

digital keying modular
interface audio
converters analogue video

Playback

HD/SD instant replay device

USER MANUAL



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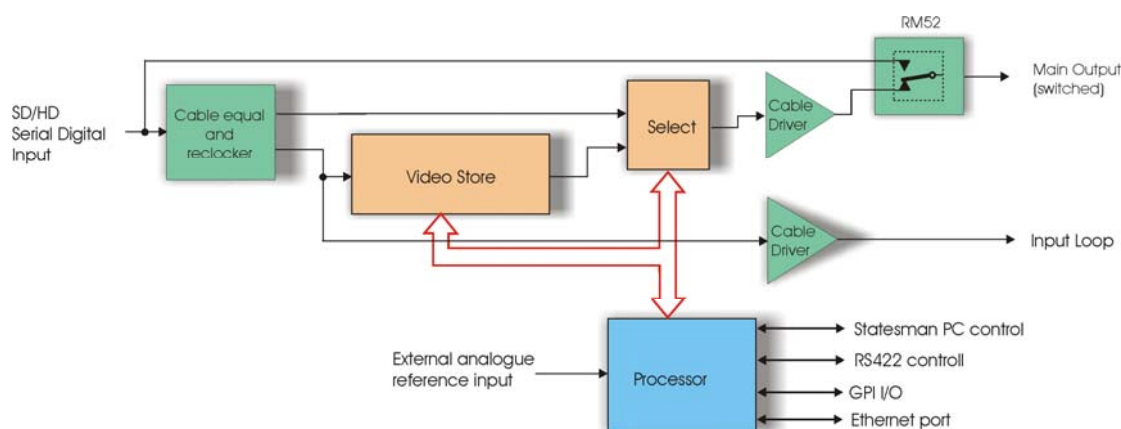
Revision 1.	VDCP extended protocol added. Reference and comms mode selection added to board edge. Software version 1.32	21-07-09
Revision 2.	Additional RM52 information added. Page 6.	30-06-11

1 Introduction

Playback is a HD/SD instant playback device which will find many applications but is particularly useful in sporting applications. Playback can replay up to 30 seconds of High Definition video or 155 seconds at Standard Definition. Playback 8G can replay up to 60 seconds of High Definition video or 310 seconds at Standard Definition.

Playback can be controlled by any third party hardware or software supporting industry standard protocols (including VDCP) and will continuously record (and overwrite) until receiving a stop command. The last period of video is then available for replay. All the normal controls such as Play, Stop, Still, Continue, Jog, and Vari Play are available.

Playback runs the uCLinux operating system and with on-board industry standard protocols allowing it to be used with control panels and studio automation systems. Alternatively, using a PC running Crystal Vision's own Statesman PC software will allow basic control.



Playback

Playback's main features are:

- Works with both High Definition and Standard Definition
- 4 GB or 8 GB video store
- Up to 30 seconds replay in HD, 155 seconds SD with 4 GB video store
- Up to 60 seconds replay in HD, 310 seconds SD with 8 GB video store
- Industry standard software protocols including VDCP
- Relay bypass protection of main input

Playback is a 100mm x 266mm module, which fits in the four standard frames and can be integrated with any boards from the company's full product range. Playback uses the RM52 frame rear module, which includes relay bypass protection of the input in the event of power failure or board malfunction or removal.

1.1 Operating modes

Input and output video standards

Playback will automatically switch between SD-SDI and HD-SDI inputs. The output timing is locked to the input.

If Playback is powered without an input it will default to outputting 1080i 50 or that of the external reference if connected. To change the output to say 1080i/720p 59.94 momentarily, apply a 1080i/720p 59.94 input to so that Playback can relock.

Should video have been copied into the RAM with an HD-SDI input connected, that video will no longer be valid if the input is changed to SD-SDI as the video resolution will have been determined by its input standard.

It should also be noted that all ancillary data in a stored clip will have been blanked prior to playback.

External reference

The Playback input has a 1-line TBC for alignment of the input signal timing and to allow for system timing. The external reference can be selected to be composite black and burst, bi-level syncs or tri-level syncs. The digital signal on input 1 may also be used as a reference to lock to.

The inclusion of a 1-line input TBC and external reference ensures that the output will remain stable after a hot cut from an upstream switch.

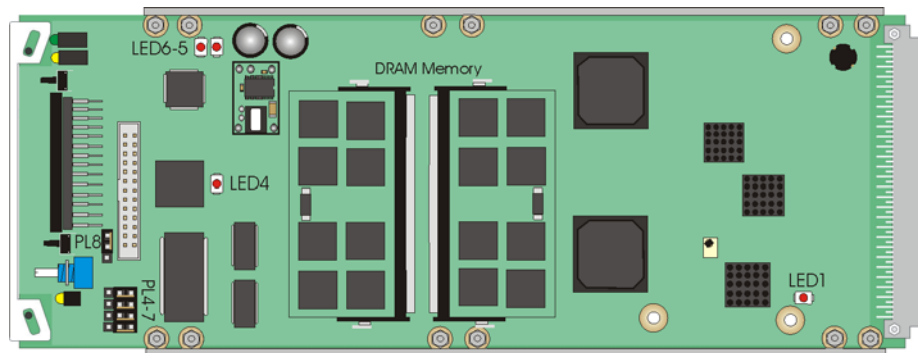
The minimum delay from the input to the output is 6.5 μ s for SD and 1.7 μ s for HD. When locked to an external reference the delay through Playback will be 0.0 μ s plus any user set offset delay. Using input 1 as the reference source will give the minimum day plus any user selected delay.

2 Hardware installation

The Playback single height module uses the RM52 rear connector that will fit into all Crystal Vision rack frames. All modules can be plugged in and removed while the frame is powered without damage.

2.1 Module configuration

Playback



Link configuration and LEDs

There are six jumper links and four surface-mounted LEDs on the Playback motherboard. The surface-mounted LEDs are not visible from the front of the frame and are included for diagnostic purposes only.



	Comment
PL4, PL5, PL6, PL7	GPI/RS422 comms. GPI pins 2-3 (right position). RS422 pins 1-2 (left position). Factory set for GPI
PL8	1-2 selected IP address. 2-3 forced IP address 10-0-0-201
PL9 (under side)	Not applicable
LED1	Input present
LED4	CPU configuration in progress
LED5	Ethernet Data
LED6	Ethernet Link

2.2 Rear modules and signal I/O


The Indigo 4 4U frame will house up to 24 single height modules with up to four power supplies. The Indigo 2 2U frames will house up to 12 single height modules and dual power supplies. The Indigo 1 1U frames will house six single height modules and a single power supply. The Indigo DT desk top boxes have a built-in power supply and will house up to two single height modules.

