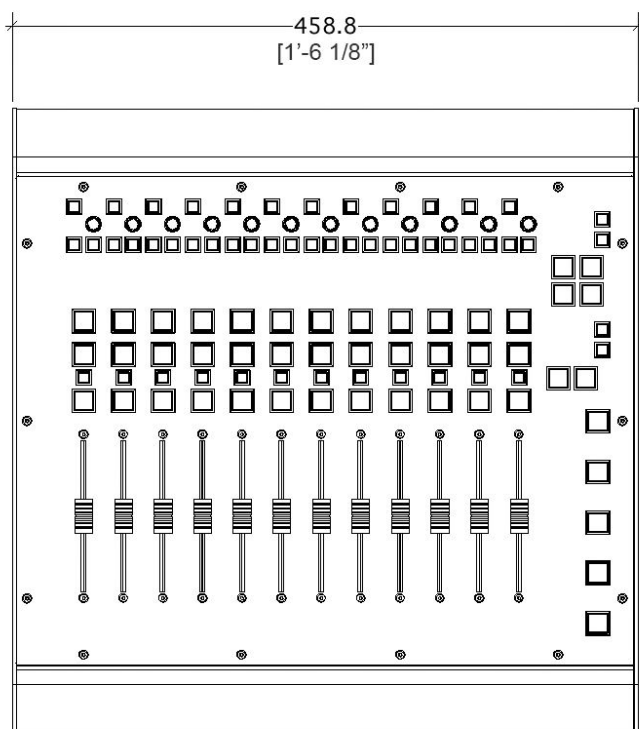
Connects to console via USB A-B Cable (up to 5m without active repeaters)

Remote Tile Weight, Power & Dimensions

| | |
|------------------------------|--|
| Weight (without flight case) | 9.7 kg (21.4 lbs) |
| Weight (with flight case) | 19.7 kg (43.5 lbs) |
| Acoustic Noise | Fan does not start until external temperatures reach approximately 40 °C. Above 40 °C, NR33. |
| Power | <100 W |

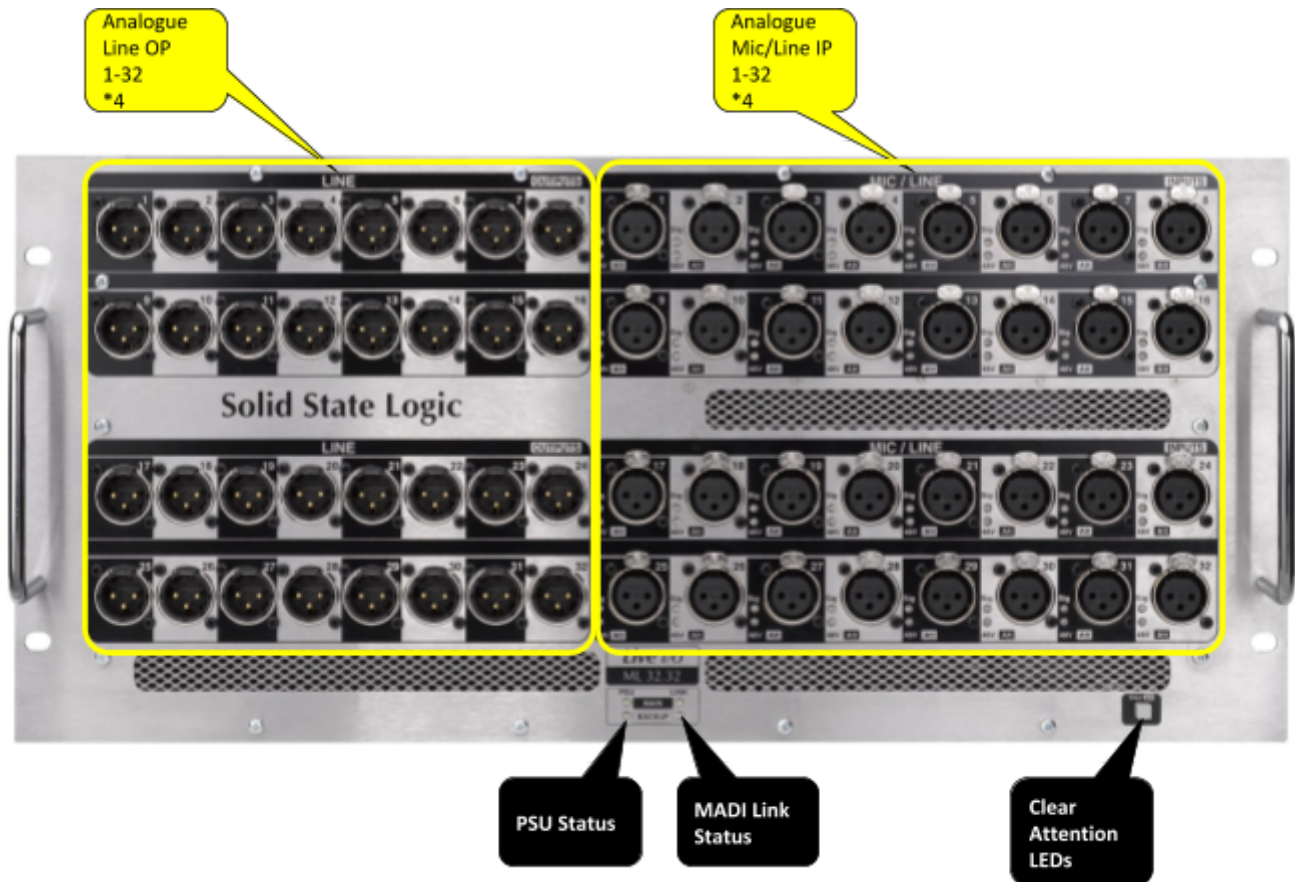
Console Dimensions: (upper figures in millimeters, lower figures feet & inches) - A DXF drawing is available from SSL

