USER MANUAL

Indigo SYSTEM

CoolFlow

MultiLogo V132 and V432

HD/SD three-layer logo keyer

Crystal Vision

Contents

| Revision 1 | VisionWeb section added. GPIs tab section added. Deleted 4U frame references. GPIs on Page 13 updated. Removed audio recording reference. Removed dual channel logo keyer reference. LogoKeyer Software renamed as MultiLogo Control Software. | 26/10/17 |

1 Introduction

MultiLogo is a sophisticated modular logo keyer that provides three layers of keying from a variety of internal and external sources. Its multi-port non-volatile video store can read six images and write two images simultaneously. There are two versions of MultiLogo available, the MultiLogo V132 with a single HD/SD video input and the MultiLogo V432 that has four HD/SD video inputs. Both versions come with 4 GB of video store as standard, or optionally with 8 GB (V132 8G and V432 8G).

MultiLogo can be used either with graphics that have a separate key signal or with self-keyed graphics. Both additive and multiplicative keying is available. Three-layer keying allows three still or animated graphics to be independently brought up either from the video store or from external sources. The first external video source is normally dedicated to the main programme because of its relay bypass protection while the other three external feeds (MultiLogo V432 only) are completely flexible and configurable. Typically, these inputs could be used for such things as a back-up feed or character generator for an emergency message and its key signal. It is also possible to grab a logo from a live video feed.

MultiLogo runs the uCLinux operating system for sophisticated file handling and stability, and with on-board industry standard protocols allowing it to be used with studio automation systems. Alternatively, using a PC running Crystal Vision's own drag and drop software will auto-convert images of most common file formats required by the MultiLogo and transfer them over 100Mbit Ethernet directly onto the board via its dedicated rear module RJ45 Ethernet connection.
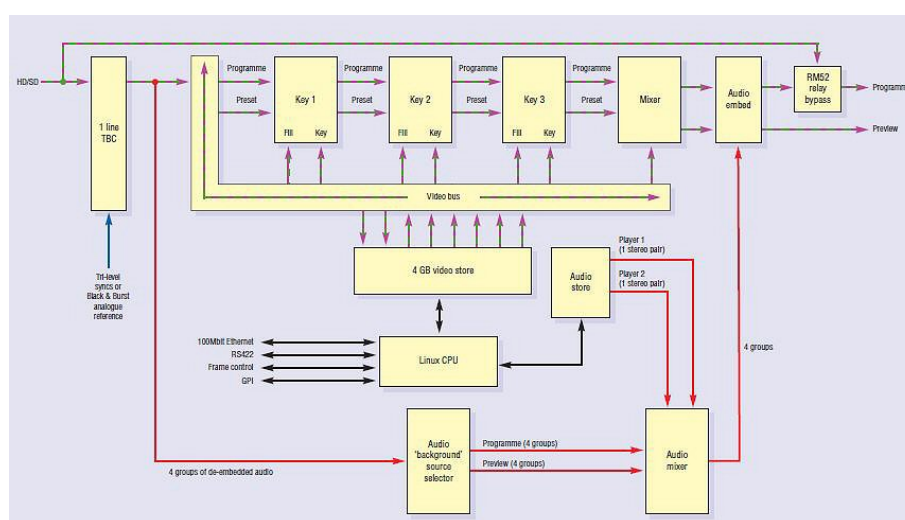
MultiLogo V132 Block Diagram

MultiLogo is designed for branding HD or SD stations, but for people who just need one station ident the V432 can be used as a dual channel device – sharing the three keyers between two channels. Both versions share a look-ahead preview facility, which has the benefit of allowing sophisticated transitions to be previewed before committing to the main output.
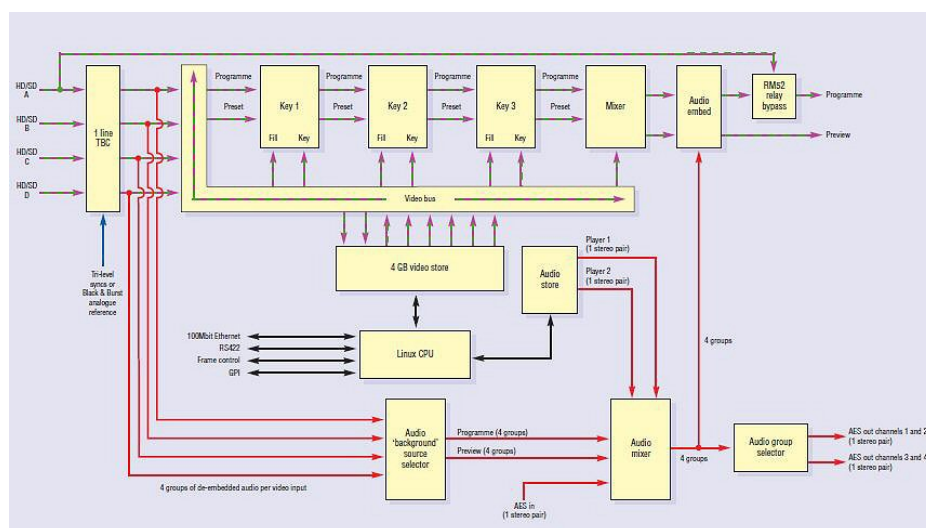
MultiLogo V432 Block Diagram

MultiLogo's main features are:

- Modular logo keyer, available in two versions with either 4 GB or 8 GB of video store
- Three layers of keying
- Multi-port video store with DRAM memory, backed up to Flash
- Graphics can have separate key signal or be self-keyed
- Additive and multiplicative keying
- Up to four configurable external inputs for live video (MultiLogo V432)
- External AES input and two outputs (MultiLogo V432 with RM34)
- External GPI inputs for preset recall and transition action e.g. key fade
- Drag and drop PC software for auto conversion of graphics from any format
- Easy transfer of graphics from PC to board over 100Mbit Ethernet
- Look-ahead preview
- External reference input with 1-line TBC on each input
- AES audio locked to logo
- Industry standard software protocols help use with automation systems
- Relay bypass protection of main input (RM52)

MultiLogo is a 100mm x 266mm module, which fits in the three standard frame sizes and can be integrated with any boards from the company's Indigo product range. MultiLogo V132 is a single height module and uses the RM52 rear module, which includes relay bypass protection of the input in the event of power failure or board malfunction or removal. The MultiLogo V432 is a 'double decker' module and requires an RM34 rear connector in its upper position in combination with the RM52 rear module in the lower position.

