Solid State Logic

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# C10 HD

DIGITAL BROADCAST CONSOLE

# Installation Manual

Part Number: **82BCXG02F**

Version 1.0

# Solid State Logic

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E&OE

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# SECTION 1:

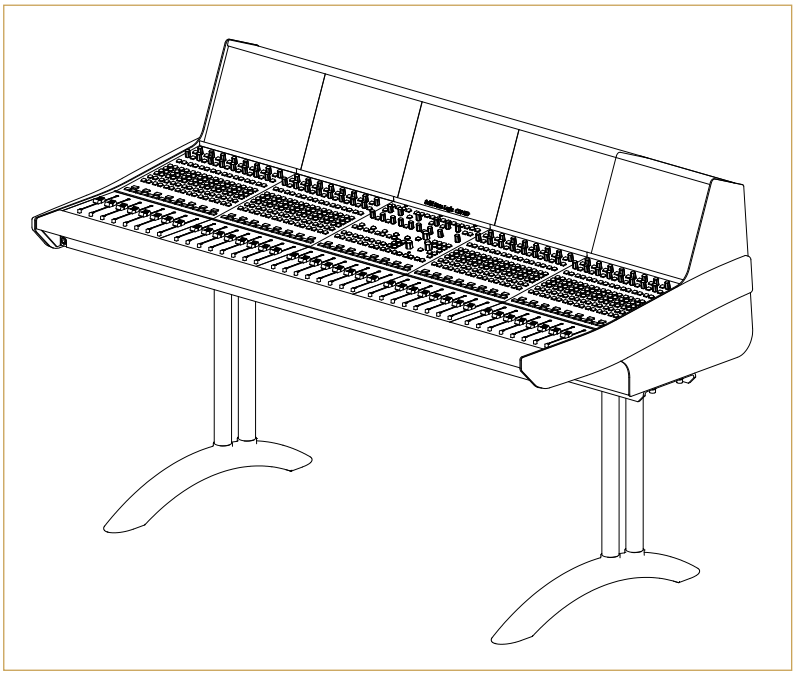
# INTRODUCTION

## In this section ...

… is an overview of the scope of this manual, but, before installing anything, please take time to read this section fully as it also includes important information relating to electrical and to physical ***safety***.

# C10 HD

Digital Broadcast Console



Solid State Logic

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# INTRODUCTION

Welcome to Solid State Logic's C10 HD™ broadcast console.

## Aim of this manual

This manual aims to provide everything you are likely to need to know about how to install and configure the C10 HD console, whether you are a new user with little operational experience, an operator who is familiar with SSL consoles, or a system administrator who is in charge of the maintenance and configuration of the console.

This manual is divided into seven sections which progressively cover the details required to prepare the proposed location, be able to install and commission the console and finally configure the software to achieve a basic level of operation – ie. from delivery to getting audio in and out.

*Section 1* **Introduction** – *This section*. Please take time to read this section fully as it includes important information relating to electrical and to physical ***safety***.

*Section 2* **Preparation** – Covers the requirements for the intended location of the room/studio and then lists the peripheral equipment that will be needed. Note that some items and services will need to be supplied by the facility. This section also provides an overview with more detailed descriptions of the main component parts of the C10 HD system.

*Section 3* **Installation** – Provides step-by-step cabling instructions and includes a section on the initial setup of the system network.

*Section 4* **Configuration** – Covers the first steps necessary to set up the console surface in order to name signals and to make basic I/O routes (This is the section that should result in sound coming out!)

*Section 5* **Administration** – The console can be configured in different ways depending on the degree of control required by individual users (ie. access levels). This section covers these level settings and also looks at maintenence and remote monitoring functions.

*Section 6* **Appendices** – These include: Specifications, connector pinouts, configuration details and useful guidelines. Also covered are options that include: Additional I/O, resource sharing capability and processor redundancy.

*Section 7* **Servicing Procedures** – This section shows how to remove the various console assemblies from the frame.

The information provided by this manual is relevant to the all versions of the C10 HD. In certain areas differences exist between the 16-channel fader frame and the 24 and 32-channel frames. These details will be highlighted in the specific section.

## Limitations

Certain configurations of the C10HD console will automatically include commissioning by an SSL engineer so are not covered, or are only mentioned briefly, in this manual. Some detail of these options is covered in the Appendix section.

These configurations include:

- Consoles fitted with the Redundant processing
- Consoles equipped with a MORSE resource sharing router
- Remote MORSE stageboxes equipped with SDI I/O cards

## Symbols Used Throughout This Manual

 Electrical safety hazard.

 General safety warning.

 Indicates that it is the responsibility of the facility to provide this item or service.

*Important, useful or otherwise noteworthy information will be indicated with a ruled line above and below.*

 Indicates that additional information may be located on another page or in an Appendix.

## Contacting SSL

For all general enquiries about installation please contact your local SSL representative.

For support or training enquiries contact: Customer Support: support@solidstatelogic.com

## Additional Reading.

This manual includes console operational information that will be of use during the console's initial configuration. More extensive console operational information will be found in the separate Operator's Reference Manual.

SSL also provide extensive on-site training for their consoles; if this is of interest, please contact customer support at the address shown above.

# Safety Information

This section contains definitions and warnings, and practical information to ensure a safe working environment. Please take time to read this section before undertaking any installation work.

## Definitions

*'Maintenance'*

All maintenance must be carried out by fully trained personnel. Note: It is advisable to observe suitable ESD precautions when maintaining electronic assemblies.

*'Non-User Adjustments'*

Adjustments or alterations to the equipment may affect the performance such that safety and/or international compliance standards may no longer be met. Any such adjustments must therefore only be carried out by fully trained personnel.

*'Users'*

This equipment is designed for use solely by engineers and competent operators skilled in the use of professional audio equipment.

*'Environment'*

This product is a class A product intended to form an integrated component part of a professional audio recording, mixing, TV, radio broadcast or similar studio wherein it will perform to specification providing that it is installed according to professional practice.

## Electrical Safety Warning

When installing or servicing any item of SSL equipment with power applied, when cover panels are removed, HAZARDOUS CONDITIONS CAN EXIST.

These hazards include:

- High voltages
- High energy stored in capacitors
- High currents available from DC power busses
- Hot component surfaces

Any metal jewellery (watches, bracelets, neck-chains and rings) that could inadvertently come into contact with uninsulated parts should always be removed before reaching inside powered equipment.

## Safety Earth Connection

Any mains powered item of SSL equipment that is supplied with a 3-core mains lead (whether connectorised or not) must always have the earth wire connected to the mains supply ground. This is the safety earth and grounds the exposed metal parts of the racks and enclosures and must not be removed for any reason.

## Mains Supply and Phases

To ensure safe operation of this equipment, connect only to an AC power source that contains a protective earthing (PE) conductor. This equipment is designed for connection to single phase supplies with the neutral conductor at earth potential – category TN or TT – and is fitted with a protective fuse in the live conductor only. This equipment is not designed for use with live and neutral connections reversed or where the neutral conductor is not at earth potential (IT supplies). This equipment should not be connected to a power system that switches open the return (neutral) lead when the return lead also functions as the protective earth (PE).

 All mains powered assemblies must be connected to the same mains phase. In particular, note that as PSU redundancy is standard, the two input leads must NOT be connected across different phases of a 3-phase supply.

Mains cables will be coded with either of the following colour schemes:

| | **1** | or | **2** |
|---|---|---|---|
| LIVE: | Brown | | Black |
| NEUTRAL: | Blue | | White |
| EARTH: | Yellow/Green | | Green |

The ratings label, which details the console power requirements, is located adjacent to the mains inlet connectors on the power input panel beneath the rear of the console.

## Mains Isolation and Over-Current Protection

An external disconnect device is required for this equipment which must be installed according to current wiring regulations. A detachable power cord, as fitted to this equipment, is a suitable disconnect device.

An external over-current protection device is required to protect the wiring to this equipment which must be installed according to the current wiring regulations. The fusing or breaking-current is defined in the product specification. In certain countries this function is supplied by use of a fused plug.

Some units (specifically, those fitted with PSU Redundancy) utilise multiple power sources. This is clearly marked on the equipment. The finished installation must also be clearly marked to ensure that all sources of power are removed before servicing work begins.

## Physical Safety

 The console surface is too heavy for one person to move; ensure sufficient manpower is available when positioning the console. Take particular care if removing a fully populated RIO chassis from an equipment rack.

 If the console trim is removed for any reason then there may be sharp edges exposed on the frame metalwork.

## CE Certification

The C10 HD system is CE compliant. Note that cables supplied with SSL equipment may be fitted with ferrite rings at each end. This is to comply with the current regulations and these ferrites should not be removed.

If any of the console metalwork is modified in any way – particularly the addition of holes for custom switches etc. – this may the adversely affect the CE certification status of the product.

## FCC Certification

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Instructions for Disposal of WEEE by Users in the European Union

The symbol shown here, which is on the product or on its packaging, indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

- **Services Available From SSL**
- **Pre-Installation: Physical Requirements**
- **Pre-Installation: Technical Requirements**
- **Installation Cabling**
- **C10 HD System Components**
- **C10 HD Options**

# SECTION 2:

# PREPARATION

**IN THIS SECTION ...**

… will be found a description of services which are available from SSL that may be useful when planning the delivery and support of the console. To help with the preparation, two pre-installation sections then list all the physical and technical requirements necessary to ensure with a smooth installation. Finally, each component part of a C10 HD system is described in more detail.

## Section Contents

*1" equals 25.4mm exactly*

*1metre equals 3' 3" roughly*

*1kg equals 2.2lb roughly*

# PREPARATION

## Services Available From SSL

### Delivery

All C10 HD consoles are available ex-works and can be collected from SSL's headquarters in Begbroke, Oxfordshire, UK. Packing and shipment by specialist carrier can be provided at additional cost. Various options are available but generally consoles will be packed into wooden crates suitable for airfreight.

### Commissioning

C10 HD systems do not include on-site commissioning by an SSL engineer as standard†. Commissioning can be requested at the time of purchase at additional cost and is usually expected to take from 1 to 2 days depending on system size, options included and the I/O capacity.

> *†Commissioning will be automatically included for systems that include processor redundancy, stageboxes equipped with SDI cards or a MORSE router.*

You should contact your local SSL office or agent at least four weeks prior to delivery to arrange a commissioning date.

> *Before the console can be installed all building work should be completed and the environment MUST be clean. The presence of dust – particularly cement particles – increases the chance of long-term damage being caused to the moving faders and other controls. Such damage may cause the warranty to be rendered invalid.*

### Training

Two days of standard operator training can be ordered for the C10 HD system. This is normally be scheduled to take place immediately following the commissioning period and is usually carried out by the commissioning engineer. The training period may also be extended by an additional day to cover basic maintenance functions.

Any training should be requested at the time of order. For all training we recommend that no more than five persons attend each session. If the use of an interpreter is necessary the training period may need to be extended (at additional cost). Note that travel and subsistence costs are not normally included. For further information please contact SSL's training department at: support@solidstatelogic.com.

## Factory Warranty

All new systems include a 13 month warranty which commences on the date of shipment. This warranty includes:

- Technical support – phone, fax and e-mail – via your local distributor or office during normal business hours
- Supply of exchange parts*
- Service engineer visits (note that travel and subsistence costs are not covered by the warranty)
- Maintenance software upgrades

* It is not anticipated that a visit from an SSL engineer will be necessary in the majority of cases where a replacement part is required. Console sub-assemblies are designed to be easily removable to facilitate replacement. Additional information can be found in the Servicing Procedures (Section 7) of this manual.

### Extended Warranty

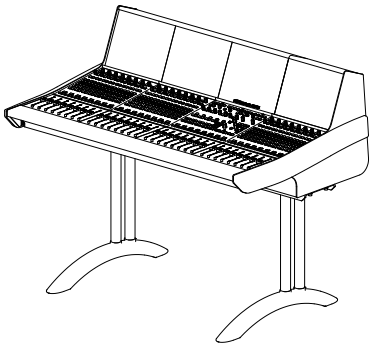
The standard warranty period may optionally be extended up to a maximum of 5 years. Three levels of extended cover can be specified: '*Out-of-hours Pager Support*', '*Parts supply*' and '*Parts and Labour*'. In each case the travel and subsistence costs are not included.

To order extended warranty please contact your SSL representative or e-mail SSL's Service department at: support@solidstatelogic.com.

# Physical Requirements

## Console Basics

The C10 HD Broadcast console system comprises two main elements: the console control surface and separate racks for the connection of input/output. The I/O racks are connected using readily available fibre optical cables so can be located remotely from the console.



*C10 HD Console – 24 channel*

- The console is self-contained with power supplies, processing functions and DSP resource all contained within the frame. There are no additional power supplies or computer racks to be accommodated.
- The console control surface is available in five sizes: 8, 16, 24, 32 or 40 channel faders plus the centre section. (The centre section is fitted with 8 additional faders).
- The console surface may be operated on a table or suitable racking.
- The sides of the console are flat to reduce the overall width and to simplify the positioning of adjoining furniture. Where consoles are freestanding contoured side arm trims can be included to provide a more comfortable finish.

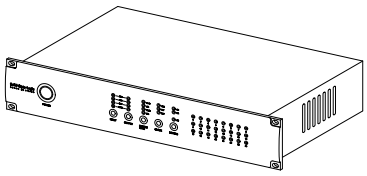
*Refer to Appendix A for the console dimension drawings. Systems Integrators will be able to download CAD files of these drawings from the SSL SI website.*

## Remote I/O Units

All audio input and output for the C10 console is accessed via remote 19" rack assemblies so some external racking space will be required.

### Alpha-Link I/O

Standard I/O units for the C10 console are the '***Alpha-Link LIVE-R***' and '***Alpha-Link 8-RMP***'. Each unit is 2U in height and 300mm deep. The quantities of each rack supplied will depend upon the user's specific requirement of analogue, digital and microphone signals.



*Alpha-Link LIVE-R I/O Unit*

It is recommended that a 1U ventilation space be added after every two Alpha-Link units when allocating rack space.

### Additional I/O

- ***RIO*** (Remote Input Output) – 7U rack; five slots to accommodate a range of plug-in I/O cards; contains cooling fans. *Refer to Appendix H.*
- ***MORSE*** – MORSE Stageboxes are 3U and feature 14 slots into which a range of I/O modules may be fitted. Systems that require resource sharing may also be equipped with the 6U or 3U MORSE router rack *Refer to Appendix J.*
- ***SDI–MADI*** – 1U chassis. De-embedds the audio data from up to four SDI audio signals (SD, HD and 3G).
- ***MADI Remote*** – This feature allows the console to send mic amp control over MADI to third-party amplifiers or routing systems which use the DHD control protocol data, such as Optocore and RocNet systems.

## Acoustic Isolation

The console surface and the Alpha-Link I/O units do not contain cooling fans so can be located in recording areas.

The optional larger RIO chassis is fitted with temperature controlled low-noise fans so will requires a degree of noise isolation from recording areas.

*Noise figures for the individual units are listed in Appendix A.*

## Air Conditioning Requirements

It is unlikely that additional air conditioning will be required after installation of the C10 HD console (with its typical 300W dissipation). It is possible however, that if all studio equipment is taken into consideration, particularly if lighting equipment is included, that the combined heat output could be sufficient to cause the temperature to rise to uncomfortable levels.

If a RIO is being used for multiple microphone inputs its heat dissipation can equal that of the console and it should therefore be operated in an air-conditioned environment.

*Environmental requirements and power dissipation figures for individual system components are listed in Appendices A and E.*

## Cable Ducting

Cable ducting will be required between the console and any outboard racks and the recording areas. Ducting provided should be of sufficient size such that approximately 100mm x 50mm can be allocated for console surface connections. This should be sufficient for the remote I/O cabling and for the T/B Mic etc. in addition to the console connections.

## Service Access

Access to sub-assemblies within the frame is from either the front or above the console. If the console is being built into restricted space – as in some mobile installations – then sufficient clearance must be available above the top of the console to allow access to the fixing screws which secure the top trim.

*Also see the clearance diagram on page 2-13.*

# Technical Requirements

## Sync Source

A sync reference needs to be provided for the system to function correctly when connected to external digital equipment. If the generator does not provided multiple buffered outputs then a separate distribution amplifier will also be needed.

- Recommended source of sync is: ***Analogue video*** *(1Vp-p, SD[NOTE 1], PAL, NTSC, Composite, B&B)*. Alternative sources are ***Wordclock*** or ***AES3id***.
- Sync is required at the console surface. Consoles that feature processor redundancy will require two separate sync cables, one to each processor – sync should not be daisy-chained between units.
- Sync is required by each Alpha-Link LIVE-R I/O unit[NOTE 2].
- Sync will be required by a MORSE router.

*NOTE 1 – The console processor is also able to accept HD and Tri-level sync reference signals. However, the Alpha-Link LIVE and MORSE units cannot accept HD sync signals so a source of SD sync will still be a requirement.*

*NOTE 2 – Remotely located Alpha-Link LIVE units may optionally be configured to use their incoming MADI signal as the sync reference. Note however, that when operating in this mode, the inherent nature of the MADI signal means there will be a degradation of jitter performance and redundant-processor systems may experience a slight delay and/or drop of audio if it becomes necessary to re-reference to the backup MADI stream.*

## Mains Input Voltage & Current

The console surface and all external I/O racks are mains powered. All units are fitted with auto-sensing power supplies so do not require voltage selection adjustment.

All power inlets use detachable IEC-type mains leads. The leads supplied are 2m in length and the cable diameter is approximately 6mm. The free end of each lead is unterminated and will need to be connected to a suitable outlet. C10 HD systems are equipped as standard with dual redundant power supplies for '*On-Air*' resilience so are fitted with two separate IEC mains input connectors. (See note on UPS provision below).

*Mains supply requirements are:*

- *100V – 240V ±10%*
- *AC Only*
- *50 – 60 Hz*

*The inrush current present when powering the console can be significant – typically ten times the steady current – so the use of 'slow' or 'motor' rated fuses or circuit-breakers is recommended.*

The console power rating label will be located adjacent to the mains input connectors beneath the rear of the console.

*Power ratings are listed in Appendix A.*

### UPS Provision

Where either supply of mains power is provided from an uninterruptable source (UPS) the output waveform of the UPS equipment must be of the sinusoidal variety. Switched or stepped output waveforms may cause damage to the console power supplies so must not be used.

## Grounding

A standard system should not require any additional grounding over and above that supplied by a correctly installed mains supply. All rack unit cases are permanently bonded to mains earth. A mains earth connection via the mains inlet must be provided.

All audio connectors, both analogue and digital, have their screen pins connected directly to the chassis at the point of entry to comply with AES/EBU EMC grounding standards.

## Computer for File Management

☞ The console processor – in addition to providing the DSP capability – functions as the file sever to its internal RAID storage array. It will be necessary to have access to a computer which can communicate with this server (using SAMBA share) to access operator project files, to update the console's system software, to perform basic configuration and to gain access to SNMP status information.

The PC used for communication with the Blackrock can either be connected over the facility's TCP/IP network or can be a local Ethernet connection. Also see the note on network hubs below.

*Note that if connecting directly to a local PC then the network cable may need to be of the 'crossover' type.*

The computer selected will need to have an SSH terminal client installed – *'PuTTY'*, for example, if using a PC. Macintosh users can use the *'Terminal'* utility included with OSX.

The Blackrock processor does not support wireless networking.

### Computer for MORSE Configuration

If a MORSE router has been specified it will also require connection to a PC. The PC chosen can be the same one as used for file management providing it can be equipped with two separate network ports (MORSE router connects to the SSL network, file management uses TCP/IP and the two networks need to be kept separate).

See console networks page 2-15??

## Network Hubs/Switches

☞ Although not necessary in all cases, some configurations will require external hub/switchs to be supplied order to create the separate data networks that are needed to properly control and manage the console systems.

Switchs provided must be 100mb capable.

### Hub for the TCP/IP network

Consoles that feature redundant processing will require two separate network links to the file-management PC so an external TCP/IP hub or switch will need to be provided. (The provision of a hub is often the most convenient method of connecting single processor consoles to the network PC.)

i *See page 3-4 for additional network cabling information.*

### Hub for the SSL network

If more than one external GP IO unit is used, or of a system includes a MORSE switch plus a GP IO unit, then a separate external hub/switch will required to extend the SSL network to these devices.

i *See page 3-4 for additional network cabling information.*

### Hub for the ipMIDI network

If a redundant ipMIDI link to a workstation is required than an additional hub will be needed.

i *See page 3-25 for additional ipMIDI cabling information.*

# Installation Cabling

C10HD systems are supplied with mains leads, sync termination and short fibre cables which will allow the system to be connected for initial testing. Systems are not supplied with the longer runs of network, fibre, sync or other cabling necessary to connect remote I/O boxes or to integrate with associated studio systems. The cables which form part of the studio infrastructure will need to be sourced and installed by the facility or systems integrator.

## Network Cables

Standard RJ45 Cat-5e or Cat-6 Ethernet cables can be used. The maximum permissable length of any cable run is 100m.

Cables will need to be installed between the console surface and the file management PC or its network switch. Separate cables may be required to connect a MORSE router or to remote GP IO units

*See page 3-4 for additional network cabling information.*

## Sync Cables

Sync must be distributed using 75Ω coaxial cable terminated with 75Ω BNC connectors.

The sync signals provided must be from a common source to all equipment. For example, if both video and Wordclock signals are being used then Wordclock must be generated by, or locked to, the video sync generator.

## Analogue Cables

The console surface includes an inbuilt talkback microphone with amplifier and a headphone socket is mounted under the consols's front buffer. To use these features audio wiring will need to be installed between the console and suitable I/O units and/or the facility's comms system.

## Digital Cables

Cables used for any AES I/O circuits should be 110R balanced.

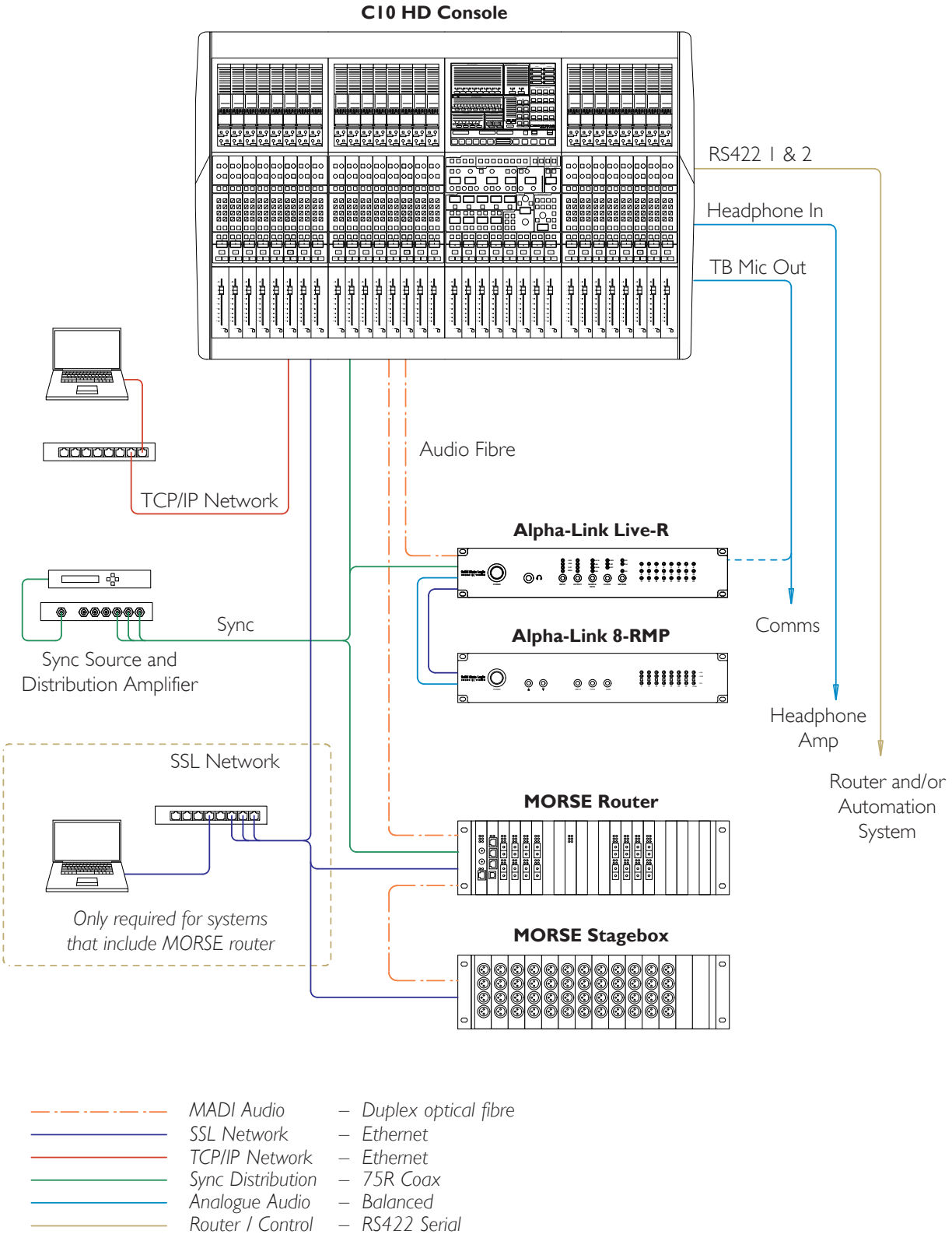
For installations that distribute AES-3 using unbalanced coaxial cabling suitable 75Ω BNC adapter-panels are available to order from SSL.

## Serial cables

C10HD systems include the ability to communicate with routers and automation systems. RS422 serial cables will need to be installed between the console surface and the remote devices. Two serial ports are fitted to the console.

## System Wiring Overview

For the majority of installations cabling will need to be installed between units as indicated below:



## Fibre cables

Fibre optic cabling will be required between the console processor(s) and each outboard I/O Unit – RIO, Alpha-link LIVE-R, SDI-MADI and MORSE units all use duplex fibre for audio interfacing. Redundant systems will require two individual fibre links to each outboard unit; see the examples on the following page.

*The Alpha-Link 8-RMP microphone amplifiers do not require audio fibre connection to the console. They connect to a local Alpha-Link LIVE-R unit using analogue and network cabling.*

*It is a sensible practice to install spare cable runs to allow for system expansion or to replace any leads that may subsequently become damaged.*

The table below details the connectors used to interface the individual I/O units.

***Fibre Connectors***

| Source | Destination | Data Type | Connectors | Standard |
|---|---|---|---|---|
| C10 Console | Alpha-Link LIVE-R | MADI | LC – SC | Multimode only |
| C10 Console | RIO | MADI | LC – LC | Multimode or Singlemode |
| C10 Console | MORSE Router | MADI | LC – SC | Multimode or Singlemode* |
| C10 Console | MORSE Stagebox | MADI | LC – SC | Multimode or Singlemode* |
| MORSE Router | MORSE Stagebox | MADI | SC – SC | Multimode or Singlemode* |
| C10 Console | SDI – MADI box | MADI | LC – ST | Multimode only |

** MORSE units are fitted with multimode adapters as standard. Singlemode interfaces are available to special order only and will have extended lead-times.*

### Fibre Standards

The default fibre interface adaptors fitted are suitable for multimode fibre connections. RIO stageboxes and MORSE units may optionally be ordered with singlemode versions for any of the fibre links. (The corresponding port on the console processor must also be changed to singlemode.) Alpha-Link LIVE is only available with multimode interfaces.

All SSL fibre interfaces use flat (PC) termination not angled (APC).

*Singlemode and multimode interfaces and connectors are almost identical in appearance, however, they are operationally incompatible – the two different standards cannot be mixed for any individual link.*

The table below lists the maximum cable lengths permissable for the fibre interface standards available.

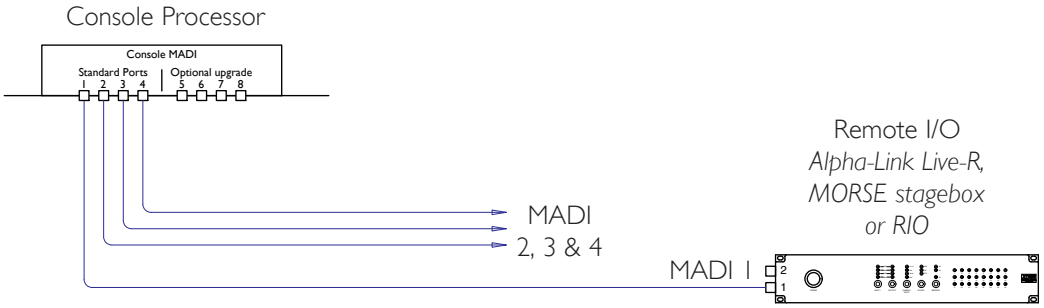
***Fibre Standard Maximum Distances***

| Data Type | Fibre Type | Specification | Maximum Length | Note |
|---|---|---|---|---|
| MADI | Multimode | 50/125um | 550m | Default fitment |
| " | Multimode | 62.5/125um | <300m | |
| " | Singlemode | 9/125um | 2,000m | |

## I/O Fibre Connection Arrangements

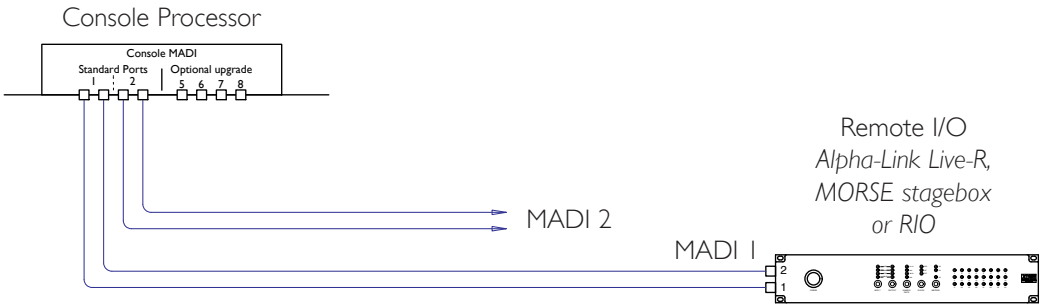
### *1. Individual MADI*

Single processor: Single MADI I/O card fitted (4 ports) – four separate MADI ports are available for the connection of I/O units.




### *2. Link-Redundant MADI*

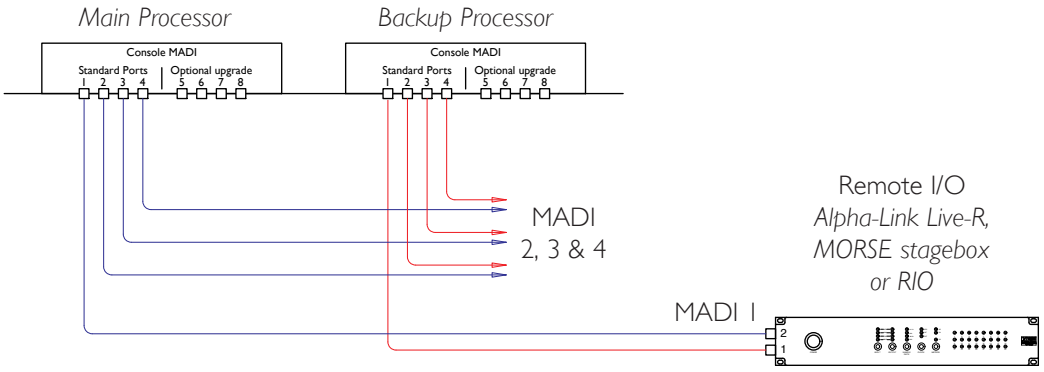
Single processor – Single MADI I/O card fitted (configured as 2 x redundant ports) – backup fibre links to each I/O unit provide for continued operation even if the primary fibre is lost.




### *3. Processor-redundant MADI*

Dual processors – Single MADI I/O card fitted to each (4 ports) – separate links from each processor to each I/O unit. The ability to swap cores provides for continued operation in the event of a fibre loss or primary processor failure.

*Note that the connection of port 1 on the I/O unit to the Backup processor is the correct arrangement.*



### Channel Capacity

All I/O units use the ***MADI*** standard for audio data transfer; the maximum data capacity of each fibre run is therefore ***64*** channels.

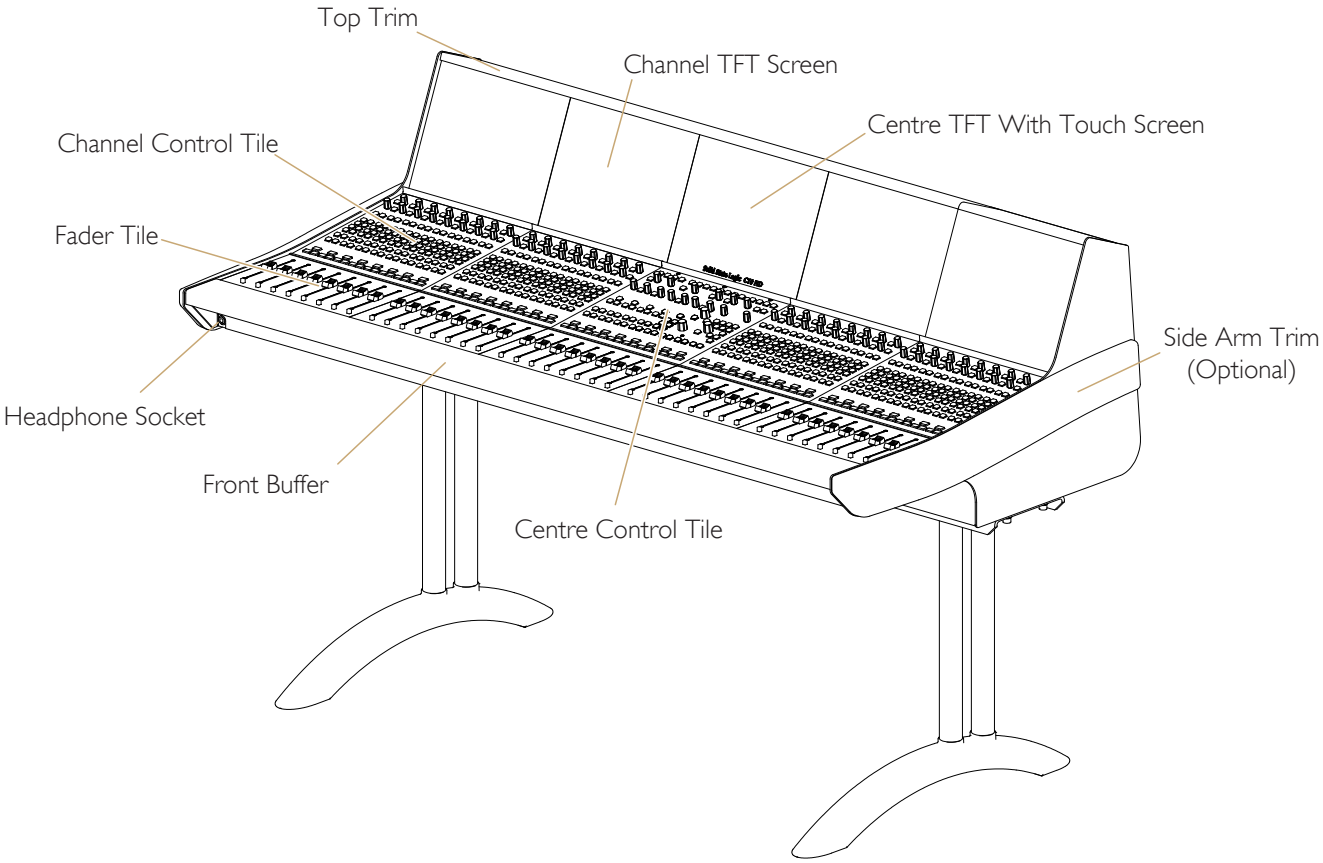
> *Specifically, Alpha-Link Live units use up to 48 channels; MORSE stageboxes use up to 56 channels per MADI link.*

### Fibre Cabling Examples (See Opposite)

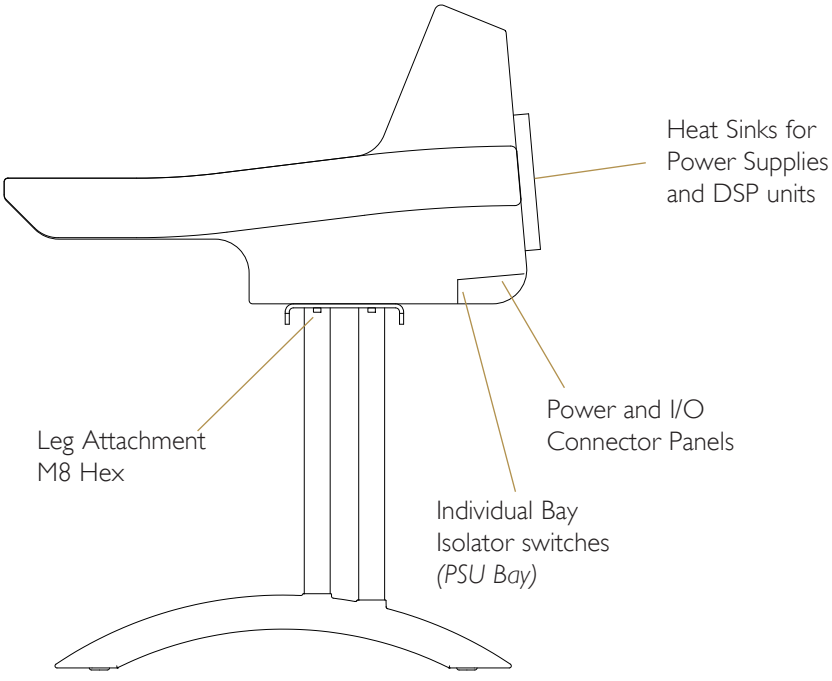
The number of fibre connections that will need to be run between the processor and each remote i/o locations will depend on the type of connection chosen.

All I/O units are fitted with two audio connectors to facilitate the installation of redundant audio links.

## C10 HD Control Surface Layout (32ch)




## Connector Panel Location



# C10 HD System Components

## C10 HD Console

### Frame Layout

C10HD consoles can be specified with 8, 16, 24, 32 or 40 channel faders plus the 8-fader master section (usually referred to as the centre section). The centre section can be located in any of the console channel bays. Producer's tables, 19" racking or corner sections are not available.

*The physical size of the console does not limit the number of DSP processing channels available; this is determined solely by the quantity of DSP resource specified for the processor. Processing is available in quantities of 64, 96, 128 or 160 channels.*

All processing functions are internal to the console frame – there are no remote PSU or computer racks to be accommodated. Input/output is handled by remote I/O units which connect to the console using MADI fibre cables.

### Trim

The frame is supplied with flat sides to reduce the overall width. Where a console is freestanding contoured side arms are available to provide a comfortable finish. These arms must be specified at the time of order.

### Legs

Consoles of 16 channels and above are normally supplied with legs as shown opposite. The legs can be removed if the console is to be used on a table or where it is more convenient to mount the console to a separate chassis – such as in an OB vehicle. Four threaded inserts are fitted to the base of each channel bay which should be used to secure the console.

Legs are not available for the 8-channel console.

*Console fixing inserts are metric M8 standard. Ensure that a minimum of 10mm and a maximum of 25mm thread protrusion is available to secure the console.*

The supporting table must not extend beyond the flat base of the console into the rear connector panel area. Doing so would not allow sufficient space for the fibre cables to exit without excessive bending strain and possible risk of fracture.

*Refer to Appendix F for additional details of how to table mount the console.*

### Power Supplies and Isolator Switches

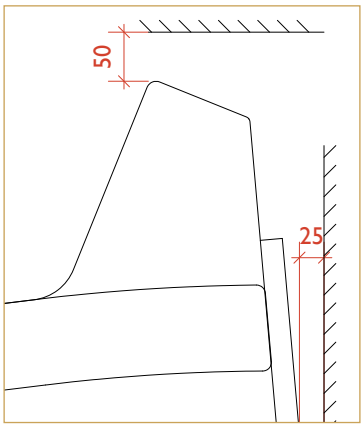
The console includes double power supplies, either of which is capable of powering the console thus providing power redundancy. All PSU units are autoranging; mains inputs are accessed via a standard IEC male connectors.

The location of the power supplies in the frame is dependant upon the console frame size – see page 2-14 for bay layout drawings. The PSU frame section is fitted with individual isolator switches for each console channel bay plus the processor card(s).

### Heatsink Clearance

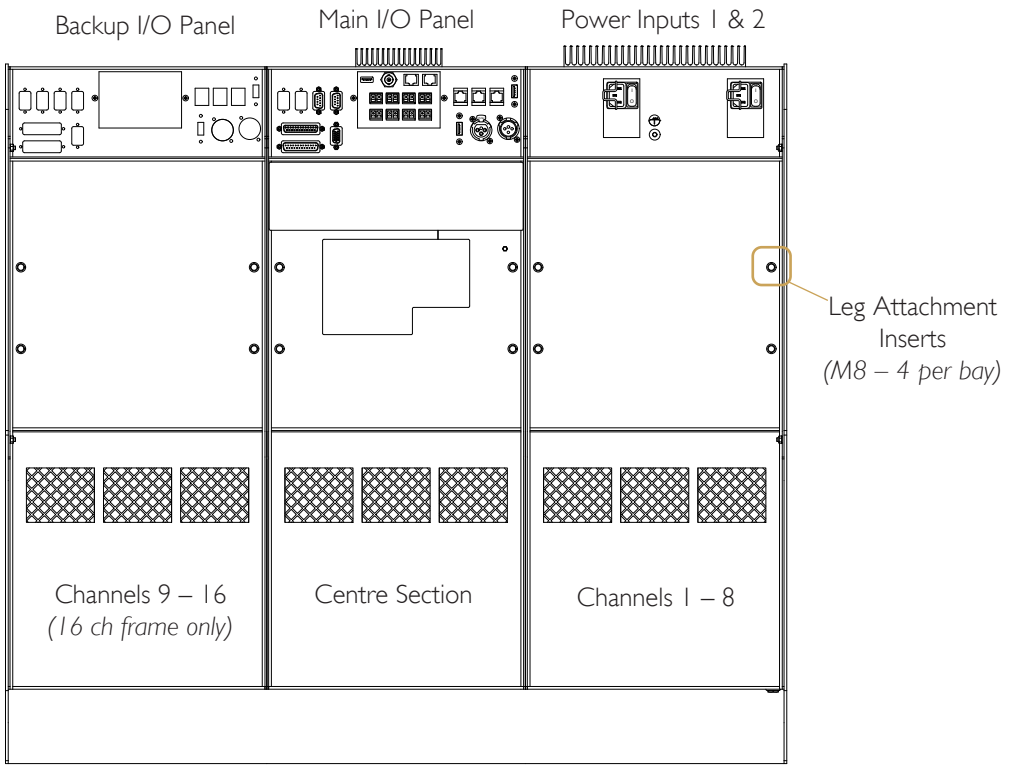
The rear panels of PSU and DSP channel bays are fitted with protruding heatsinks so care must be taken when planning the installation of studio furniture – such as shelving – across the rear of the console. Sufficient space must be left to allow the free flow of air from the rear grills and above the heatsink fins.

⚠ Clearance behind the console must not be less than 25mm and clearance above the console not less than 50mm.

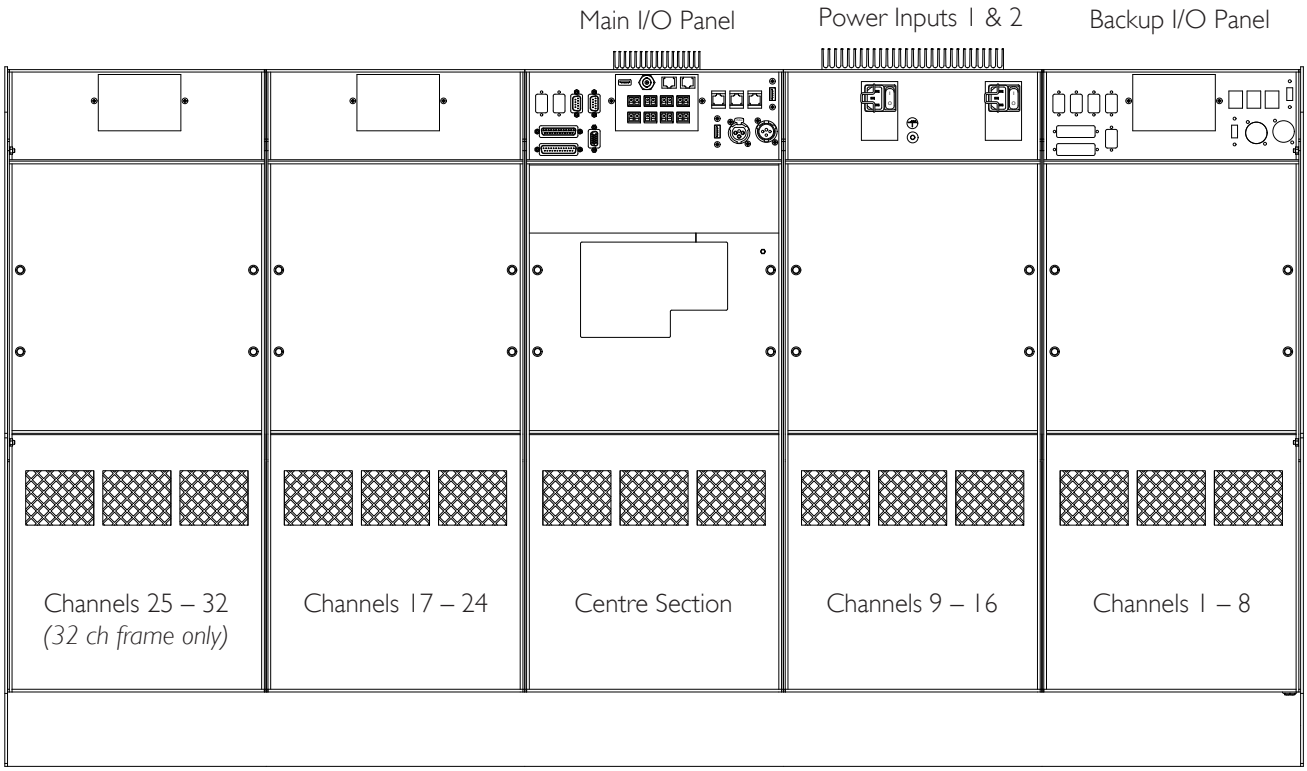



*Minimum Heatsink Clearances*

### Connector Panels – 8ch and16ch Frames




### Connector Panels – 24ch and 32ch Frames




*Frames viewed from below. Legs not shown for clarity.*

## Console Processors

The console frame is equipped with two independent control processors: The digital signal processor ***DSP*** and the single board computer ***SBC***. All processing is contained within the console frame; there are no external computer racks to be accommodated.

### Audio Processor (DSP)

The operation of the surface controls and the digital signal processing functions are managed by a dedicated proprietary PCIe processor card – the DSP card. The MADI audio fibre connections to the remote I/O racks are made to this card. This processor is mounted to the centre of the main I/O connector panel

DSP processor resource can be specified as either 64, 96, 128 or 160 full-function channels at 48kHz. DSP resource is always available to channel strips so does not have to be assigned during project setup.

*Consoles running V3 software that were originally specified with fewer than 160 DSP channels may subsequently be expanded by means of a license upgrade. (Earlier consoles may require hardware upgrade prior to installing V3 software).*

### Single Board Computer (SBC)

The SBC is a separate industrial PC that provides storage for console configurations, operator projects and functions as the network file server for the internal RAID disc storage array. The SBC runs SSL's own embedded Linux operating system (so there are no 3rd party licensing requirements). The SBC is also able to provide SNMP monitoring data to facilitate remote service diagnostics when connected to an external PC via the standard TCP/IP network.

### Processor Redundancy

Console sizes of 16 channels and above can be specified with duplicate DSP and SBC assemblies to provide full processor redundancy. i *Refer to Appendix G for additional information relating to redundant processing.*

## Console Networks

The console uses two separate Ethernet networks:

- The first is used solely by the console to transfer data between its individual processing elements. The console control panels, the DSP processor and the SBC processor are all linked within the frame to form one local network – this is the ***SSL Network***. The SSL Network will only need to be extended outside the console frame to communicate with optional remote peripherals such as the GP IO relay box or a MORSE router.
- The second network connection is provided for communication with a remote PC. This network is used for file transfer and monitoring functions and is a standard ***TCP/IP Network***.

*Although both of these networks conform to the Ethernet standard the data transfer settings are different so It is important that these two networks are kept separate at all times.*

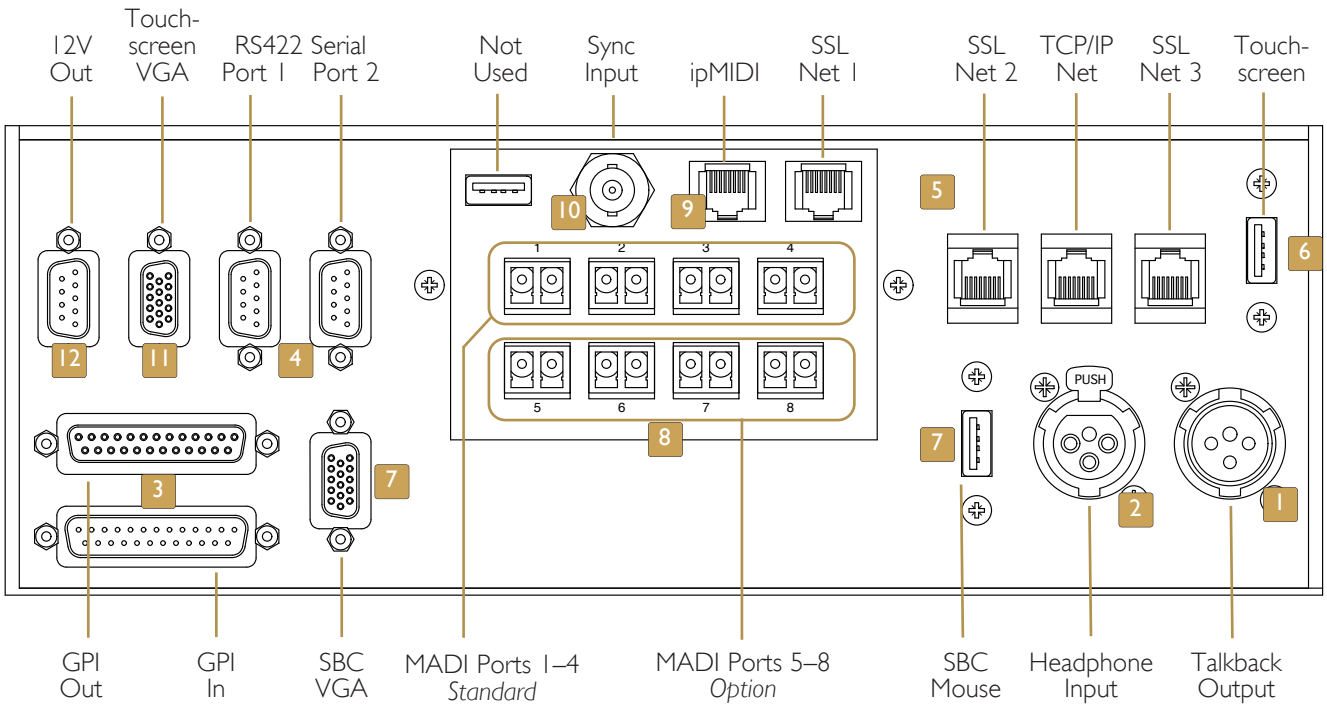
## Connector panels

All connections (apart from the jack socket for headphones) are made to the rear of the console. Connector panels face downwards so that cables do not protrude beyond the rear panels.

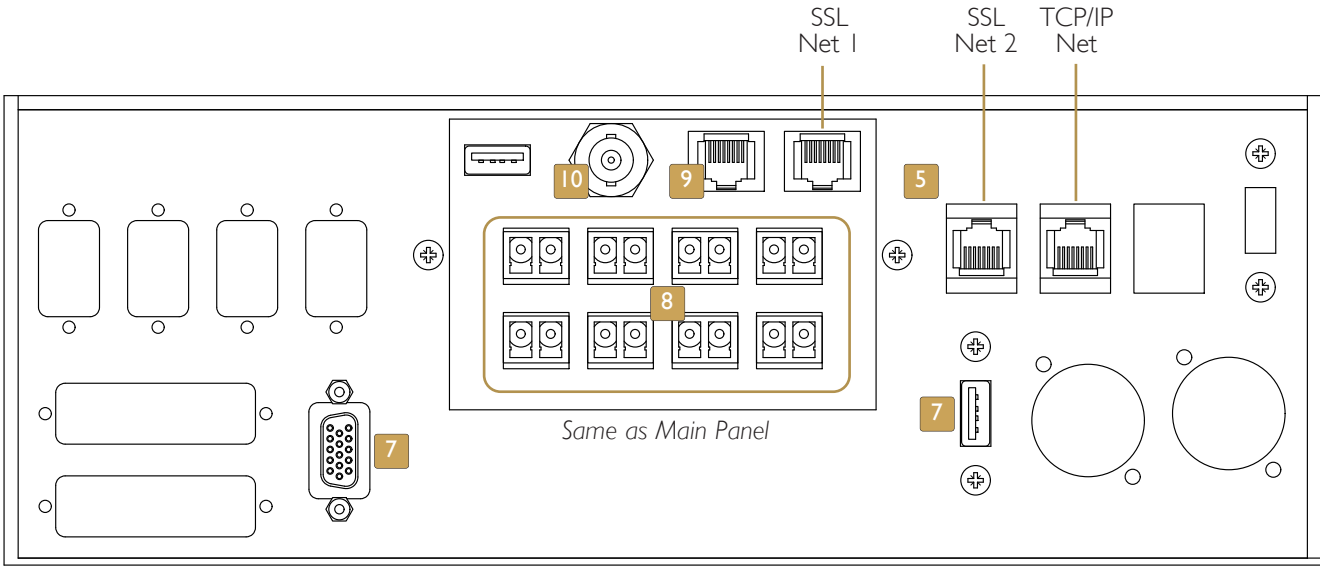
Consoles equipped with processor redundancy will have the additional processing hardware and connectors fitted to the backup I/O panel.

*The mounting pillars for the D-sub connectors fitted to the connector panels use the UNC-440 thread.*

## Main I/O Panel




## Backup I/O Panel




*Backup panel connectors are only fitted on systems that include redundant processing*

## CONNECTORS:

**1 TALKBACK OUTPUT** *XLR-3 male*

The centre control tile of the console is fitted with a talkback microphone. The output signal is balanced analogue at approximately 0dBu. *Page 3-19.*

**2 HEADPHONE INPUT** *XLR-3 female*

Connector wired to a 1/4" stereo Jack socket fitted under the left hand end of the console's front buffer. This is a wired connection only; the console is not fitted with any amplification or a level control. *Page 3-21.*

**3 GP INPUT** *D25 male* **OUTPUT** *D25 female*

12 circuits of GP input and output. Inputs are opto-isolated voltage triggered, outputs are via DIL relay. Outputs can be configured to be either momentary or latching. *Page 3-17.*

**4 RS422 SERIAL PORTS** *D9 male*

Two 9-pin serial ports are available for the connection of 3rd party equipment to provide router naming and automation control. Automatic control backup will be included on systems that are equipped with processor redundancy. Allocation of function is setup in system software. *Page 3-23.*

**5 NETWORK CONNECTIONS** *RJ45*

SSL Net 1&2 – Must always be linked to connect the DSP processor to the internal SSL network. *Page 3-5.*

SSL Net 3 – Available for the connection of the optional MORSE router or remote GP IO units. Note that it will be necessary to supply an external Ethernet hub/switch if multiple units are to be connected.

TCP/IP – Must be connected to a PC via the facility's Ethernet network. *Page 3-5.*

**6 TOUCHSCREEN** *USB*

Available for the connection of an external keyboard/trackball for text input as an alternative to the touchscreen. A suitable combined keyboard/trackball is available to order as an option.

**7 SBC – VGA & MOUSE** *HD15F USB*

Direct keyboard and monitor connections to the SBC Linux PC. A permanent connection is not required – these ports are available for access during initial system configuration where no network computer is available.

**8 MADI I/O** *LC Fibre*

Fibre interface ports for the connection of remote I/O units. Four ports are supplied as standard – each fitted with a multimode duplex LC fibre interface adapter. A second four port card can be specified (as shown opposite) to provide additional I/O capacity. *Page 2-10, 3-11.*

**9 IPMIDI** *RJ45*

Direct network connection to facilitate communication with a suitably equipped DAW. *Page 3-25.*

**10 SYNC** *BNC*

Input for system reference. A sync reference common to all equipment will be required if using digital peripherals. The input is not internally terminated and must be fitted with the external tee-piece and terminator provided. Two sync cables will be required for redundant processor systems – sync must not be daisy-chained between units.

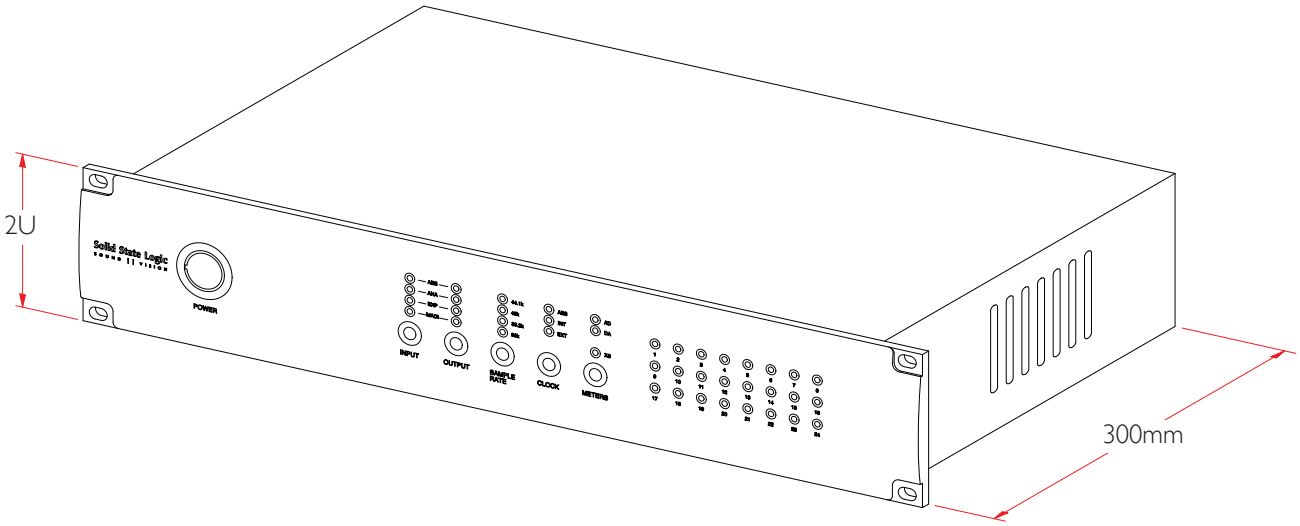
**11 TOUCHSCREEN VIDEO OUT** *D9 female*

Video output of the centre section touchscreen. Can be connected to an external XGA monitor for backup or training purposes – note that the display is in portrait orientation. *Page 3-23.*

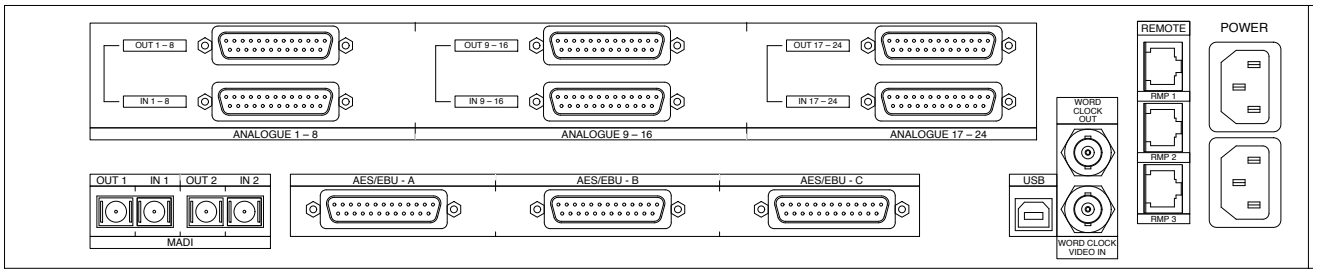
**12 12V OUTPUT** *D9 female*

Used only to power the optional SSL relay fibre-changeover switch. Do not use for any other function. *Not fitted to the 16-channel frame or to consoles without processor redundancy.*

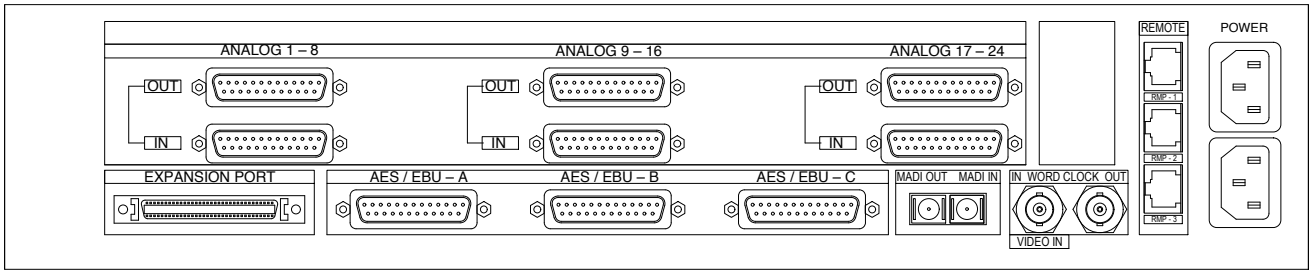
## ALPHA-LINK LIVE-R/LIVE




## REAR PANEL CONNECTORS – ALPHA-LINK LIVE-R




## REAR PANEL CONNECTORS – ALPHA-LINK LIVE



## Alpha-Link LIVE-R

The Alpha-Link LIVE-R is a 2U high 300mm deep 19" rack unit featuring dual power supplies for on-air reliability.