Plan & Side View

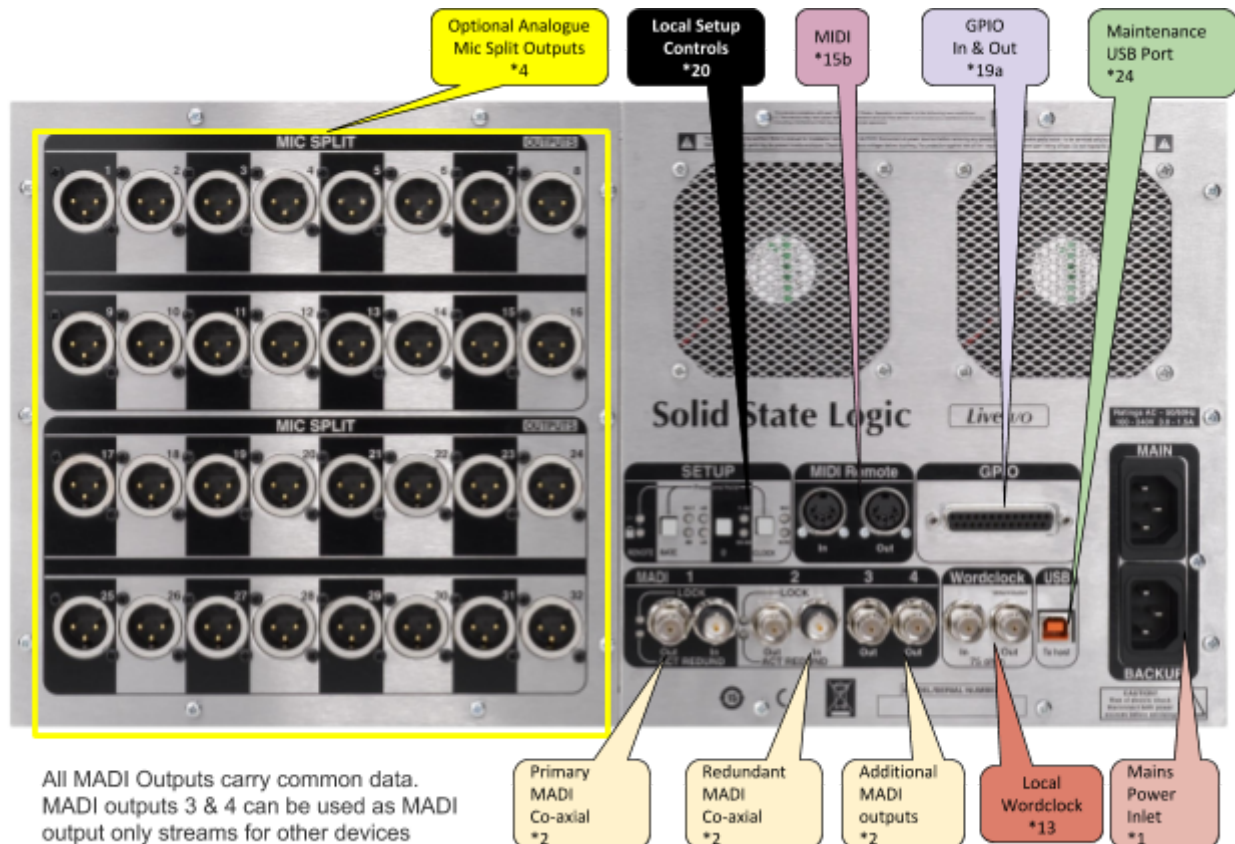


ML 32.32 5U Mic/Line Stagebox

Front



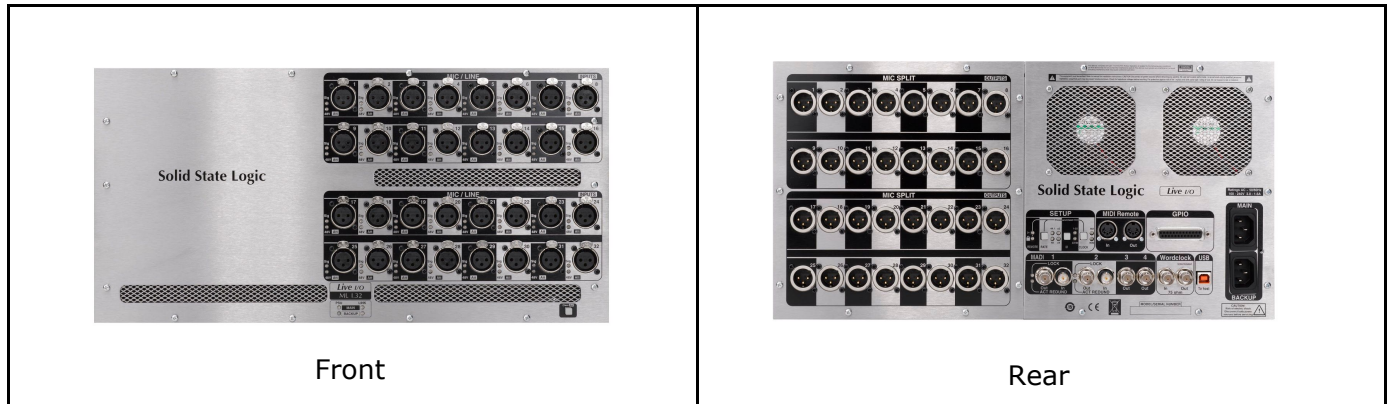
Rear



ML I.32 5U Mic/Line Input Stagebox

Mic/Line Only version of the ML 32.32. See ML 32.32 for relevant connector details.

*Optional Mic Splits shown on rear picture.

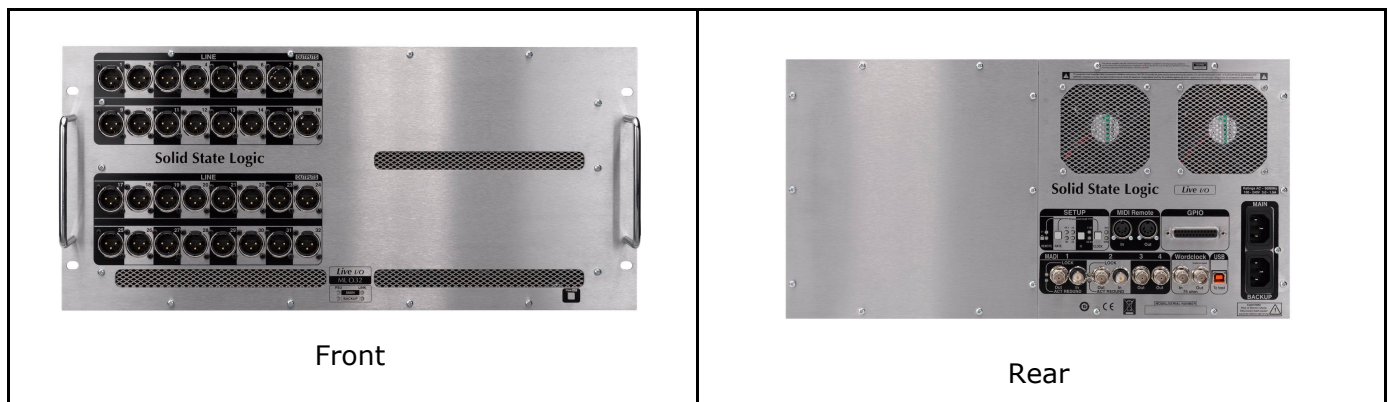


Front

Rear

ML O.32 5U Line Output Stagebox

Output Only version of the ML 32.32. See ML 32.32 for relevant connector details.



Front

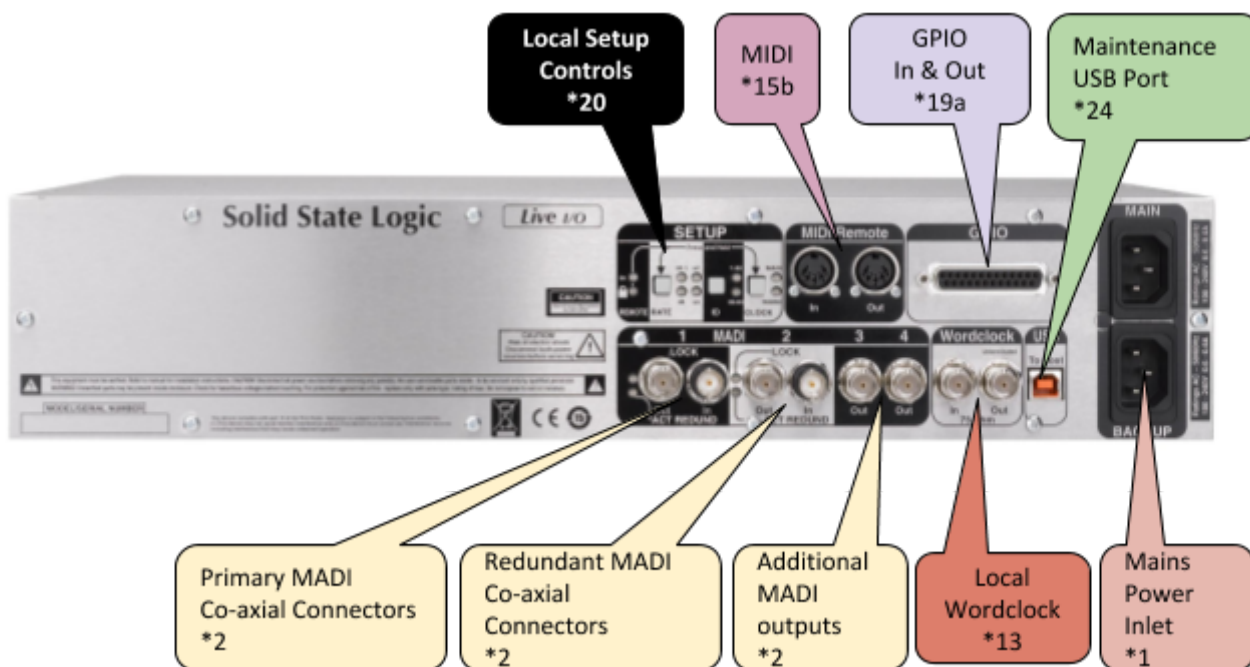
Rear

ML 32.32 Weight & Dimensions

| | |
|-----------------------|------------------------------------|
| Height | 5U - 223 mm (8.75 inches) |
| Depth | 446 mm (17.5 inches) |
| Width | 483 mm (19 inches) |
| Weight | 17 kg (inc optional Split Outputs) |
| Power | 150 W |
| Acoustic Noise | typically NR 40 |