1.1 Operating modes

Input and output video standards

MultiLogo will automatically switch between HD and SD SDI inputs.

Note: *All inputs of the MultiLogo V432 must be of the same standard and co-timed to within one line.*

The output video standard can be fixed so that MultiLogo can be powered without input and used as a standalone video source. In auto mode, it will default to outputting either its input standard or that of its external reference. If neither input nor external reference are connected, the output will default to the 'Power save on' setting or finally 1080i 50, should no other criteria be met. It is then possible to change the output by momentarily applying an input to Input 1 so that MultiLogo can relock.

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

Note: *MultiLogo's memory store can contain graphics of all supported video standards but they will only be valid in their native standard.*

External reference

Each input of the MultiLogo 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.

Ancillary data

Output ancillary data will be passed directly from the selected input to the outputs, or if an audio source is selected the ancillary data will be blanked before the audio insertion.

Audio

Two stereo channels of audio data can be transferred to and from the board via Ethernet using the PC drag-and-drop software. Audio routing allows the selection of which channels can then be embedded into any of the four groups at the video outputs and/or routed to the two external AES outputs (MultiLogo V432 only).

Stored audio can be played out separately, or audio and video ports can be locked together so files can be played out at the same time - allowing logos to have accompanying audio.

MultiLogo V432 also has an external AES input which can be embedded into the output video.

MultiLogo also features a voice-over facility whereby stored or external audio can automatically fade down the audio de-embedded from the video inputs.

2 Hardware installation

The MultiLogo V132 single height module uses the RM52 rear connector that will fit into all Crystal Vision rack frames. The MultiLogo V432 is a 'double decker' module that uses an RM52 plus RM34 rear module. The MultiLogo V432 takes up two frame slots. All modules can be plugged in and removed while the frame is powered without damage.

2.1 Module configuration
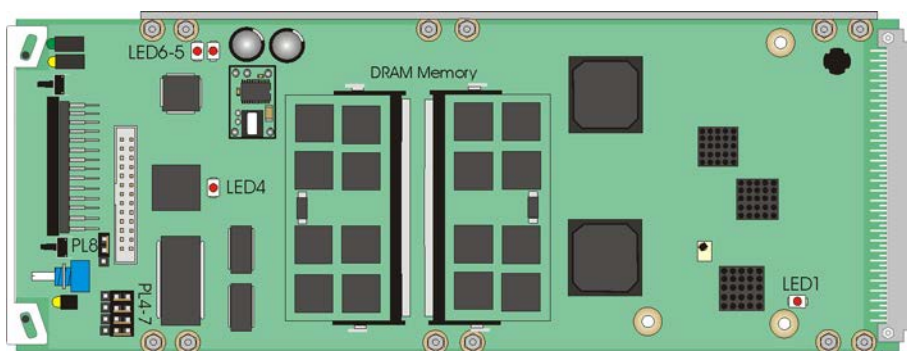
MultiLogo V132
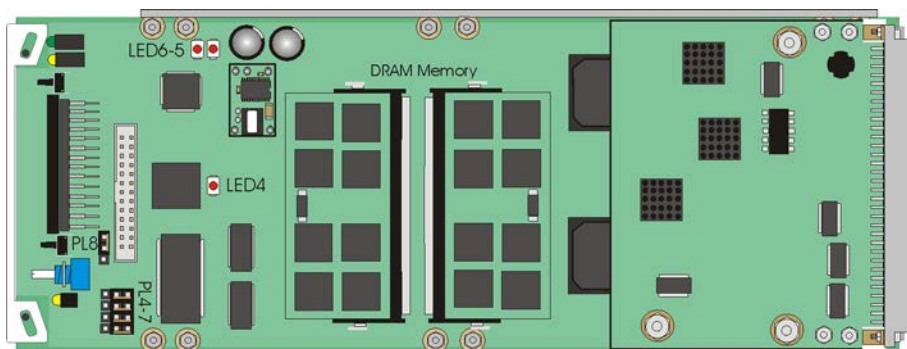
MultiLogo V432
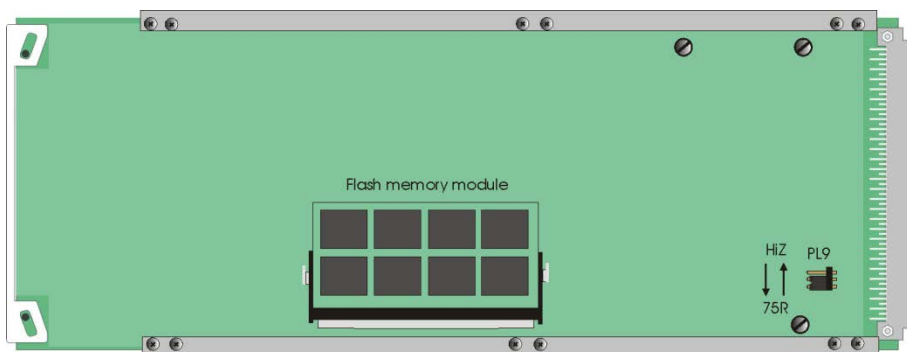
MultiLogo V132/432 underside showing the Flash memory module fitted

Link configuration and LEDs

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

Link	Comment
PL4, PL5, PL6, PL7	GPI/RS422 comms selection: 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 (underside)	Not applicable

MultiLogo V132 and V432 Link Settings

LEDS	Comment
LED1	Input present
LED4	CPU configuration in progress
LED5	Ethernet Data
LED6	Ethernet Link

MultiLogo V132 and V432 LEDs

3 Rear modules and signal I/O

The Indigo 2 2U frames will house up to 12 single height or six double height modules and dual power supplies. The Indigo 1 1U frames will house six single height or three double height modules and a single or dual power supply. The Indigo DT desk top boxes have a built-in power supply and will house up to two single height modules or one double height module.

Note: *For details of fitting rear connectors please refer to the appropriate frame manual.*

Rear module connections with RM52

The RM52 is a single height module that is used either as the only rear connector for the MultiLogo V132 without a ML-GPI8 board, as the lower rear connector for the MultiLogo V132 fitted with a ML-GPI8 top-board in conjunction with a RM33, or as the lower rear connector for the MultiLogo V432 in conjunction with a RM34.