Output levels at 0dBfs are user adjustable to cover the range +14dBu to +24dBu.*

Each Alpha-Link LIVE-R provides 24 channels of line-level analogue input & output and also 24 channels of AES/EBU input & output. Digital channels 1–8 feature sample rate conversion on their inputs; circuits 9–24 operate at the system sample rate.

*Line level outputs from the 8-RMP remote mic amps connect to the Alpha-Link LIVE-R analogue inputs. When allocating audio circuits ensure that a sufficient number of connectors are reserved for any microphone channels.*

### Fibre Connection

Alpha-link LIVE-R units are connected to the Blackrock processor using fibre optic cabling. Suitable cables should be installed by the facility. Fibre specification is: 50/125µm multimode duplex LC to SC.

Each unit is equipped with two MADI connectors*. MADI-1 is the default input. Should the MADI-1 signal become lost – as a result of a broken or disconnected fibre – the unit will automatically switch to its MADI-2 input.

*Each Alpha-Link is supplied with one 2m fibre cable. This cable is intended to be used for initial testing only. It is the responsibility of the facility to provide the longer fibre cables necessary to remotely locate the Alpha-Link units.*

### Connector Summary

| Name | Connector | Description |
|---|---|---|
| Analogue | D25 F | 8 channels, balanced, line-level audio input or output per connector. |
| AES/EBU | D25 F | 4 AES/EBU input pairs plus 4 AES/EBU output pairs per connector. |
| MADI | SC Fibre | MADI audio data link to the console DSP processor. |
| Remote 1,2,3 | RJ45 | Control link to the 8-RMP remote mic units. *Standard Ethernet cables can be used.** |
| Video In | 75Ω BNC | Video sync input required. *(Alternatively, sync can derived from the incoming MADI stream but with slightly reduced technical performance.)* |
| Wclock Out | 75Ω BNC | Provides a source of Wordclock output locked to console sync input. |
| USB | MDR 56 | No connection required. *Service diagnostic use only.** |

**Alpha-Link LIVE-R only, see below.*

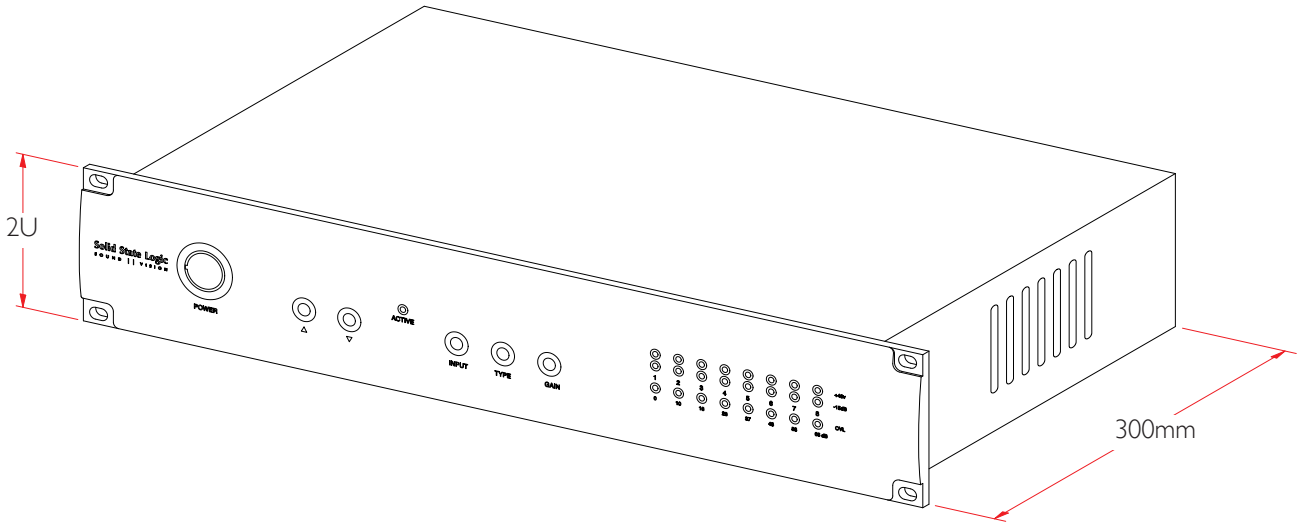
*See Section 6-11 for the connector pinouts.*

## Alpha-Link Live

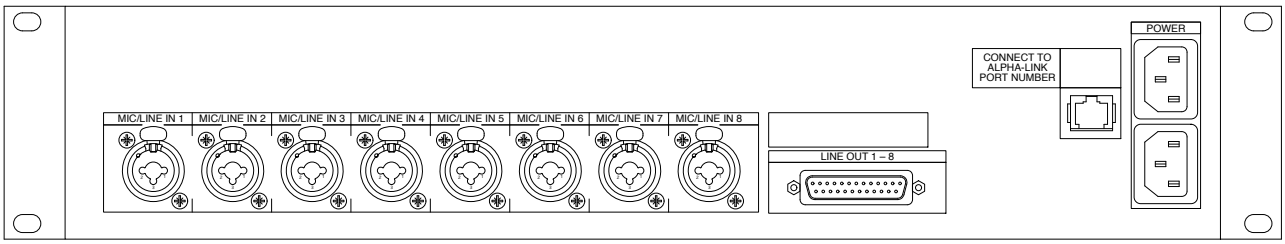
Alpha-Link Live is operationally the same as the 'LIVE-R except in the following areas:

- Only a single MADI fibre connector is included. See panel layout opposite.
- Two versions of the unit are available which provide either +18dBu or +24dBu analogue output level at 0dBfs. This setting is NOT user-selectable so the version required must be specified at the time of order.
- The 'RMP 1, 2 & 3' control connectors have a different pinout. Standard Ethernet cables CANNOT be used. *Refer to Appendix page 6-12.*
- The additional 'Expansion Port' connector is not used so does not require a connection.

## ALPHA-LINK 8-RMP




Rear Panel Connectors



## Alpha-Link 8-RMP

The RMP is an 8-channel microphone amplifier in a 2U high 300mm deep 19" rack unit. It features dual power supplies for on-air reliability. Switchable phantom power is available on each input.

The 8-RMPs connect directly to an Alpha-Link LIVE-R unit, not to the console surface. Up to three units can be connected to each Alpha-Link LIVE-R.

### Audio and Control Cables

Analogue outputs from the 8-RMP are at line level and should be connected to an Alpha-Link LIVE-R using 8-circuit balanced audio cable.

Remote control information is provided by a separate RJ45 data cable.* Pairs of audio-plus-control cables can be ordered from SSL in lengths of 1m, 5m, 10m and 25m. Cable pinouts are listed in the appendices. The maximum recommended cable length between each Alpha-link 8-RMP and an Alpha-Link LIVE-R is 50m.

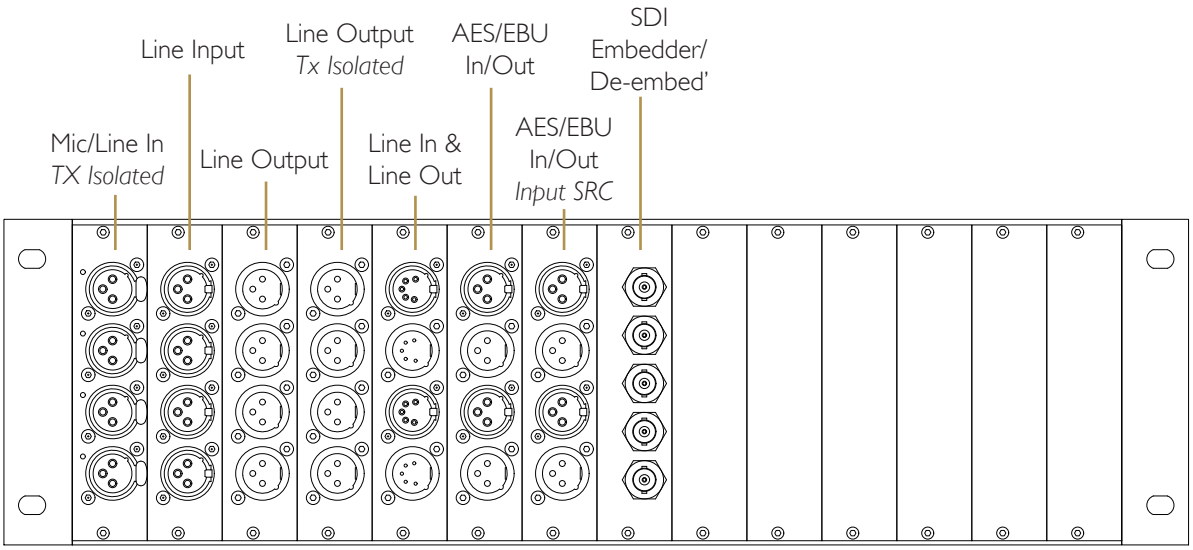
### Connector Summary

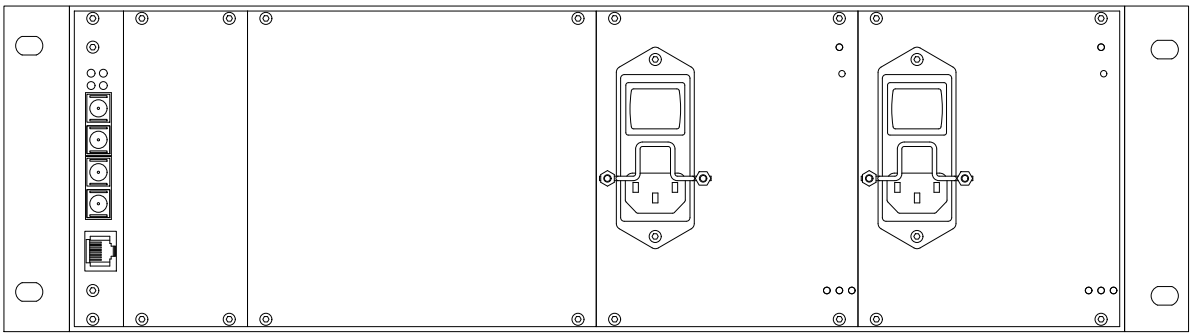
| Name | Connector | Description |
|---|---|---|
| Mic/Line In | XLR3 F | Microphone input. Pin 2 +ve. Switchable phantom power. |
| Line Out | D25 F | 8 channel balanced audio outputs, line level. |
| Remote | RJ45 | Control data connection to Alpha-Link LIVE-R.* |

*See Section 6-12 for the connector pinouts.*

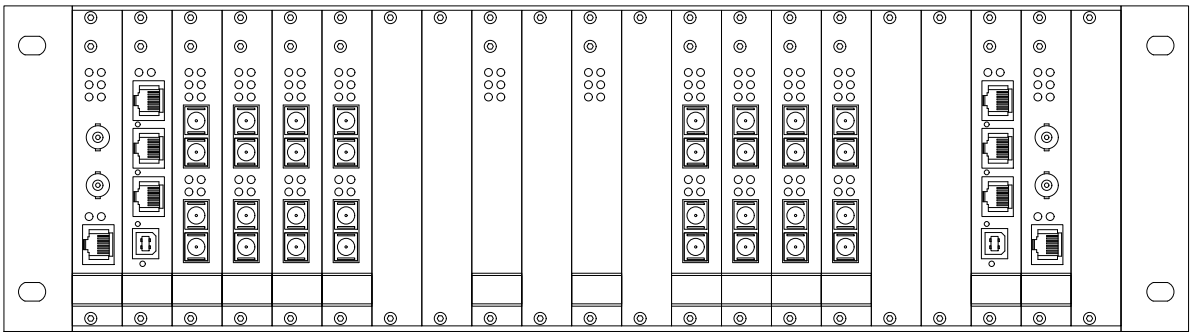
**Pinout of the data cable will differ depending on whether Alpha-Link Live or Alpha-Link LIVE-R is being used. Refer to previous section for further information.*

## MORSE Stagebox



## MORSE 3U Router



## MORSE System (option)

The MORSE (MOdular Resource Sharing Engine) system provides a cost-effective, scalable solution for the sharing of local or remote audio I/O and managing control data. The system is specifically designed for on-air reliability and features optional redundancy on all data links and fault tolerant proprietary software.

The system comprises a central router to which remote stageboxes and consoles may be connected via optical MADI links to provide a resource sharing solution. The router is available as a 3U rack with up to 24 individual links available or as a 6U rack with up to 48 links.

Stageboxes can be connected to the router so that any I/O signal is then able to be allocated to any Blackrock processor connected to the router. If however resource sharing is not a requirement stageboxes can be directly connected to the processor. Both router and stagebox can support redundant fibre link connection.

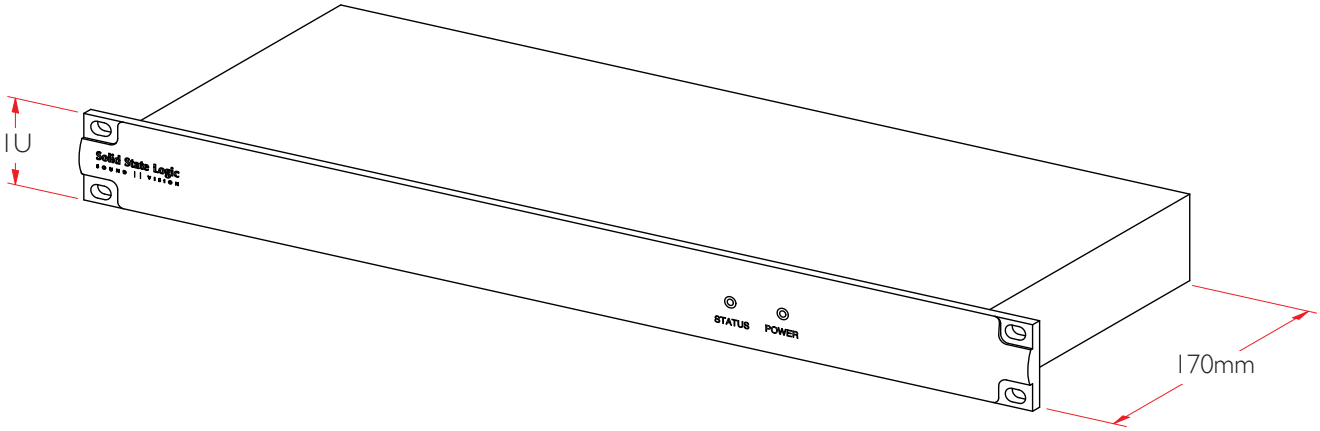
Each stagebox provides 14 slots for input modules so can each can be fitted with up to 56 channels of I/O. Plug-in modules are available that provide: Microphone level input, line level analogue I/O, AES, MADI and HD-SDI embedding and/or de-embedding. A 2nd redundant power supply can be fitted. Stageboxes are connected to the router or console using one or two duplex optical MADI links. The analogue operating level can be adjusted to cover the range +15, 18, 21 or 24dBu.

The Stagebox layout and range of I/O cards is shown opposite.

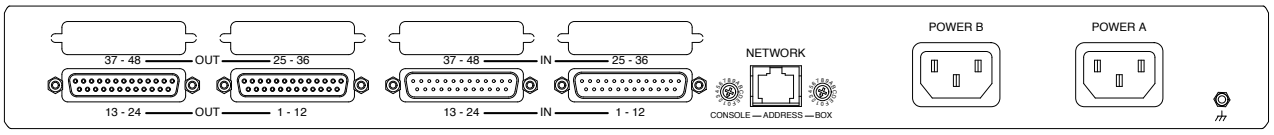
> *The fibre links between the Blackrock and the MORSE router are available as multimode or as singlemode to special order. Blackrock to MORSE fibre leads are LC – SC duplex.*

The MORSE system is more fully described in a separate SSL document *'Morse Specification Guide'* part number: 82S6SMO10A.

## Remote GP IO Interface




Rear Panel



## Remote GP IO Interface

The SSL remote GP IO unit is a 1U rack mounted chassis and is available in two versions that provide either 24 or 48 channels of GP input and output. The chassis features two mains power supplies thus providing '*On-Air*' redundancy.

GP IO boxes are connected to the console surface by a standard Ethernet connection. Connection is made to the SSL network and should therefore be kept separate from the facility's IT infrastructure.

Input and output signals can be either latching or momentary; this setting is individually assigned in software via the touch screen. When set to momentary the input trigger signal duration must be greater than 50mS.

*Refer to Section 6-13 for the connector pinouts.*

The internal mains power supplies are of the fully isolated type. It is recommended that a separate earthed lead is attached to the rear of the chassis to ensure a permanent ground connection. An M3 threaded insert is provided on the rear panel for the ground lead.

### Input Switching

Inputs are triggered by applying a voltage of between 4V and 30V (AC or DC) across each pair of inputs pins. The current drawn is approximately 10mA.

A 0V reference is available on all input connectors. A protected source of +12V available on all output connectors.

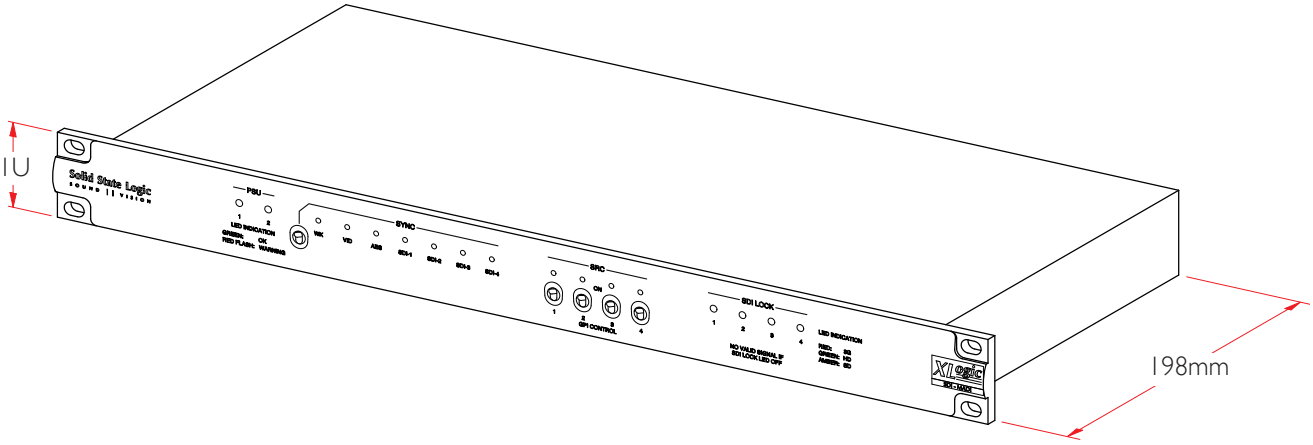
### Output Switching

The switch closures are via DIL relay. Contact rating is 100Vdc, 125Vac, 100mA max.

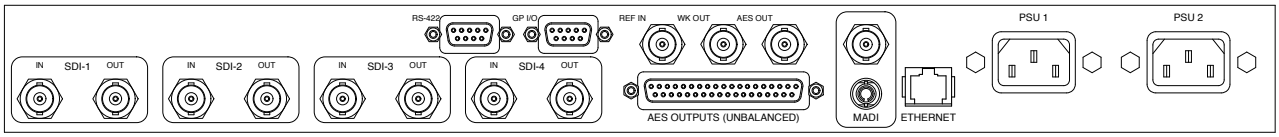
Do not use the output contacts to directly switch capacitive or reactive loads; always use an external relay with a suitable contact rating.

*If used for discrete track arming with associated tally, the tally must return to the same number input as the arming output signal, (ie. The tally for GP Out 1 will be on GP In 1).*

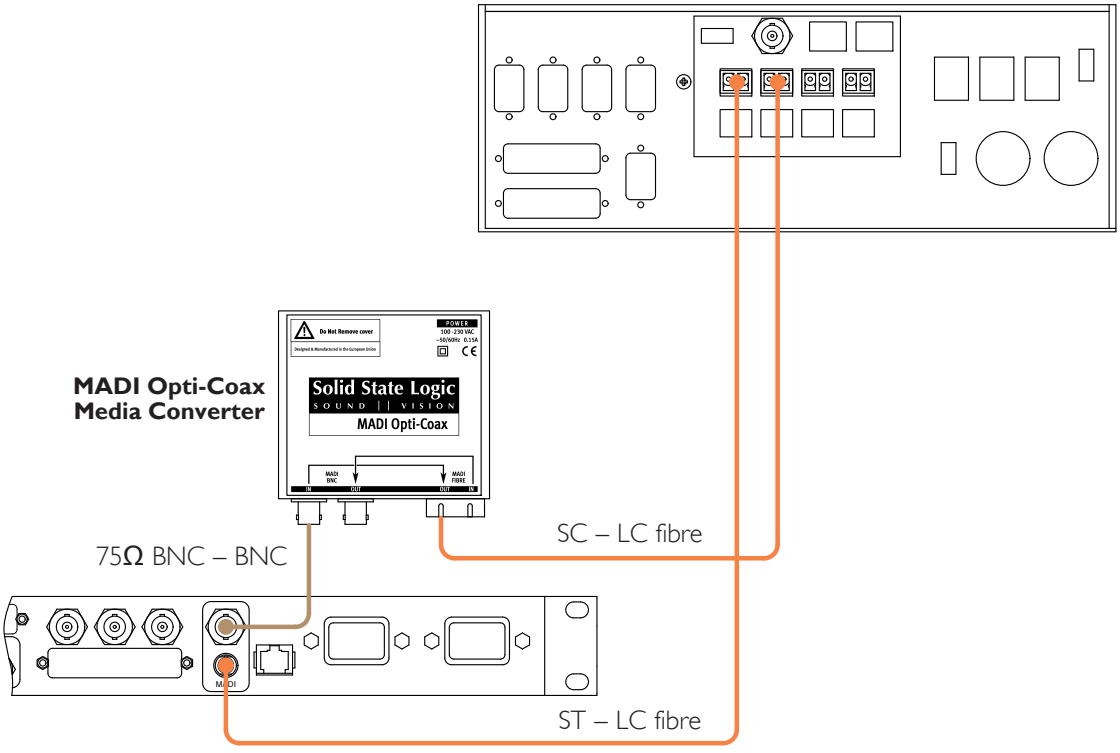
## SDI–MADI Interface




Rear Panel




## Redundant Fibre Connection Using Opti-Coax



## SDI–MADI Interface

The SSL SDI-MADI interface is a 1U rack mounted chassis including two mains power supplies thus providing '*On-Air*' redundancy.

The unit provides the interface between SDI video bitstreams and digital audio. SDI-MADI extracts up to 16 audio channels from each of the unit's four SDI inputs to provide a total of up to 64 audio channels in both MADI (AES10id-2008) and AES3 (AES3-1992) formats.

SDI inputs independently auto-sense between 3G, HD and SD standards and provide loop-through outputs for downstream equipment. With a comprehensive range of synchronising options and switchable sample rate convertors, the SDI-MADI is designed to reliably and seamlessly integrate into any broadcast environment where SDI-embedded audio channels require format conversion.

*More detailed installation and operational information can be obtained from the separate installation manual which can be downloaded from the SSL website:*

http://www.solid-state-logic.com/broadcastsound/Xlogic%20SDI-MADI/documentation.asp

### Fibre Connections

Connection to the Blackrock computer is by single unidirectional fibre (a return path from the Blackrock is not required). Note that the fibre connector on the SDI–MADI unit is the ST version.

If a redundant connection to the Blackrock is required this can be implemented by utilising the BNC copper-MADI connector on the rear panel. This signal is a duplicate of the primary MADI but will need to be converted to fibre media – this can be achieved by using the SSL copper-to-fibre media converter '***Opti-Coax***'. The diagram opposite shows the redundant connection.

# System Options

## Loudspeaker Shelf

A flat secure shelf is available for the positioning of loudspeakers, monitors etc. Each shelf is 400mm wide by 253mm deep. A shelf is securely attached by locating under the front of the top trim and then screws are used to fix to the console's back panel.

## Side Arm Trim

Standard side panels of the consoles are flat to simplify the positioning of adjoining furniture. A smooth contoured arm in contrasting silver finish is available which can be attached to the side panels to provide a more comfortable and attractive finish.

- System Overview Diagram
- Power Supply
- Sync Source
- Network Connections
- Network Configuration
- Alpha-Link Live and LIVE-R
- Alpha-Link 8RMP
- GP I/O
- Talkback and Oscillator
- Headphones
- ipMIDI

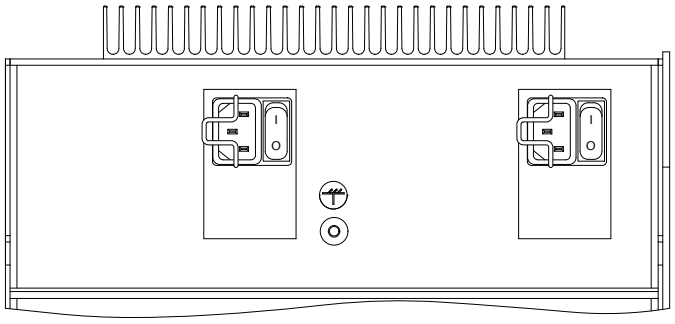
# SECTION 3: INSTALLATION

## IN THIS SECTION ...

… are step by step instructions about how to connect the console to its peripherals and any optional items. Note that there is a section describing the initial setup of the IP network.

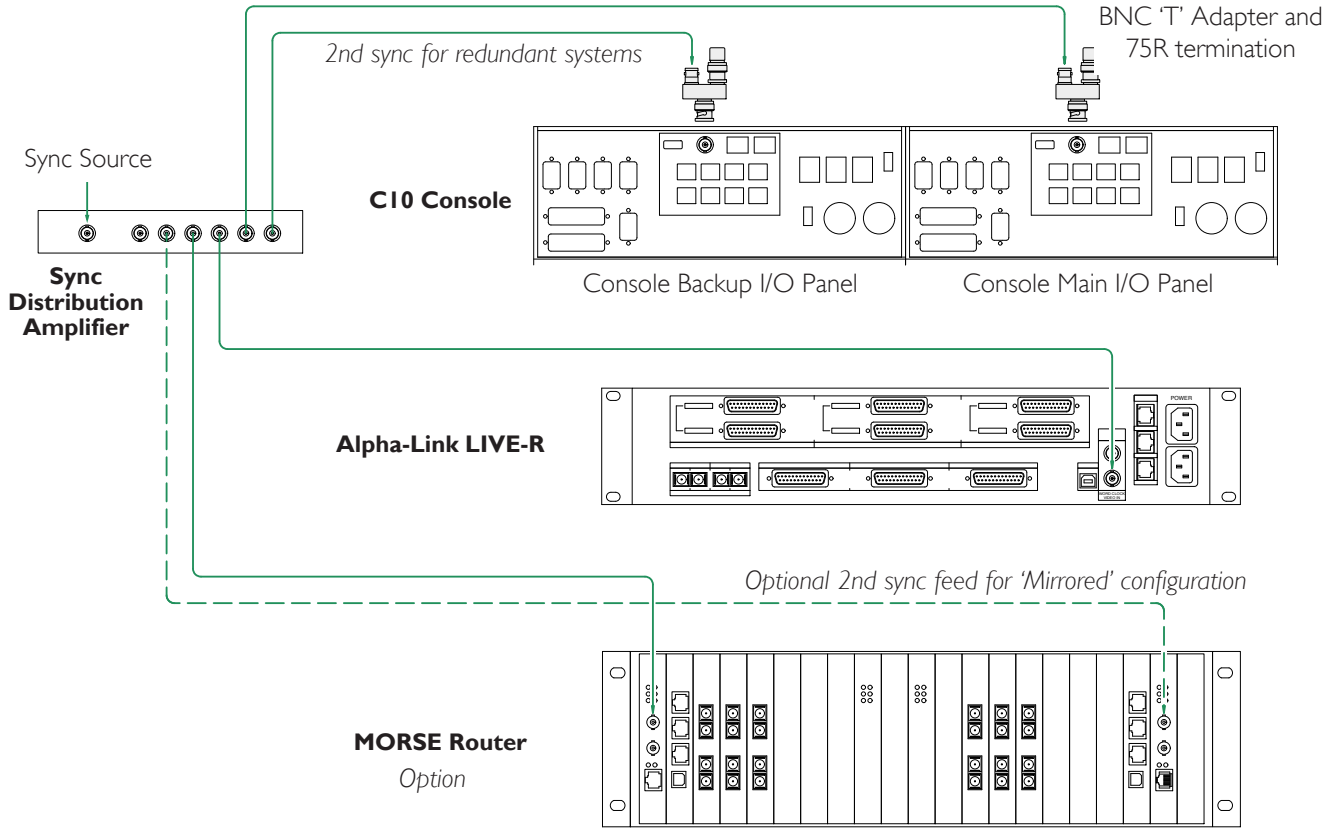
## Section Contents

## Console Mains Inlet Panel



Chassis earth bolt

## Sync Connections



# Mains Connection

All units are fitted with auto-ranging power supplies which will accept mains voltages which range from 100 to 240V ±10% without adjustment. The mains rating label is located adjacent to the mains input socket on the centre section power inlet panel.

THE MAINS SAFETY EARTH MUST BE CONNECTED.

THE TWO POWER SOURCES MUST NOT BE FROM DIFFERENT PHASES OF A 3-PHASE SUPPLY.

For live transmission work it is normally recommended that one of the power feeds should be from an uninterruptable source – please also refer to note on page 2-5 relating to UPS units.

## Chassis Earth

An M6 earth bolt is provided on the mains input panel. This is an optional safety earth connection for external equipment or for where the power supply ground may be inadequate. This chassis connection is directly linked to the earth pin of the incoming power lead.

# Sync Connections

A sync input signal is required by the Blackrock processor(s), each Alpha-Link LIVE-R* and the MORSE router (if fitted). Sync signals are not required by Alpha-Link 8-RMP or RIO units.

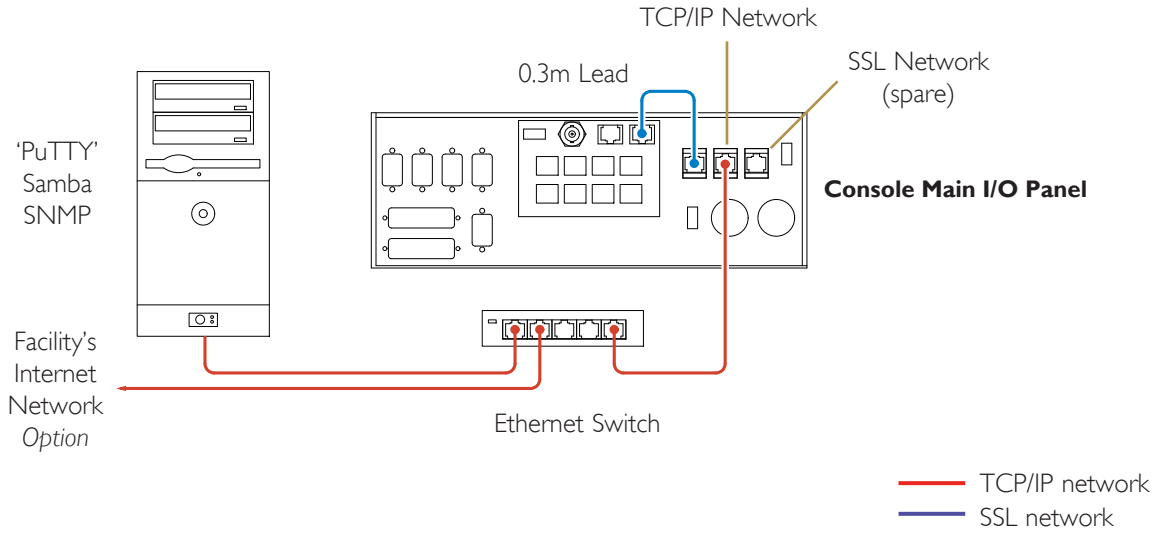
Refer to the diagram opposite for the recommended sync distribution arrangement.

Note that the Blackrock processor(s) do not include internal termination. Termination needs to be provided by fitting the BNC adapter and termination plugs; these items are located in the console's trim kit.

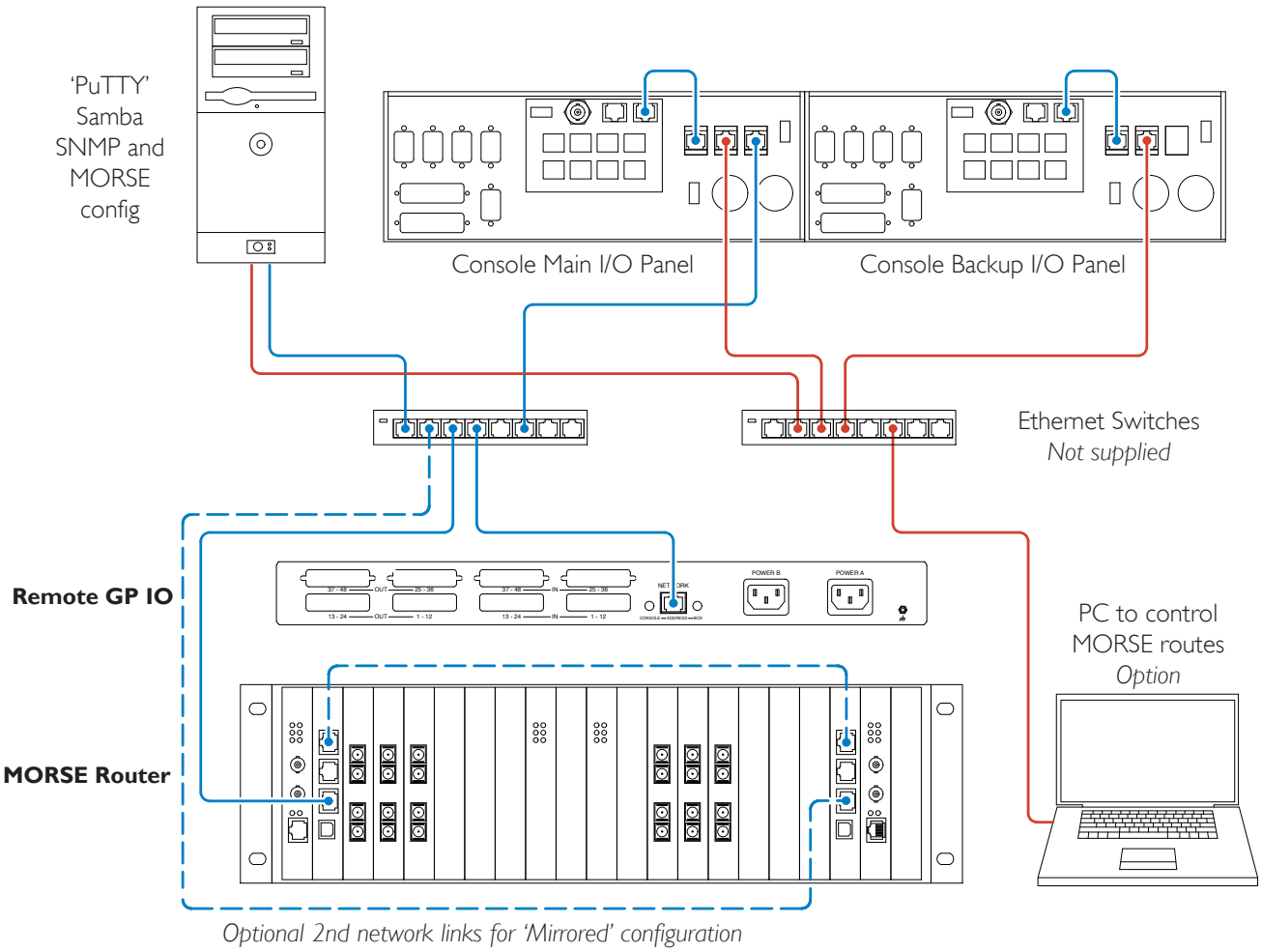
** If an Alpha-Link LIVE unit is positioned at a remote location where it is impossible to provide a sync signal the unit can be configured to use its incoming MADI signal as the sync reference. See page 8 of the Alpha-Link LIVE-R User Manual regarding clock source selection. HOWEVER, when operating in this mode there will be a degradation of jitter performance and redundant-processor systems may experience a slight delay and/or drop of audio whilst the unit re-references to its backup MADI stream.*

*Refer to Appendix page 6-31 for the full list of supported sync frame rates*

## Network Connections – Single Processor




## Network Connections – Redundant Processor plus MORSE and GP IO



# Network Connections

Assemble the two console networks as indicated by the appropriate diagram opposite.

- Standard cat-5e or cat-6 Ethernet cables are suitable for all network connections.
- Hubs should preferably be of an 'auto-negotiating' type or of at least 100BaseT capacity.
- The SSL and TCP/IP networks must be kept separated.

## TCP/IP Network

☞ The remote PC, network hub and interconnecting cables are not supplied and will need to be sourced by the facility.

The PC may also be directly connected to the console's TCP/IP Network port without the need for a hub. Note that in this configuration the Ethernet cable used will need to be of the 'crossover' type.

The console does not support wireless networking.

## SSL Network

The SSL network is a closed proprietary network used to transfer data between the different items of SSL equipment – including the optional MORSE router.

For single consoles, or for systems without a MORSE router or a GPIO box, the only connection that needs to be installed is the 0.3m link between the DSP card and the SSL network port on the connector panel. (This lead will be located in the console's trim kit).

Redundant systems, multiple console installations or systems that include a MORSE router will almost certainly require an external Ethernet switch to be supplied.

### Control of a MORSE router

The routing matrix in a MORSE router can always be controlled by using the console's touchscreen.

Routing, and optional scheduling, can also be controlled remotely using a PC by purchasing an appropriate license.

The file management PC can also be used to control a MORSE router providing it is equipped with two independent network cards. This configuration will also allow additional suitably licensed PCs access the router.

# Network Configuration

Once the physical connections between the console and the network PC have been established it is then likely that whoever manages the facility's IT network will wish to perform some initial system administration.

The networked computer used will need to have an SSH (secure shell) client programme installed. Macintosh users will be able to use the '*Terminal*' application that is included with the OSX operating system. For PC users it will be necessary to install a 3rd-party terminal emulator application. (Most terminal applications support ssh connection; the free, downloadable application *'PuTTY'* is a suitable example). This program will be used to communicate with the C100 HDS administration programmes.

*Mac 'Terminal' settings should be: [Preferences…/Terminal type: – Xterm Color], [Window Settings.../Display/Wide Glyphs – unchecked] to give the correct colour display.*

To be able to log-in to the console's SBC server it will be necessary to know its IP address. The default IP details are listed below. It is recommended that the processors are given usernames to simplify future logins; if a hostname has already been allocated then the IP address can be replaced by the hostname – refer to page 3-9.

## User Access to Shared Folders

A user network login is provided on the console's internal Blackrock server. This account provides access to all the Samba shared folders used for the storage of projects and backups as well as the uploading of '*Eyeconix*' images.

*Access to shared folders*

| | |
|---|---|
| *IP:* | *192.168.1.2 (static)* |
| *Login name:* | *root* |
| *Password:* | *pavili0n* |

## Service Access

A technical-level login account '***SBC***' (Single Board Computer) is also provided on the Blackrock server. This account provides terminal access to all user files. System administrators should always log-in using this account. The default login details are shown on the right.

Some system settings may require a '*root*' password – see 'Administrator access' below.

*Service access*

| | |
|---|---|
| *IP:* | *192.168.1.2 (static)* |
| *Login name:* | *sbc* |
| *Password:* | *sbc123* |

***Administrator Access***

*Note that in order to modify the SBC server's default settings it will be necessary to log in as '***root***'. Only log-in as root when prompted and always log-out when finished. This login has the full range of access permissions and is able to change or delete system level files. The root password is 'pavili0n' [Note the use of the numeral 0].*

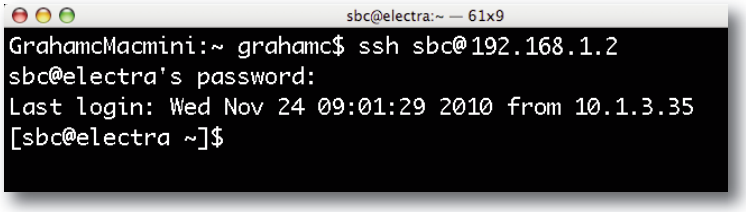
## 'SBC' LOGIN (MACINTOSH OSX)

- Launch the '*Terminal*' application on the Mac. ('Terminal' is located in 'Applications / Utilities')
- At the terminal prompt type the following command: '`ssh sbc@192.168.1.2'` <CR>

  *Where: '`ssh`' is the command for a secure shell connection.*

  '`192.168.1.2`' *is the IP address of the computer when shipped from the factory and*

  '<CR>' *indicates the 'Return' key on the computer keyboard.*




- Enter the sbc password '`server`' <CR>.

You should now be logged-in to the console server.

*Note that in the example shown the server has already been assigned the name 'electra'.*

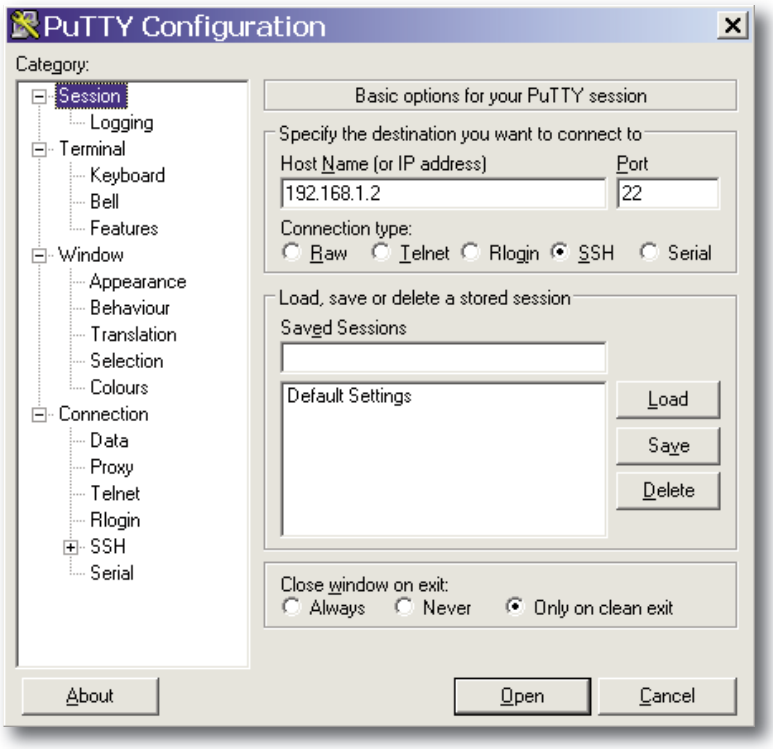
## 'SBC' LOGIN (PC)

- Once PuTTY is installed on your computer click on its icon to launch the terminal program.
- Enter: '`192.168.1.2`' in the '*Host Name*' field and click '*Open*'
- You will be prompted for the login level, enter: '`sbc`' <CR>
- Enter the sbc password '`server`'.

You should now be logged in to the console server with root access.

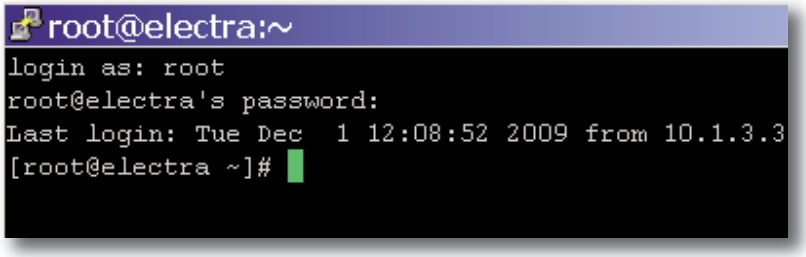
*Note that in the example shown the server has already been assigned the name 'electra'.*

> *Other terminal emulator programmes may omit the configuration window stage. For these applications the connection command used in the Macintosh example may be appropriate.*




## 'ROOT' LOGIN

- Type '`ssh root@192.168.1.2`' <CR> or enter '`root`' at the login prompt in place of '`sbc`'.
- Enter the root password '`pavili0n`' <CR>.




## LOGGING OUT

Because the root login has full access permissions it is recommended that after running either setup program the connection to the server is closed. This will prevent unintentional alteration of critical files.

- At the server prompt type '`exit`' <CR>.

## TIME ZONE SELECTION

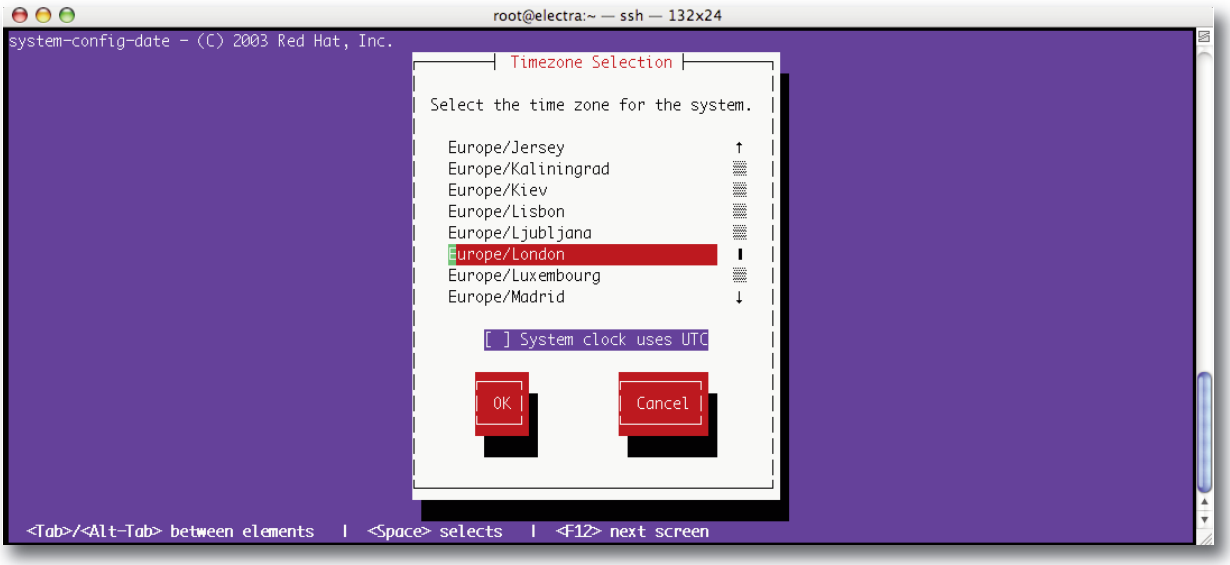
The console's real time clock is set to observe GMT at the factory and should not be adjusted.

☞ It will however, be necessary to enter the studio's global location in order to set the appropriate world time-zone offset value, (unless of course, the studio is also located in a zone that observes GMT).

To enter the timezone selection utility:

- Log in to the console server as '*root*' using the appropriate method shown previously.
- At the server prompt type: '`system-config-time`' <CR>. *Ignore the warning about text entry.*
- Use the Up/Down arrows to choose the appropriate continent and country locations from the lists provided.
- Tab to '`OK`' or '`Cancel`' and press the space-bar to accept. *Do not select the 'System clock uses UTC' box.*
- Once the selection has been made the programme will return to the '*root*' prompt.

Remember to log out of the root level access when finished.

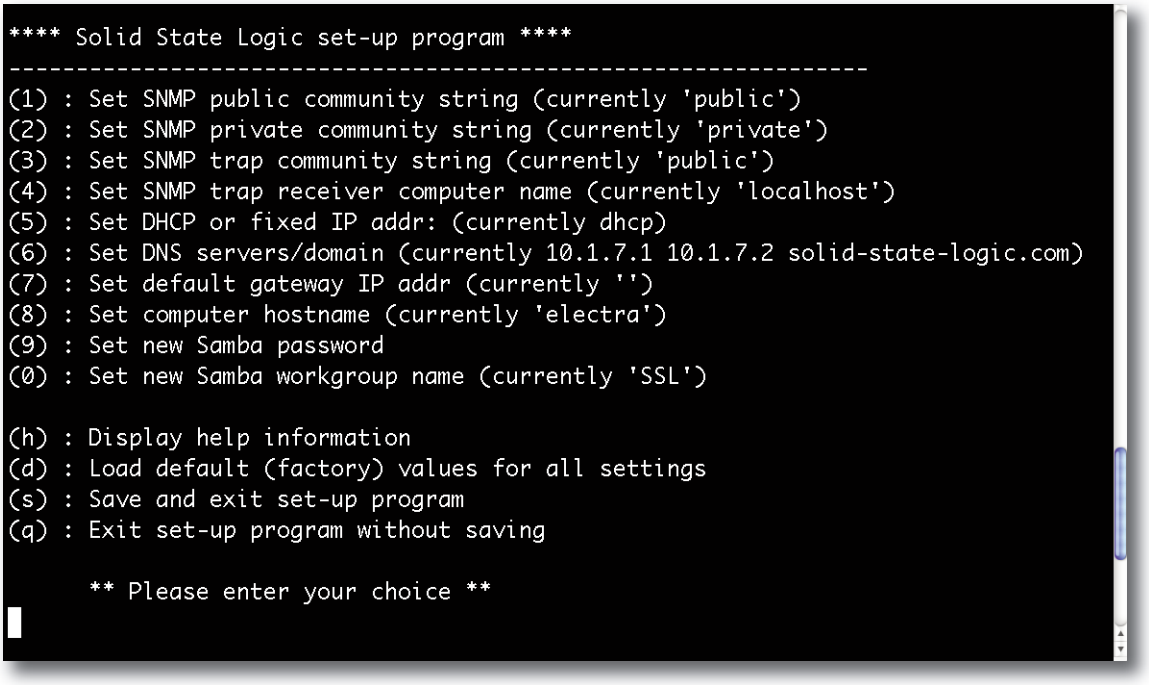



*If the console is fitted with a backup processor it is important to input the correct time zone to both the main and the backup servers – the servers will not synchronise correctly if set to different time-zones. It can take 10–15 minutes for dual Blackrock systems to become synchronised.*

## Server Configuration Options – 'ssl_setup'

The default network settings for the console server, such as its hostname and the IP address allocation method, can be changed to suit the client's IT infrastructure. System settings are configurable via a system setup menu as shown below.

*It is important that values for the network settings are provided by whoever administers the facility's IT systems.*




To access the server's set-up menu:

- Log in to the console server as '*root*' using the appropriate method shown previously.
- At the server prompt type: '`ssl_setup <CR>`'
- The set-up program offers a list of options available to the user. Each option provides on-screen prompts.

*Refer to Appendix K for further information relating to the use of SNMP.*

### Assigning a Server Hostname (Option 8)

It is recommended that the console SBC server is given a hostname; particularly if using DHCP as the IP assignment method. This name can then be used to identify the server for future logins *(In the example on the previous pages it will be noticed that the server has already been named as 'electra').*

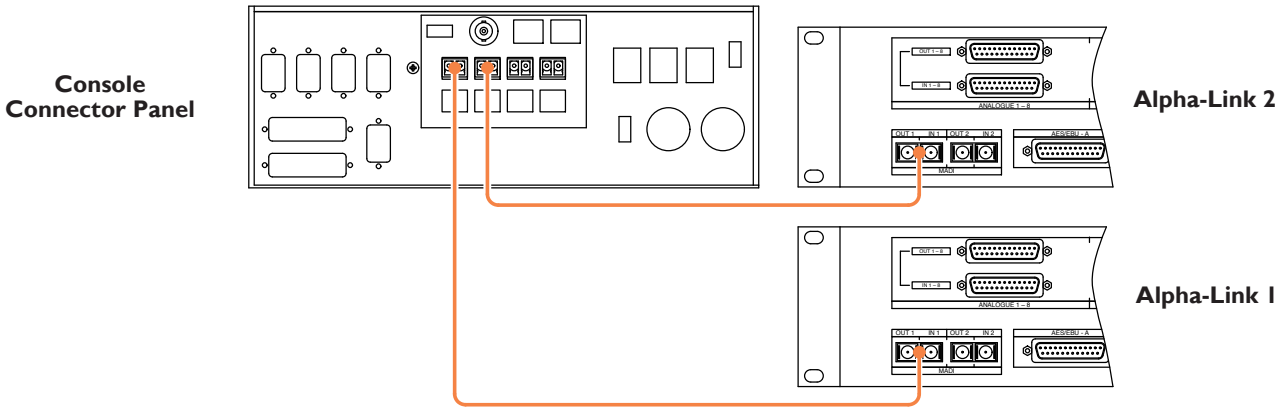
*NOTE. In order for the change of name to become effective it will be necessary to reboot the Linux core of the SBC computer. DO NOT assign a new hostname if the console is in use as network changes can result in a temporary loss of control. NOTE. For consoles fitted with redundant processors the two SBC servers must be assigned different names.*

To assign a hostname and to reboot the core:

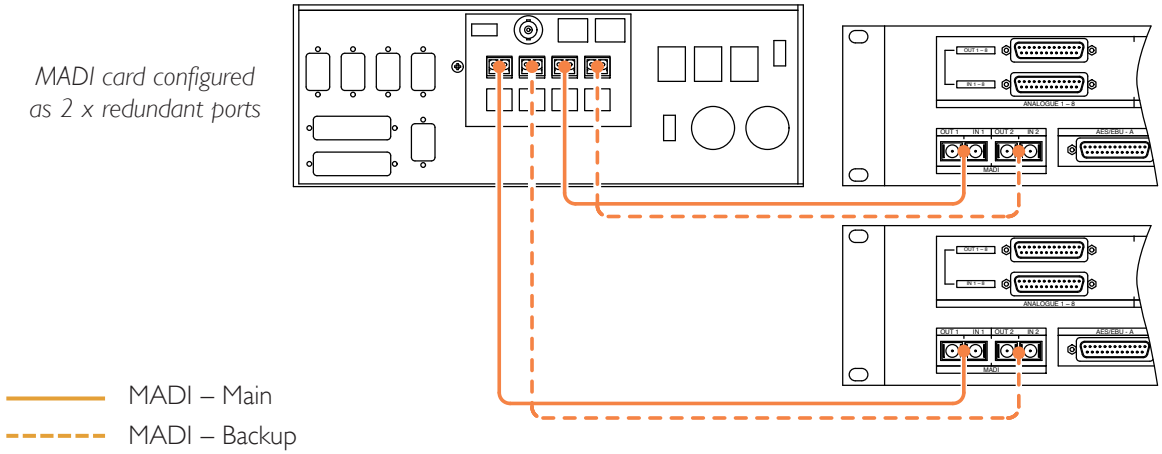
- Assign a new hostname string using the ssl_setup program as shown above.
- Save and exit the setup program using the `(s)` option. *(The may be a network restart message).*
- Then, at the server prompt type: '`reboot <CR>`'

You will then be logged out and the core will restart immediately.

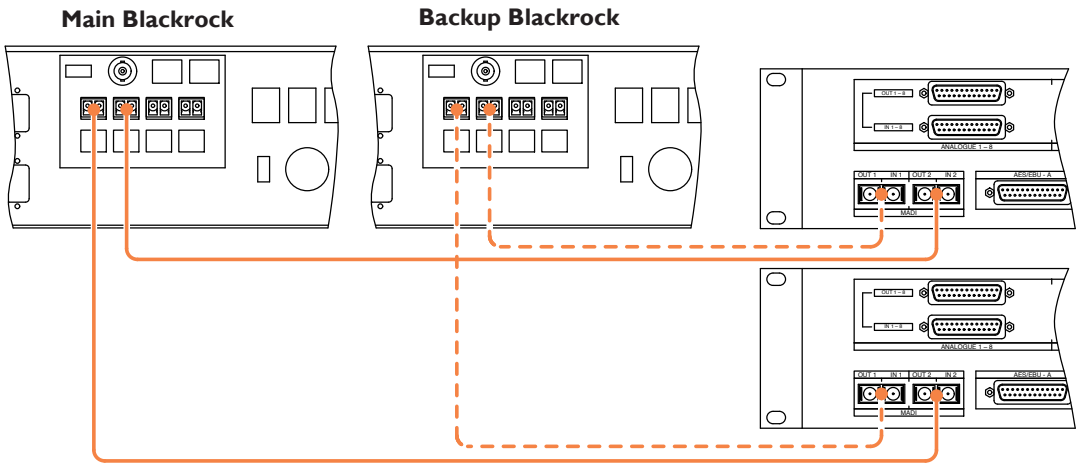
## Fibre Connections – Single MADI




## Fibre Connections – Link Redundancy




## Fibre Connections – Link plus Processor Redundancy



# Alpha-Link LIVE-R

Connect sync source as described in the earlier section page 3-3

*Refer to Appendix page 6-11 for the connector pinouts.*

## Fibre Cables

2m fibre cables are supplied with each Alpha link Live-R which can be used for initial testing or if the units are adjacent to the Blackrock processor.

It is the responsibility of the facility or system integrator to supply longer fibre cables that may be necessary to allow the Alpha-Link units to be remotely located.

Each unit will require one or two fibre cable runs depending on the method of connection to the Blackrock. The diagrams opposite show the different connection arrangements.

- Cable specification is: 50/125µm, multimode, duplex LC (at the Blackrock) to SC (at the Alpha-Link).
- Singlemode 9/125µm cables cannot be used.
- It is recommended that spare cables are run to remote units to allow for damage or future expansion.

Suitable cables are readily available from networking and computer supply outlets.

## Analogue I/O

Balanced analogue inputs and outputs are available via the D25 connectors. Each connector provides eight channels.

## Digital I/O

Four input circuits and four output circuits of 110Ω balanced AES/EBU are provided on each connector. Use only appropriately matched 110Ω cable for the connection of digital equipment.

Digital channels 1–4 feature SRC conversion on their inputs. All other digital inputs operate at the system sample rate.

### Unbalanced Digital I/O

A 1U, 32-channel, BNC converter/breakout panel is available for the connection of 75Ω unbalanced digital equipment.

Panels can be ordered with either 1m or 3m connection cables. Note that 3m is the maximum distance at which the panel can be located.

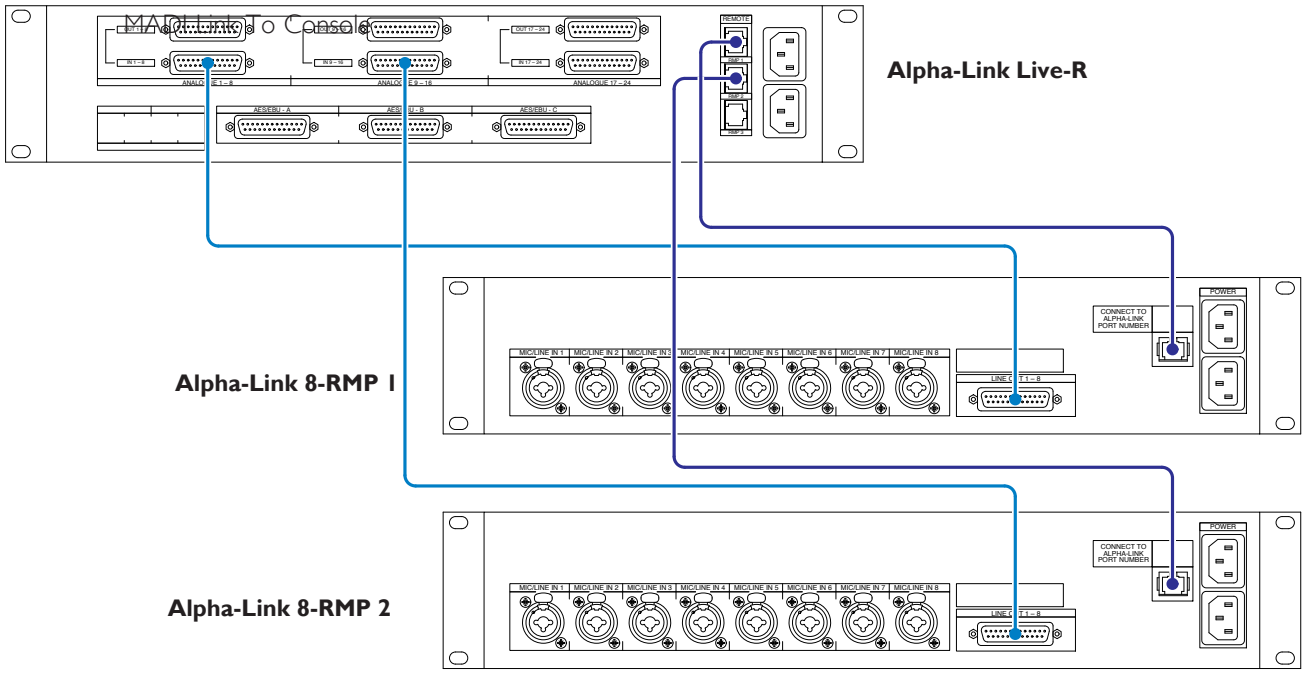
## 8-RMP Remote

For remote control connection to separate Alpha-Link 8-RMP microphone amplifier units. See following pages.