D 32.32 AES Digital 2U Stagebox

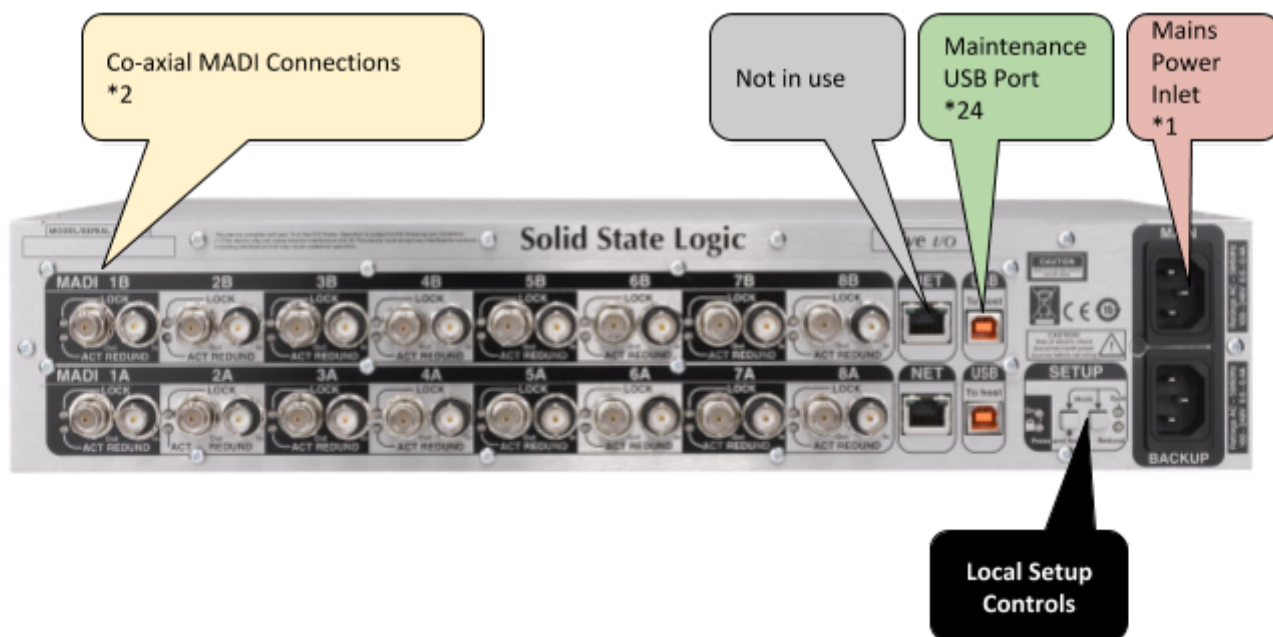
32 AES Digital Inputs/Outputs
(16 AES Pairs)
Arranged as In/Out Pairs
*5



D 32.32 Weight & Dimensions

| | |
|---------------|-------------------------|
| Height | 2U - 89 mm (3.5 inches) |
| Depth | 305 mm (12 inches) |
| Width | 483 mm (19 inches) |
| Weight | 6.2 kg |
| Power | 60 W |

BLII.D 2U Blacklight-MADI Concentrator

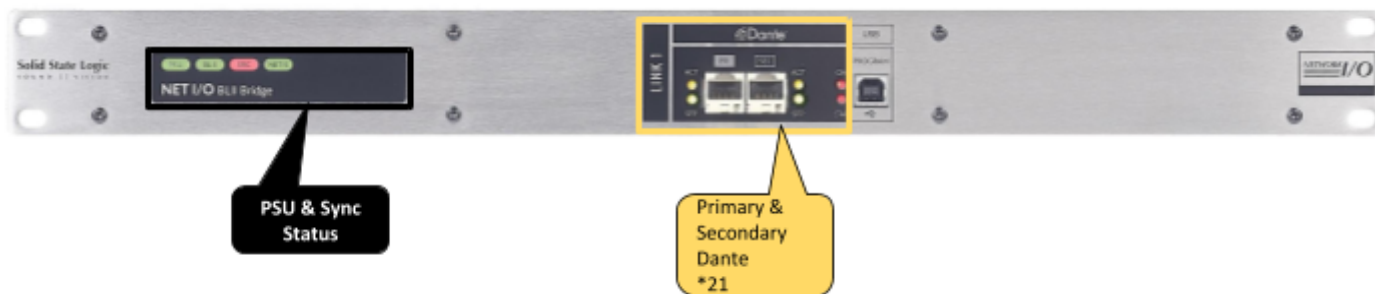


BLII.D Weight & Dimensions

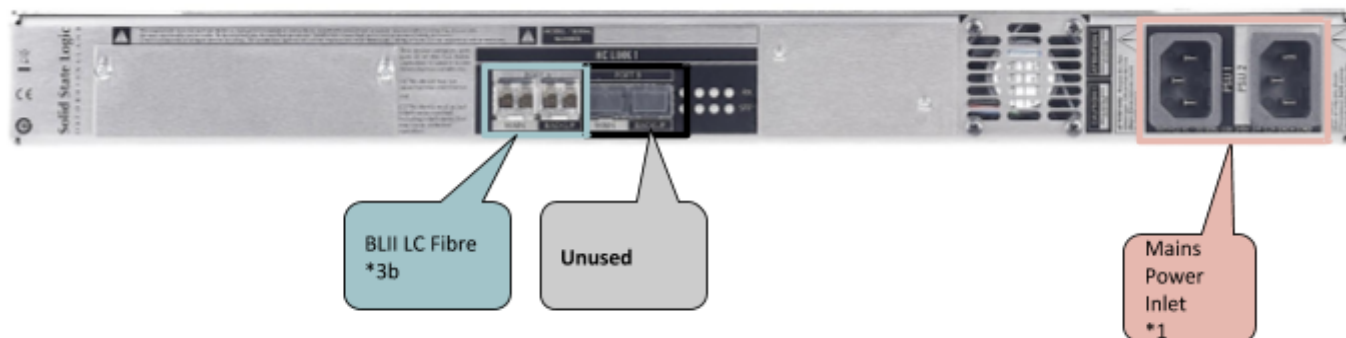
| | |
|---------------|-------------------------|
| Height | 2U - 89 mm (3.5 inches) |
| Depth | 305 mm (12 inches) |
| Width | 483 mm (19 inches) |
| Weight | 6.5 kg |
| Power | 60 W |

Net I/O BLII Bridge - Blacklight II to Dante Bridge

Front



Rear



PSU Status and Sync (Clock) status LEDs. For more information on LED status meanings please see livehelp.solidstatellogic.com/Help/DanteBridges.html.

BLII Bridge Weight & Dimensions

| | |
|----------------------------------|----------------------------|
| Height | 1U - 44.5 mm (1.75 inches) |
| Depth | 340 mm (13.4 inches) |
| Width Including Rack Ears | 483 mm (19 inches) |
| Weight | 4.5 kg (9.9 lbs) |
| Power | 100-240 V <100 W |

Net I/O X-Light Bridge

Front



Rear



PSU Status, Sync (Clock) and fibre status LEDs. For more information on LED status meanings please see livehelp.solidstatellogic.com/Help/DanteBridges.html.

X-Light Bridge Weight & Dimensions

| | |
|----------------------------------|----------------------------|
| Height | 1U - 44.5 mm (1.75 inches) |
| Depth | 340 mm (13.4 inches) |
| Width Including Rack Ears | 483 mm (19 inches) |
| Weight | 4.8 kg (10.6 lbs) |
| Power | 100-240 V <100 W |

Connections - Key



***1 - Mains Power Connector**

Connector Type - IEC 60320 - C13



***2 - MADI**

BNC Co-axial MADI connections

Co-axial MADI

BNC connections to IEC 60169-8

Cables should be at least to Belden 1694F Low Loss Serial Digital Coax standard, fitted with high quality BNC connections.

Cables runs between Console or Blacklight-MADI Concentrators and Stageboxes up to 75 meters. Higher quality cable/connections can support up to 100 meters.

75 m Drum of correct cable - SSL Part Number 66DR07501

Specification for Belden cable can be found here:

edesk.belden.com/products/techdata/metric/pdf/1694F.pdf

Fibre MADI

Duplex SC multimode sockets

Fibre - Multimode 50/125 μm , maximum length <1000 m (quality cables, connections and no intermediate connections)



***3a - Blacklight II**

Redundant pair(s) of fibre connections. The pair consists of primary and redundant connections.

Connector Type - Neutrik opticalCON DUO for ruggedised applications (compatible with duplex LC fibre connections for non-rugged applications).

Fibre - Multimode 50/125 μm , maximum length <300 m (quality cables, connections and no intermediate connections)

Pre-terminated drums available from SSL in 150m (std) and 100m (to order) lengths.

150 m BL MM Fibre cable drum SSL Part No. 66DP15003

100 m BL MM Fibre cable drum SSL Part No. 66DP10003

Fibre - Singlemode (special order) 9/125 μm , maximum length <1 km (quality cables, connections and no intermediate connections)

Pre-terminated drums available from SSL in 150m and 300m (both to order) lengths.