RM52 rear module connector	Description
	RM52 • 12 MultiLogo V132 modules (without ML-GPI8 board) per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used

BNC and other Connections
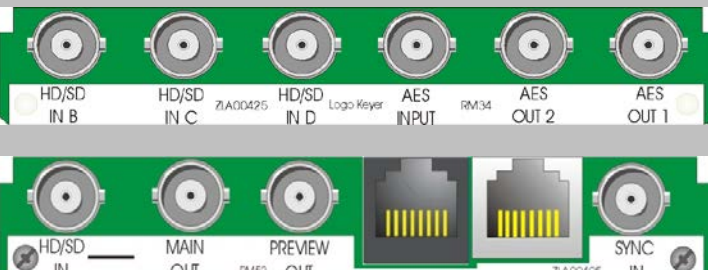
BNC	I/O assignment
SYNC IN	External analogue reference input
PREVIEW OUT	Preview output (serial digital)
MAIN OUT	Serial digital output with relay bypass
HD/SD IN	High Definition/Standard Definition serial digital input
Ethernet connector	Ethernet control from PC
RJ45 connector	RS422 control from control panel

RS422 Connector Pin-out

RM52 RS422 connector pin numbers		
87654321	**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)

Rear module connections with RM34

The RM34 is a single height module that is used as the upper rear connector for the MultiLogo V432. The RM52 is always fitted as the lower rear connector in conjunction with this module.

RM34 rear module connector	Description
	RM52 + RM34 • Six MultiLogo V432 modules per Indigo 2 frame • Three per Indigo 1 frame • One per Indigo DT • Alternate frame slots can be used

BNC	I/O assignment
AES OUT 1	AES digital audio output
AES OUT 2	AES digital audio output
AES INPUT	AES digital audio input
HD/SD IN D	High Definition/Standard Definition serial digital input
HD/SD IN C	High Definition/Standard Definition serial digital input
HD/SD IN B	High Definition/Standard Definition serial digital input

Rear module connections with RM33

The RM33 is a single height module that is used as the upper rear connector for the MultiLogo V432 fitted with a ML-GPI8 board. The RM52 is always fitted as the lower rear connector in conjunction with this module.

RM33 rear module connector	Description
	RM52 + RM33 • Six MultiLogo V132 modules fitted with ML-GPI8 board per Indigo 2 frame • Three per Indigo 1 frame • One per Indigo DT • Alternate frame slots can be used

BNC	I/O assignment
NC	No Connection
NC	No Connection
GPI I/O	ML-GPI8 GPI inputs and outputs
NC	No Connection
NC	No Connection

4 General Purpose Interface

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.

The GPIs are fully configurable to allow the user to recall presets or directly action transitions e.g. key on/off. The user can set whether they are working with pulse or latching GPI levels.

The MultiLogo V132 has four GPI lines for control. These are GPIs 'a', 'b', 'c' and 'd' as shown in frame wiring pin-out tables. There is also a GPI which is used for tally 1 output (GPI 'e'). If the ML-GPI8 add-on board is fitted there are an extra eight GPI lines for preset recall and two additional tallies. (See *MultiLogo GPI module: ML-GPI8.*)

The MultiLogo V432 has the same GPI assignment as the V132 on its lower (main) board and an additional four GPI inputs and two additional GPI outputs on the top board.

GPI lines for MultiLogo V132 or main board of V432

GPI		
'a'	Transition GPI 1 or Recall preset bit 0	
'b'	Transition GPI 2 or Recall preset bit 1	Ground the GPIs to activate
'c'	Transition GPI 3 or Recall preset bit 2	
'd'	Transition GPI 4 or Recall preset bit 3	
'e'	Tally 1 out	Tally pulls to ground when key is on
'f'	No connection	

GPI lines for top board of MultiLogo V432

GPI		
'a'	Recall preset bit 4	
'b'	Recall preset bit 5	Ground the GPIs to activate
'c'	Recall preset bit 6	
'd'	Recall preset bit 7	
'e'	Tally 2 out	Tallies pull to ground when key is on
'f'	Tally 3 out	

Recalling stored presets using the GPIs (V132 or V432)

The table below applies if GPIs 'a', 'b', 'c' and 'd' are set to Preset. In the event of GPI 'a', for example, being set to Transition, Preset recall bit 0 will be shifted to the next available GPI set to Preset. This action is indicated on the control GUI. For MultiLogo V432, up to 256 preset locations are accessible, and if lower board GPIs a-d are all set as transition GPIs then preset recall bit 0 will move to be GPI 'a' on the top board. The table below shows the binary coding

for the first four preset recall bits. For the MultiLogo V432, up to eight preset recall bits are available.

GPI	Bit 3	Bit 2	Bit 1	Bit 0
Preset				
1	H	H	H	H
2	H	H	H	L
3	H	H	L	H
4	H	H	L	L
5	H	L	H	H
6	H	L	H	L
7	H	L	L	H
8	H	L	L	L
9	L	H	H	H
10	L	H	H	L
11	L	H	L	H
12	L	H	L	L
13	L	L	H	H
14	L	L	H	L
15	L	L	L	H
16	L	L	L	L

Binary coding of GPI inputs to recall preset configurations in level mode

GPI	Bit 3	Bit 2	Bit 1	Bit 0
Preset				
No change	—	—	—	—
1	—	—	—	⎍
2	—	—	⎍	—
3	—	—	⎍	⎍
4	—	⎍	—	—
5	—	⎍	—	⎍
6	—	⎍	⎍	—
7	—	⎍	⎍	⎍
8	⎍	—	—	—
9	⎍	—	—	⎍
10	⎍	—	⎍	—
11	⎍	—	⎍	⎍
12	⎍	⎍	—	—
13	⎍	⎍	—	⎍
14	⎍	⎍	⎍	—
15	⎍	⎍	⎍	⎍

Binary coding of GPI inputs to recall preset configurations in pulse mode

Each General Purpose Interface (GPI) input is fitted with a 10kΩ resistor connected to the internal +5V and in the table above, this equates to logic 'H'. With the GPI lines set to 'level' mode and no connections (logic 'HHHH'), preset 1 will be selected. With the GPI lines set to 'pulse' mode, the GPI will be activated whenever a bit is pulled low but no change to the

preset selection will occur when all bits return to logic 'HHHHH'. Note that preset 16 is not accessible in pulse mode for MultiLogo V132.

