Solid State Logic

SOUND || VISION

C100
HDS

Digital Broadcast Console

V3.0/3 Software Update and Install Notes

Applicable to upgrades from V1.1/15 onwards

Packing List

Please check that the V3.0/3 Software Upgrade Kit (706C100LN) contains the following items:

1	V3.0/3 Update Notes	(this document)
1	C100 HDS Software Disk (DVD-ROM)	P996C100A (or website download)
1	Software Licence String *(redundant systems will require two licence strings)*	P996C120A

If any of the listed items are missing, please contact your local SSL representative before attempting the upgrade

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This document contains essential information – please read it carefully before making any attempt to upgrade the system

Solid State Logic

S O U N D || V I S I O N

Initial Release (AA): July 2010

Introduction

This document describes the new features, new options and bug fixes incorporated in the V3.0/3 software upgrade and details the hardware and software installation procedure required to update your system to this latest release of C100 HDS software.

Please note that this release is only applicable to those systems that have previously been installed with V1.1/15 or greater software and that have had the new 256 channel PCIe installed. If the new PCIe card has been purchased as part of a V3 upgrade then follow the hardware installation procedure on page 6 **before** installing the software. If you have any questions about this release, please contact your local SSL office or distributor.

> *Do not apply power to – or re-start – the Blackrock processor with the C100 HDS Software Disk in the processor's DVD drive; doing so will force a complete system re-install!*

Assumptions

The following points are assumed in these installation instructions:

A1. This installation procedure details installation of new software and hardware on a running system, not a fresh installation.

A2. During commissioning/installation of the C100 HDS system, at least one networked computer within the studio facility – ideally located in the same room as the console – will have been configured to communicate with the system. Access to one of these computers will be required to run the software installation process. This will be referred to in the following text as the '**networked computer**'.

A3. The network IP Address that has been assigned to the C100 HDS system will be required. If you do not know either of these details, please contact your IT or Studio Maintenance Department.

A4. The **networked computer** used for this installation should have an SSH client installed ('PuTTY', for example). This program will be used to communicate with the C100 HDS system – login as 'sbc' using 'server' as the password. If you are unsure how to run this program, or the default password has been changed, please contact your IT or Studio Maintenance Department. This computer must also be fitted with a DVD ROM drive.

A5. Backing up of the current system and installation of the new software will require that the **networked computer** has access to the folders exported by the C100 HDS system. This can be achieved as follows:

    a. Click on 'Run' in the Windows Start menu.

    b. In the 'Run' box, type '\\<IP_Address> <CR>'
        Where: '\\' indicates that we wish to mount a file share,
            '<IP_Address>' is the IP Address of the C100 HDS system,
            '<CR>' indicates the 'Return' key on the computer keyboard.

    c. At the resulting login prompt, enter the username ('sbc') and password (the default for this login being 'sbc123'). This will result in a view of the shared folders on the C100 HDS system, similar to that shown below:
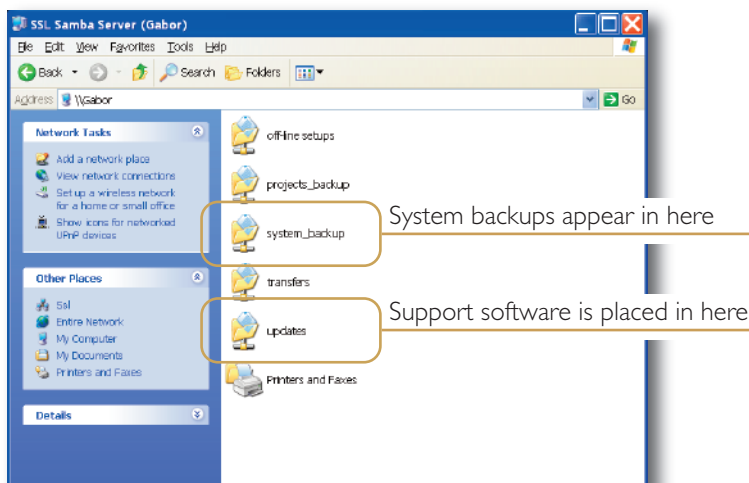
Software Installation on a Single Blackrock System

This installation procedure applies to single Blackrock systems only – the process for redundant systems is slightly different and so is detailed separately on page 4.

1. Check the contents of the Software Upgrade Kit against the packing list; if there are any omissions, please contact your local SSL office before proceeding further.

Archiving the System Disk

2. As with all software installations, we strongly advise you to generate a 'mirror' copy of the C100 HDS System Disk before proceeding. Open the SSH client on the **networked computer** and login to the C100 HDS system (ref. **Assumption A4.**). Once you are logged in (as user 'sbc'), 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 C100 HDS System Disk and so will take a considerable time (≈15min) to complete. It is of course also recommended that any backups created are stored off-line elsewhere.

3. To ensure that sufficient space is still available to contain the upgrade, type:

    `df -h /home <CR>` Check that the percentage used is less than about 90%. If it is higher, consider removing any old backups from the 'system_backup' folder.

Installing the Support Software

4. Place the C100 HDS Software Disk in the DVD drive in the **networked computer** and open a window that displays the contents of the DVD – *do not place the software disk in the DVD drive on the Blackrock processor!*

5. Locate the 'updates' folder within the folders exported by the C100 HDS system (ref. **Assumption A5.**).

6. On the DVD, open the 'C100_V2_0_7 Updates' folder and drag the following three .rpm files from the CD into the 'updates' folder:

    *   `kernel` *SBC kernel and associated modules*
    *   `ssl_console_files` *Blackrock system software and files*
    *   `ssl_host_tools` *SBC support files and applications*

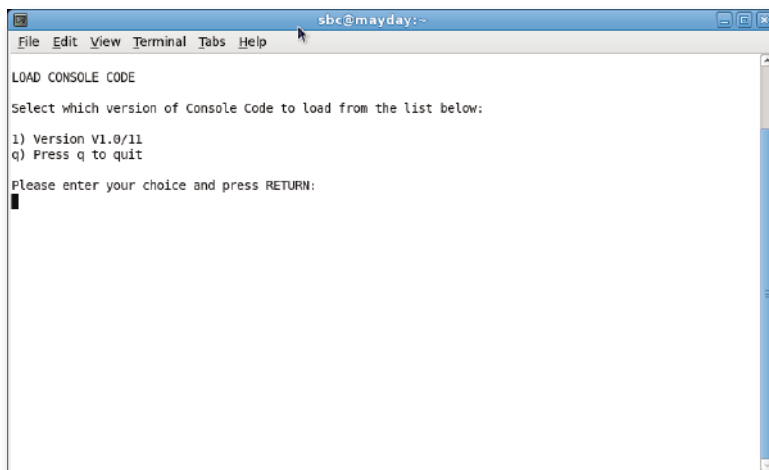7. Once the .rpm files have been copied, return to the SSH client and type:

    `install_updates <CR>.` This will unwrap and install each of the .rpm archives. Follow the on-screen instructions to install them. Ignore any error messages printed to the terminal during this time.

Installing the C100 HDS System Software

8. Once the files are installed the system code will need to be copied to the flash memory on the Blackrock processor's PCIe card. At the terminal prompt typing `load_console_code <CR>` will result in a list of software versions similar to that shown here.

    Select the version of code you wish to install by entering the number next to the software version, eg. `1 <CR>` in the illustration opposite. The system code will now be copied to the flash device on the PCIe card. A percentage indicator on the terminal will provide an indication as to how far through the process the system is. On completion a prompt will request a key on the keyboard be pressed to shutdown 'p' or reboot 'r' the Blackrock processor – it is recommended that at this point the Blackrock processor be shutdown and re-powered if possible.

```
                           sbc@mayday:~
File  Edit  View  Terminal  Tabs  Help

LOAD CONSOLE CODE

Select which version of Console Code to load from the list below:

1) Version V1.0/11
q) Press q to quit

Please enter your choice and press RETURN:
```

Enabling the New System

9. When the system has fully booted, a pop-up will appear on screen inviting you to enter a Software Licence string and so enable the software.

