

# Solid State Logic

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

## C10 HD

Digital Broadcast Console

### V2.0/1 Software Update and Install Notes

*Applicable to upgrades from V1.2/17 onwards*

#### Check List

Please ensure that you have the following items before attempting any part of the upgrade:

- I V2.0/1 Update Notes (this document)
- I C10 HD Software Disk Image (website download)
- I Software Licence String  
(Redundant systems will require two licence strings)

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*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

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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  
3700 Wilshire Blvd, Suite 720, Los Angeles, CA 900310, 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>

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Initial Release (Rev 0): June 2010

Added additional bug fixes/feature notes, corrected typos (Rev 1): July 2010

As research and development is a continual process, Solid State Logic reserves the right  
to change the features and specifications described herein without notice or obligation

E&OE

## Introduction

This document describes the new features and fixes incorporated in V2.0/1 software, and details the software installation procedure required to update your system to this latest release of C10 HD software.

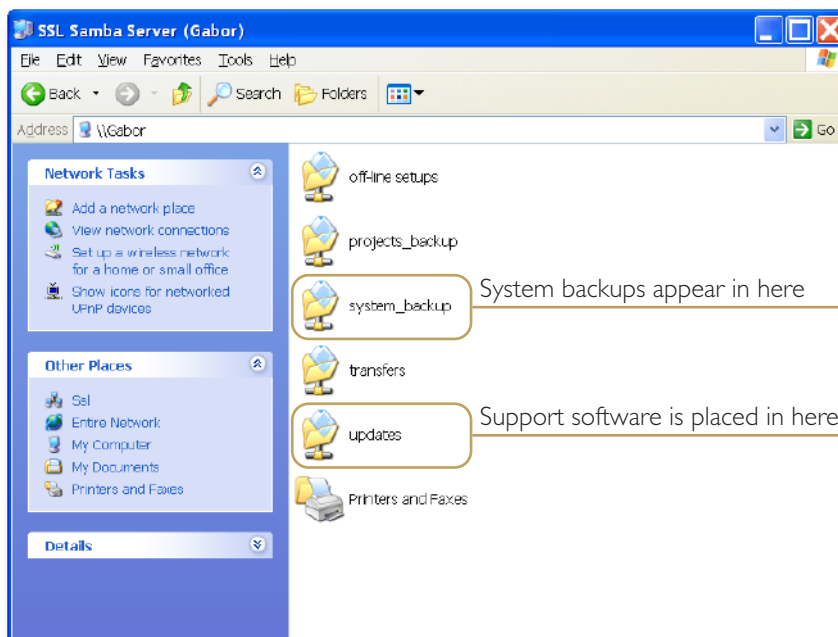
Please note that this release is only applicable to those systems that have previously been installed with V1.2/17 software. If you have any questions about this release, please contact your local SSL office or distributor.

## Assumptions

The following points are assumed in these installation instructions:

- A1. This installation procedure details installation of new software on a running system, not a fresh installation
- A2. During commissioning/installation of the C10 HD 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 C10 HD system will be required. If you do not know 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 C10 HD 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.
- A5. Back 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 C10 HD 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 C10 HD system, similar to that shown below:



## **Software Installation on a Single Blackrock System**

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*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.*

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1. Ensure that you have all of the items shown in the **Check List** at the beginning of this document; if you are unsure about any item, 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 C10 HD System Disk before proceeding. Open the SSH client on the **networked computer** and login to the C10 HD 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 C10 HD 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. Connect the USB memory device containing the V2.0/1 Software Disk image to the **networked computer** and open a window to display the contents of the USB device.
5. Locate the 'updates' folder within the folders exported by the C10 HD system (ref. **Assumption A5.**).
6. On the USB device, open the 'C10\_V2.0/1\_Updates' folder and drag the following three .rpm files from the USB device 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:

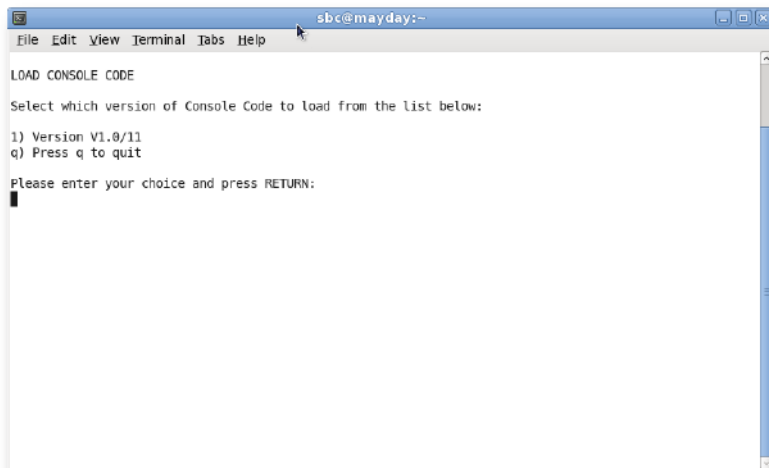
```
install_updates <CR>.
```

This will unwrap and install one of the .rpm archives. Follow the on-screen instructions to install it.

## Installing the C10 HD System Software

- 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 C10 HD console be shutdown and re-powered if possible.



## Enabling the New System

- 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.*

---

Carefully enter the Software Licence 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.

- Remember to store the Software Licence string in a safe place along with the C10 HD Software.

---

*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 IT or Studio Maintenance personnel to check this.*

---

## Software Installation on a Redundant Blackrock System

1. Ensure that you have all of the items shown in the **Check List** at the beginning of this document; if you are unsure about any item, 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 C10 HD System Disk before proceeding. Open the SSH client on the **networked computer** and login to the C10 HD 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 C10 HD 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. Connect the USB memory device containing the V2.0/1 Software Disk image to the **networked computer** and open a window to display the contents of the USB device.
5. Locate the 'updates' folder within the folders exported by the C10 HD system (ref. **Assumption A5.**).
6. On the USB device, open the 'C10\_V2.0/1\_Updates' folder and drag the following three .rpm files from the USB device 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:

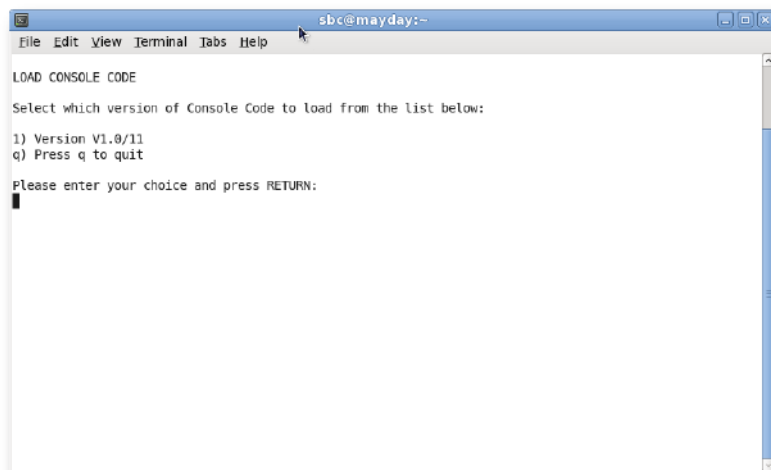
```
install_updates <CR>.
```

This will unwrap and install one of the .rpm archives. Follow the on-screen instructions to install it.