The ML-GPI8 board of the MultiLogo V132 provides additional recall preset control lines if more than 16 presets need to be recalled via GPI. MultiLogo V432 has an additional four GPI lines on its top board.

GPI pin-out information

To determine the correct pin-out for your GPI wiring, check which slot position and frame type the MultiLogo is in. Then refer to the GPI connection tables below for the correct frame type to establish the pin connections of the GPIs you want to wire to.

For example, you may want three GPIs on a MultiLogo V432 to fade each key layer on and off. You should therefore wire to GPIs 'a', 'b' and 'c' on the main PCB. If the main PCB of the MultiLogo V432 is located in slot position 2 of an Indigo 2 frame the GPI connection table shows GPI 'a' = pin 7 of the Remote 1 D-Type on the rear of the frame, GPI 'b' = pin 16 of Remote 1, and GPI 'c' = pin 17 of Remote 1.

Note: *The GPI controls need to be enabled using the MultiLogo Control Software GUI.*

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.

Example connections: If a MultiLogo V432 was located in slot position 1 and 2 the GPIs should be wired to slot position 2 (the main board). The preset recall GPIs are 'a', 'b' and 'c' so by referring to the table above we can see pins 7, 16 and 17 on the Remote 1 frame D-Type will need pulling to ground to action preset recalls.

MultiLogo GPI module: ML-GPI8

This hardware option consists of an additional PCB that plugs onto MultiLogo V132. When fitted the ML-GPI8 provides eight GPI inputs and eight GPI outputs (tallies) to a D-Type connector situated on the rear module. In their inactive state, all GPIs will be pulled to +5V by way of a weak pull-up and are pulled to ground to be asserted. When taken to ground each individual GPI input will recall one previously stored preset.

Note: ML-GPI8 requires ML-GPI8 firmware/software. It is not available for MultiLogo V432.

Extra GPI I/O for MultiLogo V132 with ML-GPI8 board

GPI input		GPI output	
'a'	Preset 1 selected when pulled to ground	'a'	Tally pulls to ground when preset 1 selected
'b'	Preset 2 selected when pulled to ground	'b'	Tally pulls to ground when preset 2 selected
'c'	Preset 3 selected when pulled to ground	'c'	Tally pulls to ground when preset 3 selected
'd'	Preset 4 selected when pulled to ground	'd'	Tally pulls to ground when preset 4 selected
'e'	Preset 5 selected when pulled to ground	'e'	Tally pulls to ground when preset 5 selected
'f'	Preset 6 selected when pulled to ground	'f'	Tally pulls to ground when preset 6 selected
'g'	Preset 7 selected when pulled to ground	'g'	Tally pulls to ground when preset 7 selected
'h'	Preset 8 selected when pulled to ground	'h'	Tally pulls to ground when preset 8 selected

ML-GPI8 pin-outs

GPI	26-way D-Type Pin-out	GPI	26-way D-Type Pin-out
GPI 1 In	2	GPI 1 Out	10
GPI 2 In	3	GPI 2 Out	11
GPI 3 In	4	GPI 3 Out	12
GPI 4 In	5	GPI 4 Out	13
GPI 5 In	6	GPI 5 Out	14
GPI 6 In	7	GPI 6 Out	15
GPI 7 In	8	GPI 7 Out	16
GPI 8 In	18	GPI 8 Out	17
GND	1, 9, 19, 20, 23, 24, 26	NC	21, 22, 25

5 Web browser interface

Some setup features of MultiLogo can be accessed by connecting a PC via the RM52 rear module Ethernet connector.
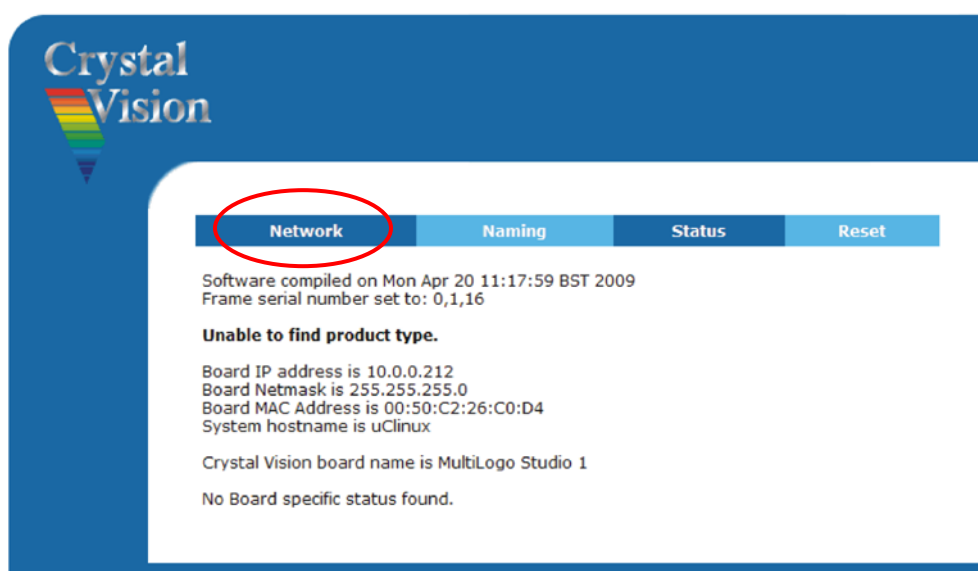
5.1 Resetting IP address