150 m BL SM Fibre cable drum SSL Part No. 66DP15004

300 m BL SM Fibre cable drum SSL Part No. 66DP30004

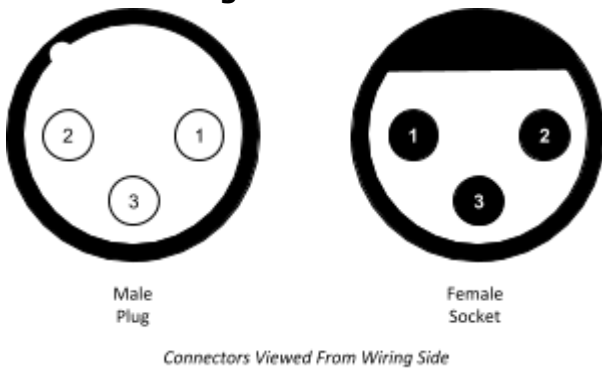
***3b - Blacklight II LC fibre**

Redundant pair(s) of LC fibre connections. The pair consists of primary and redundant connections.

Connector Type - Duplex LC fibre connections for non-rugged applications.

Fibre - Multimode 50/125 μm , maximum length <300 m (quality cables, connections and no intermediate connections)

*4 - Analogue



Analogue Inputs and Outputs on 3 pin XLR connections.

Dimensions: Cable Dia: 19 x 60 mm (approx.) 8-12 mm (typical)

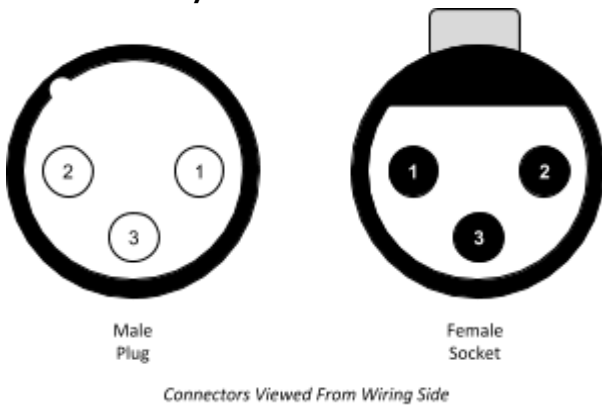
Pinout for balanced audio:

Pin 1 Screen/Ground

Pin 2 Hot (+ve)

Pin 3 Cold (-ve)

*5 - AES/EBU



AES3 Inputs and Outputs on 3 pin XLR connections. (IEC 60958 Type I)

Dimensions: Cable Dia: 19 x 60 mm (approx.) 8-12 mm (typical)

Pinout for AES3 XLR:

Pin 1 Screen/Ground

Pin 2 Hot (+ve)

Pin 3 Cold (-ve)

*6 - MADI FX Loop

Fibre MADI connection to external effects processor.

Duplex SC multimode socket

Fibre - Multimode 50/125 μ m, maximum length <1000 m (quality cables, connections and no intermediate connections)



***7 - VGA Monitor**

Connection to optional Overview monitor

Three-row 15-pin D-type DE-15 connector

Native resolution : 1280 x 1024 pixels



***8a - USB Connections**

USB 2.0 spec. connections for optional keyboard, mouse or storage peripherals
Up to 500 mA

***8b - Power USB Connector**

USB Power connection for tablets and USB powered devices
Up to 3 A

***8c - USB B Connection**

USB B Connection. Connect to console via USB A-B cable



***9 - Dante**

1 pair of Dante network connections.

Connector type: 2 x RJ45 for Primary and Secondary Connections.



***10 - Headphone Outputs**

A pair of front panel mounted ¼" jack sockets for Headphones.

Headphone Output Pinout :

Sleeve Screen/Ground

Ring Right

Tip Left



***11 - 3.5 mm Jack Input**

3.5 mm stereo jack socket for phones or portable media players.



***12 - Reserved**



***13 - Wordclock**

BNC connections to IEC 60169-8

75 Ω Characteristic Impedance, unterminated internally.

Wordclock Output is active when no Input is present. Wordclock Output follows console selected reference source for use as a local Wordclock reference.



***14 - Connectivity Network Port**

Connector type: RJ45

Cat 5e 10/100/1000 bit/s Ethernet Ports, used to connect remote devices to console (not Dante).



*15a - Console MIDI Connections

5-pin DIN standard MIDI connections for In, Out & Thru connections:
midi.org/techspecs/electrispec.php

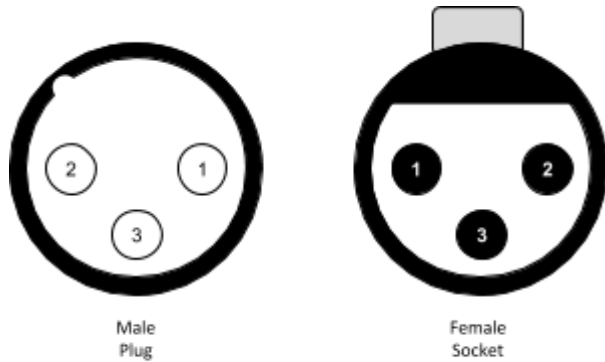
Used for MIDI Timecode (MTC) and other MIDI control triggers/commands.

*15b - Stagebox MIDI Connections

5-pin DIN standard MIDI connections for In & Out connections.



*16 - AES 11 DARS Reference



Connectors Viewed From Wiring Side

AES11 DARS Input and Output on 3 pin XLR connections. (IEC 60958 Type I)

Dimensions: Cable Dia: 19 x 60 mm (approx.) 8-12 mm (typical)

Pinout for AES3 XLR:

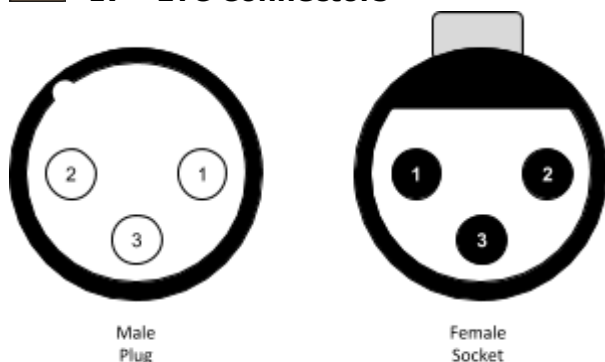
Pin 1 Screen/Ground

Pin 2 Hot (+ve)

Pin 3 Cold (-ve)



*17 - LTC Connectors



Connectors Viewed From Wiring Side

Linear Time Code (LTC) in and out using Balanced XLR connections.

Dimensions: Cable Dia: 19 x 60 mm (approx.) 8-12 mm (typical)

Pinout for LTC In and Out

Pin 1 Screen/Ground

Pin 2 Hot (+ve)

Pin 3 Cold (-ve)



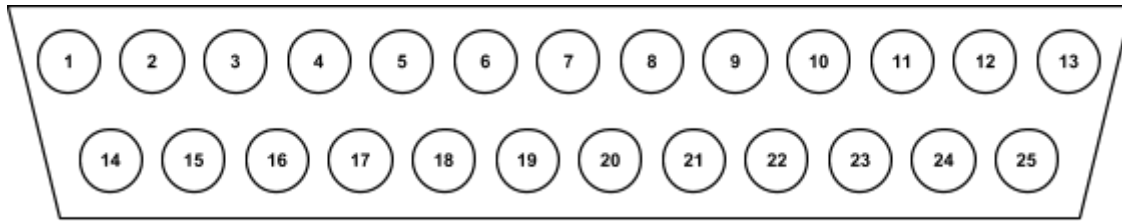
***18 - Video Reference**

BNC connectors to IEC 60169-8

75 Ω Characteristic Impedance, Analogue video (1 Vp-p, PAL, NTSC, Composite, B&B)



***19a - Stagebox GPIO Connections**



Socket (Female)

Connector Type: 25-Way D-Type Female (Combined Inputs & Outputs)
 Dimensions: Cable Dia: 55 x 15 mm (approx.) 8 mm (typical)
 Screwlock thread: 440-UNC