    You will not be able to use the console until the Software Licence has been accepted.

    Open the Software Licence envelope containing your Licence string and type this carefully using the on-screen keyboard. Once the system has verified the validity of the Licence, a Software Licence Agreement will appear on-screen. Stab on the '*I Agree*' box at the top of the pop-up to complete the licensing procedure. Reboot the processor to ensure the licence is correctly read.

10. Remember to store the Software Licence string in a safe place along with the C100 HDS Software Disk.

    Once the update is complete and the console has rebooted, any Windows workgroup the Blackrock has been assigned to may need to be reassigned (updates performed by the SSL Host Tools package may erase various parts of the network integration settings) – you may need to contact your contact your IT or Studio Maintenance personnel to check this.

Software Installation on a Redundant Blackrock System

Installation of software and support files on a redundant Blackrock system must be performed on one processor at a time with the other processor powered down. Do not attempt this process with both units running!

1. Check the contents of the Software Upgrade Kit against the packing list; if there are any omissions, please contact your local SSL office before proceeding further.

Archiving the System Disk

2. As with all software installations, we strongly advise you to generate a 'mirror' copy of the C100 HDS System Disk before proceeding. Open the SSH client on the **networked computer** and login to the C100 HDS system (ref. **Assumption A4.**). Once you are logged in (as user 'sbc'), 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 C100 HDS System Disk and so will take a considerable time (≈15min) to complete. It is of course also recommended that any backups created are stored off-line elsewhere. This must be done separately for both Blackrock processors – but this can be done on both processors simultaneously.

3. To ensure that sufficient space is still available to contain the upgrade, on each system type:

   `df -h /home <CR>`   Check that the percentage used is less than about 90%. If it is higher, consider removing any old backups from the 'system_backup' folder.

Installing the Support Software

4. Ensure that the slave Blackrock processor has been powered down. Proceed through the following steps on the master processor first.

5. Place the C100 HDS Software Disk in the DVD drive in the **networked computer** and open a window that displays the contents of the DVD – *do not place the software disk in the DVD drive on the Blackrock processor!*

6. Locate the 'updates' folder within the folders exported by the C100 HDS system (ref. **Assumption A5.**).

7. On the DVD, open the 'C100_V2_0_7 Updates' folder and drag the following three .rpm files from the CD into the 'updates' folder:

   - kernel   *SBC kernel and associated modules*
   - ssl_console_files   *Blackrock system software and files*
   - ssl_host_tools   *SBC support files and applications*

8. Once the .rpm files have been copied, return to the SSH client and type:
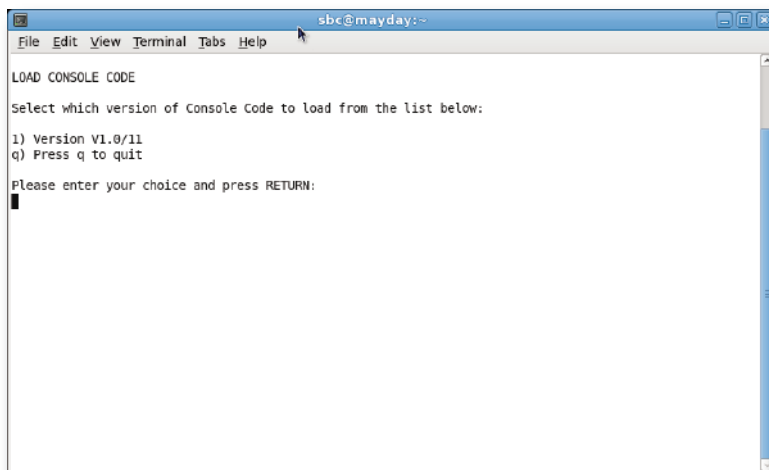
   `install_updates <CR>.`   This will unwrap and install each of the .rpm archives. Follow the on-screen instructions to install them. Ignore any error messages printed to the terminal during this time.

Installing the C100 HDS System Software

9. Once the files are installed the system code will need to be copied to the flash memory on the Blackrock processor's PCIe card. At the terminal prompt typing `load_console_code <CR>` will result in a list of software versions similar to that shown here.

Select the version of code you wish to install by entering the number next to the software version, eg. `1 <CR>` in the illustration opposite. The system code will now be copied to the flash device on the PCIe card. A percentage indicator on the terminal will provide an indication as to how far through the process the system is. On completion a prompt will request a key on the keyboard be pressed to shutdown 'p' or reboot 'r' the Blackrock processor – it is recommended that at this point the Blackrock processor be shutdown and re-powered if possible.

Enabling the New System

10. When the system has fully booted, a pop-up will appear on screen inviting you to enter a Software Licence string and so enable the software.

You will not be able to use the console until the Software Licence has been accepted.

Open the Software Licence envelope containing your Licence strings. Each processor will have a different licence; match the 5 digit PAL id. given with the licence to the Blackrock network ID on the sticker on the front face of the Blackrock unit and type this in carefully using the on-screen keyboard. Once the system has verified the validity of the Licence, a Software Licence Agreement will appear on-screen. Stab on the '*I Agree*' box at the top of the pop-up to complete the licensing procedure. Reboot the processor to ensure the licence is correctly read.

11. Power down the master Blackrock processor and power up the slave processor, such that only the slave processor is on and running. Repeat this process from Step 2. for the slave processor.

12. Once all updates have been performed, re-boot both processors together.

13. Remember to store the Software Licence strings in a safe place along with the C100 HDS Software Disk.

Once the update is complete and the console has rebooted, any Windows workgroup the Blackrock has been assigned to may need to be reassigned (updates performed by the SSL Host Tools package may erase various parts of the network integration settings) – you may need to contact your contact your IT or Studio Maintenance personnel to check this.

Update Contents

Important Information

> ## Please Note
>
> - C100 HDS V3 software is a chargeable upgrade which is compatible *only* with the latest 256 channel Blackrock DSP card (626996X4)
>
> - All consoles shipped prior to January 2010 will require a new 256 channel Blackrock DSP card to run this software
>
> - Consoles shipped since December 2009 will require a memory module and firmware upgrade to run this software
>
> Please also note the following:
>
> - Because C100 HDS V3 software is compatible only with 256 channel hardware, *all future development will be for the 256 channel platform*
>
> - Support for the existing 128 channel platform will continue until August 2011

A chargeable upgrade path for all C100 HDS customers is available:

SSL Part No.	Description
726750S1	C100 HDS V3 UPGRADE SINGLE CORE *Contains new PCIe card with memory module, firmware, software and software licence*
726750S2	C100 HDS V3 UPGRADE DUAL CORE *Contains two new PCIe cards with memory modules, firmware, software and software licence*
726750S3	C100 HDS V3 UPGRADE SOFTWARE ONLY SINGLE CORE *Contains one new memory module and new firmware, software and software licence*
726750S4	C100 HDS V3 UPGRADE SOFTWARE ONLY DUAL CORE *Contains two new memory modules and new firmware, software and software licence*

Due to the complexity of replacing a Blackrock DSP card in the field and the requirement of both a firmware and a memory upgrade for all 256 channel Blackrock DSP cards a service visit will be necessary for all upgrades.

C100 HDS V3 Software Options

The following chargeable software options are available for customers who have upgraded to V3:

SSL Part No.	Description
626750S3	Production Automation – *using Ross Overdrive® or SONY ELC® protocols*
626PSROA	Stereo to 5.1 Up-mix
626PDA0A	Dialogue Automix
626PDS0A	Additional 32 Channels of DSP – *up to a maximum 256 Channels*
626PDW0A	DAW Control

C100 HDS V3 Hardware Options

The following hardware options are now available for customers who have upgraded to V3:

SSL Part No.	Description
626477XA	24 IO 1U Ethernet GPIO Unit
626477XB	48 IO 1U Ethernet GPIO Unit
626750BX/BY	High Capacity Blacklight I/O

New Features

The following new features are introduced with this C100 HDS V3 software update.