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/
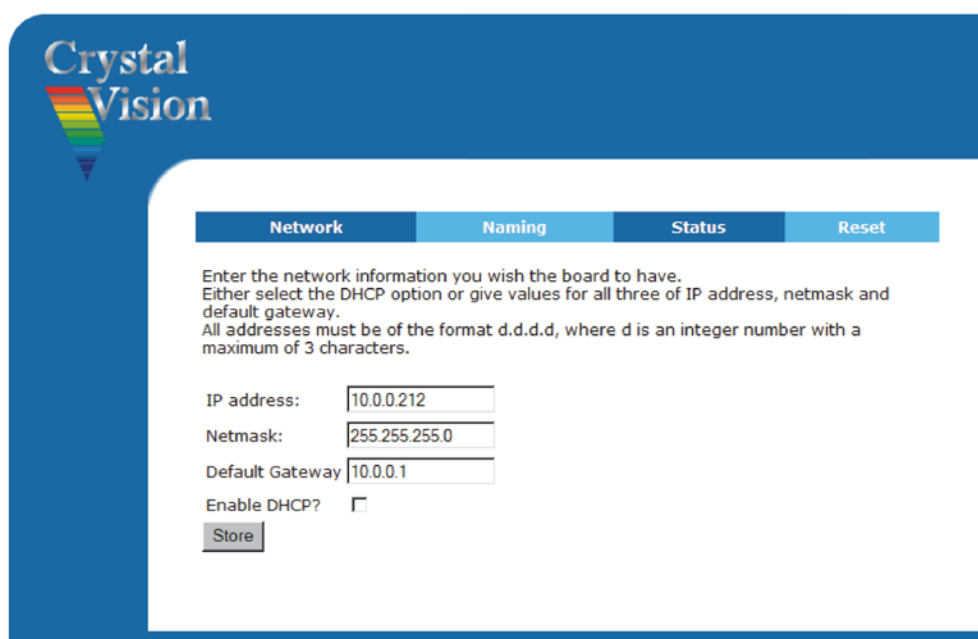
The IP address of the MultiLogo can be defaulted to 10.0.0.201 by powering it with PL8 near the front of the board in the Force IP Address position.

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.
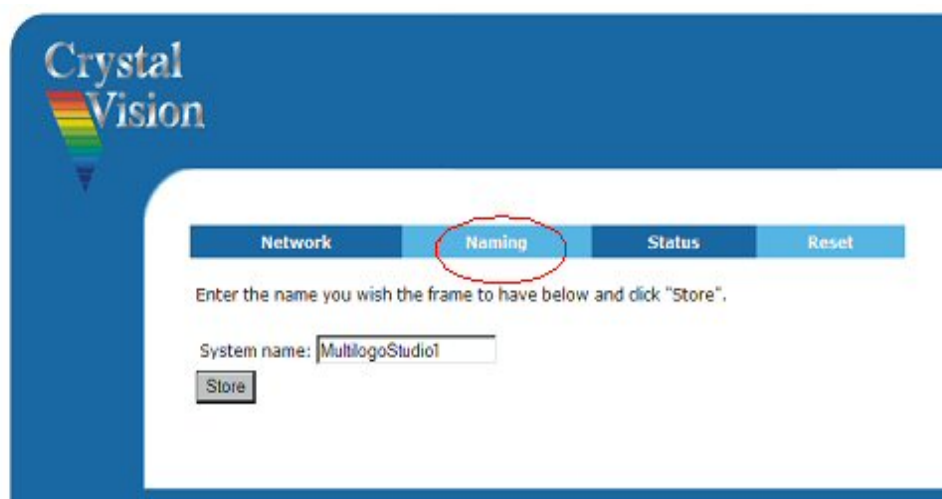
Once the information has been entered click 'Store'. You will then need to reboot the card to complete the update. The card can be rebooted by either using the reset page or withdrawing from the frame and reinserting. Make sure PL8 near the front of the board is not in the Force IP Address position when rebooting the board, otherwise the IP address will default to 10.0.0.201.

Note: *The reset page will be talking about resetting a frame. In this instance, it will be the card that receives a reset command. Ignore any reference to piano switch 4 in the web browser. This is used on Crystal Vision front panels only.*

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 board to be rebooted remotely, such as is required when the IP address is changed.
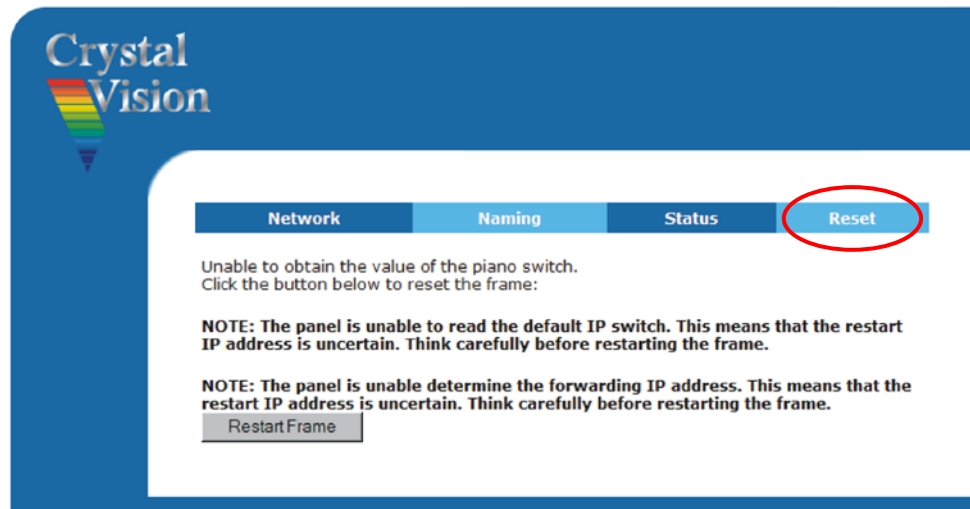
Note: Performing a reset will restore all current settings to their defaults but leave any configurations stored as presets unchanged.

6 VisionWeb interface

Note: *Only for Indigo frame software versions v4.6 or later and MultiLogo firmware v1.64 or later.*

Crystal Vision Indigo frame's internal web pages are called VisionWeb and enable the user to configure the frame, monitor status of the frame and cards, and to control cards from a PC running a web-browser*. To access the VisionWeb home page, connect to the frame's Ethernet port, open up your web browser and enter the frame's IP address (which will be the default value 10.0.0.201 if the frame has yet to be configured). The web page displayed will show the names of the cards installed, the slot number they are fitted into, and the firmware version and serial number:

Typical VisionWeb home page showing two fitted modules including a MultiLogo

This page will give status information about the frame, its power supplies and means to access each card's controls. *See 'Indigo Frame User Manual' for more information.*

Although the MultiLogo Control Software is the recommended product for full control of MultiLogo's features, VisionWeb allows PC control of many of MultiLogo functions. Click on 'MultiLogo' to open up the card's 'Status' page:

VisionWeb's MultiLogo 'Status page

Other pages are accessed via the tabs on the bottom of the page. These give access to most of the controls but will NOT allow graphic conversion and storage.