Rear module connections with RM52

The RM52 is a single height module with dedicated connector for a RS422 controller.

RM52 rear module connector		Description
		<p>RM52</p> <ul style="list-style-type: none"> • 24 Playback modules per Indigo 4 frame • 12 per Indigo 2 frame • 6 per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used
RM52 individually retained rear module connector		Description
		<p>RM52</p> <ul style="list-style-type: none"> • 24 MultiLogo V131 modules per Indigo 4 frame • 12 per Indigo 2 frame • 6 per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used
BNC	I/O assignment	
Ethernet connector	Ethernet control from PC	
RS422 connector	RS422 control from control panel	
SYNC IN	External analogue reference input (currently not supported)	
INPUT LOOP	Input loop-through	
MAIN OUT1 (Switched)	Serial digital output with relay bypass	
HD/SD IN	High Definition/Standard Definition serial digital input	

RS422 connector wiring details

Pin numbers	
 <p>87654321</p>	1 Chassis/GND
	4 Tx+ (connect to Rx+ at controller end)
	5 Tx- (connect to Rx- at controller end)
	7 Rx+ (connect to Tx+ at controller end)
	8 Rx- (connect to Tx- at controller end)

2.3 General Purpose Interface (GPI)

Each frame slot has up to six connections 'a-f' for GPI control and monitoring. These connections are available at the rear of the frame on the 26-way D-type remote connectors. Playback uses these connections as a RS422 port for the external controller.

GPI		
0	'a'	Tx-
1	'b'	Tx+
2	'c'	Rx+
3	'd'	Rx-
4	'e'	Not used
5	'f'	No connection

For convenience these connections have been taken to an RJ45 connector on the RM52.

4U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of eight rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)
Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (5)	9 (5)	18 (5)	26 (5)	19 (6)	20 (6)
2	7 (5)	16 (5)	17 (5)	25 (5)	10 (6)	11 (6)
3	8 (7)	9 (7)	18 (7)	26 (7)	19 (8)	20 (8)
4	7 (7)	16 (7)	17 (7)	25 (7)	10 (8)	11 (8)
5	5 (5)	6 (5)	15 (5)	24 (5)	1 (6)	2 (6)
6	4 (5)	14 (5)	13 (5)	23 (5)	3 (6)	4 (6)
7	5 (7)	6 (7)	15 (7)	24 (7)	1 (8)	2 (8)
8	4 (7)	14 (7)	13 (7)	23 (7)	3 (8)	4 (8)
9	3 (5)	12 (5)	22 (5)	21 (5)	12 (6)	13 (6)
10	10 (5)	11 (5)	19 (5)	20 (5)	21 (6)	22 (6)
11	3 (7)	12 (7)	22 (7)	21 (7)	12 (8)	13 (8)
12	10 (7)	11 (7)	19 (7)	20 (7)	21 (8)	22 (8)

Table shows pin number (Remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.

Remote 2, Remote 4, Remote 6 and Remote 8 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2 and Remote 6.

The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A. Remotes 5-8 are similarly protected.

2U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of four rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)

Table shows pin number (remote number)

Note: Remote 1 and Remote 3 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2 and Remote 4 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2.
The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A.

1U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of two rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
4	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
5	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
6	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)

Table shows pin number (remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.
Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15

The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

Indigo DT desk top box GPI connections

GPI lines 'a' to 'f' of each card connect to the rear remote connector as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)

Table shows pin number (remote number)

Note: Remote 1: 26 way high-density D-Type female socket. Frame ground is pin 2 and +5V @500mA is pin 1.
 Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15
 The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

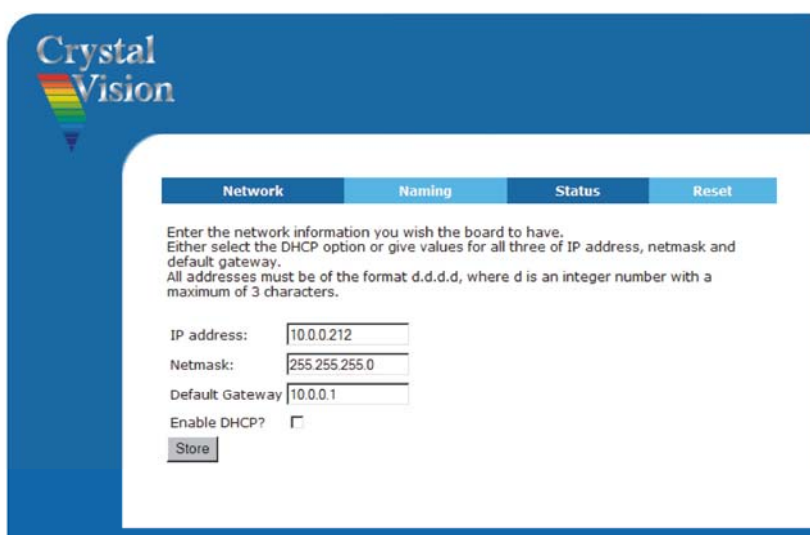
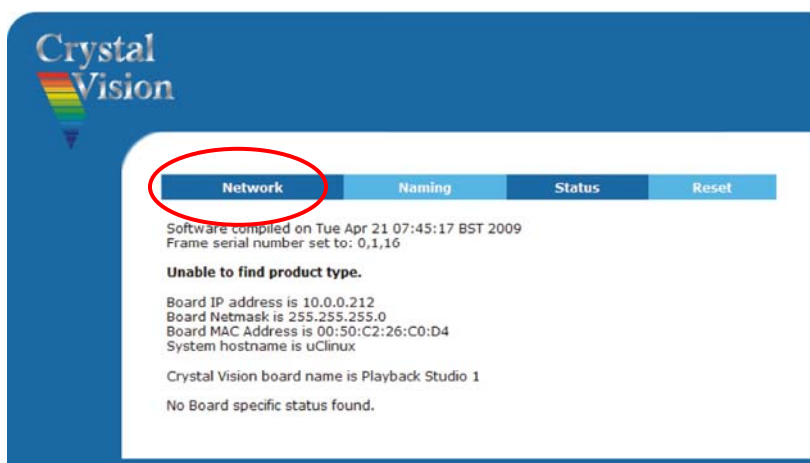
2.4 Playback - Setting IP Address

The unit is shipped using the following IP address 10.0.0.201. To set it to the IP of your choice, in your web browser enter the address <http://10.0.0.201/> and press go. The address bar will change to <http://10.0.0201/cgi-bin/status.cgi> and the status page will upload.

