C200
Installation Guide

Solid State Logic

SOUND | | VISION

C200

Digital Production Console

Installation Guide

Version 2.1.3

82S6PC2010E

Solid State Logic

SOUND || VISION

Begbroke, Oxford, England, OX5 1RU • +44 (0)1865 842300

320 West 46th Street, 2nd Floor, New York, NY 10036, USA • +1 (1) 212 315 1111
Suite 401, 5757 Wilshire Blvd, Los Angeles, CA 90036, USA • +1 (1) 323 549 9090
3-55-14 Sendagaya, Shibuya-Ku, Tokyo 151-0051, Japan • +81 (0)3 5474 1144
7 bis, rue de la Victoire, le Blanc Mesnil, Paris 93150, France • +33 (0)1 48 67 84 85
Via Timavo 34, 20124 Milano, Italy • +39 (0)39 2328 094

Visit SSL at URL: http://www.solid-state-logic.com

Contents

Section 1 – Introduction

The object of this manual is to provide purchasers of the C200™ Console and Centuri™ Processor with information in the following areas:

- Safety considerations
- Installation requirements
- Items supplied: – Main components and optional items
- Installation: – Physical assembly
  – Electrical connections and cabling
  – System options
- Specifications and Physical dimensions
- Pinouts of standard connectors

The information provided by this manual is relevant to all of the versions of the C200.

The aspects of the C200 which can be customised – frame size, channel layout, meter panel as examples – will be fully documented in the Custom Specification information for a specific console.

The Custom Specification information, which details the actual console as built, will be found in Section 10 of the console's Service Manual.

Section2 – Safety Considerations

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.

Installation Instructions

Voltage Selection and Fusing

Although the majority of SSL equipment uses auto-ranging power supplies, some sub-systems have user-selectable voltage inlets. Always confirm that the input mains voltage range is set correctly before applying power. Always isolate the mains supply before changing the input range setting.

If it is ever necessary to replace a blown mains-fuse, then always use the correct rating and type of replacement. If a correctly rated fuse continues to blow, then a fault exists and the cause should be investigated or the unit returned to SSL for repair/replacement as appropriate.

Details of mains settings and correct fuse ratings can be found in Appendix A of this manual.

Safety Earth Connection

Any mains powered item of SSL equipment that is supplied with a 3-core mains lead (whether connectorised or not) should 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 cases and should 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).

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

Mains Isolation and Over-Current Protection

An external disconnect device (switch) is required for this equipment which must be installed according to current wiring regulations. A detachable power cord, if fitted to this equipment, is a suitable disconnect device; otherwise an approved disconnect switch is required – the rating of which is defined in the product specification (Appendix A) and on the equipment itself.

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 equipment (specifically units with PSU Redundancy) utilises 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 begins.

Physical Safety

Most subsystems are too heavy for one person to lift. Take particular care when removing the computer chassis from the 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 C200/Centuri system is CE compliant. Note that the majority of cables supplied with SSL equipment are 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

The equipment which forms a C200/Centuri system 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.

Section 3 – Pre Installation Information

Physical installation of the console is normally carried out by a specialised transportation company. In some cases this will have been arranged by the local SSL office, in other cases by the facility.

The cables that run between console and processor can be shipped in advance of the console in a separate kit (the pre-install kit). These cables should be installed by the facility engineers. Instructions for installing these cables are found on pages 26 to 31 of this manual.

Note: Cables for the connection of ancillary functions, Meters, talkback, oscillator and any custom switches etc. are not supplied by SSL and will need to be provided by the facility. See pages 43–45 for wiring information.

Before the console is installed all building work should be completed and the environment MUST be clean otherwise the warranty will be rendered invalid.

Before commissioning can take place the following must be completed:

- Air Conditioning installed, tested, blown-through and working
- Lighting installed and tested
- Cable Trunking installed
- Wall and floor finishes completed
- Power Distribution installed and tested
- Cables installed and tested
- Monitor loudspeakers installed and working
- Other utilities (telephone, water etc.) available

Services provided by SSL

Commissioning

All C200 systems include on-site commissioning by an SSL engineer. This is usually expected to take from 2 to 4 days depending on system size, configuration and options. Large systems, or consoles split for shipment, may require an additional 1–2 days of commissioning time.

You will be contacted by your local SSL office or agent shortly before delivery to arrange a commissioning date.

Training

Three days of standard operator training are provided with each C200 system. If required, this is scheduled to take place immediately following the commissioning period and is usually carried out by the commissioning engineer. A further day of advanced operator training is available at additional cost.

On-site maintenance training is also available at additional cost. This can be either one day for a basic overview or two days for more advanced training.

Training should be requested at 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. Please contact SSL's training department at: support@solid-state-logic.com.

Warranty

All systems normally include 13 months warranty from date of shipment. This does not include consumable items such as magnetic media, disks etc. Further details may be found in SSL's Conditions of Trading (printed on the reverse of all SSL invoices).

Physical Requirements

Console Control Surface

The console control surface can be specified to have from 16 to 96 channels so the size and weight will vary considerably. A dimensioned footprint drawing for each specific console control surface can be provided by SSL's Project Engineering Department. See page 8 for an example of a 32-channel footprint.

Consoles can be built with split points at any profile. The console can then be split for shipment to simplify installation into client's premises. Reassembly will be by SSL engineers.

Refer to Appendix A for weights and power consumption information.

Rack Mounting Equipment – Centuri, NetBridge and Stageboxes

The Centuri Processor is a 15U height chassis into which a range of I/O cards can be fitted. The system's processing and DSP resource is also housed in the Centuri rack. The Centuri is therefore fitted with cooling fans and is expected to be housed in a separate 'machine' room.

A 19" equipment rack will need to be provided into which the Centuri Processor can be mounted. Note when positioning the rack that cards are inserted into the Centuri Processor from both the front and the rear depending on function. Clearance for access to cards must therefore be provided both in front of and behind the rack (see page 10 for service clearance diagram).

NetBridge – which is an option – is a 2U high rack mounting unit.

Remotely located stageboxes (C-SBs) – which are also optional – may be specified. These are 14U rack units.

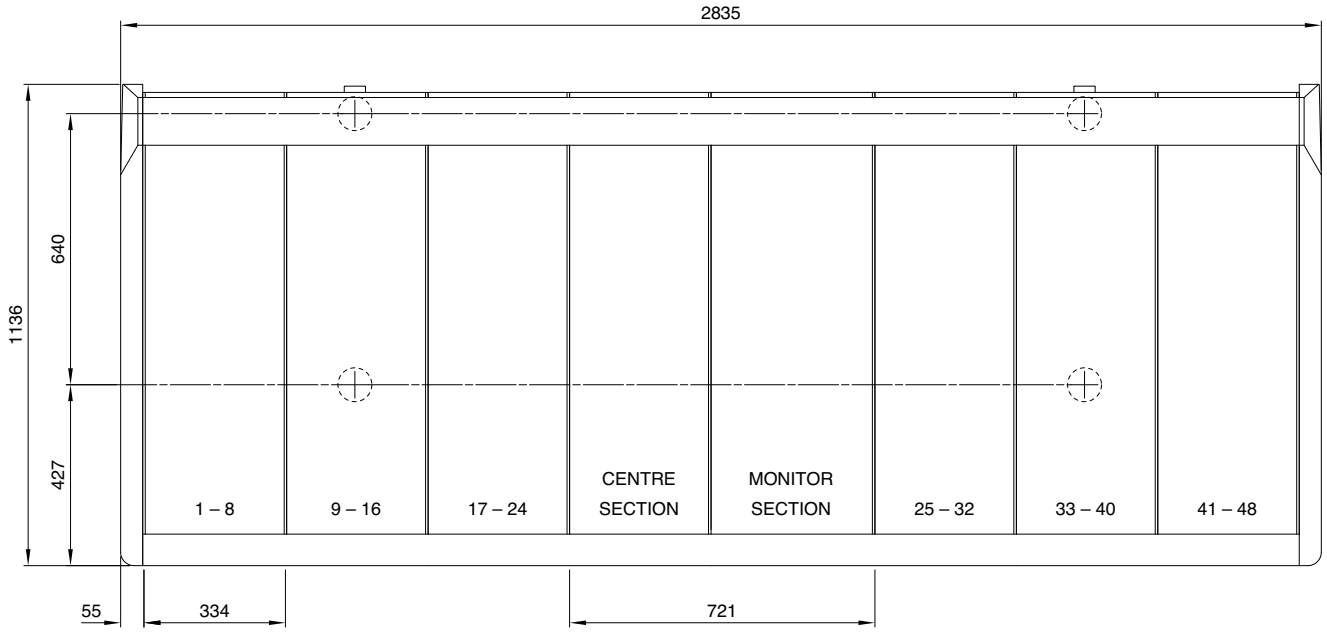
Note. Centuri, NetBridge and stagebox units MUST be supported on shelves and not only by the rack ears.

Acoustic Isolation

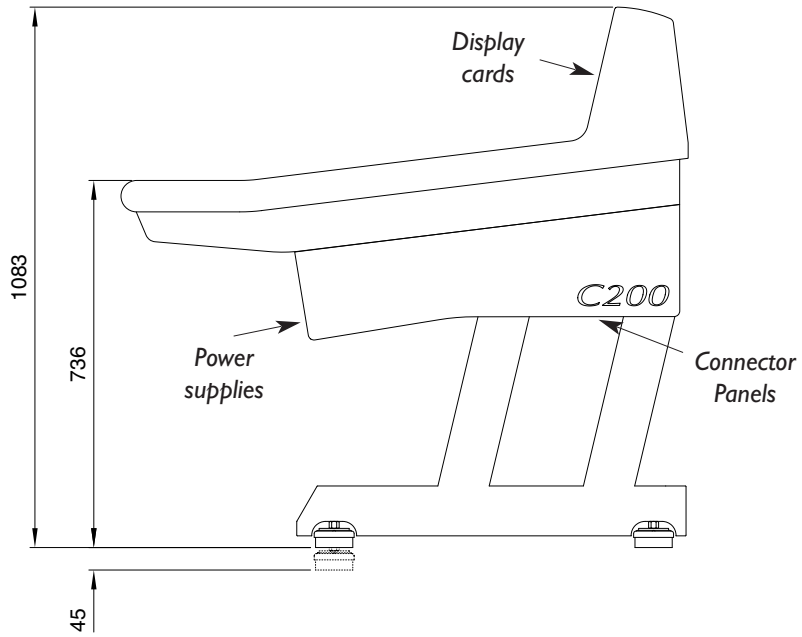
Because of the noise generated by cooling fans the Centuri core should be located in a separate machine room. Adequate noise isolation should exist between the machine room and control room/recording areas.

Noise figures for individual units are given in Appendix A.

48 Channel Footprint



Side Profile Showing Service Access



Air Conditioning Requirements

Air conditioning will almost certainly be required for both the Machine and Control rooms in order to maintain the temperature and humidity to within the required levels.

Power dissipation figures for console control surface and equipment rack are listed in Appendix A.

Appendix E contains the environmental specification for SSL equipment.

Cable Ducting

Cable ducting will be required between the console and the Machine room (as well as to any outboard racks and the recording areas). The ducting provided should be of sufficient size such that approximately 50mm x 35mm is available for console surface connection.

The connectors for all control and interface cables are located beneath the console's Centre Section. The connector panels are orientated so that cables will route towards the rear of the desk.

The mains input power connector will be located on a separate panel. This panel is usually positioned in a bay adjacent to the Centre Section nearest to the centre of the console but may vary due to console layout.

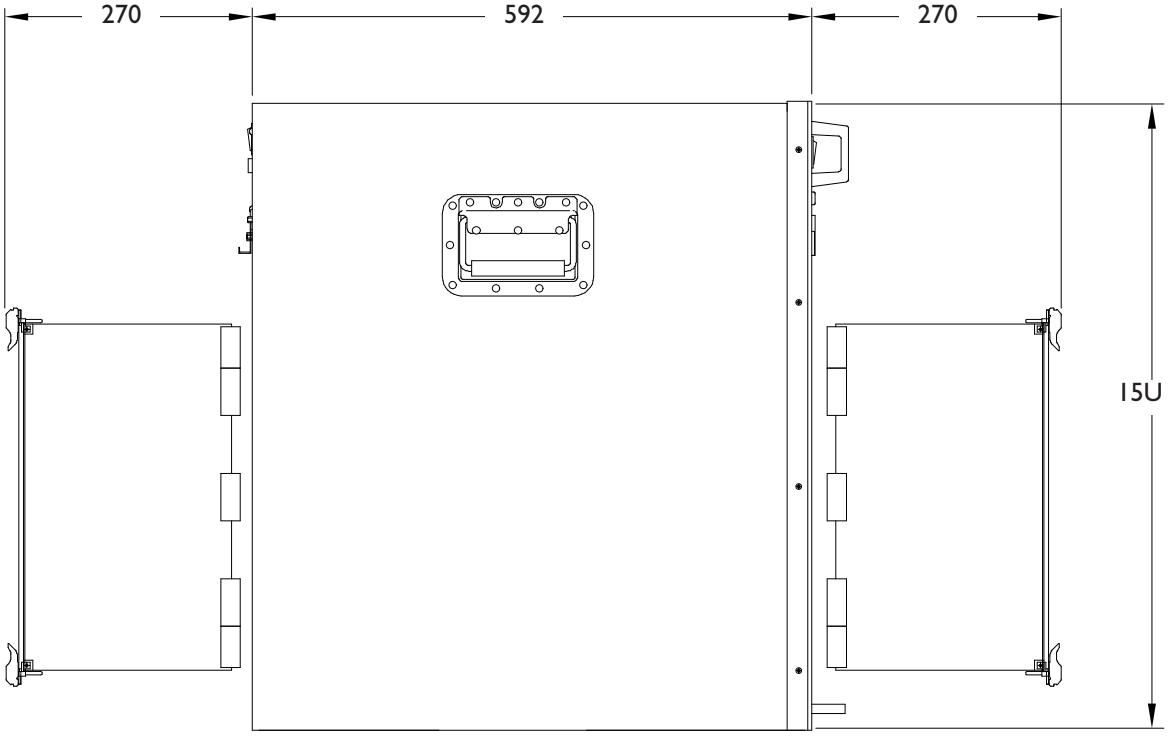
Cable sets are available in 10, 16, 20, 25, 48 and 80m standard lengths. Sets longer than 16m are at additional cost.

Service Access

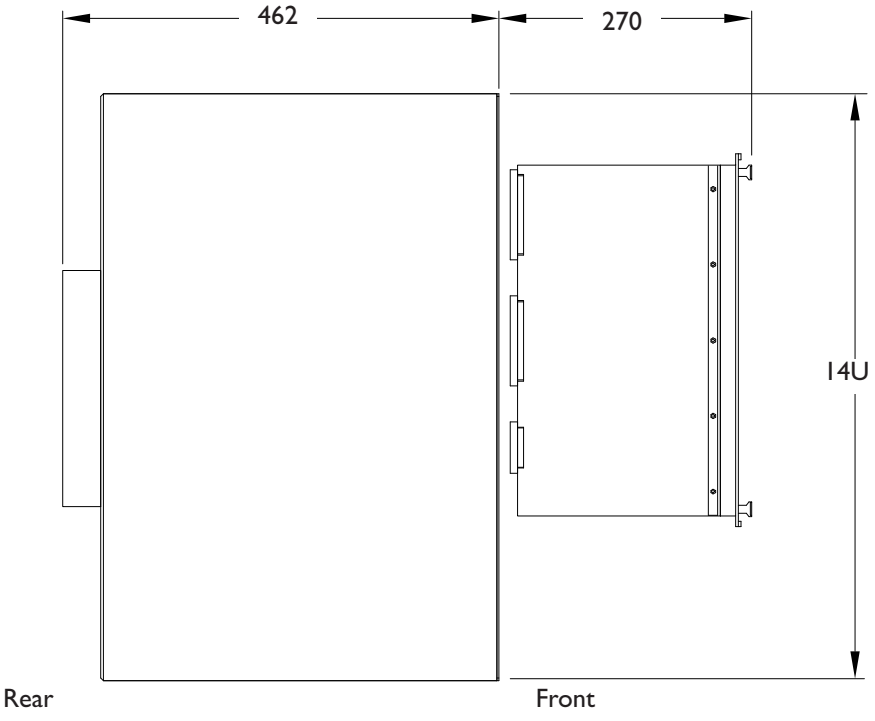
Access to all major electronic assemblies within the frame is either from the front or from beneath the console. The meter LCD panels are retained by finger-screw fastener beneath the top trim. The top trim is designed to hinge upwards to allow access to these screws. If the console is being built into restricted space – as in some mobile installations – then always allow a minimum of 80mm clearance above the top trim.

Sufficient clearance must be provided in front of and behind the rack into which the Centuri processor is installed so that cards can easily be removed. See the drawing on page 10 for minimum clearances.

Centuri Processor Crate (side view) Showing Card Access



C-SB Crate (side view) Showing Card Access



Dimensions in mm

Technical Requirements

Video Sync Source

The Centuri Processor requires a feed of video sync. Other sources – MIDI or wordclock etc. – cannot be used as the sync reference.

The sync required is 75Ω 1V(pk-pk) black-and-burst video. The standard can be either PAL (625 line, 50Hz) , NTSC (525 line, 59.94Hz or 60Hz). Composite sync may also be used.

Many other studio peripherals (digital recorders, editors and all video picture recorders) will also require a feed of video sync. Depending on the studio configuration, a suitable video distribution amplifier may also be required.

Note: The Centuri processor does not provide internal sync generation.

Power Connections – Mains Input Voltage & Current

Both the console control surface and the Centuri processor rack are fitted with auto-sensing power supplies and will function at any voltage from 100 to 240 volts without adjustment.

The console is supplied with one or more detachable mains leads. These leads are 2m in length and the cable diameter is 11mm. The free end of these leads is unterminated for connection to a suitable outlet.