256 Channel Blackrock DSP Card

This software release supports the new 256 channel Blackrock DSP card only. This new varient of the Blackrock DSP card now supports up to 256 channels with full processing on each channel. Included on this card are:

- Extended memory to support the greater channel count
- Support for high capacity Blacklight I/O providing 256 channels of I/O within a single fibre with full redundancy

Alpha-Link 8-RMP Control

Control for the Alpha-Link 8-RMP Remote Microphone Pre-amplifier has been added, enabling remote control of the input gain as well as +48V and –20dB pad switching.

Remote control of the Alpha-Link 8-RMP is only possible if the unit is connected to an Alpha-Link LIVE

To configure the C100 HDS to control an Alpha-Link 8-RMP, stab on **Config** in the **Link Use** menu for the Alpha-Link LIVE unit that the 8-RMP is connected to. This opens the **Alpha-Link I/O Setup** pop-up, in which the function of each set of 8 inputs can be set; either as standard Alpha-Link Line Inputs or as Alpha-Link 8-RMP Inputs:
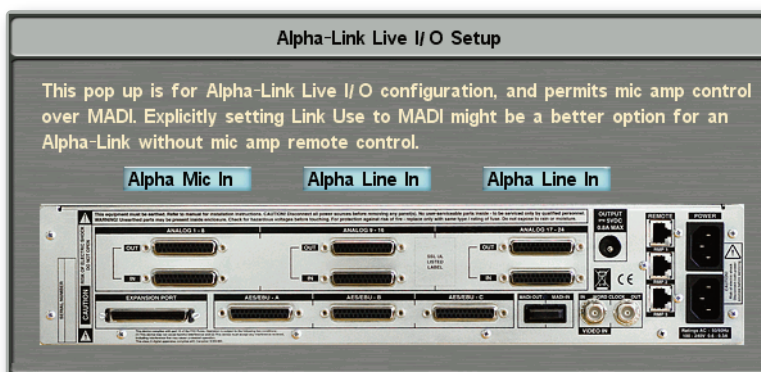
Note that the Microphone inputs must be grouped to enable routing – as with standard I/O – whilst routing and control occurs in the same manner as with B-RIO or MORSE Microphone inputs.

Delay on Programme Output

A new Program Output Delay feature has been added, providing additional tools for dealing with the video frame delays which are common in a modern digital production environment. Touching the screen on the label or meter areas of either Programme Output produces the normal Programme Control pop-up to which a Delay button has been added. Delays of up to 5.5 seconds for *NTSC* and 5.46 seconds for *PAL* can be inserted by pressing the **ATT** button and adjusting the Delay rotary pot on a Master Tile. Pressing and turning the rotary pot sets the display units as Milliseconds, Frames, Samples or Seconds.
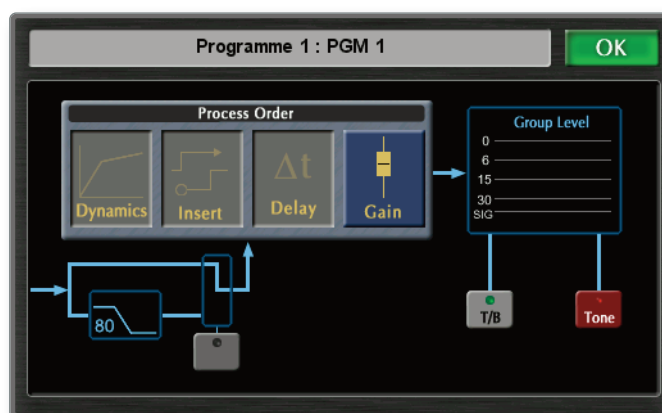
Free Control Layering

For Free Control Layering to operate correctly, the '`Function Lists`*' folder must first be amended – please contact SSL Service for details and assistance with these changes.*

It is now possible to toggle the existing user-defined Channel Free Controls with a new selection of pre-defined Channel Free Control 'banks'.

For example, customised Channel Free controls can be quickly swapped with the new 'fast access' controls such as Aux 1/2, Aux 3/4 or even filters, compressor, Dialogue Automix or Upmix controls. This feature has been designed to ease and speed up access to essential master controls regardless of the Free Control setup. Each of the defined layers are accessible via the Centre Free Controls switches.

To configure the Centre Free Controls and to program the pre-defined access on the Channel Free Controls, press **Misc** on the centre touchscreen and then press **GPI Free**. A new pop-up will appear which gives access to a list of functions that can be assigned to the Centre Free Controls:

1. The displays associated with each Free button will flash displaying '– – – –'.

2. Select one of the 10 Free keys available in banks 1 to 6 – the selected key will initially display '????'.

Free Key

3. Using the centre section misc scroller select the *Chans Free CTRL Layers* line.
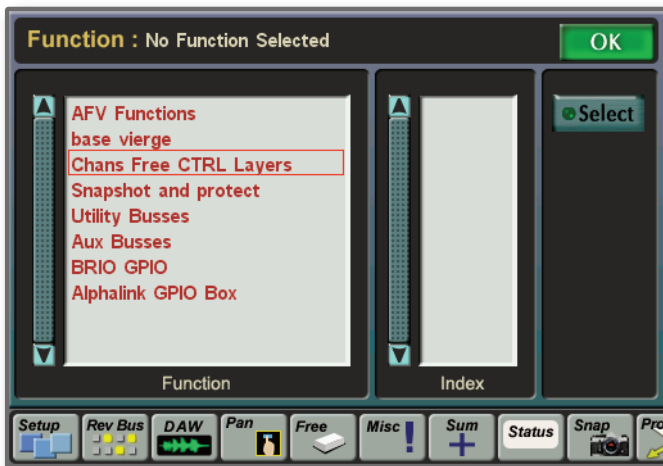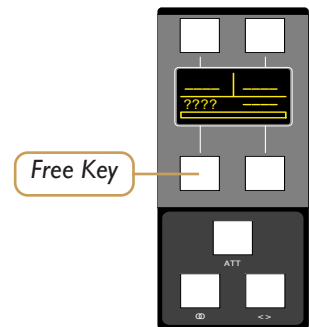
4. Still using the scroller, select one of the required functions and press select.
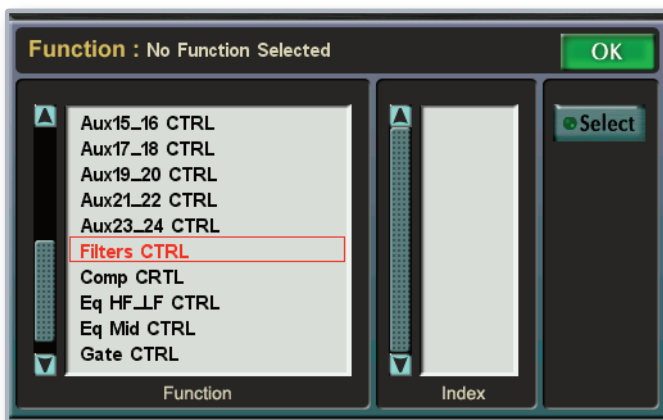
5. Pressing the **>** key next to the scroller will highlight the pop-up **Select** key and pressing the scroller will confirm this.

6. Press OK to close the pop-up.

7. Pressing the programmed Free key will toggle the Channel Free controls and pressing the **Page** switch on any channel will toggle through any adjustable parameters associated with that function. Parameters are adjusted using the rotary encoders above the **Page** switch.