N.B. You will need to set your PC on the same IP address and subnet mask range.



Once the status page is displayed, click on the 'Network' button. In the IP address field enter the IP address you wish, along with the appropriate subnet mask and default gateway.

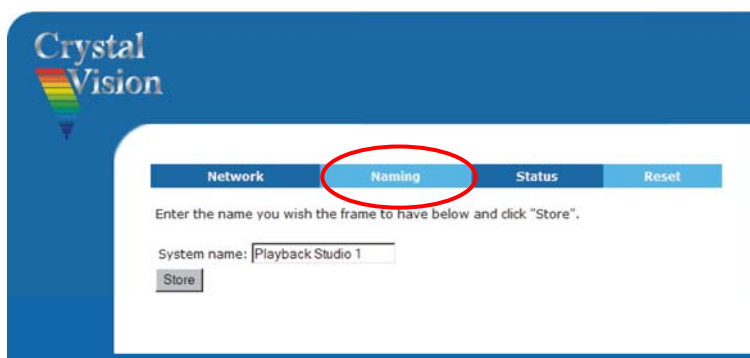


Once the information has been entered click 'Store'. You will then need to reboot the card to complete the update. The card can be rebooted by either using the reset page or withdrawing from the frame and reinserting.

Note: The reset page will be talking about resetting a frame. In this instance it will be the card that receives a reset command.

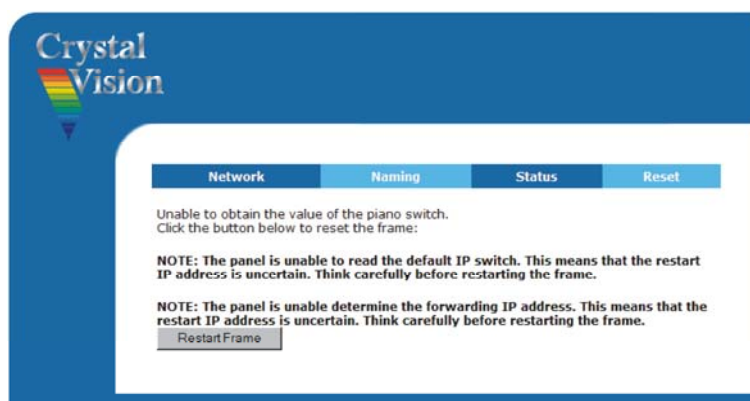
Naming

As well as having a discrete IP address it can be useful to give a frame its own unique name, perhaps to reflect its location. The naming tab allows this with up to 20 characters and no spaces.



Reset

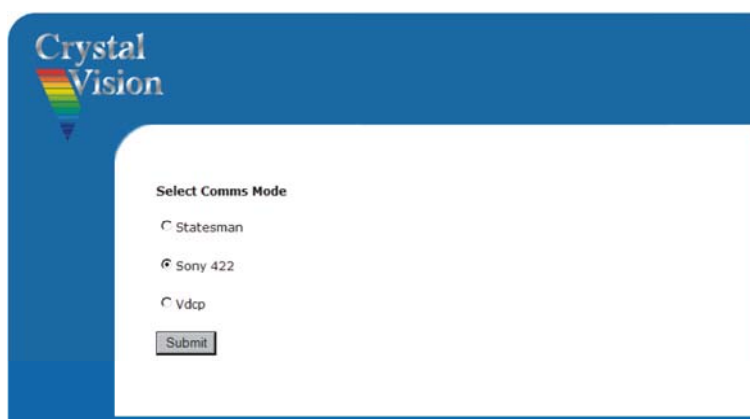
The reset button allows the frame front panel to be rebooted remotely, which is required when the IP address is changed.



Note: Restart only affects the front panel and not any other cards within the frame. No stored information will be lost.

Remote controller comms mode

To set the remote controller comms mode, change the web address to the following: http://10.0.201/cgi-bin/comms_mode.cgi and press go. If necessary substitute the appropriate IP address. Select between Sony 422 and VDCP. Note Statesman mode is not currently supported.



2.5 Updating Playback software

On occasion new software may be released to add new features or enhance performance. All upgrades to the Playback board will be carried out from a PC connected to the Ethernet connector situated on the Playback's frame rear module connector. The Crystal Vision board update tool can be downloaded from the Crystal Vision web site.

Upgrading the Playback board software

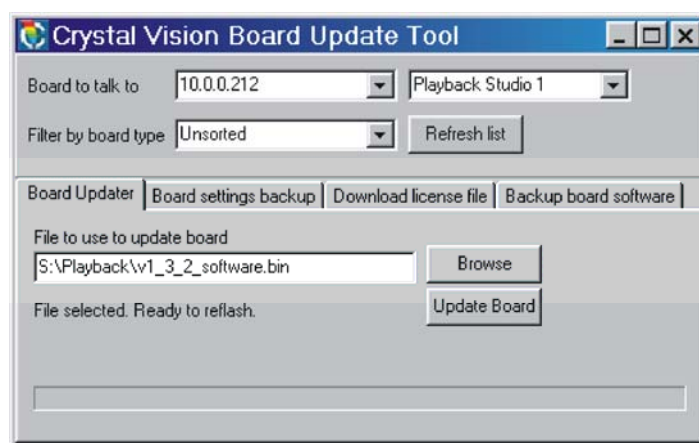
Note: Before you upgrade your board you should note that during the upgrade process all items stored in the D-RAM will be over-written.

Save the Crystal Vision board update tool (cv_refresher.exe) and its associated files to your desktop. It may also be wise to save the binary file (merged.bin) to the same location to make it easy to retrieve.

Launch the Flash Upgrade software.

It will then be required to identify the board to be updated. There are several ways in which this may be done. If the IP address is known simply type the address into the left side 'Board to talk to'. Similarly if the board name is known type its name into the right side box.