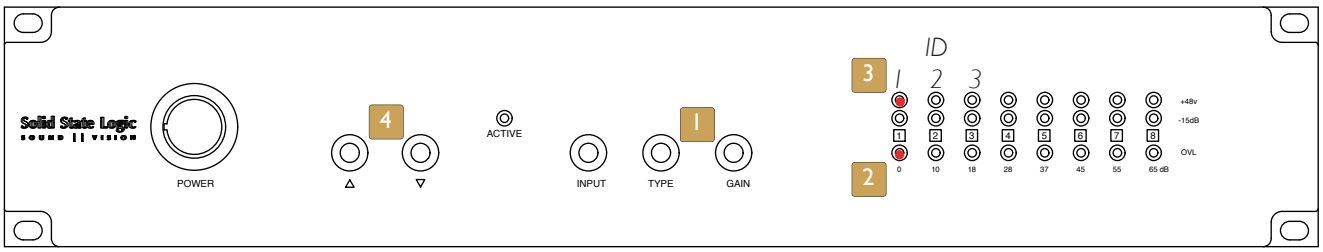
# Alpha-Link Live

The Alpha-Link Live unit does not feature twin MADI fibre ports. The creation of redundant connections to this unit will therefore require the use of an external fibre changeover switch.

## Alpha-Link LIVE-R To Alpha-Link 8-RMP Connection




## Front Panel ID Configuration



# Alpha-Link 8-RMP

## Audio Connection

Microphone inputs are via XLR 3-pin female connectors.

The line-level outputs are accessed on a 25-way D-type female connector. A pin-to-pin individually screened, balanced audio cable should be used to connect the 8-RMP output to one of the Alpha-Link LIVE-R analogue input connectors. Standard cables are available to order in 1m, 5m, 10m and 25m lengths.

*The maximum recommended length of the audio cable between Alpha-Link LIVE-R and 8-RMP is 50m.*

## Remote Control Link

A separate RJ45 lead must be installed to provide control for the *Gain*, *Pad* and *Phantom Power* settings. Where connection is made to an Alpha-Link LIVE-R then standard Ethernet cables can be used.

*Alpha-Link Live units use a custom pinout for the 'Remote' connector so standard Ethernet network leads cannot be used. If making your own cables, refer to page 6-10 for the pinout of the custom control lead.*

Audio and control leads are available to order in standard 1m, 5m, 10m and 25m lengths.

*Refer to page 6-12 for the connector pinouts.*

## Remote ID configuration

The 8-RMP units are configured with an identification number (ID-1, 2 or 3) via the front panel buttons to match the corresponding '*Remote*' port used on the controlling Alpha-Link. A unit configured to be ID-1, for example, will not respond if connected to Alpha-Link LIVE-R '*Remote*' ports 2 or 3.

***To Configure The Channel ID port:***

a. Switch off the power, remove the RJ45 control lead and re-apply power to the 8-RMP unit.

*If the unit is already communication with the Alpha-Link LIVE-R it will not be possible to alter the configuration.*

b. Press and hold the 'TYPE' and 'GAIN switches 1 down together for about 1 second.

*This will enter the configuration mode.*

c. The '0' level LED 2 will begin to flash.

*This indicates that the unit is in its channel ID setup mode. (If either the '10' or '16' LEDs is lit instead then press the 'INPUT' button once or twice until the '0' LED lights).*

d. One of the '*+48v*' lights 3 will also be lit.

*This indicates the current channel ID number.*

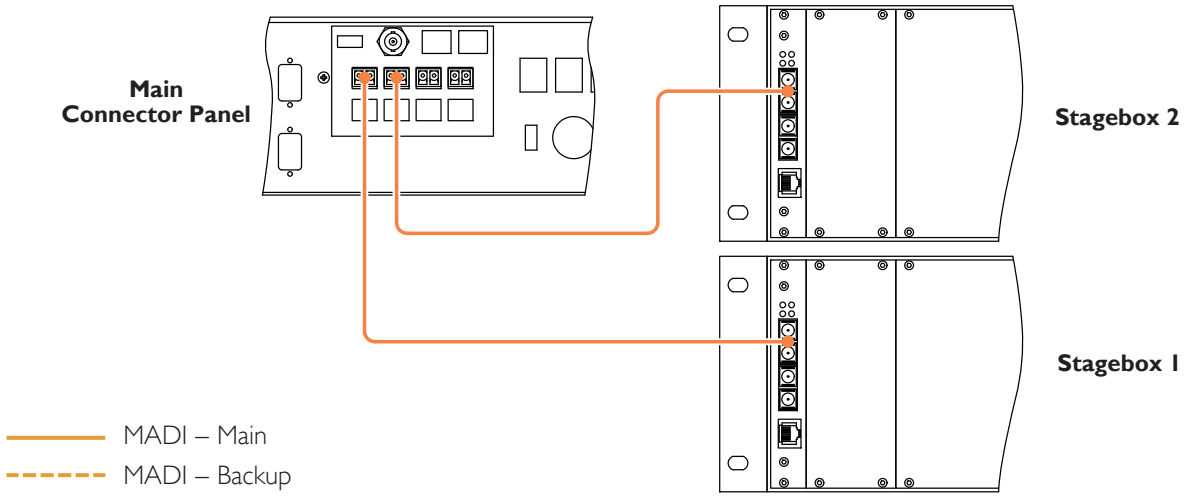
e. To alter the current channel ID number press the 'UP' or 'DOWN' buttons 4 on the front panel until the required channel is indicated.

*NB. It is possible to set channel numbers above ID3. Settings ID4 and above are invalid and will result in a loss of control of the unit.*

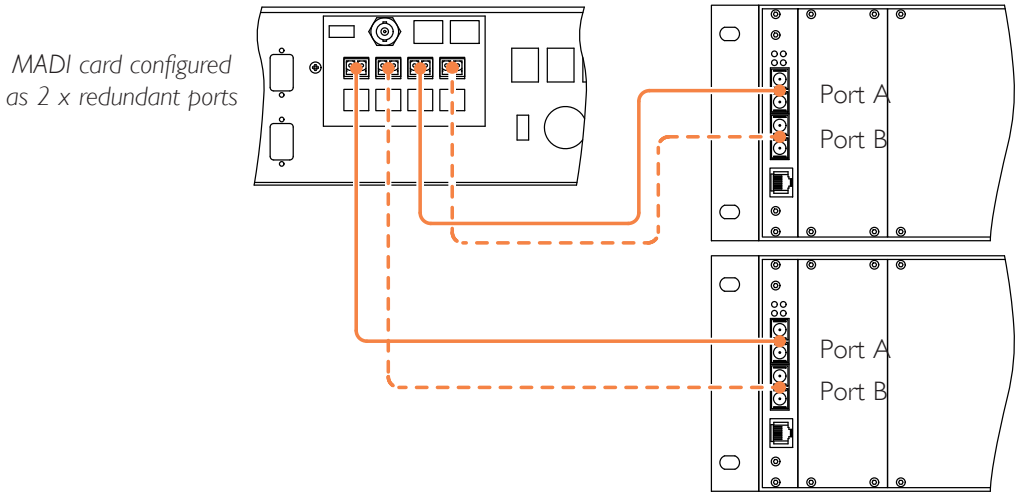
f. Press the 'TYPE' and 'GAIN switches down together for about 1 second.

*This will exit the configuration mode. Remember to reconnect the control lead.*

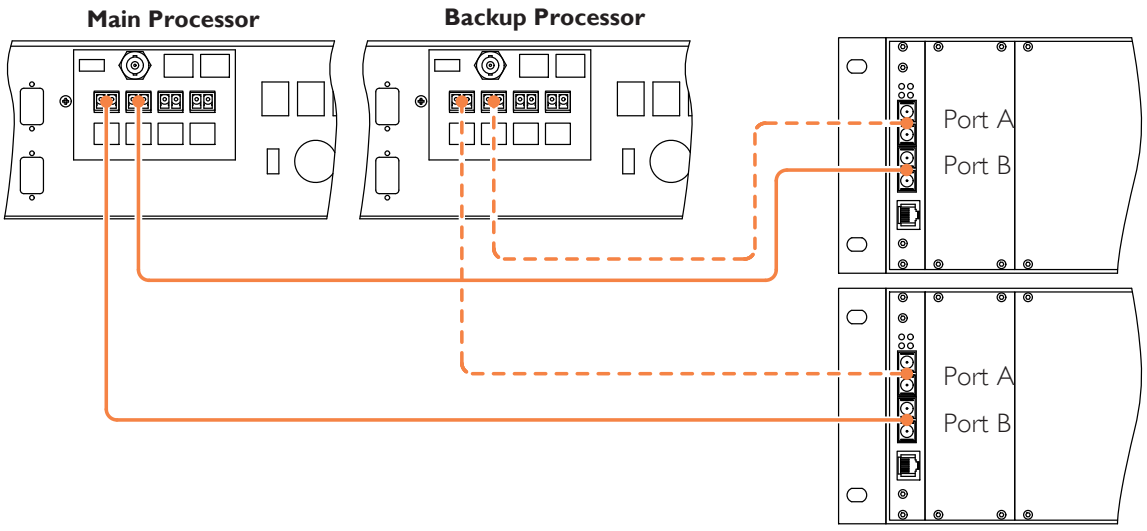
## Fibre Connections – Single MADI




## Fibre Connections – Link Redundancy




## Fibre Connections – Link plus Processor Redundancy



# MORSE Stageboxes

The information following applied to stageboxes that are directly connected to the Blackrock processor(s) without the MORSE router.

The MORSE router can be assembled and configured in different ways to suit specific requirements for resource sharing and redundancy. Systems that include a router will be individually tailored and then commissioned by SSL engineers so are not covered by this document.

## Fibre Cables

2m fibre cables are supplied with each 3U stagebox which can be used for initial testing or if the units are adjacent to the Blackrock processor.

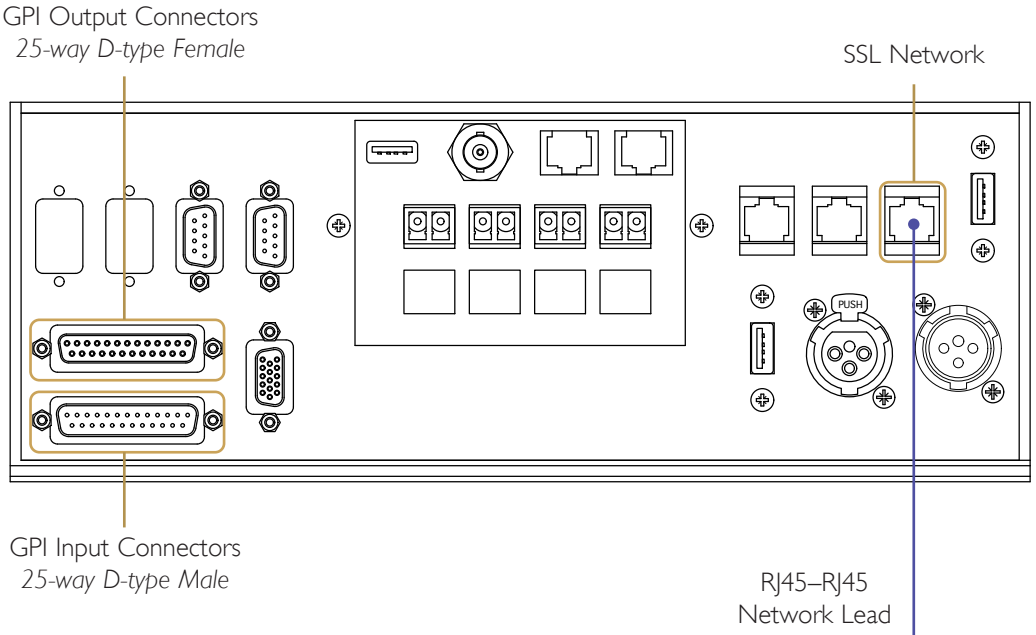
It is the responsibility of the facility or system integrator to supply longer fibre cables that may be necessary to allow the Alpha-Link units to be remotely located.

Each unit will require one or two fibre cable runs depending on the method of connection to the Blackrock. The diagrams opposite show the different connection arrangements.

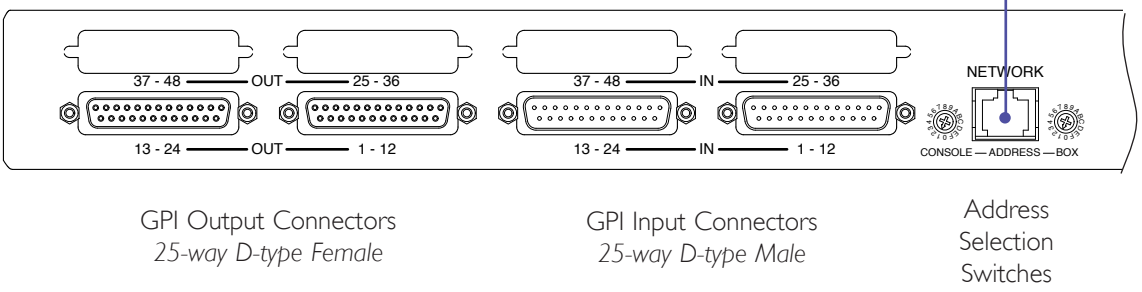
- When connecting to redundant Blackrock processors the main processor should be connected to input 'B' of each stagebox and the backup processor connected to input 'A'.
- Standard interface specification is: 50/125µm, multimode, duplex LC (at the Blackrock) to SC (at the stagebox).
- Singlemode versions of the stagebox MADI interface card can be specified at the time of order.
- It is recommended that spare cables are installed to remotely located units to allow for possible damage or future expansion.

Suitable ready made fibre cables are available from networking and computer supply outlets.

## GP IO Connections

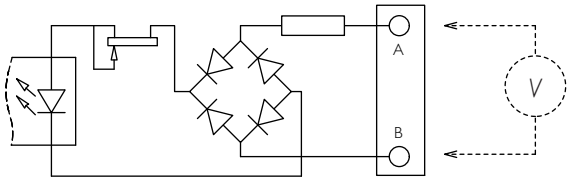



**GP I/O Box Rear Panel**

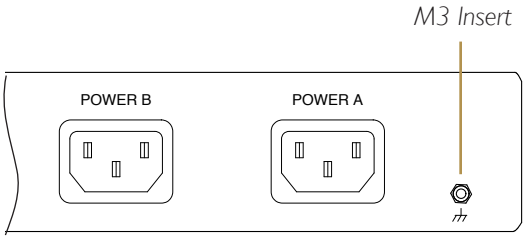



## GP Voltage Input Circuit

*GP Inputs are triggered by applying an AC or DC voltage of between 4V and 30V. The current drawn is approximately 10mA.*




## Chassis Ground Connection



# GP I/O – Console and Remote GP I/O Box

All GP IO circuits are fully isolated from the internal electronics – inputs are opto-isolated and outputs are via relay.

The input and output signals can be either latching or momentary; this parameter is individually assigned in software via the touch screen. When set to momentary the input signal trigger duration must be not less than 50mS.

*If used for discrete track arming with associated tally, the tally must return to the same number input as the arming output signal, (ie. the tally for GPI Out 1 will be on GPI In 1).*

### Outputs

All output switch closures from the console or the GP IO Box are via DIL relay. Do not use these outputs to directly switch capacitive or reactive loads; always use a separate external relay with suitable contact rating.

*DIL Relay Ratings:*

- *100V DC, 125V AC*
- *100mA max.*

### Inputs

The Inputs circuits are of the configuration shown opposite so an external voltage must be applied to trigger each input. A voltage suitable for the input trigger is available on the output connectors and a 0V reference is provided on the input connectors.

*Refer to page 6-13 for the connector pinouts.*

## Remote GPIO Box

### Network Connection

Installation simply requires that the unit be connected to the console's SSL Network using a standard Ethernet cable. Note that if a MORSE router is being used, or if multiple GP IO boxes are connected to the same console, then an Ethernet switch/hub will need to be included to provide the additional SSL network connections.

### Chassis Ground

The internal mains power supplies are of the fully isolated type. It is recommended that a separate earthed lead is attached to the rear of the chassis to ensure a permanent ground connection. An M3 threaded insert is provided on the rear panel for the ground lead.

### Address Selection Switches

The default '*BOX*' switch setting for the initial GP IO unit is '*1*'. If a second unit is connected to the same console network then the address switch of the second unit will need to be set to position '2' – and so on for each additional unit up to the maximum of 15.

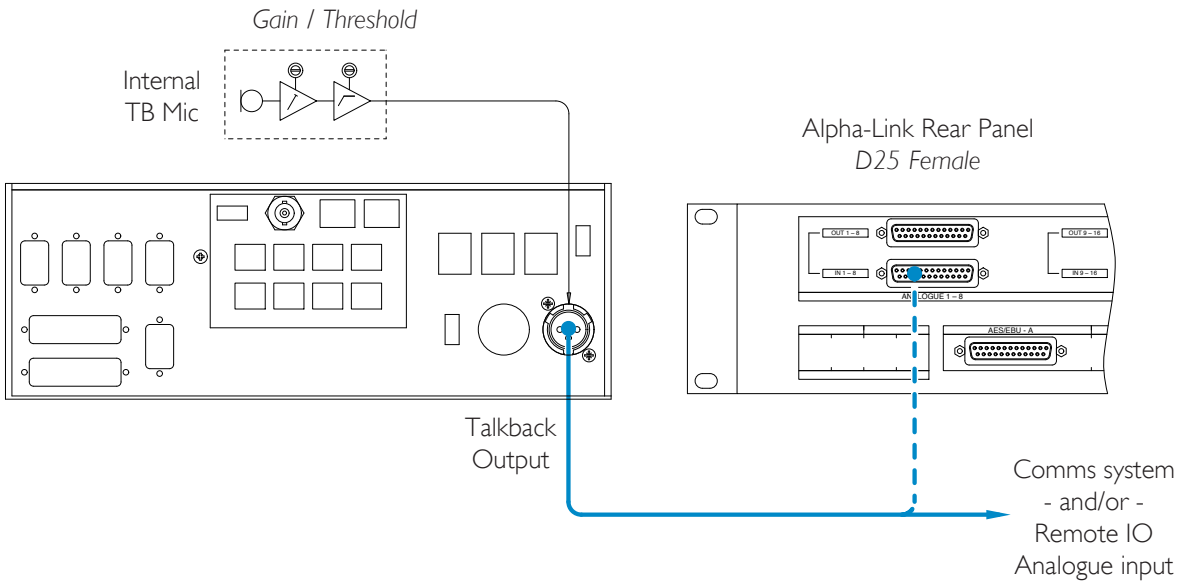
The '*CONSOLE*' switch will only require adjustment in installations where there will be more than one console connected to the same SSL network. The switch must be set to the same position as the console ID switch (located beneath the centre control tile) in order for the console to communicate with a GP IO box. The default setting of both ID switches is 1. Note that it is not possible for two consoles to share control of the same IO unit.

### Indicators

| STATUS LED | |
|---|---|
| *State* | *Indication* |
| Flashing quickly | Ethernet activity |
| Flashing slowly | Network not connected |

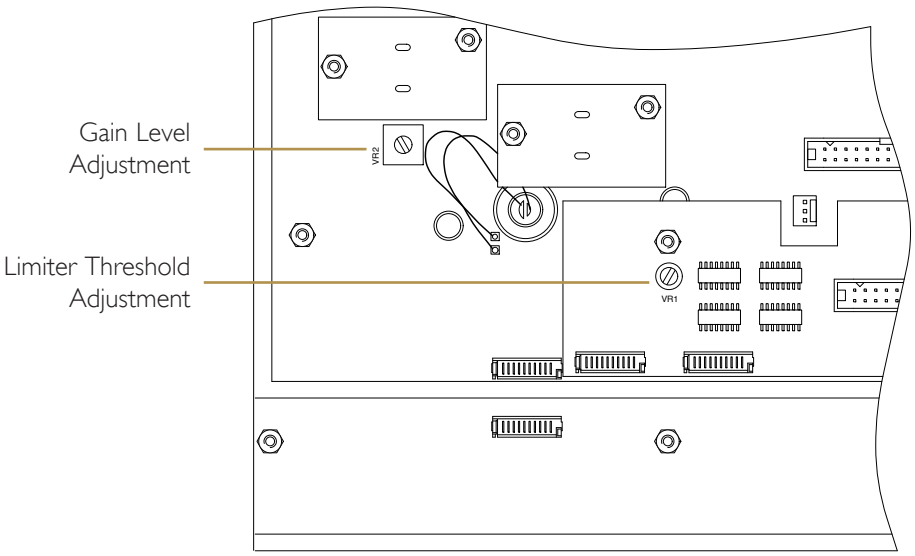
| POWER LED | |
|---|---|
| *State* | *Indication* |
| Steady illumination | Both PSUs powered |
| Flashing slowly | One PSU powered |

## Talkback System




## Talkback Level

**Rear of Centre Master Tile**



# TALKBACK

The C10 HD console contains an in-built talkback microphone and amplifier. The microphone is located next to the main monitor level pot on the centre-control tile. The output is balanced and at line level (approximately 0dB) and the circuit features an inbuilt compressor. *See following page for TB gain adjustment information.*

- The TB output signal is provided on an ***XLR 3-pin male*** connector fitted to the console connector panel.
- Install a single balanced audio cable between the Talkback Output XLR and the facility's comms system and/or an analogue input circuit on an I/O unit (RIO or Alpha-Link LIVE). The input circuit number chosen can then be assigned as the talkback source via the console touchscreen.

## TALKBACK LEVEL

The talkback microphone level is factory adjusted to provide an output level of approximately 0dBu during typical speech volume. The input gain of a comms system should be adjusted to match this level.

If adjustment of the TB output level is necessary then presets for microphone gain and limiter threshold are available on the rear of the master controls panel in the centre section.

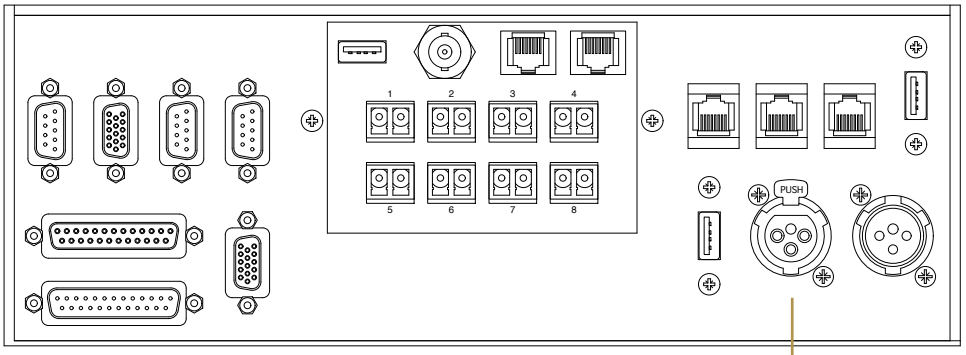
*Note that the compressor threshold may need to be increased – by turning preset VR1 clockwise – BEFORE attempting to increase the amplifier gain, VR2.*

# OSCILLATOR

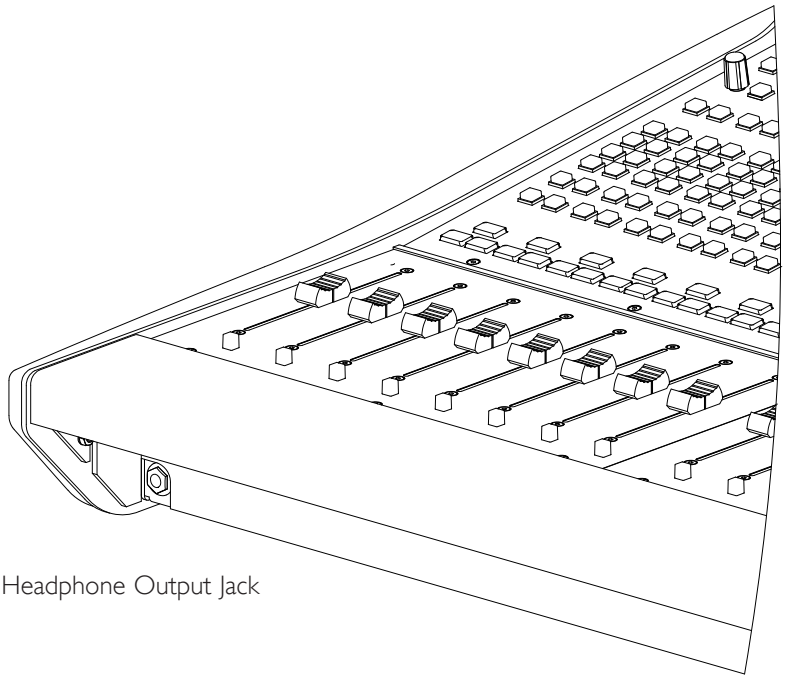
The C100 HDS provides an inbuilt software oscillator. The oscillator signal can be assigned to any console output without the need for external cabling.

Alternatively, external hardware oscillators (either analogue or digital, mono, stereo or 5.1) may be supplied. In this configuration one or more circuits should be allocated on the appropriate analogue or digital input connector; these signals can then be allocated as the oscillator inputs via the touchscreen.

## Headphone Connectors




XLR Headphone Input



Headphone Output Jack

# Headphone Input

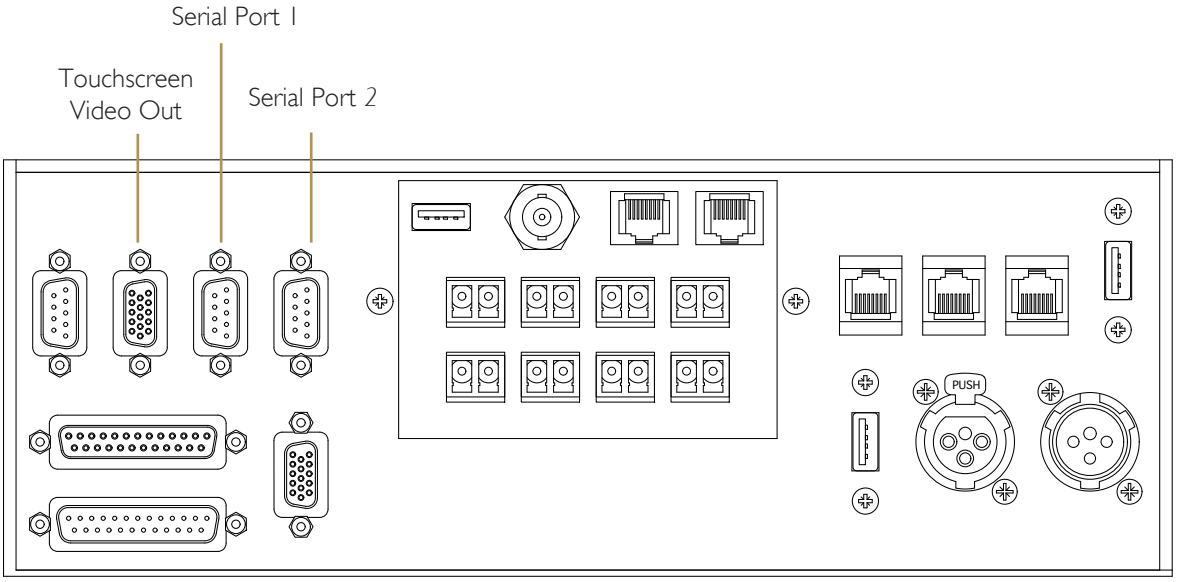
The console is fitted with a stereo 1/4" headphone jack socket beneath the front buffer at the left hand end of the console. This socket is internally wired to an XLR 3-pin socket fitted to the connector panel.

The headphone output is directly connected to the input. There is no internal amplification or level control.

*Page 6-9 for the connector pinouts.*

*It is the responsibility of the facility to ensure that all cabling necessary to make use of the headphone function is installed prior to the console being commissioned.*

### SERIAL PORT AND XGA OUTPUT CONNECTORS



## RS422 Serial Ports – Automation/Router Data

Two serial control services are available on C10 HD systems:

1. Router name transfer using the Probel PB08 protocol.
2. Remote control automation using the Sony ELC or Ross Overdrive protocols. *An license upgrade is required to activate the Automation feature.*

*Refer to Appendix G of the C10 Operators Manual for further details of the automation feature.*

It will be necessary to install appropriate cabling between the console and the remote equipment.

Two serial ports are located on the console main connector panel. Note that the console includes internal switching so that the serial ports will automatically become redundant on systems that feature dual Blackrock processors.

Either serial service can be assigned to the serial connectors. The port allocations are stored in system text files which can entered via the touchscreen terminal.

| **Serial Port File Allocation** | |
|---|---|
| *Physical Port* | *Software Identification* |
| Console Serial Port 1 | 12 |
| Console Serial Port 2 | 13 |

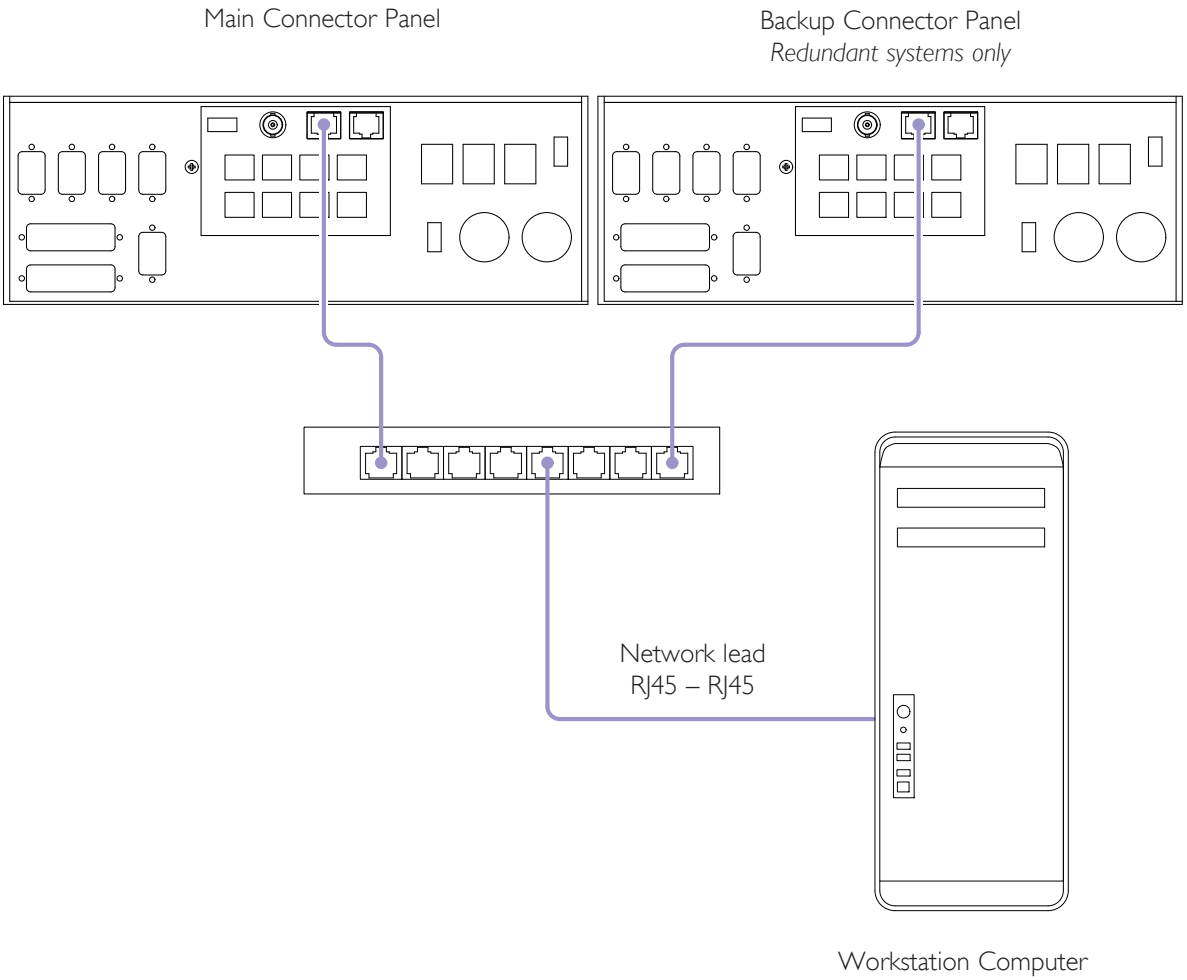
## Touchscreen Video Output

A duplicate of the centre section touch-screen image is available on an XGA connector beneath the console. The connector is located on the additional connector panel; pinout follows standard HD-15 VGA.

Please note that the image output is in ***portrait*** orientation, not landscape, so an external monitor will need to be able to rotate by 90°.

Image resolution is 1024 x 768 @ 60Hz,

## IPMIDI DAW CONNECTION



# ipMIDI

The C10 HD console is able to communicate with a DAW directly via Ethernet.

To use the interface a third party ipMIDI software driver will need to be installed on the DAW computer. Using this method of communication allows the C10 HD to be used with a wide variety of DAW applications on a number of different platforms. The C10 HD uses a 'HUI' compatible protocol.

Please refer to your DAW manual for details on how to configure the DAW application for C10 HD under HUI control.

### Installing The ipMIDI Driver

Download to your workstation computer either the *IP_MIDI_MAC* disk image (Macintosh) or the *IP_MIDI_PC* file (Windows). These folders contain the latest version of the ipMIDI applications and include installation instructions.

The files are downloadable form the SSL website using the following URL:

http://www.solid-state-logic.com/support/Consoles/C%20Series/downloads.asp

### Network Connection

The console features a dedicated ipMIDI connector for linking to DAW controllers as shown opposite. Connect this port directly to your workstation computer's Ethernet connector using a standard Ethernet lead. (If using a PC, it may be necessary for the Ethernet lead to be of the 'crossover' type).

> *The ipMIDI data may also be connected to the workstation computer via a local network. Note however that ipMIDI implementation uses is a multicast UDP protocol which can increase the network traffic. On larger systems it may be of advantage to configure the facility's network routers to block the ipMIDI data from destinations other than the DAW computer. The ipMIDI multicast group adderss is 255.0.0.37.*

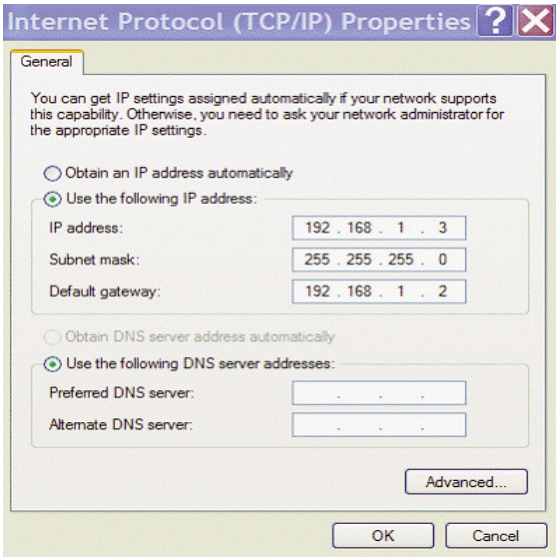
### Configuration – PC

After downloading the ipMIDI files from the link shown above, run the '`setupipmidi_1.x.exe`' application (note that the revision number will depend on the version you are installing) by double clicking on it. You will have to restart the computer at the end of the setup process. Once the computer has restarted, right click on the 'ipMIDI' icon in the task bar and set the number of MIDI ports to 12 in the resulting pop-up.

> If you are upgrading an older copy of ipMIDI it will be necessary to uninstall the previous version (using Add/Remove programs) before running the installer.

The IP address of the console's ipMIDI port is **192.168.1.2.** This is a static address and cannot be altered.

Enter this number into the '*Default gateway*' field of the TCP/IP Properties window.



### Configuration – Mac

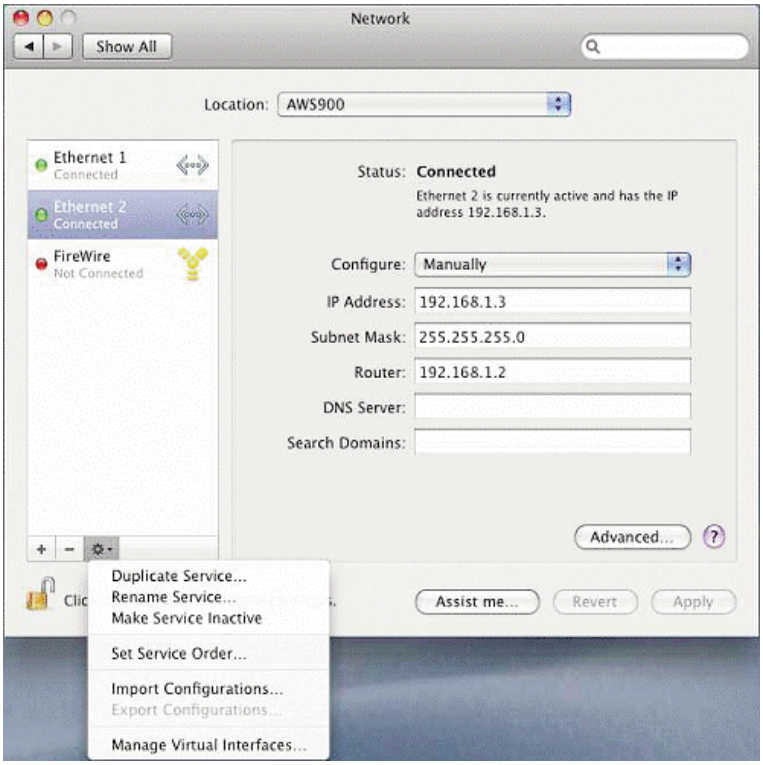
After downloading the ipMIDI files from the link shown previously, double click on the `ipMIDI.pkg` file to run the installation program – note that you will be asked to log out and in again once the installation has completed .

Once you have logged back in, open `Audio MIDI Setup` and double click on the ipMIDI icon. Set the number of MIDI ports to 12 in the resulting pop-up.

*If you are upgrading an older copy of ipMIDI you must uninstall it before running the installer. To uninstall ipMIDI simply delete:* `</Library/Audio/MIDI Drivers/ipMIDIDriver.bundle>`*. You should empty the Trash after deleting the .bundle file before running the installer.*

The IP address of the console's ipMIDI port is **192.168.1.2.** This is a static address and cannot be altered.

Enter this number into the '*Router*' field of the Ethernet Network window.



## Notes

- **File Transfer and Backup**
- **A: I/O Configuration**
- **B: Console Configuration**

# SECTION 4:

# CONFIGURATION

## IN THIS SECTION ...

… you will be guided through all of the initial system configuration tasks which are needed in order to complete the console's commissioning. It is important that everything described in the Installation Section has been completed.

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# Section Contents

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# CONFIGURATION

## INTRODUCTION

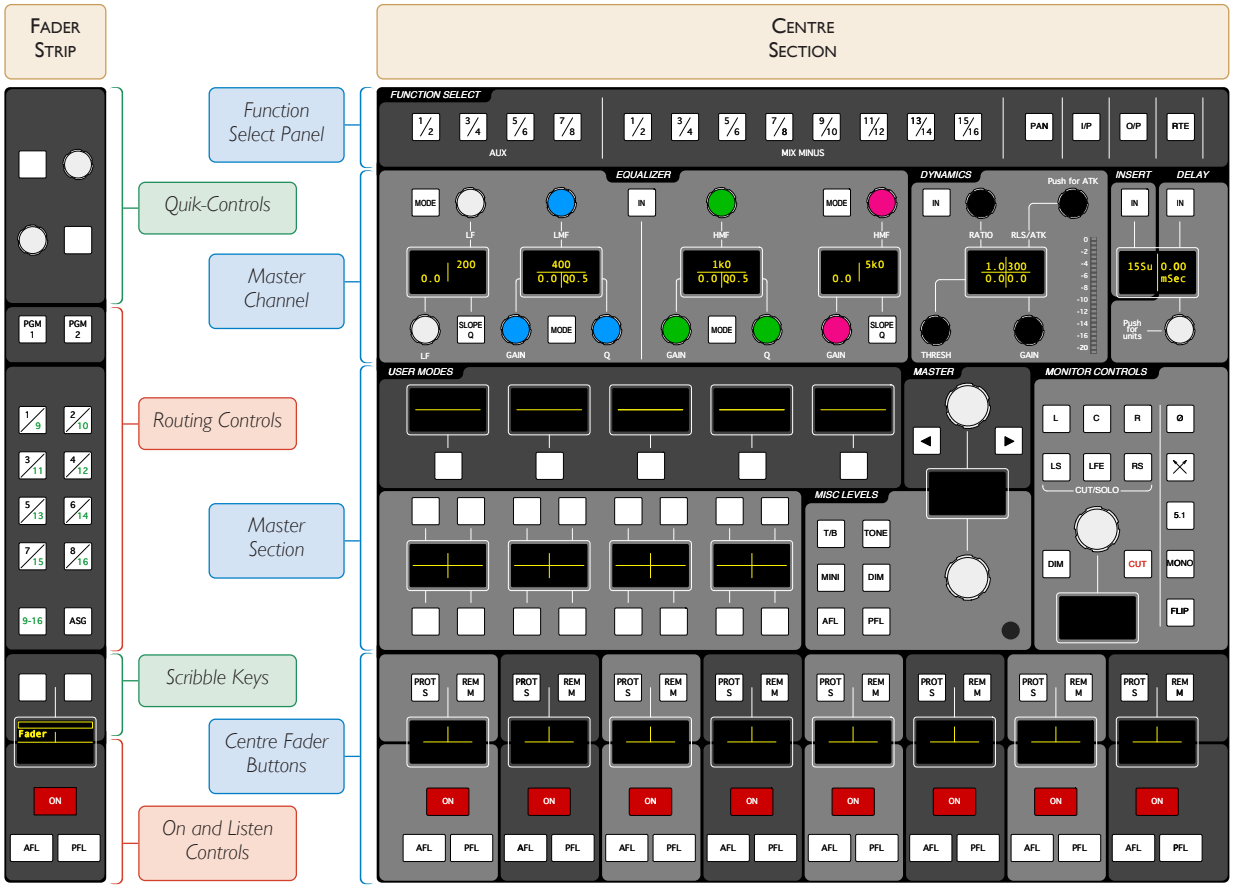
This section provides system administrators with step-by-step guides for the basic configuration of the C10HD. The procedures described here presume Administrator-level access to the console, and should not be attempted until the procedures in the Installation Guide have been completed.

Before beginning the software confirguation of the control surface please ensure that the networked PC is available and can be used for file backup – refer to the following section '*File transfer and Backup*'.

Part A then guides you through the console's IO configuration – naming, grouping and routing the IO, and creating Quickroute lists. Part B describes the initial configuration of the Control Surface, especially regarding Preset-level access.

> *More detailed configuration of the console is described in Section 5 of this manual.*

The illustration below shows the layout of the console and the names used to describe each area:




The screens above the fader strips are referred to as Channel Information Displays, and the touchscreen above the Centre Section is simply referred to as the Touchscreen.

# File Transfer and Backup

An essential part of system mainteneance is carrying out the process of file and data backup. It is for this reason that a networked PC must be available for the storage of backup filesa and user projects.

C10 supports standard network protocols to communicate with a remote PC via a TCP/IP connection.

Shared folders on the C10 system disk can be mounted on the remote PC using the Windows SMB/CIFS protocol and the C10 Diagnostic terminal can be opened using a SSH (secure shell) client such as PuTTY.

For information regarding connecting the console to an external computer, please see Sections 2-11 and 3-5.

## IP Address and Names

The default IP Address of a C10 as shipped direct from the SSL factory is **`192.168.1.2.`** It is likely that this address will have been changed by the IT administrator or the commissioning engineer so will no longer be appropriate. Secondly, if the server has been set to obtain an IP address using DHCP then the console's address will no longer be a constant value.

The simplest method of reliably logging in to the server, either from the terminal or to access the Samba shared folders, is if the SBC server has been assigned a suitable **`hostname`**. This name can then be entered in place of the IP address whenever you wish to connect with the server.

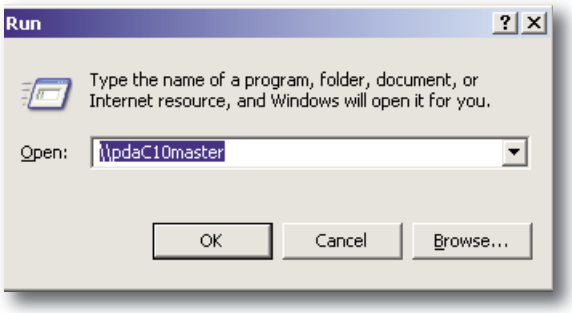
Refer to section 3-9 for setup information relating to *hostname* and other network settings

It will be seen in the following examples that the SBC servers used to provide the images have been assigned the hostnames '*pdaC10master*' and '*pebble*'.

## Accessing C10 Shared Folders

➤ Click on the *'Run…'* icon in the Windows Start menu list

➤ In the 'Run' box, type '`\\<hostname> <CR>`'

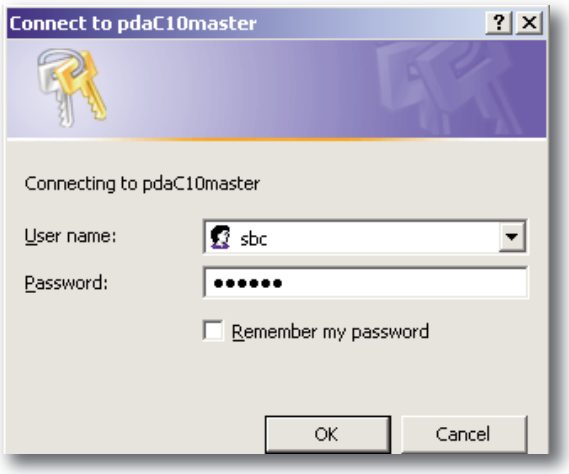



'`\\`' *indicates that we wish to mount a shared file*

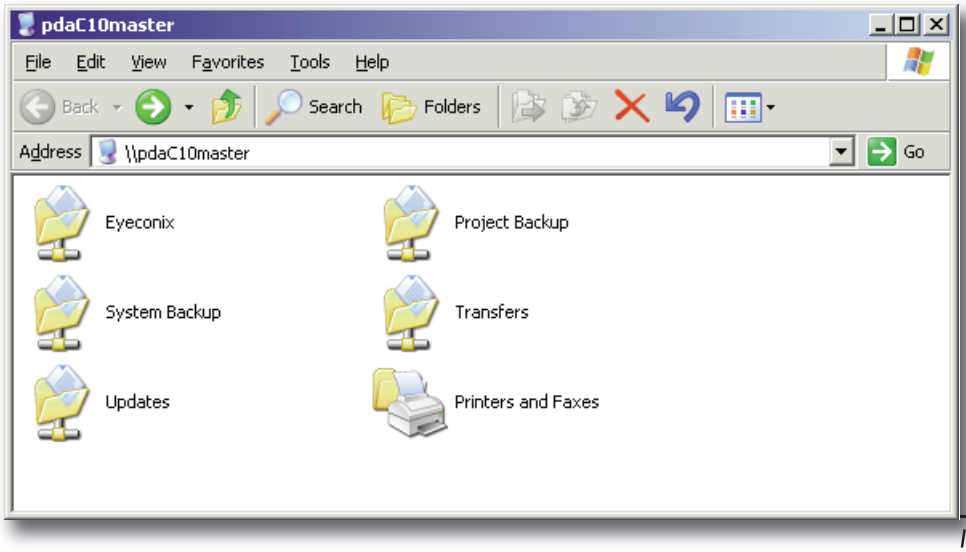
'`<hostname>`' *is the name of the C10 SBC server – 'pdaC10master' in this case (or the IP address if known).*

`<CR>` *indicates the 'Return' key on the computer keyboard.*

➤ In the connect window, login as '`sbc`' followed by the system password. The default password is '`sbc123`'.




This will result in a view of the shared folders on the C10 system, similar to that shown below:




*Ignore the Printers and Faxes Folder, it may or may not be visible.*

## System Backup

It is strongly advised that the C10 system disk is backed up regularly via the externally connected PC.

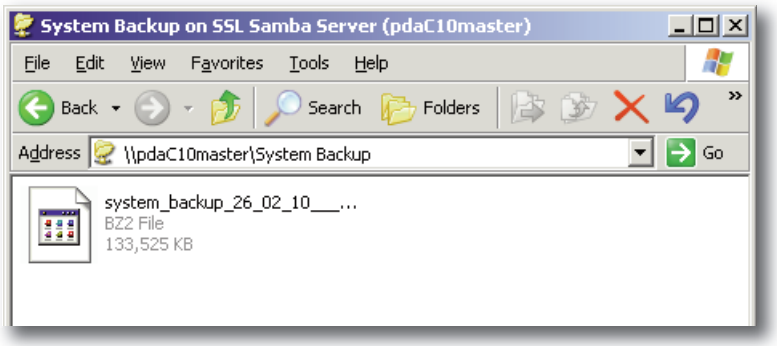
Backups have to be initiated from the terminal login so the SSH terminal client will be required (eg. '*PuTTY*' for PC users or '*Terminal*' for Mac OSX).

➤ [PC] Open the SSH application on the networked PC and login to the C10 system; the username is '`sbc`' and the password is '`server`'.

➤ [Mac] Open the 'Terminal' application and enter:

'`ssh sbc@<hostname>`' `<CR>` *and then enter the password '*`server`*'. '*`<hostname>`*' can be either the name or the IP address of the server.*

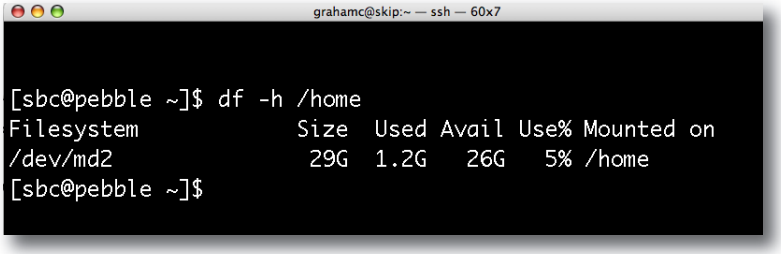
The compressed back-up files will be stored in the shared 'System Backup' folder.




➤ To check that there is sufficient space for the backup type the following command line:

'`df -h /home`' `<CR>`

*If the percentage used is greater than 90%, move an existing back up out of the System Backup folder to a local drive on the PC or to any mounted removable or networked storage.*




➤ To create the new backup type:

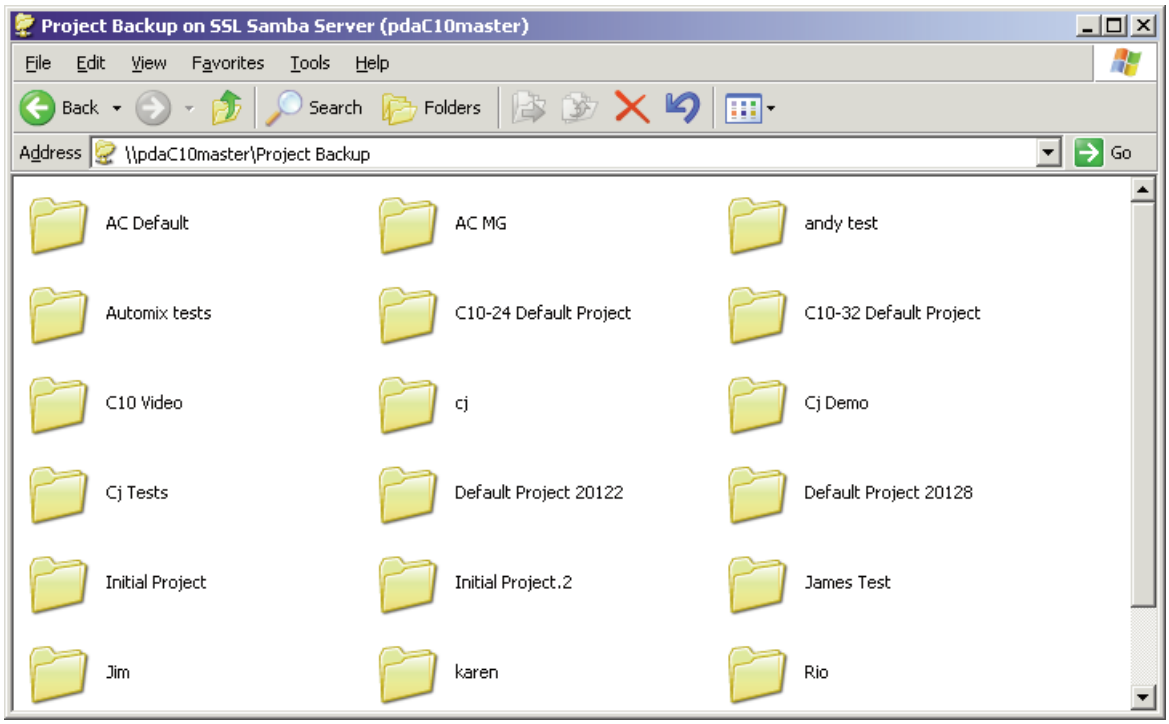
'`backup_system_disk`' `<CR>`

This will create a time and date stamped backup file in the system_backup folder.

*The backup process copies the entire C10 System Disk and so will take a considerable time (**~20 min**) to complete. It is of course recommended that any backups created are also stored off-line elsewhere by copying via the PC to an external removable storage device or to a designated networked drive.*

## Project Backup

Projects backed-up via the Copy button in the Project menu will be located in the Project Backup folder and can then be archived to the local PC disk, a removable storage device such as a USB memory stick, or to networked storage.




## Transfers

The Transfers folder is a bridge between the C10 system File system and an external PC. The Transfer Folder is visible in the Copy menu available from the STUDIO File Menu commands detailed later in this section and any files copied to that directory can then be transferred to a folder on the local PC or archived as required. Files edited on the PC can, in turn, be placed in the Transfers folder and then copied back into the C10 system folder. The Transfers folder provides a simple mechanism for transferring diagnostic logs and text based configuration files, such as the lists that define the C10 Free Controls, GPIO functions and DAW control menus, so that they can be edited on a PC.

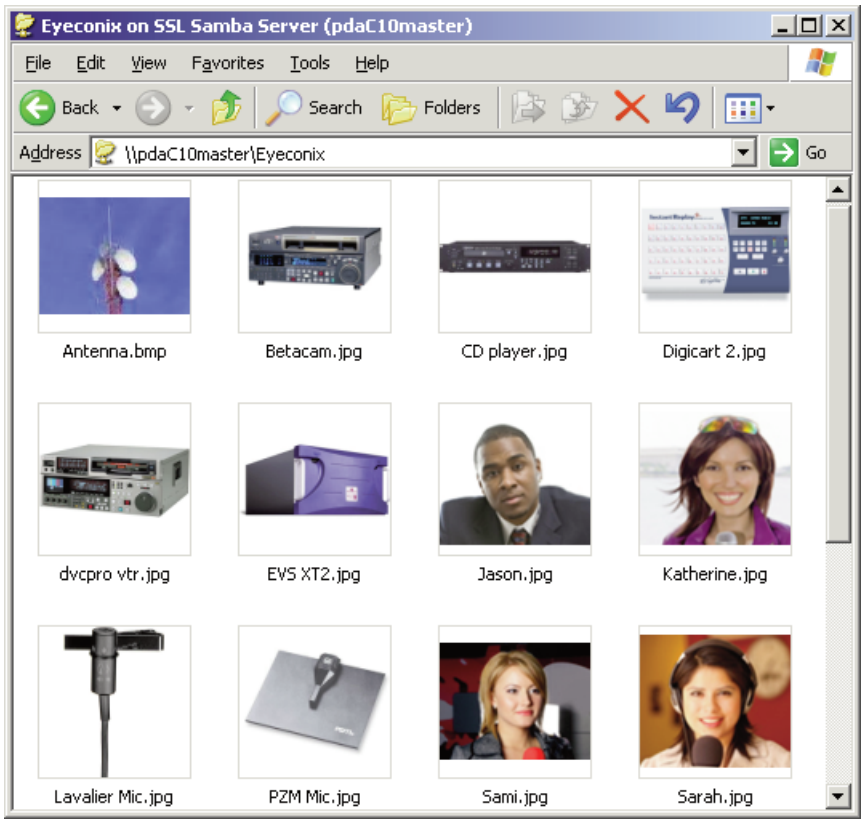
## EYECONIX

The Graphic Images used as C10 Eyeconix Channel Labels are stored in this folder.

To add images, simply copy or paste them into the folder and they will then automatically appear in the console LOAD EYECON popup; see the Operator's Reference Manual for additional information.

### IMAGE SPECIFICATIONS

Images can be either .bmp or .jpg format and should have a colour depth of 24 bits (which is the default setting on most graphics programmes) File names can be a maximum of eleven characters. Although images will be automatically re-sized, for best results you should prepare the images such that they have a width of 109 pixels and a height of 83 pixels.




## UPDATES

C10 software update files are placed in this folder. Full details are provided in the install notes that accompany a C10 software update.

# A: IO Configuration

## Step A1: Check Connections.

Ensure that the system is connected and powered according to the Installation section and any additional facility-specific interconnection drawings.

## Step A2: Startup Console and Login.

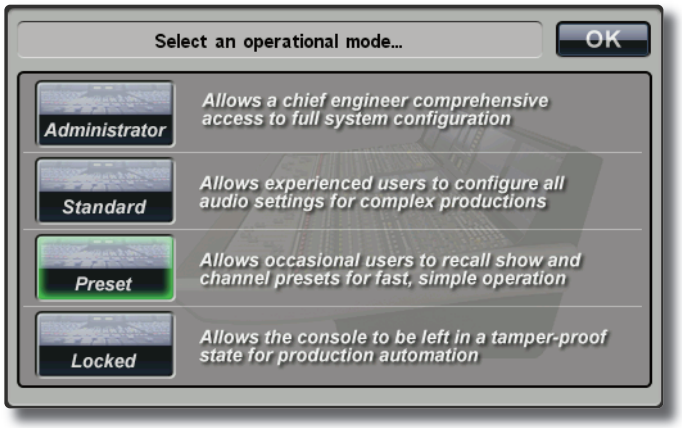
➤ Power up the console.

Once the console has fully booted, log in as Administrator:

➤ Touch the padlock button towards the bottom right-hand corner of the Touchscreen:


*Project Information Strip*

This will activate the login display:




➤ Touch **Administrator**, enter the Administrator password in the keyboard which appears, and touch **OK**.

*The Administrator password is initially simply set to 'A'. For details regarding changing the user-level passwords, see Tutorial B.*

## STEP A3: ENTER THE ROUTING CONFIGURATION PAGES.

*On systems with a redundant core, note that whenever system settings are changed, a flashing Press to Synchronise icon will appear in the bottom right-hand corner of the screen. You do not need to synchronise the redundant system until you have completed all of your configuration and are ready to exit the Maintenance pages.*

➤ Press the **MENU** ( Menu ) button towards the right-hand end of the Project Information Strip at the base of the Touchscreen:


*Project Information Strip*

➤ Press the **STUDIO** ( Studio ) button, located towards the right-hand end of the User Toolbox which appears:

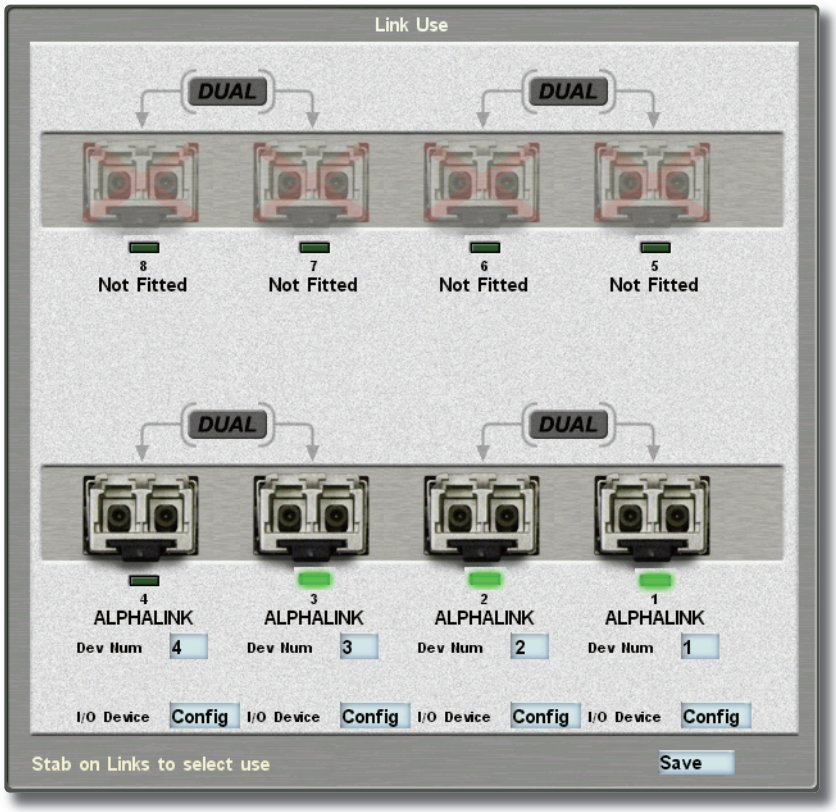

*User Toolbox*

➤ Touch the **ROUTE** ( Route ) button which now appears at the bottom of the screen.