6 opto-isolated GP input and 5 relay-closure outputs

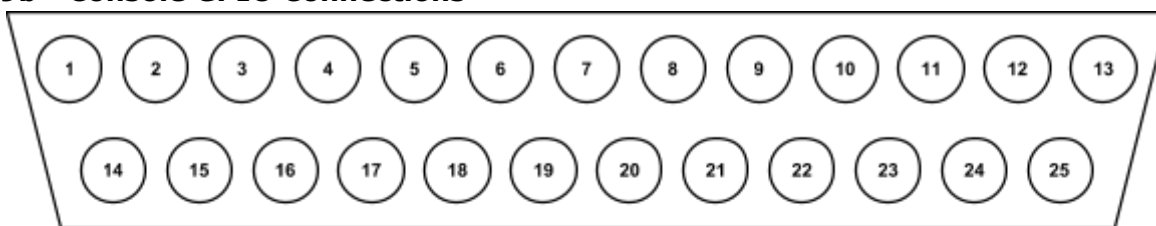
GPIO Connector Pinout

GP Output - D-type Female

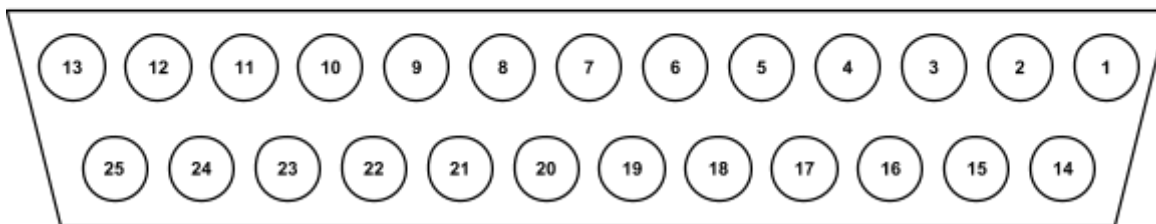
| Pin | Description | Pin | Description |
|-----|-------------|-----|----------------------|
| 1 | Input 1A | 7 | +12V (450mA maximum) |
| 14 | Input 1B | 20 | 0V Chassis |
| 2 | Input 2A | 8 | Output 1A |
| 15 | Input 2B | 21 | Output 1B |
| 3 | Input 3A | 9 | Output 2A |
| 16 | Input 3B | 22 | Output 2B |
| 4 | Input 4A | 10 | Output 3A |
| 17 | Input 4B | 23 | Output 3B |
| 5 | Input 5A | 11 | Output 4A |
| 18 | Input 5B | 24 | Output 4B |
| 6 | Input 6A | 12 | Output 5A |
| 19 | Input 6B | 25 | Output 5B |
| | | 13 | +12V (450mA maximum) |



***19b - Console GPIO Connections**



Socket (Female)



Plug (Male)

Connector Type: 25-Way D-Type Male (Inputs) and Female (Outputs)
 Dimensions: Cable Dia: 55 x 15 mm (approx.) 8 mm (typical)
 Screwlock thread: 440-UNC

12 opto-isolated GP input and 12 relay-closure outputs

GPIO Connector Pinout

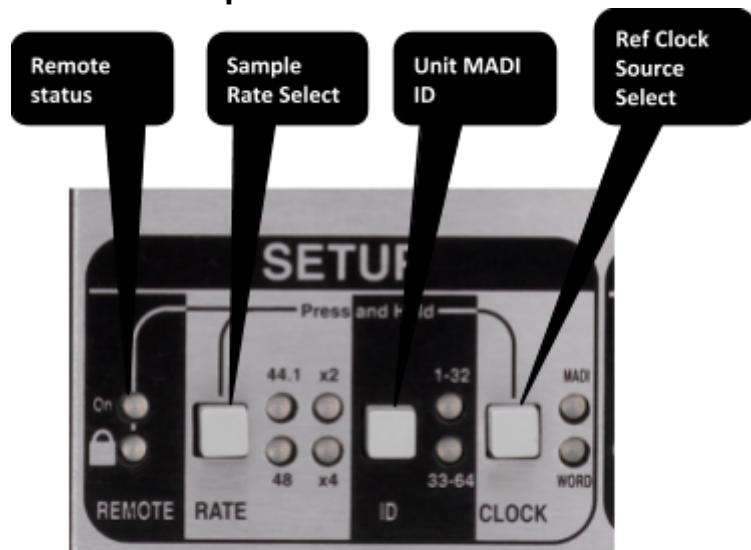
GP Input - D-type Male

| Pin | Description | Pin | Description |
|-----------|-------------|-----------|-------------|
| 1 | Input 1A | 7 | Input 7A |
| 14 | Input 1B | 20 | Input 7B |
| 2 | Input 2A | 8 | Input 8A |
| 15 | Input 2B | 21 | Input 8B |
| 3 | Input 3A | 9 | Input 9A |
| 16 | Input 3B | 22 | Input 9B |
| 4 | Input 4A | 10 | Input 10A |
| 17 | Input 4B | 23 | Input 10B |
| 5 | Input 5A | 11 | Input 11A |
| 18 | Input 5B | 24 | Input 11B |
| 6 | Input 6A | 12 | Input 12A |
| 19 | Input 6B | 25 | Input 12B |
| | | 13 | 0V |

GP Output - D-type Female

| Pin | Description | Pin | Description |
|-----|-------------|-----|------------------|
| 1 | Output 1A | 7 | Output 7A |
| 14 | Output 1B | 20 | Output 7B |
| 2 | Output 2A | 8 | Output 8A |
| 15 | Output 2B | 21 | Output 8B |
| 3 | Output 3A | 9 | Output 9A |
| 16 | Output 3B | 22 | Output 9B |
| 4 | Output 4A | 10 | Output 10A |
| 17 | Output 4B | 23 | Output 10B |
| 5 | Output 5A | 11 | Output 11A |
| 18 | Output 5B | 24 | Output 11B |
| 6 | Output 6A | 12 | Output 12A |
| 19 | Output 6B | 25 | Output 12B |
| | | 13 | +12V (450mA max) |

***20 - Setup Controls: MADI**



REMOTE - Padlock LED

Red indicates SETUP controls are locked

Press and hold **RATE** & **CLOCK** simultaneously to activate controls. The Padlock LED will flash green to indicate controls are unlocked. After a few moments of inactivity, the controls will lock again.

REMOTE - On LED

On LED flashes green when remote MADI control data is received.

RATE - Sample Rate

RATE button selects different box sample rates (See [Live Console Synchronisation & Clocking](#) earlier in this guide)

ID - Daisy Chaining Stageboxes

Sets Unit **ID** if stageboxes are daisy chained (See [Live Console Synchronisation & Clocking](#) earlier in this guide)

CLOCK

The **CLOCK** button selects unit clock reference to MADI, Wordclock or internal inputs.

MADI LED colour meanings are as follows:

Green - Main and Redundant are both locked

Flashing Red and Green - Only one MADI receiver is locked

Red - Neither Main or Redundant are locked

Off - Stagebox is clocking from its internal clock source



***21 - Dante SFP Cages**

1 pair of Dante network connections.

SFP cages, can be fitted with RJ45 SFPs or singlemode/multimode fibre.



***22 - X-Light fibre**

Redundant pair(s) of fibre connections. The pair consists of primary and redundant connections.

Connector Type - Neutrik opticalCON QUAD for ruggedised applications.

Fibre - Multimode 50/125 μm , maximum length <300 m (quality cables, connections and no intermediate connections)

Pre-terminated drums available from SSL in 150 m (std) and 100 m (to order) lengths.