The above controls are all replicated and explained in the section MultiLogo Control Software and are not explained here.

Note that the GUI layout of the MultiLogo Control Software is different to VisionWeb, for instance the above 'Status' controls mainly appear in the MultiLogo Control Software's 'Engineering tab'.

7 MultiLogo Control Software

MultiLogo is shipped with the MultiLogo Control Software that gives full control of all features including drag and drop of files from the PC into MultiLogo's internal memories.

7.1 Installing the software

Run the 'Setup.exe' and follow the on-screen instructions. The software will be installed to a folder on your computer. Once the installer has completed click 'Close'

Upon installation, six shortcuts are placed on the desktop:

- MultiLogo V131/431 – for older MultiLogo versions V131/431 on 32 bit PCs.
- MultiLogo V131/431 (x86) – for older MultiLogo versions V131/431 on 64 bit PCs.
- MultiLogo V132/432 – for MultiLogo versions V132/432 on 32 bit PCs.
- MultiLogo V132/432 (x86) – for MultiLogo versions V132/432 on 64 bit PCs.
- ClipNKey – for Clip N Key on 32 bit PCs.
- ClipNKey (x86) – for Clip N Key on 64 bit PCs.

MultiLogo V131/431 is for older models that would benefit from using the latest MultiLogo Control Software for added features – see the MultiLogo V131/431 User Manual.

Clip N Key is a reduced function version of MultiLogo and is documented in another user manual.

To run the software, simply double-click on the appropriate icon. To determine whether your PC is 32 or 64 bit, go to Start -> Control Panel->System and Security-> System.

Setting the correct IP address

The MultiLogo Control Software has to be set to the correct IP address to control your board. The MultiLogo Control Software defaults to IP address 10.0.0.201. If your MultiLogo is not set to this address, click on 'File' then 'Change Connection' and enter the board's IP address into the edit box and press 'Connect'. There may be a delay whilst the connection is made.
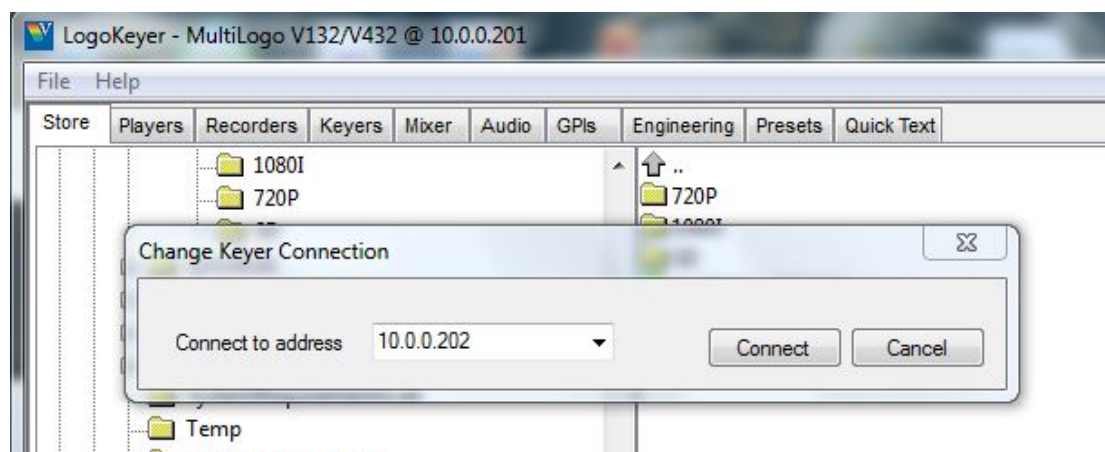
MultiLogo 'Change Keyer Connection' window

7.2 Store tab

Using the controls on this tab you can upload still and moving images on to the RAM storage areas.

From within the store tab, browse in the top left hand pane to the folder that contains the images you wish to upload. To upload the file, simply drag and drop into the lower pane.
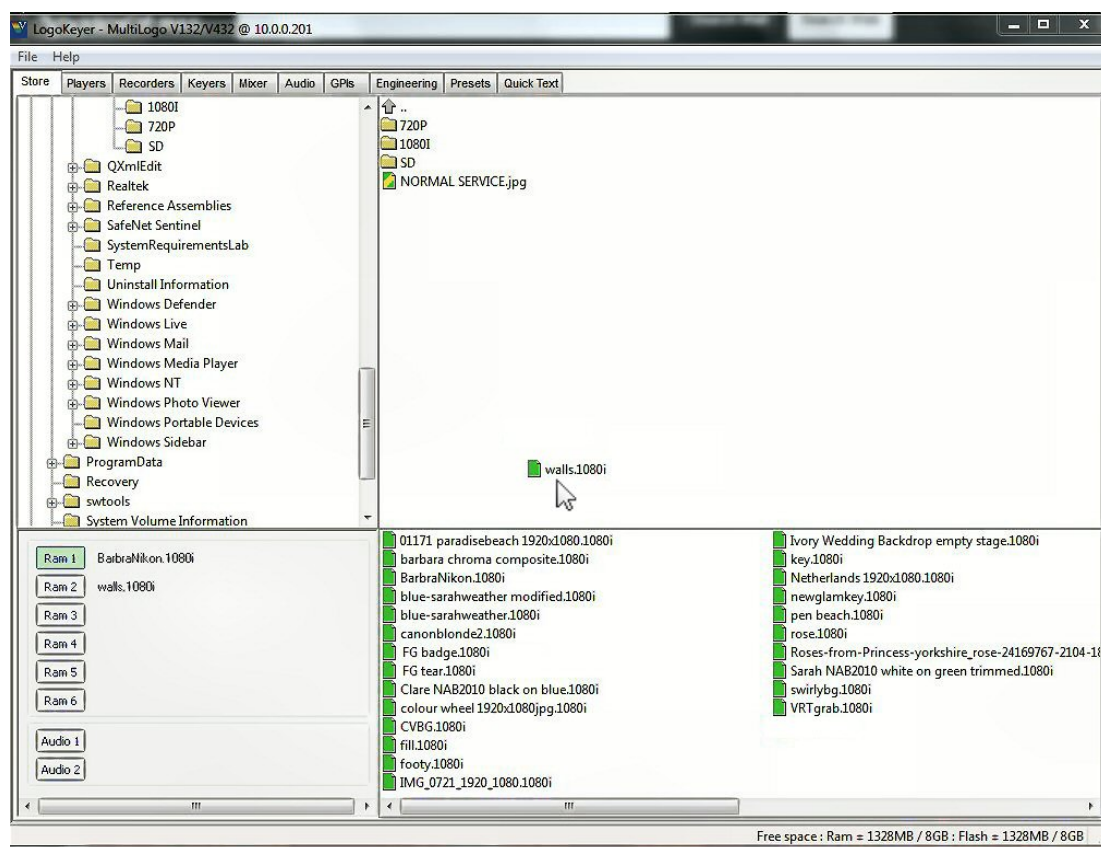
MultiLogo V132/432 'Store' tab showing files 'walls.1080i' being dragged to the bottom pane