*Maintenance Menus*

## STEP A4: CONFIGURE MADI CONNECTIONS.

➤ Touch the **IO Links** button to open the **Link Use** display, which is used to determine how external IO is linked to the console.




The pop-up shows graphical representation of the eight possible MADI links to the console processor. Those which are not fitted are greyed out and crossed out in red, as shown for Links 5 to 8 above.

➤ Stab on the MADI socket to which the Alpha-Link is attached. The **Select Link Use** pop-up will appear, from which that IO link's connection can be defined.


➤ Stab the IO format for the link (e.g. **AlphaLink**). The pop-up will close automatically.

➤ Repeat this process for all MADI links which are being used.

Below each connection in the **Link Use** display, there is a 'light' which is lit green to indicate that the link is working, a link number and format, and any link-specific details.

➤ Alpha-Link modules display a single blue box which defines the address for the IO included in them. Stabbing on the box brings up a calculator pop-up on which the address can be defined.

*Note that each device needs to have a unique device number.*

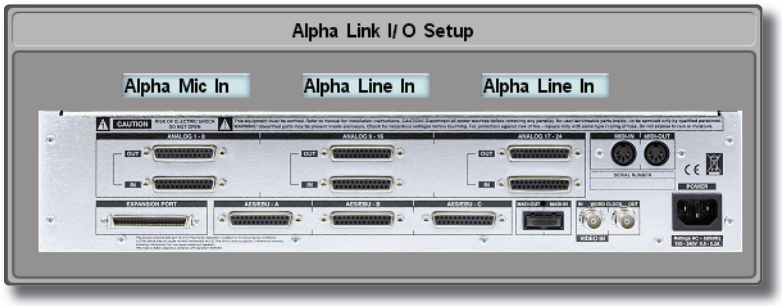
Links to other **MADI** units display the IO channels currently assigned to that link – these are automatically assigned by the console.

*Note that on a redundant system, the processors have to be configured independently and must be identical. If the **IO Links** page is incorrectly configured on one processor, the redundancy indicator at the top of the Touchscreen will still display **Sync OK**.*

➤ When using redundant fibre Links to an Alpha-Link LIVE-R the MADI ports will need to be configured as redundant pairs by stabbing the **Dual** button. See Section 5-35 for additional details.

### Alpha-Link Configuration

➤ Stabbing on the **Config** button for an Alpha-Link module brings up the **Alpha-Link I/O Setup** display, in which each input to the 8-RMP unit can be selected:



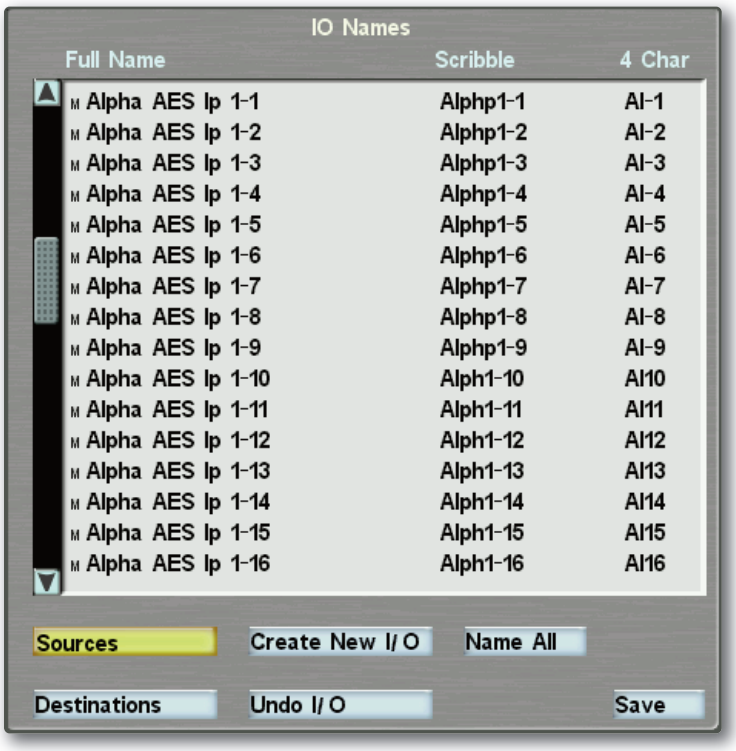

➤ Touch each blue box to switch between **Alpha Line In** and **Alpha Mic In**, then touch outside the display to close it.

➤ Touch the **Save** button in the **Link Use** display before touching outside of the display to close it.

*If you are configuring links to MORSE stageboxes or B-RIO units, please refer to the Operator's Manual Section 7 for additional details.*

## STEP A5: NAME AND BUNDLE THE IO.

➤ Touch the **Names** button to open the **IO Names** display, which is used to name physical inputs and outputs, and create suitable multichannel 'bundles'. It has two pages: **Sources** and **Destinations**:




Initially, sources are listed with default names. These names are constructed as follows:

- The IO type is displayed first, with sources from an Alpha-Link prefixed **Alpha**. IO type labels include the following:

| **IO Type** | **Label** |
|---|---|
| AES input | AES |
| Mic card | Mic |
| Line in on Alpha-Link or DHD Stagebox IO card | Line |
| Line in on DHD Stagebox Line In card | 5260 |
| Line in on B-RIO card | ADC |
| DHD Stagebox SDI card | Embed |

- Signals to/from cards which include both inputs and outputs then display input (**Ip** or **In**) or output (**Op** or **Out**)
- Signals to/from B-RIO racks and DHD stageboxes are appended with their module number (as defined in the **Link Use** display – See Step A4) hyphenated with the individual signal number.

For example, the fourth mic input on the second Alpha-Link will be listed as **Alpha Mic IP 2-4**.

Other MADI IO is named **Local MADI** followed by the channel number, which is set by the console according to the MADI link being used (See Section 7).

Input and output signals are configured separately.

➤ Touch **Sources** to bundle and name inputs, or touch **Destinations** to bundle and name outputs.

### GROUPING MULTI-CHANNEL COMPONENTS:

You may bundle sources together to allow a neater arrangement of associated channels:

➤ Touch **Create New I/O** and a pop-up appears:


➤ Select the box next to the **Name** legend and enter a suitable title for the bundle.

➤ Press the box next to the **Format** legend and choose from **MONO**, **STEREO** or **5.1** – this will set the number of sources you can choose under the **Components** legend.

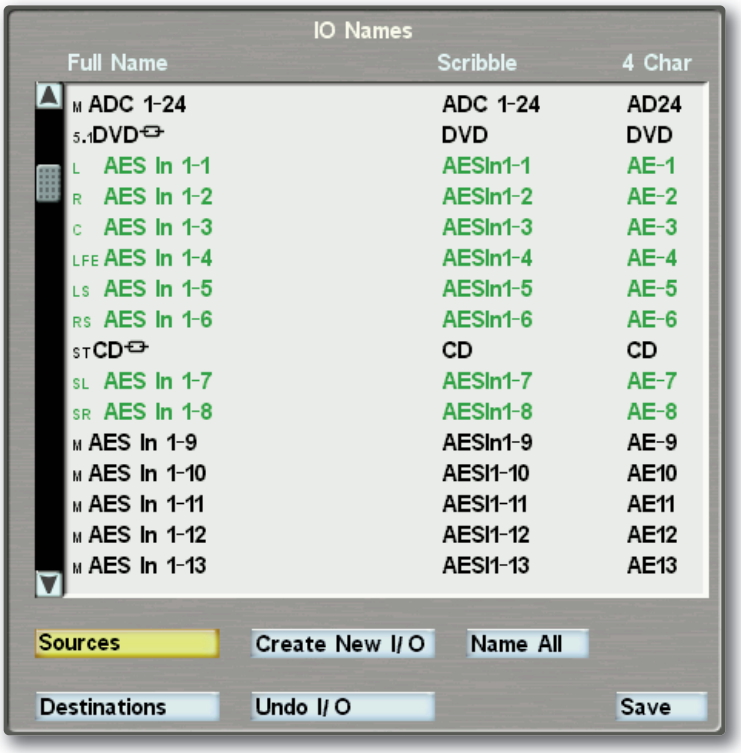
➤ Simply press each component in turn and choose the appropriate physical input according to your wiring.

Note that the name of the bundle is prefixed with **M** for mono, **ST** for stereo and **5.1** for (you guessed it) 5.1, and the components are prefixed with **SL** for stereo left and **SR** for stereo right, or **L** for 5.1 left, **R** for 5.1 right, **C** for 5.1 centre, **LFE** for 5.1 LFE, **LS** for 5.1 left surround and **RS** for 5.1 right surround. Component signals retain their physical connection name (**AES In 1-1** etc.), so that troubleshooting or physical overpatching may be performed easily in the future.

➤ Press **Ok** to make this new bundle (note that any customised component names are erased when you do this) or touch **Quit** to cancel.

➤ To dissolve an I/O bundle, touch the **IO Names** / **Undo I/O** box and then the list item you wish to remove – all the components will become individual again.

Components are displayed in green in the **Names** list underneath their bundle name. In the example below, AES digital inputs 1-1 to 1-6 are fed from a DVD player, so they have been made into a 5.1 source called **DVD**:




### CUSTOMISING IO NAMES:

When you are sure of a signal's connection to the outside world, you may give it a more obvious name (eg. **Mic A-1**, **Tie Line 4**, **CD**).

> *MORSE router Sources and Destinations will appear in the list in blue, indicating that it is not possible to rename these signals from the console.*

➤ Touch an entry in the **Full Name** list, enter a new name in the QWERTY pop-up which appears, and press **OK**.

With the **Name All** box lit, renaming one input will automatically add the numeral 1 to the given name and simultaneously rename all subsequent inputs of that type with incrementing numbers.

The **Scribble** column shows how the name will appear in the 8-character scribble strip displays on the console and the **4 Char** column shows how the names will appear in the 4-character Master Channel displays – both are automatically derived from the **Full Name** column, but these may individually be edited for better clarity and less ambiguity if required.

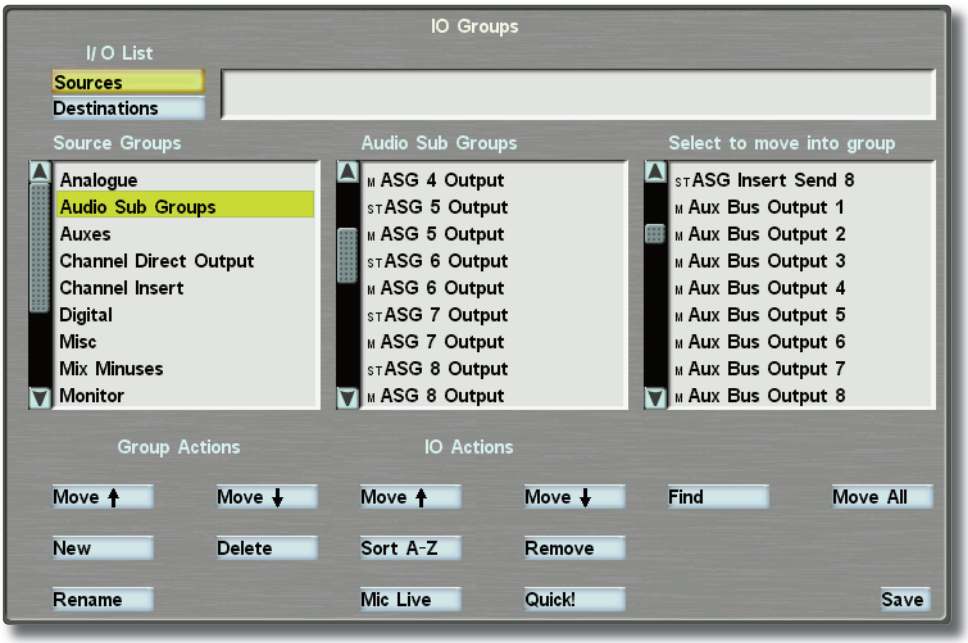
> *Note that renaming the **Full Name** will result in both shortened versions being renamed. It is therefore important to settle on the **Full Name** before editing the shortened versions.*

➤ When you've finished modifying items in the **Sources** or **Destinations** list, make sure you select the **Save** box before repeating the process for the other list. When both lists are configured, touch anywhere outside the display to close it.

## STEP A6: GROUP THE IO

➤ Touch the **Groups** button to open the **IO Groups** display, which is used to arrange inputs and outputs into user-friendly Groups – these are the groups seen within the console routing system so clarity and logical arrangement will definitely help you when routing. The console has number of pre-configured groups, many of which are inherent to the console's structure, such as **Audio Sub Groups**. Custom groups can be created for any grouping that suits your operational context, such as Digital, Analogue, Mics, Studio Floor etc.

The pop-up has two pages, **Sources** and **Destinations**, each of which has three scroll windows:




➤ Touch **Sources** to group inputs, or touch **Destinations** to group outputs. While the following description describes **Sources** grouping, the **Destinations** page works in precisely the same way.

When the **Sources** button (upper left) is selected, the right-hand window shows all of the sources in one long list, ready to be subdivided by signal type into the **Source Groups** shown in the left hand list. The middle window lists those sources already placed into whichever source group is currently selected (in the example shown above, **DVD**, **CD**, **AES In 1-9** to **1-15** are already placed in the **Digital** source group).

> *If your console is connected to a MORSE router, any IO sourced via that router will be coloured blue to distinguish it from other IO. See the MORSE supplement in Appendix B of this manual for more details.*

➤ For each new group to be created, touch **New**, enter the name for the new group in the pop-up which appears, and press **OK**. Group **Delete** and **Rename** functions are also available.

To add signals to a group:

➤ Select the group in the left-hand column.

➤ Scroll the right-hand list to display a signal to be included, then touch that signal. It will appear in the centre column.

➤ To find specific sources within the list, touch **Find**, type a keyword into the pop-up which appears and press enter. This will filter the right-hand source list to simplify finding a particular source,

➤ To move all similarly named sources into the current source group, select one of the sources, then touch **Move All**.

It is recommended that you rename and reorder both the list of **Source Groups** and the signals within each group to put the most important and frequently accessed signals at the top:

➤ Select a source group or a source within a group, then use the two **Move** boxes under that list to move it through the list. Alternatively, sources within a group can be re-arranged using the **Sort A-Z** and **Move** boxes under the **IO Actions** menu, or removed from the group to allow it to be placed somewhere else using the **Remove** box.

The **Mic Live** box toggles a logic flag for the selected source within the middle list, allowing it to put the console in 'On Air' mode whenever it is live to either of the Programme outputs. This can be applied to analogue line and digital inputs as well as true mic inputs, and is shown by a small mic icon to the right of the source name (not seen in this screenshot).

➤ When you've finished grouping the **Sources** or **Destinations** list, make sure you select the **Save** box before repeating the process for the other list. When both lists are configured, touch anywhere outside the display to close it.

> *Note that all the options work in the same way as for the Sources page, except for Mic Live, which has no function when dealing with destinations*

## STEP A7: SELECT SIGNALS FOR THE QUICK-ROUTING FUNCTION.

The **IO Groups** display is also used to configure the Quick-Routing lists which will be used by Preset-level users both for selecting input channel sources and for selecting sources and destinations within the **ROUTING** panel in the top right-hand corner of the Touchscreen.

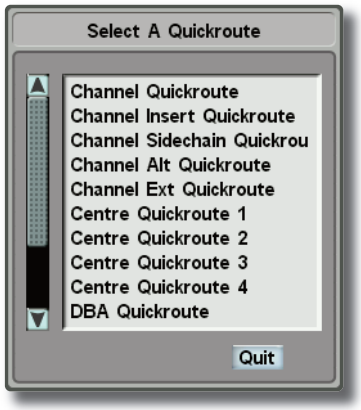
To select a Source for a Quickroute list:

➤ Ensure that the **IO Groups** display is displaying **Sources**.

➤ Select a Source which is to be added to a Quickroute list.

➤ Press the **Quickroute** button, located under the **Remove** button in the **IO Groups** display, and the Quickroute pop-up will appear:

*Note that multiple sources can be selected before pressing **Quickroute**.*




➤ Touch Quickroute list to which the Source is to be added; the pop-up closes automatically.

➤ Select a new Source and repeat the process.

A pointing hand appears next to signals to indicate that they have been directed to a Quickroute list.

➤ To select a Destination for the Centre Section **ROUTING** panel, touch the **Destinations** box in the top-left of the **IO Groups** display. Destinations are then selected in exactly the same way as Sources.

➤ Remember to press **Save** in the **IO Groups** display after configuring the Quickroute lists.

➤ Press the console (  ) button in the lower right-hand corner of the Touchscreen to exit the console's configuration pages.

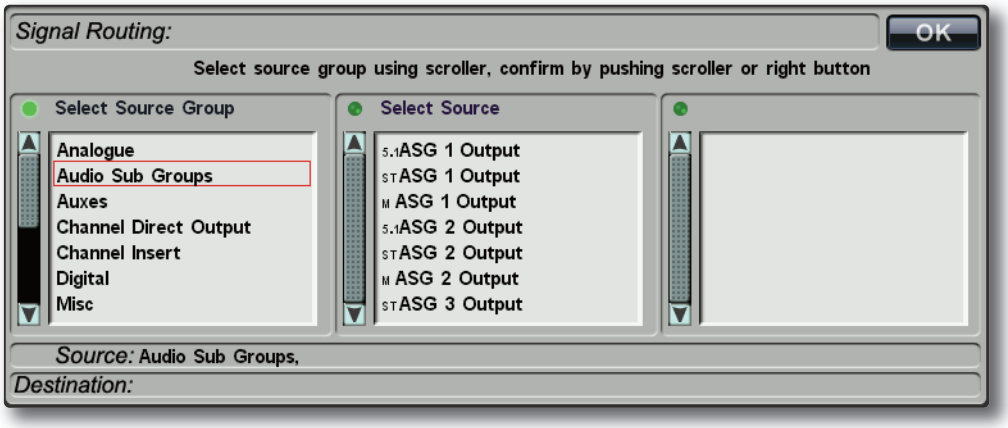
## STEP A8: ASSIGN FIXED ROUTING.

All fixed installation routing, such as monitor and meter outputs, can be set up using the consoles main routing procedure:

➤ Touch the **MENU** ( Menu ) button, located towards the right-hand end of the Project Information Strip near the bottom of the Touchscreen, followed by the **MISC** ( Misc ) button in the User Toolbox which appears:

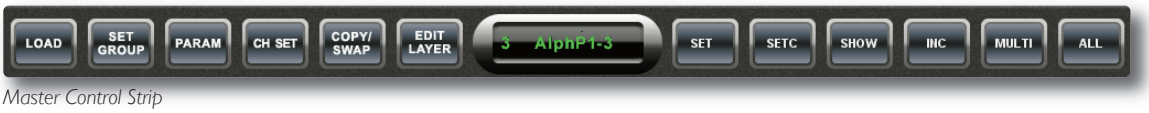

*User Toolbox*

➤ In the sub-menu that appears, touch the **ROUTE** ( Route ) button to open the **Signal Routing** display in the lower left-hand corner of the Touchscreen:




In addition, the right-hand side of the Master Control Strip will display **SET**, **SETC**, **SHOW**, **INC**, **MULTI**, and **ALL** buttons.

> *Note that, while on this occasion these buttons are activated using the **ROUTE** button, functions are normally assigned to these buttons using the buttons in the left-hand side of the Master Control Strip.*




*Master Control Strip*

Routing operations follow a logical 'source to destination' sequence of steps and, to aid in this, the lists display any current source and destination assignments.


*Master Scroller*

The display is navigated using Centre Section ***MASTER*** Scroller and associated left and right buttons. The Scroller's cursor is indicated by a red surround on the currently selected entry, and each selection turns yellow when it is confirmed.

The Scroller's left button can be used to deselect the current selection and move the cursor back through the left-hand lists.

> *Note that at each stage of the routing process, helpful guidance is shown across the top of the display.*

The majority of the sources and destinations require no explanation, though the following clarifications may be helpful:

- PGM monitor signals (and their downmixes) are taken pre-tone, pre-talkback.
- PGM and ASG 'bus' (as opposed to 'output') signals provide a raw, pre-processing feed from the bus.

➤ Turn the Scroller to select the required entry in the Source Group list and press the Scroller (or the its right button) to confirm the Source Group selection. The cursor will move to the Source list for that Source Group.

➤ Turn the Scroller to select the required Source within the Source Group list and press the Scroller to confirm the Source selection.

➤ Press the Scroller's right button to move to the next list.

The next list displays **<New Destination>**, along with any currently assigned destinations.

➤ Select **<New Destination>** and press the Scroller. **<New Destination>** will turn yellow and the cursor will move to the Destination Group list.

➤ Turn the Scroller to select the required entry in the Destination Group list and press the Scroller to confirm the Destination Group selection. The cursor will move to the Destination list.

➤ Turn the Scroller to select the required Destination within the Destination Group list and press the Scroller to confirm the Destination selection.

➤ Confirm the new route, by pressing the **SET** button.

*Routing operations are described in more detail in the Operator's Manual.*

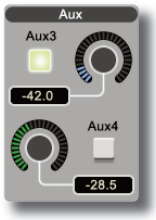
## STEP A9: CHECK THE NEW IO CONFIGURATION.

We will now run through the basic channel routing and monitoring operations necessary to confirm that the sources are correctly configured. It will help if you can use a source which is generating a signal that can be auditioned!

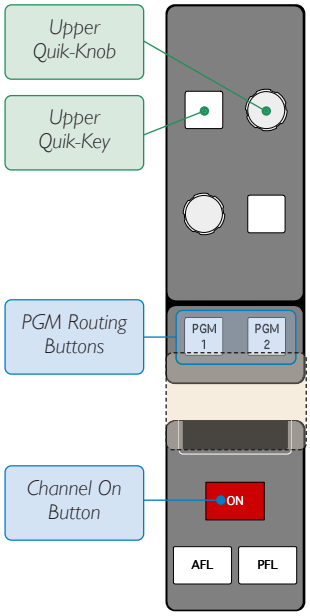
### ASSIGNING INPUT SOURCES TO CHANNELS:

➤ Assign the input routing function to the channel softkeys by pressing the **RTE** button at the right-hand end of the ***FUNCTION SELECT*** panel. The Input and Insert lists will appear in the bottom of the Channel Information Display.


*Function Select panel*




➤ Using the Upper Quik-Knob in any channel, move through the list of available inputs as (indicated by the source names in the black box to the right of the Take button) and press the button to its right to 'Take' the input signal (in other words, to assign the selected input to the channel). If the channel was unformatted, it will now automatically take on the format (mono, stereo or 5.1) of the input signal.

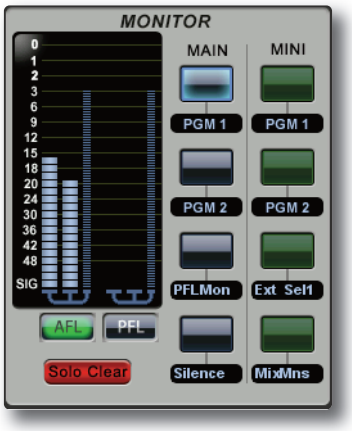



### ROUTING THE CHANNEL TO THE PROGRAMME BUS:

➤ Lift the channel fader, and ensure that the channel is 'on', as indicated by the **ON** button above the fader being lit, and by the presence of the moving meters in the Channel Information Display above the fader strip.

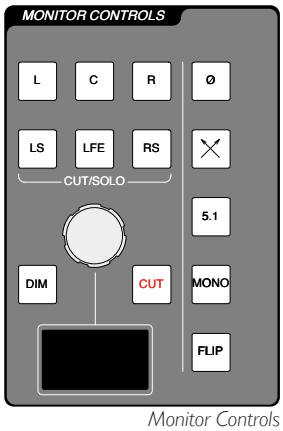
➤ Press **PGM 1**, located above the eight numbered buttons in the fader strip, to route the channel to Programme Bus 1.

### AUDITIONING THE PROGRAMME BUS ON THE MONITORS:




➤ In the **MONITOR** area of the Touchscreen, touch the top button in the **MAIN** column. This routes the PGM 1 bus to the main monitors, as indicated by the label beneath it. The button surround should become blue. Also ensure that the Solo Clear button below the AFL and PFL buttons is grey, indicating that no AFLs or PFLs are active.

➤ In the ***MONITOR CONTROLS*** area of the Centre Section, ensure that neither the **DIM** nor **CUT** buttons are active, and turn up the encoder. The signal selected for the channel input should now appear on the monitors.




*Monitor Controls*

*This page is intentionally almost blank*

# B: Console Configuration

This guide covers the setting up of user access, and the creation and basic configuring of projects. When the console is first booted, it will boot with the Default Project. This Project can be used as a starting point for new configurations, and includes basic softkey assignments and fader layouts which are described in the relevant Steps of this guide.

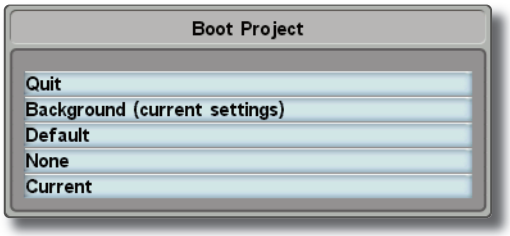
## Step B1: Set the Boot Project

It is recommended that the console is set to boot up in the state it was in when it was last shut down. The Project that is loaded when the console boots is defined in the **Project Status** pop-up:

➤ Go to the **STUDIO** (  ) pages, open the **PROJECTS** (  ) menu and press the **Status** button:


The **Boot Project:** box is initially set to **Default Project**.

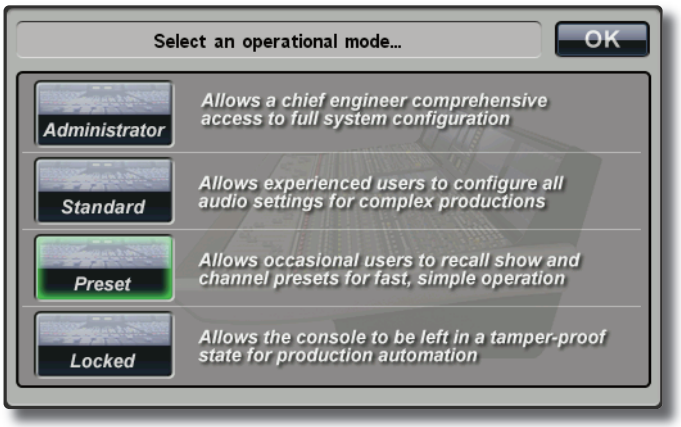
➤ To set the console to boot in its last active state, touch the **Boot Project:** box and select **Background (current settings)**:



## STEP B2: SET PASSWORDS

By default, the passwords for each user level are set to the first letter of the level's name: A for Administrator, S for Standard and P for Preset. To change the passwords:

➤ Bring up the Login QWERTY keyboard for the user level whose password you wish to change.




*Note that in order to do this, you will need to start in a lower access level than that to be edited, and then go up a level.*

➤ Instead of typing the password, type: **edit**

➤ Press **OK**.

➤ Type the old password for the level and press **OK**.

➤ Type the new password and press **OK**.

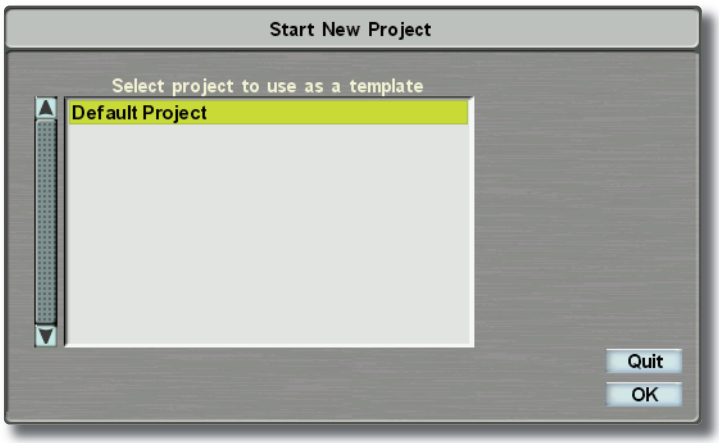
➤ Re-type the new password and press **OK**.

## STEP B3: CREATE PROJECTS

In order to keep track of different console settings, each new show/job should have its own Project. The new Project can be based on the Default Project or any other Project already on the system. This process will take the data held in the latest Version of the selected Project, and store it in the new Project in a new Version named **Default Version**. Projects are explained in full in Section 6 of this manual.

➤ Touch the **STUDIO** (  ) button, located towards the right-hand end of the User Toolbox, followed by the **PROJECT** (  ) button which appears at the bottom of the screen, and then the **Project New** button which appears above it.

The **Start New Project** display will appear:




➤ Select the **Default Project** (it will highlight in yellow), and then touch **OK**. You will be asked to name the new Project, using either the resulting QWERTY pop-up or an external keyboard.

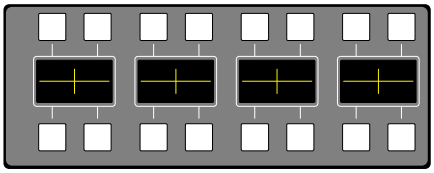
➤ Touch **OK** to confirm the new Project's name and after a few seconds you will be asked if you wish to load the newly created Project; touch **Yes**.

There are a number of Project elements which require initial configuration. These elements can be edited by users with Standard-level access, but not by users with Preset-level access. It is recommended that, once one Project has ben created, the Project-specific configuration described over the following steps be completed before further projects are created. Basing further new Projects on one taylored parent Project will greatly speed up the configuration process and will facilitate some consistency of configuration.

## Step B4: Assign Centre Section and Touchscreen Softkeys

All of the functions found within the bus configuration screens can be assigned to Centre Section and Touchscreen softkeys. They can also be linked to GPI circuits for control and/or tallies from external equipment (see Section 7).

In the left-hand side of the Centre Section there is a panel containing 16 softkeys divided into two rows of eight. The current function of each button is shown in the display between the button rows. These softkeys can be run in two modes: Banked or Unbanked: When Unbanked, the 16 softkeys can each be assigned a single function. When Banked, there are six banks of softkeys available, each containing 10 softkeys. The six right-most buttons in the lower row become bank selectors, while the remaining buttons can be assigned.



*Centre Section Softkeys*


*Touchscreen softkeys*

In addition to the Centre Section softkeys, the **USER ASSIGNED FUNCTIONS** area in the right-hand side of the Touchscreen provide a further 16 softkeys. The function of each button is displayed immediately beneath it.

*Note that, if using the Banked configuration for the Centre Section softkeys, you may want to duplicate important functions, such as layer selection, in the Touchscreen softkeys, in order to provide permanent indication their status.*

### Default Project Softkey Assignments:

In the Default Project, the top row of the first bank of Centre Section Softkeys includes Layer Select keys for Layers 1, 2 and 3 (**L 1**, **L 2**, **L 3**) towards the left, and the Softkey bank/unbank switch (**SftB**) towards the right. The bottom row includes a multi-channel spill button (**Spil**) towards the left. When the softkeys are in Banked mode, most of the rest of the row is taken up with bank selector keys (**Bnk1** to **Bnk6**). If Unbanked, softkeys 3 and 4 route talkback to Stereo Comms bus 1 (**CM1>**) and Stereo Comms bus 2 (**CM2>**). The remaining softkey banks are unused.

In the **User Assigned Functions** area of the Touchscreen, softkeys 3 and 4 on the first row are assigned as power supply indicators for the main and backup PSU (**PSU1** and **PSU2**).

To assign softkey:

➤ Touch the **MENU** ( Menu ) button, located towards the right-hand end of the Project Information Strip near the bottom of the Touchscreen, followed by the **FREE** ( Free ) button in the User Toolbox which appears:


The displays associated with each Free button flash **----** followed by a 4-character legend indicating the current function (or blank if none assigned).

➤ Press the softkey that you want to assign (selecting a new bank if required). Once pressed, Centre Section softkeys will flash and **????** will appear in their display, or Touchscreen softkeys will flash yellow.

➤ Touch the on-screen function that you want to assign to that button. The displays associated with each Free button will return to flashing **----** followed the current function name, including the newly assigned key.

➤ Press another button to assign and repeat the process, or deselect the **FREE** button to complete the assignment.

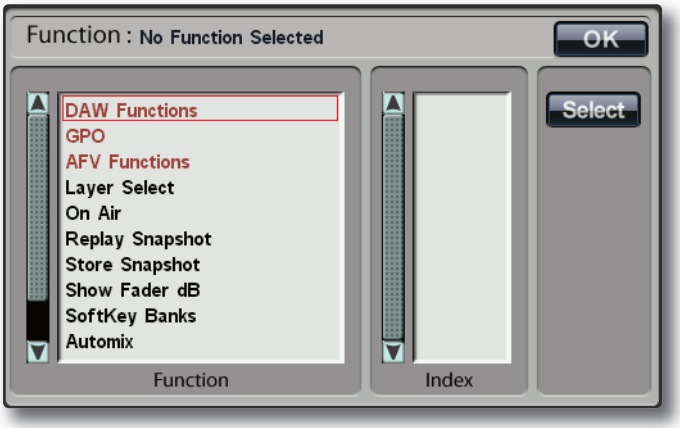
➤ To clear a softkey assignment, simply select the **FREE** button, press the button to be cleared, and deselect the **FREE** button.

*It is important to close the display before configuring any channel softkeys so as to avoid assigning the wrong functions to the softkeys in question.*

### The Centre Section Function display

A number of additional functions, including GPI outputs, are assigned via the Centre Section Function display. Function groups are displayed in the scrollable left-hand column, and the functions within the selected group are shown in the right-hand column. To assign a function from this list to a softkey:

➤ Touch the **FREE** (  ) button within the **MISC** (  ) menu, located in the User Toolbox to open a **Function** display. In the display, functions are shown in black and function groups shown in red:




➤ Press the softkey that you want to assign. Once pressed, Centre Section softkeys will flash and **????** will appear in their display, and Touchscreen softkeys will flash yellow.

*Master Scroller*

➤ Turn the ***MASTER*** Scroller to select the required function or group, and press the Scroller to confirm selection. The entry will highlight in yellow.

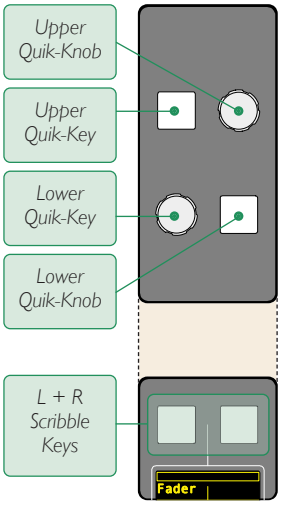
➤ If assigning a function from a list, move the cursor to the required function within the list, and press it to select. If there is a function value which needs defining, these will then appear in the smaller right-hand column, and can be selected in the same way.

➤ Touch the **Select** button in the right of the display to confirm selection.

➤ To move the cursor back to the function group list, select the **<Back>** entry at the top of the function list.

*See Section 5 for more on Softkeys, including definitions of the functions contained within the **Functions** display.*

## Step B5: Assign Channel Softkeys



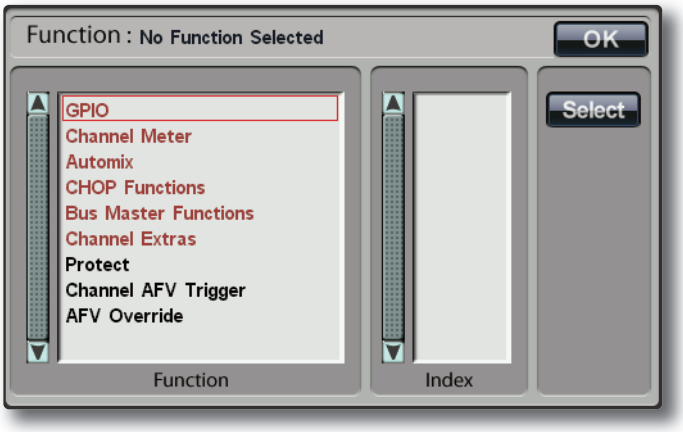

Assignable controls within the channel strip may be set up as clones of any channel function, suchas those involvd in routing or signal processing, so that you may keep commonly-altered or vital settings permanently available. Softkeys can also be used to make Standard-level controls available to Preset-level users.

➤ Press the **ATT** button on the channel whose softkeys you wish to assign.

➤ Press the **PARAM** button in the Master Control Strip at the base of the Touchscreen, and then press the **FREE** button which appears to its right.

The Quik-Control display at the bottom of the Channel Information Display and the labels in the scribble strip below the Scribble keys will all display a flashing dashed line, followed by any currently assigned function name.

A Function display similar to the one used for Centre Section softkeys will also in the bottom-left of the Touchscreen, and can be used in precisely the same way.




➤ Press or turn whichever softkey that you want to use. If it is a Quik-Knob or Scribble Key, **????** appears in its display to indicate that it has been selected. If it is a Quik-Key, it will flash.

➤ Press or turn the required button/control on the Master Channel, or select the required entry from the Function display. If Quik-Knob is assigned a Master Channel rotary control that has an associated button (such as in the Aux sends), then that button will be automatically assigned the Quik-Key adjacent to the Quik-Knob.

➤ To cancel an existing softkey assignment, use the procedure described above, but when **????** shows in the control display, deselect the **PARAM** button to clear the assignment.

➤ Press **OK** to close the display.

*Note that fader starts are configured via the **CH SET** button in the Master Control Strip, as described in the Operator's Manual.*

*Note also that some Center Section functions, such as Aux and Mix Minus talkback activation, can be assigned to Channel softkeys*

## Step B6: Configure Fader Layers

The C10's fader strips, in both the Channel and Centre Sections, are arranged in Layers, each of which can be brought onto the physical control surface using softkeys. There are ten Fader Layers available.

Each channel can be placed in more than one Layer. For example, any signals that require constant attention might be placed in the same position within each Layer so that they are always in the same channel strip on the control surface, regardless of the selected Layer.

Fader Strips can be any of the following, as explained in the table below:

- Input channels
- ASG (Audio Sub Group) 1 to 8 (for 8 x stereo format) or 1 to 4 (for 2 x 5.1 and 2 x stereo format).
- PGM (Programme) 1 or 2
- DBA (Direct Bus Access) 1 to 16
- Aux busses 1 to 8 (even-numbered busses are locked out when part of a stereo aux)
- Mix Minus busses 1 to 16 (even-numbered busses are locked out when part of a stereo Mix Minus)
- Control Group Master 1 to 16
- DAW Control Channels

*Note that some busses, such as ASG busses, can access Master Channel functions and can feed Aux and Mix Minus busses. To take full advantage of this, assign these busses to full fader strips. Refer to the Operator's Manual for a full list of signal path functionality.*

| Signal `Path | EQ | Dynamics | Insert | Delay | Aux/MM Route | ASG Route | PGM Route | Formats |
|---|---|---|---|---|---|---|---|---|
| Input Channel | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | Mono, Stereo, 5.1, Custom* |
| Audio Subgroup (ASG) | | ✔ | ✔ | ✔ | ✔ | | ✔ | Stereo 5.1 |
| Programme Bus (PGM) | | ✔ | ✔ | | | | | Stereo 5.1 |
| Aux / Mix Minus | | | ✔ | | | | ✔ | Mono Stereo |
| Direct Bus Access (DBA) | | | | | ✔ | ✔ | ✔ | Mono |

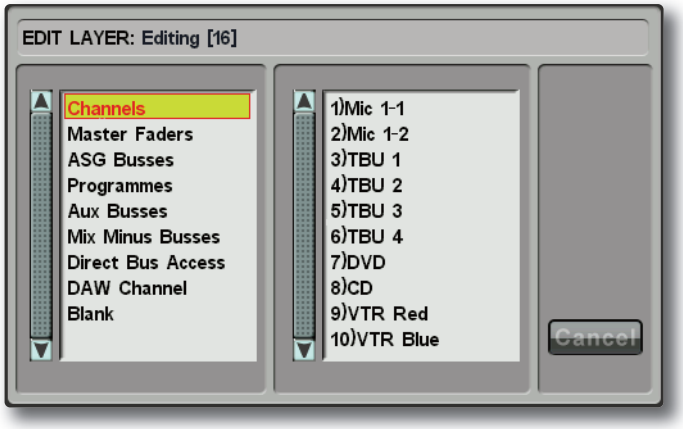
The Default Project which is present on the console at commissioning has the following signals pre-assigned:

| Console Size | Layer | Bay 1 (Fdr 1-8) | Bay 2 (Fdr 9-16) | Centre Section | Bay 3 (Fdr 17-24) | Bay 4 (Fdr 25-32) |
|---|---|---|---|---|---|---|
| **24 Channel Faders** | 1 | Mono channels | Mono channels | 4 Stereo ASGs<br>2 Group Masters<br>2 Stereo PGMs | Stereo channels | – |
| | 2 | Mono channels | Mono channels | *As Layer 1* | Mono channels | – |
| **32 Channel Faders** | 1 | Mono channels | Mono channels | 4 Stereo ASGs<br>2 Group Masters<br>2 Stereo PGMs | Stereo channels | Mono channels |
| | 2 | Mono channels | Mono channels | *As Layer 1* | *Blank* | *Blank* |

To assign a signal path to a fader strip:

➤ Bring the Layer to be configured onto the control surface, using its assigned softkey.

➤ Open the **EDIT LAYER** display by pressing the **EDIT LAYER** button in the Master Control Strip at the base of the Touchscreen, followed by the **EDIT** button which appears to its right. The **EDIT LAYER** display will appear in the lower left-hand corner of the Touchscreen:

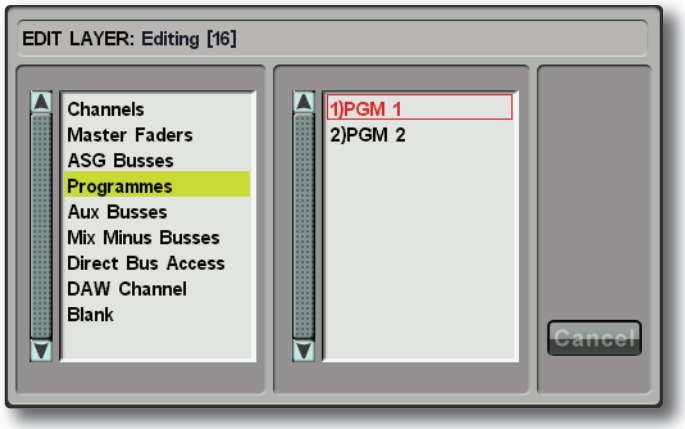



➤ Select the fader strip to which you would like to assign the signal path by pressing the **ATT** button below its fader. The **MULTI** button in the right-hand side of the Master Control Strip will allow you to select multiple fader strips within the Layer, and the **ALL** button next to it selects all of the Layer's fader strips.

*Master Scroller*

➤ Choose the type of signal path to be placed on the fader by scrolling the ***MASTER*** Scroller to the appropriate entry in the left-hand list of the **EDIT LAYER** display and pressing the Scroller's right arrow.

The signal type will go yellow, and the cursor will move to the right-hand list showing the signal paths within that type:




➤ Scroll to the signal path of your choice with the ***MASTER*** Scroller and press the Scroller to confirm the selection. If you are assigning a signal path which has already been configured, the fader strip will take on any relevant attributes of that signal path. If using **MULTI** or **ALL**,the first fader within the selection will be assigned the selected signal, and then the remaining faders will automatically increment from the list of signals.

*Refer to the Operator's Manual for more on configuring Fader Layers.*

## STEP B7: NAME BUSSES, SOFTKEYS AND LAYERS

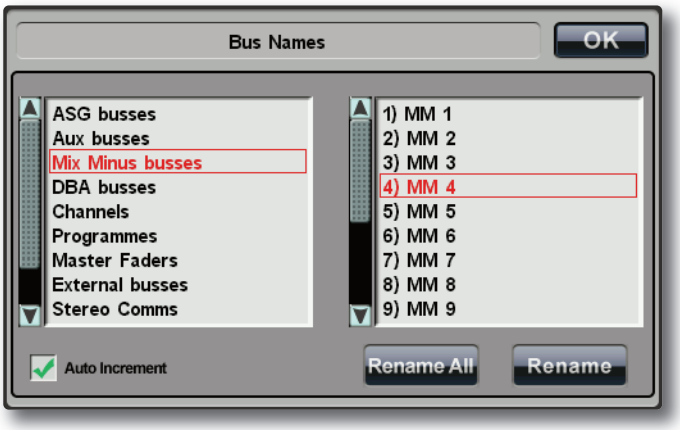
The 8-character bottom half of the scribble strip above each fader is used to display a specific channel/fader name. Channels and busses, as well as softkey banks, can be named in the **Bus Names** display.

> *Note that ASG, Programme, Mix-Minus and Aux busses may also be named via their individual Touchscreen parameter displays.*

➤ Open the User Toolbox at the bottom of the Touchscreen by pressing the **MENU** ( Menu ) button located towards the right-hand end of the Project Information Strip, and select the **NAMES** ( Names ) button which appears near the centre of the User Toolbox:


*User Toolbox*

The **Bus Names** display will appear in the lower left of the Touchscreen:




The left hand list shows the categories of items that can be named; the right hand list shows the elements within each category.


*Master Scroller*

➤ In the left hand list, touch the bus type for the bus to be named; the right hand list will flip to show the current names of all busses of that type. The ***MASTER*** Scroller can be used as an alternative method of navigating the lists.

➤ Select the bus you want to rename (it will be outlined in red).

➤ If the bus already has a name, press **Rename** to open an on-screen QWERTY keyboard. If the bus has no name, the keyboard will appear automatically.

➤ Enter a new name via either the on-screen keyboard which appears (or on the external keyboard) and hit OK.

➤ When renaming multiple busses in a category, select the **Auto Increment** box in the bottom left-hand corner. Pressing **OK** will now cause the QWERTY keyboard to move to the next bus in the list, instead of closing. This enables you to rapidly name one element after another without having to call up the QWERTY keyboard each time.

➤ When **Auto Increment** is active, clear the keyboard after your last entry by selecting **Cancel** on the on-screen keyboard.

➤ For additional characters, press the **Symbols** box on the on-screen keyboard.

You can name all busses with the same prefix followed by the channel number (when using a different language, for example):

➤ Once the bus type is selected, touch the **Rename All** button.

➤ Enter a new name of up to 6 characters, using the on-screen keyboard which appears, and press **OK**.

*Note that one version of the **Names** data is held in each Project Version.*

### Naming Softkey Assignments

Once a softkey has been assigned, it is given a default 4-character name which appears in its associated display. This name can be altered as follows:

➤ Touch the **FREE NAME** ( Free Name ) button in the User Toolbox to open the **Free Assign** display:


➤ Press the softkey which you want to rename. It's function will appear in the **Selected Function** box at the top of the display, and the default name will appear in the **Default four-Character Name** box in the left of the display.

➤ Touch the **Rename** button, type the new name in the QWERTY keyboard which appears, and press **OK**. The new name will appear in the **User four-Character Name** box in the right of the Free Assign display, as well as in the softkey's associated display.

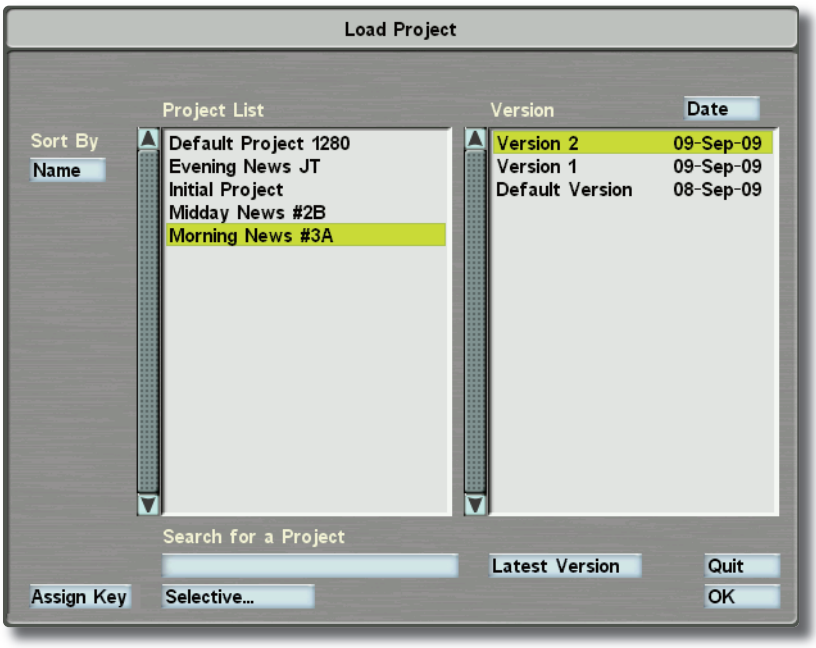
➤ Press another softkey to rename if required and repeat the process, or touch **OK** to close the display.

## STEP B8: ASSIGN PROJECTS TO USER MODES BUTTONS

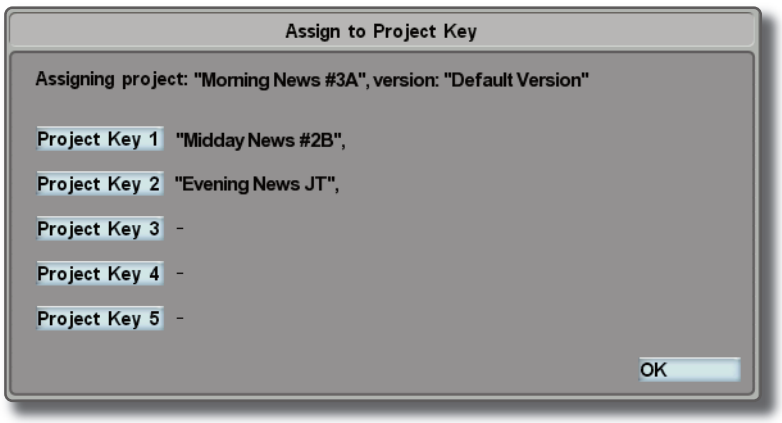
The ***USER MODES*** buttons in the Centre Section can be used for providing Preset-level users with access to the Projects they might use. By default, all five buttons are set to be Project Load buttons

> *Note that if a redundant core is fitted, the right-most button is reserved for core change-over. Other functions can also be assigned to the **USER MODES** buttons, as described in Section 7.*

➤ To select a Project Version to be assigned to a ***USER MODES*** button, touch the **STUDIO** ( ) button in the User Toolbox, followed by the **PROJECT** ( ) button which appears at the bottom of the screen, followed by the **Load** button which appears above it. The **Load Project** display will appear:




➤ Touch the appropriate Project in the left-hand list, followed by the Project Version to be assigned, which will then be located in the right-hand list, then touch the **Assign Key** button in the lower-left of the display to open the **Assign to Project Key** display:




➤ Touch the **Project Key** button to which the Project is to be assigned, and press **OK**. The Project name will appear above the ***USER MODES*** button.

## STEP B9: UPLOAD EYECONIX IMAGES

The Eyeconix images which can be displayed on the Channel Information Display are loaded onto the internal SBC Linux server disks via an external computer, connected either locally or over the IP network:

*Please see the Install Guide for information regarding networking the console's SBC server.*

- Ensure that the external computer has access to the folders exported by the C10 system.
- Login to the console (the username is `sbc` and the password is initially set to `sbc123`).
- Locate the Eyeconix folder on the console hard drive and copy the images into it.

*Note that .jpg and .bmp file types can all be used with the Eyeconix system, and that images are automatically resized.*

*Filenames are restricted to 14 characters in length (not including the 7 characters added by the console) – files with longer names will be ignored.*

## STEP B10: FURTHER PRESET-LEVEL USER CONFIGURATION.

The final procedures for Preset-level user configuration are the creating of Channel Presets and Control Linking. These allow the settings on any section of the channel to be stored and recalled. They are particularly important to Preset-level users as they include a number of important parameters which are locked out to them.

Presets are recalled using the Master Control Strip **LOAD** / **PRESET** function, and any Preset can be recalled to any relevant channel. Control Linking allows the same parameters as are available in Presets to be associated with a specific input source, enabling channels to be automatically configured according to the input that is routed to them.

If you are new to operating a C10, then Sections 2 and 3 will provide you with all of the channel configuration guidance you may need.

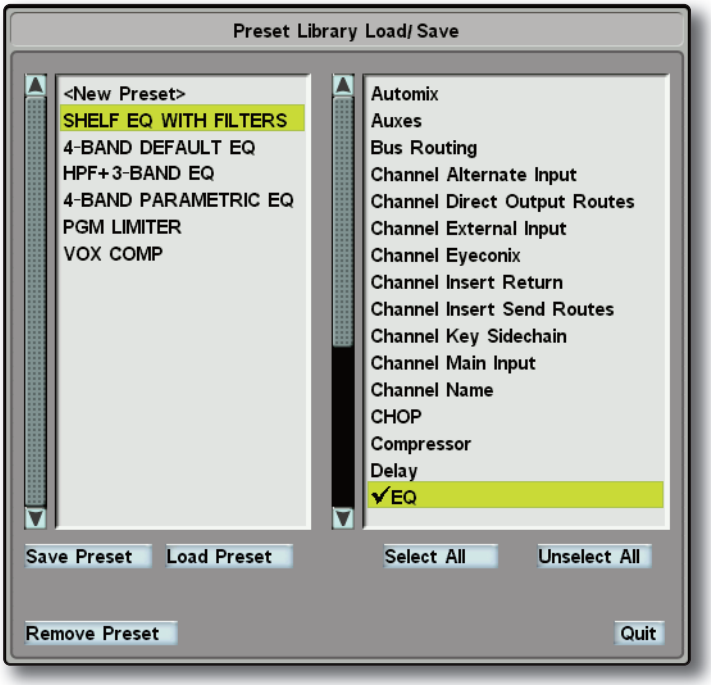
### PRESETS

To create a Preset:

➤ Configure a channel to reflect the Preset you wish to create.

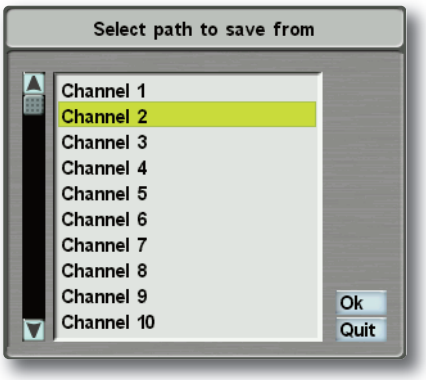
➤ Press the **MISC** ( Misc ) button in the User Toolbox, followed by the **PRESETS** ( Presets ) button in the sub-menu that appears to open the **Preset Library Load/Save** display in the Touchscreen:

➤ Highlight all of the parameters/sections of the channel that you would like to store in the right-hand list (they will turn grey-blue). You can use the **Select All** and **Unselect All** boxes to highlight all or none of the parameters respectively.




➤ Press **Save Preset**, name the new preset using the pop-up keyboard and press **OK**.

➤ Once a name is entered, a new pop-up will appear asking you to **Select path to save from**. Press the **ATT** button on the channel strip that has the correct settings to be saved in this preset, or select the channel from the on-screen list:




➤ Press **OK** and the selected settings will be copied from the channel and stored as a preset on the console's hard disk, with the name that you gave. It will also be listed in the left-hand window with all other presets, arranged in the order they were created.

➤ To delete a Preset, highlight the unwanted preset in the **Preset Library Load/Save** pop up and press the **Remove Preset** box.

There are a number of default Presets included in the console which can be used as a starting point:

| **EQ Presets:** | **Band 1** | **Band 2** | **Band 3** | **Band 4** |
|---|---|---|---|---|
| SHELF EQ WITH FILTERS | Hi-Pass Filter, 24dB per octave | 500Hz Lo-Shelf, Q = 0.4 | 1.5kHz Hi-Shelf, Q = 0.4 | Lo-Pass Filter, 12dB per octave |
| 4-BAND DEFAULT EQ | 200Hz Lo-Shelf, Q = 0.4 | 400Hz Parametric Q=0.5 | 3kHz Parametric Q=0.5 | 5kHz Hi-Shelf, Q = 0.4 |
| HPF + 3-BAND EQ | Hi-Pass Filter, 24dB per octave | 200Hz Lo-Shelf, Q = 0.5 | 500Hz Parametric Q=1 | 3kHz Hi-Shelf, Q = 0.4 |
| 4-BAND PARAMETRIC EQ | 80Hz Parametric Q=0.4 | 400Hz Parametric Q=0.5 | 3kHz Parametric Q=0.5 | 5kHz Parametric Q=0.4 |
| **Dynamic Presets:** | **Ratio** | **Release Attack** | **Threshold** | **Gain** |
| PGM LIMITER* | (Limit) | 100ms 0.7ms | 6dB | 0dB |
| VOX COMP | 10:1 | 251ms 1ms | 12dB | 3dB |

*All EQ Presets are initially set as flat.*

**The PGM Limiter also has a feed forward delay of 1ms.*

### Control Linking

To configure a source's Control Linking:

➤ Assign the source to be Linked to a channel strip and configure it to reflect the Control Linking you wish to add. (Use the routing procedure described on Page 4-17)

➤ Touch the **STUDIO** (  ) button in the User Toolbox, followed by the **CTRL LINK** (  ) button which appears at the bottom of the screen.

The **Control Linking Load/Save** display will appear, which looks almost identical to the **Preset Library Load/Save** display: The full list of sources appears on the left, with the user names that you previously gave them in the **IO Names** pop-up. The list to the right of the pop-up shows the individual channel settings that may be saved and recalled.

➤ In the left-hand list, select the source to be Linked. It will go yellow.

➤ In the right-hand list, highlight the settings to be included. They will go blue to indicate that they have been included.

➤ Press **Save Config**.

➤ If that source is routed into two or more channels on the console, a pop-up will appear, asking you to select which channel is to be used as a template for storing the Control Linking data. Press the **ATT** button on the channel strip that has the correct settings, or select the channel from the on-screen list, and press **OK**.

The Control Linking information will be saved, and a small chainlink icon appears to the right of the source and its elements in the display.

*The configuration of the console may now be complete. For more advanced configurations, please refer to Section 5 of this manual for more in-depth descriptions of everything included in these setup guides.*

- System Backup
- File Menu
- System Menu
- Route Menu
- Network Menu
- Config Menu
- DSP Menu
- Front Panel Menu
- Router Label Import

# SECTION 5

# SYSTEM ADMINISTRATION

## IN THIS SECTION...

… the console's high-level configuration and maintenance pages are examined. All procedures described here presume Administrator-level access. A guide to the initial setup of the console, which introduces many of the procedures in this section, can be found in Section 4. It is recommended that administrators familiarise themselves with all previous chapters before attempting the configurations described here.

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# Section Contents

# SYSTEM ADMINISTRATION

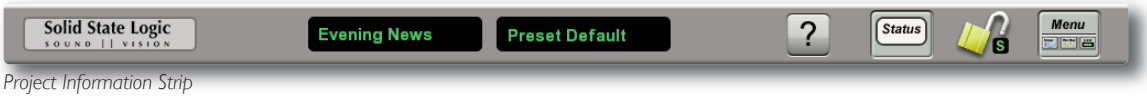
## INTRODUCTION

This section includes detailed descriptions of the system administration procedures of the C10HD, and presumes Administrator-level access.

> *Refer to Section 4, B-2 for an overview of Access levels.*

The first part of this section describes how to do back-up of the system, either as a whole or in part. The remainder of the console concerns the Studio pages of the console. To enter the Maintenance pages:

➤ Press the **MENU** ( Menu ) button towards the right-hand end of the Project Information Strip at the base of the Touchscreen:




*Project Information Strip*

➤ Press the **STUDIO** ( Studio ) button, located towards the right-hand end of the User Toolbox which appears:


*User Toolbox*

Once the Studio pages have been accessed, a new set of buttons appears across the foot of the Touchscreen:


*Maintenance Menus*

These separate the configuration menus into logical groups. When you select most of these buttons, further sub-menus will appear.

The **Project** menu is fully discussed in the Operator's Reference manual. The **Offline Setup** button has been included for software compatability purposes and is currently unused on the C10. The rest of these menus and submenus are described in this section of the manual. Each menu will be dealt with in order, from left to right starting with **File**.