C200 systems can be fitted with dual redundant power supplies for 'on-air' use. In this case, the console will be fitted with two mains input connectors. Consoles larger than 56 channels will be fitted with two input connectors for the standard mains supply, so if the same console is also fitted with PSU redundancy it will have four input leads.

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/circuit-breakers is recommended.

NetBridge (which is a separate 2U unit – see page 23) is fitted with a voltage select switch for 230V or 115V operation. Confirm that the voltage is correctly set before applying power – see page 23.

See Appendix A for equipment specifications.

Grounding

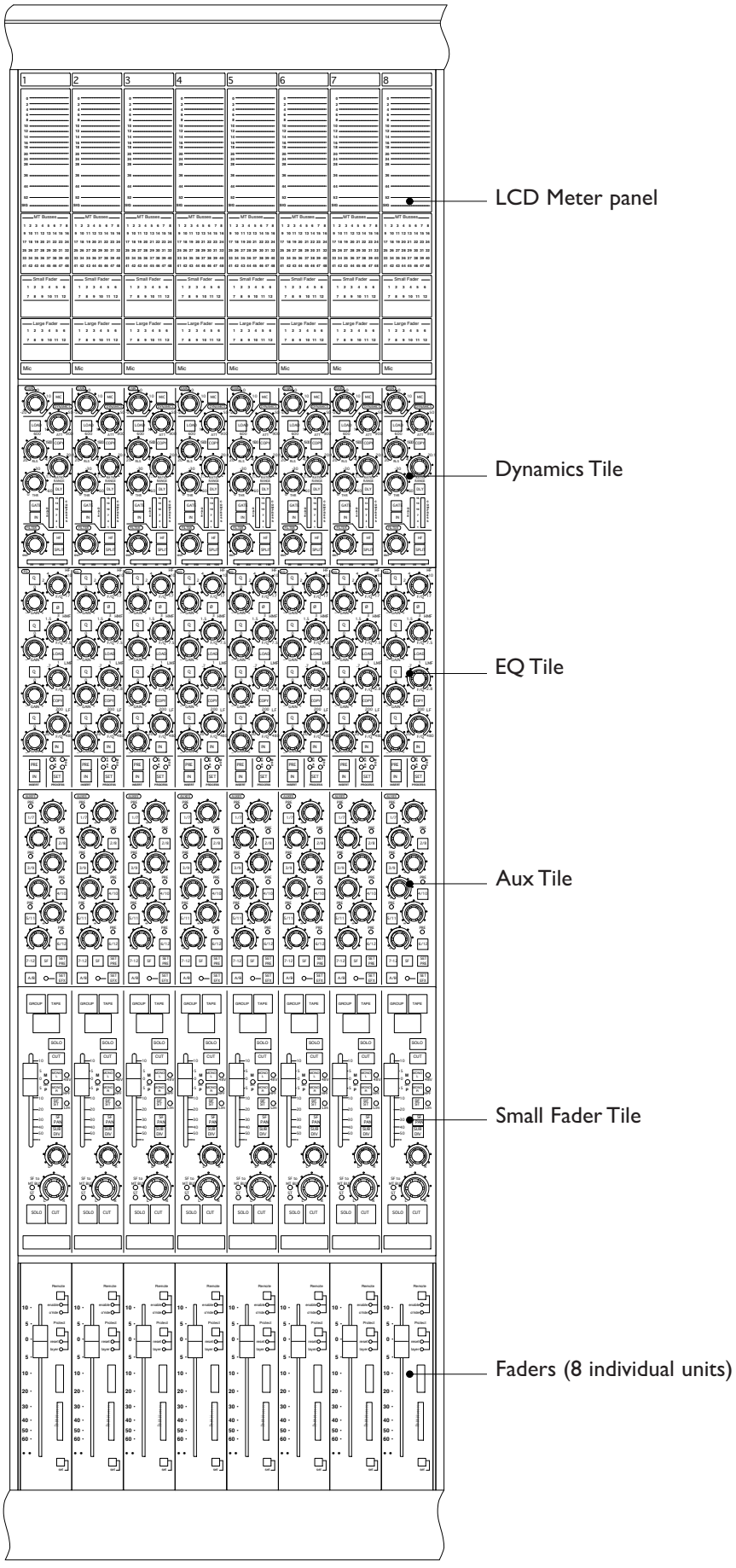
A standard system should not require any additional grounding over and above that supplied by a correctly installed mains supply. All rack unit chassis are permanently bonded to mains earth. A permanent mains earth connection via the mains inlet must be provided.

If, due to the quality of the mains wiring within an installation, it is deemed necessary to improve upon the mains earthing, chassis ground connection points are provided as follows:

Centuri rack chassis ground can be accessed via a stud located on the rear panel.
Console chassis ground can be accessed via a stud located on the mains power connector panel.

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 grounding and EMC standards.

C200 Channel Bay Layout



Section 4 – System Components

This section gives an overview of the main units in the system. See Appendix A for specifications and Appendices B and C for connector details and pinouts.

C200 Console

Each console control surface will consist of one Centre Section and can be specified to have from 16 to 96 channel faders in groups of 8. (Note: a group of 8 faders and controls and its frame is termed a bay). See page 10 for frame sizes.

Each console channel bay consists of five sections: Main Faders, Small Faders, Auxes, EQ, Dynamics and the meters. This layout is not fixed so that, for example, the Aux and EQ positions could be swapped.
Only the faders are removable individually, all other panels (termed tiles) are 8 channels wide.

Only the faders are removable individually, all other panels (termed tiles) are 8 channels wide.

> *Note that the number of physical faders fitted does not limit the number of processing channels available; this is determined by the amount of DSP resource fitted to the processor.*

The Centre Section may optionally be specified with a 6 or 8-channel LCD phase-scope and has additional space for mechanical meters. Alternatively, a range of custom meter configurations is possible; these should be detailed at the time of order.

The console frame may be specified to have 19" wide sections for script space (known as 'Producer's' tables). These can be fitted with either a full-depth flat table or a shorter table and either 7U or 14U of equipment racking.

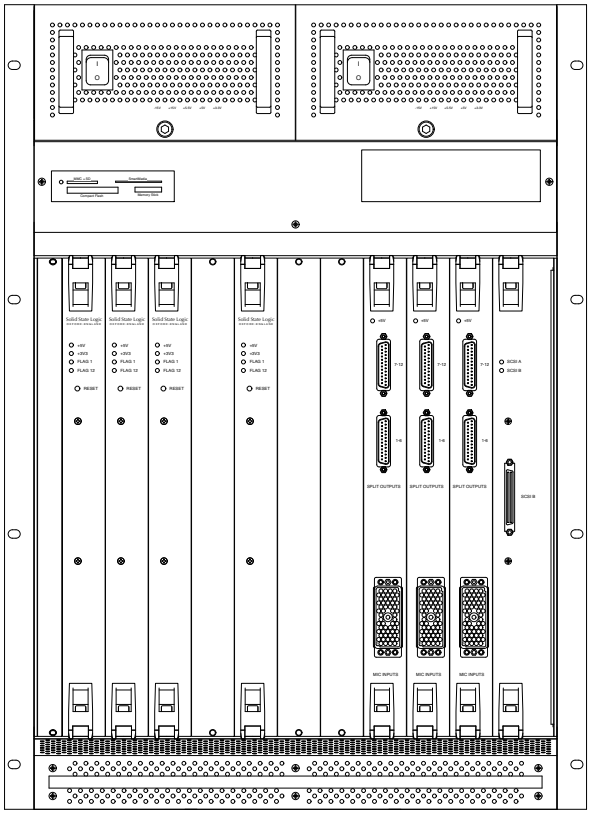
SSL's Project Engineering Department can provide specific console footprint drawings detailing metering options during the specification process.

Single Width 'Mobile' Centre Section

For installations where width is restricted a narrower, or 'mobile', Centre Section may be specified. This will reduce the console overall width by 387mm.

In this configuration, the Centre Section will consist of a single eight module-width bay fitted with the master control and monitoring panels. The section containing the TFT display and motion control panel is not fitted. The trackball, the Jogwheel and some automation buttons are not fitted. Additionally, there is no space to fit mechanical meters.

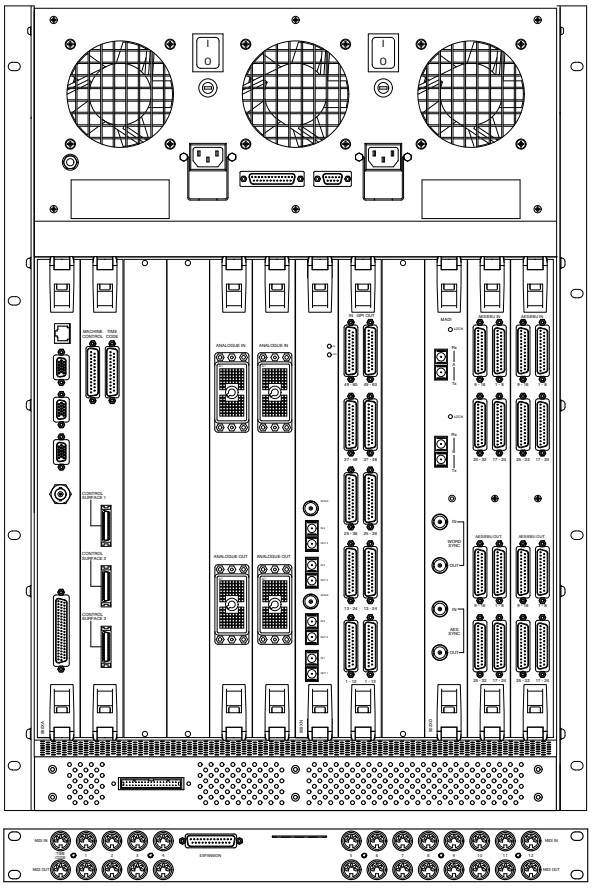
It will be necessary for the facility to provide an external XGA video monitor for the computer control display. The video signal is is available on an analogue HD15 connector on the rear of the Centuri processor (see page 28).



Centuri Processor Crate (Front View)

Access to:

PSUs
Removable media drive
DSP cards
System Disk card
I/O Cards (Mic or Digital*)



Centuri Processor Crate (Rear View)

Access to:

CPU card
Front panel card
GPI/O card
Routing/Link card (fitted with 2 Fibre Link ports)
I/O Cards (Analogue, Digital or Mic*)
DAW Midi panel (option)

**special order only*

NB. Cards shown are an example. Configuration will vary according to specification.

The Centuri Processor

The Centuri processor is a 15U high 600mm deep rack unit. Cards are fitted to the front and rear of the chassis so space for access is essential. See page 10 for chassis dimensions and minimum service clearance.

At the front of the processor is located the plug-in PSU module. A second module may be specified if redundancy is required. One unit is capable of powering the system.

The panel below the power supplies is fitted with the Compact Flash memory card reader. This is used to transfer system software onto the internal hard disk. Note that although a multiformat card reader is fitted, only the Compact Flash device is currently supported.

Below the drives is the front card-cage which has space for 11 plug-in cards, numbered from left to right. The cards are arranged as follows:

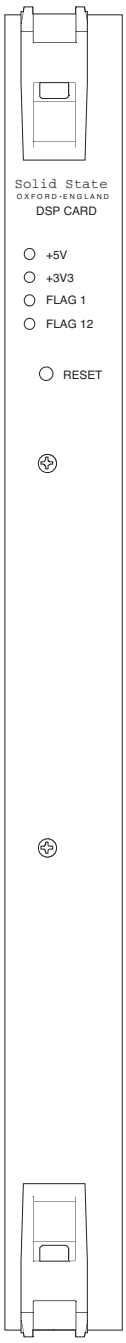
Slots 1–4	Channel DSP cards.
Slot 5	Always fitted with a DSP card for the Centre-Section mixes.
Slot 6	Reserved for future expansion.
Slots 7–10	Can be a combination of additional DSP cards and/or I/O cards – micamp cards (digital or MADI cards to special order only)†.
Slot 11	Always fitted with the system disc card unless the dual-redundant disc option is specified.

There rear of the processor has space for 12 plug-in cards. Note that these slots are numbered from right to left.

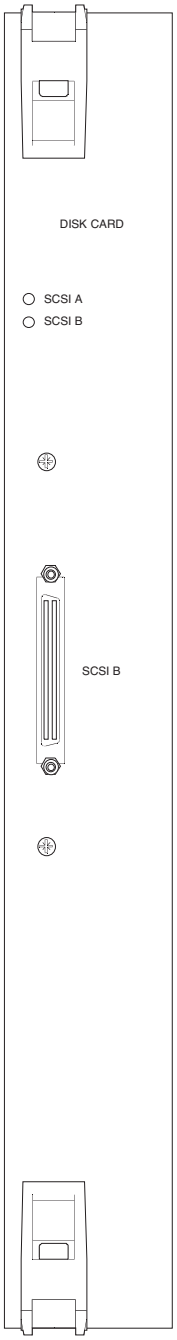
Slots 1–4	Available for I/O cards (analogue, digital and MADI).
Slot 5	Always fitted with the console's Routing/Link card.
Slot 6	Reserved for the optional GPI/O card.
Slots 7–10	I/O cards – analogue, digital and MADI (mic cards to special order only)†.
Slot 11	Always fitted with the Console-Interface card.
Slot 12	Always fitted with the CPU card.

Note that front and rear mounting I/O cards, although functionally identical, are physically different so it is not possible to exchange cards between back and front.

† Specifying rear mounted micamp cards or front mounted digital/MADI cards will extend the order lead time.



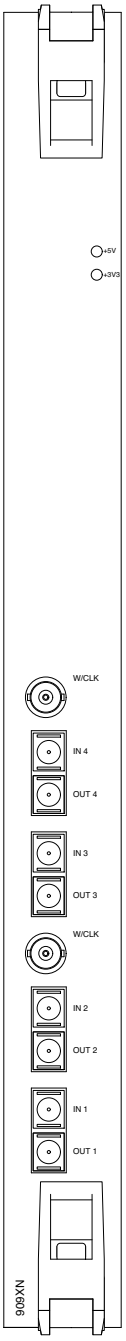
DSP Card



System Disk Card

CPU Card

Console Interface Card



Routing/Link Card
(shown with two Fibre Links)

Centuri – DSP Card

The DSP cards supply the signal processing function for the Centuri system. Each card provides 32 channels of processing at 48kHz. or 16 channels of processing at 96kHz. DSP cards are all the same and do not require configuration. They can therefore be fitted into any of the appropriate slots in the front of the Centuri rack.

For a system to pass any audio, there must a card fitted in slot 5 and a card in slot 1.

Centuri – Disk Card

This is a 1.5 width card which is always fitted in the right-hand slot (slot 11) of the front card-cage. It houses the system hard-disk. This card is not fitted if the dual redundant disk option is specified. In this case a blank panel is fitted and the system discs are mounted internally in the space beneath the power supplies. A front panel key switch is provided to select which disk is in use.

Centuri – CPU Card

The Centuri Processor is always fitted with the CPU card. It must be fitted to the left-most rear slot.

The CPU card is fitted with connectors for the following functions:

Ethernet	–	100baseT console network[1]
Video 1	–	Display output for the Centre Section monitor (Video 2 and 3 are unused).
Sync	–	Video sync input. Video black & burst is required for system reference.
Serial	–	62-pin connector providing eight RS422/RS232 serial ports. An adaptor cable breaking out to eight off 9-way D-type male connectors, labelled 'TTY-A' to 'TTY-G', is provided.

TTY-B:	-	Keyboard (RS422)
TTY-C:	-	Touchscreen data (RS422)
TTY-G:	-	Bitpad (RS422)
TTY-E:	-	Console (RS232) – Connection for data terminal
TTY-A, D, F & H		Unused on C200

[1] *The ethernet connection is used for SSL control information, it is not TCP/IP protocol. Do not combine with proprietary networks. Standard ethernet repeaters can be used.*

Centuri – Console Interface Card

The Centuri Processor is always fitted with one Interface card. It must be fitted to the rear of the card-cage next to the CPU card.

The card provides the connection to the console's control surface and handles all switch and lamp signals. Of the three 'Control Surface' connectors, only numbers 1 and 2 are used as these contain sufficient capacity for the largest C200 console.

This card also provides the connectors for parallel machine control and analogue timecode.