150 m X-Light MM Fibre cable drum SSL Part No. 66DPX1501

100 m X-Light MM Fibre cable drum SSL Part No. 66DPX1001

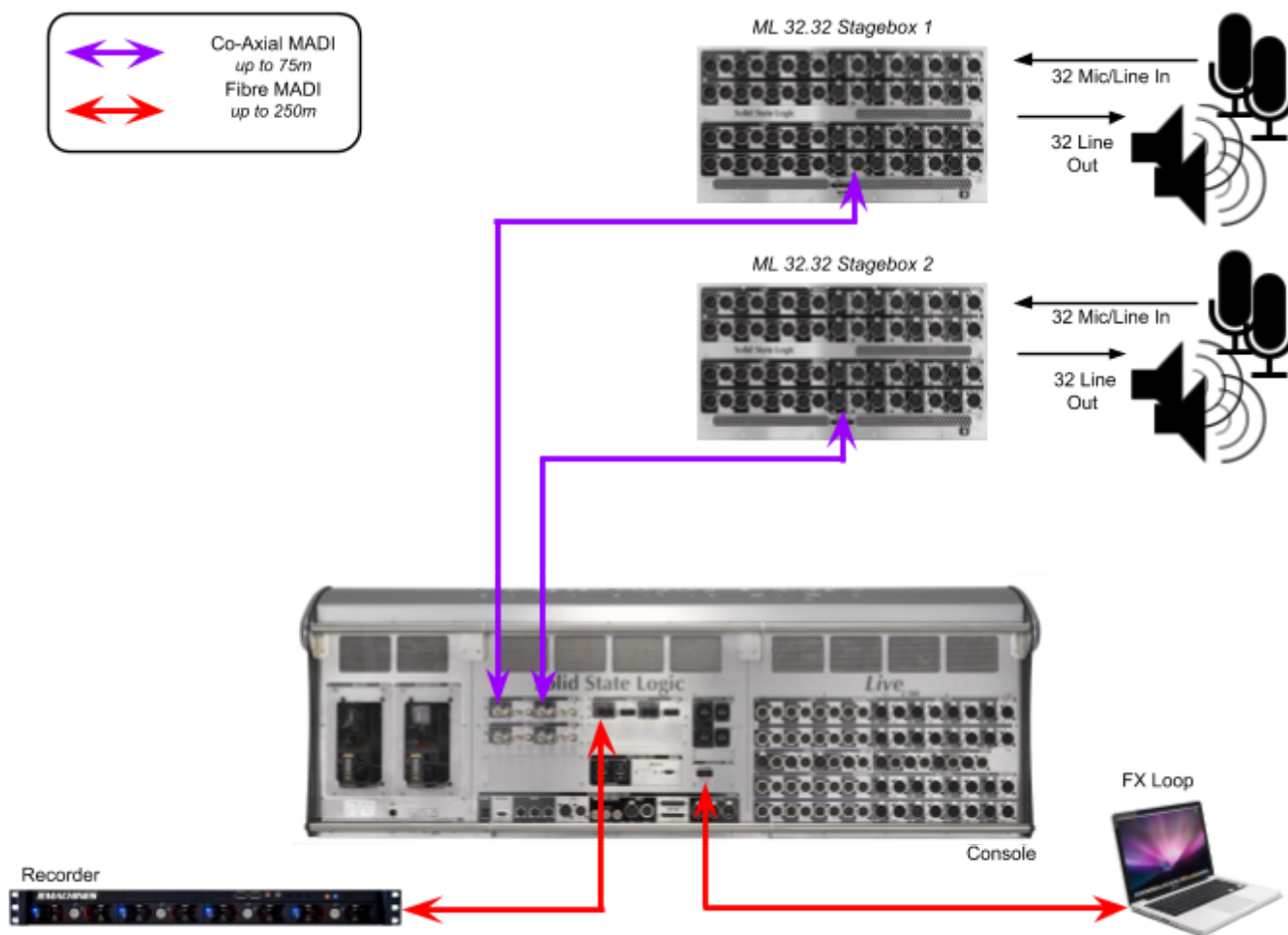
Typical Installation Diagrams

Simple Single System

L500 Plus Control Surface shown with optional local IO and additional Co-ax MADi interface provide 32 analogue IO and 16 AES IO at FOH position. 12 MADi ports plus MADi FX Loop.

2 off ML 32.32 stageboxes provide 64 Mic/Line inputs and 64 line outputs on stage

Additional/different MADi stageboxes can be connected as required.



Blacklight II Single System (with Redundancy)

L500 Plus Control Surface shown with optional local IO, additional Co-ax MADi interface and optional 4 port BL II Blacklight interface to provide 32 analogue IO and 16 AES IO at FOH position. 12 MADi ports plus MADi FX Loop.

2 pairs of Blacklight II connections provide 2 x 256 channels to/from stage using fibre up to <300m (quality cables, connections and no intermediate connections).

1 off BLII.D Blacklight II MADi concentrator provides 4 redundant on-stage MADi ports connected to...

3 off additional I.32 stageboxes provide an additional 96 Mic/Line inputs

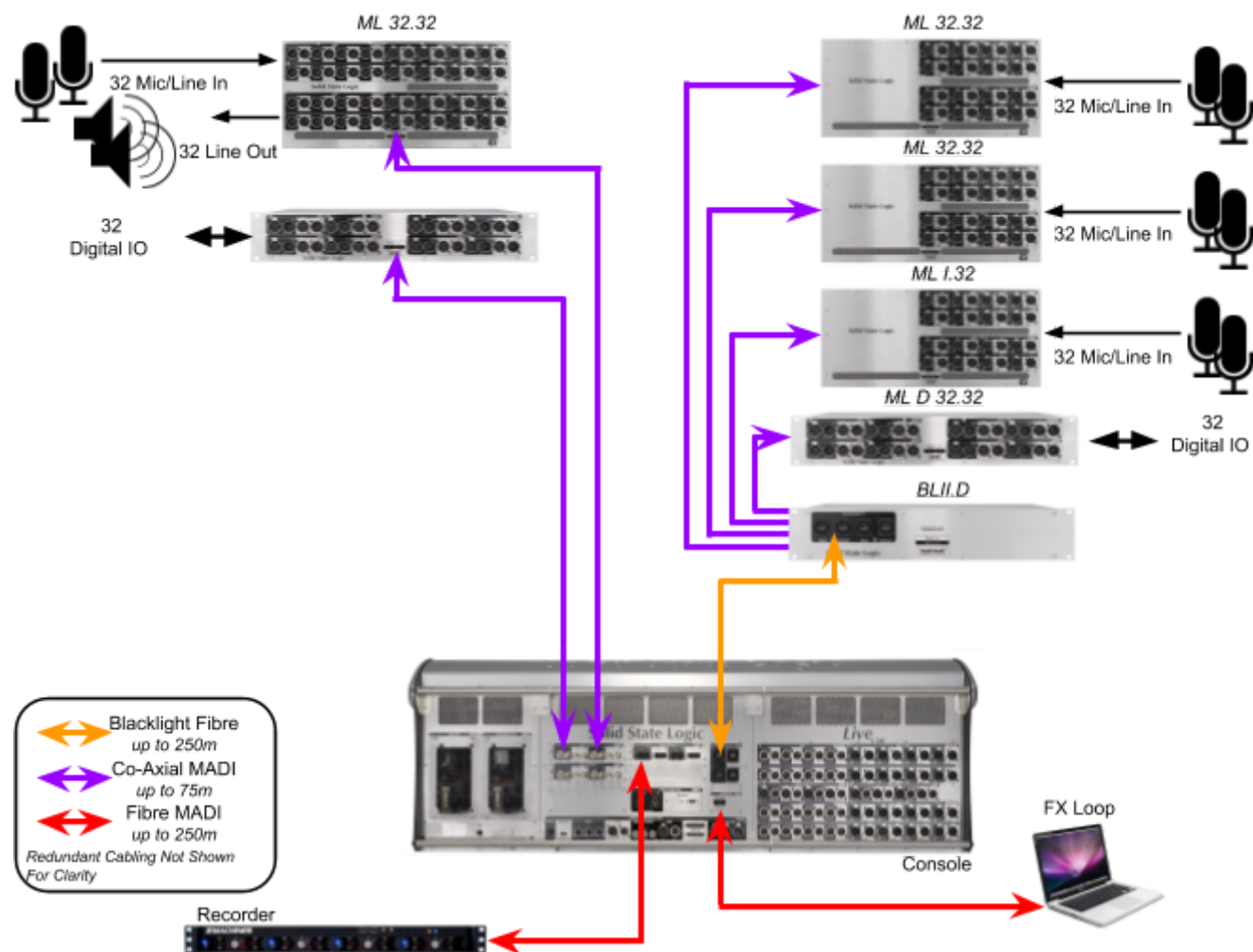
1 off additional D 32.32 AES boxes provide 32 AES digital IO

Co-axial MADi connected IO

1 off ML 32.32 stageboxes provide 32 Mic/Line inputs and 32 line outputs on stage

1 off additional D 32.32 AES boxes provide 32 AES digital IO

Total IO of 128 Mic/Line Inputs, 32 Line Outputs, 64 AES IO, 36 GP inputs, 30 GP Outputs



Dual Console MADi System

Two L500 Plus Control Surfaces (FOH and Monitor) shown with optional local IO and additional Co-ax MADi interface to provide 32 analogue IO and 16 AES IO at the consoles, 12 MADi ports plus MADi FX Loop.