The following pre-defined layers are available:

- Auxes 1/2 up to 23/24
- Compressor
- CHOP
- Dialogue Automix *(available as an option)*
- EQ LFHF
- EQ MID
- Filters
- Gate
- Input
- Stereo to 5.1 Up-mix *(available as an option)*
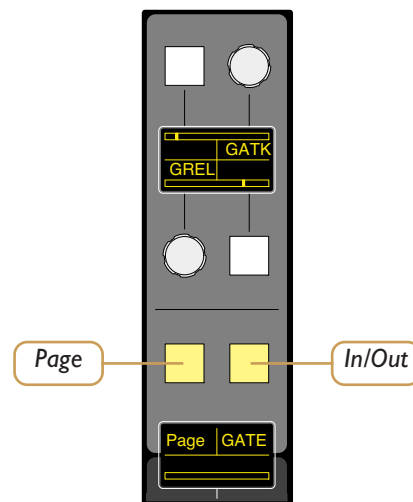
User Defined Labels for Centre Section Free Controls

The Free Controls available in the console Centre Section for assigning essential touchscreen controls for fast access can now be renamed by the user. Functions are assigned in the usual way however a **Rename** box has been added which now allows the user to change the default four character name to something which may be more suitable.

Snapshot Replace Function

The snapshot feature has been enhanced with the introduction of Replace. This option allows the user to update an existing snapshot by simply highlighting the snapshot to be updated and pressing **Replace**.
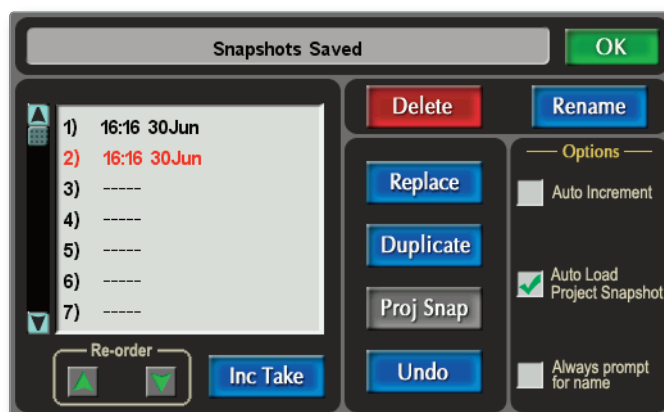
Aux Pre/Global/Post Selection on Front Panel Switches

In addition to now being able to map Auxes 1/2 up to 23/24 to Channel Free Controls, a facility is now available that allows Pre/Post/Global selection via physical Front Panel switches. Once an Aux pair has been added to the Free Switches using **Misc/GPI Free/Chans Free CTRL Layers** – as described previously – Pre/Post/Global switching can be actioned by pressing front panel switches as shown here.

Pressing the Aux Pre/Post/Global switch will toggle through the options with the LED signaling where in the signal path the Auxes are inserted:

- Half-bright LED represents *Global*
- Full-bright LED represents *Pre* Fader
- LED Off represents *Post* Fader

Additionally, when the Auxes are swapped to the faders the **Mode** button, situated below the channel Pan, can be used to toggle between Pre, Post and Global positions.
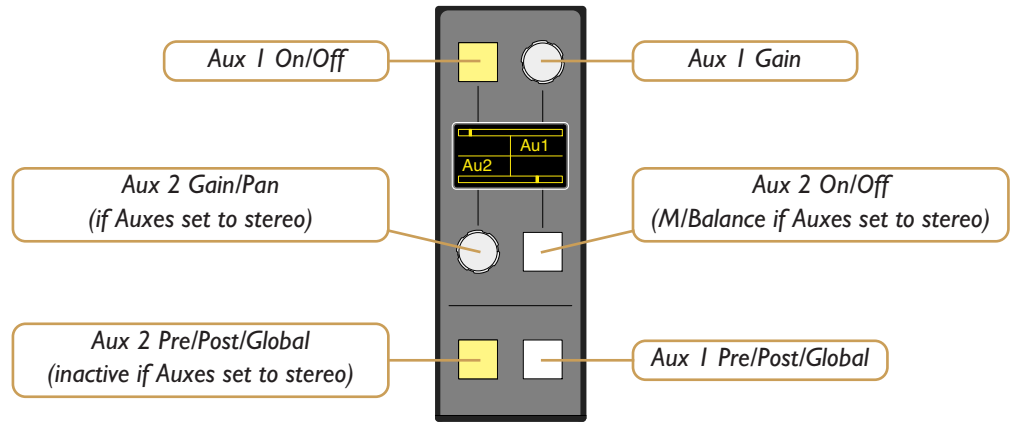
Fader to 0dB/Off Function

A new Fader to 0dB feature has been added to the Channel Settings Menu for incoming pre-mixed feeds. Selection is via the channel **ATT** switches and any number of channels can be set to either *0dB* or *Closed* (Off). This facility can be used for any type of fader displayed on the SSL and User layers, including VCA masters, ASG faders, PGM faders, Aux masters, Utility faders as well as Utility Output Faders and Direct Bus Access faders.

1. Press **CHAN** on the Master Tile control strip and press the **ATT** switch on the relevant channel. Multiple channels may be selected by pressing **MULTI** on the control strip and selecting the **ATT** switch on the first and last channels of the required group.

2. In the resulting pop-up use the rotary encoder to scroll to and select *Fader Levels* followed by either *0dB* or *Closed*, depending on the requirement, and confirm the selection.
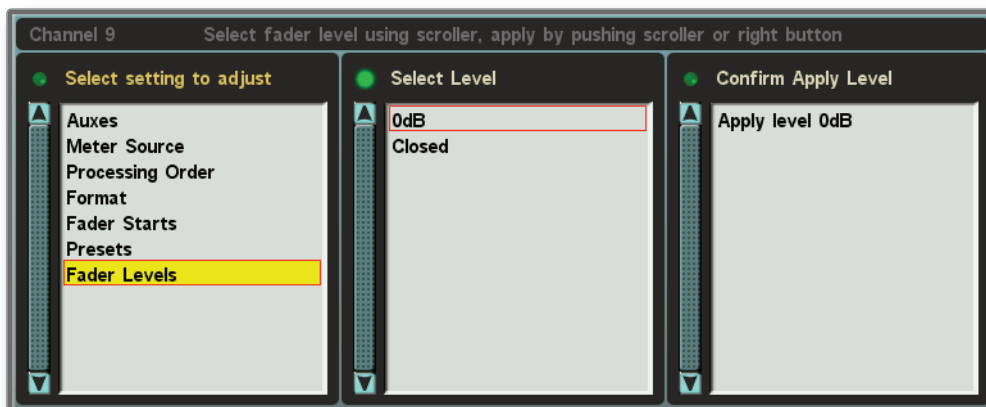
Front Panel Tiles Replace Utility

It is now possible to replace any of the console front panel tiles without having to restart the console.

1. Turn off the power to the relevant console bay(s).

2. Replace the offending tile(s).

3. Turn on the power to the relevant console bay(s).

4. Press **Front Panel/Ethernet FP Setup.**

5. Pressing **Check** will bring up a pop-up which details the changes and asks whether the user wants to confirm the change. Confirmation will then update the panel layout with the new tile IP addresses.

6. Alternatively, highlighting a single tile and pressing **Replace** will update the file for a single tile.

MORSE Redundant Ethernet Controller Support

Support has been added to provide Ethernet link redundancy for the MORSE Router controller card. Previously the mirrored redundant card would only become active if the main controller failed, with the changeover being determined by the Router software. With C100 HDS V3 a second fail-safe has been introduced so that if the main controller card loses it's Ethernet connection the Blackrock will force the MORSE Router to use it's redundant controller.

Software Fault Diagnosis

An `ssl_diags.sh` command has been introduced. This command, run from the SBC terminal, will collect all of the log files and other system information necessary for software fault diagnosis into a single file for easy return to SSL. The resultant archive will be placed in the following locations:

- On the Desktop of the SBC user
- Into the `Transfers` folder – accessible via the Samba shares

This command can only be run from the 'root' account and the archive produced will be a gnu-zipped tar file, named in the form of '`<Serial_No>.tar.gz`'.

Optional Features

The following features are chargeable options introduced with this C100 HDS V3 software update.

SSL Broadcast Automation Interface

The C100 HDS supports both the Ross Overdrive and Sony ELC automation systems. Both systems connect to an RS422 port on the C100 HDS console control surface and use serial communication to send and receive data to and from the console. (In the case of the Sony system, their Ethernet based control is converted to Serial with a Lantronix Ethernet to Serial convertor.) Information about the wiring of these interfaces can be found in the relevant **Console Installation Guide**. For the purposes of these notes, we'll assume the wiring and any necessary ancillary hardware is in place and working.