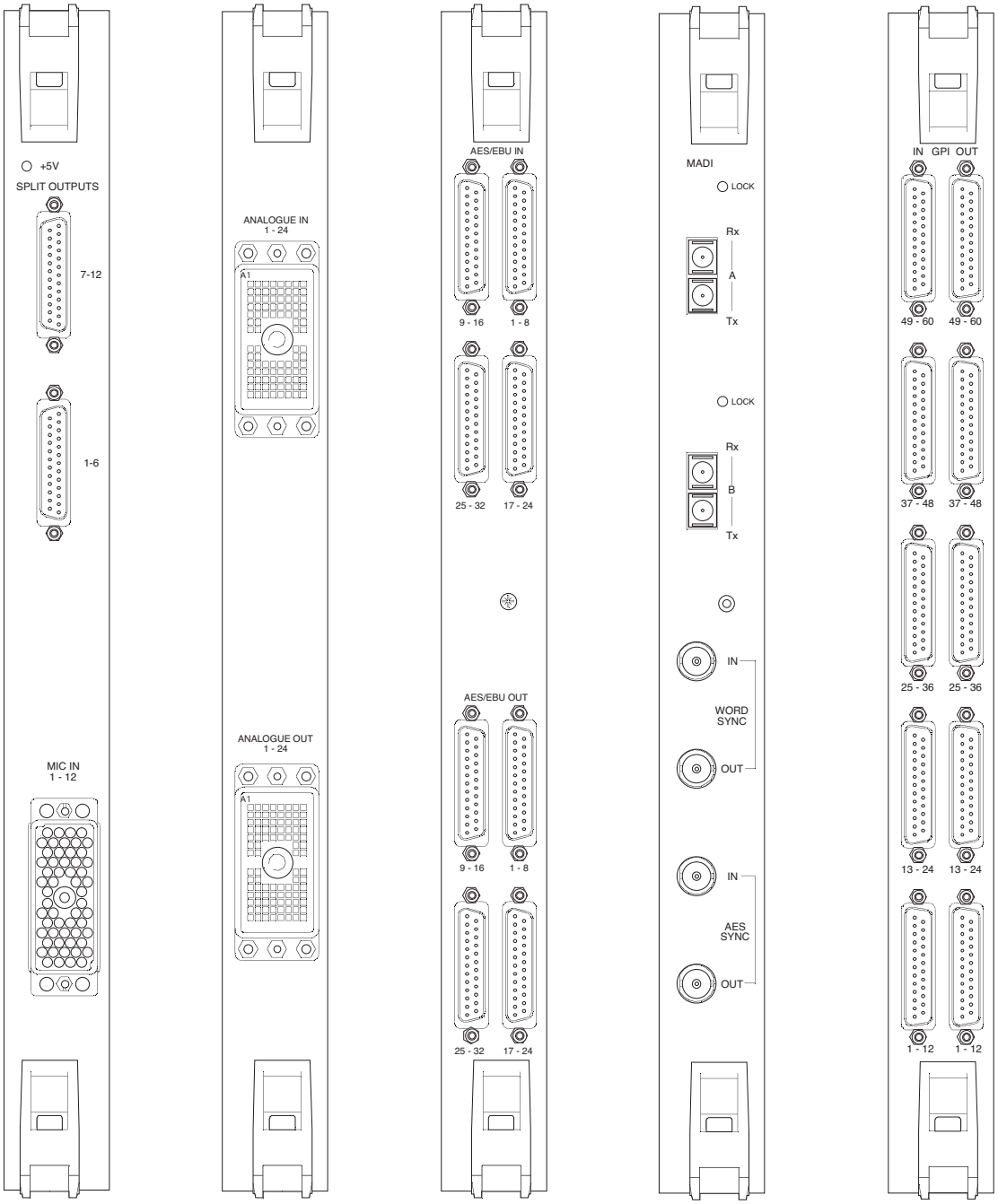
Centuri – Routing/Link Card

The Centuri is always fitted with a Routing/Link card. It must be fitted to the rear card-cage in position 5.

This card has two functions. The first is an internal function to organise the audio routes across the system's backplane. The second is to provide access to the optical audio interfaces to stageboxes. These optical audio connections are called Fibre Links and 1, 2, 3 or 4 can be fitted to the Routing card. Fibre Links are cost options and should be specified at the time of order. Note that each fibre link connection comprises two pairs of optical connectors – one for the main link and one for the optional redundant link.

In addition, each Fibre link provides an output of system Wordclock on a separate BNC connector.

Fibrelinks are available as either multimode or singlemode versions. The multimode link can be used for cable lengths of up to 550m and the singlemode version for up to 2km.



Mic Input Card

Analogue I/O Card

Digital I/O Card

MADI I/O Card
(Fibre version)

GPI I/O Card

Centuri – Micamp Card

The Microphone input card (generally known as the BMA or 'Broadcast Mic Amp') provides 12 input channels. The input is via a female Varicon (EDAC) connector. Mating connectors can be supplied as a cost option.

Each of the mic inputs has a buffered split output. The buffering takes place after the input pad, the RFI filter and the 25KHz low-pass filter but before the variable gain stage. The split output has a gain of 26dB above the mic input level (or 6dB with the pad in circuit) but is unaffected by the consoles' mic gain setting. The split outputs are available on two female 25-way D-type connectors.

Micamp cards are normally fitted to the front of the Centuri. If more than 48 channels are required then rear mounting cards can be specified as a special order.

Refer to section C for connector pinouts.

Centuri – Analogue I/O Card

The Analogue card provides 24 channels of balanced line-level input and output. At least one Analogue card will need to be included to feed the monitor speakers as the post monitor-pot signals are only assignable to analogue outputs. The connectors used are Canon DL96 types. Mating connector kits and a contact crimp tool can be supplied (as cost options). This card is rear mounting only.

See page 57 for the DL pinout.

Centuri – Digital I/O Card

The Digital I/O card is available in two versions: 110Ω and 75Ω . Both types provide 64 channels (32 AES/EBU pairs) of digital input and output. The 110Ω card provides balanced output signals whereas the 75Ω card is unbalanced for correct matching to coaxial cables. Sample rate conversion is available on every input so the card can accept input rates from 32kHz to 96kHz. The connectors are all D-25 type females and mating connectors can be supplied (as a cost option).

A breakout panel is available as an option for the 75Ω card – this converts D-25 connectors to chassis BNC plugs and comes with 1m connecting looms. These panels should be mounted behind the Centuri rack; they cannot be remotely located because the linking cables are unbalanced.

Front mounting versions of the digital cards are available to special order.

Centuri – Madi Card (Copper version)

The MADI I/O card can operate in two ways: either as a 56 channel varispeed I/O multitrack interface (at 48kHz ± 12.5%) or as a 64 channel fixed 48kHz link (station router). In either case a source of sync is required. The sync source can be AES, Word sync or self clocked from the MADI bitstream. This sync source must be derived from the same station video reference as used for the CPU card sync input.

The card is fitted with dual MADI connections – MADI A and MADI B. The outputs are duplicates of the MADI signal so that a safety backup can be made without having to use external distribution. For the inputs, MADI A has priority but MADI B will take-over if the A signal is lost.

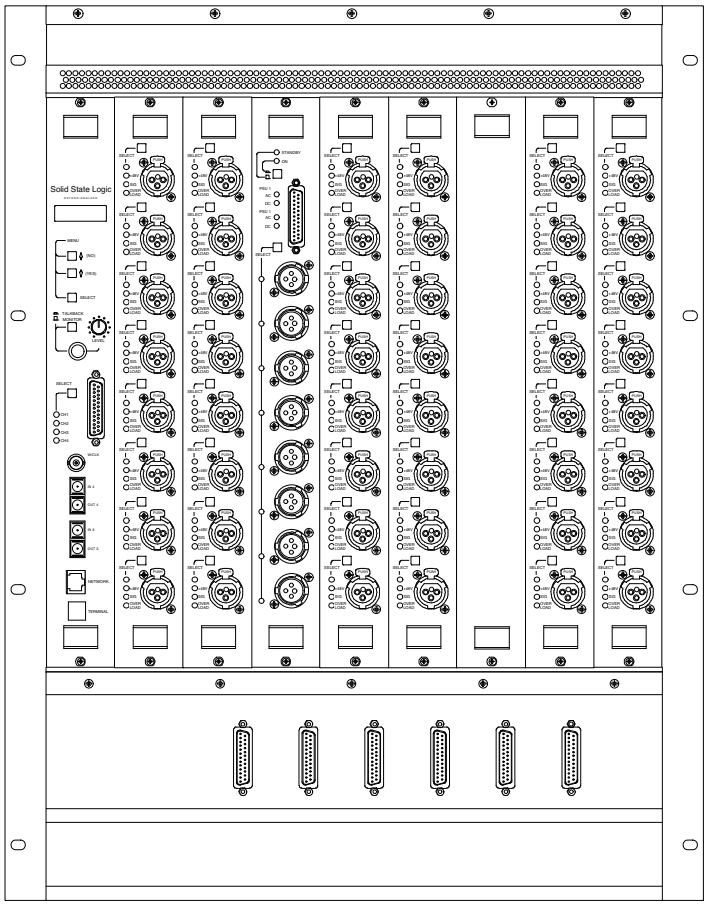
Centuri – Madi Card (Fibre version)

Operates in exactly the same way as the copper version but the MADI connectors are now singlemode or multimode SC optical types. The fibre type must be specified at time of order.

Centuri – GPI/O Card

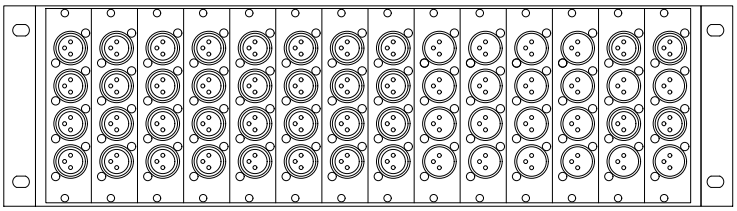
The optional GPI/O card provides 60 GPI inputs and outputs. Inputs (which can trigger many console functions including channel faders and cuts) are opto-isolated. The outputs are provided by relay closure. Access is via 25-pin D-type connectors; inputs are male and outputs are female.

Only one GPI/O card can be fitted to the Centuri rack.



C-SB Stagebox
(Front View)

Access to:
48 inputs
48 Split outputs
16 Line outputs
4 GPI I/O
Single or dual Fibre Link



3U Stagebox

C-SB Stagebox (option)

The C-SB is a Mic/Line input/output stagebox which can be located remotely from the Centuri chassis. It operates at 48KHz sample frequency and is a 14U high, 462mm deep, rack-mounted unit.

At the front of the rack are nine slots for plug-in cards: six slots for mic/line input cards; two slots for line output cards and one for the CPU card. At the rear is an auto-ranging switch-mode power supply. This will accept input voltages from 100–240v without adjustment. The PSU units provide two unswitched mains outlets via IEC 6A shuttered sockets. A 2nd power supply unit may be fitted to provide redundancy.

Each micamp input card provides 8 channels, therefore a C-SB rack may be fitted with from 8 to 48 mic inputs. The line output card also provides 8 channels but also features 4 channels of GPI relay closure. The CPU card is fitted with a headphone socket to allow local monitoring of sources and also provides four analogue outputs via a 25-way D-type connector. These outputs are assigned from the console and may be used for additional analogue feeds such as talkback or SLS.

Each mic input is provided with a split output. This output functions in the same way as the BMA circuit. (ie. post pad, limiter and 26dB buffer but pre the variable gain stage). The split outputs are available on 25-way D-type male connectors.

Remote stageboxes are linked to the Centuri core using duplex SC fibre-optic cable(1) for the audio data and a separate ethernet cable(2) for the control functions (gain, pad, filter etc.). The audio fibre links to a stagebox can be duplicated thus creating audio redundancy for critical or on-air reliability. (Fibre Links for the Centuri rack should be specified at the time of order).

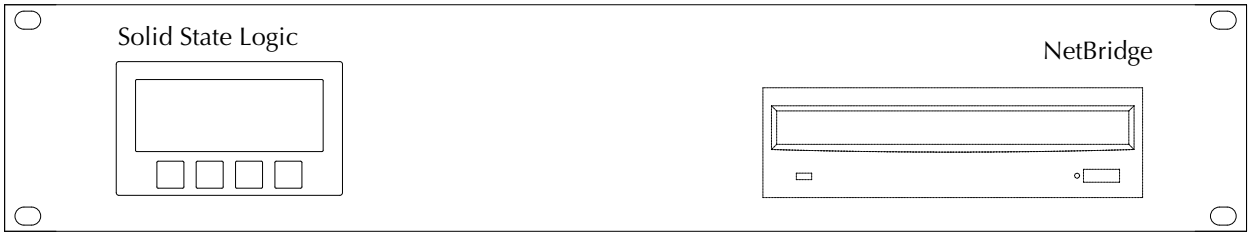
The standard unit is fanless and so can be located within the live production area – subject to the following note. A low-noise fan ventilation kit is available as an option.

> *Note: The stagebox racks are cooled by convection at the front of the rack. The air flow from bottom to top of the front panel must not be obstructed in any way (cable guides are provided at each side to route cables away from the air intake). The air temperature at the intake and at the rear PSU heatsinks MUST NOT exceed 30° Centigrade.*
>
> *Special considerations need to be observed when fitting stageboxes into flight cases – refer to Appendix F.*
>
> (1) The fibre optic cable is available in two types: for distances of up to 550m (multimode fibre) and distances of up to 2Km (singlemode fibre).
>
> (2) The standard maximum limit for ethernet cable is 100m. For distances of over 100m ethernet repeaters may be needed. Alternatively, the ethernet cable can be converted to fibre. This can then run the same distances as the audio fibre. Please discuss specific requirements with SSL's Project Engineering Department.

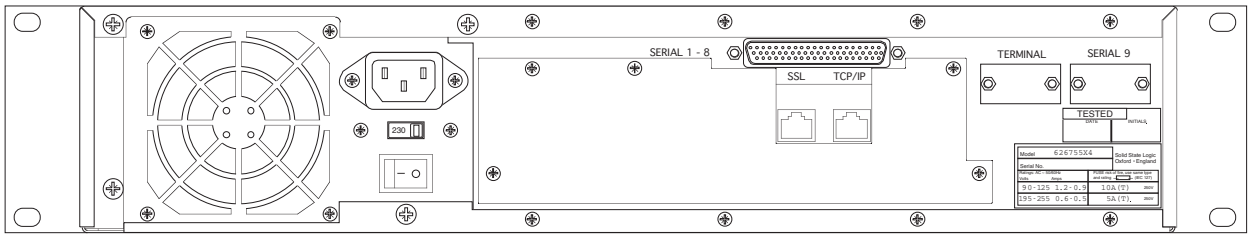
3U Stagebox (option)

A smaller 3U Madi stagebox is available. Each unit can be fitted with up to 56 channels of I/O. Plug-in modules are available for mic, line, AES, MADI and SDI. A 2nd redundant power supply can be fitted. Stageboxes are connected to the console using one or two duplex optical MADI links.

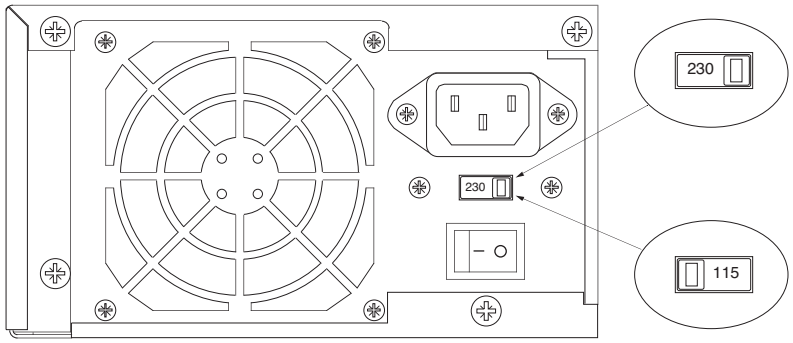
NetBridge (Front View)



NetBridge (Rear View)



NetBridge - PSU Voltage Selection



Voltage select switch shown in the 230V position

Voltage select switch shown in the 115V position

NetBridge (option)

NetBridge is a 2U rack mounting unit.

The NetBridge provides two main features. Firstly (as the name suggests) it is a bridge between the proprietary Solid State Logic network, and the standard TCP/IP protocol, allowing remote diagnostic connection over the Internet. Up to 7 diagnostic ports may be served by a single NetBridge unit, with secure log-in facilities enabling trained staff or SSL engineers to access diagnostic functions remotely from any location worldwide.

Note: Do not combine the SSL network and the facility's TCP/IP network; they are different protocols.

Secondly it can be used to transfer data files between the C200 console to which it is dedicated and the 'SSL-Network' central file server (CFS). This allows C200 session templates (used for offline configuration) and project archives to be moved across the Internet without requiring access to the console's CPU.

Using the secure login access provided by NetBridge, users may upload a console template to a secure website, edit the configuration offline and then reload their profile prior to the production saving valuable setup time. Parameters available for offline configuration include fader strip allocations, channel names and type, bus routing assignments, processing order, output options and fader grouping setup.

NetBridge requires access to the facility's internet service. To do this, an Ethernet connection will be required. The NetBridge will also need permission to access the SSL Network secure server; this may require the configuration of any firewall software that may be in use. (See page 39 for further information.)

NetBridge does not have dual power supplies as it is not critical to console operation.

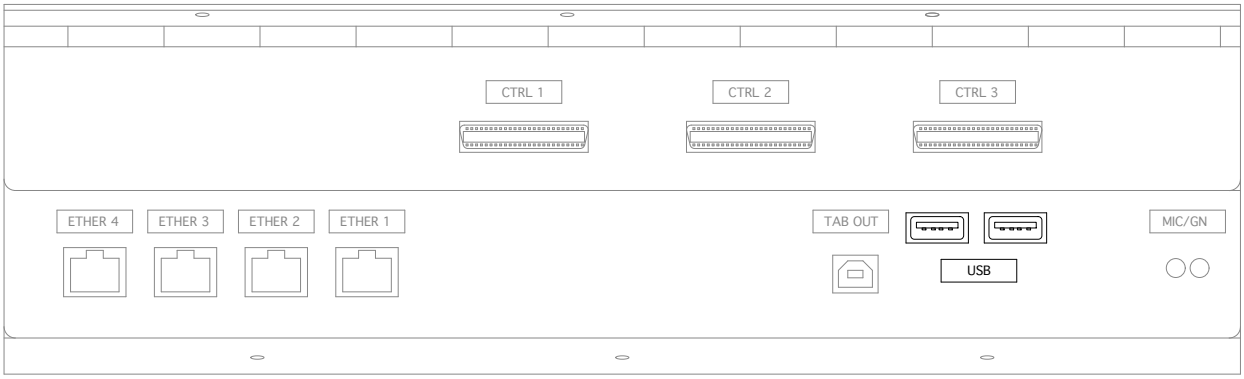
Note: NetBridge is not fitted with an auto-ranging power supply and the input setting must be confirmed before applying power. The voltage select switch is located on the rear of the PSU unit, see opposite for switch location.