The special drag and drop software will convert most common graphics file formats to the format required by MultiLogo. The supported file types are: BMP, JPG, WAV (audio), TAGA, PNG and SGI. Other file formats can be supported but require conversion using the Image Converter software supplied. See *Image Converter* for details on how to use the Image Converter software. If there is insufficient memory to perform the image transfer, then a message will be displayed. All image transfers are backed up in non-volatile flash memory.

Once the file has been moved to the bottom pane it can then be assigned to one of the six available ports. Select the port in which you wish to store the file with the buttons to the lower left of the screen and simply double click the file to assign it to that port. The file name will appear beside the port button to show that the port has a file assigned to it.

To aid easy identification of file status the file icons have been given a colour code.

Green	Green files are those that have been converted to the Crystal Vision's proprietary file format required by MultiLogo. These files may have been converted by drag and drop or by the image converter.
Yellow	Any file will be displayed as yellow whenever the selected video format is different to the native video standard of that file. For instance, a file that shows green in say 1080i 50 will show yellow if the MultiLogo video format is set to any other format i.e. 1080i 59.94.
Blue	An audio file will show blue i.e. a WAV format file.
White	A white file is any file that requires converting to the format required by MultiLogo by both drag and drop or by image converter.
Green with yellow flash	Files of this type are already in the required MultiLogo format and have been directly copied into RAM.
Red corner	Any icon showing a red corner indicates a file in RAM only, this file would be lost should the power be removed. Files that are recorded using the 'Recorder' tab are not automatically backed up in Flash memory. To back-up these files to Flash memory hold the mouse cursor over the file and right-click. The following pop-up box will appear:
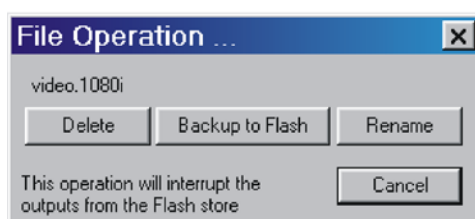
7.3 Mixer tab
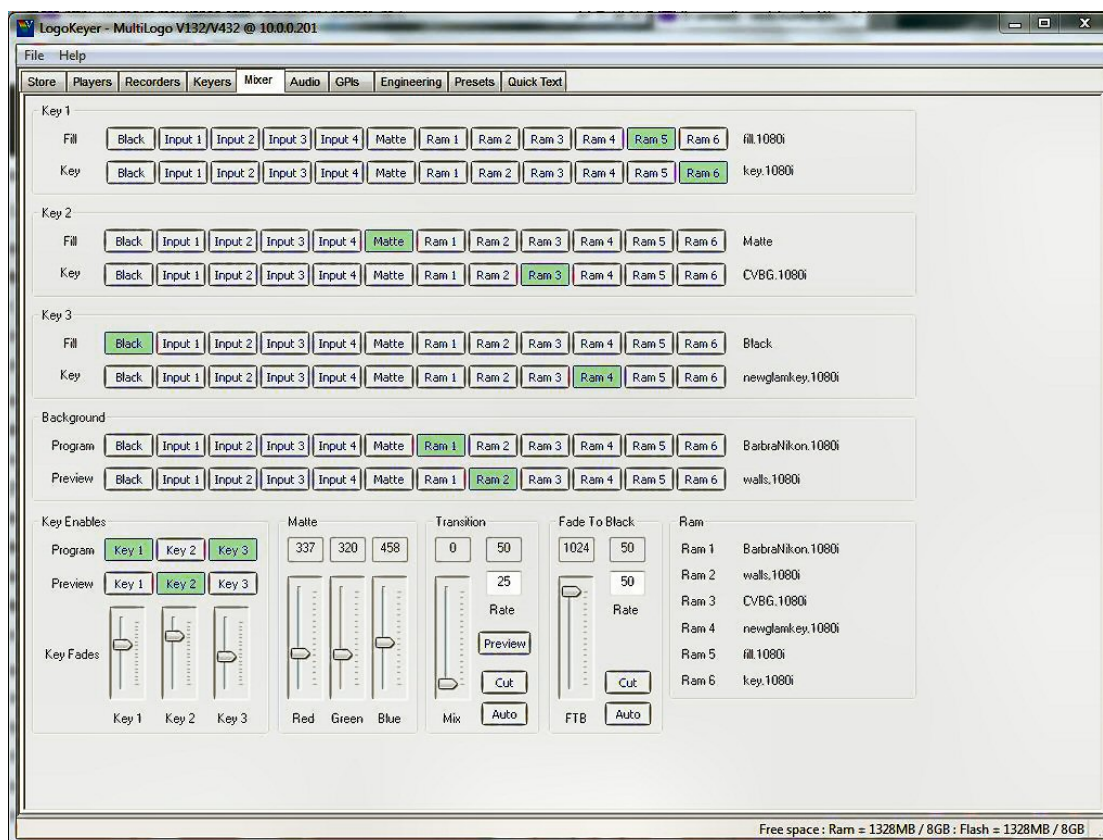
MultiLogo 'Mixer' tab showing the assignments of the keys, fills, Program and Preview buses