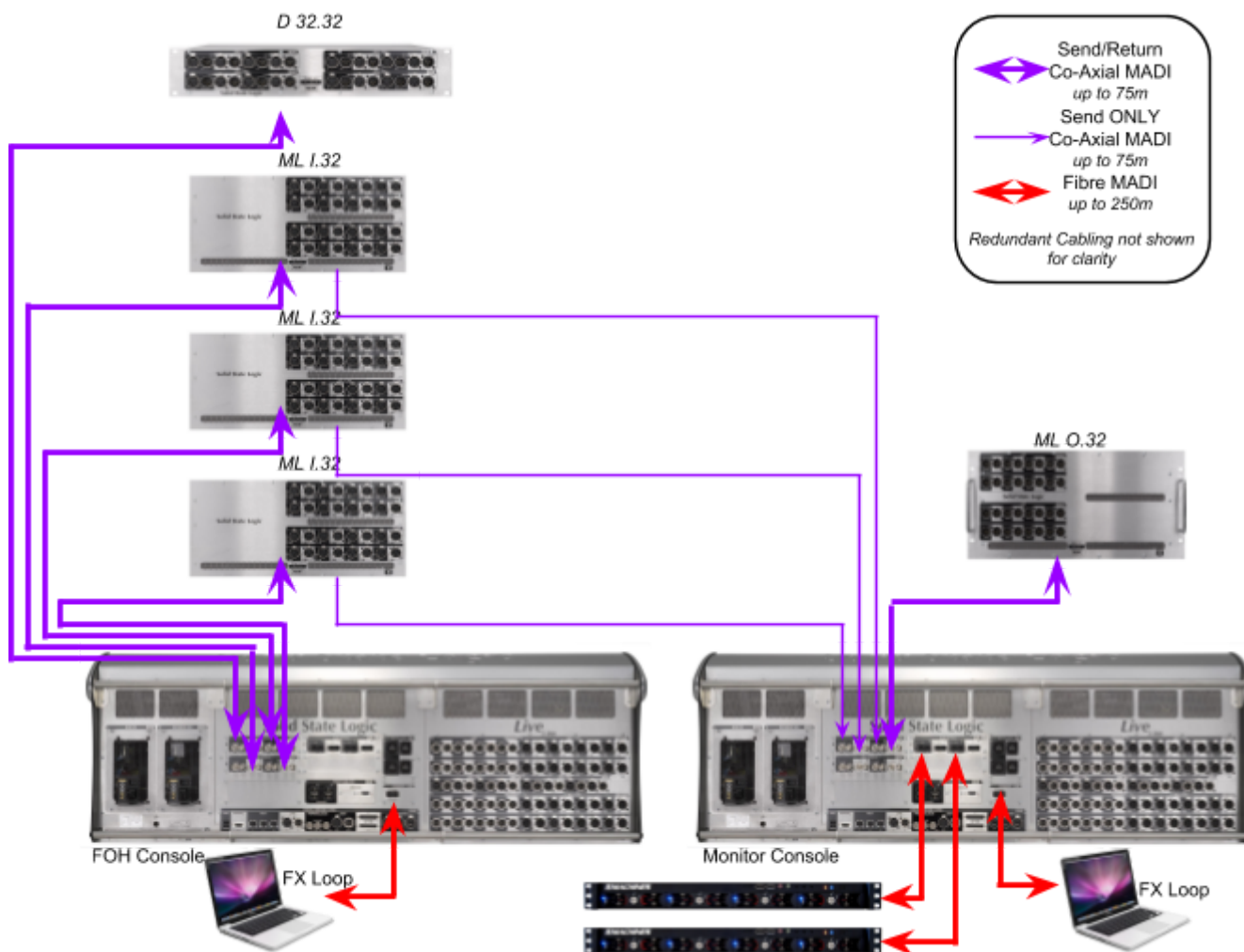
FOH Console has redundant MADi RX/TX to MADi ports 1 & 2 of the ML I.32 stageboxes. Monitor Console is connected to the TX only connection from MADi ports 3 & 4. FOH console controls the Mic Amp Gain, Monitor console uses Gain Sharing to adjust local levels.

3 off additional I.32 stageboxes provide an additional 96 Mic/Line inputs

1 off additional D 32.32 AES boxes provide 32 AES digital IO

1 off ML O.32 stageboxes provide 32 line outputs on stage from Monitor console

Total IO of 96 Mic/Line Inputs, 32 Line Outputs, 32 AES IO, 30 GP inputs, 25 GP Outputs



Dual Console System with Blacklight from each console

Two L500 Plus Control Surfaces (FOH and Monitors) shown with optional local IO, additional Co-ax MADI interface and optional 4 port BL II Blacklight interface to provide 32 analogue IO and 16 AES IO at the consoles, 12 MADI ports plus MADI FX Loop.

2 pairs of Blacklight II connections provide 2 x 256 channels to/from stage using fibre up to <300m (quality cables, connections and no intermediate connections).

FOH Console has redundant Blacklight II Fibre connections to A port of the BL II.D Blacklight MADI Concentrator.

Monitor Console redundant Blacklight II Fibre connections to B port of the BL II.D Blacklight MADI Concentrator.

FOH console controls the Mic Amp Gain, Monitor console uses Gain Sharing to adjust local levels.

1 off BLII.D Blacklight II MADI concentrator provides 4 redundant on-stage MADI ports connected to...

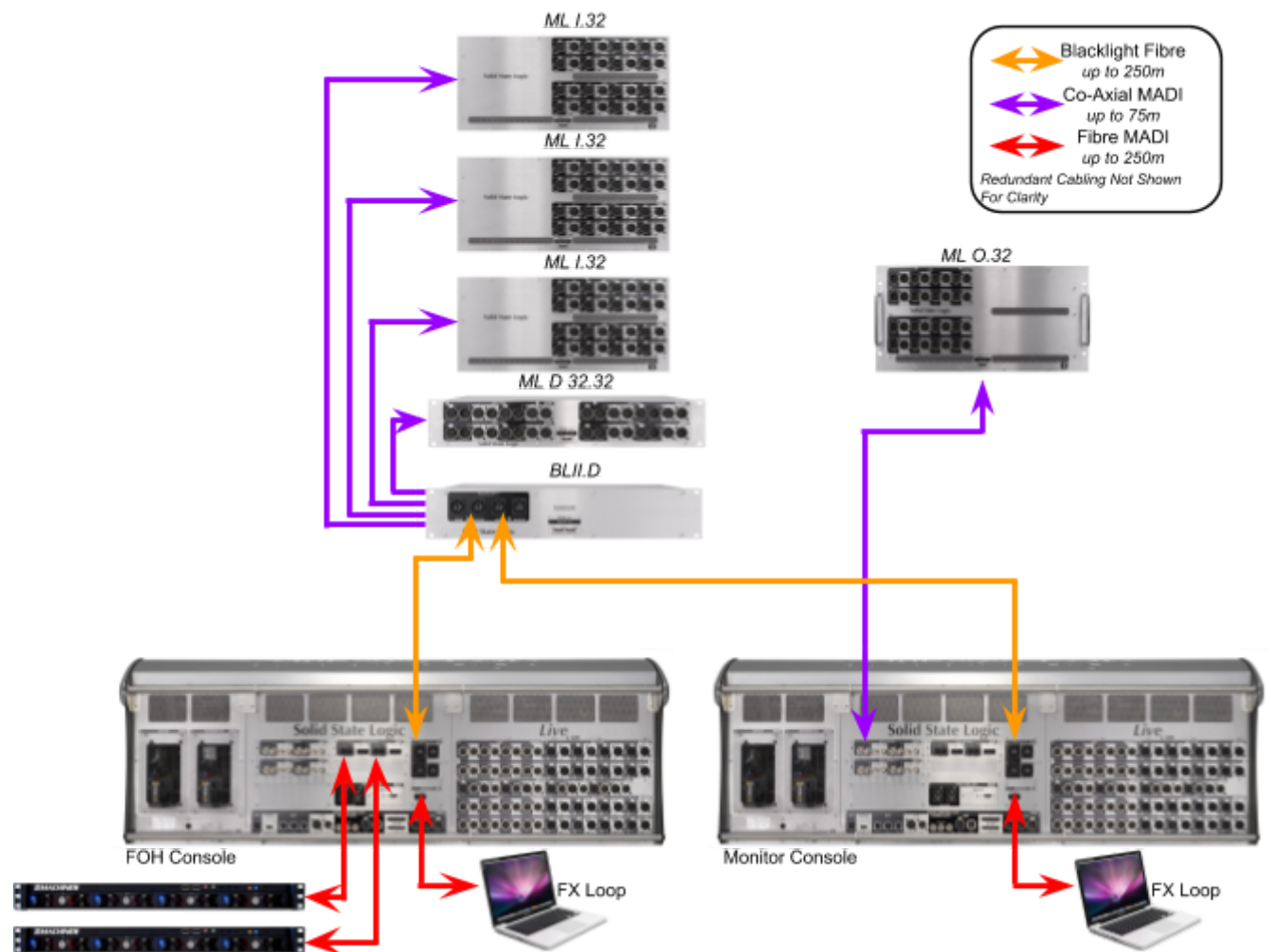
3 off additional I.32 stageboxes provide an additional 96 Mic/Line inputs