To change the setting:

1. *Switch off and remove the IEC lead.*

2. *Using a small flat-bladed screwdriver, slide the select switch so that the appropriate voltage is indicated.*

Location Of Bellypanel USB Connectors



External Keyboard / KVM Switch

There is an inbuilt USB trackball included in the C200 system. Three additional USB connectors are available to allow connection of a computer keyboard. One connector is located in the monitor section penthouse panel, the two others are on the monitor section belly panel – see diagram opposite.

The C200 console contains additional hardware that allows its trackball to be used to control an external workstation and the console monitor may be used to display the workstation's video output.

The switches to control the keyboard and video selection are located in the panel directly below the monitor section's LCD screen. The switches may be operated individually or can be electronically linked – by pressing both down together – to simplify operation.

> *Note. On consoles with the 'Mobile' centre section, the reduced space means that the switching hardware is not included; only the electronic circuit for latching two external (SP momentary) switches is provided. The output signal from this circuit then may be used to operate an external video switcher as required. See page 56 for the appropriate connector pinout.*

Script Tray (option)

The script tray is a movable transparent panel which fits over a channel bay. It has rollers fitted to allow it to move along the length of the desk.

The script tray does not require modifications to the console and can be added to existing consoles.

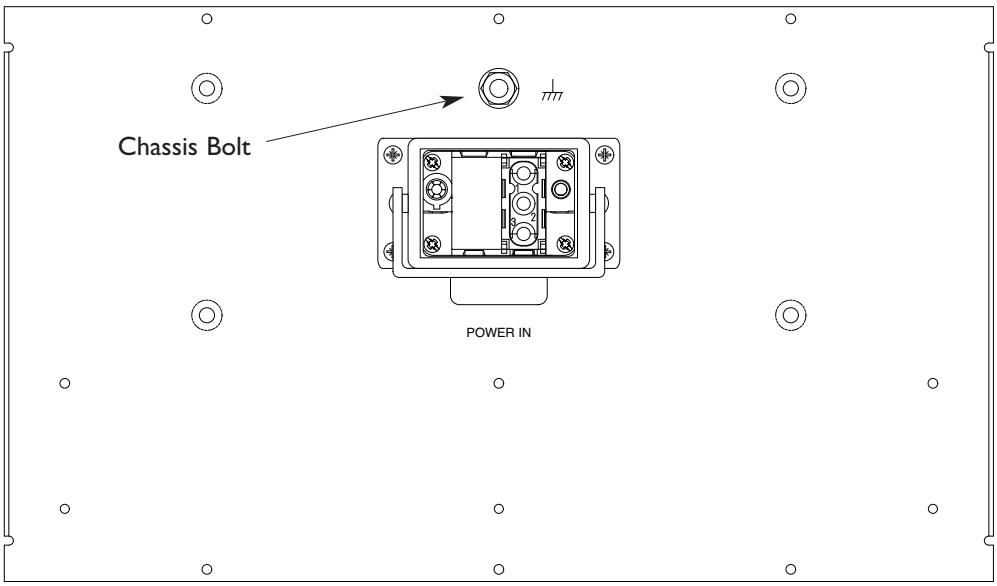
Loudspeaker Shelf (option)

A flat secure shelf is available for the positioning of loudspeakers, monitors etc. Each shelf is 400mm wide by 253mm deep. A supporting rail is fixed to the console back panel for each speaker shelf. Additional support rails can be fitted so that shelves may be moved to different positions along the console.

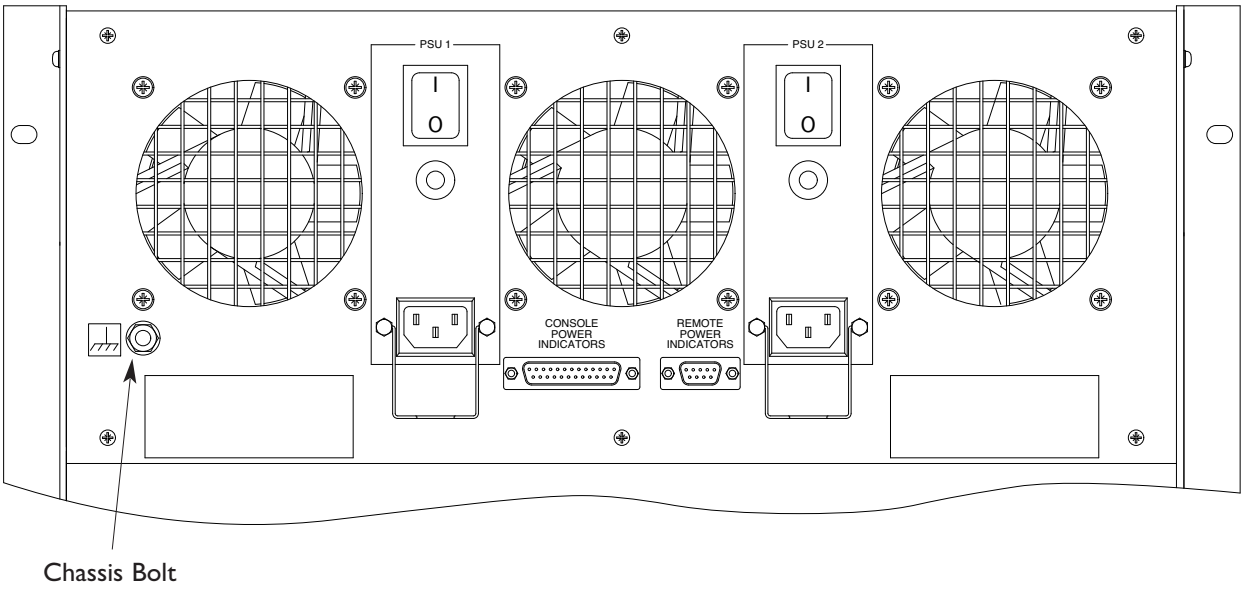
TFT External Input (option)

This option allows any of the channel bay TFT screens to be switched to show an external XGA (1024x768) video signal. The switchover may be effected either by a GPI closure triggered from a free button or by a dedicated switch which can be mounted on a custom panel.

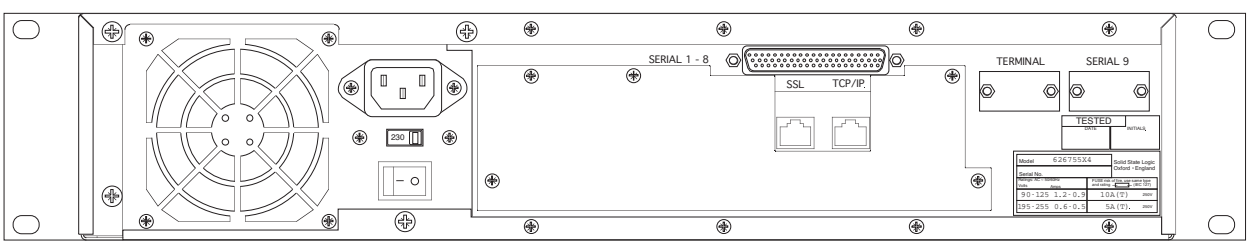
Console Mains Inlet Panel



Centuri Mains Inlet Panel



NetBridge Rear Panel



Section 5 – Installation Wiring

This section provides the details for connecting the system components together.

Power Supply Connections

This section refers to the following supplied cables :

Description	SSL Part No.	qty	Notes
Con IEC Free Socket 6A 2m	32VGL362	2	Centuri
Cable Power Digital 2m	32VALXVX	2	Main & Redundant Console power
Lead Chassis Earth 16m	66C93115	1	Console to Centuri

a) Connect the mains input lead to a suitable supply outlet.

THE MAINS SAFETY EARTH MUST BE CONNECTED

For systems where PSU redundancy is specified – Connect both the console's Harting mains leads to independent mains supplies. For live transmissions work it is recommended that one of the power sources will be from an un-interruptable source. The console is fitted with auto-ranging power supplies which will accept mains voltages which range from 90 to 255V without adjustment.

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

b) Connect the Centuri's IEC lead(s) to appropriate mains supply outlet(s). If a redundant PSU module is specified refer to the notes above for suitable supply provision.

The Centuri crate is also fitted with auto-ranging power supplies which will accept mains voltages which range from 100 to 240V without adjustment.

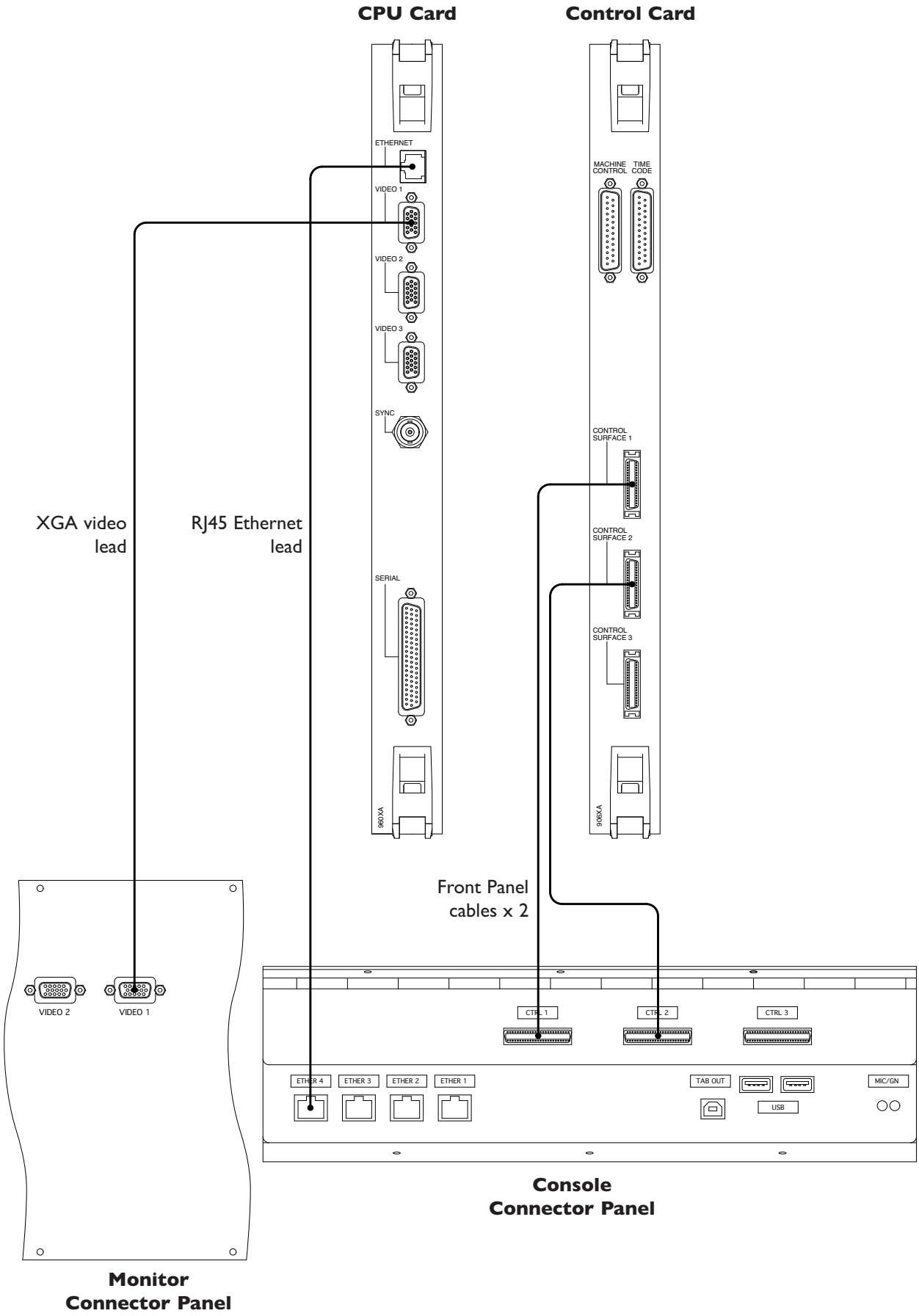
c) If specified, do not connect a source of power to the NetBridge until the voltage select switch position has been confirmed. The NetBridge operates at either 115V or 230V ranges and its power supply must be set to the appropriate range for the local supply.

Refer to the diagram on page 22 for the location of the voltage select switch.

d) **Earth Wiring –** A chassis to chassis earth cable needs to be installed between the console and the processor. This keeps the two earths at the same potential thus preventing currents flowing along the signal cables.

Run the green chassis earth cable from the Console's chassis bolt to the similar earth bolt located on the Centuri backpanel.

Control Surface Wiring - Block Diagram



Centuri to Console Surface Connections

This section refers to the following supplied items:

Description	SSL Part No.	qty	Note
Lead RJ45 Shielded 15m	66C67316	2	
Lead Video HD15W D-Type 16m	66DN(16)V1	1	(20)=20m, (25)=25m, (48)=48m
Loom 36-way H/D Digital 16m	66CN00(16)	2	(48)m and (80)m options only

a) **Front Panel Cables**

Locate the two MDR–MDR front panel cables and connect them between the Centuri Control card and the console interface panel as shown opposite. Although there are three connectors at both the Centuri and the console ends, only connectors 1 and 2 are used.

These cables are symmetrical, having the same connectors at each end.

Note: The front panel cables are only supplied in 16m, 48m or 80m lengths. This is due to a timing requirement for the high speed serial data. Do not attempt to shorten these cables. The connectors on these cables are not removable.

b) **Network Cable**

The Centuri processor uses an RJ45 Ethernet network to communicate with the C200 console, Stageboxes and NetBridge. The console has a built-in 4-way Ethernet repeater.

Connect the Ethernet lead between the Centuri CPU card and any of the four 'Ether' sockets beneath the console.

If Netbridge is specified then a second RJ45 Ethernet lead will be supplied with the system. This lead is connected between the console and the 'SSL Network' connector on the NetBridge rear panel.

c) **Video Cable**

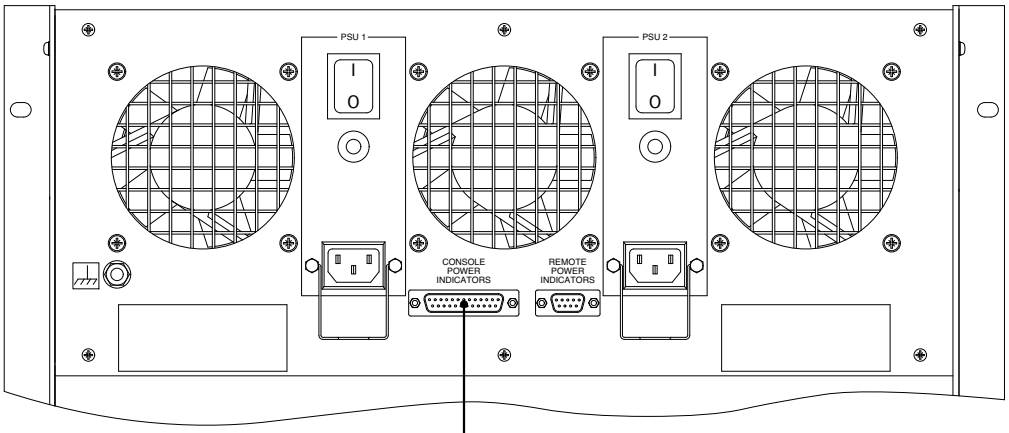
There are three video outputs available on the CPU card. Video 2 and Video 3 are static background displays. Video 1 is used for the Monitor section display. The video output is XGA standard – 1024 x 768 @ 66Hz. The connectors are high-density 15-pin D-type (HD15).

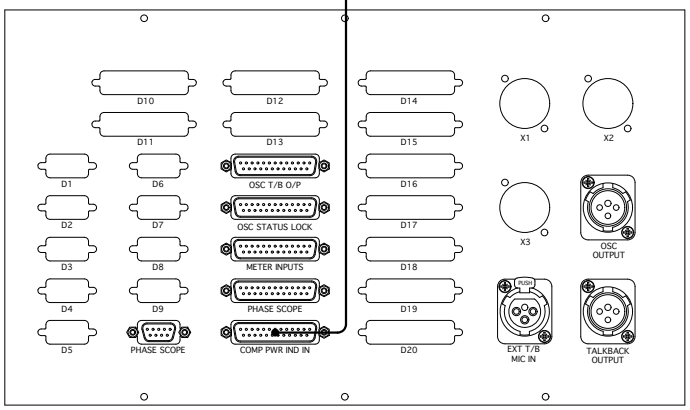
Connect the video cable as shown in the diagram opposite. The cable is male-male so does not have to be run in a particular direction.

Note: SSL does not recommend that the supplied video cable be extended. Doing so may reduce the video quality as the cable is matched to function over long runs; these cables are of a high quality individually screened type. Longer cables are available from SSL.

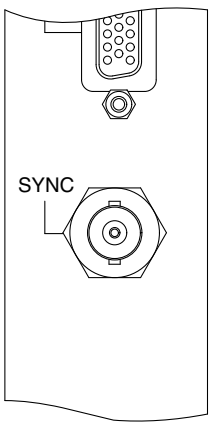
The console is fitted with a 2-input video input switcher. Connector 'Video 2' is available for connection to an external source. The native resolution of the TFT screen is 1024 x 768 but it will accept inputs of up to 1280x1024 resolution. NB not available with single-width Centre section.

PSU Status Wiring





Audio Connector Panel



CPU Card

Sync Input connector

PSU Status

This section refers to the following supplied items:

Description	SSL Part No.	qty	Note
Cable 25-way D Plug to Socket 16m screened	66C67781	1	

a) The PSU Status cable carries the status indication of the two Centuri crate PSU units.

Install the the 25 pin male to female lead and connect as shown opposite; the male end of the cable connects to the Centuri and the female to the console.

Note that the 9-way connector 'Remote Power Indicators' is not used. This connector was allocated for power indication from remote I/O units which are no longer available.