Switching Automation On

Automation capability is enabled through a software licence and is set-up in an editable text file stored with the other system set-up files. This file specifies whether the automation is enabled or disabled, the format for the serial communication (baud rate etc.) and the number of channels under automation control. The number of channels always starts with the console's first channel and counts up from there.
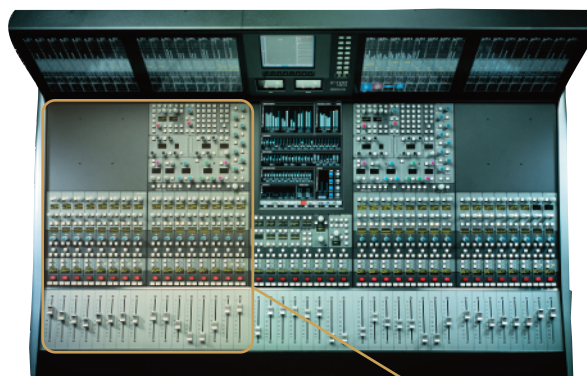
Automation control size can be specified from a single channel to all channels of the console but typically eg. 16 of 64 channel (not fader strips; see below).

Channels & Formatted Channels

Automation always controls 'formatted channel 1 and up'. On the C100 a 'formatted channel' is a single fader strip (this may be mono, stereo or 5.1 format). Therefore, if the automation asks to raise channel 1 in the console and channel 1 is set to be a 5.1 formatted channel, all 5.1 signals will change level. To understand how the C100 HDS console configures its channels, please refer to:

- **C100 HDS Operator's Reference Manual**, Section 2, Page 36

Simultaneous Automation and Operator Control

Using custom layers, the channel faders under control can be hidden from the operator's view of the surface so that the console can be used simultaneously by both an operator and the automation system without distraction.

The User Interface

From the console, the operator interface for automation control is a simple 'soft key' command labelled 'REMOTE ON' that can be programmed onto a centre section switch. This enables the control of the processing from the automation system. The status of this soft key is saved with the console project data, so that when a project is recalled with Automation control enabled, this function is also enabled.

Commands

Although largely the same, there are some minor differences in the console control functions that the Ross and Sony interfaces can support, as listed below.

Function	Ross Overdrive	Sony ELC
Master (Program) Fader Level	✔	✔
Channel Fader Level	✔	✔
Channel Pan	✔	✘
Channel On/Off	✔	✔
Channel PFL On/Off	✔	✔
Mix Minus Feeds	✘	✔

In Use

Fundamentally the SSL Broadcast Automation interface provides the Ross or Sony automation system with a remote controlled mixer. This mixer follows commands issued from the automation system (or the vision mixer/switcher) and thus controls the audio mix of the production.

The Automation System works in parallel with the console's physical controls, so if you adjust the level of a channel under automation control, the audio will change level. The fact that the level has changed will also be flagged to the automation system.

The limited abilities of the automation system (fader level, on/off etc.) mean that the console will most likely have to be pre-configured for a specific show, to set mic gains, EQ, master bus settings etc. This can all be simplified by the creation of projects to work with specific automated productions, other advantages are listed at the end of this section.

Ross Overdrive

For the Ross Overdrive to SSL Console interface to operate, the Ross Large Audio Mixer Interface option and the SSL Broadcast Automation Interface option need to be purchased from their respective manufacturers (Ross & SSL) and installed as part of the automation system and console configuration.

Connection

The SSL console connects directly to the Ross video switcher/mixer using an RS422 serial communication link between the console and the communication ports on the rear of the vision switcher/mixer.
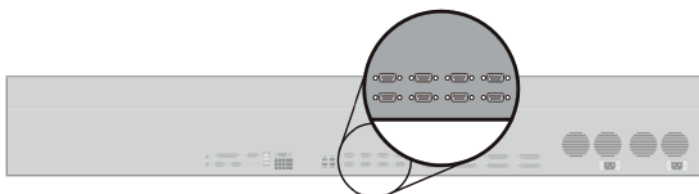
Rear view of the Ross Vision Switcher Control Panel; the RS422 cable can connect to any of these ports.

Vision Switcher			SSL Console	
Remote Port	**Signal**		**RS422 Port**	**Signal**
1	n/c			
2	RxA (Rx–)	←	2	TxA (Tx–)
3	TxB (Tx+)	→	3	RxB (Rx+)
4	Gnd		4	Gnd
5	Gnd			
6	n/c		6	Gnd
7	RxB (Rx+)	←	7	TxB (Tx+)
8	TxA (Tx–)	→	8	RxA (Rx–)
9	n/c			

Vision Switcher to SSL Console cable (Pin to Pin 9-way D-type)

Configuration

Information on how to set-up the Audio Mixer control is detailed in the Ross "Vision Audio Mixer" document. This is being updated to include specific information about SSL, but largely the current set-up information for Calrec consoles is very similar, with the exception of the cable wiring as detailed above.

If the system is configured and connected correctly, enabling 'REMOTE ON' in the SSL console (via the 'soft-key') will connect the system and faders, PFL etc. will respond as described in the Ross documentation. The soft-key label for this function appears as 'RAP' on the key label and on the touch screen key. Remember that the channels 'under remote control' will be from console channel 1 up, as defined by the CONTROLLED_CHANS parameter in the ross_config file described in the *Technical Set-Up Information* section of this document.

Operation

For information on how to use the Automation Interface, please refer to:

  • **Ross Vision Operator's Manual** (Ross Part No. 4800DR-403), Ops Section 10, Pages 10 to 12.

Sony ELC Interface

For the Sony to SSL Console Interface to operate, the Sony ELC-MVS01 system will need to have both the Sony BZEL-MVS41 Sony Audio Mixer I/F Software option and the SSL Broadcast Automation Interface option purchased from their respective manufacturers (Sony & SSL) and installed as part of the automation system and console configuration.

Connection

The SSL console uses an RS422 Serial Connection to communicate with the Sony ELC automation system. The Sony ELC interconnection uses a Lantronix UDS1100 External Device Server to translate between its native Ethernet communication and RS422 Serial protocol. (www.lantronix.com/device-networking/external-device-servers/uds1100.html)

This unit is configured using the Lantronix Device Installer application provided on the CD-ROM that ships with the unit. This application scans the local network and returns the IP address of any connected Lantronix UDS1100 interfaces. Selecting the appropriate 'found' interface, then displays a screen which allows configuration of the Serial Port (interface format, baud rate, parity etc.). This should be set to match the default settings as detailed in the 'ross_config' file in the **Technical Set-Up** *Information* section of this document.

The Lantronix UDS1100 ships with a 9-pin to 25-pin D-type cable. This is wired for RS232 and is therefore not useable in this application. A custom RS422 9-pin to 25-pin cable will be required. The RS422 25 way pin-out is detailed in the Lantronix User Documentation supplied with the unit whilst the SSL 9-pin wiring is detailed in the appropriate **Console Installation Guide**.

Configuration and Operation

Information on how to set-up and use the Audio Mixer control is detailed in the **Sony Live Production Control Software ELC-MVS01 User's Guide**. At the time of writing, this is at 1st revision for software V1.2.0 and later. Useful page references are:

- Pages 11 & 12, System Configuration   How the automation system and audio mixer work together
- Page 20, Audio Mixer Settings Window   Configuring the audio mixer within the ELC software
- Pages 47 to 53, Making the Audio Mixer Settings   Describes how the audio mixer is controlled in detail
- Pages 148 to 151, Controlling the Audio Level Manually   Describes control of the mixer via ELC when On-Air

If the system is configured and connected correctly, enabling 'REMOTE ON' in the SSL console (via the 'soft-key') will connect the system and faders, PFL etc. will respond as described in the Sony documentation. Remember that the channels 'under remote control' will be from console channel 1 up, as defined by the CONTROLLED_CHANS parameter in the ross_config file described in the **Technical Set-Up** section over leaf.