> *Note: The Studio pages access a number fundamental console settings which should not be tampered with by anyone who is unsure of what they are doing.*

> *On systems with a redundant core, note that whenever system settings are changed, a flashing **Press to Synchronise** icon will appear in the bottom right-hand corner of the screen. You do not need to synchronise the redundant system until you have completed all of your configuration and are ready to exit the Studio pages. See Appendix E for details.*

To return to the User Toolbox, press the console ( ) button at the right hand end of the Maintenance pages.

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# File Menu


The File menu within the Maintenance pages is concerned with manipulation functions for the data files stored on the console processor's hard disk and removeable disks (where present). The data files fall into two broad categories, text files and machine files.

Text files may be read, edited and created at will, but machine files may not. Typically, text files are used to define custom button panels, etc. Machine files tend to be part of the software run by the console and hence are not user-adjustable!

> ***! Note that many files are used by the system for console configuration so must not be edited unless under SSL supervision. The only files which can be safely edited are described on Pages 5-9 to 5-10.***

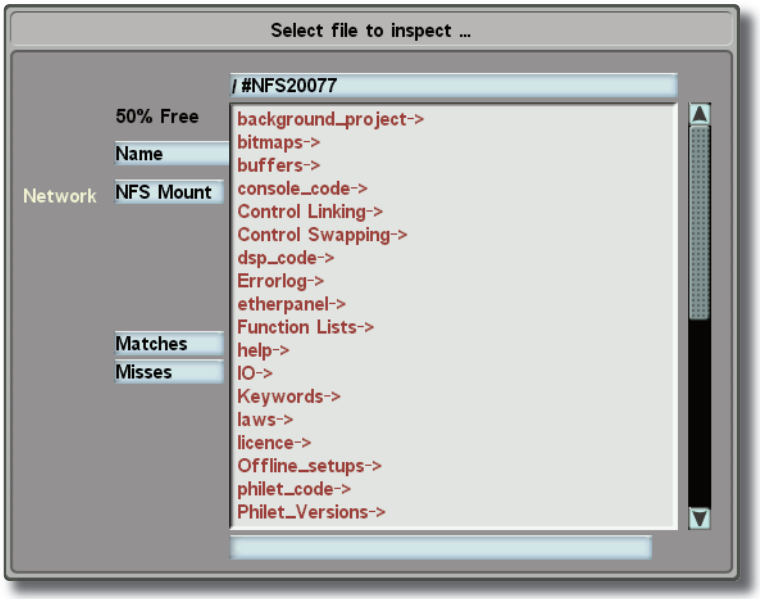
Under the File icon, there are five sub-menus: **Create**, **Inspect**, **Edit**, **Delete**, and **Copy**:

## Create

This option creates a blank text file on the console's hard disk after you have chosen a name for it, and opens it in the Text Editor so that you may put some content into it! This is normally only used under the direction of SSL Service personnel.

## Inspect

This option shows the same text as the **Edit** function described below, but without any ability to alter the contents of the text file – this is a safe way to look at the contents of a file without the possibility of accidentally changing it!




The large box across the top of the main file list displays the currently open directory, which can be scrolled using the scroll bar in the right of the window. The files appear in black and folders (directories) appear in red with a -> symbol after the name.

➤ Touch the box to go up a level or touch an entry in the display to go down a level.

The disk space available for the current location is shown bellow **Current Dir** label.

The box to the right of the **Sort** label selects how the list is sorted:

➤ To alter the sorting criterion, touch the box and select a different criterion from the pop-up list: **Type**, **Size**, **Create Date**, **Modify Date** or **Name**.

The box to the right of the **Network** label (**NFS Mount**) selects the network location being inspected:

➤ Touch **NFS Mount**, then touch the location in the list.

To search for a file:

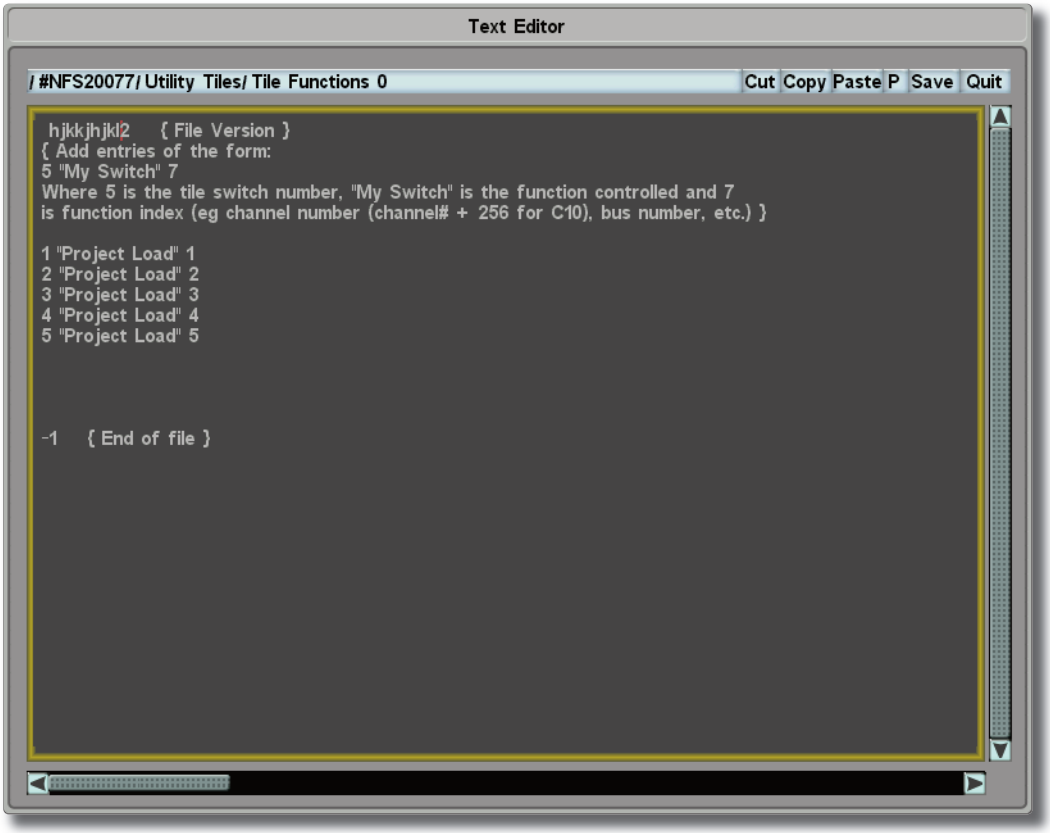
➤ Touch the bar at the bottom of the display.

➤ Type an element of the filename into the QWERTY keyboard which appears and press **OK**.

➤ Touch **Matches** to view all files with that character string (or touch **Misses** to view all files without it).

## EDIT

Pressing this button will open a directory display similar to the Inspect display. Once a file has been chosen, a window will appear where you may edit the text within that using an attached keyboard and mouse/trackball/Touchscreen:




A flashing green bar indicates the position of the cursor, and text may be highlighted by dragging across it on the Touchscreen or click-dragging with a mouse/trackball – such a block of text may be cut, copied, or pasted using the option boxes at the top right of the **Text Editor** pop-up.

The box marked **P** indicates that the text is being displayed with proportional spacing between the letters (like this document), and toggles to show **F** for fixed spacing (like a typewriter).

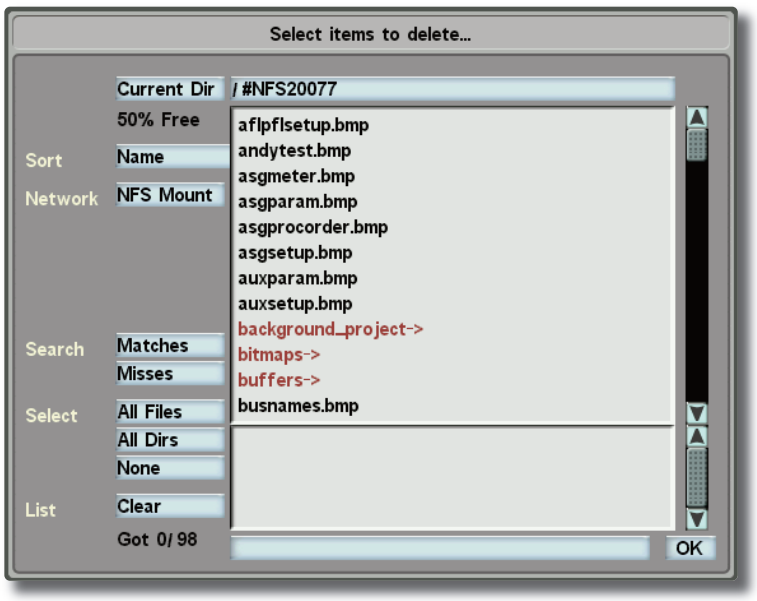
➤ When the necessary changes are made, press the **Save** box, but be careful if using the Touchscreen as the **Save** and **Quit** boxes are quite closely located.

➤ To quit without saving changes, press the **Quit** box.

*Note that only text files can be edited.*

## DELETE

This option allows single or multiple files and directories to be deleted from a disk, so please use extreme care! When you press **Delete**, the familiar file navigation window will appear:

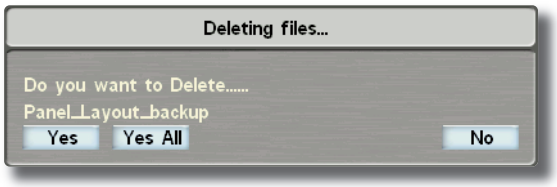



➤ Touch each file to be deleted.

Selected file(s) and folder(s) will be highlighted in yellow and placed in the small scroll window at the bottom of the pop-up. In addition to selecting files individually, the **All Files** and **All Dirs** buttons can be used to select all contents, and the **None** button can be used to deselect the list.

➤ Files can be cleared from the lower list by touching within the lower window or by pressing **Clear**.

➤ Once all files to be deleted have been chosen, pressing the **OK** box produces a confirmation pop-up:

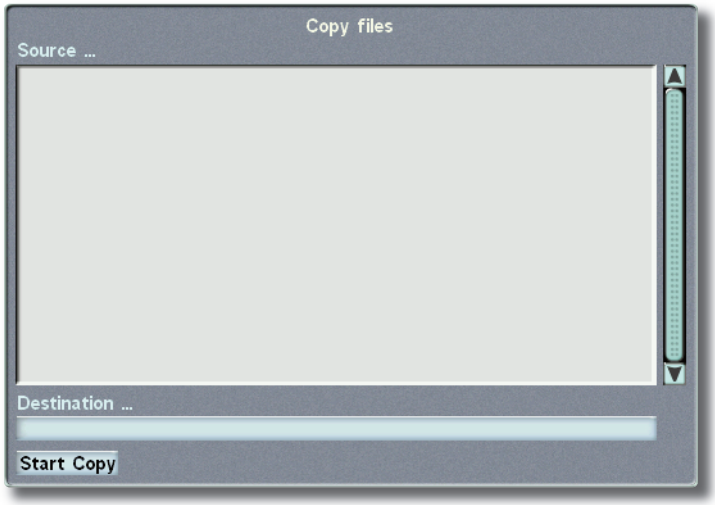



➤ To confirm deletion of the file named in the window (**Panel_Layout_backup** in this example), simply press **Yes**. If you chose multiple files and are happy to delete all of them in one operation, you may press the **Yes All** box. To cancel the delete operation, press **No.**

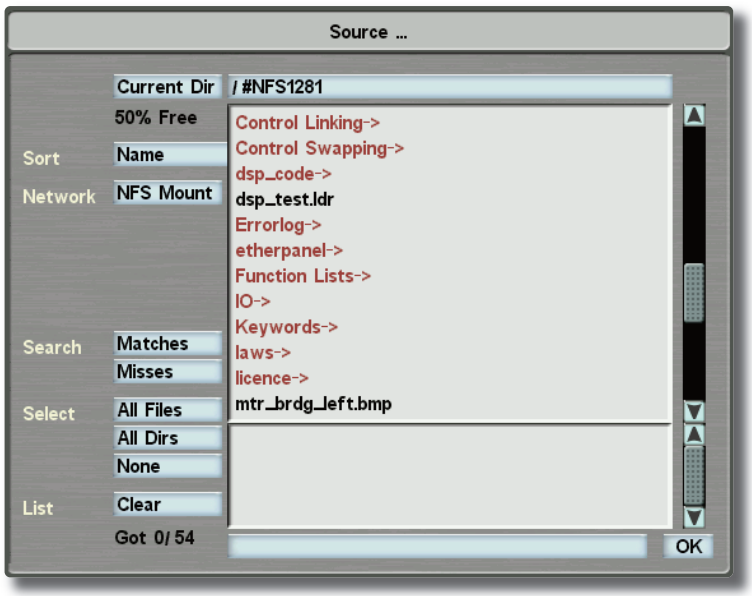
Never use this **Delete** function for Projects; use the dedicated **Delete** function found in the Projects menu.

## Copy

The copy option allows single or multiple files or folders to be copied from one location to another, either on the same disk or across different disks. This pop-up appears requiring source file(s) and a destination to be chosen:




➤ Touching the screen in the upper **Source...** area will allow source files and folders to be chosen in the same way as the **Delete** display:




Selected items will be highlighted in yellow and appear in the small scroll window at the bottom of the pop-up.

➤ To select and entire directory and all its contents, enter the folder as detailed above then press the **Current Dir** button at the top left of the pop-up.

➤ To remove accidentally selected items, touch them within the lower scroll window to deselect them from the source list. Once you have selected the required file(s), press **OK**, and you will see the file(s) appear in the **Source...** window of the **Copy files** pop-up (upper screenshot on previous page).

➤ To choose a suitable destination, touch the blue bar below the **Destination...** legend, and the disk navigation window will appear again, but this time only showing folders.

The system's own hard disk is normally selected, but any other network location can also accessed here, by pressing the blue **NFS Mount** box to the left of the pop-up and selecting the location from the resultant pop-up.

*Projects can also be copied via the Linux file management system using the terminal.*

➤ To cut down the length of any of the lists, simply enter a keyword to show any filename that includes it while all others will be hidden (and vice versa). Simply enter the keyword after pressing the blue bar at the bottom of the pop-up, and then choose **Matches** or **Misses** next to the **Search** legend on the left hand side.

➤ The lists may also be sorted by selecting (next to the **Sort** legend) from the options **Type**, **Size**, **Create Date**, **Modify Date**, and **Name**.

➤ Once you are inside the desired destination folder, press the **Current Dir** box and you will see the path of that folder appear under the **Destination...** legend – if all is correct, press **Start Copy** and you will see the grey progress bar turn gradually yellow as the process is completed! Otherwise you may go back into either navigation window to change the source(s) and/or destination, or touch anywhere outside the **Copy files** pop-up to cancel it.

## Text File Operations:

The only text files that should be edited without SSL supervision are those related to User Mode and GPIO assignments and DAW displays. Each text file includes its own set of instructions.The files which may be required are as follows (all within the **/#NFSxxxx** directory, where **xxxxx** is the console serial number):

| File and Location | Description |
|---|---|
| Utility Tiles-> Tile Functions 0 | Utility Modes assignments |
| Function Lists -> Functions.lst | The full list of console functions, including proper names as well as value ranges and offsets. |

*Important note: This file includes functions that are suitable for inclusion in the channel and Centre Section softkey Functions lists (as well as, potentially, the GPIO list), but also a number of functions that should not be assigned to softkeys. Therefore, take care not to allow softkey access to unsuitable functions.*

| | |
|---|---|
| Function Lists -> gpio.lst | GPIO functions included in the GPIO functions display. |
| sysfiles-> DAWfuncs | DAW displays assignments (See Appendix F for details). |
| config_x.0-> | The console's entire configuration is loaded in config folders, and the highest numbered folder (indicated here with an x) contains the configuration included in the most recent software update. This folder can be used for copying any files which are missing or which have been irretrievably edited. It is essential that the files contained are not edited while still within the config folder. |

### Creating Folders:

Folders can most easily be added to the Channel and Centre Section softkey Functions displays by duplicating an already existing file to a new location using the **File** / **Copy** function, renaming it and editing its contents.

### Example operation: Assigning additional functions to USER MODES buttons:

The ***USER MODES*** buttons make up the console's 'Utility Tile' 0. Note that this is the only Utility tile which is currently used on the C10.

➤ Touch the **FILE** / **Edit** button to open the file edit display and ensure that **/#NFSxxxxx** is displayed in the blue bar at the top of the screen. If the bar is blank, touch **/#NFSxxxxx** in the file list. If the list is displaying another location, touch the blue bar to move up through the filing system, until **/#NFSxxxxx** is displayed.

➤ Touch the **Utility Tiles ->** entry in the display, followed by **Tile Functions 0** from the list which appears (as shown on Page 5-5), to open the text editor.

You will see a list of five functions in the display, in the format `x "Project Load" y` where `x` refers to the button, `"Project Load"` refers to the Project load function currently assigned, and `y` refers to the index of the function.

> *If this file has already been edited, some rows may display functions other than "Project Load".*

➤ Replace the `Project Load` text with the name of the function to be assigned, retaining the quotation marks (note that the file is case sensitive). Replace the second number with the Layer you wish to be activated with this button.

Examples of functions you may wish to assign are listed below (along with their function names):

Layer Select: `"User Layer Direct"` (followed by the Layer number)

On Air GPIO: `"On Air" 0`

Solo Clear: `"Clear Listens" 0`

For example, to activate Layer 3 with button 4, the line of text should read `4 "User Layer Direct" 3`.

➤ Press **Save** and touch outside the display to close it.

➤ Restart the console in order for the changes to take effect.

# System Menu


Several useful configuration options can be found in the **System** menu within the Maintenance pages, including an interface used for installing new software.

## Shutdown

The **Shutdown** pop-up provides four options:


➤ To perform a controlled power down, press **Shutdown** and wait for the console computers to completely shut down before switching the power off at the mains.

➤ Pressing **Full** reboots both the processor core and integration computer immediately from the system disk and generates an error log.

➤ Pressing **Quick** allows for a much quicker restart whenever problems occur with the front panel or DSP. **Quick** restarts the processor core which handles DSP and the control surface, but not the Linux integration computer which provides console file management and network integration.

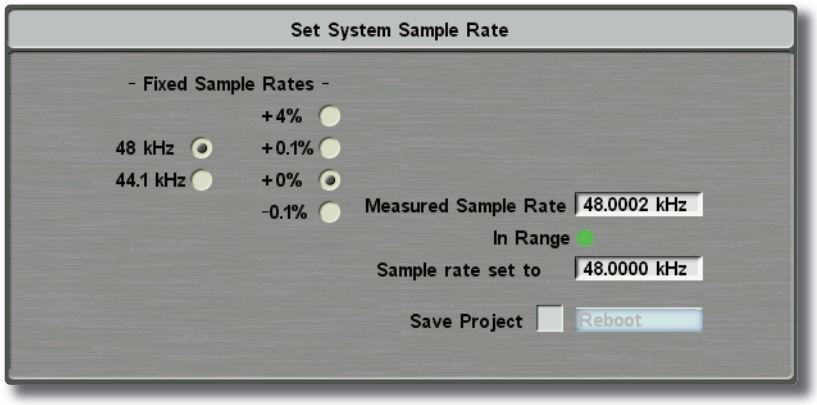
⚠ *Note that Shutdown must ALWAYS be used before switching off the console.*

➤ Press **Cancel** to clear the display without restarting or shutting down.

## SAMPLE RATE

The **Set System Sample Rate** pop-up allows the console and IO sample rate to be set at either **44.1kHz** or **48kHz**. This enables the console to run at the same sample rate as the primary source of audio playback. For RIOs, IO sample rates can be also be defined in the **IO Parameters** display, described on Page 5-34.

*The system generates its own highly accurate internal clock unless an incoming signal is detected, in which case it will automatically lock to that signal. The lock status of the system is indicated in the **SYNC** menu described on Page 5-14.*




The **Measured Sample Rate** is found in the upper box on the right side. This box is purely for information and reports the current sample rate of the system. Beneath it you will see an **In Range** indicator which should be green – this indicates that the current clock reference signal is within the ±50ppm tolerance range accepted by the console.

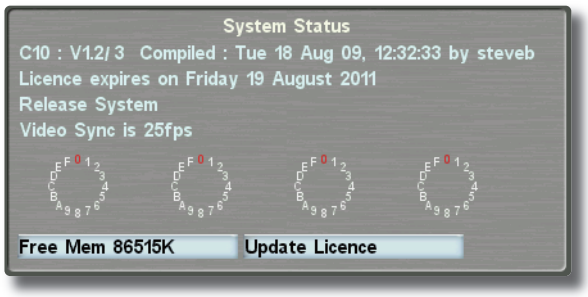
➤ To change the internal sample rate of the system, select the sample rate you require by clicking on one of the sample rate option buttons in the left of the pop-up. The **Sample rate set to** box shows your rate of choice.

*Note that the **Save Project** and **Reboot** controls can be ignored as they are not currently required.*

Check that the **Measured Sample Rate** indicates the rate you selected and that the **In Range** indicator is green. If the **In Range** indicator is red, then please check your reference clock signal – red indicates that the system is not receiving a valid clock equal to your chosen rate ±50ppm

## Status

Selecting **Status** in the **System** menu calls up a panel providing useful feedback on the status of the processor:




Text at the top of the panel confirms the software version that the processor is currently running. This area also tells you when the current software licence will run out. The lowest line of text confirms the video sync standard that is currently connected to the processor.

In the lower half of the panel, the settings of rotary bit switches on the CPU card are shown. The hex number thus derived is used for program-interpreted system options, and is likely to be of use only to SSL Service personnel!

The **Update Licence** box at the bottom of the window is used for updating the software license, and requires a licence code which will normally be provided on paper by SSL, before the expiry date of the previous license. Pressing the **Update Licence** box produces an **Update from Keyboard** pop-up. To update the licence, press **Continue**, enter the new licence code in the QWERTY keyboard which appears, and press **OK**.

The **Free Mem** box provides a readout of available RAM. Toggle the box to change the value between KiloBytes (**K**) and Percent (**%**).

## Clock Settings

➤ Stabbing the **Clock** button brings up a display of the date and time being fed from the Linux computer:


*It is not possible to set the real time clock using this pop-up. The time can only be altered using the Linux GUI.*

The **9.00pm / 21:00** pop-up allows the system time-of-day clock to be set to either a 12 hour or 24 hour format.

➤ Simply toggle the 24Hr Clock / 12Hr Clock box as required:


*Note that the time used for time stamping Projects etc is taken from the Linux computer's clock.*

## SYNC

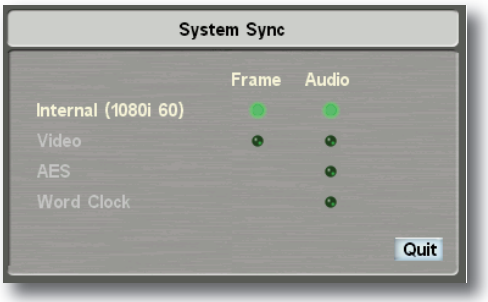
The **SYNC** pop-up indicates what reference source is being used to lock the audio sample rate and define the frame rate. the following reference source options are available:

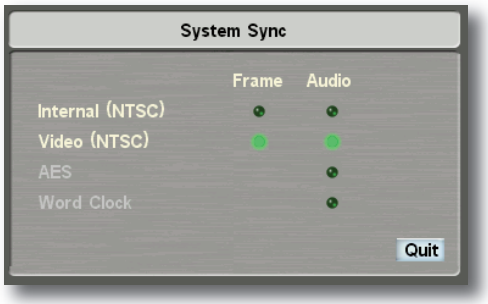
- **Internal**
- SD **Video** (PAL or NTSC 'black and burst'), and HD Video (Tri-Level Sync)
- Unbalanced **AES** (AESiD)
- **Word Clock** (Fs).

If there is no suitable incoming reference signal for either the audio sample or frame rate, the console will automatically generate its own PAL clock signal. The external sources will be greyed out in the pop-up's list, and both of the **Internal** sync lights will be lit.

If there is a suitable incoming reference signal, the console will automatically lock to it. The external reference source will lighten in the pop-up's list, and its **Audio** sync light will be green.

If this reference does not define the frame rate (i.e. if it is an AES or Word Clock signal), the frame rate defaults to PAL, as indicated by the **Internal (PAL)** / **Frame** sync light being lit.




If the video input is the selected external reference source, it also defines the console's frame rate, as indicated by **Video** lightening in the pop-up's list and both of its sync lights being lit.

The **Video** and **Internal** legends will also display the frame rate for HD and SD Video sources.

The full list of compatible sync sources is as follows:

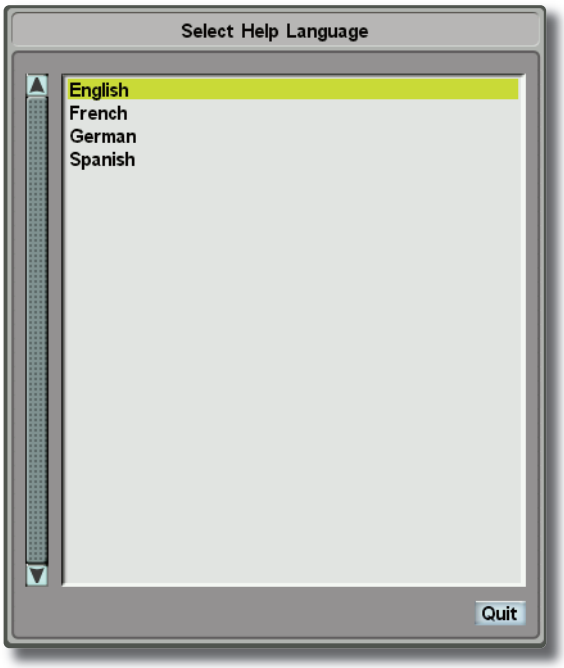
| | | | |
|---|---|---|---|
| PAL | 1080i 50Hz | 1080p 29.97Hz | 1080PsF 23.976Hz |
| PAL 24 | 1080p 60Hz | 1080p 25Hz | (1080i 47.95Hz) |
| NTSC | 1080p 59.94Hz | 1080p 24Hz | 720p 60Hz |
| 1080i 60Hz | 1080p 50Hz | 1080p 23.976Hz | 720p 59.94Hz |
| 1080i 59.94Hz | 1080p 30Hz | 1080PsF 24Hz (1080i 48Hz) | 720p 50Hz |

*Note: To lock properly to an external clock, you must provide a valid reference signal, which must be equal to the chosen sample rate (Fs) and be stable within ±50ppm.*

*Note that C10 is AES11 Compliant, with the exception of the following:*
*The console supports consistent phase locking of AES-3 outputs to a PAL video reference signal, thus ensuring consistent latency through connected AES-3 devices. Connecting video sync to the Blackrock Sync input and selecting Video as a reference will automatically enable this.*
*Phase lock to an NTSC video signal is not supported as the Blackrock processor does not support decoding of the NTSC 5 field sequence. Clients who wish to take advantage of this feature in an NTSC environment will need to carry out FSB884 on their Blackrock processor cards and connect an AES-3 DARS from a sync generator that supports decoding of the 5 field sequence.*

## LANG

The **Lang** display allows the language of the help screens to be selected.




➤ Simply touch the required language in the display.

➤ Touch outside of the display to close the window.

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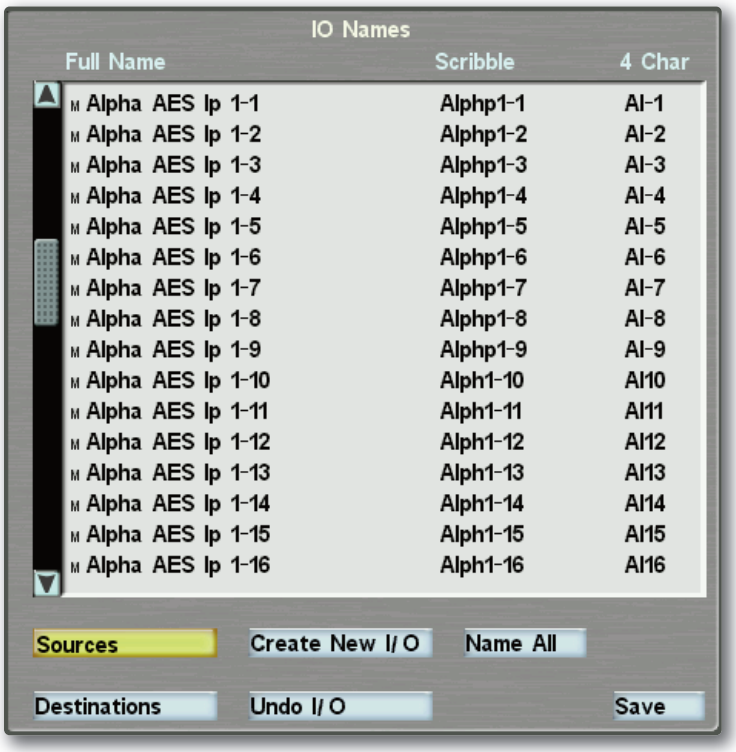
# Route Menu


The **Route** menu within the Maintenance pages holds a number of items that form key elements of the C10 I/O and routing configuration.

Under the **Route** icon are five submenus: **Names**, **Groups, Quickroute, Ctrl Link**, **IO Links** and **MORSE**.

## Names

This menu is used to name physical inputs and outputs, and create suitable multichannel 'bundles', before arranging the IO into logical groups within the **IO Groups** pop-up (see Page 5-20). It has two pages: **Sources** and **Destinations**:




Initially, sources are listed with default names. These names are constructed as follows:

- The IO type is displayed first, with Alpha-Link sources prefixed **Alpha**, and sources from a DHD stagebox prefixed '**DHD**'. IO type labels include the following:

| IO Type | Label |
|---|---|
| AES input | AES |
| Mic card | Mic |
| Line in on Alpha-Link or DHD Stagebox IO card | Line |
| Line in on DHD Stagebox Line In card | 5260 |
| Line in on RIO card | ADC |
| DHD Stagebox SDI card | Embed |

- Signals to/from cards which include both inputs and outputs then display input (**Ip** or **In**) or output (**Op** or **Out**)
- Signals are then appended with their module number (as defined in the **Link Use** display – See Page 5-25), hyphenated with the individual signal number, apart from MADI signals which simply have their channel number appended.

For example, the fourth AES input on the second Alpha-Link stagebox will be listed as **Alpha AES Ip 2-4**.

Other MADI IO is named **Local MADI** followed by the channel number, which is set by the console according to the MADI link being used (See Page 5-25).

When you are sure of a signal's connection to the outside world, you may give it a more obvious name (eg. **Mic A-1**, **Tie Line 4**, **CD**):

> *MORSE router Sources and Destinations will appear in the list in blue, indicating that it is not possible to rename these signals from the console.*

➤ Touch an entry in the **Full Name** list, enter a new name in the QWERTY pop-up which appears, and press **OK**.

With the **Name All** box lit, renaming one input will automatically add the numeral 1 to the given name and simultaneously rename all subsequent inputs of that type with incrementing numbers.

The **Scribble** column shows how the name will appear in the 8-character scribble strip displays on the console and the **4 Char** column shows how the names will appear in the 4-character Master Channel displays – both are automatically derived from the **Full Name** column, but these may individually be edited for better clarity and less ambiguity if required.

> *Note that renaming the **Full Name** will result in both shortened versions being renamed. It is therefore important to settle on the **Full Name** before editing the shortened versions.*

You may bundle sources together to allow a neater arrangement of associated channels:

➤ To make a new IO bundle like this, select **Create New I/O** and a pop-up appears:

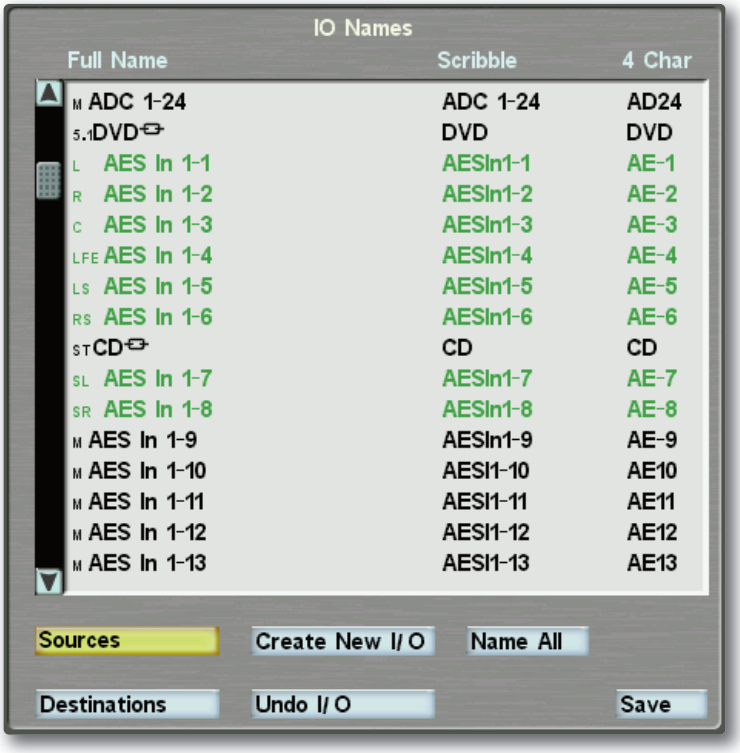

Select the box next to the **Name** legend and enter a suitable title for the bundle, then press the box next to the **Format** legend and choose from **MONO**, **STEREO** or **5.1** – this will set the number of sources you can choose under the **Components** legend, simply press each component in turn and choose the appropriate physical input according to your wiring.

Note that the name of the bundle is prefixed with **M** for mono, **ST** for stereo and **5.1** for (you guessed it) 5.1, and the components are prefixed with **SL** for stereo left and **SR** for stereo right, or **L** for 5.1 left, **R** for 5.1 right, **C** for 5.1 centre, **LFE** for 5.1 LFE, **LS** for 5.1 left surround and **RS** for 5.1 right surround.

Components are still named after their physical connection (**AES In 1-1** etc.), so that troubleshooting or physical overpatching may be performed easily in the future, and are also displayed in green.

➤ Press **Ok** to make this new bundle (note that any original component names are erased when you do this) or touch **Quit** to cancel. The components in a bundle are automatically named the same as the title of the bundle, but they may be individually renamed by touching each of the green components in turn in the list shown opposite.

For example, AES digital inputs 1-1 to 1-6 are fed from a DVD player in the screenshot below, so they have been made into a 5.1 source called **DVD**:




➤ To dissolve an I/O bundle, touch the **IO Names** / **Undo I/O** box and then the list item you wish to remove – all the components will become individual again.

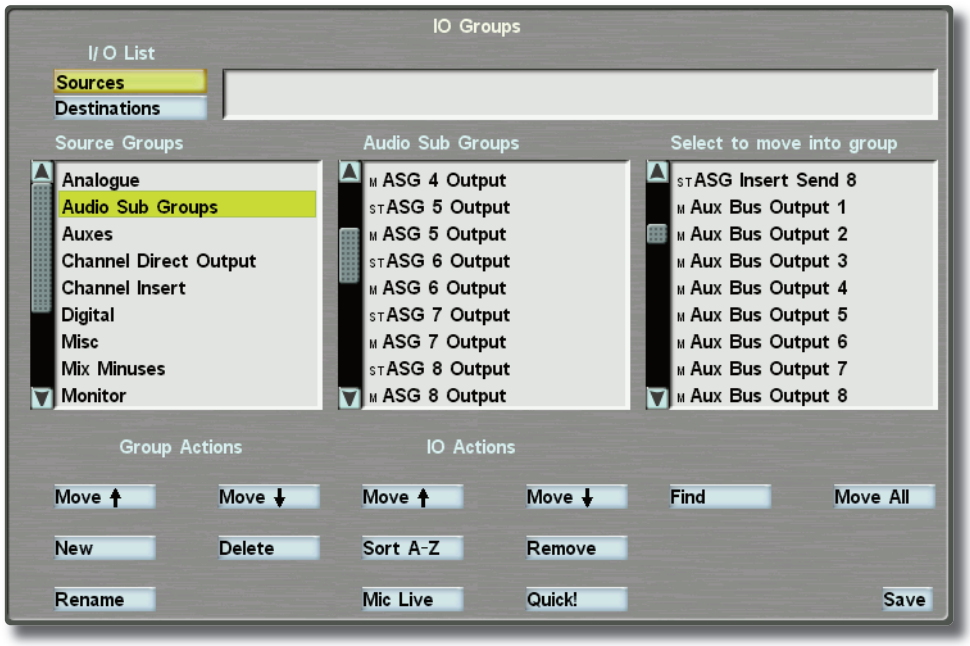
➤ When you've finished modifying items in the **Sources** or **Destinations** list, make sure you select the **Save** box!

*Note that the chainlink icon indicates that the source has Control Linking data associated with it, the mic icon indicates that the source has been designated an On-Air source, and the pointing hand icon indicates that the source has been included in a Quickroute list.*

## GROUPS

This is where the named and bundled inputs and outputs are arranged into user-friendly **Source** and **Destination** Groups – these are the groups seen within the console routing system so clarity and logical arrangement will definitely help you when routing.

The pop-up has three scroll windows:




When the **Sources** button (upper left) is selected, the right hand window shows all of the sources in one long list, ready to be subdivided by signal type into the **Source Groups** shown in the left hand list. The middle window lists those sources already placed into whichever source group is currently selected (in the example shown above, **DVD**, **CD**, **AES In 1-9** to **1-15** are already placed in the **Digital** source group).

If your console is connected to a MORSE router, any IO sourced via that router will be coloured blue to distinguish it from other IO. See the MORSE supplement in Appendix A of this manual for more details.

It is recommended that you rename and re-order the **Source Groups** to put the most important and frequently accessed signals at the top – the two **Move** boxes under the **Group Actions** label allow rearrangement. The **Group Actions: New, Delete** and **Rename** buttons are self-explanatory!

Of course, when you have the ideal source group configuration, you may add sources to them:

➤ With the **Sources** button active, select a source group on the left.

➤ Scroll the right hand list to show the required source(s) and touch the source(s) which will add to the selected source group.

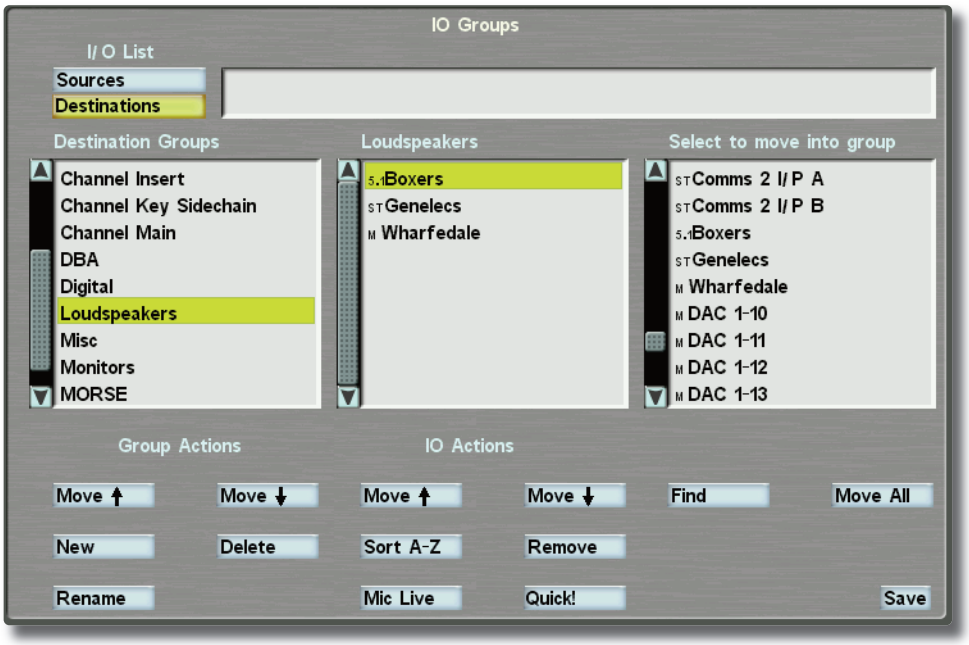
Sources within a group can be re-arranged using the **Sort A-Z** and **Move** boxes under the **IO Actions** menu, or removed from the group to allow it to be placed somewhere else using the **Remove** box.

The **Mic Live** box toggles a logic flag for the selected source within the middle list, allowing it to put the console in 'On Air' mode whenever it is live to either of the Programme outputs! This can be applied to analogue line and digital inputs as well as true mic inputs, and is shown by a small mic icon to the right of the source name (not seen in this screenshot).

The **Find** option allows a keyword to be entered which will filter the right hand source list to simplify finding a particular source, plus the **Move All** option will allow a one-touch selection of all similarly named sources into the current source group – very useful for placing all sources named 'AES' into a single group, especially when you may have several dozen of them!

➤ Remember to **Save** in order to ensure the changes are stored on disk.

➤ Now select the **Destinations** box, to carry out the same process of renaming and reordering for destination groups:




*Note that all the options work in the same way as for the Sources page, except for Mic Live, which has no function when dealing with destinations*

➤ Remember to **Save** again after editing the **Destinations**.

### Quickroute Assignments

The **IO Groups** display is also used to configure the Quickrouting lists which will be used by Preset-level users both for selecting input channel sources and for selecting sources and destinations within the **ROUTING** panel in the top right-hand corner of the Touchscreen.

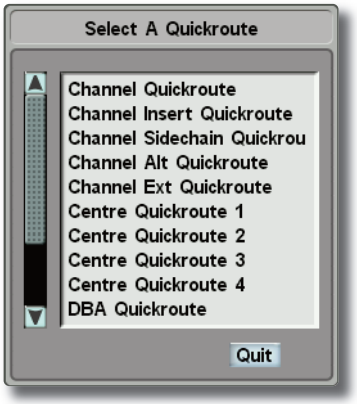
To select a Source for a Quickroute list:

➤ Ensure that the **IO Groups** display is displaying **Sources**.

➤ Select a Source which is to be added to a Quickroute list.

*Note that multiple sources can be selected within the list.*

➤ Press the **Quickroute** button, located under the **Remove** button in the **IO Groups** display, and the **Select A Quickroute** pop-up will appear:




➤ Touch Quickroute list to which the Source is to be added; the pop-up closes automatically.

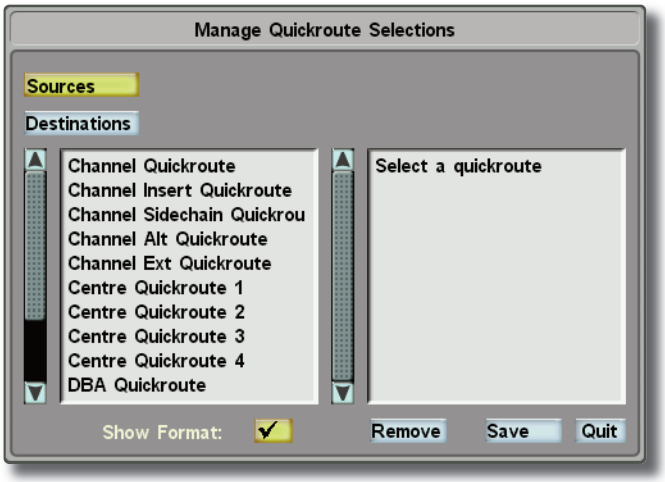
➤ Select a new Source and repeat the process.

A pointing hand appears next to signals to indicate that they have been directed to a Quickroute list.

➤ To select a Destination, touch the **Destinations** box in the top-left of the **IO Groups** display. Destinations are then selected in exactly the same way as Sources.

## QUICKROUTE

While the Quickroute lists are created in the **IO Groups** display, the **Quickroute** button in the **Route** menu opens a display providing a useful overview of the Quickroute lists and allows for entries to be deleted:



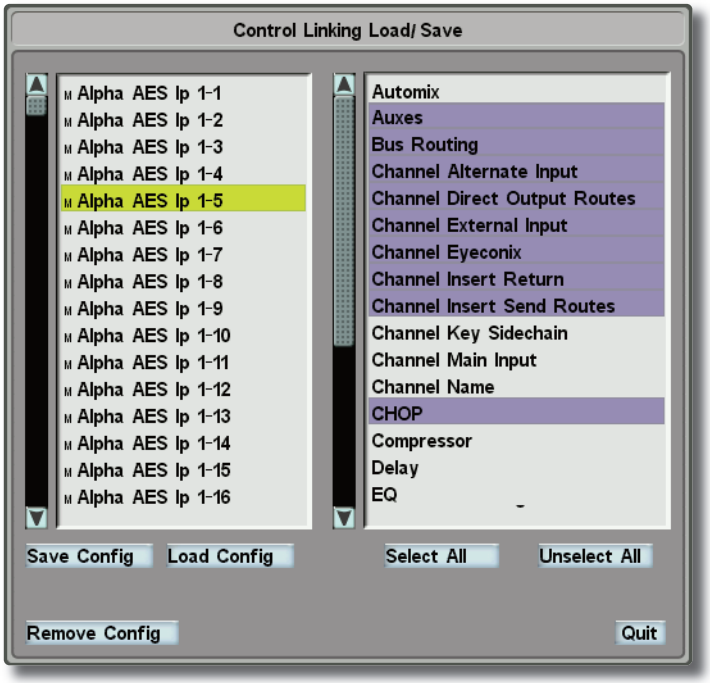

To remove a source or destination:

- Select the appropriate page using the **Sources** and **Destinations** buttons in the top left-hand corner;
- Select the appropriate route group (for example, **Centre Quickroute 1**) by touching it in the left-hand column;
- In the right-hand list, touch the Source or Destination to be removed and touch **Remove**.
- Press **Save** to save your settings,
- Touch outside of the display or press **Quit** to close the display.

## CTRL LINKS

This pop-up allows you to configure (and recall) Control Linking information for any source. Control Linking is the feature that allows any and all of a channel's settings to be stored with a particular source, so that when the source is routed into a channel anywhere on the console, you may choose to recall the saved Control Linking at the same time, reconfiguring the channel to its 'default state'.

*Note that Control Linking is always included in Quick-Route signal assignments.*




The full list of sources appears on the left, with the user names that you previously gave them in the **IO Names** pop-up. The list to the right of the pop-up shows the individual channel settings that may be saved and recalled

➤ To include a setting within the Control Linking feature, highlight it in the list. It will go blue to indicate that it has been included.

Of course, before you can recall any settings you need to save them:

➤ Ensure that the source in question is routed to a channel and configured according to your preferences, and highlight it in the left-hand list along with all the Elements that you wish to store for this source.

➤ Press **Save Config** and the Control Linking information will be saved. A small chainlink icon appears to the right of the source in the list.

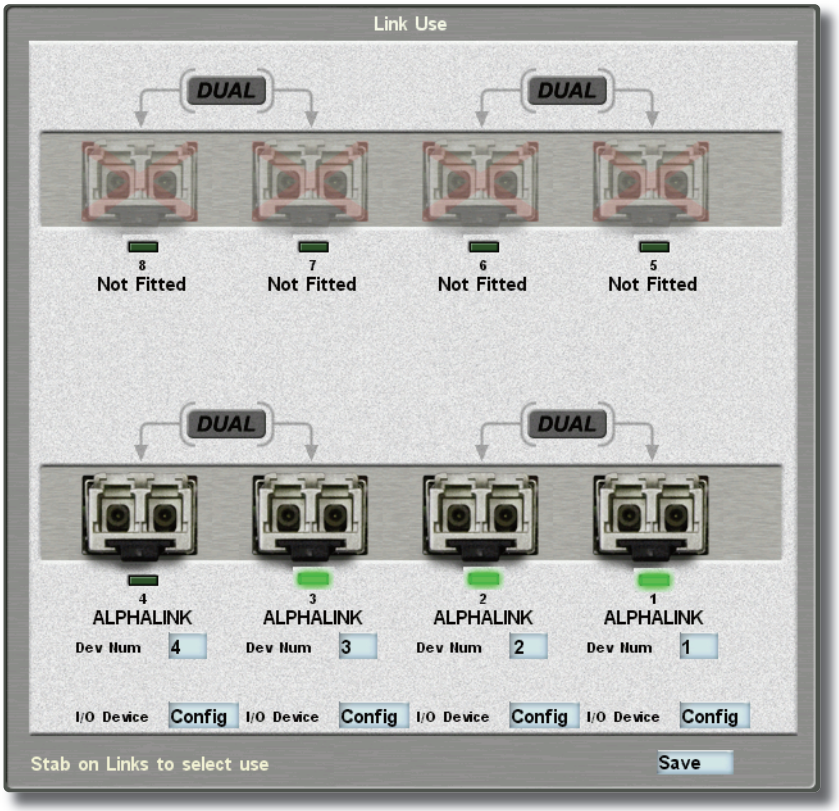
If that source is routed into two or more channels on the console, a pop-up will appear when you press **Save Config**, asking you to select which channel is to be used as a template for storing the Control Linking data.

When routing the signal into a channel, Control Linking can be included with its signal by pressing the **SETC** button (instead of **SET**) in the Master Control Strip. This may also be achieved through the **Load Config** box on this pop-up, allowing an assistant to recall complete channels on the console without getting under the engineer's feet!

## IO Links

The **IO Links** selection in the **Route** menu is used to determine how external IO is linked to the console. The primary IO option for the C10 is the Alpha-Link, though a number of other IO options are available.

*Stagebox signals may also be shared throughout the facility via a MORSE router, rather than connected directly. Third party MADI IO can also be connected directly, supporting both 56 and 64 channels.*




The pop-up shows graphical representation of the eight possible MADI links to the console. Those which are not fitted are greyed out and crossed out in red, as shown for Links 5 to 8 above.

➤ Stabbing on any of the available MADI socket pictures brings up the **Select Link Use** pop-up from which that IO link's connection can be defined:


- **MADI RMTE** (MADI connection with embedded DHD gain control capability);
- **ALPHALINK**;
- **DHD SB** stagebox;
- **MORSE** resource-sharing system;
- **RIO** rack;
- standard **MADI** link;
- **Not In Use**.

Stab on the appropriate blue box, or stab **Quit** to close the selector pop-up without changing it.

Below each **Link Use** link is displayed a 'light' which is lit green to indicate that the link is working, the link number and format, and any link-specific details, as listed below:

**MORSE** stageboxes display two blue boxes which define the current **Card Slot** and **Port** allocation for the MORSE card.

**RIO**s display two blue boxes which define which **Rio Num**ber is being linked, and which **Link on RIO** this is to be: Up to four links can be used on one RIO, allowing up to 254 channels of IO (See Page 5-29 for details).

**ALPHALINK** modules and **DHD SB** stageboxes display a single blue box which defines the address for the IO included in them. Stabbing on the box brings up a calculator pop-up on which the address can be defined.

*Note that each device needs to have a unique device number.*

Links to other **MADI** units display the IO channels currently assigned to that link – these are automatically assigned by the console.

*If a link previously configured as MADI is reassigned as Alpha-Link, then the MADI numbering is not updated until the console is re-booted.*

*On a redundant system, each processor has to be configured independently and both configurations must be identical. However, if the **IO Links** page is incorrectly configured on one processor, the redundancy indicator at the top of the Touchscreen will still display **Sync OK**.*

➤ Stabbing on the **Config** button for an Alpha-Link, DHD or RIO link brings up configuration display, as described on the following pages.

➤ Having made changes, be sure to save them by selecting **Save**.

## MADI Remote Configuration

Selecting **MADI RMTE** allows the console to send mic amp control data over MADI to any third-party pre-amps or routing systems which use DHD-protocol control data, such as Optocore and RockNet systems.

*Please see your equipment's own user documentation to establish what control protocol it uses.*

*Note that DHD protocol uses a standard 64 channel MADI Link with 56 channels for Audio; Control Data is carried on Channel 57 and the remaining channels are unused.*


➤ Ensure that the link has a suitable device number, and then press the **Config** button beneath it to open the Mic Setup pop-up.

➤ Define how many mic amps are included in the external MADI IO device by clicking on the number box, entering a new value in the numeric keypad which appears, and pressing **OK**.

➤ Touch outside the pop-up to close it.

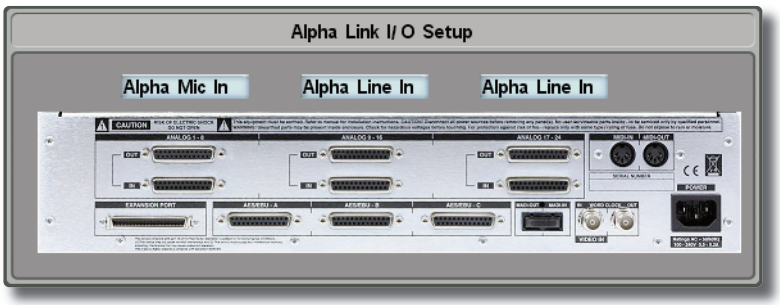
➤ The console must now be re-started for these changes to take effect.

*Note that the console assumes that mic amps occupy the lowest-numbered MADI channels – if there are 16 mic amps, the console will send mic amp control data on channels 1 to 16 of that MADI device.*

*Note also that these mic inputs are listed in the **Route** menu's **IO Groups** display as **MADI RMIC X-Y** (where **X** is the device number and **Y** the channel number). Inputs from the MADI device which have not been defined as mic amps will simply be displayed as **MADI ip X-Y**, in the normal way – though note that non-mic inputs are numbered from 1 and do not therefore refer to the channel numbers of the MADI device.*

## Alpha-Link Configuration

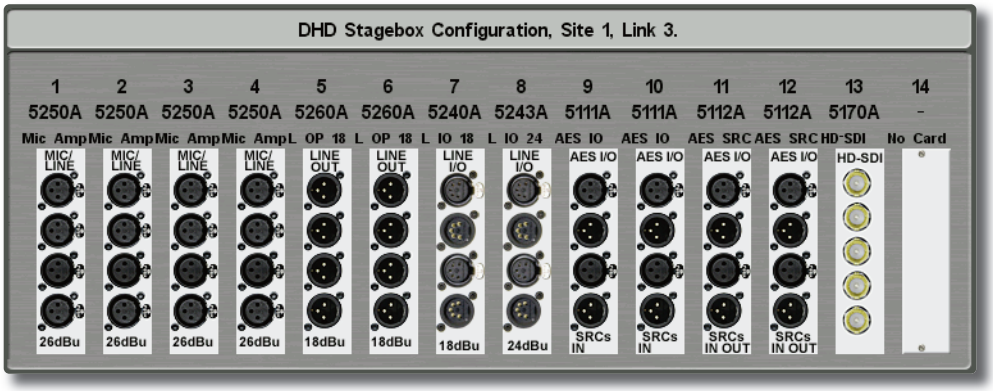
➤ Stabbing on the **Config** button for an Alpha-Link module in the **Link Use** display brings up the **Alpha-Link I/O Setup** display, in which each input to the 8-RMP unit can be selected:



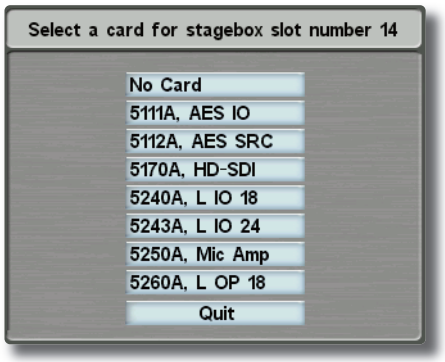

➤ Touch each blue box to switch between **Alpha Line In** and **Alpha Mic In**, then touch outside the display to close it.

## DHD Stagebox Configuration

➤ Stabbing the **Config** button below a **DHD SB** link in the **Link Use** display brings up a **DHD Stagebox Configuration** display, provideing a diagrammatic layout of cards fitted in the stagebox. This display enables each card in the stagebox to be defined, ensuring that the default IO labelling is correct and that appropriate control data can be sent.




➤ To define the card in each card slot, stab on the card slot in the graphic to bring up the '**Select a card for stagebox slot number x**' pop-up:

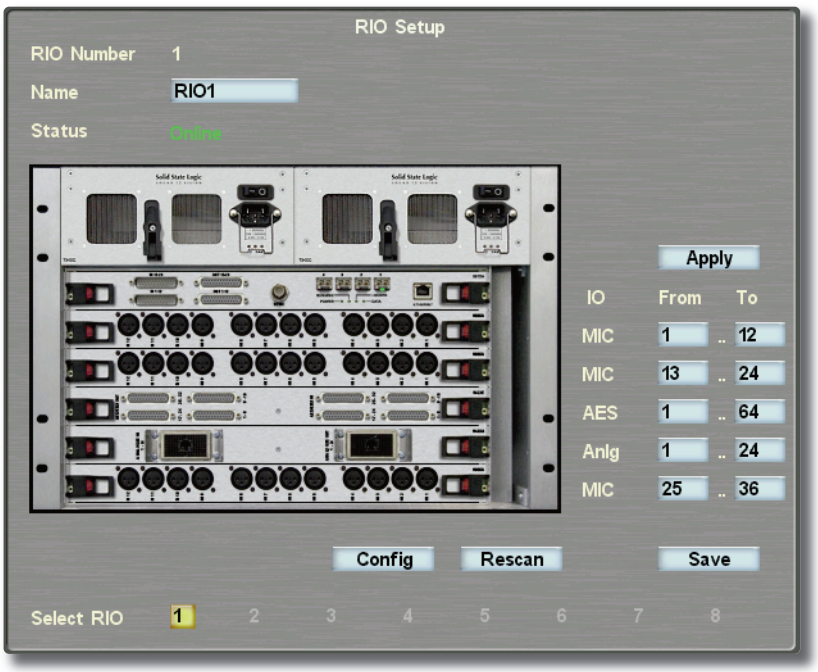



➤ Select the appropriate card type from the list, or press **Quit** to leave the card type unaltered. The pop-up will close automatically. The selected card type will be indicated graphically, and will be labelled above each card slot graphic.

➤ Close the configuration display by stabbing the screen anywhere outside of the display. Changes to this display are saved automatically.

## RIO Setup

➤ Stabbing the **Config** button below a RIO link in the **Link Use** display brings up a **RIO Setup** display. This display provides a diagrammatic layout of cards fitted to that RIO rack, and is where its IO cards are configured:




IO cards handle a different number of inputs or outputs according to their type:

**Analogue IO card** 24 balanced line inputs and outputs

**Digital IO card** 64 channels (32 AES/EBU pairs) of balanced inputs and outputs

**Mic Amp card** 12 input channels per card

*Note that the top slot in the RIO is always fitted with the controller card.*

➤ To rename the RIO, press the blue box next to the **Name** legend, type in the new name in the QWERTY pop-up which appears, and press **OK**.

If the card is online, **Online** will be displayed in green to the right of the **Status** legend. If the card is not online, **Offline** will be displayed in red.

If cards are rearranged within the RIO, pressing **Rescan** will correct the **RIO Setup** display.

➤ Press **Save** before leaving the display.

The boxes to the right of the graphic, underneath the **Apply** button, are used to defined the numbering of the IO for each card. Where there is more IO available than can be exchanged using the current link configuration, as described below, these buttons also allocate bandwidth to each card:

Each link has bandwidth for 64 channels, though two channels on the first link to each RIO are taken up with control information, thus reducing the bandwidth on that link to 62 channels. Each RIO can have up to four links, allowing space for a total of 254 channels. These RIO links are configured in the **IO Links** display, described on Page 7-27. If there is more IO enabled in the **IO Cards** display than the available links allow, priority will be given to the lowest-numbered IO within the lowest-numbered card. Any IO beyond the configuration's capacity will be greyed-out in the **IO Names** and **IO Groups** displays.

➤ To renumber the inputs within a card, select the blue box under the **From** legend and to the right of the appropriate card legend and type in the first IO number for the card using the calculator pop-up that appears. This number will be reflected in the **IO Names** and **IO Groups** displays.

➤ To use all of the IO available on the card, select the blue box under the appropriate **To** legend, and give it the last IO number for the card (In other words, give it the value found by adding the **From** value to the total amount of IO on the card).

➤ If you need to reserve bandwidth for other cards, reduce the IO number in the **To** box to limit the amount of IO used on that card.

➤ Once you have adjusted the IO numbering, press **Apply** for your changes to take effect.

## RIO Parameters

➤ Pressing the **Config** button below the main graphic in a **RIO Setup** display will bring up the **IO Parameters** pop-up for that RIO. Each card within the RIO can be accessed via the blue boxes across the top of the pop-up, with the currently selected card displayed in yellow. The **Inputs** and **Outputs** buttons define whether the card's inputs or outputs are being configured. The main part of the pop-up will then display the configurable parameters for that card type. The parameters vary according to card type, as detailed below. Each parameter can be adjusted on each input or output by stabbing the appropriate blue button.

> *Note that each parameter can also be adjusted for the entire card using the row of boxes immediately below the column labels.*

➤ Press **Save as Default** to save the current settings as the default for that card type, and **Load Default** to reset that card to the currently saved default settings.

The following pages describe the configuration of each card type.

➤ When you have finished configuring IO, press **OK** to close the **IO Parameters** pop-up.