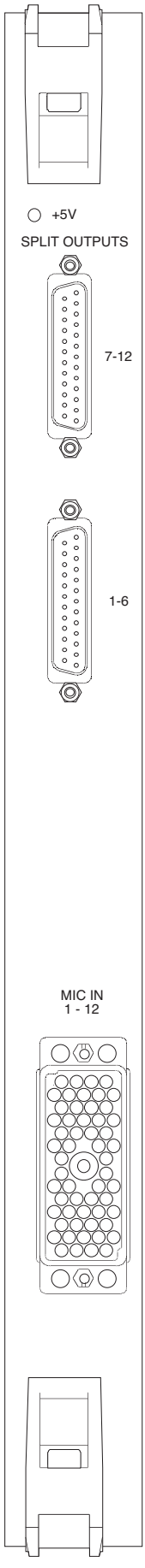
Sync Source

This section refers to the following supplied items:

Description	SSL Part No.	qty	Note
Terminator plug 75Ω	32TKB7TC	1	
BNC 75Ω TEE Adaptor	32TKU7CC	1	

a) Connect the source of black-and-burst (or composite) video sync to the SYNC IN connector on the processor crate using the T-adaptor and 75Ω Terminator supplied to provide termination.

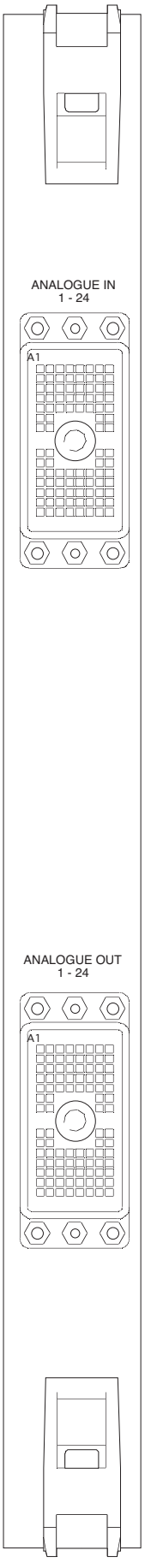
Micamp Input Card



Split Output Connectors
25-pin D-type female

Microphone input Connector
Varicon 56-way female

Analogue I/O Card



Analogue Input Connector
DL96 female

Analogue Output Connector
DL96 female

I/O – MicAmp Card (SSL ref. 908)

Each MicAmp Input Card contains 12 Microphone circuits. The inputs are accessed via a Varicon (aka. EDAC or Elco) 56-way female connector.

The split outputs are accessed via two 25-pin D-type female connectors.

Refer to Appendix C for the connector pinouts.

SSL is able to supply mating connectors if requested, (at additional cost).

If more than one micamp card is fitted then the card furthest to the right will have the lowest input number and the channel numbers will increment by 12 as each card is added. Any cards added subsequently, should be placed to the left of any existing cards otherwise the channel numbering will be altered.

I/O – Analogue input/output Card (SSL ref. 904)

The Analogue Card provides 24 circuits of electronically balanced input and output. These circuits are accessed via Canon DL 96 way female connectors; mating connectors are available to order

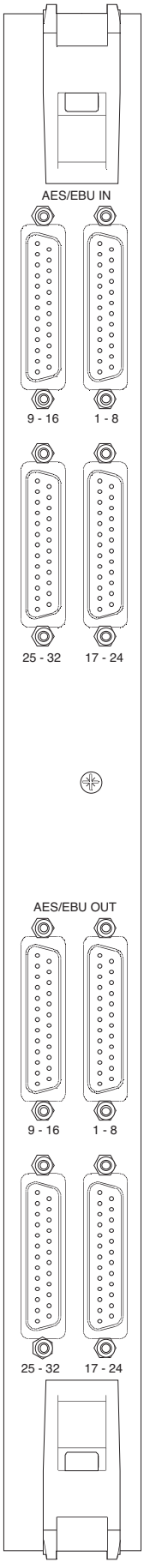
Refer to Appendix C for the connector pinouts.

As is the case for the MicAmp, cards added subsequently should be placed to the left of existing cards.

The default line-up level for analogue I/O is 0dBFS = +18dBu. This level may be globally altered and can range from +9dBu to +24dBu. The value can be adjusted from a setup screen to match the standard operating level for the facility.

> *Note. When assigning analogue output channels as insert sends, the routing system will automatically assign the same input channel number as the corresponding return. It is therefore necessary to physically wire outboard equipment so that circuit allocation follows this arrangement.*

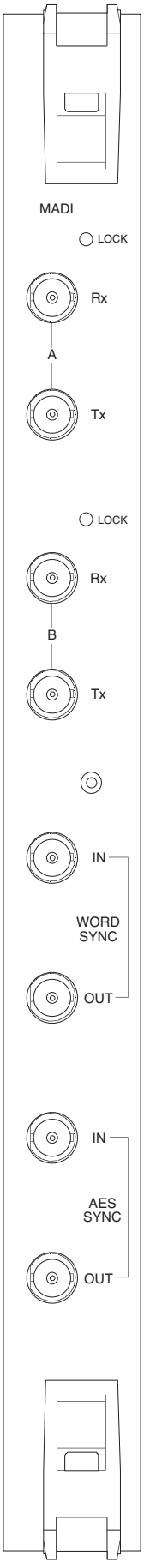
Digital I/O Card



AES/EBU Input Connectors
25-pin D-type female

AES/EBU Output Connectors
25-pin D-type female

MADI I/O Card (Copper version)



MADI Link A
BNC 75Ω

MADI Link B
BNC 75Ω

MADI Word Sync
BNC 75Ω

AES Sync
BNC 75Ω

I/O – Digital Input/Output Card 110Ω(SSL ref. 902XF)

The Digital Input Card provides 32 balanced AES/EBU signal pairs of input and output. All circuits are accessed via 25-pin D-type female connectors.

Refer to Appendix C for the connector pinout for this card.

Mating connector kits can be ordered for the card.

As in the case of the Analogue I/O, cards added subsequently should be placed to the left of existing cards.

> *Note. When assigning digital output channels as insert sends, the routing system will automatically assign the same input channel number as the corresponding return. It is therefore necessary to physically wire outboard equipment so that circuit allocation follows this arrangement.*

I/O – Digital Input/Output Card 75Ω(SSL ref. 902XJ)

This version of the Digital I/O card is externally identical to the the 110Ω version (apart from its designation number). The Impedance of each input and output circuit however, is now 75Ω and unbalanced for correct matching to installations using co-axial cabling.

A separate BNC interface panel is available as a cost option. This is 2U high and is fitted with 64 chassis mounted BNC plugs – 32 input and 32 output. 1metre D25–D25 interconnecting looms are provided. This loom should not be extended beyond 1m as the signals are unbalanced pairs.

As in the case of the Analogue I/O, cards added subsequently should be placed to the left of existing cards.

> *Note. When assigning digital output channels as insert sends, the routing system will automatically assign the same input channel number as the corresponding return. It is therefore necessary to physically wire outboard equipment so that circuit allocation follows this arrangement.*

I/O – MADI Card (SSL ref. 902XG copper version / 902XH/K fibre versions)

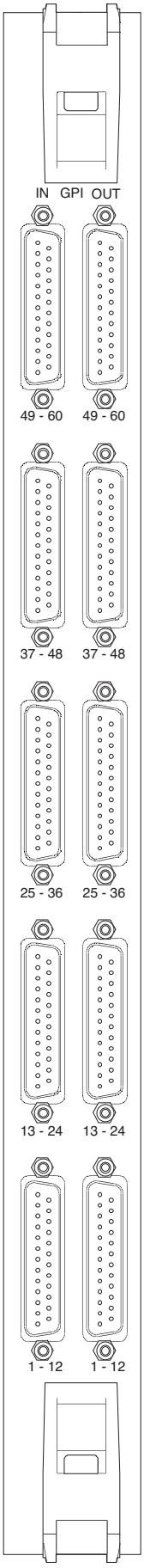
The MADI I/O card can operate in two ways: either as a 56 channel varispeed I/O (multitrack interface) or as a 64 channel 48kHz link (station router). In either case a source of sync is required. The sync source can be AES, Word sync or self clocked from the MADI bitstream.

The Card is fitted with dual MADI circuits – MADI A and MADI B. The outputs are duplicates of the MADI signal so that a safety backup can be made without having to use external distribution. On the input side, MADI A has priority but MADI B will take-over if the A signal is lost.

The fibre version of the card – see page 18 – has duplex SC optical connectors for both MADI A and B. The Fibre type can be either singlemode or multimode (this must be specified at time of order).

GPI I/O Card

GPI input Connectors
25-way D-type Male



GPI output Connectors
25-way D-type Female

I/O – GPI I/O (SSL ref. 907XA)

The GPI I/O Card contains 60 circuits of opto-isolated input and 60 circuits of relay-closure output. Inputs are accessed by 25-pin D-type male connectors and outputs by 25-pin D-type female connectors; mating connector kits are available to order.

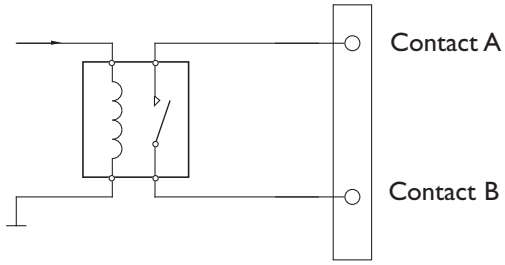
Both the input and output circuits are fully isolated from the processor electronics. On all output connectors, there is a protected source of +15V available and a 0V reference is available on each input connector.

The 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 signal duration must be greater than 50mS.

Note: When used for track arming and tally, the tally must return to the same number input as the output signal, (ie. the tally for GPI Out 1 will be on GPI In 1).

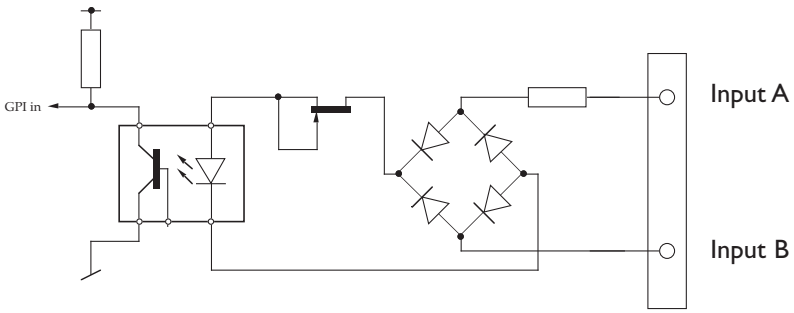
GPI Outputs

The switch closure is by 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.

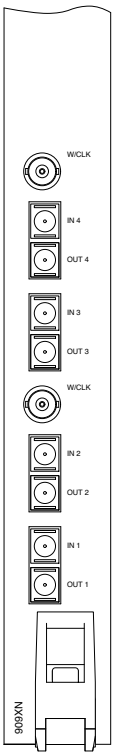


GPI Inputs

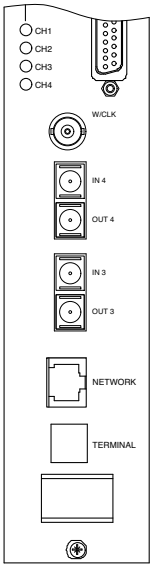
The signal input requires AC or DC voltage between 4V and 30V. The current drawn is approximately 10mA.



Fibre Link Connectors and Panels



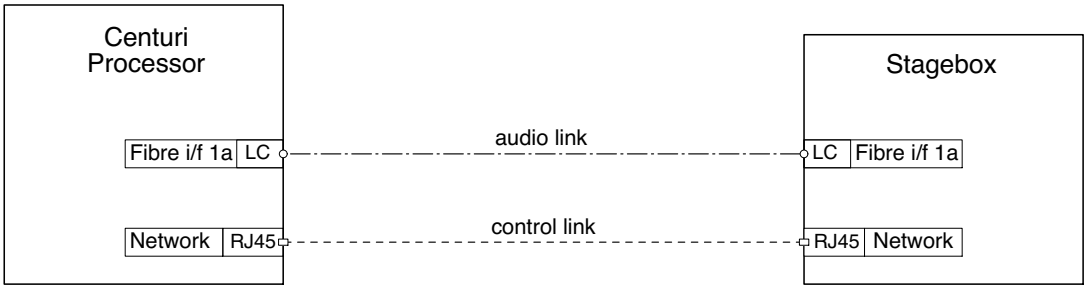
Centuri Link Card
Fitted with two links



C-SB CPU Card
With redundant Fibre Link

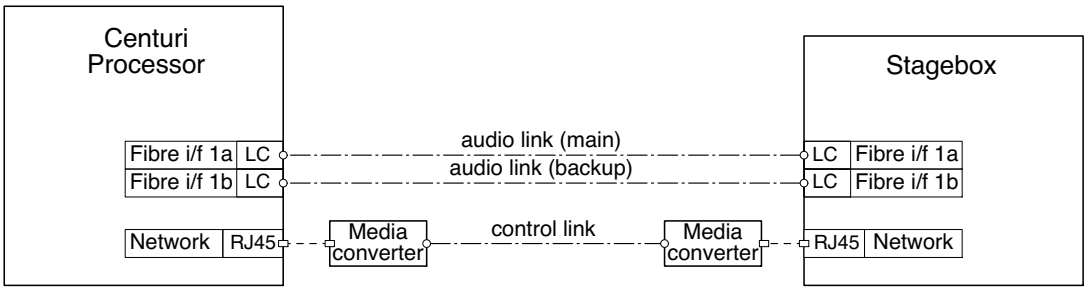
C-SB Cabling Diagrams

Fibre-Link with UTP control link (100m max)



duplex fibre link
RJ45 ethernet

Redundant Fibre-Link with fibre control link (>100m)



Stageboxes & Fibre Links

The C-SB Stagebox utilises fibre-optic cable for audio connection between itself and the Centuri processor. This provides the advantages of noise immunity, reduced weight and bulk of wiring and the elimination of earth loops. A separate control signal (for gain, pad, filter switching etc.) is carried over the SSL ethernet network. This control signal can be converted into fibre for runs longer than 100m.

The standard connectors for the fibre links are duplex SC (not APC) at both the Centuri and the Stagebox ends. Note that each individual link consists of a twin (duplex) cable to carry the separate send/receive signals. A redundant fibre Link will require two cables. A 2m duplex lead is provided as standard with each stagebox.

When Stageboxes are specified, it is recommended that a 10/100 ethernet hub/switch is installed so as to provide isolation for the remote network connection(s). A 1U rack mounting 16-port switch is available as a cost option.

Longer fibre cables and/or ruggedised OB cable using adaptor panels/patch panels are options. SSL is able to provide a range of fibre solutions although the facility may prefer to provide its own fibre installation. Details of fibre installation options should be discussed with SSL's Project Engineering Department prior to the time of order.

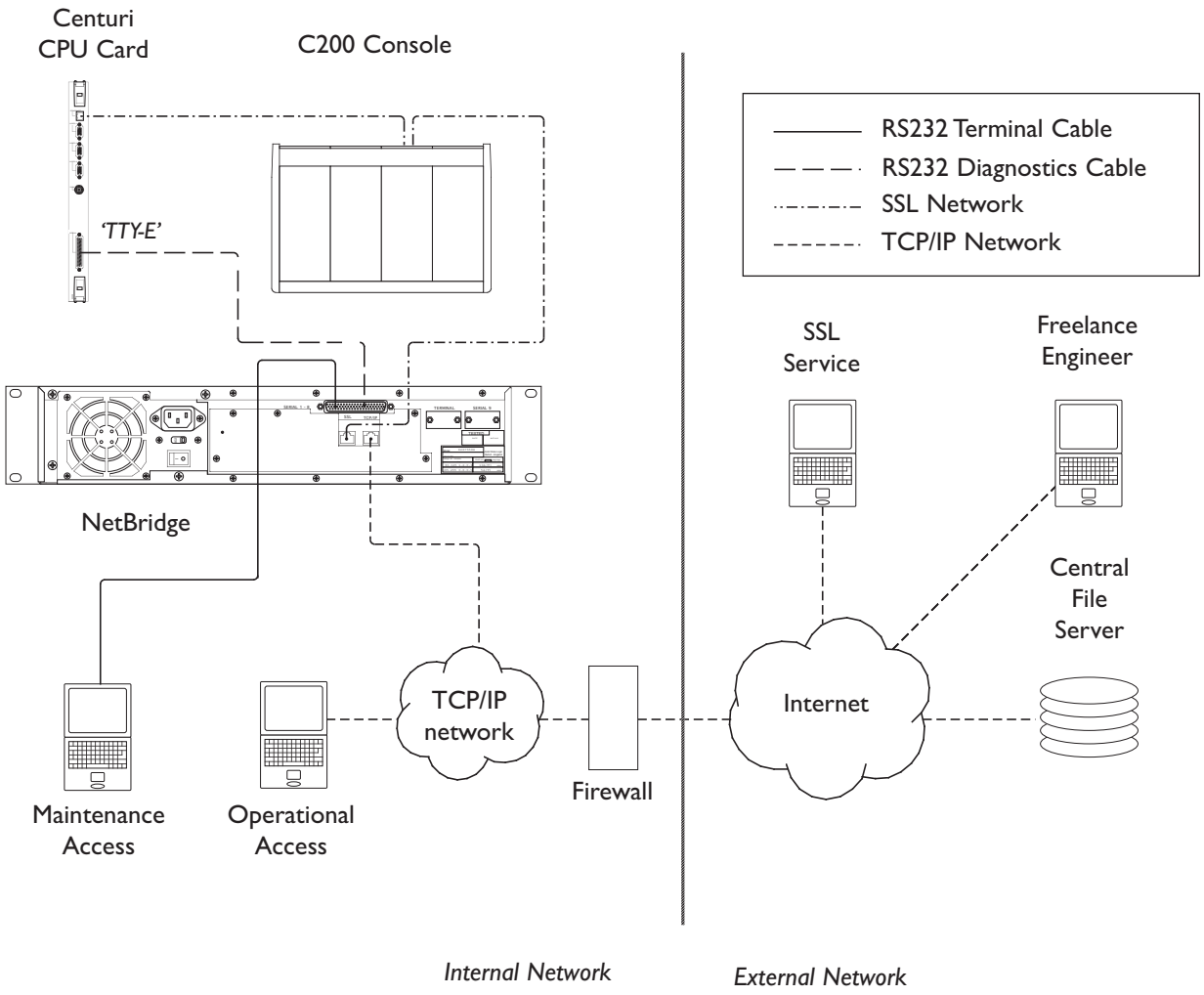
For location of Stageboxes at distances of greater than 100m from the Centuri rack the ethernet control cable will have to be buffered – using an ethernet repeater/switch – or converted to fibre by using proprietary media converters.