## Installing the C10 HD 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 C10 HD console be shutdown and re-powered if possible.



```

sbc@mayday:~$ load_console_code
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.*

---

Each processor will have a different licence; match the 5 digit PAL id. given with the licence to the Blackrock network ID shown on the screen 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.

10. Repeat this process from Step 2. for the slave processor.
11. Once all updates have been performed, re-boot both processors together.
12. Remember to store the Software Licence strings in a safe place along with the C10 HD Software.

---

*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 IT or Studio Maintenance personnel to check this.*

---





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## New Features

The following new features are introduced with this C10 HD V2 software update.

### Snapshots

The Snapshot feature has been enhanced with the introduced of Replace. This option allows the user to update existing snapshots; simply highlight the snapshot you wish to update and press 'Replace'.

### GPIO

Support has been added for the new Ethernet GPIO boxes.

### Front Panel Replacement

A 'Refresh' function in the Spanner/Etherpanel menu has been added – to be used when replacing control surface tiles.

### 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

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*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 'diag\_log\_<Serial\_No>.tar.gz'.*

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### Pan Formats

User defined pan formats are now available when creating IO groups.



# Optional Features

The following features are chargeable options introduced with this C10 HD V2 software update.

## SSL Broadcast Automation Interface

C10 HD V2 software adds support for remote control from both the Ross Overdrive and Sony ELC automation systems. Both systems connect to an RS422 port on the C10 HD 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 Linksys 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'. In the C10 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 C10 HD console configures its channels, please refer to:

- **C10 HD Operator's Manual**, Section 2, Page 5

## 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.

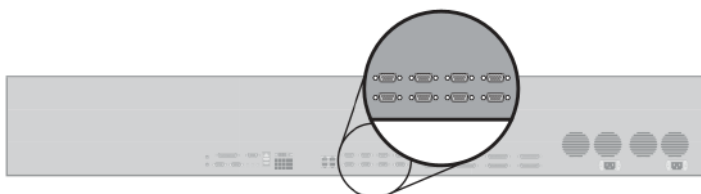
The limited abilities of the automation system (fader level, on/off etc.) mean that the console will most likely have to be pre-configured for a specific show, to set mic gains, EQ, master bus settings etc. This can all be simplified by the creation of projects to work with specific automated productions, 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 C10 HD console connects directly to the Ross video switcher/mixer using an RS422 serial communication link between the primary connector panel of 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

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*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 C10 HD 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](http://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

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 of this document.



## Technical Set-up Information

### Hardware

Both the Ross Overdrive and Sony ELC Broadcast Automation Systems connect to an RS422 serial connector, normally located on the underside of the C10 HD console. Further connection information is detailed in the latest **Console Installation Guide** for the relevant console.

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*Broadcast Automation is only supported by C10 HD V2 – 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 12
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**

<b>Entry</b>	<b>Default</b>	<b>Description</b>
ENABLED	1	Switches on Broadcast Automation Set to 1 to enable, can be set to 0 to disable
PORT	12	Selects the SSL Serial Port Port 12 is the port on the C10 HD console connector panel
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 HD). 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. The C10 HD 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.

### Bug Fixes

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

- Console no longer hangs when clearing a project
- The Write Protect option no longer disappears
- A delay is no longer applied to channels or groups if the value is anything else but 0 and Delay is switched out
- The pop-up to manage quick routes now refreshes correctly
- AFV settings are now synced across on redundant systems
- When a 5.1 channel is spilled out and one of the elements EQ'ed the audio no longer clicks
- Licence status is now reported in System/Status
- The front panel frame ID is now read correctly
- MORSE output routes are now refreshed before the MORSE input routes to solve issue with routes not being made on changeover
- MORSE static routes are no longer remade on changeover
- AFV values now synchronise between master and slave machines
- DHD stageboxes with more than 5 cards of the same type (but less than 12) are now read correctly
- When changing between PGM1 and PGM2 in the PGM page now refreshes meters correctly
- Console responds to MORSE router restart by resending mic gain, pad etc values
- Support added for MORSE router card changeover when network to the active MORSE controller card fails
- Indication in the MORSE setup page showing if a spare MORSE controller card fitted
- Improved speed of routing list refresh
- Locks correctly to AES sync
- Added System Dormant and System Slave functions to match the System Active and System Master ones

## Software Licence Agreement

Solid State Logic ('SSL') is willing to license this C10 HD software and accompanying documentation for this product (the 'Software') to the customer (the entity that purchased the product and software) on the condition that you read and accept all of the terms in this agreement. Please read the terms below carefully. By continuing to install the software and using the enclosed information to license the software you acknowledge that you have read and understood the agreement and agree to be bound by its terms and conditions. If you do not agree to these terms then do not open this package, discontinue the installation process and contact your local SSL representative for advice.

### Licence

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