> *Note that Analogue and MIC Amp cards have no configurable output parameters.*

### MIC AMP INPUT PARAMETERS:

**St Lim** Selects a 'soft' protection limiter with 17dB headroom; the threshold is fixed at –2dBFS.;

**PAD** Introduces a 20dB pad;

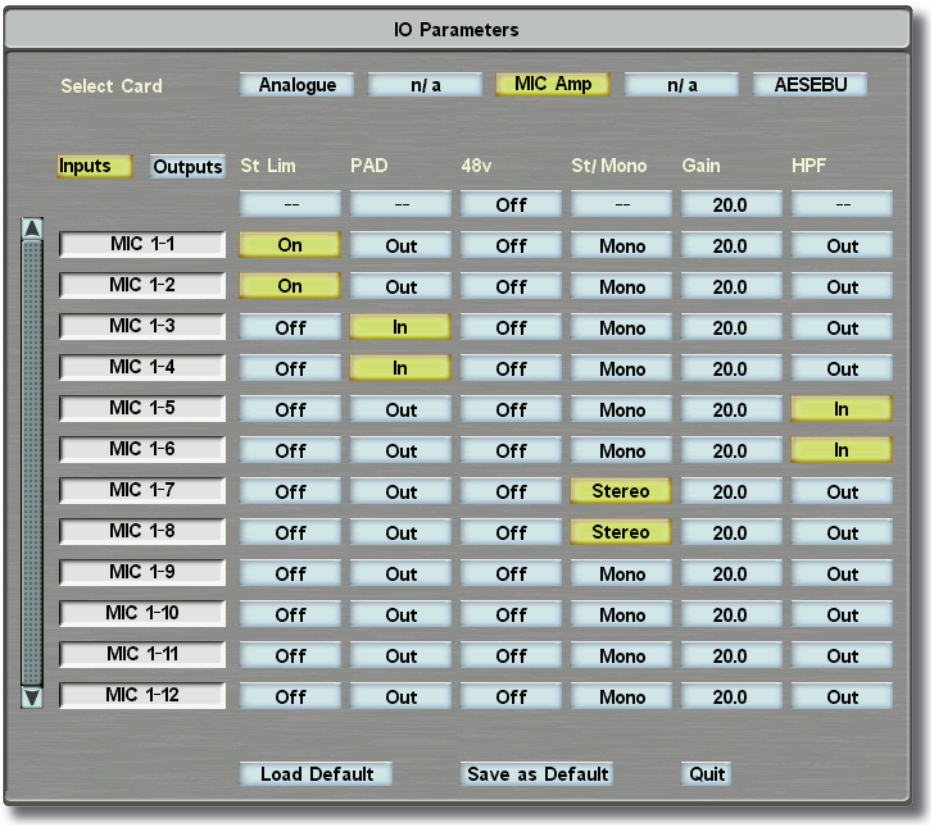
**48v** Activates the phantom power;

**St/Mono** Switches each pair of inputs between two **Mono** signals and a **St**ereo signal;

**Gain** Brings up a numeric pop-up which displays the gain of the mic amp. Mic gains can be set by touching a gain value box, typing the desired value in the calculator pop-up which appears, and pressing **OK**.

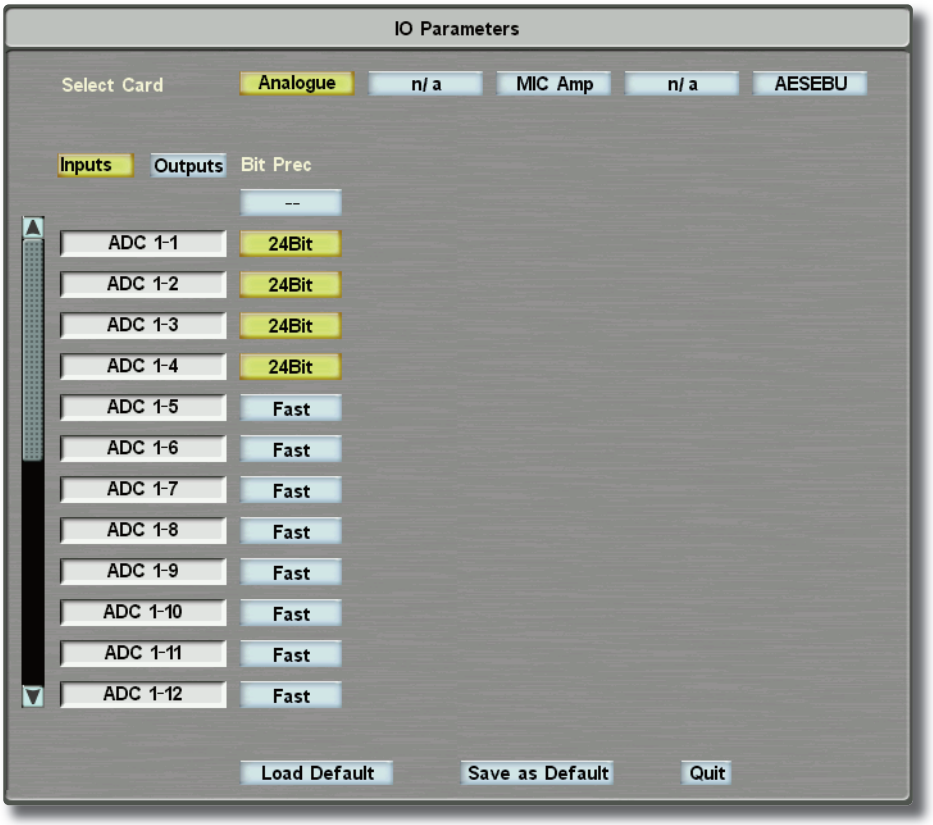
**HPF** Introduces a high pass filter.

*Note that these parameters can also be adjusted in the Master Channel.*



### Analogue Input Parameters:

**Bit Prec** defines whether priority is given to high audio quality or low latency in the signal's conversion to digital: Select **Fast** for a low latency conversion with a small reduction in signal quality (ideal for monitoring) and **24Bit** for a high quality conversion with a slightly larger latency.



### AESEBU Input Parameters:

**Mono 96** defines the format of 96kHz inputs: Single Wire (**Sing**) or Dual Wire (**Dual**);

**SRC** allows sample rate converters to be placed on a pair of inputs.

### AESEBU Output Parameters:

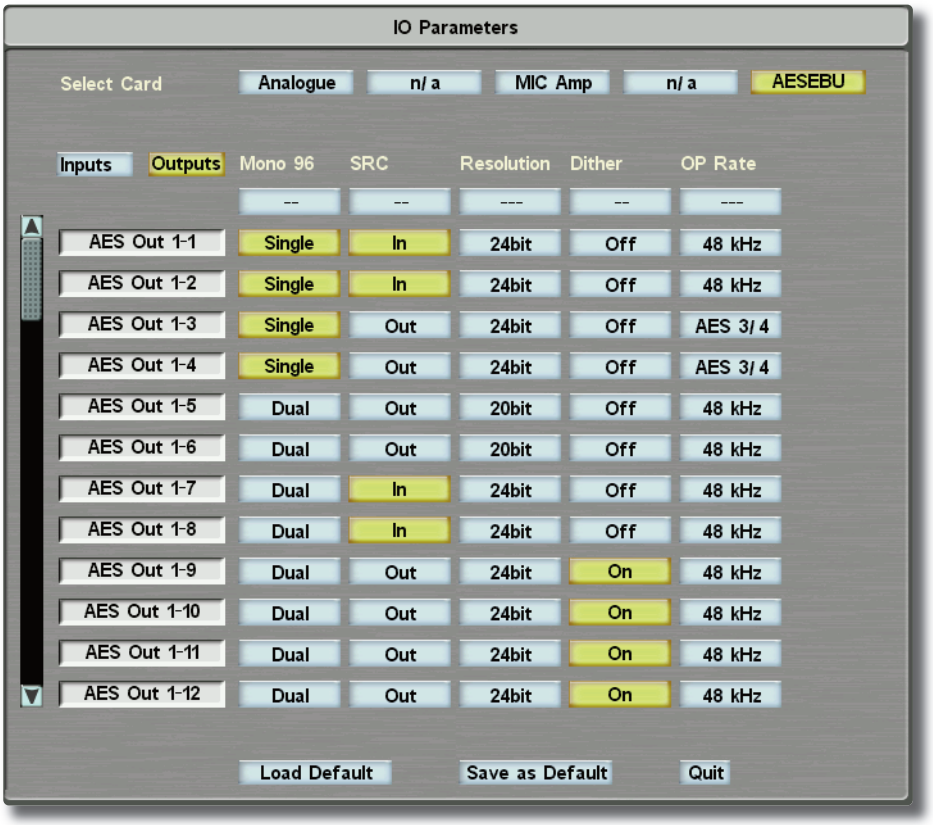
**Mono 96** determines how 96kHz outputs are derived. The options are Single Wire (**Sing**) where each channel uses one output clocked at 96kHz, or Dual Wire (**Dual**) where each channel using two outputs clocked at 48kHz for odd/even samples. However, as 96KHz outputs don't provide any benefits (see note above), how they are derived is largely irrelevant!

**SRC** allows sample rate converters to be placed on outputs. If any of the remaining digital output parameters require SRCs, they are automatically introduced;

**Resolution** allows the output bit resolution to be altered. Stabbing these buttons calls up a **Resolution** pop-up from which **24bit**, **20bit** and **16bit** can be selected;

**Dither** switches dither on and off;

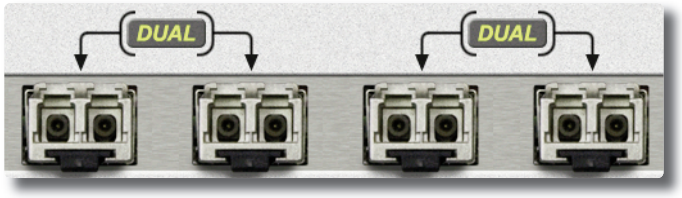
**OP Rate** calls up an **Output Clock** pop-up which allows the output sample rate to be set to follow the first six digital inputs (**AES 1/2**, **AES 3/4**, **AES 5/6**), 44.1kHz (**44.1kHz**), the current console sample rate (displayed above the option **44.1kHz**) or twice the current console sample rate (**2 x Fs**).




*Note: Digital IO is configured in pairs.*

## Creating Redundant Alpha-Link LIVE-R RIO and MORSE Links

It is possible to reserve two of the four links to a LIVE-R RIO or MORSE router for redundancy. To do this, simply touch the **DUAL** label above each pair of links in the **Link Use** page, and the higher (even) numbered link will become the back-up link for the lower (odd) numbered link. The **DUAL** label turns yellow to indicate that dual redundancy has been enabled. The configuration will be communicated to the IO unit when the **Save** button is pressed: If the first link in each pair fails, the second link will now automatically take over.



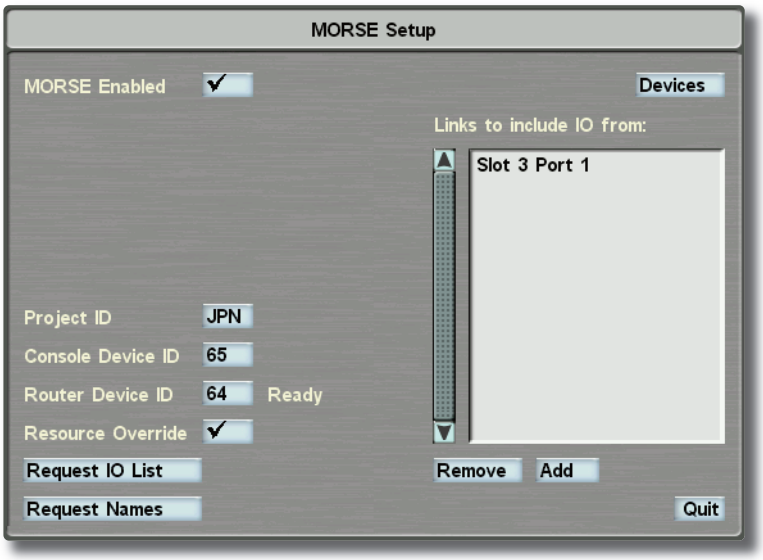

*Warning: If the second link is configured for another IO module when the faliure occurs, the other module's audio will appear in place of the first link's audio. It is important, therefore, to ensure that the second link in a redundant pair is correctly connected.*

*Note that all four RIO links in each row of the display are switched between Single mode and Dual Redundant mode together.*

*Note also that when dual redundancy is enabled, the IO capacity to that RIO is reduced to 126.*

## MORSE Setup

If your C10 HD is connected to a MORSE system, the **MORSE Setup** pop-up (see below) must be configured correctly before you will be able to take full advantage of the IO available via a MORSE router.




Unless there is a tick in the **MORSE Enabled** box, none of the other options on this pop-up will be available.

*Note also that you will be unable to access the MORSE options here unless the **IP** pop-up in the **Network** menu (see Page 5-39) has been configured.*

*See Appendix B for more details.*

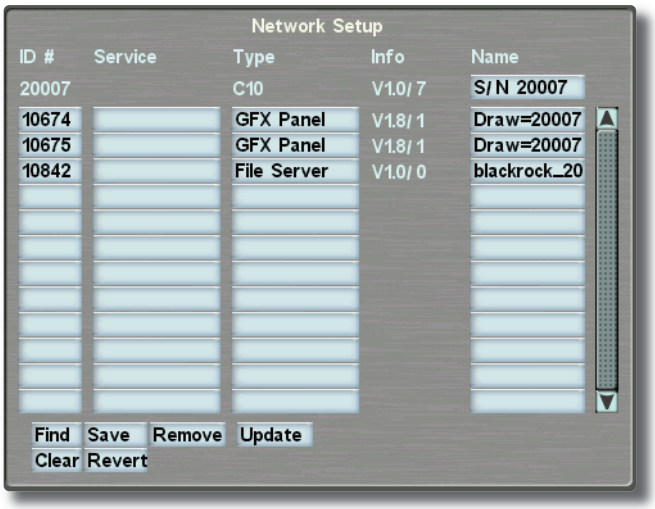
# Network Menu


The **Network** menu within the Maintenance pages contains the items that define the network configuration of the C10.

Under the Network icon are two submenus: **Netlist** and **IP**.

## Netlist

This page displays the configuration of the SSL network, and is used to define the relationship between control surface, the internal processor core and other SSL equipment processors:




In the configuration seen here, there are just two other networked processors in addition to the console computer. The columns of information give the 4-digit network **ID** numbers, the **Type** of unit, **Info** on software revision and a **Name** for each unit.

> *Note that the **Service** column is included for software compatibility purposes and is superfluous on the C10.*

➤ To search for all units currently connected and running, press the **Find** box, then make sure none of the options in the subsequent **Net Service Selector** pop-up are highlighted (ensuring that you will scan the network for machines of all types) and press **OK**. After a few moments the screen will refresh with all items found.

> *Note that in a multi-console installation the list could be fairly long!*

➤ To force the console to find a single item whose ID number is know, simply touch one of the blank boxes in the ID column and enter that number – if the unit is connected and powered it will appear almost immediately.

➤ To remove an unnecessary item from the list touch the **Remove** box and then the ID number in the list, or to **Clear** the list simply touch that box – if you make a mistake you can **Revert** the list to the way it was when you entered the page, and you can **Save** the settings to disk when you have completed your changes.

*Any units previously present but currently offline (disconnected, powered down or experiencing network problems) will appear in red. Once the problem has been fixed, pressing Update will re-establish communications and the entry will turn black again.*

Typical types of network devices are listed here, with a brief explanation of their function:

| **Type** | **Function** |
|---|---|
| **C10** | Console main CPU, deals with filing system and management of all parts of the console's processing. |
| **GFX Panel** | Provides the graphics for the Channel TFT screens. |

*Bitmaps are loaded to this panel via Ethernet, but actual data displayed is transferred over the high speed front panel connections*

| | |
|---|---|
| **Fibre MicAmp** | DHD fibre-connected mic stagebox. |

In multi-console installations it is often useful to give descriptive names to items of the same type in order to differentiate them, e.g. 'C10 St1' instead of just 'C10'!

➤ To rename items, touch its box in the **Name** column and enter a suitable title for it.

*Some items do not allow renaming if their system name includes vital information about which console is their master.*

➤ Remember to **Save** any long term changes – otherwise settings will only apply until the console is restarted.

## IP

The **IP Setup** display shows the addresses of the console's internal network, and should not be altered unless instructed to do so by an SSL service engineer. If your C10 is connected to a MORSE system, the **IP Setup** pop-up must be configured correctly before you will be able to take full advantage of the IO available via a MORSE router.


***Please note that these settings do not refer to the console's connection to an external TCP/IP network****. See Section 3 for information regarding the initial configuration of the console on an external network.*

*Where there is a redundant core, the two host IP addresses refer to the two cores. If the system has no redundant core, there will only be one host IP address.*

*This page is intentionally almost blank*

# CONFIG MENU

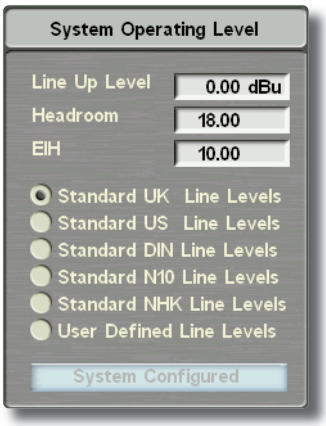

The **Config** menu within the Maintenance pages holds a number of items that form key elements of the C10 HD configuration.

Its submenus are **Levels**, **GPIO**, **AFV Setup** and **Pan Format.**

## LEVELS

This pop-up allows the global calibration of analogue line I/O cards fitted to a RIO I/O rack:

*These settings do not affect to digital, MADI or Alpha-Link I/O units.*




You may either choose one of the national **Standard** options, or you may select the **User Defined Line Levels** option and enter your own **Line Up Level** (eg. test reference in dBu) and **Headroom** (in dB).

If you choose a national standard, its values will be displayed automatically, all you must do is press the **Reconfigure System** box which appears at the bottom of the pop-up – when completed, this box changes to show **System Configured**, as above.

Regardless of the choice of line level, you may extend the analogue headroom in your SSL microphone preamplifiers by entering a positive value in the box next to the legend **EIH**. This acronym stands for Extended Input Headroom, and uses a differential gain stage to increase the analogue headroom in the mic amp with minimal impact on its sonic performance.

It achieves this by applying the specified EIH value to the digital input trim of any channel accepting a mic source, while reducing the analogue gain of the mic amps by the same value. So, if an EIH of 10dB was set and a mic gain was set to 50dB, then 40dB would be applied in the mic amp and 10dB at the top of the channel strip.

The EIH digital gain is transparent, as you will still see the channel input trim pot at 12 o'clock and reading 0dB, plus due to the low-noise design of the mic amp, 10 dB of EIH will not deteriorate the performance of the mic for gains above 25dB, and only slightly so for gains less than that.

*Alpha-Link Live units are only available in two fixed operating levels: +18 and +24dBu. The system should be set to match the appropriate Alpha-Link standard so that tone and mic gains are displayed correctly.*

## GPIO

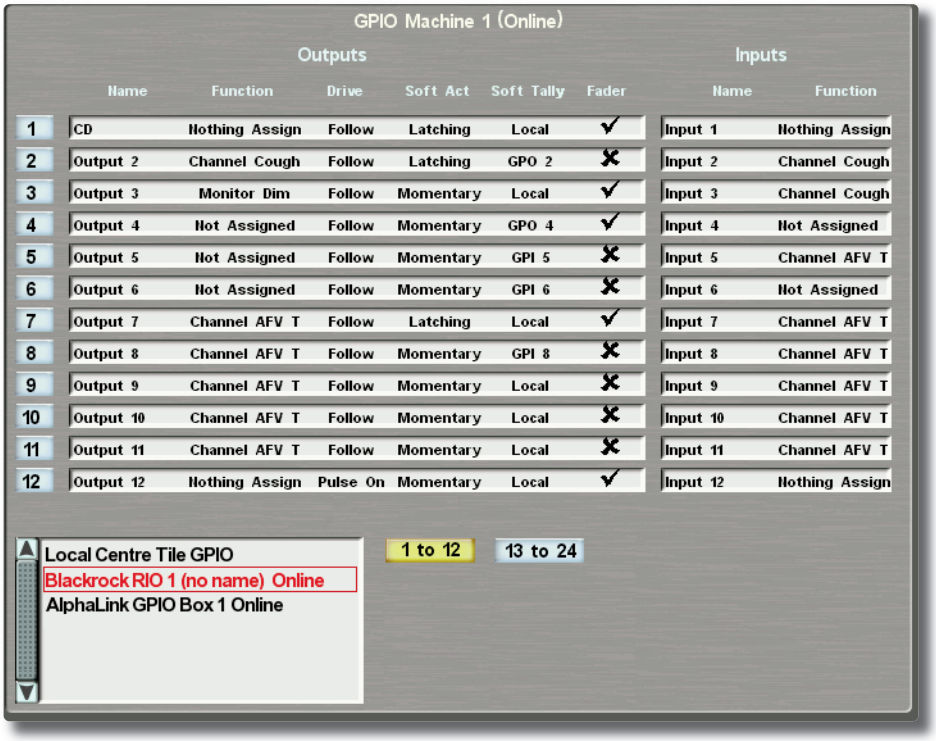
There are 12 local GPI ports, in addition to those present in any RIO connected to the console (RIOs have 24 GPI ports), providing opto-isolated inputs and relay closure outputs for simple and reliable connection to equipment such as playback machines and external controllers.

The inputs may be used to trigger any of the console's internal switch functions such as Talkback, or they may be used to indicate tallies from external machines such as the transport status of a CD player.

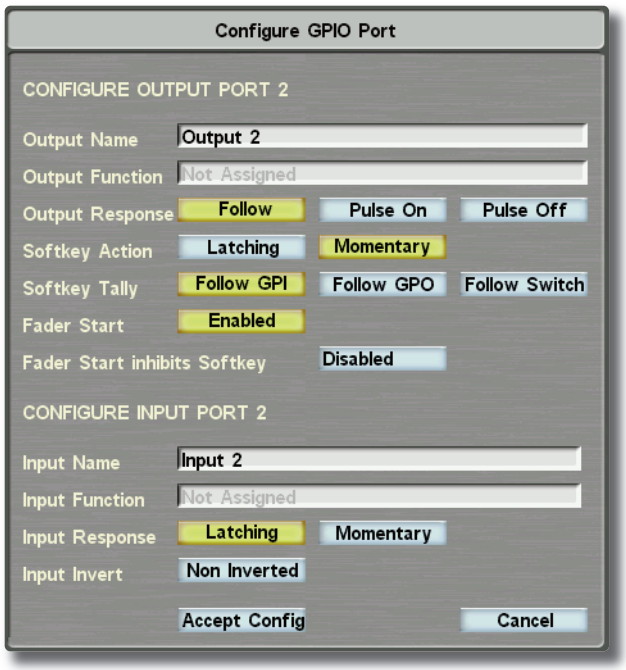
Likewise, outputs may be set to indicate the status of the console's internal switch functions such as. On-Air status, or they may be used to control external machines, such as a fader start for a CD player.

Both inputs and outputs may be set to behave in different ways depending on user preference and the style of control signal supplied or expected by external equipment.

GPIs are configured in the GPIO display. The bottom left-hand corner of the display lists any available RIOs, in addition to the **Local** ports. To configure a GPI port, stab on it in this list. The display will then show the first 12 outputs on the left and inputs on the right. RIO GPIs 13 to 24 can be access by pressing the **13 to 24** button at the bottom of the window.



➤ Press on a row in the display to bring up its **Configure GPIO Port** pop-up, which shows the output and input programming for that GPI:



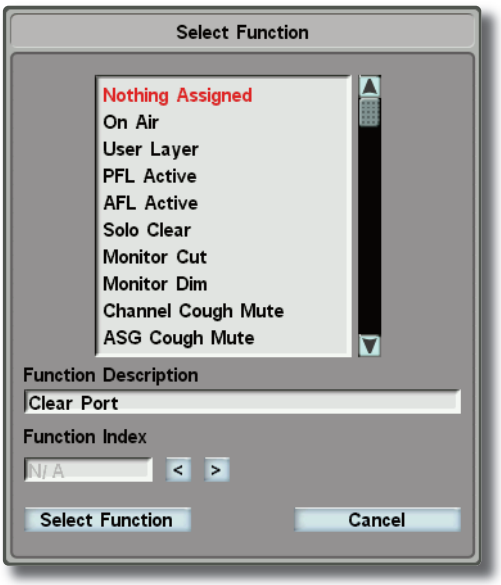

You can see here that the output and input ports are in fact completely independent, although they may be used together. Each output may be given a name, as may the inputs, using the boxes to the right of the **Output Name** and **Input Name** legends. Note that these are the names that appear in the Free Control lists etc.

If an input is not programmed (i.e. it has the words **Not Assigned** next to the **Input Function** legend) then it may still be used as a tally return for an external signal. Likewise, if an output is not programmed by the **Output Function** legend, it may still be used as a fader start trigger, as long as the box next to the **Fader Start** legend reads **Enabled** (as shown above).

For a fader start output to be active (i.e. the output relay contacts closed), the fader must have the fader start GPI output assigned to a fader (refer to the Operator's Manual section 3), the fader must be open and the channel must be switched on – remembering that any VCA master fader must also be open! When the fader start is active, the fader icon in the processing order shown in the Channel Information Display will be coloured green.

If **Fader Start** is **Enabled**, a further option becomes available: When **Fader Start inhibits Softkey** is **Enabled**, any softkey assigned to the same function as the fader start is inhibited when the fader start is active.

➤ If you want the GPI input to trigger a console function, then press on the **Not Assigned** box and another pop-up will appear with a full list of available functions:




➤ Choose one of the functions from the scrollable list, which will give a brief description of what it is in the white box just below.

Most functions also require a **Function Index** number, which is used to identify the channel or ASG or PGM on which you want this GPI to trigger (or to follow if you are programming a GPI output). Some functions in the list, such as **Monitor Cut**, do not have a **Function Index** as there is only one of those buttons on the console.

➤ The **<** and **>** boxes next to the **Function Index** number allow you to change the value shown there. The **Select Function** box must be used to confirm the choice, or the **Cancel** box may be used to clear the pop-up without making any change.

Once you have chosen the function, you have the option of altering the way in which the GPI input or output responds to the trigger. The **Input Response** options are **Latching**, where a pulse on the input latches a function until another pulse cancels the function, or it can be **Momentary**, where the function is only active for as long as the input is active. There is also an option to invert the logic of the function, so it is triggered when there is no input to the GPI and vice versa; this is chosen next to the **Input Invert** legend.

The output port also has options for changing its behaviour, these start with the **Output Response**, which may be set to **Follow** (the GPI exactly matches the state of the function), **Pulse On** (the GPI pulses briefly when the function is activated) and **Pulse Off** (the GPI pulses briefly when the function is deactivated). Of course, if the **Fader Start** option is set to **Enabled** then this GPI output can be triggered from the fader.

The GPI output may also be triggered from a 'softkey' – these can either be channel or Centre Section Free Control buttons (Refer to the Operator's manual for more on **Free Assign** and **GPI Free** functions). Once you have a softkey controlling a GPI output, you may choose the button to be either **Latching** or **Momentary** next to the **Softkey Action** legend.

There are three **Softkey Tally** options, defining how a GPI triggers a softkey light: If **Follow Switch** is selected, the tally is triggered simply by pressing the softkey – useful where there is no external tally back to the button; If **Follow GPI** is selected, the corresponding GPI input is used to light the softkey button – useful for confidence monitoring of fader starts and similar external machine control. If **Follow GPO** is selected, the GPI output ('GPO') triggers the light – useful if the GPI can also be triggered by something other than the softkey.

➤ Once you have programmed the GPI output and input, press the **Accept Config** box to confirm your choices, or press **Cancel**.

➤ If you want to control a console function that is not currently available in the **Select Function** list (shown opposite), import it by finding the appropriate entry in the **Functions** file in the **Function Lists** directory on the console's hard disk, then copying that line into the **GPIO.lst** file found in the same directory, and restarting the console.

*Note that you should of course make a backup of any file before editing, using any computer on the console's network (see Section 4 for details).*

The entries in the **GPIO.lst** file follow the format:

```
Function, min, max, offset, list name, description
```

For example, to add the channel compressor in/out function:

```
Comp In, 257, 352, -256, Channel Comp, Chan Compressor In/out
```

*Note: For all channel-based functions, the min, max, and offset values should be 256, 352, and -256 respectively, or they will not work correctly. Also, the function name at the start of each line should be entered exactly as the Functions file states, but you may choose the list name and description.*

All other functions use min and max values as found in the **Functions** file, with an offset of 0, eg:

```
ASG On, 0, 8, 0, ASG On, ASG On/off
```

It is a good idea to limit the **GPIO.lst** file to only the essential functions, as this is loaded at bootup, and the more functions it has will increase the console's boot time.

## AFV Setup

The C10 has a comprehensive Audio follow Video (AFV) system that allows external equipment to trigger the opening and closing of channel, ASG, and even PGM faders, using GPI inputs. This provides an automatic mix capability for events where audio sources need to track camera changes quickly, for example the drive-by mics on a motorsport racetrack.


➤ Touch **Override** to override the AFV GPI inputs. The button goes yellow to indicate that it is Override.

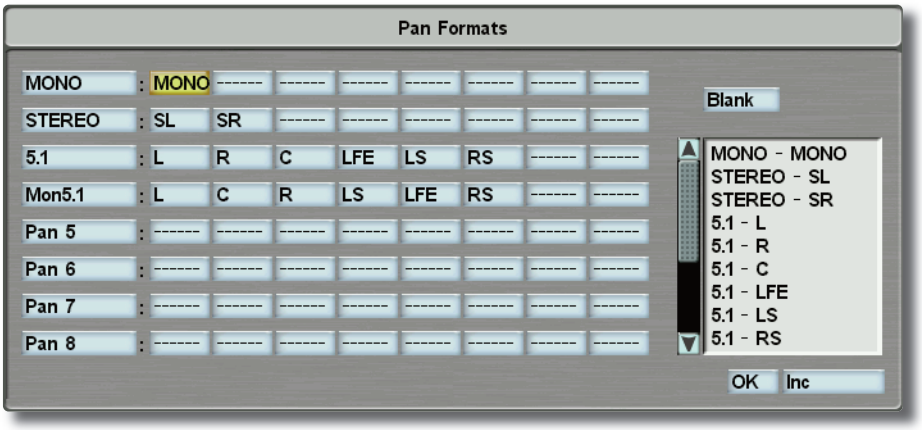
*The Override function may be assigned to an external GPI input, or to a console softkey.*

➤ To alter the glide time on or off, touch the value box to the right of **AFV On Glide Time** or **AFV Off Glide Time**, type in a new value in the pop-up which appears, and press **Enter**.

Glide times can be set between 1 and 200 video fields (4 seconds for PAL and 3.33 seconds for NTSC).

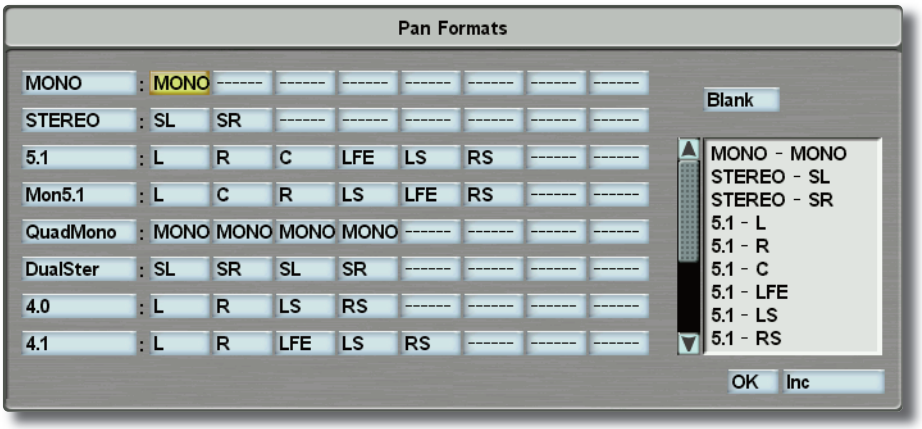
## Pan Formats

In addition to Mono, Stereo and 5.1 pan formats, this pop-up allows access to various additional multichannel formats which can be customised for specific operational contexts:




It is not possible to alter the first four format presets – the console will warn you if you try! However, there are 4 more presets, here displayed as **Pan 5** to **Pan 8**, which are available for user-defined multichannel presets.

As an aid to understanding, we have produced a suggested layout for these additional formats, providing some practical presets for use in TV production:




Notice that the 5th row is called '**QuadMono**', because it is four mono channels grouped together. This can be used to bring all four mono tracks on a VTR into a 'quad mono' channel on the console, which can be spilt across adjacent faders to show the master and four mono components individually, just like a stereo or 5.1 channel. Likewise the '**DualSter**' preset has 2 stereo channels, for playout devices that typically have two stereo tracks.

The '4.0' channel has L/R front and L/R surround components, but no Centre or LFE – ideal for crowd ambience for sports and music production in HD – why waste two DSP channels from a 5.1 input channel when you only need to handle 4 sources? Likewise, the '**4.1**' preset is intended for Music & Effects (M&E) mixes of sports, music programmes, etc. where the announcers/presenters are handled separately and there is no need to have a Centre channel.

It is possible to create customised format presets, but we suggest that you experiment with these on the control surface to ensure that you understand how they work before using them on-air!

All of the **Pan Format** settings are stored in a new Element within each Project.

Occasionally, it may be desirable to change a channel's format between two presets that have the same number of components – e.g. a VTR was playing 4 mono tracks but is now playing 2 stereo tracks. Without destroying your channel settings, it is possible to reconfigure a channel while on-air to handle such a change:

➤ Press the **CH SET** button on the Master Control Strip.

➤ Select the appropriate channel using the **ATT** button.

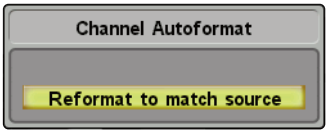
➤ Scroll the cursor down to **Format** and select the new preset you'd like to apply.

As long as the current format and the new format have the same number of elements, the console does not need to release the DSP from that fader and then remake the channel (which is a destructive process), so you have a new option '**Change to Format**'. Selecting this option will retain the DSP and all of the channel's settings, but it cancels the channel **ON** button to avoid any noise being generated while the format is reset – so remember to switch the channel back on again afterwards! That channel immediately provides the panning and other related features relevant to the format preset that was chosen.

## Auto Format

Channels can be automatically reformatted when an input source of a different format is routed to it, without editing the **Channel Settings** display.

To activate this feature, open the **Auto Format** pop-up located, located in the **Config** menu:




Touch the button to switch auto-formatting on and off – Auto-formatting is on when the button displays **Reformat to match source** (yellow background) and off when it displays **Preserve format on re-route** (blue background)

# DSP Menu


The **DSP menu** within the Maintenance pages holds one item, **Status DSP**, which provide feedback of the usage and operating status of the console's digital signal processing:

## Status DSP


Each of the 16 DSP chips is shown by an animated fish, swimming back and forth to indicate that all is well – if a software hang or crash occurs the fish graphic turns to a skeleton on the aquarium floor(!), but immediately the Self-Healing system will mute the chip (to avoid digital noise being transmitted) then restart and test the chip for correct operation before placing the processing back into the audio path – all in less than 0.2 seconds!

You therefore need very good eyesight to see the Self-Healing process in operation, and quick ears too. Each chip runs a different algorithm to ensure that the resources are generated in the most efficient way, plus this also allows the no-glitch reordering of processing in the channel/ASG/PGM paths.

If the chip has been experiencing problems (most likely to be software conflicts) that caused it to reboot, the number of times it has been reset by the Self-Healing system (since the console was last powered) is listed as the **Reboots** text item under each fish display – the other text items are diagnostic readouts intended for service use, so we won't bother looking at them in any detail.

It is possible to manually reboot any of the DSP chips by touching the fish and choosing **Yes** from the subsequent confirmation pop-up, but this is intended as a diagnostic feature and should NOT be performed while on-air!

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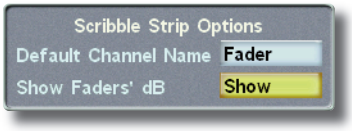
# Front Panel Menu


These options within the Maintenance pages allow a number of facilities to be configured that relate to the operating surface of the console.

The submenus are: **Scribble**, **Settings**, **Ethernet FP Setup**, and **Fader Reset**.

## Scribble

This pop-up allows the electronic scribble strips (found above every fader) to be configured. The pop-up shows two options:

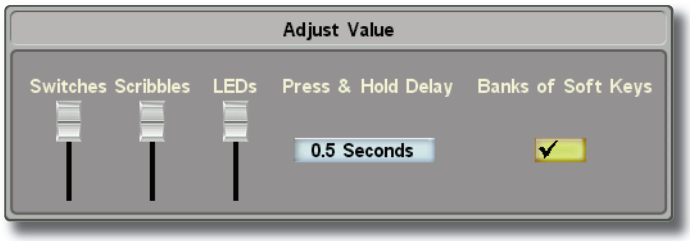



The **Default Channel Name** option allows you to enter a default name for the scribble strips when no user name has been entered (the console will automatically add the appropriate fader number to the end of this). If you leave this box blank, then the input name of the channel source will be copied directly to the scribble strip – ideal for channels fed from a router as its name labels may then be dynamically imported to the channel TFT screen and the scribble display simultaneously!

The **Show Faders' dB** option allows the momentary display of the fader gain in the scribble window when the fader is adjusted.

## Settings

This pop-up includes three small faders which control the brightness of (from left to right) the console's screens, scribble strip, and LEDs.



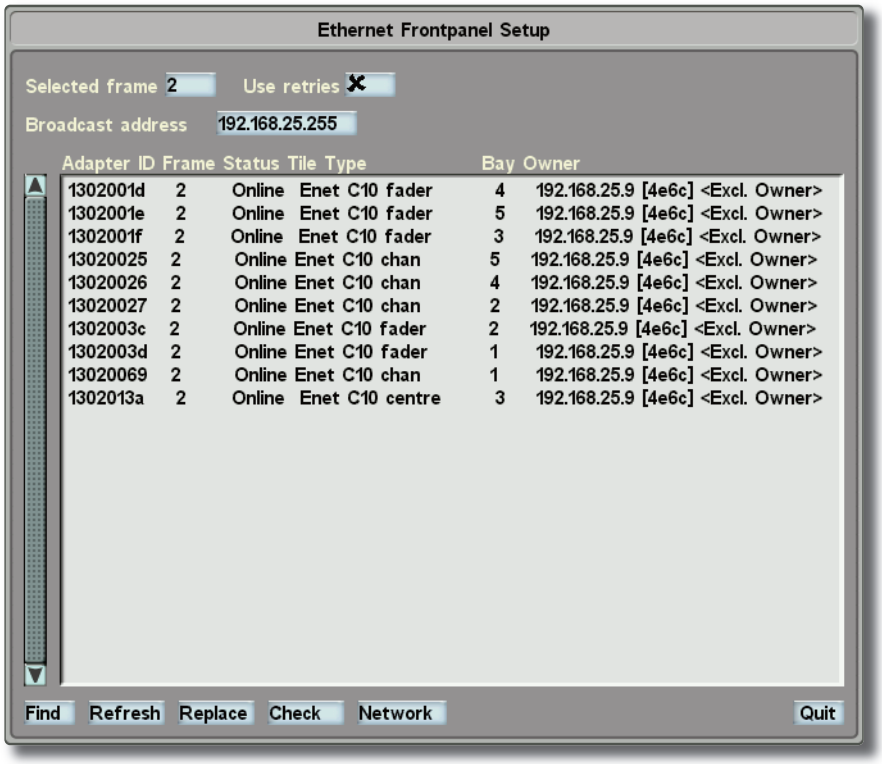

➤ To adjust each fader, simply drag it on the Touchscreen.

➤ To set the '2nd function' time delay for all press-and-hold functions (such as resetting the EQ section), touch the **Press & Hold Delay box**, type a new time and press **Enter**.

➤ To switch the Centre Section softkeys between Banked and Unbanked modes, touch the box by the **Banks of Soft Keys** label. The box is ticked when banks are active.

## ETHERNET FP SETUP

All of the tiles on the C10 control surface are connected to the console processor via Ethernet, and the **Ethernet FP Setup** section of the **Front Panel** menu manages these connections. You will only need to access this section if any part of your front panel has been changed or stops working properly. We recommend that you do not alter any of the settings in these submenus without close consultation with your local SSL Service representative.




The main part of the **Ethernet FP Setup** screen consists of a list of each tile in this frame, and the columns contain the following information:

- **Adapter ID** is the tile's unique ID which is the same as that printed underneath the tile.
- **Frame** is the frame number which has been defined in the Enter Frame ID pop-up described below.
- **Status** shows whether the tile is online or offline.
- **Tile Type** displays what type this tile is:

  Centre Section ('**centre**'),

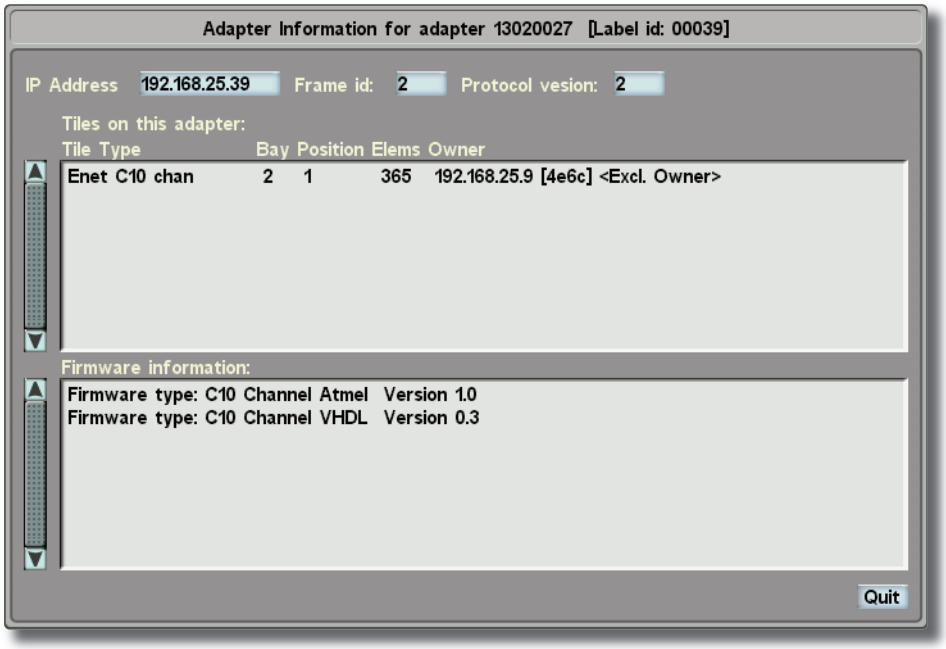
  Fader ('**fader**'),

  Master Channel ('**bay**')

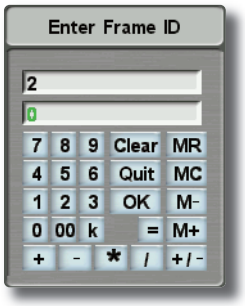
  Channel Strip ('**chan**').
- **Bay** identifies which bay of the frame the tile is located in, and is detected automatically.
- **Owner** displays the IP address of the parent CPU, along with its serial number in brackets, and the state of the connection (4 meaning good!)

The text for working tiles will be black, whereas the text for any tiles which can no longer be found will be red.

Pressing on any line in the screen will bring up an information pop-up for that tile. The only information you are likely to need from this page is the firmware type, shown at the bottom, which a Service engineer may ask you to provide. You can also set the tile's IP address:




The frame number for your front panel is displayed in the top left-hand corner of the main **Ethernet FP Setup** screen. To edit this, press the blue box containing the '**Selected frame**' number to bring up the Enter Frame ID pop-up:

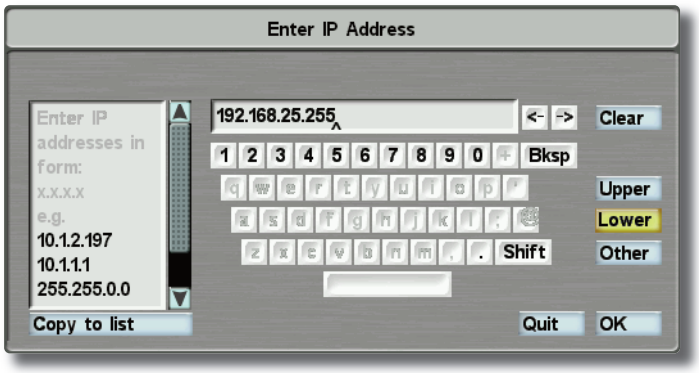



Frame numbers run from 1 to 15. Frame 0 is reserved and means 'not in a frame'. The frame number for your front panel must be unique on the network it is on.

The **Use retries** box in the main **Ethernet FP Setup** screen allows you to choose whether or not the CPU automatically retries communications with tiles when they time-out.

The broadcast address is set to 192.168.25.255 by default. Set it to something suitable if you have different IP settings to those suggested above.

➤ To do this, press the blue box containing the broadcast address to bring up the **Enter IP Address** pop-up:




➤ Type the required address using the numeric section of the QWERTY keyboard.

The **Copy to list** button, located below the IP address list on the left of the pop-up, allows you to add the new address to your list of addresses, for quick entry elsewhere in the console's setup pages.

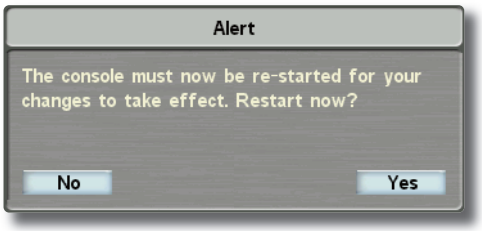
The **Find** button in the **Ethernet FP Setup** screen searches the front panel for tile alterations.

➤ Press this to bring up a pop-up alerting you that a restart will be required:


➤ Press **Yes** to bring up the following warning:


➤ Press outside the box to start the search.

Once the changes are complete, a pop-up inviting you to restart the desk will appear:

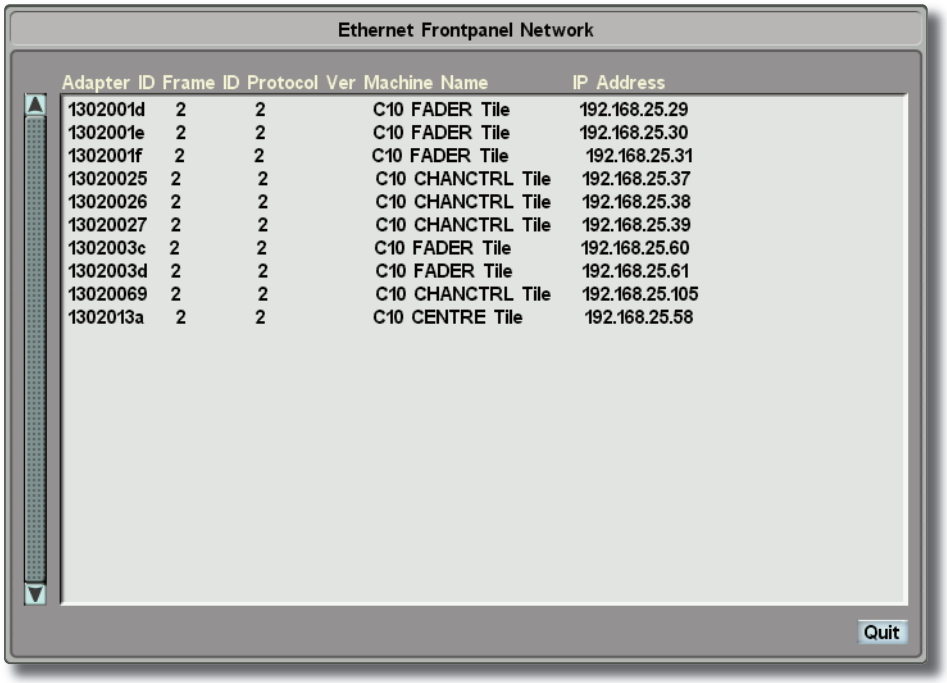



➤ Press **Yes** to continue.

*Please note that this restart takes much longer than a normal boot-up. You will find that any malfunctioning tiles which previously appeared in red will now no longer appear at all.*

➤ Press **Refresh** button in the **Ethernet FP Setup** to refresh the front panel.

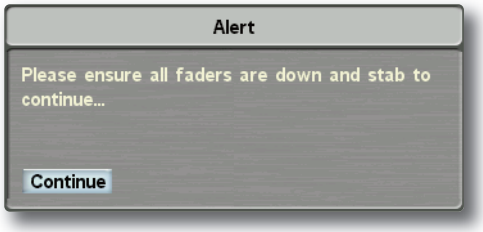
➤ Press the **Network** button in the **Ethernet FP Setup** screen to bring up a pop-up which tells you what tiles are available across the whole network, not just in this frame:



## Fader Reset

If the faders become miscalibrated due to temperature variations or physical knocks since the front panel was last powered up, they can be recalibrated by pressing this button.

All of the faders will close and an **Alert** pop-up will appear in the centre of the Touchscreen:




*Note that when the faders close, the audio is not changed in any way – it is completely safe to do a fader reset, even while On-Air!*

The system uses the fully closed position as a mechanical reference for calibrating the faders.

➤ Manually close any faders that were not moved to this position — perhaps their motion was blocked by a book or tape.

➤ Touch **Continue** to activate the recalibration process, which takes a couple of seconds.

➤ Once the reset is completed, faders are returned to their correct mixing positions and you may continue working as normal.

*Note that this function also re-initialises all the front panel controls, and could therefore be used after clearing a front panel lockup if you are suspicious that some of the controls have been knocked out of position (note that a Layer change will also refresh the front panel).*

## ROUTER LABEL IMPORT

The C10 can interrogate a plant router in order to import and display the router's mnemonics (name labels) on the console. This facility enables you to see the real names of the sources that are being fed into the console by an external router, automatically updating every second.

The C10 uses one of its serial ports to communicate with the router, using the Probel 'General Switcher Protocol SW-P-08' (GSP) over an RS422 link (found on the rear of the console). The console needs to be told which crosspoints correspond to its inputs, then it will poll the router and extract the relevant names to be shown in the routing lists, channel source names, fader scribble strips, and even on the Touchscreen (eg. where an external router feeds one of the four 12-way source selectors).

There are three text files relevant to this configuration that are stored in the 'sysfiles' directory on the hard disk; The **Switcher_Serial_Config** and **Switcher_IO_Allocation** files configure the hardware and inform the console where to look in the router for the labels that correspond to a particular input. The **Switcher_Poll_Time** file determines the time interval between information (cross point interrogation) requests to the external router.

In the Switcher_Setup file there are 8 lines of text, here is an example:

| | |
|---|---|
| `<Switcher_Setup>` | This signifies the start of the data |
| `SYSTEM PROBEL` | This defines the type of router system as PROBEL or NONE |
| `PORT 1` | This defines the serial port used on the console processor |
| `BAUD_RATE 38400` | This defines the data rate, must be identical to the router |
| `PARITY EVEN` | This defines the parity, must be identical to the router |
| `DATA_BITS 8` | This defines the data bits, must be identical to the router |
| `STOP_BITS 1` | This defines the stop bits, must be identical to the router |
| `/<Switcher_Setup>` | This signifies the end of the data |

If this feature is not being used, entering NONE as the type of router system will tell the console not to try to interrogate anything over the serial connection, and the other parameters may be set to any values in this case – they are no longer relevant.

> *Note that the Switcher_IO_Allocation file may not be present – it will be created automatically on reboot after the system type entry in the Switcher_Serial_Config has been set to PROBEL. Resetting the system type entry back to NONE will leave the Switcher_IO_Allocation file untouched.*

At the top of the **Switcher_IO_Allocation** file there is a brief explanation of the data layout:

```
{ Switcher IO Allocation File }
{ System IO name eg "ADC 1" "(serno) ADC 1"}
{ Switcher matrix number 1..n}
{ Switcher level number 1..n}
{ Switcher source number 1..n}
```

This is then followed by groups of 4 lines, each of these entries tells the console from where in the router an input is fed.

| | |
|---|---|
| `<Switcher_IO_Allocation>` | This signifies the start of the data |
| `allocate` | This allocates the following input to a router crosspoint |
| `Dig In 1` | This is the C10's input being allocated |
| `1` | This is the matrix number in the router |
| `1` | This is the level number in the router |
| `1` | This is actually the *destination number* – as seen by the Router (despite the explaination at the head of the file…) |
| `allocate` | (the file continues with as many allocations as required) |
| `Dig In 2` | |
| `1` | |
| `1` | |
| `2` | |
| `/<Switcher_IO_Allocation>` | This signifies the end of the data |

The matrix, level and source number all define the crosspoint in the router which feeds signal to the relevant C10 input, so that the console knows which name to extract from the router and attach to the signal coming in to a particular input. This file can be extended to include many such allocations according to the number of inputs fed from router outputs. If this feature is not being used, no **Switcher_IO_Allocation** file is required.

If the feature is being used but communication to the router is lost, an error message will appear on the Touchscreen, which can be cleared manually, or will disappear as soon as communication is restored.

The **Switcher_Poll_Time** file is normally written to by a diagnostic command:

| | |
|---|---|
| `CP140 Poll n <CR>` | Where 'n' is the interval between polls |

Note that the base interval is fixed at 20ms and the default interval number is '5'. This provides a default interval of 100ms which suits a Probel system whilst a minimum interval of '12' (240ms) will be necessary for a Miranda NVision router. The maximum interval allowed is '50' (1 sec).

The file can also be edited by hand if necessary. By default it will contain the following:

| | |
|---|---|
| `<Switcher_IO_Allocation>` | This signifies the start of the data |
| `5` | This is the poll interval ('5' = default) |
| `/<Switcher_IO_Allocation>` | This signifies the end of the data |

*It is recommended that the system be rebooted after adjusting the polling interval.*

- **Equipment Specifications**
- **Connector Specifications**
- **Connector Pinouts**
- **Environmental Specifications**
- **Audio Interfacing**
- **Table Mounting the Console**
- **The RIO I/O Unit**
- **MORSE I/O and Routing System**
- **System Redundancy**
- **SNMP**
- **Supported Sync Rates**

# SECTION 6:

# APPENDICES

**IN THIS SECTION ...**

… is all that useful reference information.