The maximum cable length for a multimode Fibre Link is 550m, and for singlemode is 2km.

The Centuri Routing card can be fitted with up to four individual (or dual-redundant) Fibrelinks.

The BNC connector associated with each pair of Fibrelinks provides an output of system Wordclock.

NetBridge Installation



NetBridge Installation

NetBridge has eight serial ports plus two Ethernet ports. The first Ethernet port is connected to the C200's network. The second port is for connection to the Internet; this can be via DHCP server (for a dynamically assigned IP address), or a static IP address defined by the operator. The IP number (in 'dot' notation) will be shown on the front panel while the unit is powered.

In facilities with a firewall to the Internet, this address is likely to be for internal use within the installation and not visible to the outside world. For external diagnostic access, the firewall will have to be set to pass (and redirect) the appropriate incoming traffic to the NetBridge unit, which will have to be agreed with and configured by the facility's IT staff.

NetBridge operation is more fully described in a separate document which is supplied with the hardware.

Connection

The eight serial ports are all located on the single 62-pin connector (a breakout adaptor is provided). Serial ports 1 to 7 can be connected to the 'Console' port on the Centuri's CPU card (on port TTY-E), allowing one NetBridge to have terminal diagnostic access to up to seven C200 processors.

Serial port 8 may be connected to a data terminal (or software terminal emulator) for permanent local diagnostic access without requiring login. (see Appendix C for cable details)

Access

For security purposes, the NetBridge file transfer functions can only be accessed by one registered user who must be logged into the Central File Server (CFS). This uses the secure HTTPS protocol, which must be passed through any firewall (and redirected as required), although this is unlikely to cause any security concerns as it has 128bit Secure Socket Layer encryption. For file transfer between the console and the CFS, the user must be logged in at the console itself. For file transfer between the CFS and another computer (eg. authorised freelance engineer or SSL support staff), the user may login from an Internet connection, with the same username and password security requirements.

Diagnostic access also uses 'Secure Socket Layer' encrypted login, and is available to multiple users simultaneously over the TCP/IP network link. They can log-in as terminal users and each run the terminal client application on the NetBridge to give them switched access to the seven serial ports.

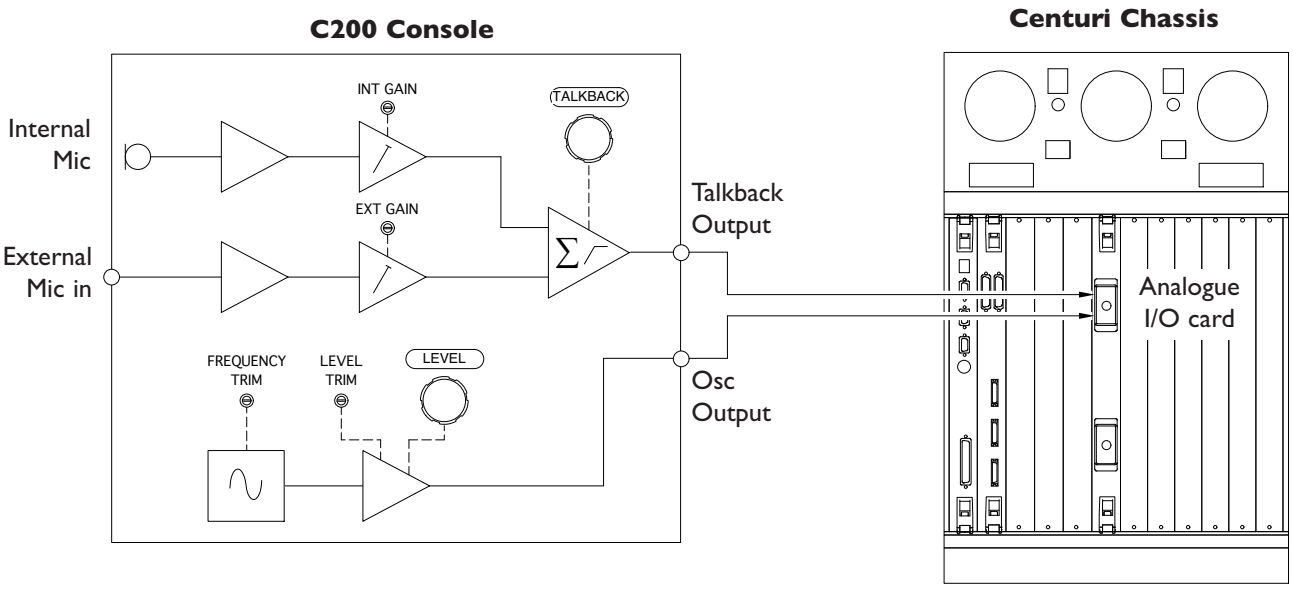
File Transfer

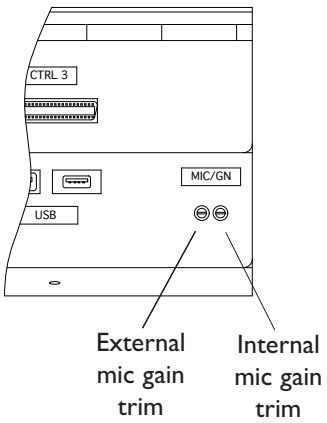
If a console operator wishes to export a session template to the CFS so that others may create offline setups from it, secure login from the C200 allows that file to be uploaded to the facility's private account on the CFS, so that registered users can download the template and upload their own setups. Any existing setups in that account can be downloaded from the CFS to the console's hard disk.

Remote Diagnostics

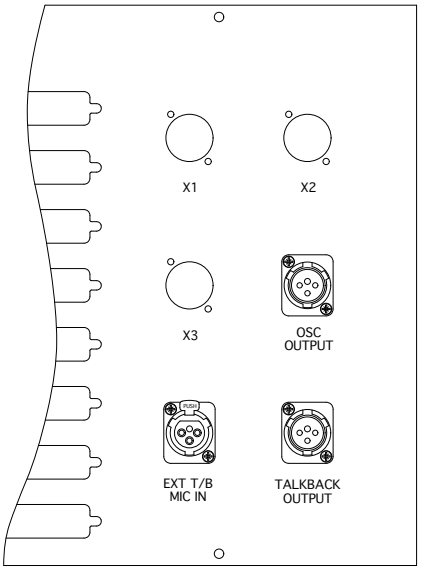
In order to access a C200's diagnostics through its NetBridge, first you need to know the IP address of that unit (on the front panel, or defined by a firewall/router), which can be determined by contacting the facility's IT staff or consulting the security arrangements agreed with them. Once a secure connection has been made, running the terminal server application on the NetBridge will allow you to connect from the Internet to any of the seven 'console diagnostic' ports on that NetBridge.

Talkback and Oscillator – Block Diagram





Connector Panels



Oscillator Output, External Mic Input and Talkback Mix Output connectors

Talkback and Oscillator

Talkback Connections

The C200 console contains a built-in talkback microphone and amplifier. In addition, a second input is available for connection to an external dynamic microphone. This input is mixed with the internal T/B mic and the combined signal is available via an XLR connector on the audio interface panel beneath the console. The overall level is controlled by the 'Talkback' control on the master status panel. This signal should be connected to an analogue input circuit in the Centuri processor. The circuit chosen can then be assigned as the talkback source via the console's routing.

The gain of each mic signal can be independently adjusted. Access to the trim controls is from beneath the console on the console interface panel.

The external mic input is via a 3-pin XLR female labelled 'Ext T/B Mic In'.

The mixed T/B output is via a 3-pin XLR Male labelled 'Talkback Output'.

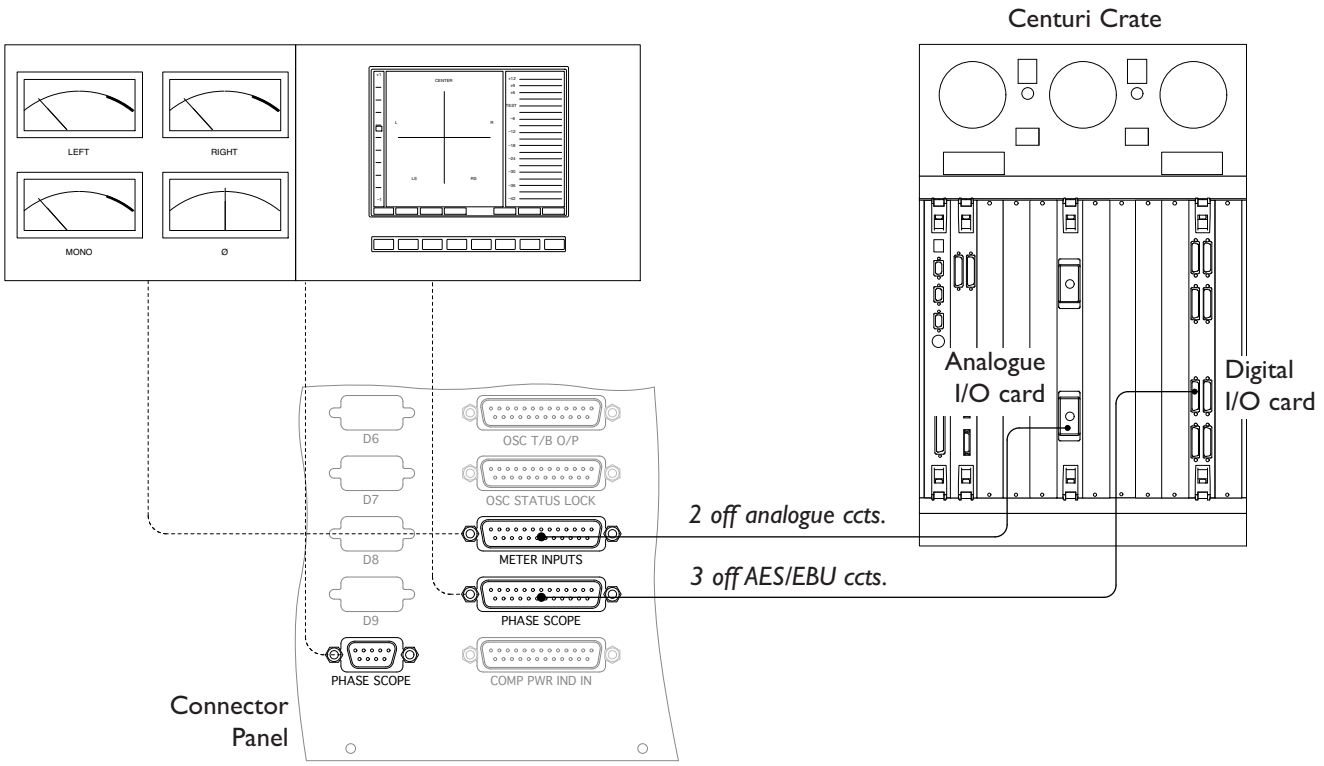
Oscillator Connections

The C200 console includes an inbuilt analogue oscillator. The output is available on a male XLR connector located on the audio connector panel. This signal should be wired to an available circuit on the analogue input card.

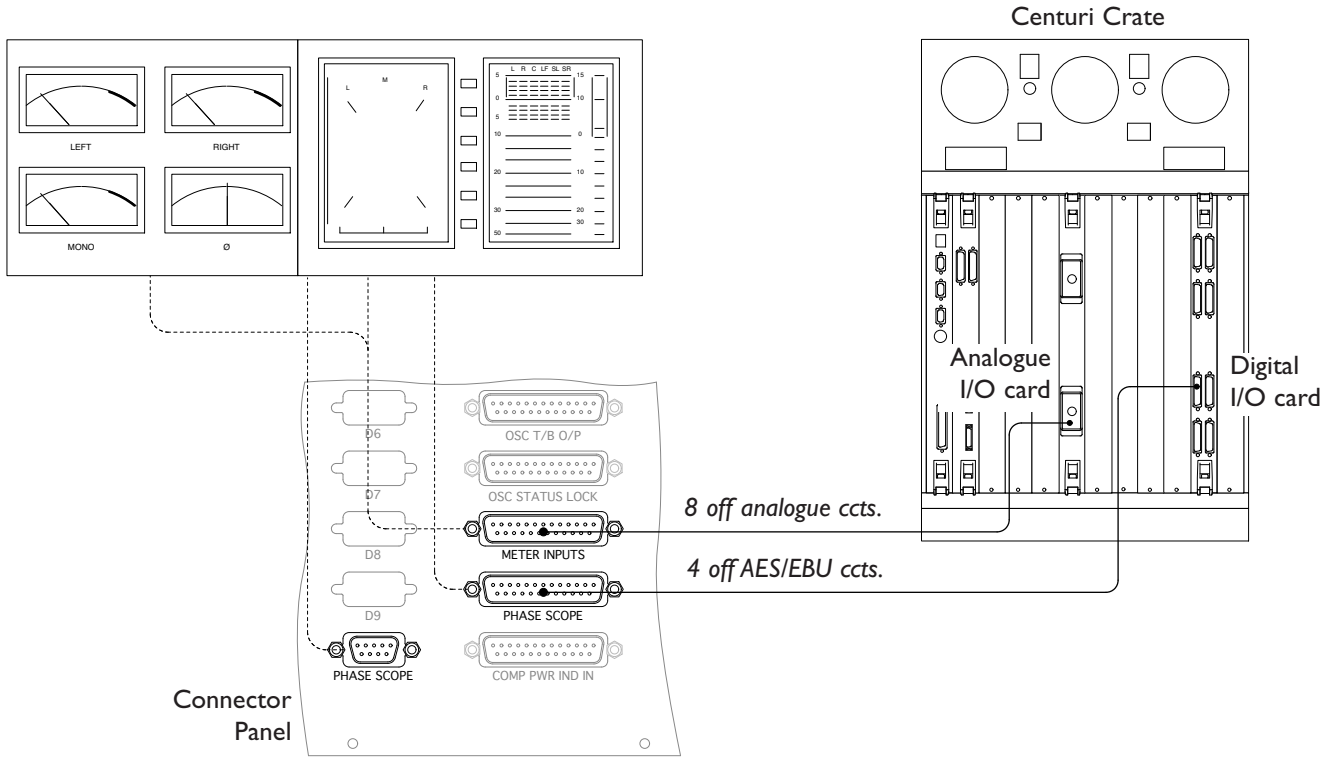
Alternatively, an external oscillator (either analogue or digital, mono or stereo) may be used. In this instance one or two circuits should be allocated on an input card, they can then be assigned in software.

Refer to Appendix C for connector pinouts.

Meter and Phasescope wiring – MSD 600C



Meter and Phasescope wiring – RTW 10830



Meters and Phasescope

The Centre Section of the C200 console is fitted as standard with four off analogue VU meters. The meters supplied are for Left, Right, Mono and Phase signals. Note that only analogue feeds of Left and Right audio need to be provided as the Mono and Phase signals are derived internally to the console.

In addition, the Centre Section may optionally be fitted with an LCD phasescope. Two standard phasescope types are available, the MSD600C or the RTW 10830. Other custom meter solutions may be possible.

Cable connections to the meters and phasescope will need to be run between the Centuri and the Console. Both balanced analogue and 110Ω digital cables may be necessary depending on configuration. These cables are not supplied by SSL.

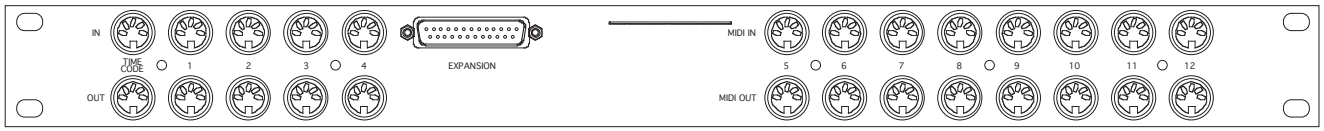
The MSD600C 5.1 phasescope has inputs for 6 digital signals (3 AES/EBU pairs), plus a serial diagnostic port.

The RTW 10830 has eight digital input signals, eight digital output signals, eight analogue input signals plus a remote control port. Note that two of the analogue input signals would normally also feed the L and R mechanical meters.