Technical Set-up Information

Hardware

Both the Ross Overdrive and Sony ELC Broadcast Automation Systems connect to an RS422 serial connector on the rear panel of the C100 HDS processor (or in some cases of C100 HDS, on the underside of the control surface; please contact SSL Project Engineering for the appropriate information for a specific console). Further connection information is detailed in the latest **Console Installation Guide** for the relevant console.

Broadcast Automation is only supported by C100 HDS V3 – or later – software

Software

SSL System Configuration

Broadcast Automation is a software licence enabled feature. If the software option for the console has been purchased, there will be a licence string for the console that enables the feature.

If either the licence string or the feature is missing, please contact SSL Support for assistance.

If the feature is enabled, there will be a plain text file located in the `sysfiles` directory named `ross_config`. This file controls the configuration of the interface and is usually set-up on system installation and shouldn't need to be changed.

This file is called `ross_config` for both Ross and Sony interfaces.

The `ross_config` file should normally contain the following:

```
<Ross_Setup>
ENABLED 1
PORT 1
BAUD_RATE 115200
PARITY ODD
DATA_BITS 8
STOP_BITS 1
TX_TIMEOUT 25
SEND_ACKS 1
EXPECT_ACKS 0
REPORT_CHANGES 1
MAX_UPDATES_PER_SEC 10
CONTROLLED_CHANS 256
/<Ross_Setup>
```

The table on the page opposite provides details each of these entries.

Config File Explanation

Entry	Default	Description
ENABLED	1	Switches on the Automation *Set to 1 to enable, can be set to 0 to disable*
PORT	13	Selects the SSL Serial Port
BAUD_RATE	115200	Baud rate for communication *This should match the automaiton system's serial setting*
PARITY	ODD	Parity format for communication *This should match the automation system's serial setting; options are NONE, ODD and EVEN*
DATA_BITS	8	Data Bits used for communication *This should match the automations system's serial setting*
STOP_BITS	1	Stop Bits used for communicaton *This should match the automation system's serial setting*
TX_TIMEOUT	25	Communication timeout (in milliseconds) after which the console will re-send a command if no acknowledge has been received *This is currently unused in both Ross Overdrive & Sony ELC systems*
SEND_ACKS	1	Enable/Disable sending communicaton acknowledge messages *Value should be 1 (enabled) for both Ross Overdrive and Sony ELC systems*
EXPECT_ACKS	0	Enable/Disable expecting communicaton acknowledge messages *Value should be 0 (disabled) for both Ross Overdrive and Sony ELC systems*
REPORT_CHANGES	1	Enable/Disable announcing local console changes to the automation system *Value should be 0 (disabled) for Ross Overdrive and 1 (enabled) for Sony ELC systems*
MAX_UPDATES_PER_SEC	10	Controls the messaging limit to the automation system *Ross Overdrive specifies a limit of 10 changes per second per control, hence the default value of 10 which also works for the Sony ELC system. If set to 0, the console sends messages as fast as possible.*
CONTROLLED_CHANS	256	Number of channels under Broadcast Automation control *This allows a limit to the number of automation controlled channels that are reported to the broadcast automation system. The minimum value is 1, the maximum value is 256. The actual number of controllable channels reported will be limited by the size of the console's licensed processing channels (eg. 64 or 96 channels in the case of C10). Ideally this number should be optimised to the number of console channels that require automation control, rather than just the size of the console. Doing so will speed up the polling of the console by the Broadcast Automation system*

Automation Support Features

The following is a list of the SSL Broadcast Console features that can help the smooth workflow of an automated production environment.

Feature	Benefit
Project System Configuration	Allows a preset show to be recalled for the whole console, ready for the automation system to control the show with no set-up.
Delay Compensation Tools	Delay Compensation in the console allows video and audio to be synchronised, even with complex production chains that include graphics and caption insertion devices.
Source Linking	Selection of a channel's source sets up the console processing automatically with preset values – "This is Sandy's Mic and here are the normal EQ, Dynamics etc settings that this uses" – all achieved at the press of a button.
Mix Minus Busses	With show set-ups that have multiple presenters or external sources, the ability to create audio monitoring feeds including mixes 'minus' the source feed are essential.
5.1 Capable	With the commonplace use of High Definition production, consistent 5.1 performance is important. Both C10 HD and C100 HDS have a complete set of surround tools including dedicated channel configurations and monitoring. The console also handles down-mixing to stereo automatically too.
Dialogue Automix	This sophisticated tool option allows the console to manage the opening and closing of multiple presenter microphones automatically to achieve a consistent, professional output with minimal leakage noise and no missed cues, hands free. Super fast cuts from mic to mic!
5.1 Up-Mix	Many viewer's complaints in surround are to do with the collapsing of the surround audio when stereo feeds are selected. This option provides the ability to up-mix automatically without the need for additional processing. A further benefit is that the algorithm will also seamlessly down-mix without artefacts if the signal is folded to stereo later in the production signal chain.

Dialogue Automix

The C100 HDS Dialogue Automix Controller assists skilled and unskilled audio mixers in managing multiple live mics without having to continually ride their individual faders to eliminate spill and room colouration.

Automix detects which mics are receiving an input and makes fast, transparent crossfades between them, freeing the mix engineer to focus on balance and sound quality rather than be chained to the faders. These voice-controlled crossfades closely track unpredictable dialogue, eliminating cue mistakes and late fade-ups, while avoiding the choppy and distracting effects common to noise gates.

Signal Present LED

Automix Meter
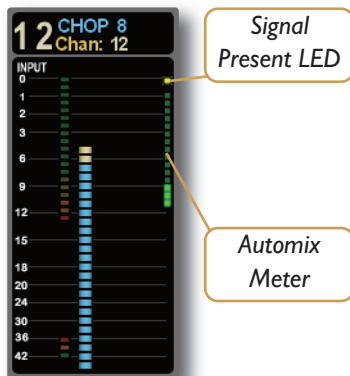
The overall gain of multiple active channels is automatically adjusted to keep the overall output equivalent to a single channel, thus eliminating level build-up when more that one channel is contributing to the mix.

Each channel's Automix activity is displayed to the right of the in the Channel Meter Display (see left).

Automix settings are included in both Control Linking and Presets.
A maximum of 16 signals can be included in the Automix system. If only one channel is included, Automix will have no effect. All included channels must be mono.

Activating Automix

Ensure that the input level for each channel to be included in the Automix is set appropriately.

1. Assign Automix control to the channel Free Controls by touching the **Misc** button followed by the **GPI Free** button which appears in the pop-up.
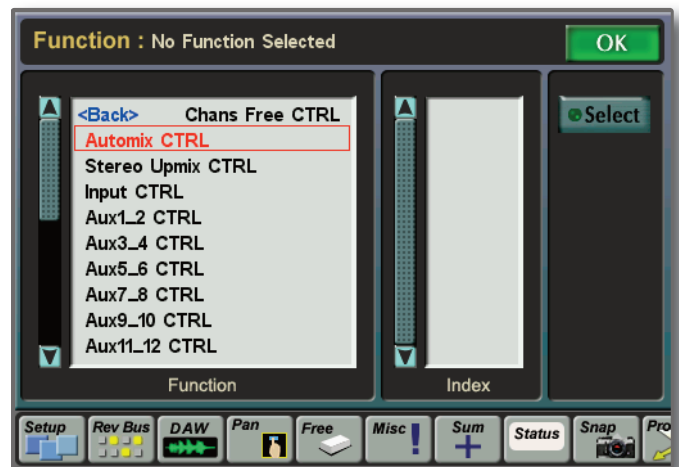

2. The displays associated with each Free button will flash displaying '– – – –'. Select one of the 10 Free keys available in bank 1 to 6 (the selected key will display '? ? ? ?').