Finally the board can also be selected from a list, which can be compiled by pressing the 'Refresh list' button. The board can then be selected from either the IP address list or name list. It is also possible to refine a compile by first selecting the board type in the 'Filter by board type' box. This will then only search for and list boards of the selected type.



Once the board to be updated has been located the new merged.bin file has to be located by using the browse function.

Press the 'Update Board' button to update the board with the new software

Once the update has finished you should receive a message reading 'Upload successful. Reboot board to allow changes to take effect'.

3 Remote control

Playback supports both the Sony and VDCP controller protocols. The required protocol is selected by using Playback's internal web page. See Chapter 2.4 for information about accessing this web page.

See Chapter 2.2 and 2.3 for controller wiring details

Sony 9-pin remote protocol

The following table lists the commands that are available to control Playback

Command	Title
10-01	ACK
11-12	NAK
20-00	STOP
20-01	PLAY
20-02	REC
20-10	FASTR FWD
20-20	REWIND
2X-11	JOG FWD
2X-12	VAR FWD
2X-13	SHUTTLE FWD
2X-21	JOG REV
2X-22	VAR REV
2X-23	SHUTTLE REV
61-0C	CURRENT TIME SENSE
61-20	STATUS SENSE

Status data

Playback supports a limited amount of status data. The following table lists the returned data.

Command	Bit-7	Bit-6	Bit-5	Bit-4	Bit-3	Bit-2	Bit-1	Bit-0
Data No. 1	Standby On	Stop					Record	Play
Data No. 2			Shuttle	Jog		Tape Direction	Still	Cue up Complete
Data No. 4		Full EE On						
Data No. 5			Assemble	Video				

Video disk communications protocol (VDCP)

The following table lists the commands that are available to control Playback

Command	Title
0x1x 0x01	PLAY
0x1x 0x00	STOP
0x1x 0x04	PAUSE
0x1x 0x02	RECORD
0x1x 0x08	VARPLAY/SHUTTLE
0x1x 0x08	REWIND
0x1x 0x08	FAST FORWARD
0x3x 0x06	GET the time code

Status data

Playback supports a limited amount of status data. The following table lists the status bits implemented.

Port Status 0x01		Port Status 0x02		Port Status 0x03	
Bit 0x00	Stopped	Bit 0x00	No used	Bit 0x00	No used
Bit 0x01	No used	Bit 0x01	No used	Bit 0x01	No used
Bit 0x02	Play or Record	Bit 0x02	No used	Bit 0x02	No used
Bit 0x03	Still	Bit 0x03	No used	Bit 0x03	No used
Bit 0x04	Jog	Bit 0x04	No used	Bit 0x04	No used
Bit 0x05	Var Play	Bit 0x05	No Video input	Bit 0x05	Disk Full
Bit 0x06	No used	Bit 0x06	No used	Bit 0x06	No used
Bit 0x07	No used	Bit 0x07	No used	Bit 0x07	No used

For further controls and information about all controls see Appendix 1.

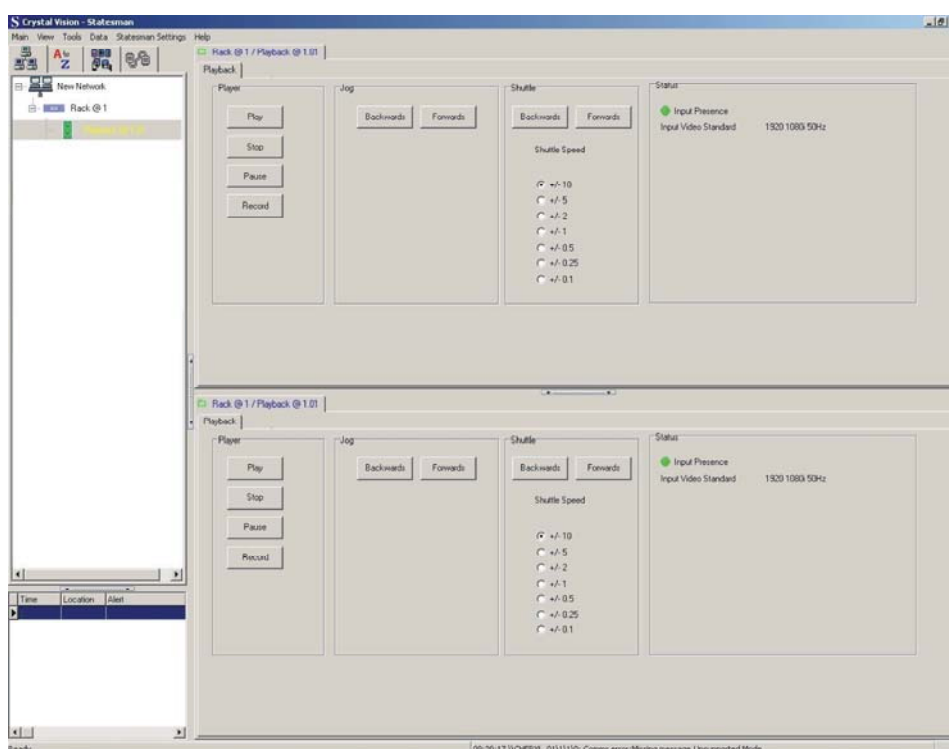
4 Statesman operation

The Crystal Vision Statesman PC control software is designed to control a range of Crystal Vision modules via serial control from a PC. Statesman provides a user friendly means of configuring and operating Crystal Vision modules with the benefit of “see-at-a-glance” status monitoring.

The main Statesman application communicates with each module in a frame through a Statesman capable or active control panel. An active panel or REMIND remote control panel must be fitted to allow Statesman control.

4.1 Statesman operation

The initial view will show an Explorer style view of the connected frames and modules. Double clicking on a module will enable the display of the main application menus.