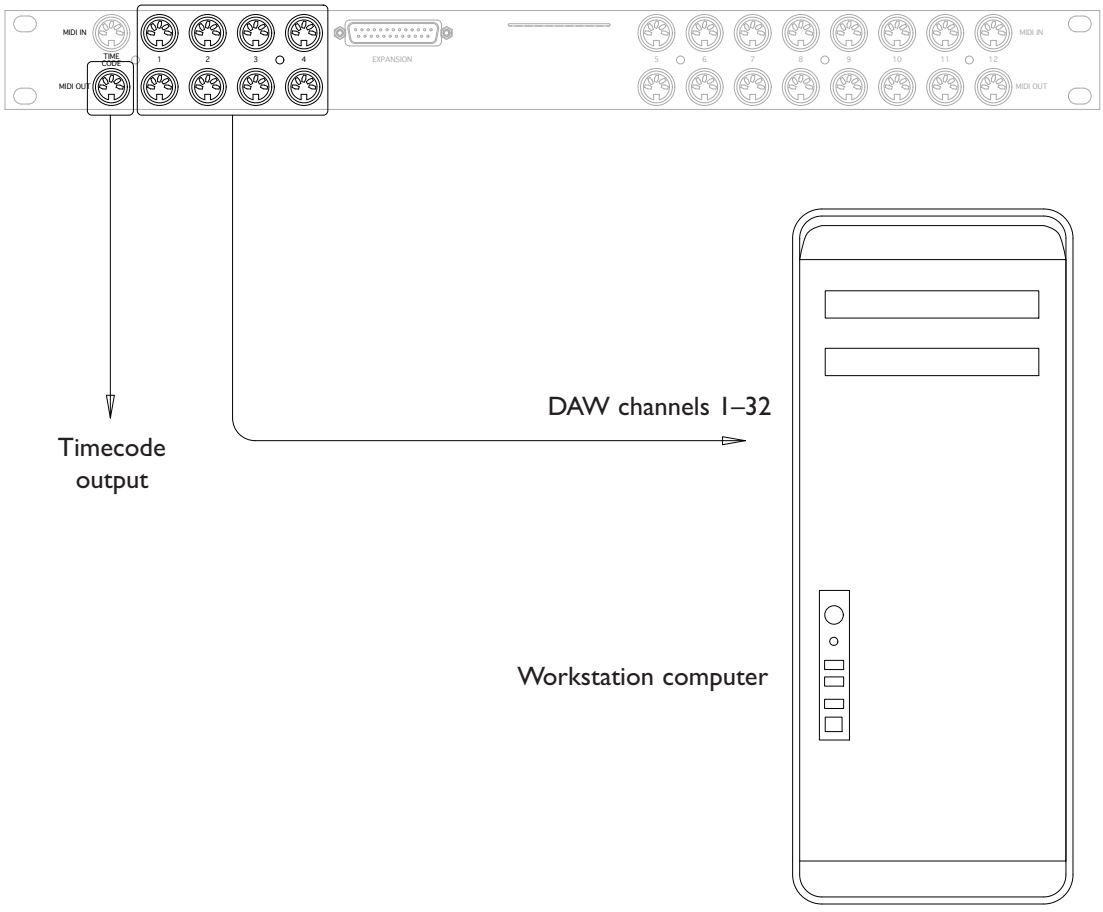
The signals for the Analogue meters could be paralleled from the console main output signals or, alternatively, independent feeds from the analogue output card.

Refer to page 55 for the analogue meter wiring pinout and page 56 for the digital wiring.

DAW Mid Interface Panel (Option)



DAW Mid Wiring



DAW Midi Connection (Option)

If the DAW option is specified, then a separate 1U breakout panel is provided for access to the system's Midi circuits . This should be connected to the lower rear panel of the Centuri chassis and mounted in a suitable position in the equipment rack.

Connector pairs 1–4 are available for integration with a DAW system. Each connector can control 8 audio channels. An independent feed of Midi timecode is provided on a separate connector. Note that Midi connectors 5–12 are not implemented at this time and are reserved for future expansion.

Standard Midi 5-pin DIN cables should be used to connect the workstation.

Note: The 'Expansion' connector has no function on C200.

Gold is 1.9 times heavier than Lead.

Appendix A: Specifications

C200 Console				
Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height	To top of meter trim	1083	U	
Height adjustment		-0 +45	mm	
Width	Centre Section plus end trims	831	mm	
	8 channel fader bay	334	mm	
	Producer's table section	491	mm	
Depth		1136	mm	*excludes connectors/cables*
Weight	48 channels with 2 legs	354	kg	
	8 fader bay (add/subtract)	40	kg	
	Additional leg	15	kg	
Heat Dissipation	48 channels	1,050	W	*approximately*
	8 fader bay (add/subtract)	125	W	*approximately*
Voltage	Range	100 – 240	V	*AC only*
Current	48ch. Maximum over voltage range	10.3 – 4.3	A	
Power Factor		0.95		*approximately*
Fusing	No user-accessible fuses			
Noise	Fanless			
Connectors	Power in main/backup	Harting™ Modular 3-pin		
	Network	RJ45 100 baseT		
	Control Surface	3M™ MDR high-density 50-way female		
	Video in 1 and 2	HD15 female		
	Trackball out	USB B female		
	External USB in	USB A female		
	Phasescope signal input	25-way D-type female		
	Phasescope diagnostics/control	9-way D-type female		
	Meter inputs	25-way D-type male		
	Osc/Status Lock	25-way D-type female		
	Osc/TB out	25-way D-type female		
	External T/B mic input	XLR 3-way female		
	T/B audio output	XLR 3-way male		
	Osc audio output	XLR 3-way male		

Centuri Processor Crate

Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		15 665	U mm	
Width	 Case only without rack ears	19 449	in mm	
Depth		592	mm	*excludes connectors/cables*
Weight (†)		35 – 45	kg	*depending on I/O fitted*
Heat Dissipation	32 DSP, no I/O 64 DSP, 24 mics, 48 analogue 128 DSP, 48 mics, 96 analogue	300 550 910	W W W	*minimum* *typical* *maximum*
Voltage	Range	100 – 240	V	*AC only*
Current	Maximum over voltage range	12.3 – 4.9	A	
Power Factor		0.95		*approximately*
Fusing	Thermal current trip. No fuses	16	A	*each input*
Noise		75	dB(A)	*approximately*

Connectors	Power in 1 and 2	IEC male	
	Network	RJ45 100 baseT	
	Sync in	BNC 75Ω analogue video	
	Video out 1, 2 and 3	HD15 female	
	Serial	62-way HD D-type female	*9-way breakout lead supplied*
	Control Surface	3M™ MDR high-density 50-way female	
	Machine Control	25-way D-type male	
	Timecode	25-way D-type female	
	Control Power Indicators	25-way D-type female	
	Remote Power Indicators	9-way D-type male	*unused*
	Expansion	25-way D-type female	*unused*
	MIDI	5-pin 180° DIN female	

† Centuri must be supported on rack shelves. Do not rely on the rack ears alone.

Netbridge				
Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		2 89	U mm	
Width	 Case only without rack ears	19 432	in mm	
Depth		360	mm	*excludes connectors/cables*
Weight (†)		11	kg	
Heat Dissipation	32 DSP, no I/O	45	W	*maximum*
Voltage	Switch selectable	115 or 230	V	*AC only*
Current	At 115V input At 230V input	0.5 0.2	A A	
Fusing	No external fuses			
Noise		50	dB(A)	*approximately*
Connectors	Power in	IEC male		
	Network – TCP/IP	RJ45		
	Network – SSL	RJ45		
	Terminal	9-way D-type male		
	Serial	62-way HD D-type female		*9-way breakout lead supplied*

† Netbridge must be supported on rack shelves. Do not rely on the rack ears alone.

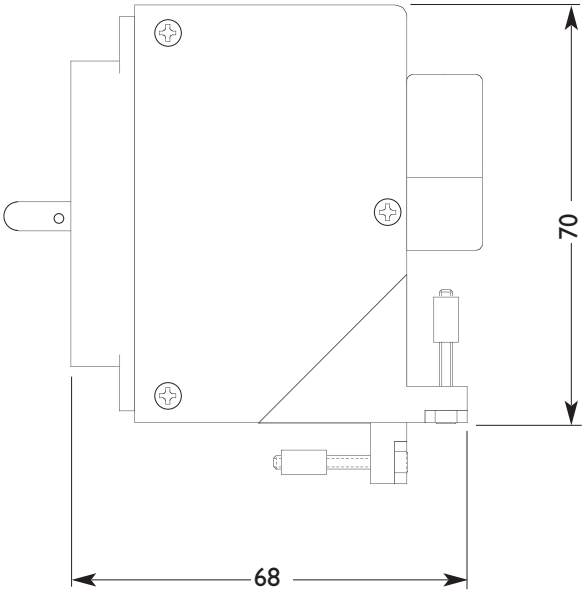
C-SB Stagebox				
Parameter	*Condition*	*Value*	*Unit*	*Notes*
Height		14	U	
		620	mm	
Width		19	in	
	Case only without rack ears	432	mm	
Depth		462	mm	*excludes connectors/cables*
Weight	Rack with single PSU unit	19	kg	
	Each Mic input or Line output card	1.7	kg	
	Additional PSU module	5.8	kg	
Heat Dissipation (†)		380	W	*maximum with 48ch fitted*
Voltage	Range	100 – 240	V	*AC only*
Current	At voltage range	10.0 – 3.9	A	*maximum with 48ch fitted*
Fusing		6.3(T)	A	*1.25" time delay*
Noise	Fanless			
Connectors	Mains supply in	IEC male		
	Mains supply output (x2)	IEC female		*6A max total*
	Network – SSL	RJ45		
	Microphone input	XLR 3-pin female		*pin 2 hot*
	Insert send	25-pin D-type male		
	Audio interface (FibreLink)	Duplex SC fibre optic		

(†) Cooling is via vents at the top and bottom of the front panel. Do not obstruct these vents – refer to Appendix F for additional information.

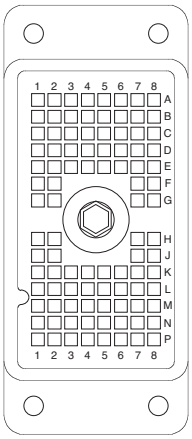
Appendix B: Connector Details

DL 96-Pin

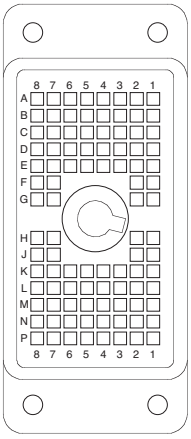
Hood



Plug



Socket

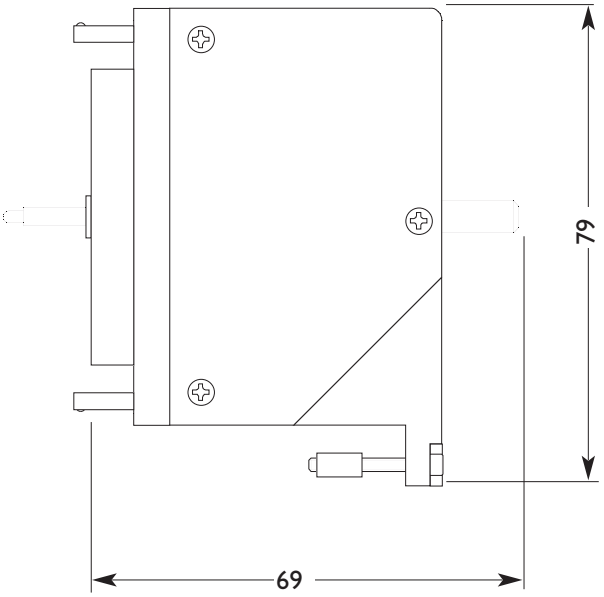


Connectors Viewed From Wiring Side

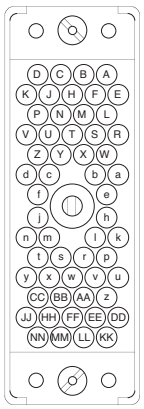
Dimensions: 29mm x 69mm

Varicon™ 56-pin

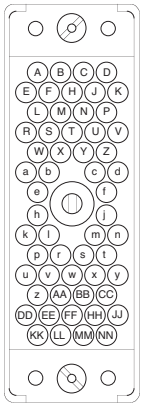
Hood



Free Socket



Free Plug



Connectors Viewed From Wiring Side

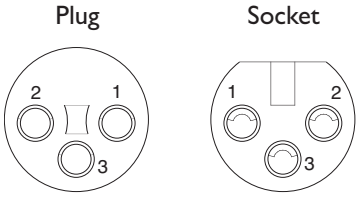
Dimensions: 22mm x 67mm

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)



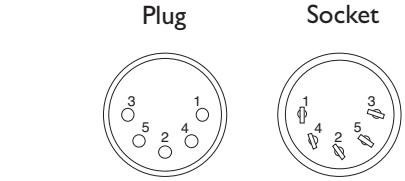
Connectors Viewed From Wiring Side

DIN 5-Pin 180°

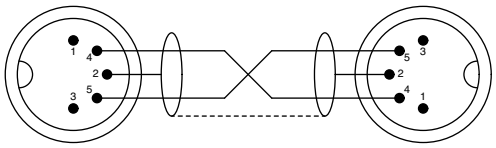
Dimensions: 15mm dia.
Cable Dia: 4mm - 7mm (typical)

Pinout for MIDI signals:

Pin 1 - n/c
Pin 2 - Screen
Pin 3 - n/c
Pin 4 - Midi +
Pin 5 - Midi -



Connectors Viewed From Wiring Side



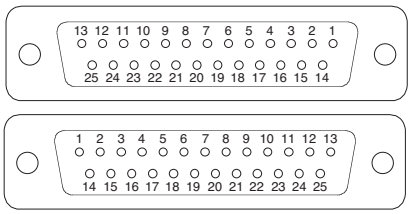
Midi lead construction

D-Type Multipin

Connectors Viewed From Wiring Side

25-way

Dimensions: 55 x 15mm (approx.)
Cable Dia: 8mm (typical)

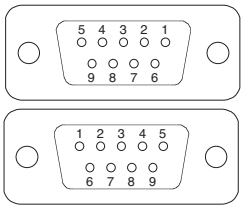


Plug

Socket

9-way

Dimensions: 35 x 15mm (approx.)
Cable Dia: 7mm (typical)



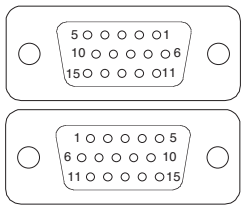
Plug

Socket

HD 15-way

Dimensions: 35 x 15mm (approx.)
Cable Dia: 12mm

RGBHV (XGA) connector



Plug

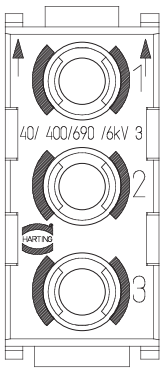
Socket

Harting Mains Insert

Pin 1 LIVE
Pin 2 n/c
Pin 3 NEUTRAL
Earth contact is via Earth pin in the housing frame

Note: The inserts utilise crimped pins which are not removable.

Part	*SSL Part Number*
3-way socket housing	*32VAK3DC*
40A Contact	*32VAQXEX*



Socket Viewed from wiring side

Appendix C: Connector Pinouts – C200 Console

Meter Inputs	(Analogue Circuits)		
Location:	Audio Belly Panel		
Connector Type:	25-way D-type male		
pin	*Description*	*Notes: VU or PPM only*	*Notes: RTW10830*
1	Meter 1 input +	Left meter	Input 1
14	Meter 1 input -		and Left meter
2	n/c		
15	Meter 2 input +	unused	Input 2
3	Meter 2 input -		and Right meter
16	n/c		
4	Meter 3 input +	Right meter	Input 3
17	Meter 3 input -		
5	n/c		
18	Meter 4 input +	unused	Input 4
6	Meter 4 input -		
19	n/c		
7	Meter 5 input +	unused	Input 5
20	Meter 5 input -		
8	n/c		
21	Meter 6 input +	unused	Input 6
9	Meter 6 input -		
22	n/c		
10	Meter 7 input +	unused	Input 7
23	Meter 7 input -		
11	n/c		
24	Meter 8 input +	unused	Input 8
12	Meter 8 input -		
25	n/c		
13	n/c		

Note. If both the RTW phasescope and mechanical meters are fitted refer to the RTW circuit allocations.

Phase Scope	(Digital Circuits)		
Location:	Audio belly panel		
Connector Type:	25-way D-type female		
pin	*Description*	*Notes: MSD600*	*Notes: RTW10830*
1	Circuit 1 +	AES/EBU in 1/2	AES/EBU out 7/8*
14	Circuit 1 -		
2	n/c		
15	Circuit 2 +	AES/EBU in 3/4	AES/EBU out 5/6*
3	Circuit 2 -		
16	n/c		
4	Circuit 3 +	AES/EBU in 5/6	AES/EBU out 3/4*
17	Circuit 3 -		
5	n/c		
18	Circuit 4 +	unused	AES/EBU out 1/2*
6	Circuit 4 -		
19	n/c		
7	Circuit 5 +	unused	AES/EBU in 7/8
20	Circuit 5 -		
8	n/c		
21	Circuit 6 +	unused	AES/EBU in 5/6
9	Circuit 6 -		
22	n/c		
10	Circuit 7 +	unused	AES/EBU in 3/4
23	Circuit 7 -		
11	n/c		
24	Circuit 8 +	unused	AES/EBU in 1/2
12	Circuit 8 -		
25	n/c		
13	n/c		

* Output circuits are looped through from the corresponding input within the RTW meter.