Free Key
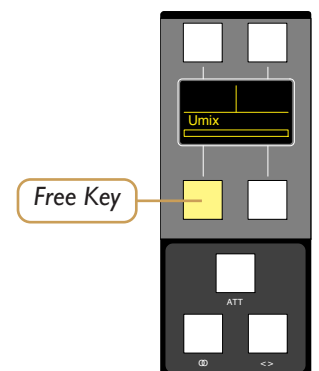
3. Using the rotary controller, scroll down to and select *Chans Free CTRL Layers*. Press **Select** in the pop-up window to action.
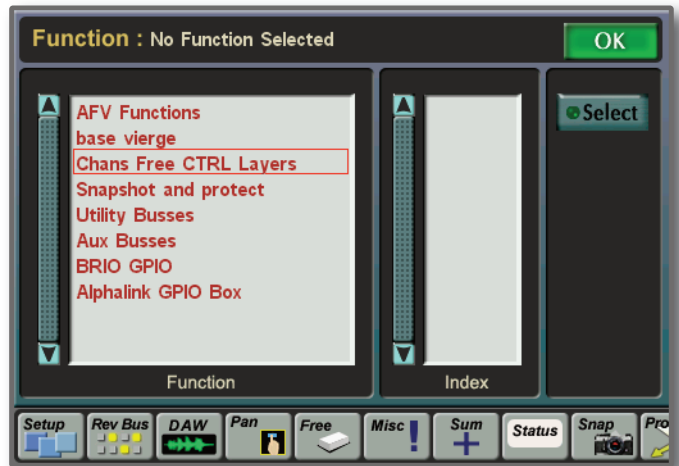

4. Still using the rotary controller, scroll down to and select *Automix CTRL*.

5. Press the > key next to the rotary controller – the **Select** in the pop-up should light, Select this by either touching the screen or pressing the rotary controller. The displays on the selected centre section Free key will now display '*Amix*'.

Automix control parameters will now be shown in the lower section of the Channel Information Display where initially '*IN*' will be displayed. Pressing the **Automix In** switch on a channel will include it in the Automix and '*Post*' will also now be displayed showing that the default position is post-fader. Pressing the Automix Pre/Post button will select whether the Automix sidechain is pre- or post-fader.
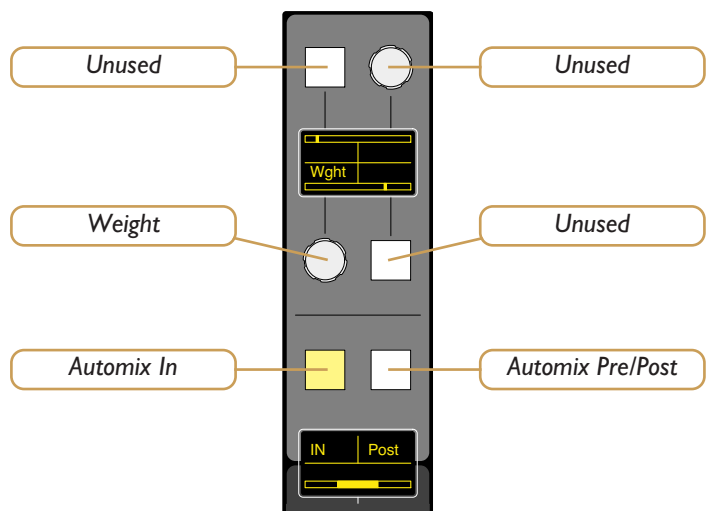
The Automix meters show the level attenuation applied to each active channel. If no segments are lit, then more than 15dB of attenuation has been applied. If all segments are on, then no attenuation has been applied. A yellow light at the top of the channel's Automix meter indicates that the channel signal is above the minimum threshold for Automix operation (this threshold is –74dB FS).

> *Tip: Running Automix pre-fade allows signals to be balanced in the normal way using the faders. However, note that closing a fader while in pre-fade mode will not remove that signal from the Automix side-chain, allowing the Automix attenuation to be controlled by signals which are not feeding the PGM busses. It is therefore important to use the fader **ON** button rather than the fader itself to mute channels, as the **ON** button affects pre-fade sends.*

Automix Weight

It is possible to alter the side-chain contributions of each channel by adjusting the channel's Weight control. Lowering the weight control on a channel decreases the channel gain during ambience and lowers the relative gain if the channel is active with other channels. Raising the weight, increases the gain during ambience and increases the relative gain if that channel is active with other channels.

> *Note that if only a single channel is active, the weight control has no effect on the overall gain – it only effects the gain when multiple channels are active.*

Automix Time Constants

It is possible to adjust the automatic fade-in and fade-out times used by the Automix algorithm. This is achieved through pressing **Misc** followed by **Automix** on the console touchscreen. The Automix Setup pop-up will appear.

Time constants can be set by stabbing in the boxes below the rotary control images and entering values using the console keyboard:

- The **Attack** time constant controls the fade-in rate and should normally be set at to a fast rate (around 1ms) to avoid an audible fade in on the start of a word.
- The **Release** time constant sets the rate of return to the ambient gain setting, and a medium to slow setting of 200ms is a good starting point to avoid pumping effects between words.
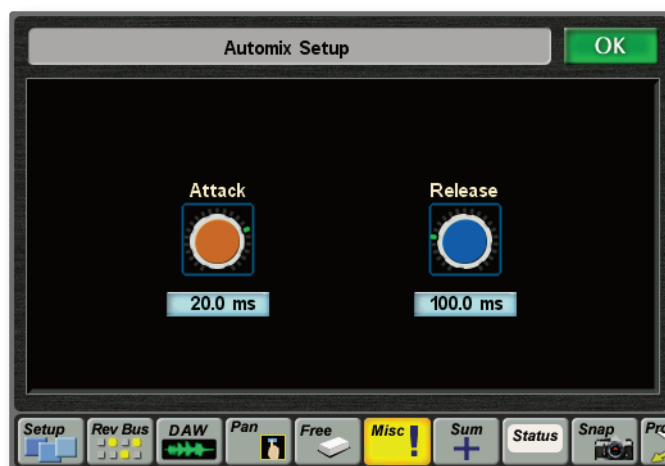
5.1 Up-mix

Introduction

5.1 Up-mix is a unique tool created by SSL to enable soundfield stability when moving between stereo and 5.1 sources. Up-mix extracts spatial data from the components of the stereo signal to create a 5.1 version of the signal, thus preventing the soundfield from suddenly collapsing into the stereo spectrum when transitioning from 5.1 material into stereo material.

While a 'Centre' signal provides a soundfield anchor, the spatial elements can be positioned around the Centre to mould a convincing 5.1 effect for the stereo signal.

Note that the 5.1 signal created can be simply down-mixed back to stereo without objectionable effects such as phase cancellation or comb filtering being generated.
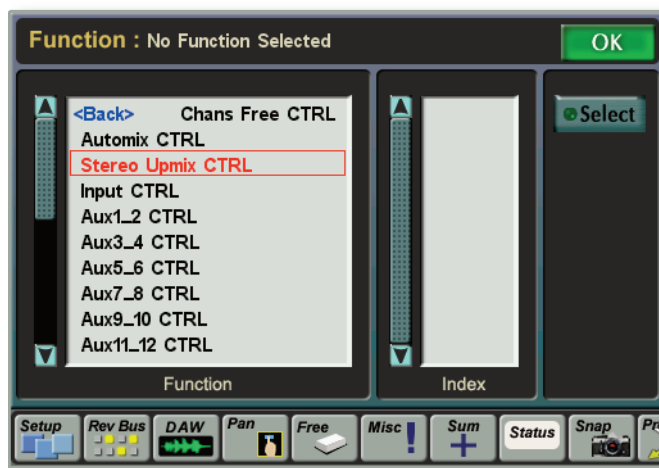
Up-mix Control

The ranges through which each pan parameter can be adjusted has been limited through careful listening tests to allow a diverse range of stereo sources to be upmixed without developing extreme or unconvincing spatial effects.

Note that Up-mix can only be applied to a stereo channel that is routed to the Programme Busses and only if the Programme Busses are set to 5.1.