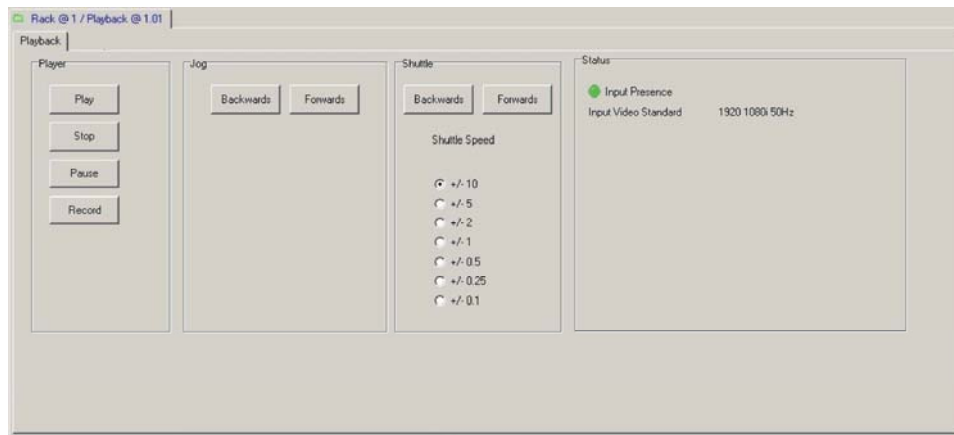
Statesman main application window

The two large control panes shown in the upper and lower halves of the window may display different menus for the same card, or controls for different cards. Click on the horizontal button-bar between the two panes to close the lower pane or drag the button to vary the size of the panes.

Note: For further details of Statesman configuration and operation please refer to the Statesman manual.

Playback control

Simple Playback control is available from Statesman. These controls are available on a single tab which consists of various simulated push buttons, selectable fixed shuttle speed and status.



Status monitoring

Player

When first powered, Playback will show the input on its output and the video store will be empty (black).

To initiate storing the incoming video it is necessary to press the 'Record' button. Playback will now start to record the incoming video to its video store whilst showing the incoming video on its output. Once the video store is full it will be continuously overwritten. This will allow the last few seconds of video to be available for instant replay.

The player has four control buttons. **Record** sets the Playback to record the incoming video to the video store. **Play** will play the video from the video store once the position in the video store has been chosen using the shuttle controls. **Pause** will stop the video playback at the instant the pause button is pressed allowing the video to be jogged and shuttled as required. Pressing the **stop** button will return Playback's output to the input video. *Note: the stored video will remain available for replay until recorded over.*

Jog

The jog buttons will forward and reverse the paused video being played from the video store in increments of one frame.

Shuttle

The shuttle controls will forward and reverse the paused video at a speed set by the shuttle speed radio group buttons. The speed settings available range from 10 x normal speed to one tenth normal speed.

Status

Input present is indicated by a simulated LED which will show green when a valid video is present. Video absence will make the LED red. The input video standard is also indicated.

5 Card edge operation

Once the start-up initialisation procedure is complete, the Playback card status can be interrogated from the card edge.

The front edge of the card provides power rail and input status monitoring by LEDs and a ten-digit visual status display.



5.1 Card edge switch settings

The two tactile push button switches allow the operator to navigate within the menu structure.

Button	Function	Normal state Up, Action Down
^	Up Menu	Push to jump up a menu level or cancel a selection.
ENTER	Select/Action	Push to select a menu and to action and confirm a change.

5.2 Card edge rotary controls

The board edge rotary encoder is used to navigate through the menu categories and adjust parameter values.

Control	Function
SCROLL /ADJUST	Rotate SCROLL to identify a menu category. In combination with the ENTER button select and ADJUST to change the current level or select a further option.

Note: The rotary control can access menus and parameter values by clockwise or anti-clockwise rotation.

5.1 Reading card edge LEDs

Card edge LEDs may be used in conjunction with status information from any connected remote status panel display or from Statesman if available.

Refer also to the trouble shooting chapter for more help with solving problems and monitoring status information.

The following table summarises the card edge LED functions and colours:

Name	LED Colour	Function when ON	Function when Off
HD	Yellow	Video input standard is HD (High Definition)	} Input not present
SD	Yellow	Video input standard is SD (Standard Definition)	
PSU	Green	Good power supply (PSU) rails.	One or more of the monitor supplies is out of specification
	Yellow		No current function
	Yellow		No current function
	Yellow		No current function

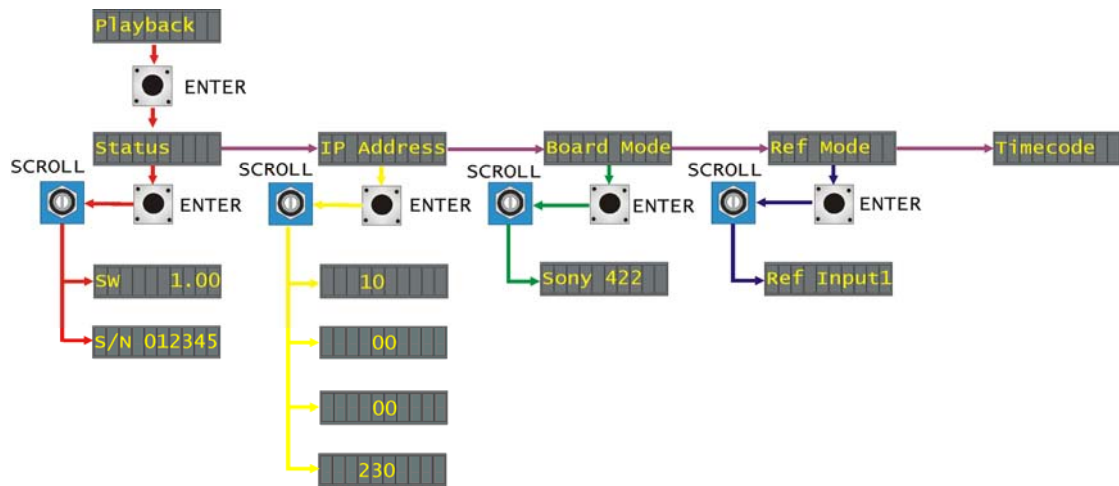
5.2 Navigating card edge menus

To access the card edge menu system proceed as follows:

- Press the up-arrow [^] until a top menu category is reached
- Rotate the SCROLL control until the desired menu category is found
- Press ENTER to enter the sub menus of that category
- Rotate SCROLL to select a sub menu
- Press ENTER to select the desired function. Selection will be indicated by the text being displayed in *italic* text
- Rotate ADJUST to make the desired change to the selected parameter. The display brightness will flash slowly to indicate that a change has been made and requires confirmation
- Press ENTER to action the change. The display will cease flashing
- Use the up-arrow [^] and SCROLL control to navigate to further menus

Note: The displayed menu brightness will flash slowly if confirmation of a change is required.

Menu tree



Playback board edge menu structure

Tip: To reach the top menu (Status) push the button repeatedly until reached.