Phase Scope	(Diagnostics and Control)		
Location:	Audio belly panel		
Connector Type:	9-way D-type female		
pin		*Notes: MSD600*	*Notes: RTW10830*
1		Chassis	Switch common
6		n/c	Mode
2		Rx Data	Select
7		n/c	Memo
3		Tx Data	Gain
8		n/c	Reset
4		n/c	Shift
9		n/c	n/c
5		n/c	n/c

OSC T/B O/P

Location:	Audio belly panel
Connector Type:	25-way D-type female

pin	*Description*		*Notes:*
1	Oscillator Output	hot	Parallel of XLR 'OSC'
14		cold	
2		screen	
15	Talkback Output	hot	Parallel of XLR 'Talkback'
3		cold	
16		screen	
4	n/c		
17	n/c		
5	n/c		
18	n/c		
6	n/c		
19	n/c		
7	n/c		
20	n/c		
8	n/c		
21	n/c		
9	n/c		
22	n/c		
10	n/c		
23	n/c		
11	n/c		
24	n/c		
12	n/c		
25	n/c		
13	n/c		

OSC STATUS LOCK

Location:	Audio belly panel
Connector Type:	25-way D-type male

pin	*Description*		*Notes:*
1	Oscillator Lock	A	Link to pin 2 to mute oscillator
14	n/c		
2	Oscillator Lock	B	
15	n/c		
3	n/c		
16	n/c		
4	n/c		
17	n/c		
5	n/c		
18	n/c		
6	n/c		
19	n/c		
7	n/c		
20	n/c		
8	n/c		
21	n/c		
9	n/c		
22	n/c		
10	n/c		
23	n/c		
11	n/c		
24	n/c		
12	n/c		
25	n/c		
13	n/c		

KVM Switcher	(Refer to console specification manual for connector location)	
Location:	Audio belly panel	
Connector Type:	25-way D-type female	
pin	*Description*	*Notes:*
1	0V	
14	0V	
2	n/c	
15	n/c	
3	LINK LED	Active low
16	Keyboard enable switch	Pull low to activate
4	Video enable switch	Pull low to activate
17	Keyboard tally LED	Active low
5	Video Tally LED	Active low
18	+5V	
6	n/c	
19	n/c	
7	n/c	
20	n/c	
8	n/c	
21	0V	
9	n/c	
22	+5V	
10	0V	
23	0V	
11	-15V	
24	Video changeover signal	Active low
12	0V	
25	0V	
13	n/c	

Connector Pinouts – Centuri Processor

Video

Location:	Centuri – CPU Card
Connector Type:	HD15 female

pin	*Description*	*Notes:*
1	Red	
2	Green	
3	Blue	
4	ID bit	
5	n/c	
6	Red screen	
7	Green screen	
8	Blue screen	
9	n/c	
10	Ground	
11	ID bit	
12	ID bit	
13	H sync	
14	V sync	
15	n/c	

Serial

(62pin to 8 off 9-pin breakout lead)

Location:	Centuri – CPU card
Connector Type:	62-way high-density D-type female

D9-pin	*Description*	*TTY-A*	*TTY-B*	*TTY-C*	*TTY-D*	*TTY-E*	*TTY-F*	*TTY-G*	*TTY-H*
1	0V	7	28	14	52	21	42	35	59
6	0V	5	26	12	50	19	40	33	57
2	Rx Data L	2	23	9	47	16	37	30	54
7	Rx Data H	3	24	10	48	17	38	31	55
3	Tx Data H	2	22	8	46	15	36	29	53
8	Tx Data L	4	25	11	49	18	39	32	56
4	0V	6	27	13	51	20	41	34	58
9	n/c	-	-	-	-	-	-	-	-
5	0V	43	45	44	44	62	61	60	61

TTY A – H

Location:	Centuri CPU serial breakout adapter lead
Connector Type:	9-way D-type male (8 off)

pin	*Con. A–E, F–H (RS422)*	*Con. E (RS232)*	*Notes:*
1	0V	0V	
6	0V	0V	
2	Rx Data L	Tx Data	
7	Rx Data H	0V	
3	Tx Data H	Rx Data	
8	Tx Data L	n/c	
4	0V	n/c	
9	n/c	n/c	
5	0V	0V	

Timecode

Location:	Centuri – Console interface card
Connector Type:	25-way D-type male

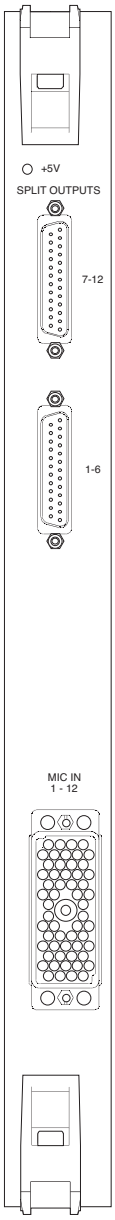
pin	*Description*	*Notes:*
1	in 1 +	
14	in 1 -	
2	in 1 gnd	
15	in 2 +	
3	in 2 -	
16	in 2 gnd	
4	in 3 +	
17	in 3 -	
5	in 3 gnd	
18	in 4 +	
6	in 4 -	
19	in 4 gnd	
7	unused	
20	out 1 +	
8	out 1 -	
21	out 1 gnd	
9	out 2 +	
22	out 2 -	
10	out 2 gnd	
23	out 3 +	
11	out 3 -	
24	out 3 gnd	
12	out 4 +	
25	out 4 -	
13	out 4 gnd	

Machine Control

Location:	Centuri – Console interface card
Connector Type:	25-way D-type female

pin	*Description*	*Notes:*
1	n/c	
14	n/c	
2	Tally common	Tally voltage can be AC or DC 4V to 30V.
15	Switch common	
3	Rewind switch	
16	Rewind tally	
4	Forward switch	
17	Forward tally	
5	Stop switch	
18	Stop tally	
6	Play switch	
19	Play tally	
7	Skip back switch	
20	Skip back tally	
8	Record switch	
21	Record tally	
9	Tach 1	
22	Tach 2	
10	Dir 1	
23	Dir 2	
11	n/c	
24	n/c	
12	n/c	
25	n/c	
13	n/c	

Mic Input Card ('908)



MIC In 1 – 12

Location:	908 Micamp
Connector Type:	Varicon 56-way female

Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	D	K	P	*All other pins unused*
2	C	J	N	
3	A	E	L	
4	B	F	M	
5	V	Z	d	
6	U	Y	c	
7	R	W	a	
8	S	X	b	
9	n	t	y	
10	m	s	x	
11	k	p	u	
12	l	r	v	

Split Outputs 1 – 6

Location:	908 Micamp
Connector Type:	25-way D-type female

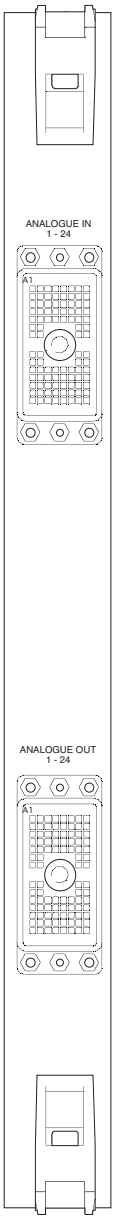
Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	24	12	25	*Pin 13 unused*
2	10	23	11	
3	21	9	22	
4	7	20	8	
5	18	6	19	
6	4	17	5	

Split Outputs 7 – 12

Location:	908 Micamp
Connector Type:	25-way D-type female

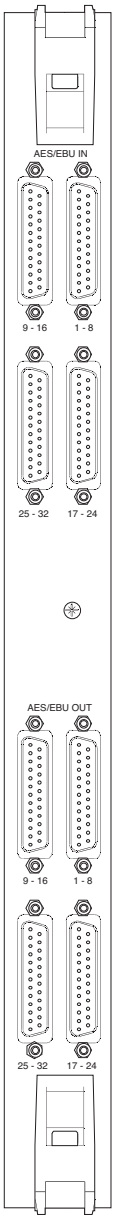
Cct	*Hot*	*Cold*	*Screen*	*Notes*
7	24	12	25	*Pin 13 unused*
8	10	23	11	
9	21	9	22	
10	7	20	8	
11	18	6	19	
12	4	17	5	

Analogue I/O Card ('904)



Analogue In / Out				
Location:	904 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	G3	
14	D6	E6	G4	
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	H3	
22	L6	K6	H4	
23	L7	K7	J7	
24	L8	K8	J8	

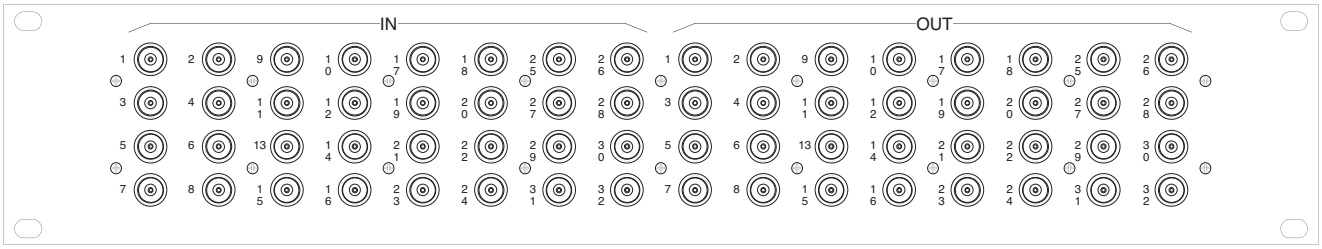
Digital I/O Card ('902)



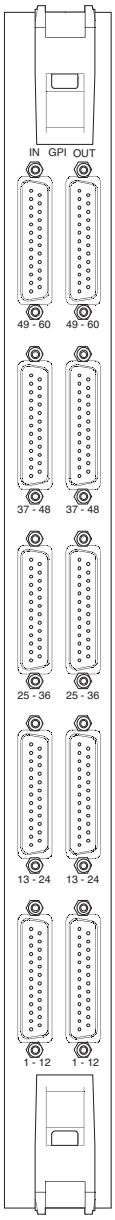
AES/EBU In 1–8 (9–16, 17–24, 25–32)				
Location:	902 DIO			
Connector Type: 25-way D-type female				
Cct	*Hot*	*Cold*	*Screen*	*Notes*
1	24	12	25	*Pin 13 unused*
2	10	23	11	
3	21	9	22	
4	7	20	8	
5	18	6	19	
6	4	17	5	
7	15	3	16	
8	1	14	2	

AES/EBU Out 1–8 (9–16, 17–24, 25–32)				
Location:	902 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	

BNC Breakout Panel



GPI I/O Card ('907)



GPI Inputs 1–12 (13–24, 25–36, 37–48, 49–60)

Location:	Centuri – Relay 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 1–12 (13–24, 25–36, 37–48, 49–60)

Location:	Centuri – Relay card
Connector Type:	25-way D-type female

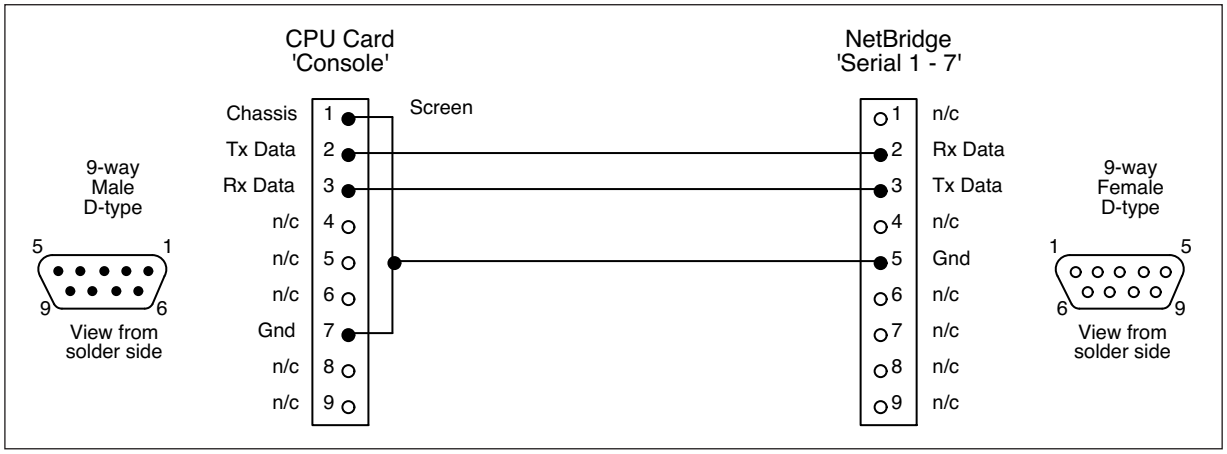
pin	*Description*		*Notes:*
1	Output	1A	
14	Output	1B	
2	Output	2A	
15	Output	2B	
3	Output	3A	
16	Output	3B	
4	Output	4A	
17	Output	4B	
5	Output	5A	
18	Output	5B	
6	Output	6A	
19	Output	6B	
7	Output	7A	
20	Output	7B	
8	Output	8A	
21	Output	8B	
9	Output	9A	
22	Output	9B	
10	Output	10A	
23	Output	10B	
11	Output	11A	
24	Output	11B	
12	Output	12A	
25	Output	12B	
13	+15V		*450mA across all connectors*

Connector Pinouts – NetBridge

Serial 1–8 (RS232)		
Location:	Netbridge – Rear panel	
Connector Type:	9-way D-type male	
pin	*Description*	*Notes:*
1	Chassis	
6	n/c	
2	Rx Data	
7	n/c	
3	Tx Data	
8	n/c	
4	n/c	
9	n/c	
5	0V	

Terminal (RS232)		
Location:	Netbridge – Rear panel	
Connector Type:	9-way D-type male	
pin	*Description*	*Notes:*
1	DCD	Data Carrier Detect
6	DSR	Data Set Ready
2	Rx Data	
7	RTS	Request To Send
3	Tx Data	
8	CTS	Clear To Send
4	DTR	Data Terminal Ready
9	RI	Ring Indicator
5	Signal ground	

NetBridge Diagnostic Cable



Resistor Colour Code:

Black	*0*
Brown	*1*
Red	*2*
Orange	*3*
Yellow	*4*
Green	*5*
Blue	*6*
Violet	*7*
Grey	*8*
White	*9*

Appendix 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)

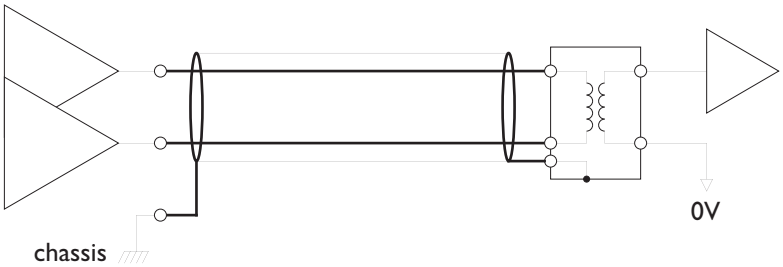
On some older items of equipment the screen connection may still be referenced to the circuit 0V rather than the chassis. In these cases it may be advantageous to disconnect the screen at this connection. Note however that this practice will degrade the EMC performance.

Balanced – Balanced
one screen connected to chassis

Connecting to Unbalanced Equipment

Connecting to unbalanced equipment can be much more problematic. It is much more likely that earth and induced RF 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)

1 inch = 25.4mm (exactly)
1m = 3' 3" (roughly)
1 mile = 1,600m (roughly)
1Kg = 2.2 Pounds (roughly)

Appendix 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

+4dBu = 1.229V rms.
0dBu = 0.775V rms.
-6dBu = 0.388V rms.

Appendix F: Additional Information for Installing Stageboxes

When positioning and installing C-SB the following rules must be followed:

- Unobstructed airflow at front and rear.
- No obstruction to airflow, horizontal or vertical, within 300mm in front, above and below both the front and rear panels.
- Ambient temperature no more than 30˚C measured at the air intake (lower front opening) or just below the rear heatsink.
- Microphone cables must not obstruct the air intake. To help ensure this, a cable guide is provided down the sides of the rack.

Design Requirements for a Flightcase

If a Stagebox is to be installed into a flight case the following requirements, in addition to those above, must be met to ensure adequate passive cooling – otherwise user must install a 'forced-ventilation kit'.

- Both front and rear covers must be completely removed during operation.
- The front and rear covers must be deep enough to ensure that the front and rear faces of Stagebox are flush with front and rear of the open flight case.

$$\text{volume of a sphere} = \frac{4\ \pi\ r^3}{3}$$

Appendix G: Cables and accessories

Cables and Accessories - by Part Description

Description	SSL Part No.
Audio Cables and Accessories	
DL Connector Crimp Contacts .32MM LOOSE	32QFXXQ1
DL Connector Free Hood 96-way	32QF96FH
DL Connector Free Plug 96-way	32QF96KC
DL Connector Handle	32QFXXKM
DL Connector 96W Chassis Socket	32QF96GC
DL Connector Crimp Contact Removal Tool	80CLAGDC
DL Connector Crimp Tool	80CLAG1C
Lead DL - DL 24cct 10m	92DL1024
Lead DL - DL 24cct 15m	92DL1524
Lead DL - DL 24cct 20m	92DL2024
Lead DL - DL 24cct 25m	92DL2524
Lead DL - DL 32cct 10m	92DL1032
Lead DL - DL 32cct 15m	92DL1532
Lead DL - DL 32cct 20m	92DL2032
Lead DL - DL 32cct 25m	92DL2532
Processor & Machine cables	
25-way D-type to 9-way D-type RS232 10m	66C60002
RJ45 to 25-way D-type RS232 10m	66C67206
9-way D-type to 9-way D-type RS422 10m	66C60007
Network Cables	
Ethernet: RJ45 to RJ45 10baseT 0.5m (pin-pin)	66C67207
Ethernet: RJ45 to RJ45 10baseT 1m (pin-pin)	66C67210
Ethernet: RJ45 to RJ45 10baseT 2m (pin-pin)	66C67220
Ethernet: RJ45 to RJ45 10baseT 5m (pin-pin)	66C67250
Ethernet: RJ45 to RJ45 10baseT 10m (pin-pin)	66C67310
Ethernet: RJ45 to RJ45 10baseT 16m (pin-pin)	66C67316
Ethernet: RJ45 to RJ45 10baseT 20m (pin-pin)	66C67320
Ethernet: RJ45 to RJ45 10baseT 25m (pin-pin)	66C67325

Description	SSL Part No.
Video & Sync	
Lead Video HD15 XGA 16m	66DN16V1
Lead Video HD15 XGA 20m	66DN20V1
Lead Video HD15 XGA 25m	66DN25V1
Lead Video HD15 XGA 48m	66DN48V1
BNC 75 'Y' piece	32TKU7CC
BNC 75 Terminator	32TKB7TC
Miscellaneous/Hardware	
39U Equipment Rack	57GQ4QA8
25-way D-type Male-to-Female Cable 15m	66C90014
IEC Mains Lead	32VGL372
IEC Mains Lead (US)	32VGL3BN

Notes

More Notes