## Section Contents

# APPENDICES

## A: Specifications

| C10 HD Console | | | | |
|---|---|---|---|---|
| Parameter | *Condition* | *Value* | *Unit* | *Notes* |
| Height | To top of meter trim | 977 | mm | |
| Height adjustment | | -0 +10 | mm | |
| Width | 24 channel console | 1146 | mm | |
| | Additional 8 channel bay | +285 | mm | *Add or subtract* |
| | Contoured side trims | +60 | mm | *30mm each side* |
| Depth | | 768 | mm | *+ additional 15mm for heatsinks* |
| Weight | 8 channel | 35 | kg | *Approximately, without legs* |
| | 16 channel | 65 | kg | *Approximately, including legs* |
| | 24 channel | 83 | kg | " " |
| | 32 channel | 97 | kg | " " |
| | 40 channel | 113 | kg | " " |
| Heat Dissipation | 8 channel | 125* | W | *Worst case, single CPU* |
| | 16 channel | 225 (275) | W | *Single CPU (Redundant CPU)* |
| | 24 channel | 250 (300) | W | " " |
| | 32 channel | 280 (330) | W | " " |
| | 40 channel | 315 (365) | W | " " |
| Voltage | Range | 100 – 240 | V | *±10%, AC only* |
| Current | 8ch max. over voltage range | 1.0 – 0.5 | A | |
| | 16ch max. over voltage range | 2.3 – 1.0 | A | |
| | 24ch max. over voltage range | 3.0 – 1.2 | A | |
| | 32ch max. over voltage range | 3.1 – 1.3 | A | |
| | 40ch max. over voltage range | 3.4 – 1.5 | A | |
| Power Factor | | 0.95 | | *Approximately* |
| Fusing | No user-accessible fuses | | | |
| Noise | Fanless | | | |
| Connectors | Power in Main/Backup | IEC 3-pin male 10A | | |
| | Network TCP/IP | RJ45 100 baseT | | |
| | MADI fibre | Duplex LC multimode (not APC) | | |
| | GPI input | 25-way D-type male | | |
| | GPI output | 25-way D-type female | | |
| | Headphone input | XLR 3-way female | | |
| | Talkback audio output | XLR 3-way male | | |

** CPU redundancy is not available on the 8-channel frame.*

## Alpha-Link Live/Live-R

| *Parameter* | *Condition* | *Value* | *Unit* | *Notes* |
|---|---|---|---|---|
| Height | | 2<br>89 | U<br>mm | |
| Width | <br>Case only without rack ears | 19<br>449 | in<br>mm | |
| Depth | | 300 | mm | *Excludes connectors/cables* |
| Weight (†) | | 6.0 | kg | |
| Heat Dissipation | | 50 | W | *Shared between two PSUs* |
| Voltage | Range | 100 – 240 | V | *±10%, 50/60Hz AC only* |
| Current | Maximum over voltage range | 0.6 – 0.3 | A | *Maximum* |
| Power Factor | | 0.95 | | *Approximately* |
| Fusing | Thermal current trip. No fuses | | | |
| Connectors | Power in 1 and 2 | IEC male | | |
| | Analogue Inputs | 25-way D-type female | | |
| | Analogue Outputs | 25-way D-type female | | |
| | Digital input/output | 25-way D-type female | | |
| | Video In | BNC 75Ω | | |
| | Word Clock Out | BNC 75Ω | | |
| | MADI input/output | Duplex SC fibre socket | | |
| | Remote control | RJ45 socket | | |

## Alpha-Link 8-RMP

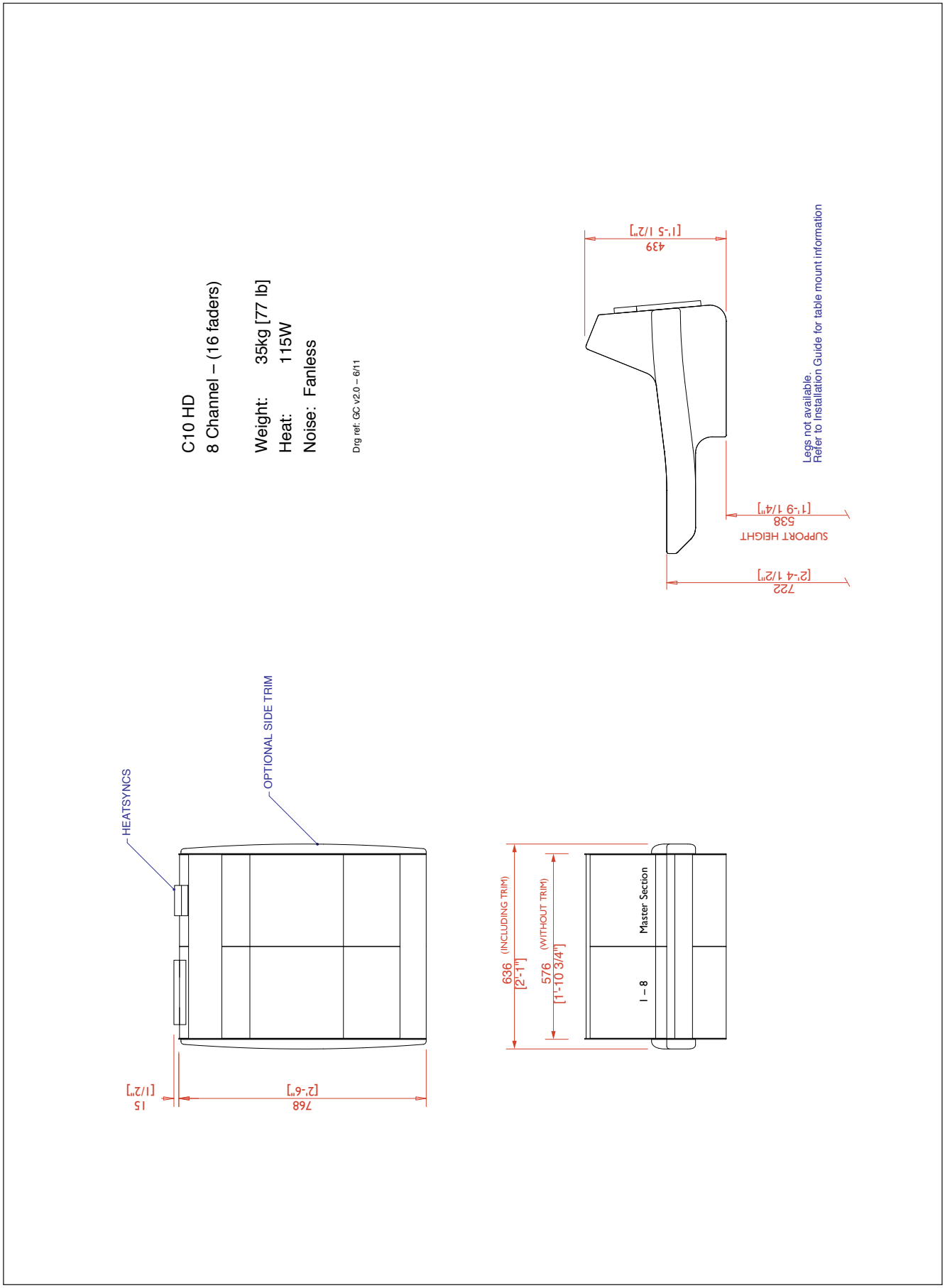
| *Parameter* | *Condition* | *Value* | *Unit* | *Notes* |
|---|---|---|---|---|
| Height | | 2<br>89 | U<br>mm | |
| Width | <br>Case only without rack ears | 19<br>449 | in<br>mm | |
| Depth | | 300 | mm | *Excludes connectors/cables* |
| Weight (†) | | 6.0 | kg | |
| Heat Dissipation | | 50 | W | *Shared between two PSUs* |
| Voltage | Range | 100 – 240 | V | *±10%, 50/60Hz AC only* |
| Current | Maximum over voltage range | 0.6 – 0.3 | A | *Maximum* |
| Power Factor | | 0.95 | | *Approximately* |
| Fusing | Thermal current trip. No fuses | | | |
| Connectors | Power in 1 and 2 | IEC male | | |
| | Microphone Inputs | XLR 3-pin female | | |
| | Line level Output | 25-way D-type female | | |
| | Remote control | RJ45 socket | | |

† *Alpha-Link units must be supported on rack shelves. Do not rely on the rack ears alone.*

| RIO | | | | |
|---|---|---|---|---|
| *Parameter* | *Condition* | *Value* | *Unit* | *Notes* |
| Height | | 7<br>665 | U<br>mm | |
| Width | <br>Case only without rack ears | 19<br>449 | in<br>mm | |
| Depth | | 344 | mm | *Excludes connectors/cables* |
| Weight (†) | | 17 – 21 | kg | *Depending on I/O fitted* |
| Heat Dissipation | 5 Mic cards<br>1 Mic, 2 analogue, 1 digital card | 500<br>350 | W<br>W | *Maximum*<br>*Typical* |
| Voltage | Range | 100 – 240 | V | *±10%, AC only* |
| Current | Maximum over voltage range | 5.6 – 2.3 | A | |
| Power Factor | | 0.95 | | *Approximately* |
| Fusing | Thermal current trip. No fuses | | | |
| Noise | Front<br>Rear | 45 – 55<br>45 – 60 | NR<br>NR | *Variable speed fans* |
| Connectors | Power in 1 and 2<br>Network<br>Sync out<br>Madi 1–4<br>GPI Input<br>GPI Output | IEC male<br>RJ45 100 baseT *(Unused)*<br>BNC 75Ω *(Wordclock)*<br>Duplex LC fibre<br>25-way D-type male<br>25-way D-type female | | |

† *RIO units must be supported on rack shelves. Do not rely on the rack ears alone.*

## Console Footprint Drawing – 8 Channels

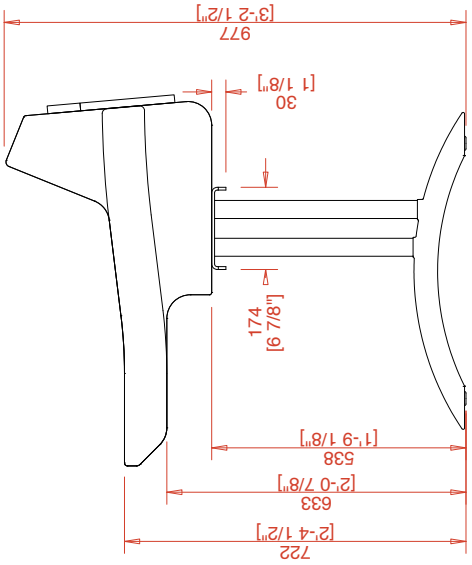


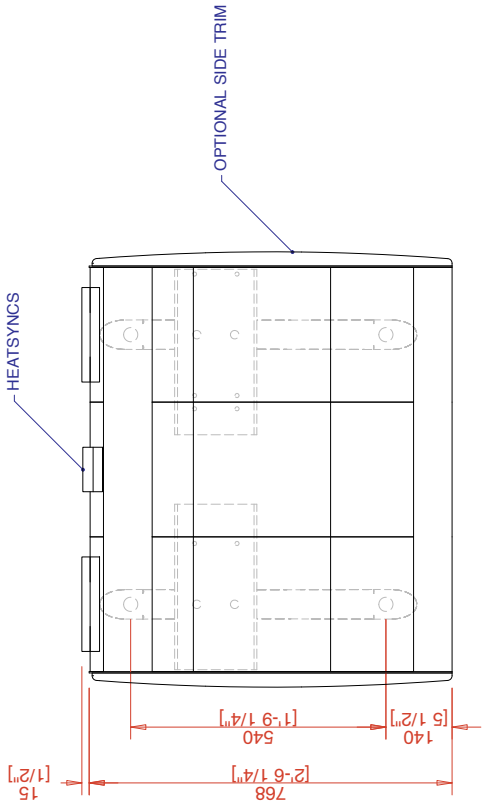
## Console Footprint Drawing – 16 Channels

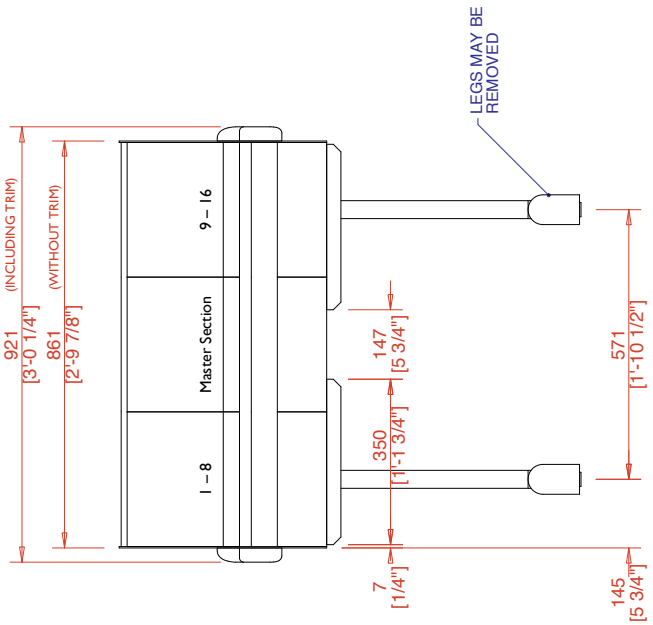
C10 HD
16 Channel – (24 faders)

Weight: 65kg [143 lb]
Heat: 275W (max. dual CPU)
Noise: Fanless

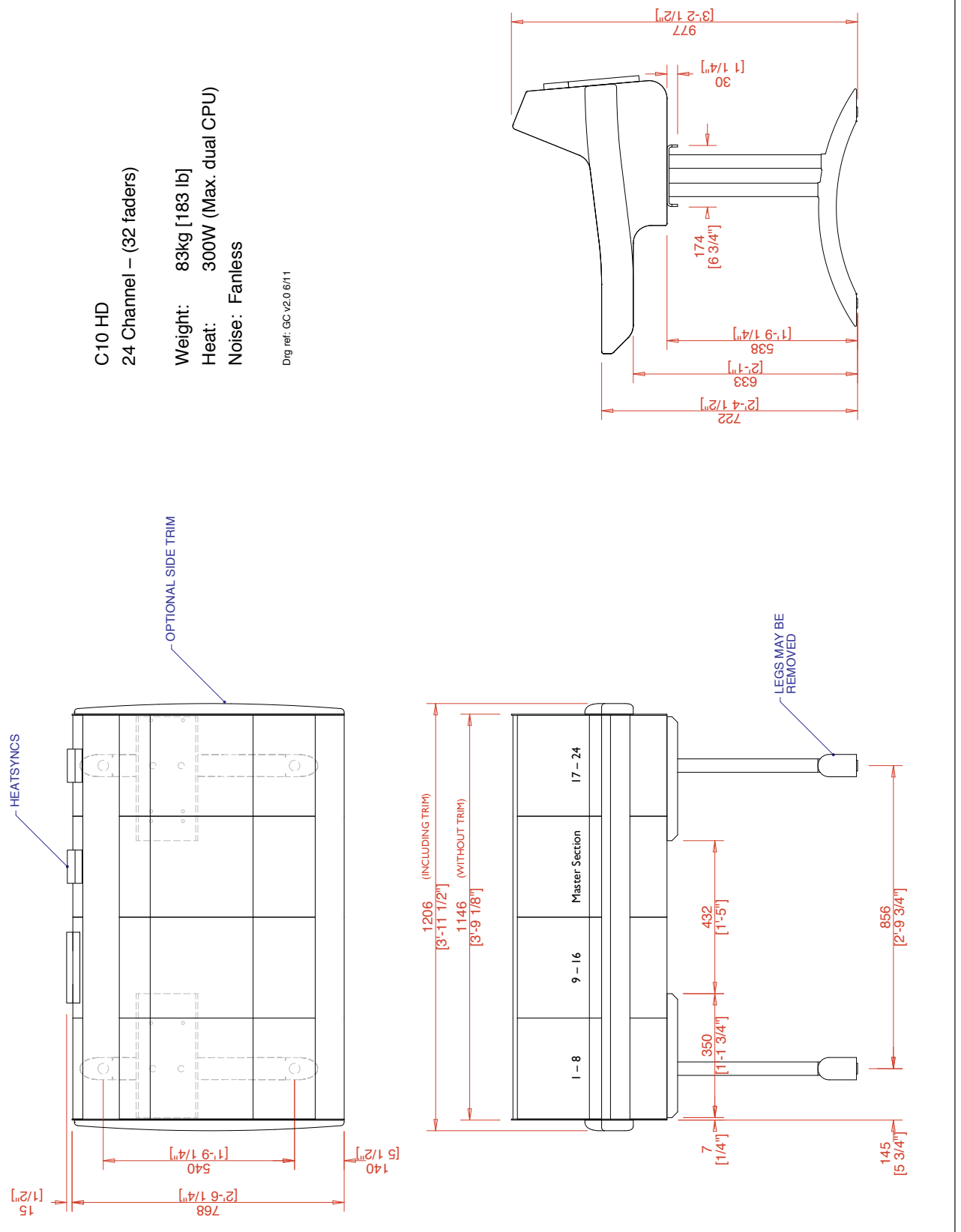
Drg ref: GC v2.0 – 6/11



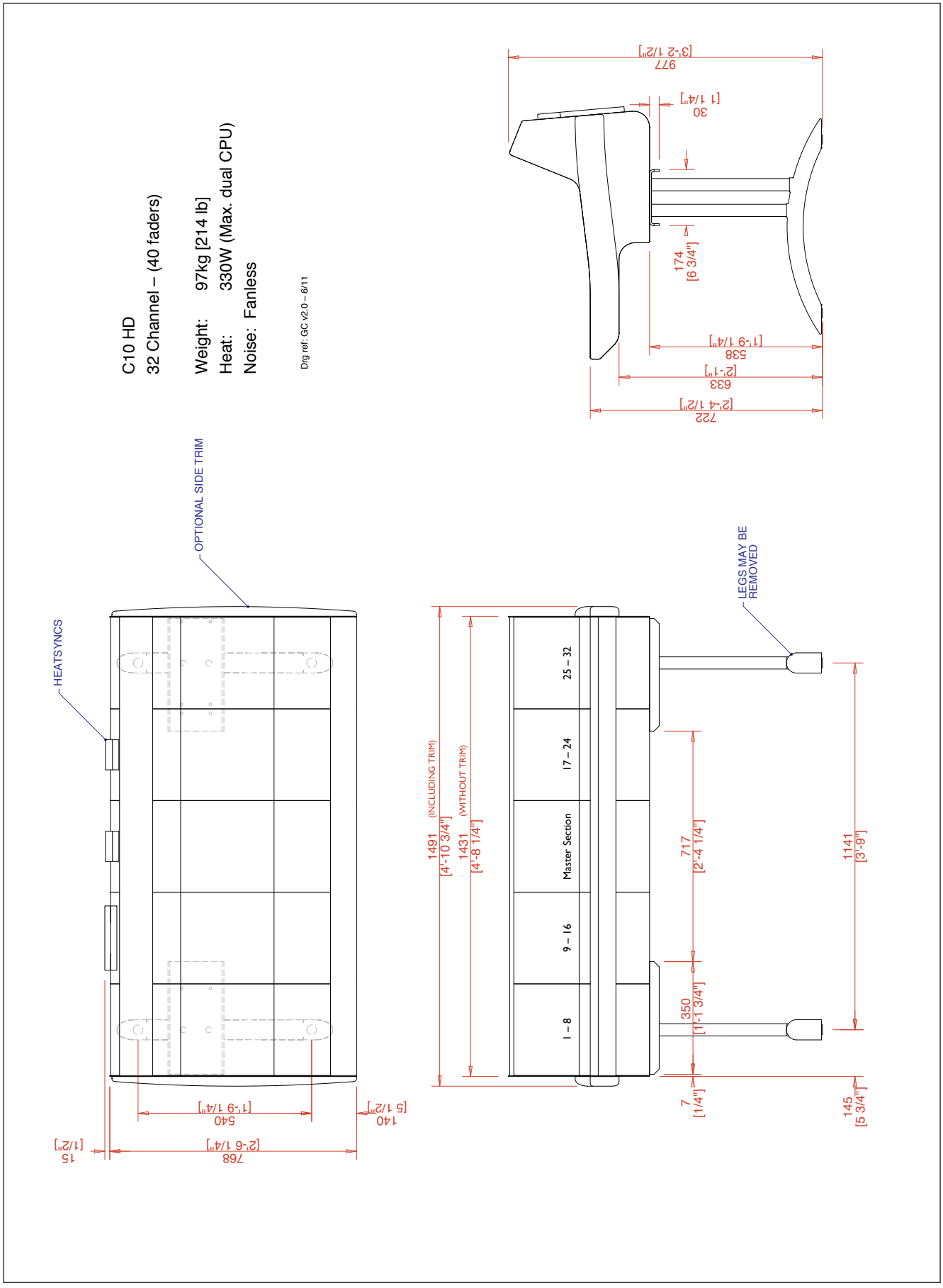



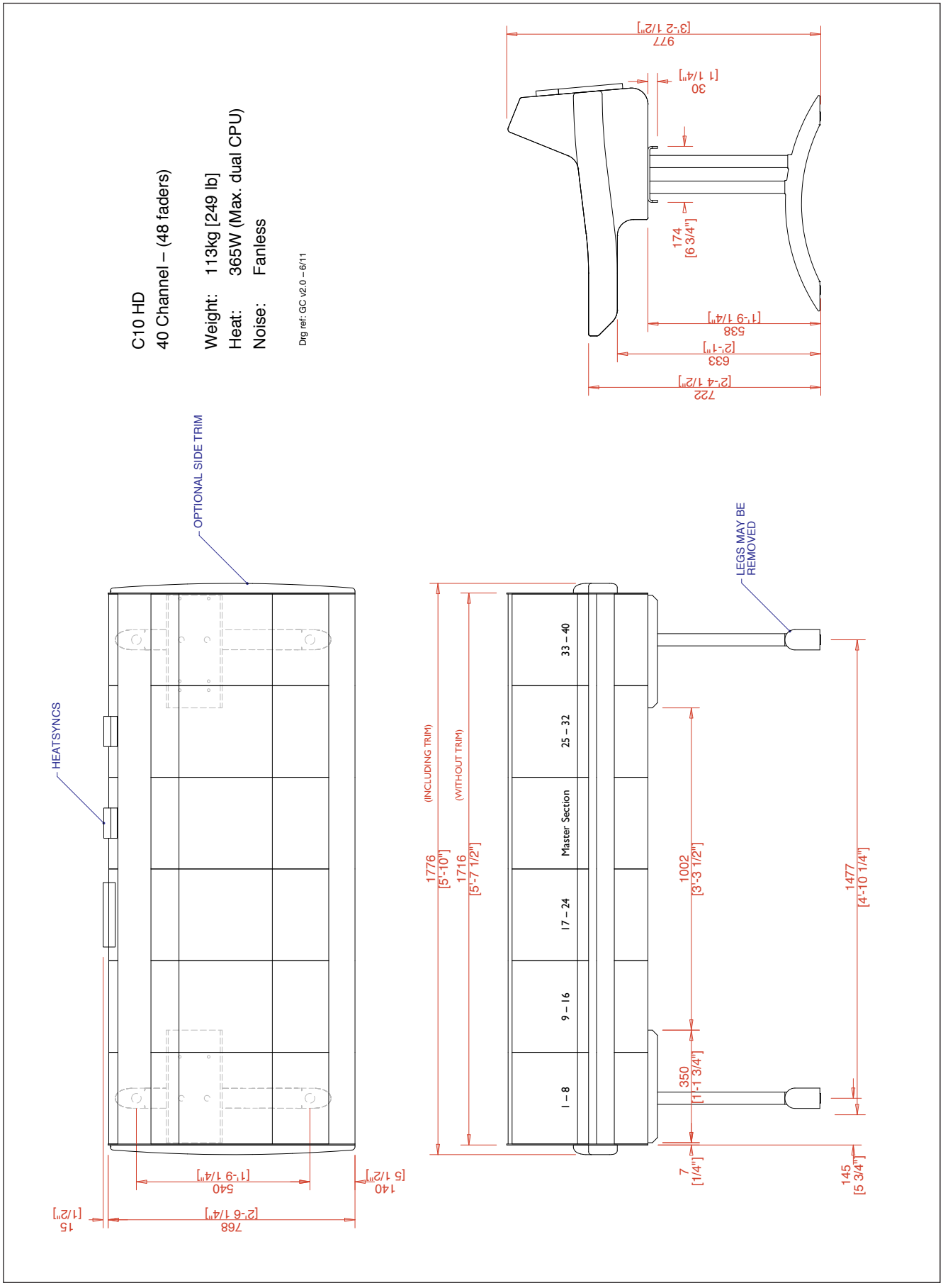
## Console Footprint Drawing – 24 Channels



## Console Footprint Drawing – 32 Channels



## Console Footprint Drawing – 40 Channels



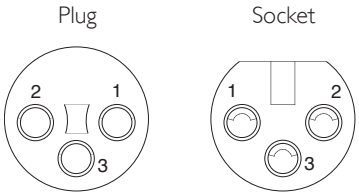
# B: Connector Details

## XLR 3-Pin

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

Pinout for balanced audio:

| | |
|---|---|
| Pin 1 | Screen/Ground |
| Pin 2 | Hot (+ve) |
| Pin 3 | Cold (-ve) |




*Connectors Viewed From Wiring Side*

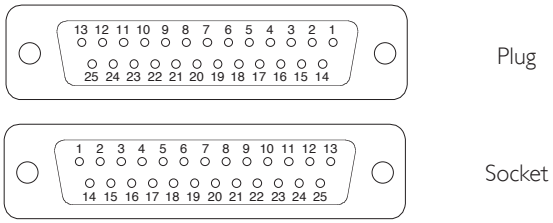
## D-Type Multipin

25-way

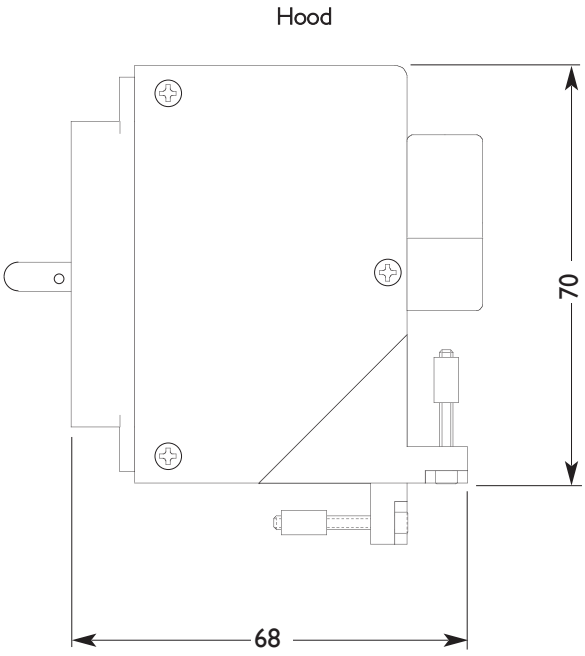
Dimensions: 55 x 15mm (approx.)
Cable Dia: 8mm (typical)

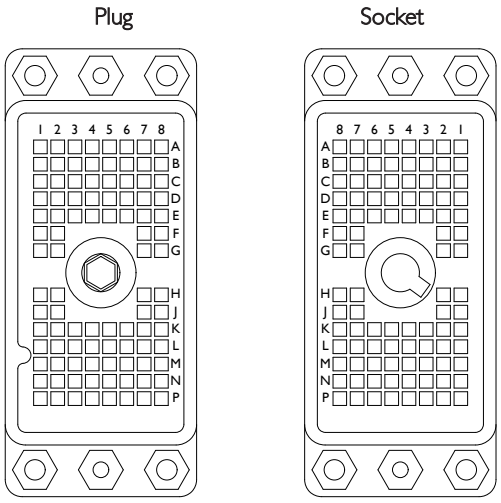
Screwlock thread: 440-UNC

*Connectors Viewed From Wiring Side*




## DL 96-Pin – Used on the RIO unit Analogue I/O card




Connectors Viewed From Wiring Side

Dimensions: 29mm x 69mm

# C: Connector Pinouts

## C10 HD Console

### TB Out

| | |
|---|---|
| Location: | Master Connector Panel |
| Connector Type: | XLR 3-pin male |

| *Pin* | *Description* | *Notes:* |
|---|---|---|
| 1 | Chassis (screen) | |
| 2 | + signal | |
| 3 | – signal | |

### Headphone Input

| | |
|---|---|
| Location: | Master Connector Panel |
| Connector Type: | XLR 3-pin female |

| *Pin* | *Description* | *Notes:* |
|---|---|---|
| 1 | Ground | Jack socket – Screen |
| 2 | Right signal | Jack socket – Tip |
| 3 | Left signal | Jack socket – Ring |

### RS422 Serial 1 and 2

| | |
|---|---|
| Location: | Console Additional Connector Panel |
| Connector Type: | 9-way D-type Male |

| *Pin* | *Description* | *Notes* |
|---|---|---|
| 1 | Chassis | |
| 2 | TX– | |
| 3 | RX+ | |
| 4 | 0V | |
| 5 | nc | *No connection* |
| 6 | 0V | |
| 7 | TX+ | |
| 8 | RX– | |
| 9 | Chassis | |

## C10 HD Console

### GPI Inputs 1–12

Location: Master Connector Panel

Connector Type: 25-way D-type male

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

### GPI Outputs 1–12

Location: Master Connector Panel

Connector Type: 25-way D-type female

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

### 12V Output†

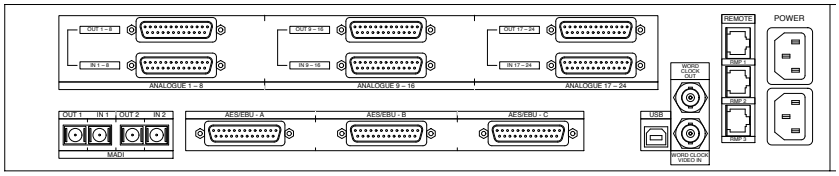
Location: Master Connector Panel

Connector Type: 9-way D-type female

| Pin | Description | Notes: |
|---|---|---|
| 1 | 0V A | |
| 2 | 0V A | |
| 3 | 0V A | |
| 4 | 0V B | |
| 5 | 0V C | |
| 6 | 0V A | |
| 7 | +12V A | *1A max* |
| 8 | +12V B | *1A max* |
| 9 | +12V C | *1A max* |

† *Only fitted to frames featuring processor redundancy.*

## ALPHA-LINK LIVE-R/LIVE




### Analogue Input/Output 1–8 (9–16, 17–24)

| | |
|---|---|
| Location: | Alpha-Link rear panel |
| Connector Type: | 25-way D-type female |

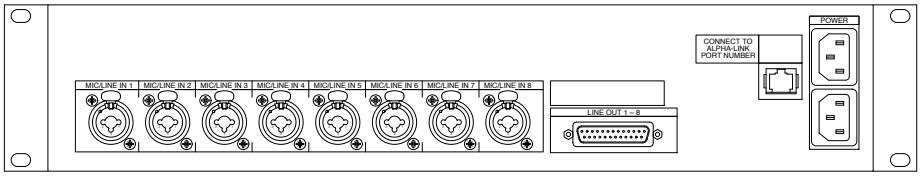
| *Cct* | *Hot* | *Cold* | *Screen* | *Notes* |
|---|---|---|---|---|
| 1 | 24 | 12 | 25 | *Pin 13 unused* |
| 2 | 10 | 23 | 11 | |
| 3 | 21 | 9 | 22 | |
| 4 | 7 | 20 | 8 | |
| 5 | 18 | 6 | 19 | |
| 6 | 4 | 17 | 5 | |
| 7 | 15 | 3 | 16 | |
| 8 | 1 | 14 | 2 | |

### AES/EBU Inputs/Outputs A,B,C (1–8, 9–16, 17–24)

| | |
|---|---|
| Location: | Alpha-Link Rear Panel |
| Connector Type: | 25-way D-type female |

| *Pin* | *Description* | *Notes:* |
|---|---|---|
| 1 | Out channels 7/8 + | *Outputs* |
| 14 | Out channels 7/8 - | |
| 2 | Ground | |
| 15 | Out channels 5/6 + | |
| 3 | Out channels 5/6 - | |
| 16 | Ground | |
| 4 | Out channels 3/4 + | |
| 17 | Out channels 3/4 - | |
| 5 | Ground | |
| 18 | Out channels 1/2 + | |
| 6 | Out channels 1/2 - | |
| 19 | Ground | |
| 7 | In channels 7/8 + | *Inputs* |
| 20 | In channels 7/8 - | |
| 8 | Ground | |
| 21 | In channels 5/6 + | |
| 9 | In channels 5/6 - | |
| 22 | Ground | |
| 10 | In channels 3/4 + | |
| 23 | In channels 3/4 - | |
| 11 | Ground | |
| 24 | In channels 1/2 + | |
| 12 | In channels 1/2 - | |
| 25 | Ground | |
| 13 | n/c | |

## ALPHA-LINK 8-RMP




### Microphone Input

| | |
|---|---|
| Location: | Alpha-Link 8-RMP Rear panel |
| Connector Type: | XLR 3-pin female |

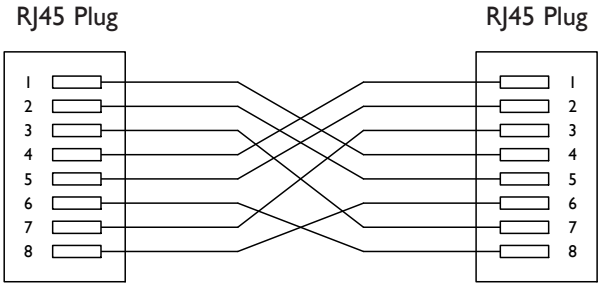
| *Pin* | *Description* | *Notes:* |
|---|---|---|
| 1 | Ground | |
| 2 | + signal | |
| 3 | – signal | |

### Analogue Output 1–8

| | |
|---|---|
| Location: | Alpha-Link 8-RMP rear panel |
| Connector Type: | 25-way D-type female |

| *Cct* | *Hot* | *Cold* | *Screen* | *Notes* |
|---|---|---|---|---|
| 1 | 24 | 12 | 25 | *Pin 13 unused* |
| 2 | 10 | 23 | 11 | |
| 3 | 21 | 9 | 22 | |
| 4 | 7 | 20 | 8 | |
| 5 | 18 | 6 | 19 | |
| 6 | 4 | 17 | 5 | |
| 7 | 15 | 3 | 16 | |
| 8 | 1 | 14 | 2 | |

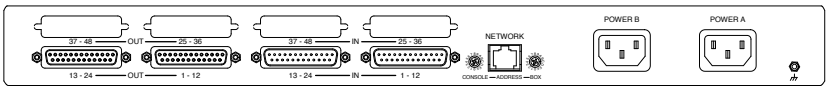
### ALPHA-LINK LIVE* TO ALPHA-LINK 8-RMP CONTROL CABLE PINOUT




| *Pin* | *Cable Pair* | *Pin* |
|---|---|---|
| 1 | 1 + | 4 |
| 2 | 1 – | 5 |
| 5 | 2 + | 2 |
| 4 | 2 – | 1 |
| 8 | 3 + | 6 |
| 7 | 3 – | 3 |
| 6 | 4 + | 8 |
| 3 | 4 – | 7 |

** Only required for Alpha-Link Live units. Alpha-Link LIVE-R is able to use standard Ethernet pin-pin cables.*

## Remote GPIO Box




### GP Inputs

Location: Rear Panel

Connector Type: 25-way D-type male

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

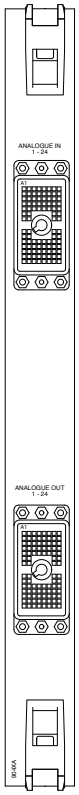
### GPI Outputs

Location: Rear Panel

Connector Type: 25-way D-type female

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

## RIO – Analogue and Digital I/O




### Analogue In / Out

| | |
|---|---|
| Location: | 944 Analogue Card |
| Connector Type: | DL96 female |

| *Cct* | *Hot* | *Cold* | *Screen* | *Notes* |
|---|---|---|---|---|
| 1 | A1 | B1 | C1 | *All other pins unused* |
| 2 | A2 | B2 | C2 | |
| 3 | A3 | B3 | C3 | |
| 4 | A4 | B4 | C4 | |
| 5 | A5 | B5 | C5 | |
| 6 | A6 | B6 | C6 | |
| 7 | A7 | B7 | C7 | |
| 8 | A8 | B8 | C8 | |
| 9 | D1 | E1 | F1 | |
| 10 | D2 | E2 | F2 | |
| 11 | D3 | E3 | G1 | |
| 12 | D4 | E4 | G2 | |
| 13 | D5 | E5 | G7 | |
| 14 | D6 | E6 | G8 | |
| 15 | D7 | E7 | F7 | |
| 16 | D8 | E8 | F8 | |
| 17 | L1 | K1 | J1 | |
| 18 | L2 | K2 | J2 | |
| 19 | L3 | K3 | H1 | |
| 20 | L4 | K4 | H2 | |
| 21 | L5 | K5 | H7 | |
| 22 | L6 | K6 | H8 | |
| 23 | L7 | K7 | J7 | |
| 24 | L8 | K8 | J8 | |


### AES/EBU In/Out 1–8 (9–16, 17–24, 25–32)

| | |
|---|---|
| Location: | 942 DIO |
| Connector Type: | 25-way D-type female |

| *Cct* | *Hot* | *Cold* | *Screen* | *Notes* |
|---|---|---|---|---|
| 1 | 24 | 12 | 25 | *Pin 13 unused* |
| 2 | 10 | 23 | 11 | |
| 3 | 21 | 9 | 22 | |
| 4 | 7 | 20 | 8 | |
| 5 | 18 | 6 | 19 | |
| 6 | 4 | 17 | 5 | |
| 7 | 15 | 3 | 16 | |
| 8 | 1 | 14 | 2 | |

## RIO – GP IO

### GP Inputs

Location: RIO – Interface Card

Connector Type: 25-way D-type male

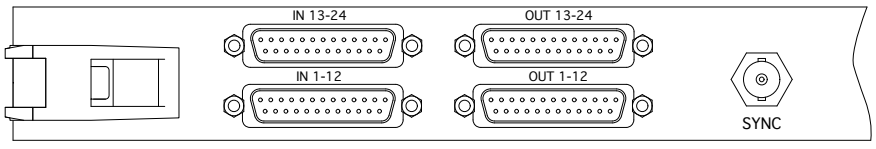
| Pin | Description | Notes: |
|---|---|---|
| 1 | Input 1A | |
| 14 | Input 1B | |
| 2 | Input 2A | |
| 15 | Input 2B | |
| 3 | Input 3A | |
| 16 | Input 3B | |
| 4 | Input 4A | |
| 17 | Input 4B | |
| 5 | Input 5A | |
| 18 | Input 5B | |
| 6 | Input 6A | |
| 19 | Input 6B | |
| 7 | Input 7A | |
| 20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

### GPI Outputs

Location: RIO – Interface Card

Connector Type: 25-way D-type female

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



# D: Audio Interfacing

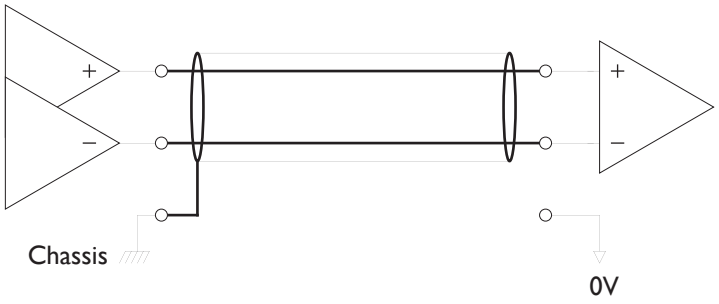
All analogue audio inputs and outputs are electronically balanced. The screen pins are all directly connected to the chassis at the point of entry to comply with AES/EBU grounding and EMC recommendations.

### Balanced Circuits

It is strongly recommended that balanced connections are used wherever possible using high quality screened cable. The following diagram shows the recommended connection with both screens connected to the chassis:


*Balanced – Balanced*
*Both screens connected to chassis*
*(Recommended)*

On some older items of equipment the screen connection may still be referenced to the circuit 0V point rather than the chassis. In these cases it may be advantageous to disconnect the screen at this connection. Note however that this practice will degrade the EMC performance.

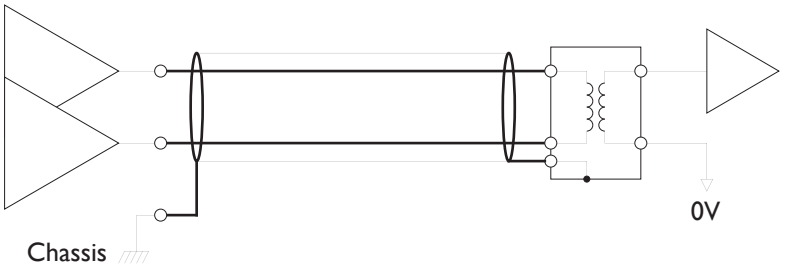



*Balanced – Balanced*
*One screen connected to chassis*

### Connecting to Unbalanced Equipment

Connecting to unbalanced equipment can be much more problematic. It is quite likely that induced RF earth currents will become referenced to the audio 0V which will give rise to audible hum and buzz.

The recommendation for connection of balanced to unbalanced equipment is to isolate unbalanced connections by using a balancing transformer.




*Balanced – Unbalanced*
*One screen connected to chassis*
*(Recommended)*

# E: Environmental Specification

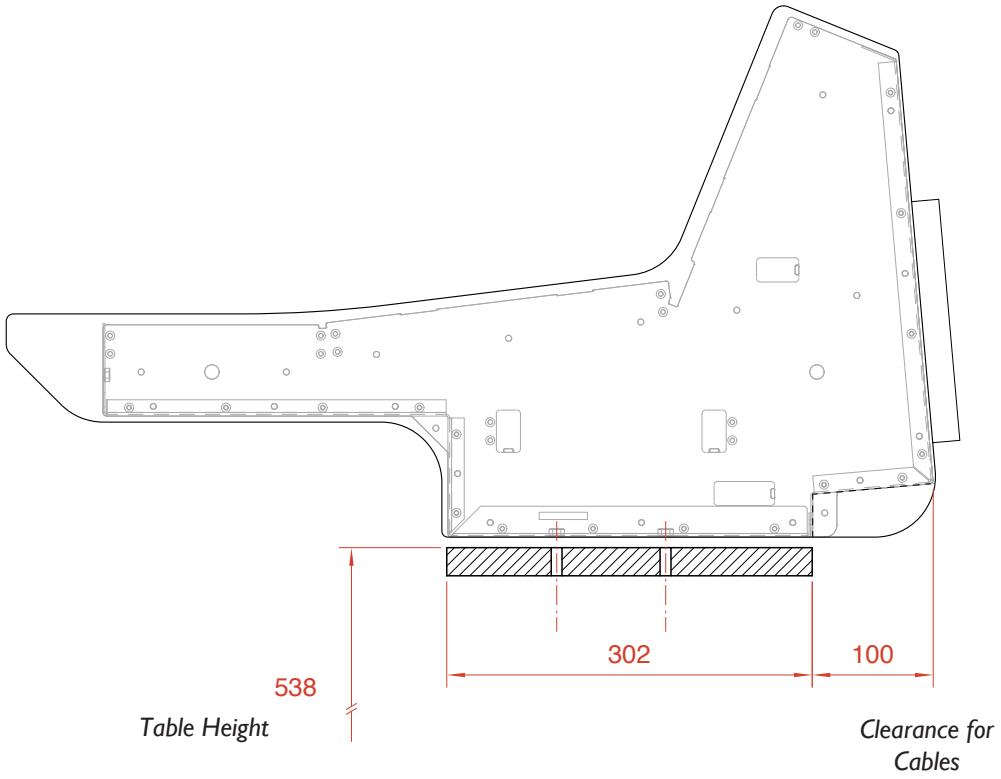
| | | |
|---|---|---|
| Temperature | Operating: | 5 to 30 Deg. C |
| | Non-operating: | -20 to 50 Deg. C |
| | Max. Gradient: | 15 Deg. C/Hour |
| Relative Humidity | Operating: | 20 to 80 % |
| | Non-operating: | 5 to 90 % |
| | Max. wet bulb: | 29 Deg. C (non-condensing) |
| Vibration | Operating: | < 0.2 G (3 - 100Hz.) |
| | Non-operating, power off: | < 0.4 G (3 - 100Hz.) |
| Shock | Operating: | < 2 G (10mSec. Max.) |
| | Non-operating: | < 10 G (10mSec. Max.) |
| Altitude (Above sea level) | Operating: | 0 to 3000 m |
| | Non-operating: | 0 to 12000 m |

# Notes Relating to Static and Air Conditioning

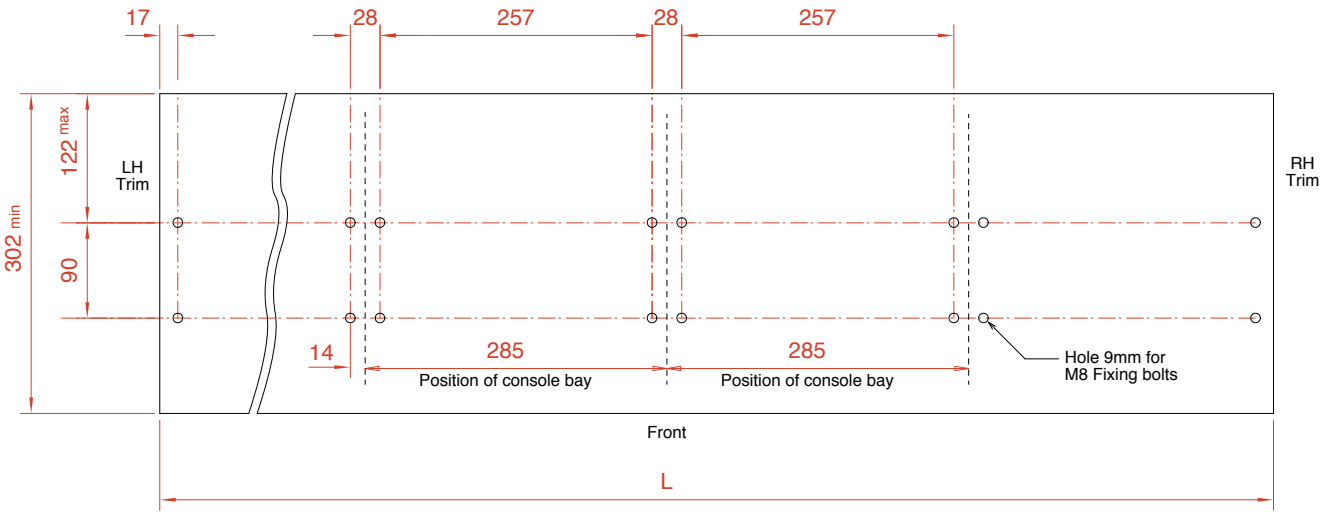
- Any item of electronic equipment can be affected by electrostatic discharge. It is considered good practice to avoid using fully insulating floor coverings in technical areas.
- Air conditioning will usually be required. Note however, that a cool and dry atmosphere can significantly increase the likelihood of a build-up of static charge. It is recommended that air conditioning systems are designed such that the relative humidity does not fall below 30% during periods of operation.

# F: Table Mounting the Console

Table Positioning




Drilling Template For Mounting Bolts




Length L

| | |
|---|---|
| 8ch | 576 |
| 16ch | 861 |
| 24ch | 1,146 |
| 32ch | 1,431 |
| 40ch | 1,716 |

# G: Redundant Processing

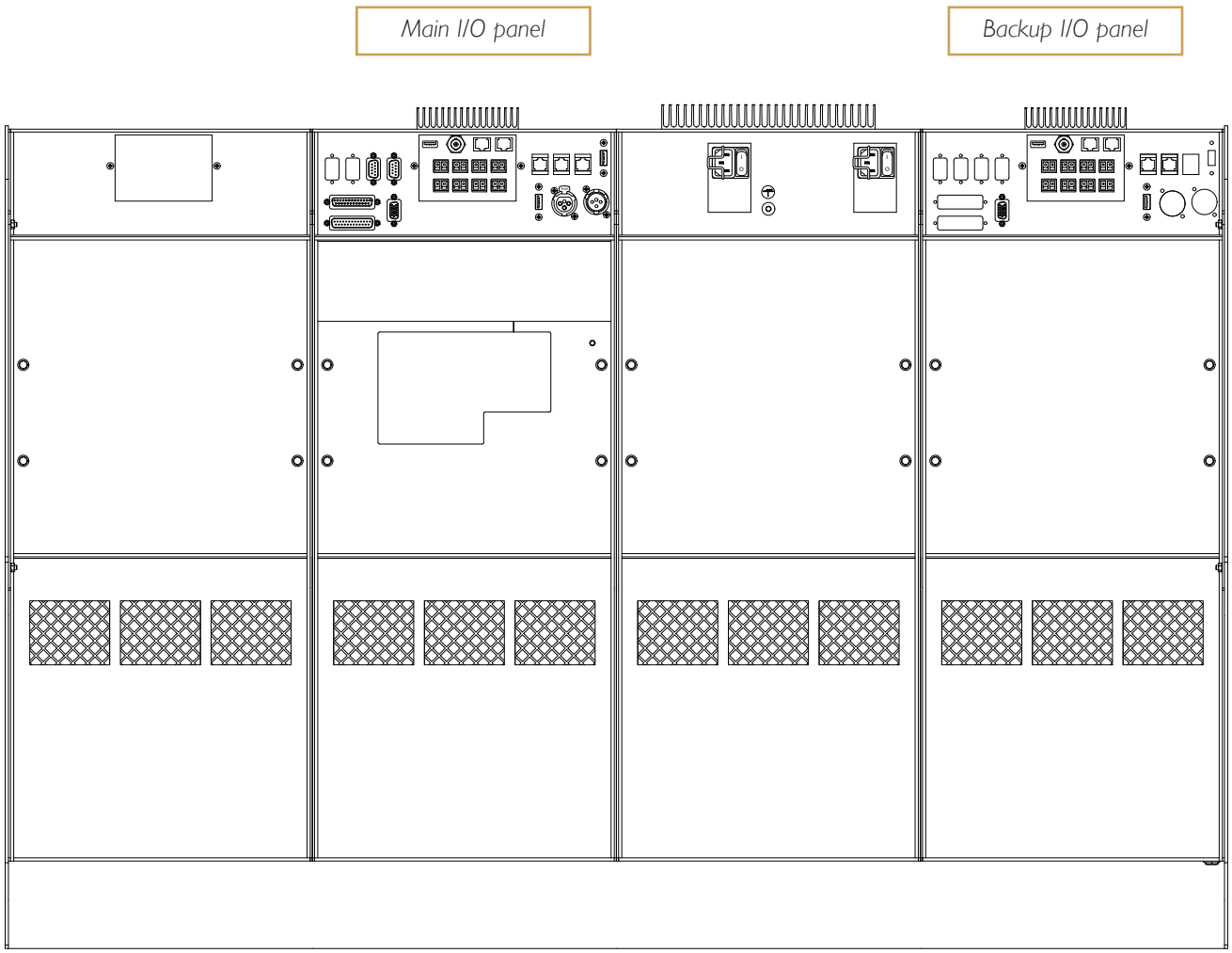
To provide continued console operation in the event of failure of the main processor, processor redundancy can be specified for consoles of 16 channels and above – redundant processing can not be fitted to the 8-channel frame as there is insufficient space to accommodate the additional hardware.

When the redundancy option is specified duplicate SBC and audio DSP processors will be fitted to the console's backup I/O panel.

When processor redundancy is used in combination with the Alpha-Link LIVE-R, MORSE stagebox or RIO I/O unit, control of all sources and destinations can be seamlessly transfered to the backup processor should the master processor fail.

> *Similar redundant switching can be achieved when using Alpha-Link Live units by the inclusion of optional MADI fibre changeover switches.*

Because there are many different ways that the I/O options can be configured to operate with the redundant processor, consoles that require redundant processing should always be specified in consultation with an SSL representative. Redundant systems will always include commissioning by an SSL engineer.



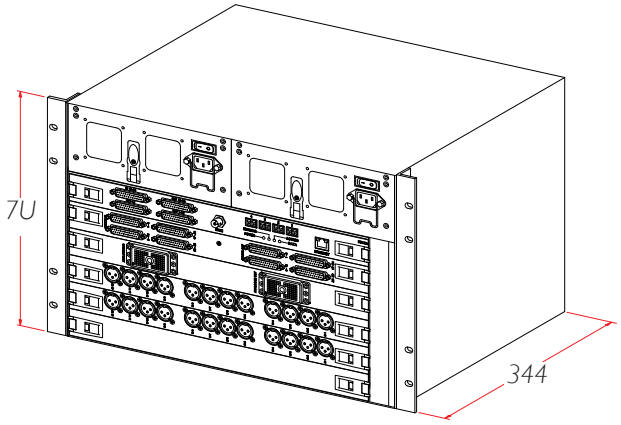
# H: The RIO

Larger quantities of audio input and output can be accommodated by using the RIO rack.

Up to four RIOs can be connected to each C10 system.

All connectors are accessed from the front of the chassis making it suitable for installation into equipment racks where space is limited. The unit is cooled from front to back using temperature controlled low-noise fans so space for ventilation must be provided behind the rack. A standard 600mm rack would provide adequate ventilation.

RIOs can be fitted with one or two removable power supplies. A single PSU unit has sufficient capacity to supply a fully fitted RIO thus full PSU redundancy can be achieved by fitting two units.




The RIO is equipped with slots for six plug-in cards. The uppermost slot is always fitted with the RIO Interface card. This card is equipped with four, 64-channel MADI interface ports for connection to the console surface.

*Each MADI link to the console has capacity for up to 64 audio channels (at 48kHz). However, the first console-to-RIO link is limited to 62 audio channels only because two channels are reserved for sync and status information; the remaining three links can access all 64 channels of bi-directional audio data. The maximum I/O capacity for a single RIO unit is therefore 254 audio channels.*

## GP I/O

The RIO interface card is equipped with 24 circuits of opto-isolated input and 24 relay-closure outputs. Connectors are all 25-way D-type female.

## Fibre Connection

RIO units are connected to the console processor using duplex fibre optic cabling. The connectors required at each end are duplex LC type – flat end, not APC.

The fibre interfaces are available in two versions: *singlemode* and *multimode*. The fibre specification chosen determines the maximum distance that a cable can be run without loss of data. Singlemode and multimode interfaces and connectors are almost identical in appearance but are operationally incompatible – the standards must not be mixed within a system.

RIO and console interface adaptors are fitted with the multimode version. Singlemode adaptors are at additional cost.

*Each RIO unit is supplied with one 2m multimode fibre cable for connection to the console surface. It is the responsibility of the facility to provide longer fibre cables necessary to remotely locate the RIO units or the additional cables that will be required to support higher numbers of audio channels.*

| *Standard* | *Cable specification* | *Maximum cable length* | *Note* |
|---|---|---|---|
| Multimode | LC – LC duplex 50/125µ | 550m (1,800ft) | Default fitment |
| Singlemode | LC – LC duplex 9/125µ | 2,000m (6,560ft) | Cost option |

## SNMP

The RIO chassis provides SNMP data over the fibre MADI connection to the SBC computer in the console surface.

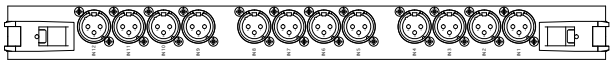
## I/O Cards

Five I/O slots are available into which a range of input/output cards can be fitted. Any unused slots must always be fitted with blank panels (supplied) to assist the correct airflow through the rack.

*Note that when assigning output channels to be insert sends, the console's routing system will automatically assign the same input channel number to be the corresponding insert return. It is therefore necessary to physically wire outboard equipment so that circuit allocation follows this arrangement.*

### MiCamp Card

The microphone input card provides 12 input channels accessible via standard XLR 3-pin female connectors.



The card has been specifically designed to operate in a broadcast environment and meets recognised performance standards. The card is fitted with RF input filtering, a high-speed analogue limiter and features high input CMRR.

*It is strongly recommended that the 48V phantom power is switched off (via the console control surface) before connecting microphones.*

### Analogue I/O Card

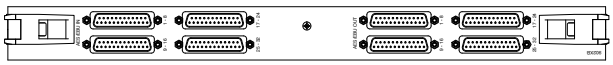
The analogue card provides 24 channels of balanced line-level input and output. The connectors used for input and output are Canon DL96 types. Mating connector kits and a contact crimp tool can be supplied (as cost options).

The default line-up level for analogue I/O is 0dBFS = +18dBu. This level may be adjusted in discrete steps that range from +9dBu to +24dBu to match the standard operating level for the facility.

*Connector pinouts are listed on page 6-12.*

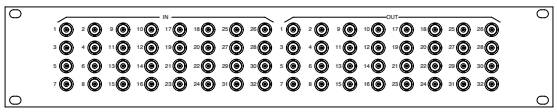
### Digital I/O Card

The digital I/O card provides 64 channels – 32 AES/EBU pairs – of digital input and output. Sample rate conversion is available on every input so the card can accept input sample rates from 32kHz to 96kHz. The connectors are all D-25 type females and mating connectors can be supplied (as a cost option).



Two versions of the card are available: 110Ω and 75Ω. The 110Ω card features fully balanced output signals whereas the 75Ω card is unbalanced for correct matching to coaxial cables.

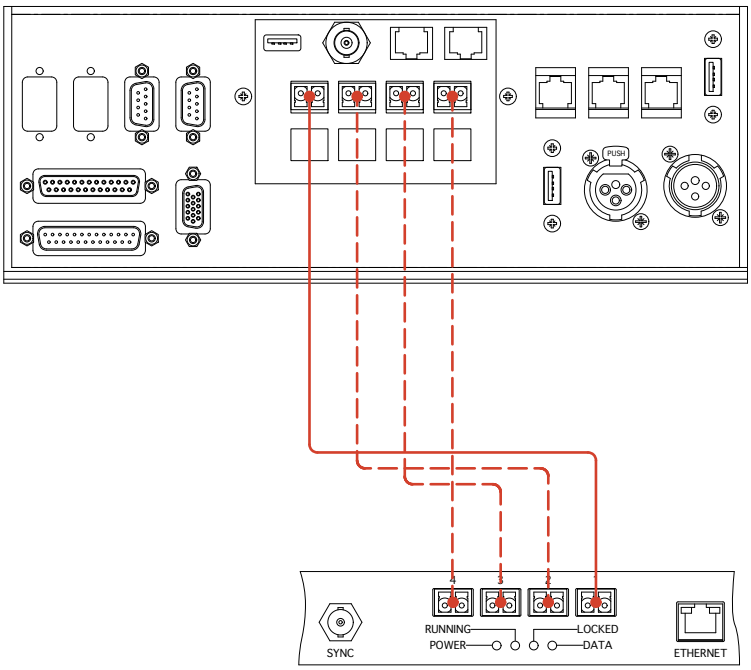
A 2U BNC breakout panel is available to interface with the 75Ω card. This panel converts the I/O card's D-25 connectors to chassis BNC plugs and can be ordered with 1m or 3m interconnecting leads.



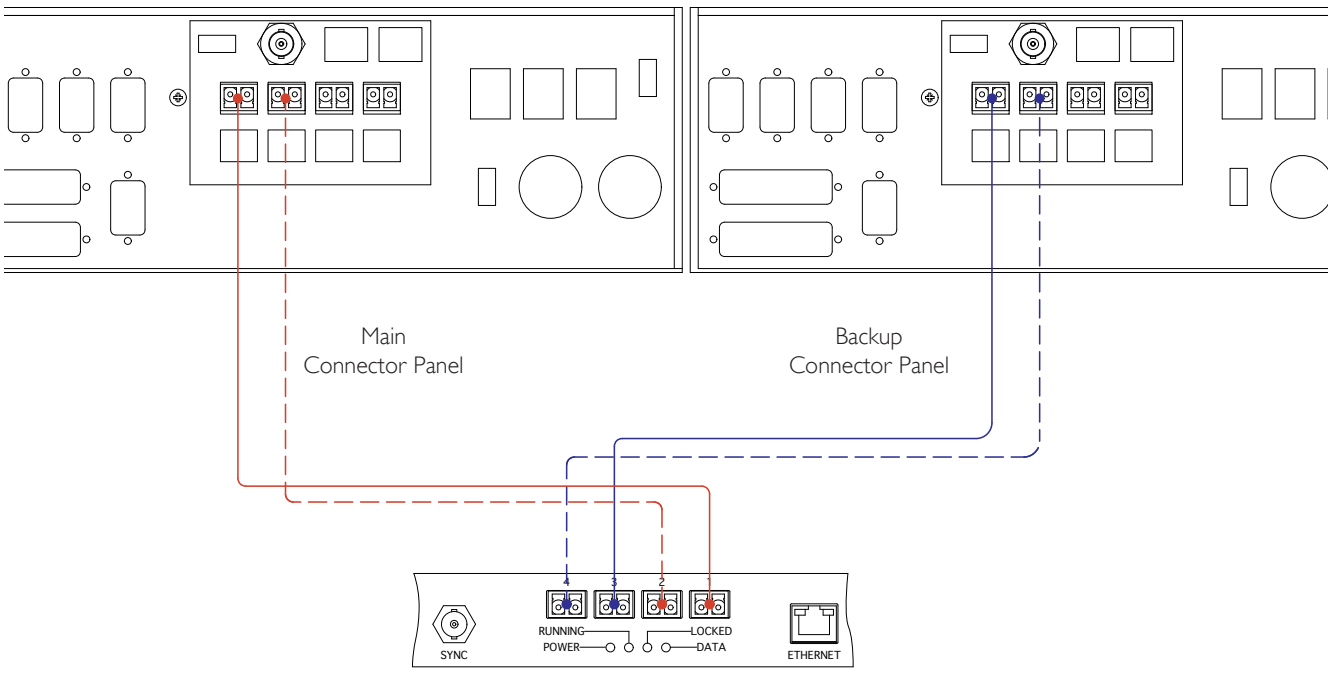
*Do not attempt to extend the panel interface leads beyond the 3m maximum; the signals are unbalanced and doing so could increase the risk of data corruption.*

*Connector pinouts are listed on page 6-12.*

## RIO Fibre Connections – Single Processor




## RIO Fibre Connections – Redundant Processor



## RIO Fibre Connections

Connections between the console and RIO units are made using industry standard multimode (50 micron) duplex LC fibre cable assemblies. Multimode fibre is adequate for cable runs of up to 550m. Suitable fibre cable assemblies are widely available from cable suppliers.

*Singlemode fibre multiplexers can be specified for the console and RIO as a cost option but will extend the console build time. Matching singlemode connectors and cable assemblies will be required. Singlemode cable is suitable for distances of up to 2km.*

The primary MADI connection between the console and any RIO will provide 62 channels of bi-directional audio data*. Subsequent links added to the same RIO will extend the capacity by 64 channels for each lead up to a maximum of 254 channels with four leads connected.

**Although MADI links have the capacity for up to 64 channels of audio, slots 63 and 64 on the primary link are allocated for sync reference and the transfer of SNMP status information.*

## Redundancy Options

The standard connection method detailed above provides the maximum number of audio channels. For installations where it is considered necessary to have redundant fibre connection or backup processing capacity the RIO can be configured to accommodate these requirements.

- *Link Redundancy*

  To protect against the loss of a fibre connection, the links between the console and a RIO can be configured to operate as two redundant pairs (main plus backup) rather than as four individual links. In this arrangement MADI fibre port 2 would function as the backup for the primary link (port 1) and MADI port 4 would backup the second link (port 3). When working in this configuration the maximum number of channels that can be accommodated will be limited to 126 *(consisting of the primary 62 channel link plus a second 64 channel link).*

- *Processor redundancy*

  Where console CPU redundancy has been specified, RIO MADI ports 3 and 4 are now connected to the backup processor (as shown opposite). If there should then be a failure of the primary console processor, its backup would already be connected to the RIO. As with link redundancy, the maximum number of I/O channels available is 126.

- *Link Redundancy with Processor redundancy*

  Link redundancy can also be combined with processor redundancy to provide the highest level of security. Note however, that the maximum channel count will now be reduced to 62 channels.

# J: MORSE System

## MORSE System (option)

The MORSE (MOdular Resource Sharing Engine) system provides a cost-effective, scalable solution for the sharing of local or remote audio I/O and managing control data. The system is specifically designed for on-air reliability and features optional redundancy on all data links and fault tolerant proprietary software.

The system comprises a central router to which remote stageboxes and consoles may be connected via optical MADI links to provide a resource sharing solution. The router is available as a 3U rack with up to 24 individual links available or as a 6U rack with up to 48 links.

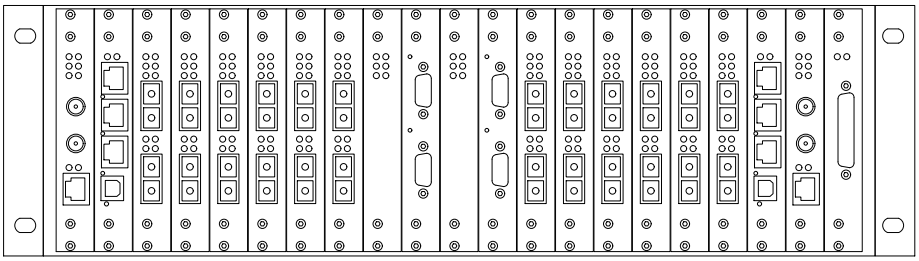
Stageboxes can be connected to the router so that any I/O signal is then able to be allocated to any Blackrock processor connected to the router. If however resource sharing is not a requirement, stageboxes can be directly connected to the processor.

Each stagebox can be fitted with up to 56 channels of I/O. Plug-in modules are available for Microphone input, line level analogue I/O, AES, MADI and SDI. A 2nd redundant power supply can be fitted. Stageboxes are connected to the router or console using one or two duplex optical MADI links.

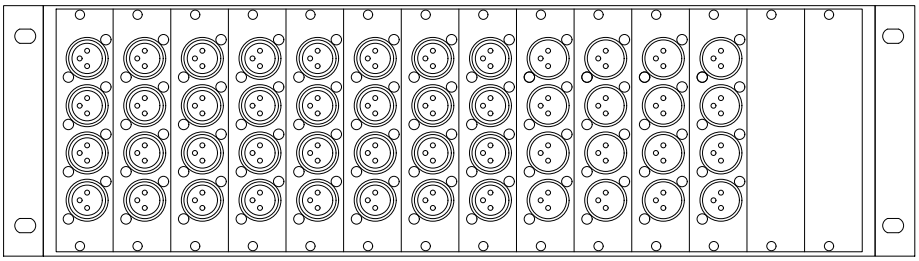
*The fibre links between the Blackrock and the MORSE router are available as multimode type only. The morse fibre connector standard is duplex SC. Blackrock to MORSE fibre leads are therefore LC – SC duplex multimode.*

The MORSE system is more fully described in a separate SSL document *'Morse Specification Guide'* part number: 82S6SMO10A.

**MORSE Router**



**MORSE Stagebox**



# K: SNMP

SNMP (Simple Network Management Protocol) is a generic network management structure that can be applied to any networked appliance for which remote or distributed monitoring is required. In a typical SNMP configuration, there will be a number of systems to be managed or monitored and one or more additional systems present to manage them. A prerequisite for this is that all monitored appliances must be accessible via an Ethernet network in some way.

In the case of the C10 HD system, the Blackrock DSP card, the console control surface and the RIO I/O unit are all systems which can be managed – access is facilitated by the SBC Linux processor. The system management function itself will be provided by a third party management system (or systems) – the SBC acts simply as an SNMP agent or bridge, communicating with the SSL system(s) and passing that information on via SNMP.