Status menu

From the Status top menu press ENTER then SCROLL to access the status menu options.

Status	Menu	Comment
SW 1.00	PCB serial number	Rotate Scroll/Adj. to show the electronically stored PCB serial number. This should correspond with the serial number label affixed to the PCB connector.
S/N 012345	Software version fitted	Rotate Scroll/Adj. to show the version number of the currently installed software.


IP Address

From the IP Address top menu press ENTER then SCROLL to access the IP address that the Playback is currently set to.

IP Address	Menu	Comment
10	IP address 1 st digits	Rotate Scroll/Adj. to show the stored IP address. This will show the 1 st three digits in the IP address. <u>10</u> .0.0.230
00	IP address 2 nd digits	Rotate Scroll/Adj. to show the stored IP address. This will show the 2 nd three digits in the IP address. 010. <u>0</u> .0.230
00	IP address 3 rd digits	Rotate Scroll/Adj. to show the stored IP address. This will show the 3 rd three digits in the IP address. 010.0. <u>0</u> .230
230	IP address last digits	Rotate Scroll/Adj. to show the stored IP address. This will show the last three digits in the IP address. 10.0.0. <u>230</u>

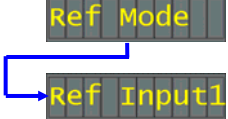
Board Mode

From the Board Mode top menu press ENTER then SCROLL to access the second serial port comms mode setting.

Board Mode	Menu	Comment
	2 nd serial port comms mode setting	Rotate Scroll/Adj. to show the 2 nd serial port comms mode setting. Press ENTER to select. <i>Sony 422, Statesman, VDCP 422.</i>

Reference Mode

From the Reference Mode top menu press ENTER then SCROLL to access the reference options.

Ref Mode	Menu	Comment
	Reference options	Rotate Scroll/Adj. to show the reference options. Press ENTER to select. <i>Ref Input1, Ref ExtRef, Ref B & B.</i>

Note: The timecode menu does not contain any user controls at present.

6 Using the front control panel

6.1 Module selected

This operational guide assumes that the panel has been set up according to the panel setup procedure described in the Crystal Vision Control Panel manual.

Note: It is **ESSENTIAL** that the panel setup procedure is followed and any old or unknown passwords cleared prior to using the panel for the first time.

At power up all eight control panel keys LEDs will illuminate briefly. Once the panel has completed its power up and configuration sequence the panel will enter Statesman mode and the message 'Press Cal to Exit' will be displayed.



Statesman mode is entered by default

To continue with control panel operation or configuration, press the CAL key once. A second press of the CAL key will return to Statesman control.

The control panel will display the name of the card that first responds to the polling request together with its location number.

The location number consists of the frame number plus the card position in the frame.

Navigating the display

The functions assigned to control panel keys are:

- DEVICE – enters Device menu to select a card or show cards available / enters panel set up when held down during power up / shows frame status when pressed from Statesman mode
- CAL – enters or leaves Statesman mode / enters Panel Diagnostics mode when held down during power up / updates the display
- Asterisk – enters Board Rename menu from the Device menu
- F1 to F4 – soft keys, function assigned within each menu
- HOME – moves the display to the Home menu
- ENTER – accept current selection
- Upward arrow – used to move up the menu structure / enter lock panel menu from the Device menu
- Rotary control – shaft encoder used to select options or variable data

Note: Please refer to the Crystal Vision Control Panel manual for details of the Panel Setup, Lock Panel and Diagnostic menus.

Selecting a Playback

To select a particular card in a frame, press the DEVICE key to go to the Device menu.

Note: There may be a delay whilst the frame is interrogated during which time the 'No cards Found' could be displayed.

The top line of the display will show 'Available Cards X', where X is the number of cards that have responded so far to the polling request.

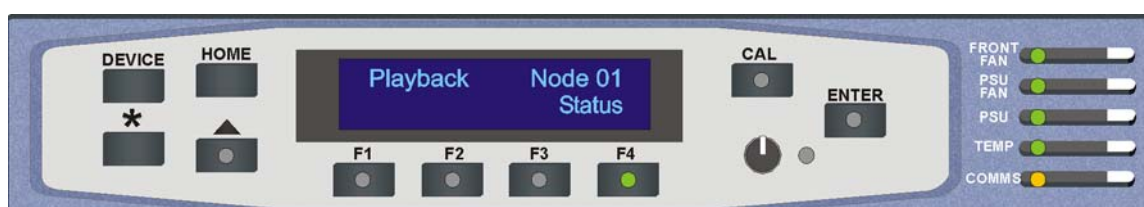


The Available Cards menu

Rotate the shaft encoder and the bottom row will display the successfully polled cards by name and location or slot number.

In the example above, the card displayed is located in the first frame in slot number 1.

When the desired card is selected press the ENTER key to access that card's HOME menu. The message shows that a Playback has been selected.



The Playback Home menu

Updating the display

The values displayed on an active front panel are only updated when an adjustment is made and when changing menu level. If changes occur through the use of card edge controls or other remote control, the text displayed on the active front panel will not be updated immediately. If necessary, use the upward arrow to leave and then re-enter a menu to update the display.

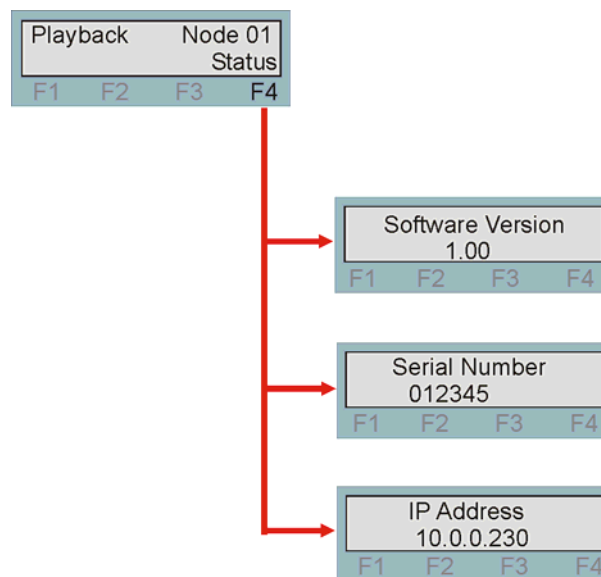
6.2 The Playback active panel menu structure

At any time the main top-level menu (Home) is obtained by pressing the HOME key. From the home menu further selections can be made. Active function keys are indicated by illuminated, integrated LEDs.