Up-mix parameters are assigned to the channel softkeys as follows:

1. Press **Misc/GPI Free/Ch Free CTRL** and select *Stereo Upmix CTRL* as described previously; the centre section Free Controls displays should flash '----'.

2. Select which of the centre section Free Controls is to be used by pressing the assign button. The console display should now show 'Umix'.

3. Press the **Upmix On/Off** key on a channel to activate 5.1 Up-mix. Remember, a stereo signal must be present for this to work. Refer to the following drawing for control positions.
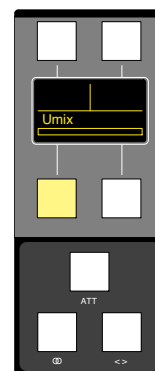
4. Press the **MODE** key to cycle through the parameters listed below, and then turn the **C DV/LF/Div** pot to adjust the parameter:

- Centre signal level trim (**C-DB**) affects the stereo width of the front image. Nominally set to 0dB, increasing the level will narrow the image and decreasing the level will widen the image.

- Centre divergence (**C-DV**) controls the spread of the front image. Normally set to 50%, a setting of 100% removes all signal from the Centre Channel giving a 4.1 Upmix often required when up mixing stereo ambience with dialogue in the centre channel.

   *Both centre parameters interact and mainly effect the front image.*

- Bias (**BIAS**) alters the front/rear perspective. Increasing the bias towards the rear gives the perception of signals emanating from behind the listening position and is useful for increasing the effect of surround channels in ambience processing.

- Spatial signal front/rear panning (**DPTH**) controls the surround channels' contribution and the distribution of the 5.1 soundfield. The default setting is half-way back, giving a diffuse 5.1 spread; increasing the depth moves the signal to the back and increases the spatial width.

    Bias and Depth parameters interact.

- LFE gain (**LFDB**) affects the Low Frequency Effect level.

- Turn the upper Pan control pot to adjust the L-R pan.

- To clear all of the current pan settings to their default positions, press and hold the **Reset** key.
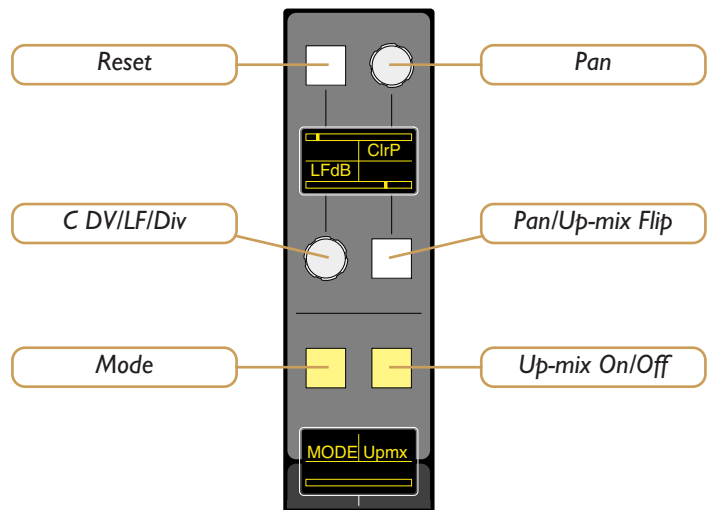
1U Ethernet GPIO Unit

Introduction

The new 1U Ethernet GPIO unit is a cost option addition to the C100 HDS and is available in 24 and 48 IO versions. The unit is connects to the C100 HDS system via Ethernet and is operated in the same way as the existing B-RIO GPIOs to provide 24 (or 48) opto-isolated inputs and 24 (or 48) relay closure outputs for simple and reliable connection to equipment such as playback machines and external controllers. A maximum of 15 units can be connected to the system.

Configuration

Connect the GPIO unit to a spare Ethernet port on the back of the Blackrock processor. The Blackrock should automatically detect its existence which can be verified by checking the Ethernet Front Panel Setup menu.

Ensure that the GPIO unit is connected to the SSL Network and not the TCP/IP Network!

Select **Ethernet FP Setup** from the **Front Panel** menu and the new GPIO box should appear in the list. Pressing **Find** will illicit a request for a Console Restart; once it has rebooted the GPIO unit will be recognised and the master Blackrock will become the 'Owner'. GPIOs can then be configured as per the B-RIO GPIOs.
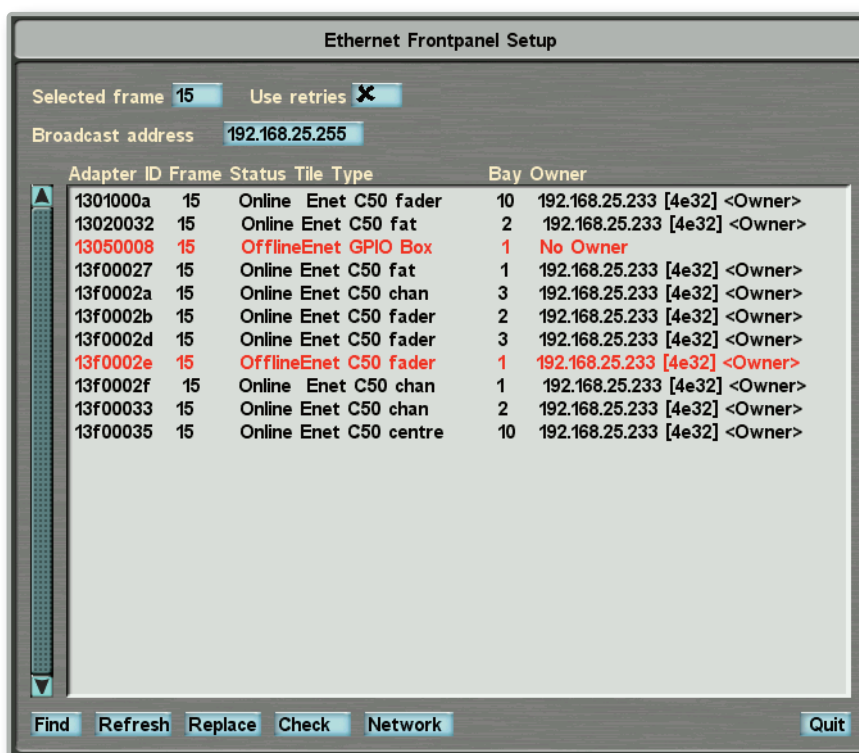
Please refer to the **C100 HDS Operator's Reference Manual**, Section 6, Page 38 for full details on how to configure GPIOs.

Bug Fixes

The following is a list of the major bugs fixed or resolved in this release:

- Improved MORSE router changeover on Ethernet failure

- Improved speed of routing list refresh and reduced duplicate refreshes to avoid routing to multiple destinations appearing to hang

- Fix the request names feature so that the names are saved. Previously had to use request IO for the names to be remembered

- When clearing or loading channel free controls, clear any selected function set which might be paged over them

- When a channel strip shows a path without a gate, gate meter is now hidden

- When loading preset to multiple channels using channel settings, use the hint to show progress in percent (%)

- On Air status now part of the background project so synchronizes across

- Made menu knobs easier to select by fixing an offset between graphics and menu box

- Increased size of the active areas in the aux, utility, dba and stereo comms submenus to make touch screen more responsive

- Prevent graphics corruption when loading project with the Protects interface up

- When leaving the Studio Computer only prompt the user to re-start the dormant machine if it is online

- When setting the Project Snapshot to auto load or not the dormant machine now picks this up automatically

- When loading a project, the project Snapshot is now correctly loaded on the dormant machine

- Only request a restart when settings have changed in the Frontpanel Settings menu

- Make sure the background project copies all required files to ProjectA and ProjectB

- Saving control linking now flags the need for the dormant system to be restarted

- When entering the Route Groups popup the IO list on the right is no longer sorted; to sort the list you must hit a button

- In the IO links page the links only show green in Dual mode when a fibre is connected – this also requires V2 firmware to be running on the MADI mezzanine card(s)

- PGM latency compensation delays are now properly initialised

- Fixed hang with routing to channels and selecting channels to route to

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