There are, at the time of writing, three 'versions' of SNMP, known simply as 'SNMPv1', 'SNMPv2' and 'SNMPv3'. The SBC at this time supports both versions 1 and 2 but not version 3. Each version of SNMP is an enhancement on the previous one where version 2 improves use and flexibility of the protocol whilst version 3 largely adds additional security features. There are at present no plans to implement SNMPv3.

### How It Works

The SNMP agent application running on the SBC accepts SNMP requests from the management system and in turn requests the required information from the Blackrock DSP card across the SSL network connection. Responses from the Blackrock DSP card are interpreted by the SNMP agent and returned to the management system. For example, if the management system submits a request for the system software version, the agent application on the SBC will send the relevent Ethernet request to the Blackrock DSP card, interpret the response and respond to the management system with the temperature measurement as follows:

- The management system sends a '`GET object sslC10SoftwareVerString`' command.
- The SBC sends an matching SNMP request over Ethernet to the Blackrock DSP card.
- The SBC extracts the data from the response and sends it back to the management system.

### SNMP Traps

By using an SNMP structure called a 'trap', an SNMP message can also be initiated by the agent application and sent to the network management system autonomously. This therefore means that the network management system does not have to continuously poll each agent for every possible status but will still be able to report on both major and minor issues. Using this structure therefore the SBC's agent application can flag – without receiving a request from the management system – significant error events such as DSP failures or a software crash.

### Local Configuration

Configuration of what status information can be requested and which errors are flagged via a trap are defined in the SBC's 'Management Information Base' or MIB for short. This is located on the SBC and will be found in the /usr/share/snmp/mibs folder. There will be two MIB files found here; one for the Blackrock DSP card (and console) and one for the B-RIO. In addition to requesting status information, management systems can also set any objects that are defined as read/writeable in the MIB although in the C10 HD implementation no parameters are set as writable – most of the objects defined in the MIBs, such as the power supply voltages, up-time, temperature etc. can't be written to anyway for what should be obvious reasons…

*Communication between the management system, the SNMP agent and the Blackrock DSP card is all by reference to the relevent entry in the MIB files. It is therefore important that the management system has access to the correct MIB files for the version of system software that the C10 HD is running. A full list of the MIB objects currently available will be found later in this section.*

### System Configuration

When setting up an SNMP system, the SNMP 'community' needs to be defined. A community is a group to which both the hosts running the SNMP service and the managed systems belong. The use of a community name provides some basic security and a reporting context for agents receiving requests and initiating traps – an SNMP agent will not respond to a request from a management system outside its configured community, nor will a management system act upon messages from an agent that is not within it's own set of communities.

Community configuration in the SBC is provided by the `'ssl_setup'` application (see page 27). Using this command line tool will allow the following to be configured:

| | |
|---|---|
| `SNMP public community string` | This string is used for read-only SNMP '`get`' requests. By default this string will be set to '`public`'. |
| `SNMP private community string` | This string is used for read/write SNMP '`set`' requests. By default this string will be set to '`private`' (although at present C10 HD has no writable SNMP objects). |
| `SNMP trap community string` | The trap community string defines the community that 'trap' events – such as a crash – are transmited to. The default entry for this is '`public`' although it can of course be partitioned into a seperate community if required. |

In addition to the trap community string, the SBC will need to know the name of the computer receiving 'trap' messages:

| | |
|---|---|
| `SNMP trap receiver computer name` | This is the hostname of the machine on which the management system receiving 'trap' messages is running. On a windows PC you can find this is in **Control Panel**, **System Info**, **Computer Name** – on a Macintosh this would be in **System Preferences**, **Sharing**, **Computer Name** whilst on a Linux system it would be the name return by `/bin/hostname`. |

*For the SBC to be able to communicate with the named receiver, the machine must be accessible by name; that means that either the machine's name and IP address must be present in the SBC's local hosts file (in the /etc folder) or details of both machines must be present in the local DNS ('Dynamic Name Server') – and both machines set to query the DNS.*

In order for the management system to know what objects might be available, it will require copies of the MIB files. These can be copied from the `/usr/share/snmp/mibs` folder in the SBC.

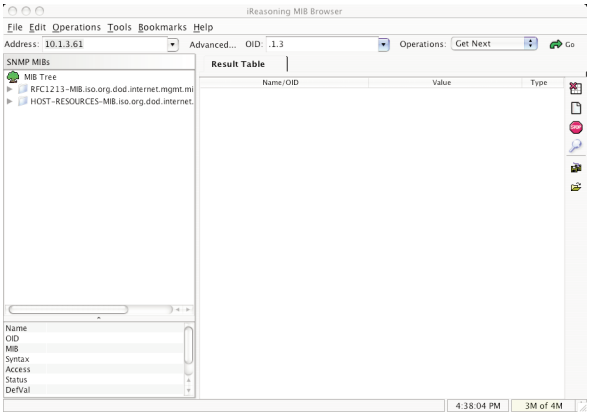
## SNMP Management Systems

There are many management systems available, just two examples being Hewlett Packard's OpenView software and packages from iReasoning inc. The iReasoning packages are of interest as there are free versions of their MIB browser available which will run on Windows, Macintosh, Linux and other Unix platforms. Whilst this package is not licensed for commercial use and only allows you to browse SNMP traps and messages – not act upon them – it can be used to investigate what might be possible with a fully configured SNMP system.

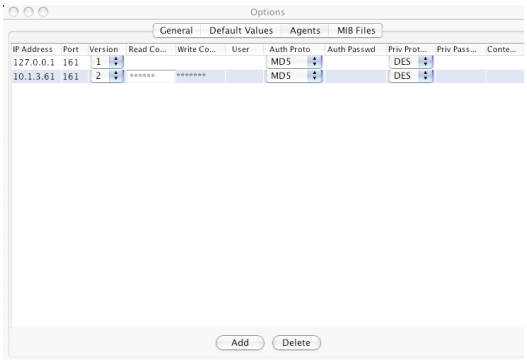
The following instructions show the basic steps necessary to get up and running with the free MIB browser from iReasoning.

*It is assumed that the iReasoning MIB Browser package has been downloaded and installed on to a computer that already has network access to the SBC via the TCP/IP network.*

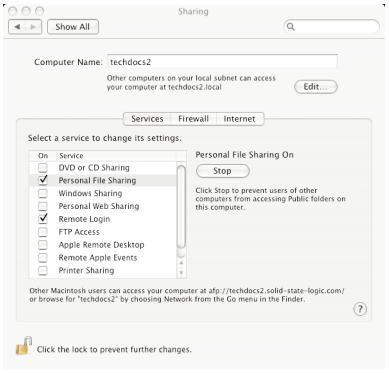
1. Launch the MIB Browser. In the top left-hand corner of the browser, enter the IP address of the Integration Computer that you wish to interrogate.



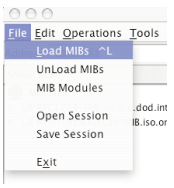

2. In **Tools**, **Options**, **Agents**, enter the read only ('public') and read/write ('private') community strings for your Integration Computer.



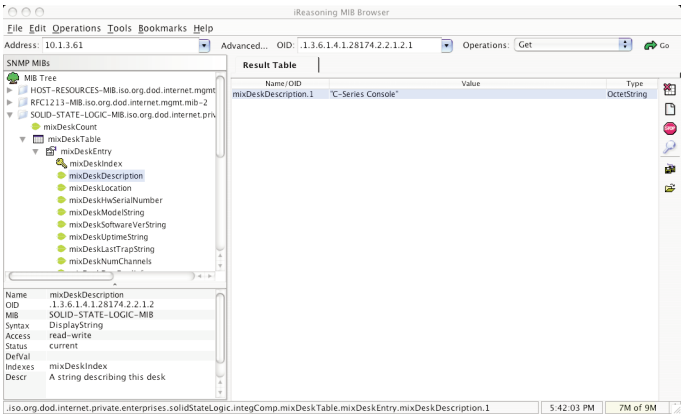

3. Identify your computer's hostname (network name) and, using the '**`SSL_setup`**' tool, set the SNMP trap receiver computer name to match this name. If you have a correctly configured local network, the SBC should be able to use this name to discover the IP address of the SNMP management system through the local DNS server. In the example shown here the name is 'techdocs2' and as will be clear, this is a Macintosh – Windows is similar with the information required residing under **Control Panel**, **System Info**, **Computer Name**.




4. Finally, use **Files**, **Load MIBs** to read in the C10 HD MIB files. These files will be found on the SBC in the `/usr/share/snmp/mibs` folder. They will be called `SOLID-STATE-LOGIC-C110-MIB.txt` for the Blackrock DSP card and `SOLID-STATE-LOGIC-RIO-MIB.txt` for the B-RIO.



5. It will now be possible to browse the available data; right click on the objects in the SNMP MIBs list and by selecting '**Get**', you can obtain the value for the object. The example here shows the result for a `mixDeskDescriptionString GET` request. Where a request is for either a valid or an un-configured object for a connected system it should return more or less instantly with either the result or a failure message. If the remote system is not present there will be a timeout period before a failure is returned. Objects which are writable can be set in a similar way by right clicking on an object and selecting '**Set**' – in the resulting pop-up, enter the required value and click on **OK**.




6. Any traps received can be viewed by selecting **Tools**, **Trap Receiver**. Clicking on an individual trap will display its details in the bottom half of the window.

## C10 HD SNMP Objects

The individual SNMP objects for the C10 HD (Blackrock) system that are exported from V1.1/5 software are as follows:

| Object | Type | Description |
|---|---|---|
| `sslC10Psu1Status` | read-only | The current status of Blackrock processor PSU 1 |
| `sslC10Psu2Status` | read-only | The current status of Blackrock processor PSU 2 |
| `sslC10MainScreenGfx1Status` | read-only | The current status of the primary console TFT Meter driver |
| `sslC10MainScreenGfx2Status` | read-only | The current status of the secondary console TFT Meter driver |
| `sslC10SerialNumber` | read-only | The SSL network id. number of this Blackrock DSP card |
| `sslC10ModelString` | read-only | String providing the model name of this system |
| `sslC10SoftwareVerString` | read-only | String providing the system software version |
| `sslC10UptimeString` | read-only | String providing the current uptime of this system |
| `sslC10SyncStatusString` | read-only | String providing the sync status |
| `sslC10NumChannels` | read-only | The number of channels currently available on this system |
| `sslC10DspInfo` | read-only | The current status of this systems Blackrock DSP array |
| `sslC10InRedundantPair` | read-only | A value representing the redundancy status if the system. Returns 'yes' if the system is part of a redundant pair |
| `sslC10MasterInRedundantPair` | read-only | A value representing the master status of the system. Returns 'yes' if it is the system master of a redundant pair or 'no' if it is either a system slave or is not part of a redundant pair |
| `sslC10ActiveConsoleInRedundantPair` | read-only | A value representing the active status of a system if it is part of a redundant pair. Returns 'yes' if it is the active system or 'no' if it is either inactive or not part of a redundant pair |
| `sslC10DiskStatusString` | read-only | String providing the system disk (SMART) status |
| `sslC10RaidStatusString` | read-only | String providing the disk RAID status |

## C10 HD SNMP Traps

The standard 'trap' objects that are available for the C10 HD system in V1.1/5 software are shown in the following table.

| Object | From | Description |
|---|---|---|
| sslC10Restarting | System | System restarting |
| sslC10MemLow | System | Blackrock DSP card memory low |
| sslC10DspReboot | System | A DSP device on the Blackrock DSP card has rebooted |
| sslC10DspRebootFail | System | A DSP device on the Blackrock DSP card has failed to reboot |
| sslC10Psu1Fail | Processor | Blackrock processor PSU 1 failure |
| sslC10Psu2Fail | Processor | Blackrock processor PSU 2 failure |
| sslC10MainGfx1Fail | Console | Primary console TFT meter driver failure |
| sslC10MainGfx2Fail | Console | Secondary console TFT meter driver failure |
| sslC10LostTileComms | System | Lost Ethernet communication to the control surface |
| sslC10ResumedTileComms | System | Recovered Ethernet communication with the control surface |
| sslC10Synclost | System | External (Video/AES) sync lost |
| sslC10SyncReturned | System | External (Video/AES) sync recovered |
| sslC10NowActiveInRedundantPair | System | Blackrock processor is now the active member of a redundant pair |
| sslC10NowDormantInRedundantPair | System | Blackrock processor is now the dormant member of a redundant pair |
| sslC10DiskStatusNotify | SBC | SBC system disk SMART status trap. This will be sent upon receiving a SMART error from the system hard disks |
| sslC10RaidStatusNotify | SBC | SBC RAID disk array status trap. This will be sent upon receiving a change in status from the system RAID disk array manager |

### B-RIO SNMP Objects

The individual SNMP objects for B-RIO units that are exported from V1.1/5 software are as follows:

| Object | Type | Description |
|---|---|---|
| sslRioIndex | read-only | The index of the B-RIO unit – up to 8 units may be connected and addressed |
| sslRioPresent | read-only | Indicates if a B-RIO unit is connected to the system |
| sslRioVersion | read-only | Carries the B-RIO firmware version string |
| sslRioTemp1 | read-only | Temperature reading in degrees Celcius from the primary internal temperature sensor |
| sslRioTemp2 | read-only | Temperature reading in degrees Celcius from secondary internal temperature sensor |
| sslRio1v2 | read-only | Voltage reading from the +1.2V rail |
| sslRio3v3r1 | read-only | Voltage reading from the +3V3 rail (primary sensor) |
| sslRio3v3r2 | read-only | Voltage reading from the +3V3 rail (secondary sensor) |
| sslRio5v | read-only | Voltage reading from the +5V rail |
| sslRio5v5 | read-only | Voltage reading from the +5V5 rail |
| sslRio15V | read-only | Voltage reading from the +15V rail |
| sslRioMinus15V | read-only | Voltage reading from the –15V rail |
| sslRioCardsInfo | read-only | A string providing details of which I/O cards are currently fitted to this B-RIO |
| sslC10NowDormantInRedundantPair | System | Blackrock processor is now the dormant member of a redundant pair |
| sslC10DiskStatusNotify | SBC | SBC system disk SMART status trap. This will be sent upon receiving a SMART error from the system hard disks |
| sslC10RaidStatusNotify | SBC | SBC RAID disk array status trap. This will be sent upon receiving a change in status from the system RAID disk array manager |

### B-RIO SNMP Traps

The standard 'trap' objects that are available for B-RIO units in V1.1/5 software are as followings:

| Object | From | Description |
|---|---|---|
| sslRioOnline | B-RIO | A B-RIO unit has come online |
| sslRioOffline | B-RIO | A B-RIO unit has gone offline |
| sslRioChassisFan1Fail | B-RIO | B-RIO chassis fan 1 failure |
| sslRioChassisFan2Fail | B-RIO | B-RIO chassis fan 2 failure |
| sslRioPsu1Fail | B-RIO | B-RIO PSU 1 failure |
| sslRioPsu2Fail | B-RIO | B-RIO PSU 2 failure |
| sslRioPsu1FanFail | B-RIO | B-RIO PSU 1 fan failure |
| sslRioPsu2FanFail | B-RIO | B-RIO PSU 2 fan failure |

### Further Information on SNMP

A great deal of information regarding SNMP is of course available from the internet whilst a highly recommended book is '**Essential SNMP, 2nd edition**', published by **O'Reilly Media** (ISBN10: 0-596-00840-6, ISBN13: 9780596008406).

# L: Supported Sync rates

| Supported Sync Rates | | | | |
|---|---|---|---|---|
| No. | Video Format | Field Rate (Hz) | Frame Rate (Hz) | *Notes* |
| 1 | PAL | 50 | 25 | *SD sync rates are suitable for all units* |
| 2 | PAL 24 | 48 | 24 | |
| 3 | NTSC | 59.94 | 29.97 | |
| 4 | 1080i 60Hz | 60 | 30 | *HD sync rates are only accepted by the console's Blackrock processors* |
| 5 | 1080i 59.94Hz | 59.94 | 29.97 | |
| 6 | 1080i 50Hz | 50 | 25 | |
| 7 | 1080p 60Hz | 60 | 60 | |
| 8 | 1080p 59.94Hz | 59.94 | 59.94 | |
| 9 | 1080p 50Hz | 50 | 50 | |
| 10 | 1080p 30Hz | 30 | 30 | |
| 11 | 1080p 29.97Hz | 29.97 | 29.97 | |
| 12 | 1080p 25Hz | 25 | 25 | |
| 13 | 1080p 24Hz | 24 | 24 | |
| 14 | 1080p 23.976Hz | 23.967 | 23.967 | |
| 15 | 1080PsF 24Hz(1080i 48Hz) | 24 | 24 | |
| 16 | 1080PsF 23.976Hz(1080i 47.95Hz) | 23.967 | 23.967 | |
| 17 | 720p 60Hz | 60 | 60 | |
| 18 | 720p 59.94Hz | 59.94 | 59.94 | |
| 19 | 720p 50Hz | 50 | 50 | |

### Unsupported rates

PAL 23.976

720p 30Hz

720p 29.97Hz

720p 25Hz

720p 24Hz

720p 23.976Hz

# SECTION 7:

# SERVICE INFORMATION

## In this section ...

… are instructions on how to remove console tiles and subassemblies to facilitate their servicing or replacement.

## Section Contents

# SERVICE INFORMATION

## Introduction

The following pages provide detailed guides to assist during the removal of console sub-assemblies as may be required for servicing or maintenance.

The following tools are supplied with the console trim kit:

| | | |
|---|---|---|
| 2mm hex driver | – | Used to remove the fixing screws for the fader and control tiles. |
| Posidrive no.1 screwdriver | | Used for other M3 fixing screws. |
| Module puller | – | Custom M4 screw used to lift the edges of the control tiles to aid removal. |
| 6mm Hex key | – | Suitable for the leg fixing bolts. |

In addition to the above a small flat-bladed screwdriver will be required to remove the locking screws on D-type connectors.

## Safety Information

- ⚠ **Always** use the software *'Shutdown'* process before switching off power to the console.

  *Using the touchscreen menus: press 'Studio' (spanner icon) –> 'System' (gear wheels icon) –> 'Shutdown' (Console with cross icon) then select the 'Shutdown' button from the four options. Wait until the screens become black before switching off the console power.*

- ⚠ **Always** switch off the mains power to both inputs AND remove both of the input power IEC connectors before removing any panels or trim.

- ⚠ Component surfaces inside may be hot immediately after switching off.

- ⚠ There may be sharp edges exposed inside the console frame.

- To help protect panels from becoming scratched after removal, have a soft cloth or sheet of antistatic foam to hand before removing them from the frame.

- A plastic cup is a useful place to store fixing screws after their removal; it prevents them from falling inside the frame and makes them easy to find during reassembly.

*Have you read the safety information?*

# S.1 Fader Panel Removal

Applies to channel and centre section fader panels.

### Tools Needed:

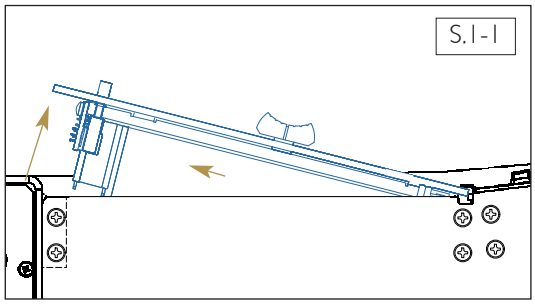
- 2mm Hex Driver
- Module Pullers (2)

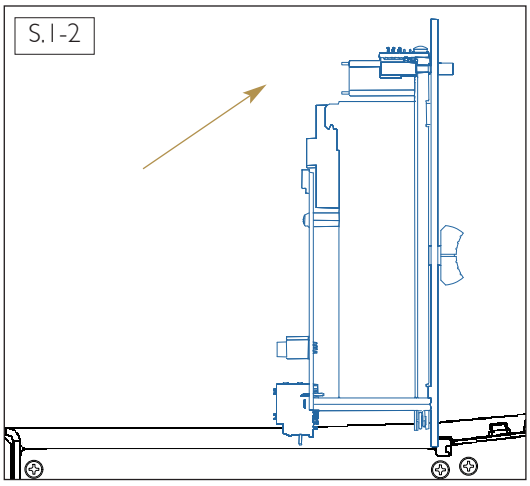
### Procedure

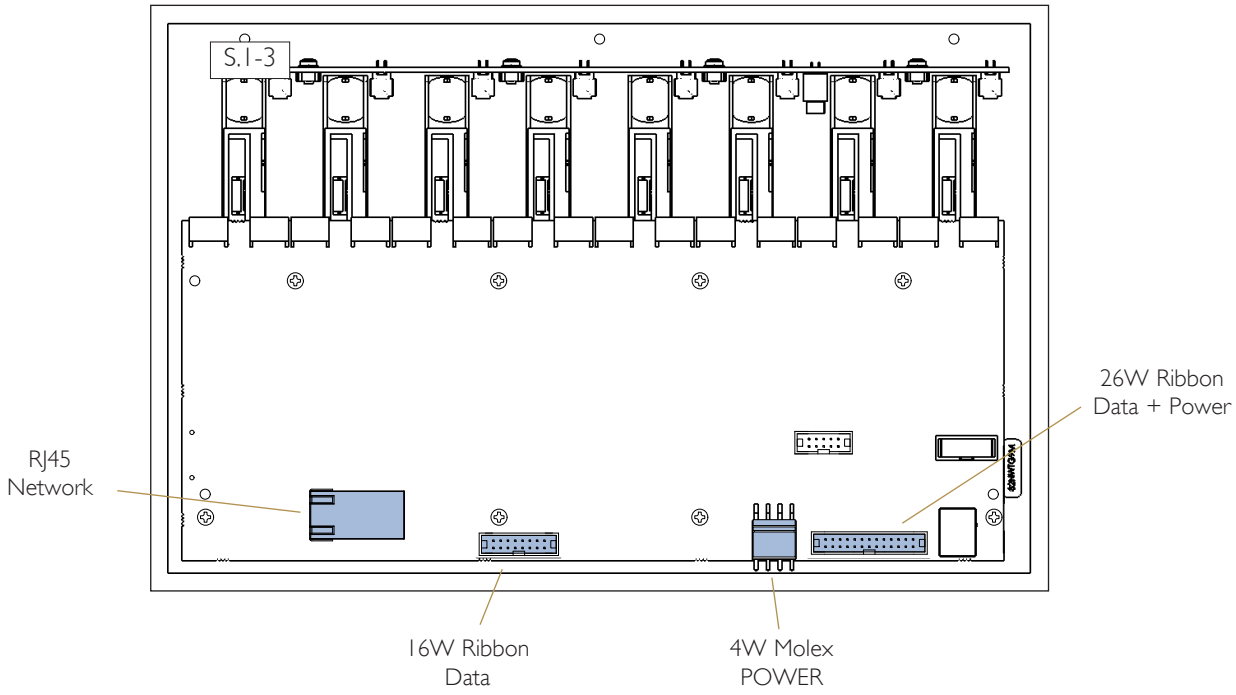
1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.
2. Remove the three 2mm hex screws at the front edge of the fader panel. Screw the module pullers into the two outer holes.
3. Slowly lift the front edge of the fader panel upwards until the fader motors are visible and are just clear of the front supporting rail in the console. Refer to diagram S1-1.

   The rear edge of the fader panel sits in a slot and will need to pull forward by approximately 5mm before the panel can be raised.
4. Tilt the panel upwards at the front until the panel sits vertically on its rear edge. Refer to diagram S1-2.

   *The connecting cables will prevent the panel from being lifted out of the frame at this stage.*
5. Remove the four connecting cables at the lower rear edge of the panel as indicated in diagram S1-3.



# S.2 Channel Control Tile Removal

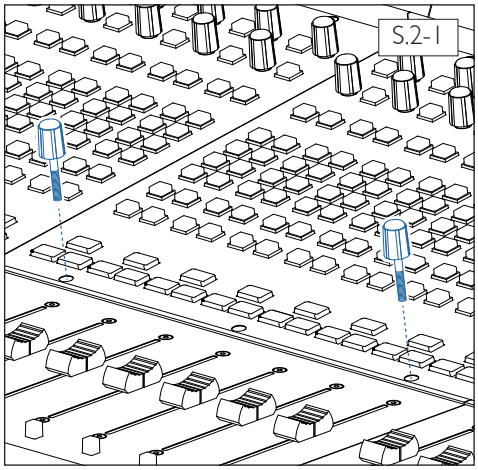
### Tools Needed:

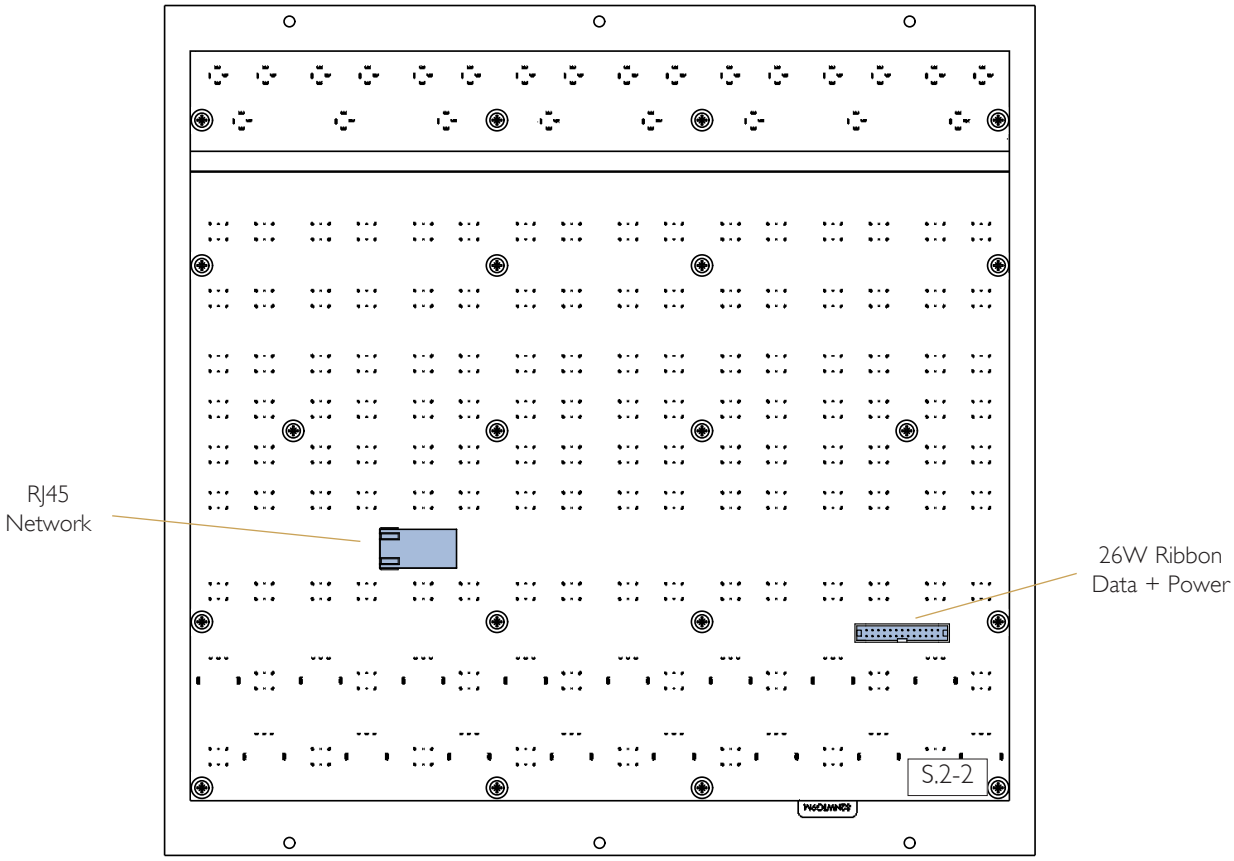
- 2mm Hex Driver
- Module Pullers (2)

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.
2. Undo and remove three off 2mm screws at the front edge of the tile and three off 2mm screws at the top edge of the tile.
3. Screw the two module pullers into the outer two fixing holes at the lower edge of the panel as shown in diagram S2-1.
4. Lift the front of the panel upwards using the pullers until the edge is free. Now support the panel by hand and continue to lift at the front until the panel sits vertically on its rear edge.

   *The connecting cables will prevent the panel from being lifted out of the frame at this stage.*
5. Remove the two connecting cables at the lower rear edge of the panel as shown below.



# S.3 Centre Control Tile Removal

### Tools Needed:

- 2mm Hex Driver
- Module Pullers (2)

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.

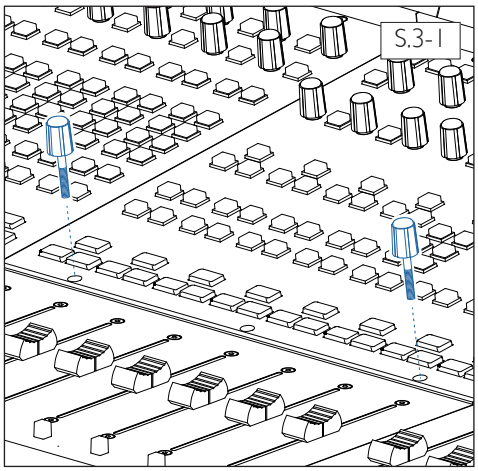
2. Undo and remove three off 2mm screws at the front edge of the tile and three off 2mm screws at the top edge of the tile.

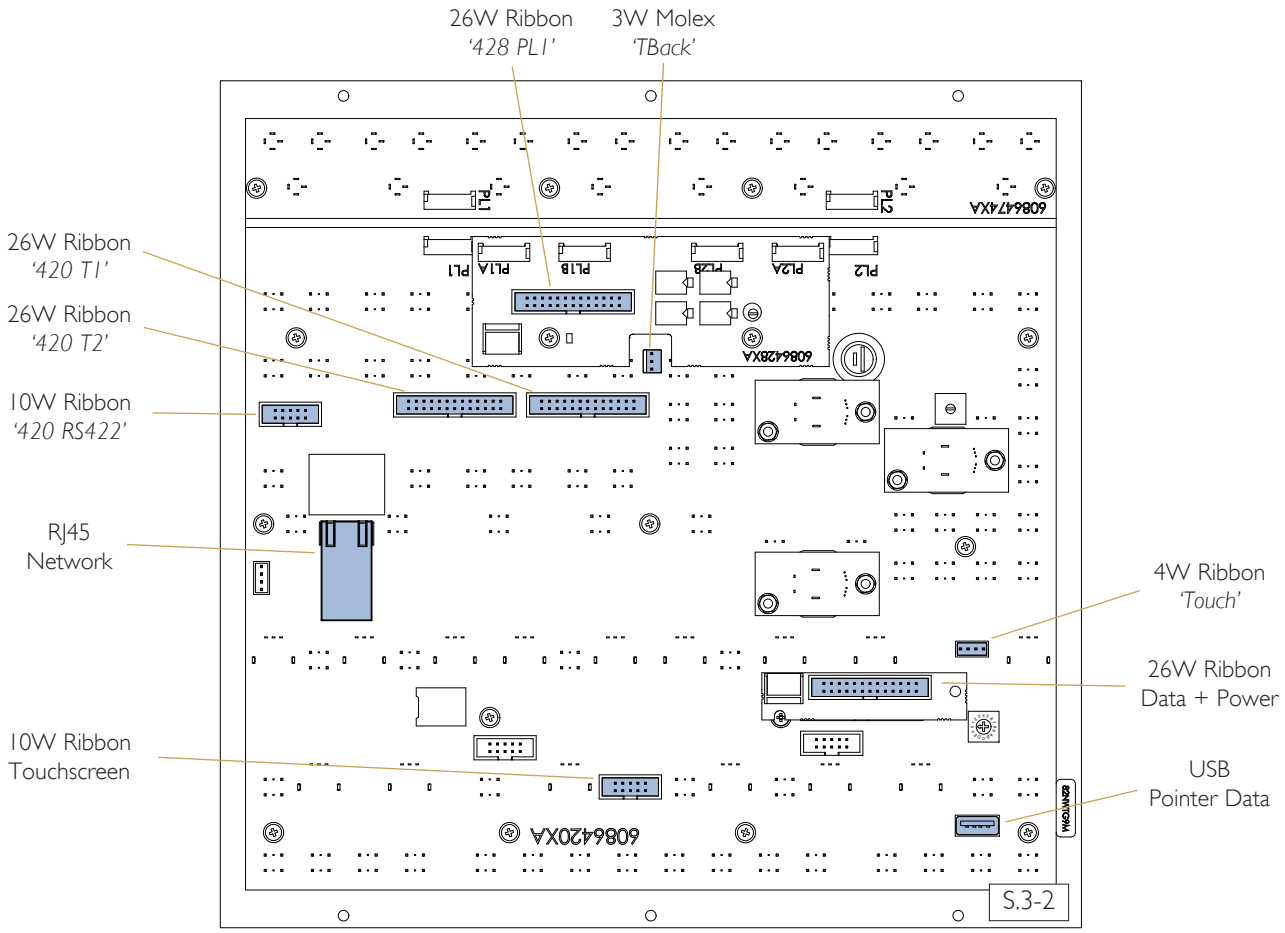
3. Screw the two module pullers into the outer two fixing holes at the lower edge of the panel as shown in diagram S3-1.

4. Lift the front of the panel upwards using the pullers until the edge is free. Now support the panel by hand and continue to lift at the front until the panel sits vertically on its rear edge.

   *The connecting cables will prevent the panel from being lifted out of the frame at this stage.*

5. Remove the ten connecting cables beneath the panel as shown below. Take careful note of the cable identification names when refitting the panel as some connectors are of identical types.



# S.4 Channel TFT Screen Removal

### Tools Needed:

- Posidrive no.1 screwdriver

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.

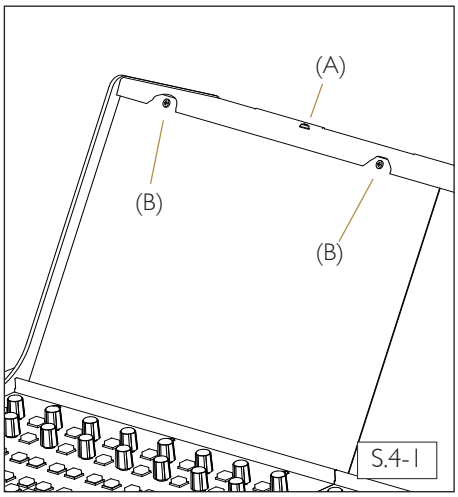
2. Remove the top trim from the console. The trim is secured with a single cross-head screw (A) in each console bay as shown in diagram S4-1. Once all the securing screws are removed the top trim can be pulled upwards at its front edge and removed.

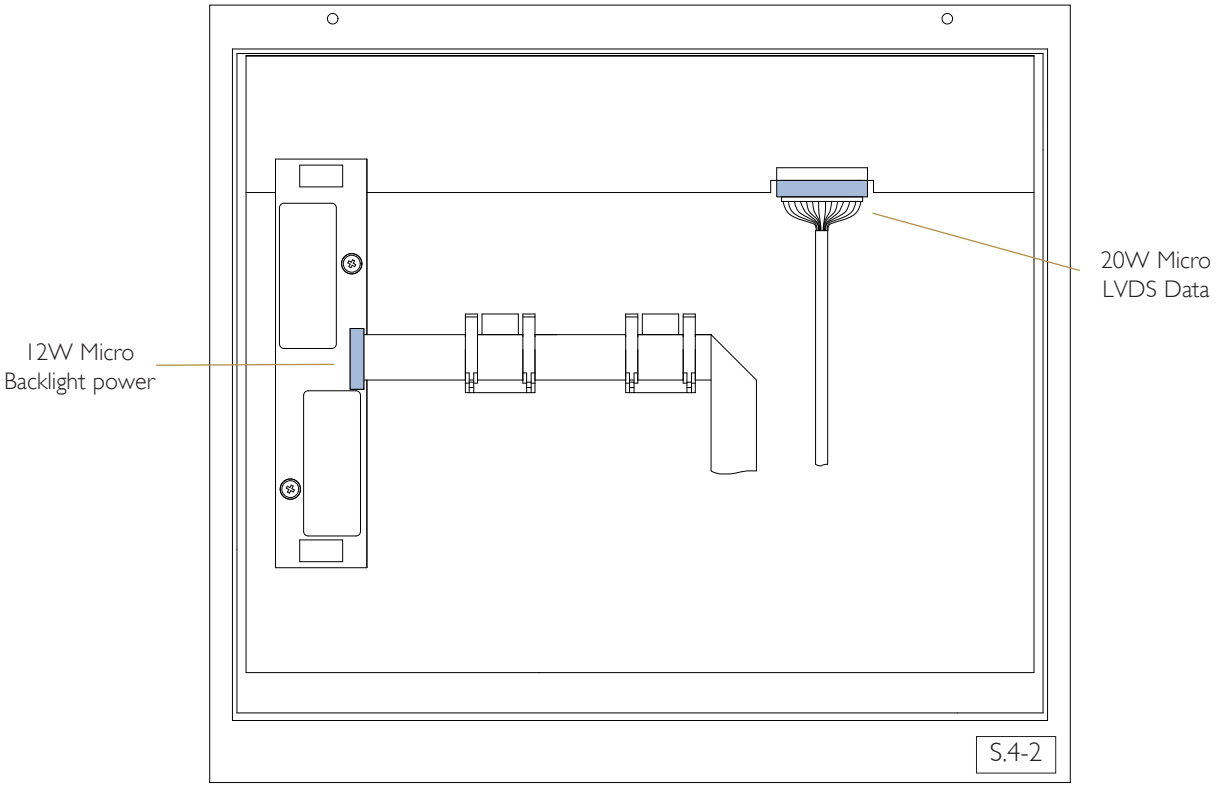
3. Remove the two cross-head screws (B) along the top edge of the TFT panel as shown in diagram S4-1.

4. Tilt the top edge of the TFT panel towards the front of the console and then pull upwards to free the bottom edge of the TFT panel.

   *The bottom edge of the panel is gripped by EMC shielding clips. A gentle side-to-side motion will assist in freeing the panel in a controlled manner.*

5. Remove the two connecting cables as indicated in diagram S4-2.



# S.5 Centre TFT Touchscreen Removal

### Tools Needed:

- Posidrive no.1 screwdriver

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.

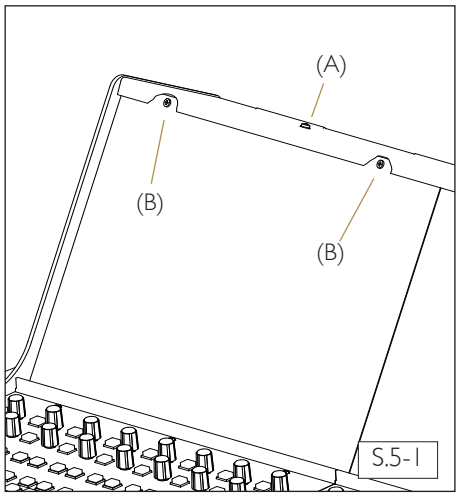
2. Remove the top trim from the console. The trim is secured with a single cross-head screw (A) in each console bay as shown in diagram S4-1. Once all the securing screws are removed the top trim can be pulled upwards at its front edge and removed.

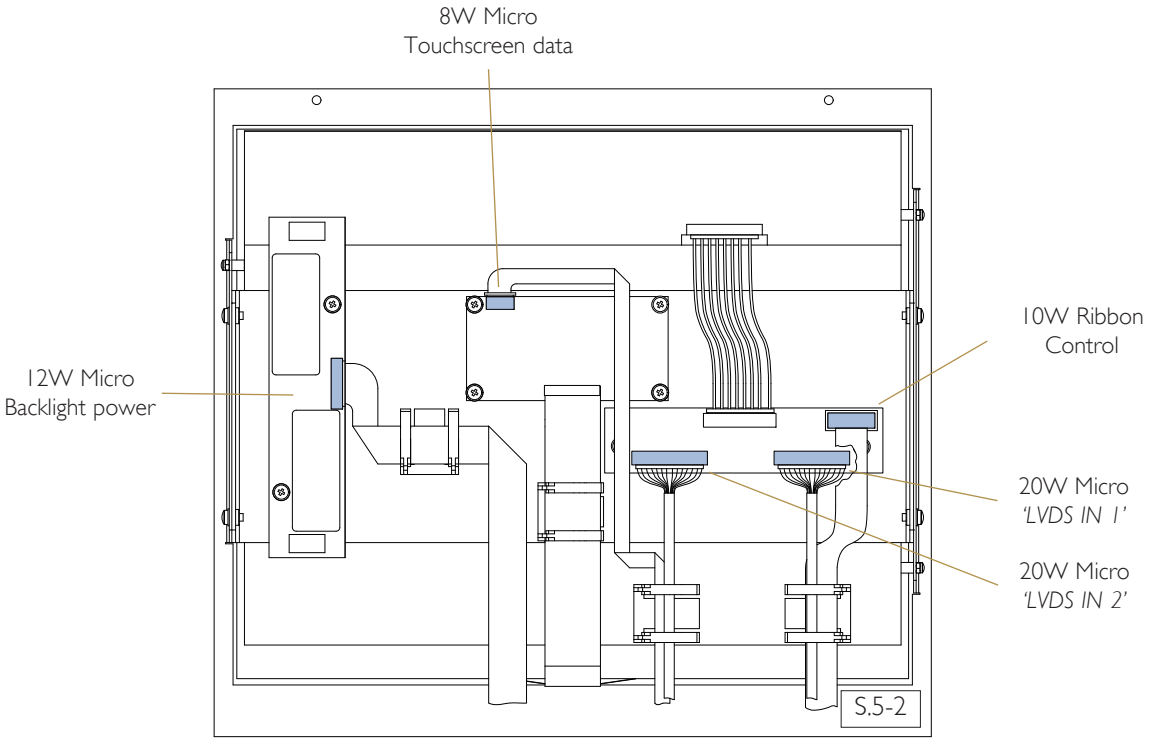
3. Remove the two cross-head screws (B) along the top edge of the TFT panel as shown in diagram S5-1.

4. Tilt the top edge of the TFT panel towards the front of the console and then pull upwards to free the bottom edge of the TFT panel.

   *The bottom edge of the panel is gripped by EMC shielding clips. A gentle side-to-side motion will assist in freeing the panel in a controlled manner.*

5. Remove the five connecting cables as indicated in diagram S5-2.



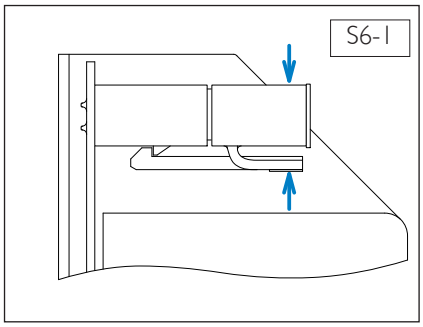
## S.6 Power Supply Removal

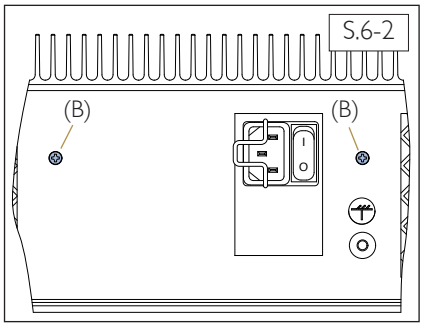
### Tools Needed:

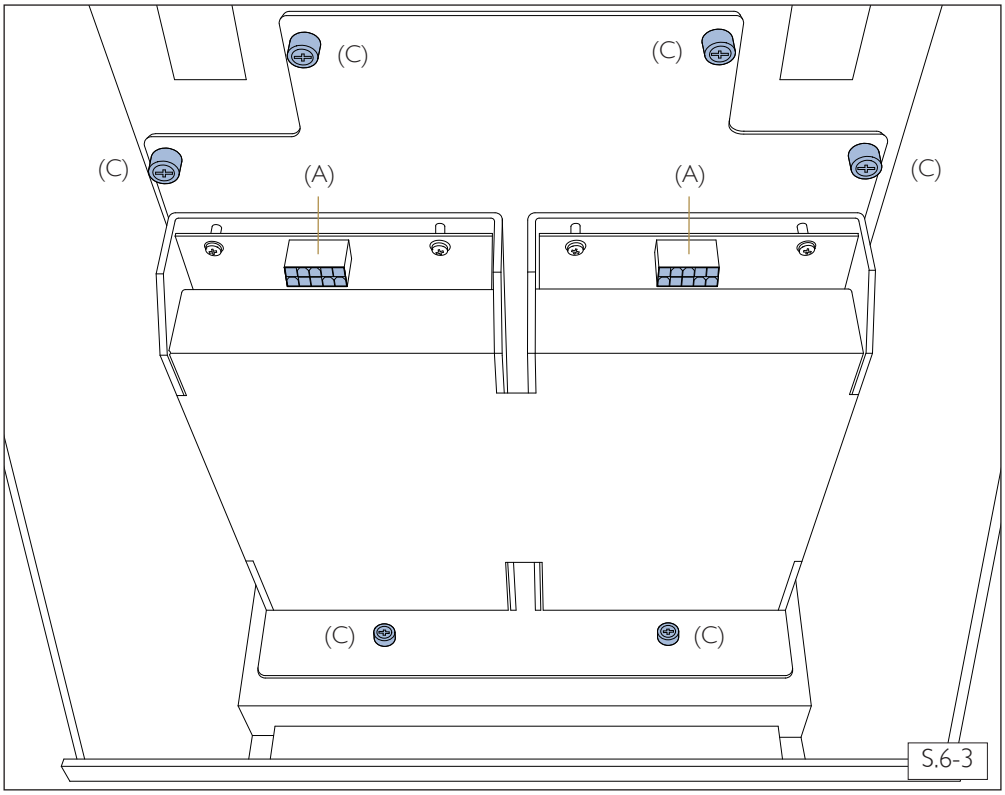
- Posidrive no.1 screwdriver

### Procedure

1. ⚠ Confirm that both the mains input power cables are disconnected before attempting to remove the power supply modules.
2. It will be necessary to remove the channel TFT screen panel from the appropriate bay to gain access to the PSU modules. Refer to page 7-4 for TFT removal instructions.
3. Disconnect both power leads (A) indicated in diagram S6-3. Note that the power connector is secured by a retaining clip on its lower side. To release the clip squeeze the tab upwards indicated by diagram S6-1.
4. From beneath the console, remove two M3 cross-head screws (B) as shown in diagram S6-2. *NOTE. This step is only required on consoles fitted with two individual modules mounted in separate console bays.*
5. From inside the console, unscrew the six finger-screws indicated by (C) in diagram S6-3. (Do not use a screwdriver to undo these fasteners).
6. The power supply assembly can now be removed from the console complete with the heatsink attached. Do not remove the PSU module from its baseplate.



# S.7 DSP Processor Removal

### Tools Needed:

- Posidrive no.1 screwdriver

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.

2. The DSP processor module is located behind the TFT touchscreen in the console's centre section. (Consoles with redundant processing will have an additional DSP processor assembly located in the first channel bay).

3. Remove the channel TFT screen panel from the appropriate console bay(s). Refer to the previous pages for TFT removal instructions.

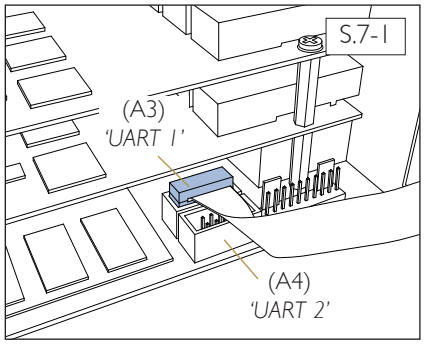
4. Disconnect the leads: (A1) *'POWER'*, (A2) data lead and (A4) *'UART 2'* as shown in diagram S7-3.

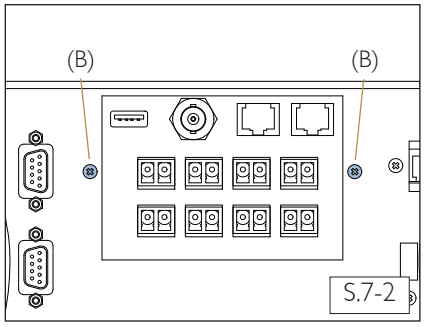
   *Note that the connector (A3) 'UART 1' is difficult to remove at this stage as it is covered by the lower MADI PCB. It is easier to remove after the DSP assembly is lifted from the backpanel. See diagram S7-1.*

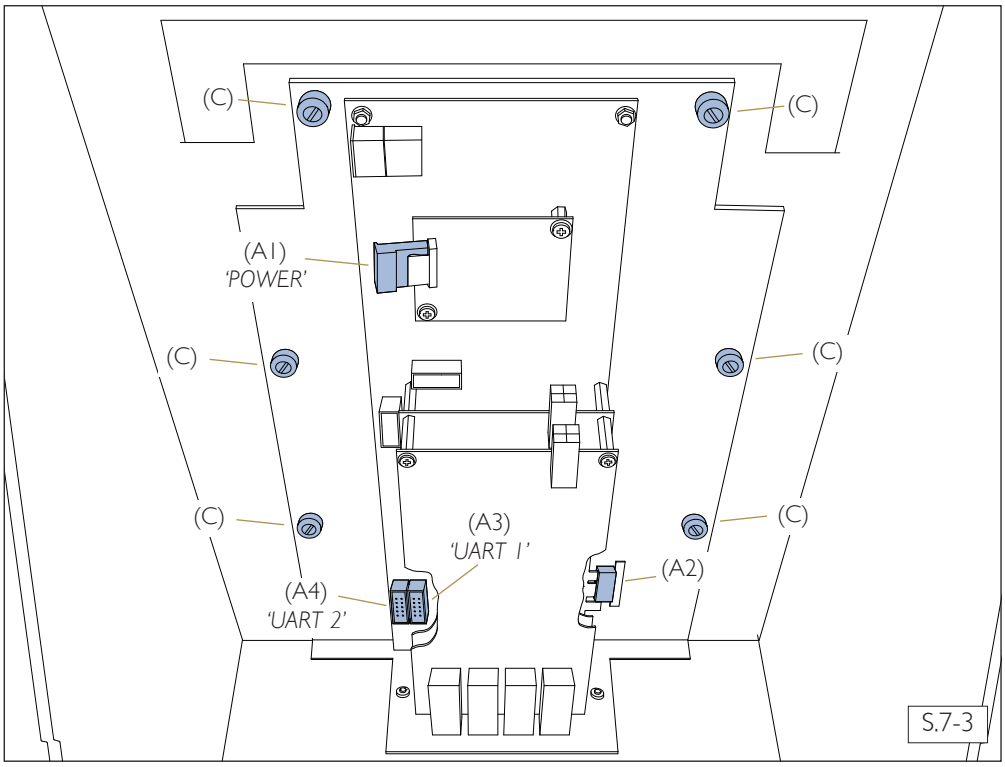
5. From beneath the console, remove two M3 cross-head screws (B) as shown in diagram S7-2.

6. From inside the console, unscrew the six finger-screws indicated by (C) in diagram S7-3. (Do not use a screwdriver to undo these fasteners).

7. Lift the assembly upwards until connector (A3) can more easily be removed. The DSP assembly can now be removed from the console.



# S.8 SBC Processor Removal

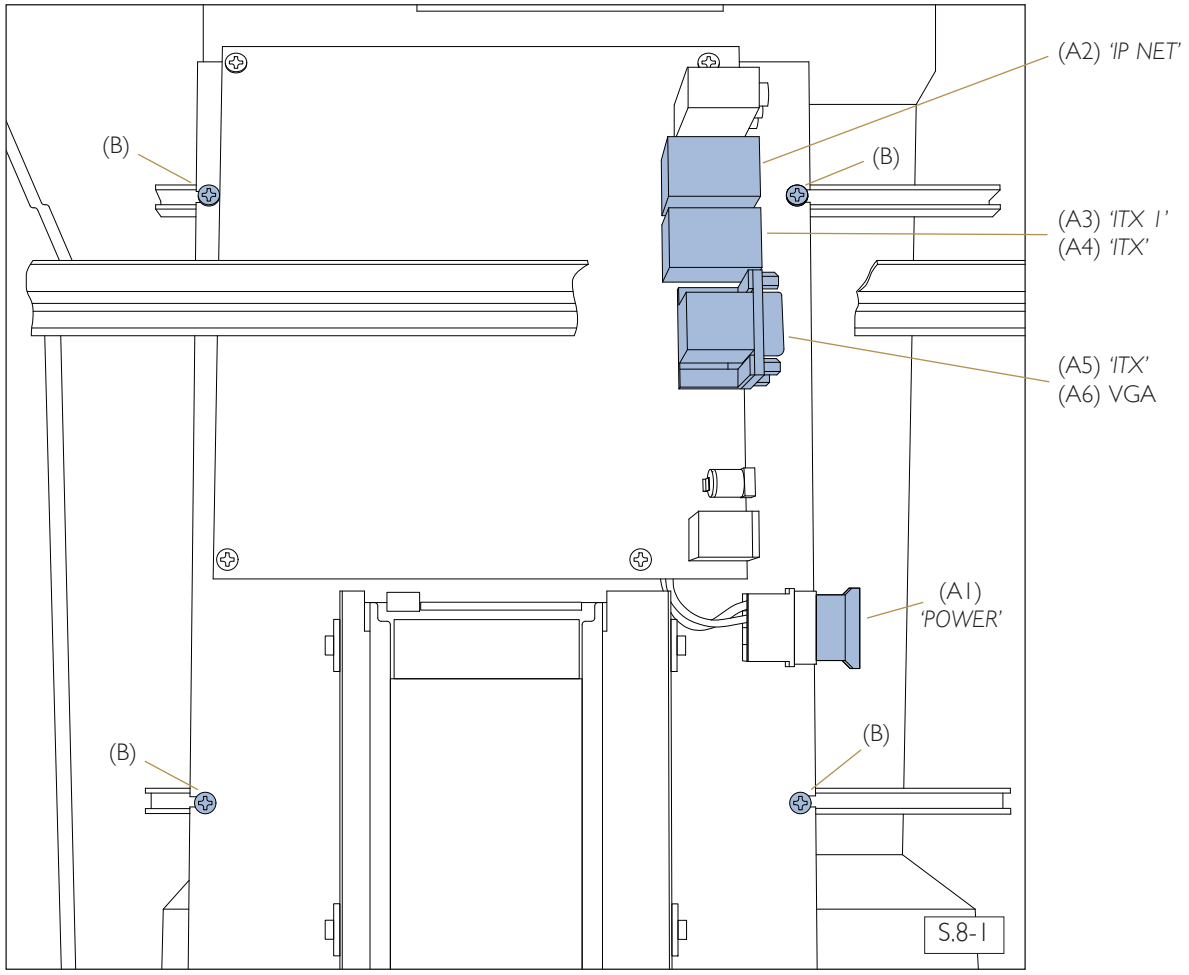
### Tools Needed:

- 2mm Hex Driver
- Module Pullers (2)
- No.1 Posidriver
- Small flat-blade screwdriver – for connector (A5)

### Procedure

1. Shutdown and then switch off the console at both power input panels. Remove both input power leads.
2. The SBC control computer is located in the console's centre section. (Consoles with redundant processing will have an additional computer assembly located in channel bay 1–8). To gain access to the SBC control computer(s) it will first be necessary to remove the appropriate channel/centre TFT screen and also the channel/centre control tile. Refer to sections S.2 – S.5 for TFT and tile removal information.
3. Remove the connector (A1) *'POWER'* as indicated in diagram S8-1.
4. Remove the RJ45 network lead at (A2) *'IP NET'*.

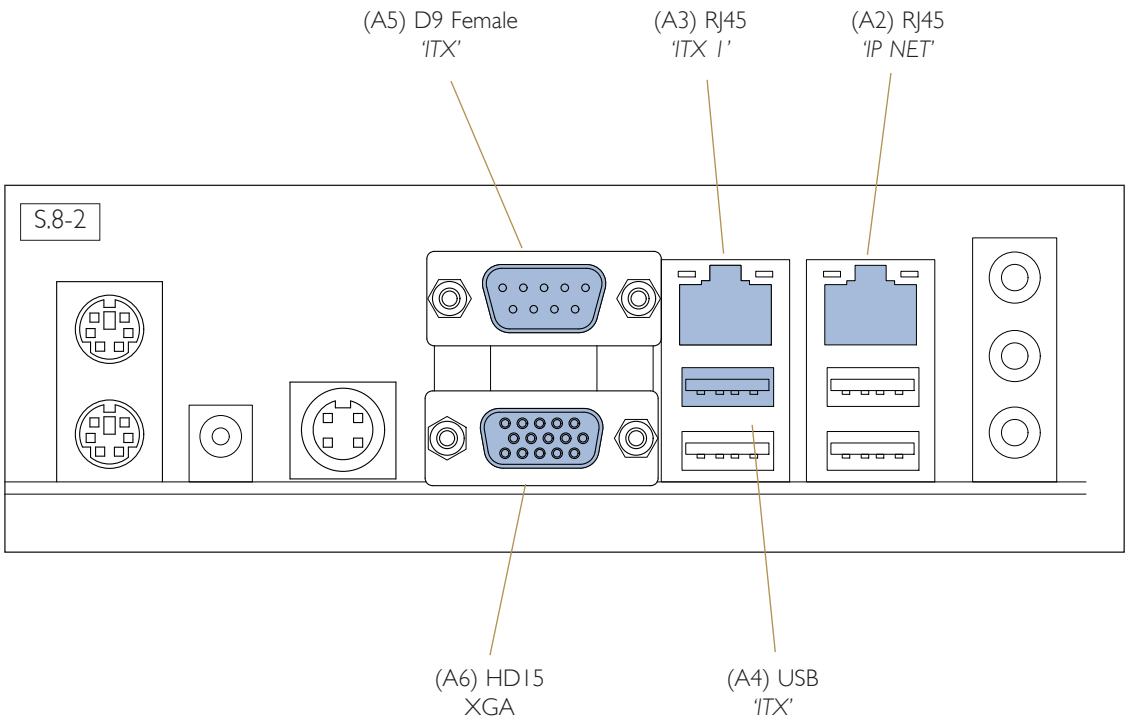
   *This gives easier access to the four fixing screws (B).*



5. From inside the console, remove four off M3 cross-head screws (B) as shown in diagram S8-1.

6. The ITX computer assembly can now be slid forwards to gain easier access to the remaining connectors at positions (A3) to (A6). The diagram S8-2 shows the locations of the connectors.

   *It is not necessary to remove any other connectors from the SBC assembly.*



# MAIN INDEX

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## I



## L



## M



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## O



## P



## Q



## R



## S

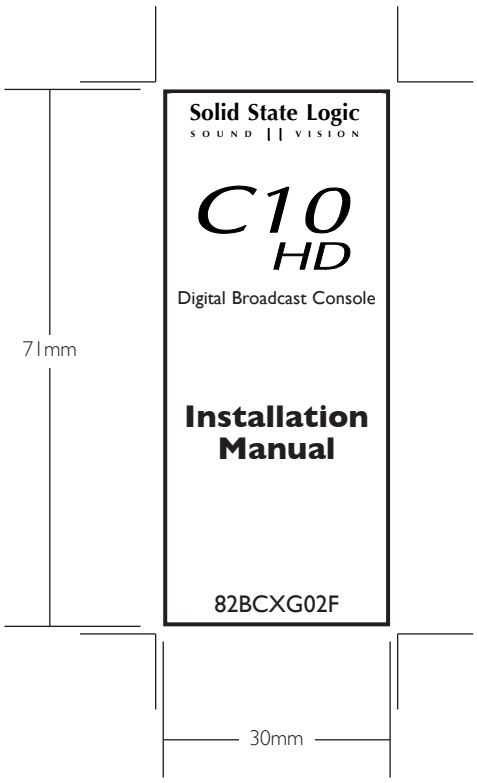
## T

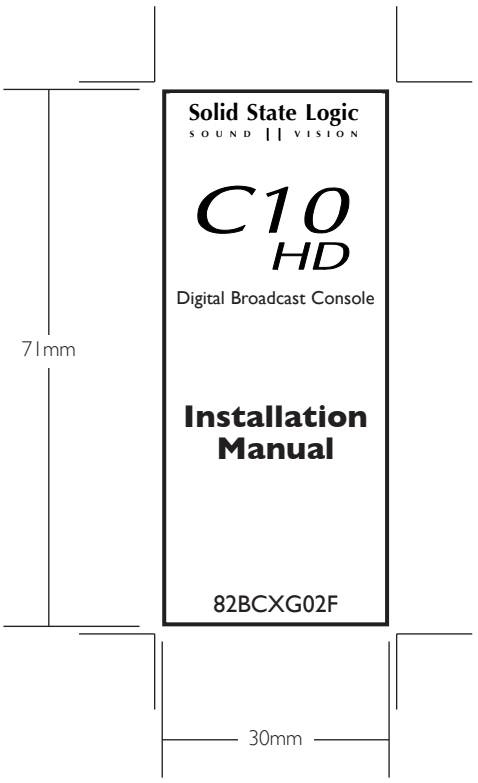


## U



## W


Solid State Logic
SOUND || VISION
C10
HD
Digital Broadcast Console
Installation
Manual
82BCXG02F
71mm
30mm


Solid State Logic
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30mm