The Playback has only one menu which is the Status menu. This can be reached by pressing the F4 key.

When a sub menu has been selected, further options may be obtained by using the Shaft control to scroll through them. Once the desired option has been located a selection or value change can be made by either toggling the appropriate function key or by selecting and using the shaft control to alter a numerical value. A configuration change or value will be activated as the shaft control is rotated or function button is toggled. The variable being adjusted will appear in brackets. If the variable updates in real time it will be contained within square brackets [letter box] or if the change needs to be accepted angular brackets will be used <CVBS>. Pressing Enter will fix the new value.

The following chart shows the available Playback menu. The actual menu available may vary slightly as software is updated.

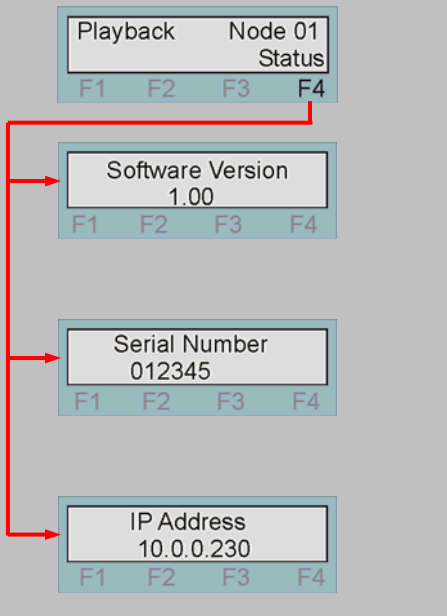


The Playback menu tree

Note: Function key LEDs are illuminated when active.

Status Menu

The status menu contains useful information about the board.

Playback status menu	Description
	<p>From the Home menu, press F1 to select the Status menu, which is then traversed by rotating the shaft control.</p> <p>Rotate the shaft control to view the currently fitted software version.</p> <p>Rotate the shaft control to view the electronically stored board serial number.</p> <p>Rotate the shaft control to view the current IP address.</p>

7 Trouble shooting

Trouble shooting may be performed by using the card edge or remote status panel display.

7.1 Card edge status LEDs

Board edge LEDs provide status reporting and may be useful when fault finding.



The following table summarises the card edge LED functions and colours:

Name	LED Colour	Function when ON	Function when Off
HD	Yellow	Video input standard is HD (High Definition)	} Input not present
SD	Yellow	Video input standard is SD (Standard Definition)	
PSU	Green	Good power supply (PSU) rails.	One or more of the monitor supplies is out of specification
	Yellow	No current function	
	Yellow	No current function	
	Yellow	No current function	

Basic fault finding guide

The Power OK LED is not illuminated

Check that the frame PSU is functioning – refer to the appropriate frame manual for detailed information

There is no video output

Check that a valid SD/HD is present and that any cabling is intact

The video output exhibits jitter

Check that the input signal stability is within normal limits and that the maximum cable length has not been exceeded

The card no longer responds to card edge or front panel control

Check that the card is seated correctly and that the Power OK LED is lit

Check any active control panel cabling

Check if the control panel can control another card in the same rack

If necessary re-set the card by simply removing card from the rack and re-inserting it after a few seconds. It is safe to re-insert the card whilst the rack is powered

8 Appendix 1

Playback via VDCP protocol

Parameter less transport commands VDCP Command No

Play	0x1x	0x01
Stop	0x1x	0x00
Pause	0x1x	0x04
Record	0x1x	0x02

The following parametered commands are also implemented

VarPlay/Shuttle	0x1x	0x08	
Rewind (Var play with negative speed)	0x1x	0x08	
Fast Forward (Var play positive)	0x1x	0x08	
Jog	0x1x	0x07	
Get the complete file ID List	0x3x	0x11	
Get the time code (Position Request)	0x3x	0x06	
Get the Active ID	0x3x	0x07	Also 0xBx 0x07
Play a clip by Filename	0x2x	0x24	

Note. This cues the clip and immediately plays it.

1. Altered on board so that if filename is

“Prestxxx”

The previously stored preset given by the value xxx will be loaded and run to allow control of clips and keys with no extra controls needed. xxx range is 0 to 255.

2. Altered on board so that if the given filename has a corresponding filename with _k as its suffix the given file will be played as a fill with the _k file played as a key. Note this will only work if the filename including the _k is not more than 8 characters.

3. Altered on board so that if the given filename has a corresponding filename with _a as its suffix the given file will be played as a fill with the _a file loaded as the audio. Note this will only work if the filename including the _a is not more than 8 characters.

Delete	0x2x	0x26
---------------	------	------

If supplied ID is in the system and not active the file will be deleted from Ram and Flash.

An error code will be set in the Port Status Byte 0x3c if the file is active.

Get Clip Length 0x3x 0x14

This will be implemented using the existing 0x3x 0x14 Command

Rename ID 0x2x 0x1d

This changes the name of a clip from the existing name to a new eight or less letter Id.

Data bytes 0 to 8 contain the name of the existing valid ID

Data bytes 9 to 16 are the new ID

Play with Data 0x9x 0x24

This is an extension of the play command 0xax 0x24

This allows the ganging of clips and also allows the setting of the play loop bounce parameter

The data bytes are as follows

Data Byte 0x01

Operation	Value
Fill Only	0x00
Key Only	0x01
Fill And Key	0x02
Audio only	0x03
Fill and audio	0x04
Key and audio	0x05
Fill,key and audio	0x06

Data Byte 0x02

Play Once	0x00
Loop	0x01
Bounce	0x02

Data Bytes 0x03 to 0x0A First Clip ID

If data byte 1 is fill only or fill and key, or fill, key and audio then these bytes contain the fill file ID. This will be played from the main (program output of the board).

If data byte 1 is key only these bytes contain the file ID of the Key.
This will be played from the key or preset output of the board.

If data byte 1 is audio only these bytes will be the file ID for the audio file.

Data Bytes 0x0B to 0x12 Second Clip ID

If data byte 1 is set to fill and key, or fill, key and audio these bytes will contain the key file ID. This will be played from the key or preset output of the board.

If data byte 1 is set to fill and audio or key and audio then these bytes will contain the audio file ID.

If Data byte 1 is set to fill only, key only or audio only these bytes should not be sent.