1 off additional D 32.32 AES boxes provide 32 AES digital IO

Co-axial MADI connected IO

1 off ML O.32 stagebox provides 32 line outputs on stage from Monitor console

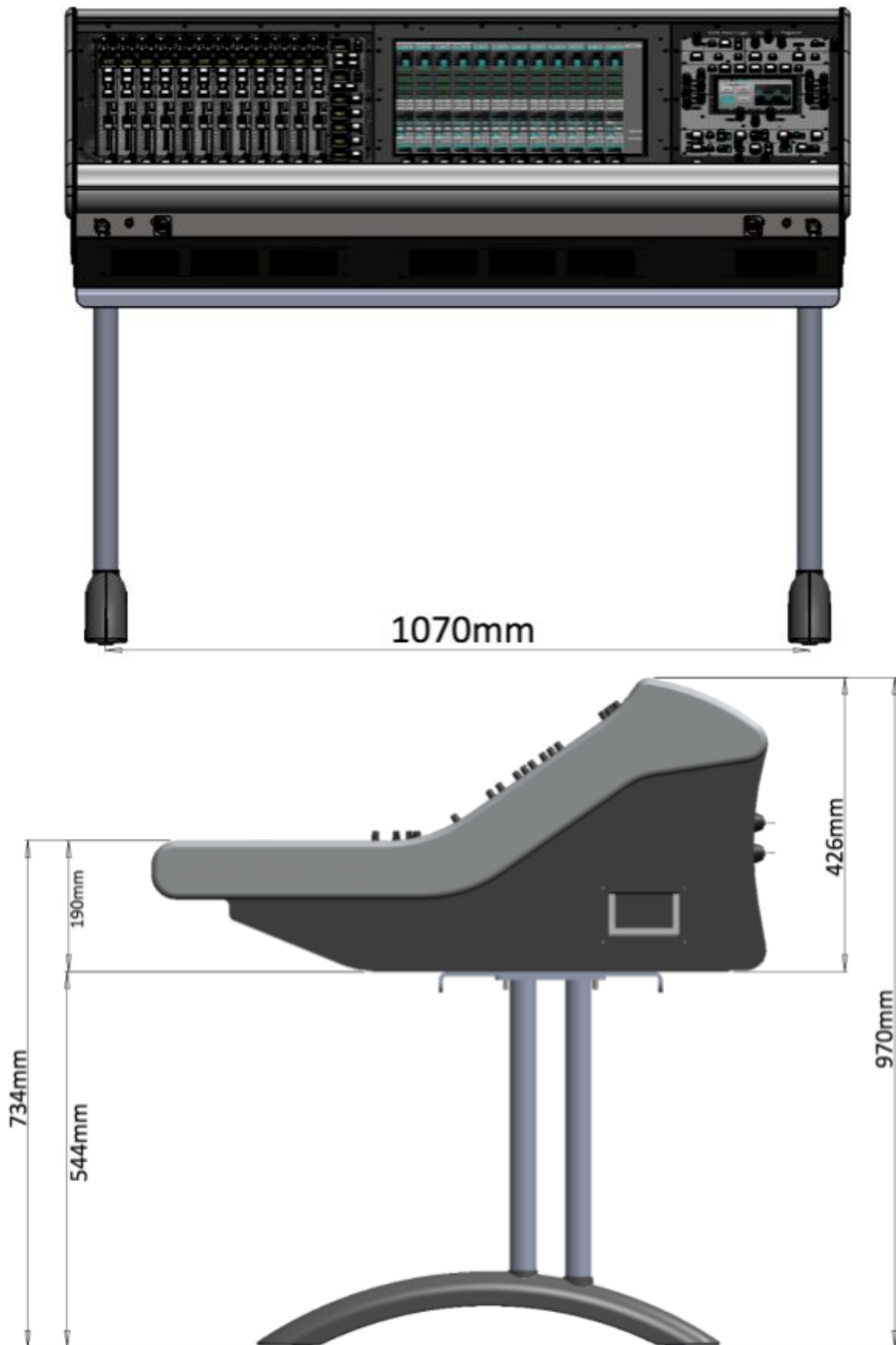
Total IO of 96 Mic/Line Inputs, 32 Line Outputs, 32 AES IO, 36 GP inputs, 30 GP Outputs



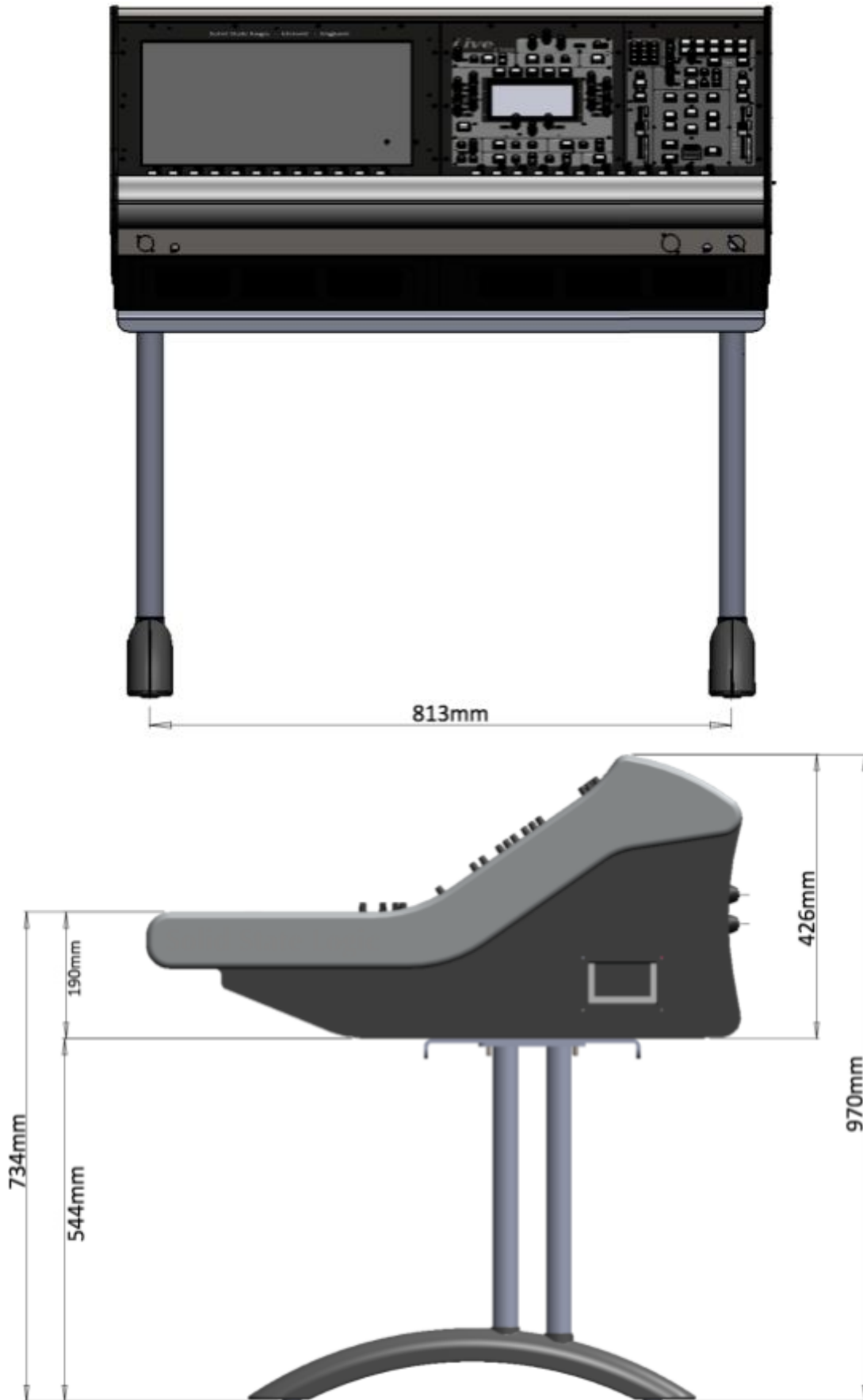
Optional Console Stand

Console Dimensions with optional stand: (figures in millimeters)

L500 / L500 Plus / L550 (SSL part 62A7000XL)



L300 / L350 (SSL part 62A7300XL)



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E&OE

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