Data Bytes 0x13 to 0x1A Audio Clip ID

If data byte 1 is set to fill, key and audio these bytes will contain the audio file ID.

If data byte 1 is set to anything else these bytes should not be sent.

Cue With Data 0x9 x 0x25 (all works except for duration).

Formerly; Set Mark In, Set Mark Out

These can be accomplished using the cue with data command 0x9 x 0x25.
The board will jump to the marked in frame and pause there.

Followed by a Play command (0x1 x 0x01) will cause the clip to play.

The intelligence of the mark in and out has been kept in the controller. This is because different controllers may want to control the same clip in different ways and this may need different clip lengths.

Data Byte 0x01

Operation	Value
Fill Only	0x00
Key Only	0x01

Data Byte 0x02

Operation	Value
Play Once	0x00
Loop	0x01
Bounce	0x02

Data Bytes 0x03 to 0x0a First Clip ID

If Data Byte 1 is Fill Only or Fill and Key then these bytes contain the Fill File ID.

This will be played from the main (Program output of the Board)

If Data Byte 1 is Key Only these contain the file ID of the Key.

This will be played from the Key or Preset output of the board.

The times are all offset from the start of the clip

Data Byte 0x0b	Start Frames BCD
Data Byte 0x0c	Start Seconds BCD
Data Byte 0x0d	Start Minutes BCD
Data Byte 0x0e	Start Hours BCD
Data Byte 0x0f	Duration Frames BCD
Data Byte 0x10	Duration Seconds BCD
Data Byte 0x11	Duration Minutes BCD
Data Byte 0x12	Duration Hours BCD

Output Select 0x9x 0x38

Selects the channel to be controlled

Use this to allow independent or combined control of each output for standard transport commands

Data Byte 0

Operation	Value
Fill Only	0x00
Key Only	0x01
Fill And Key	0x02

Jump To Beginning of Clip Jump To End Of Clip

New command; 0x9x 0x08. This will have 1 Data byte.

Data Byte 0x01

Operation	Value
Jump to start	0x00
Jump to end	0x01

Jump To Mark In 0x2x 0x25

Jump To Mark Out (VDCP Cue with data)

Save 0x2x 0x2a

This has been implemented by copying the requested file ID from Ram to Flash. It will be implemented using the 0x2x 0x2a command.

Note: Only one save can be requested and for large files this may take minutes. It is done as a background task and all other operations except deletion of this file can be carried out. When the copy is complete the ID will be added to the IDs added to archive list. The port status bit ID_ADDED_TO_ARCHIVE will be set.

This will be cleared when a further copy operation is requested.

Trim 0x9x 0x50 (new extension)

This has the following data bytes.

0x01 to 0x08 Clip ID

The times are all offset from the start of the existing clip

0x09	New Start Frames BCD
0x0a	New Start Seconds BCD
0x0b	New Start Minutes BCD
0x0c	New Start Hours BCD
0x0d	New Duration Frames BCD
0x0e	New Duration Seconds BCD
0x0f	New Duration Minutes BCD
0x10	New Duration Hours BCD

Status 0x3x 0x05

The following status bits are implemented

Port Status 0x01

Bit 0x00	Stopped
Bit 0x01	Not Used
Bit 0x02	Play Or Record
Bit 0x03	Still
Bit 0x04	Jog
Bit 0x05	Var Play
Bit 0x06	Not Used
Bit 0x07	Not Used

Port Status 0x02

Bit 0x00	Not Used
Bit 0x01	Not Used
Bit 0x02	Not Used
Bit 0x03	Not Used
Bit 0x04	Not Used
Bit 0x05	No Video Input

Bit 0x06	Not Used
Bit 0x07	Not Used

Port Status 0x03

Bit 0x00	Not Used
Bit 0x01	Not Used
Bit 0x02	Not Used
Bit 0x03	Not Used
Bit 0x04	Not Used
Bit 0x05	Disk Full
Bit 0x06	Not Used
Bit 0x07	Not Used

9 Specification

General

Playback

Dimensions	100mm x 266mm module with DIN 41612 connector
Weight	200g
Power consumption	12W

Inputs

Number and type:	One SD/HD input One external analogue reference input
Video	HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to EBU 3267-E, SMPTE 259M and SMPTE 292M HD (1.485Gb/s) Cable equalisation up to 140m with Belden 1494 or equivalent. (Approx 100m with Belden 8281) SD (270Mb/s) Cable equalisation >250m Belden 8281 or equivalent Note: HD cable length assumes new version of frame
External reference	Composite black and burst, bi-level and tri-level syncs
Return loss	-15dB for 50MHz to 1.5GHz

Outputs

Number and type:	Two main and one input loop through outputs, reclocked SDI 270Mb/s - 1.485Gb/s to EBU 3267-E, SMPTE 259M and SMPTE 292M Output follows input format. Belden 8281 or equivalent HD (1.485Gb/s) – 100m SD (270Mb/s) >250m
Jitter	Typically 0.2UI, 10Hz
Relay bypass	Input to main output (switched)

Processing

Vertical data	Passes entire SDI stream, including HANC and VANC
Video store	2 x 2GB multi-port video store DRAM HD video can replay last 30 seconds in 50Hz and 25 seconds in 59.94Hz SD video can replay last 155 seconds in 50Hz and 150 seconds in 59.94Hz
8G	2 x 4GB multi-port video store DRAM HD video can replay last 60 seconds in 50Hz and 50 seconds in 59.94Hz SD video can replay last 310 seconds in 50Hz and 300 seconds in 59.94Hz
Operating system	uCLinux

Delay through board The minimum delay from the input to the output is 6.5 μ s for SD and 1.7 μ s for HD. When locked to an external reference the delay through the Playback will be 0.0us plus any user set delay. Using input 1 as the reference source will give the minimum day plus any user selected delay.

User set offset delay, up to one video line. (Not currently supported)

Status

LED indication of power supplies OK. Main input present. SD/HD input

Remote control

RS422/485

Port 1: 19200, 8-bit, 1 stop no parity

Port 2: 38400, 8-bit, 1 stop odd parity

Status information from frame active panel and remote panel

Second serial port (link selected instead of GPI inputs) allows connection to control panel and automation systems

100MB Ethernet connection directly from board via rear module

Sony and VDCP protocols supported

Functions Stop, Record, Play, Still, Continue, Jog and Vari Play.