Assigning the card's RAM sources

Once you have programmed the RAM store images you can then assign these to the keys and the Program and Preview outputs. Select the source for each of the keys and their fills by clicking on the appropriate button. In the example below, Key 1 Fill is selected to Ram 5 which contains the file 'fill.1080i', Key 1 Key is selected to Ram 6 which contains the video file 'key.1080i'.
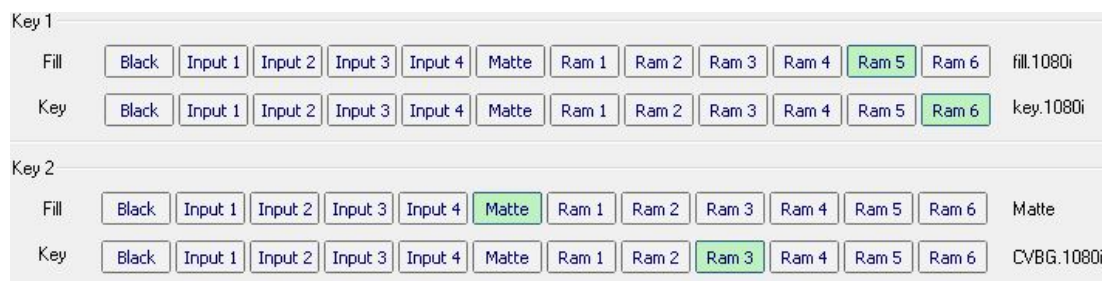
MultiLogo 'Mixer' tab close-up of Key 1 and Key 2 selection bus

The selections for all three keys can be made this way as can the selections for the Program and Preview outputs. In addition to RAM sources 1-6, it is possible to select Black, one of the four video inputs or the colour matte generator as a source. It is unlikely that Black or Matte would be selected as a key source but could certainly be used as a key fill.

Note*: Only one video input is available for MultiLogo V132.*

Matte Generator

Part of the **Mixer** tab is the controls for setting the matte colour.
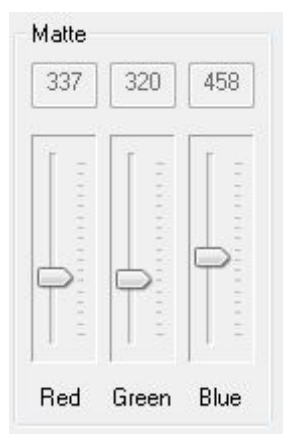
Use the Red, Green and Blue controls to set the desired colour.

Enabling the keyers

All of the three keyers can be assigned to operate on the Program and/or the Preview outputs.
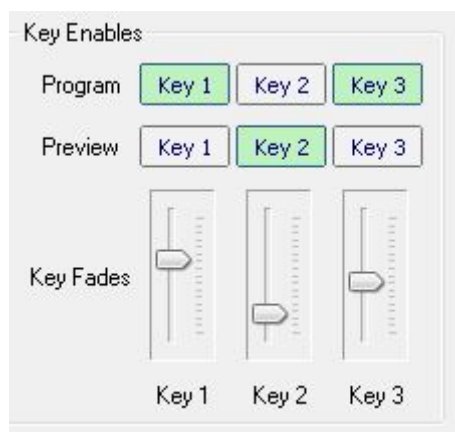
For each of the three keyers, select whether the key will be active on the Program and/or Preview output. Each key can be faded in or out manually with the fade controls.

Transitions and Fade to Black

The transition controls section in the mixer tab allow for a manual or timed automatic mix transition between the Program and Preview outputs. Also found here are the **Fade To Black** controls which allow for a manual or timed automatic fade-to-black of the main output.

Manually operate the faders to make a mix transition or enter the number of frames for an auto transition. Press 'Auto' to start an auto transition or 'Cut' for a zero-time transition. Selecting 'Preview' will rehearse the transition on the Preview output only. After a complete manual or auto transition the selections for the Program and Preview outputs will be swapped as what was the preview output will become the main output and vice-versa, after each transition. Similarly, any **Key Enable** selections will be swapped too. Similarly, for Fade to Black, either manually operate the fader or enter a rate in frames for an auto fade-to-black.

7.4 Keyers tab

Key Mode

This tab contains the controls for setting up the three key processors.
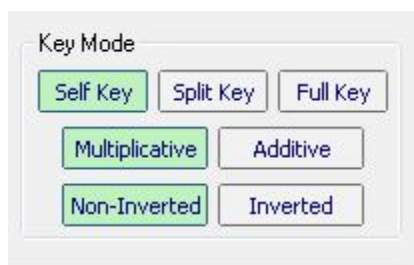
- **Self Key** – where the key signal is derived from the fill signal.
- **Split Key** – where separate selections are used for key and fill.
- **Full Key** – where the key size is as big as the key fill graphic. Full key does not use a key signal but internally generates a full frame peak white signal to force the key.
- **Multiplicative** – where the key fill signal is keyed by the processed key prior to adding to the keyed Program or Preview output. This is usually used if the key fill signal is non-black outside of the active key area.

- **Additive** – where the key fill signal is simply added to the keyed Program or Preview output. This mode of operation usually produces the best results provided that the fill signal is black outside of the active key area.
- **Non-Inverted/Inverted** – where the key shape can be inverted or not.

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Key Mask

Also found in the **Keyers** tab are the controls for sizing a key mask. The mask will disable the key in its active area. Move the Left, Right, Top and Bottom faders to position the mask as desired.
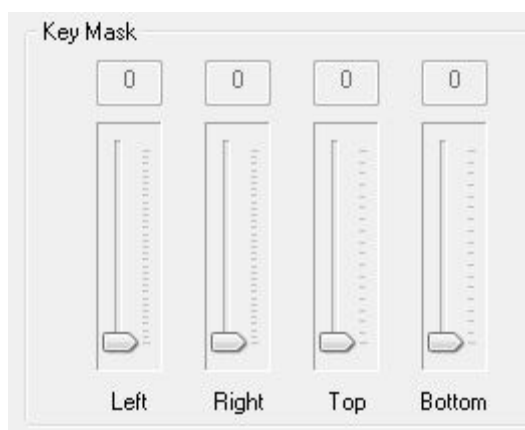
Key Processing

The **Key Processing** controls of the Keyers tab allow for individual control of the gain, offset and opacity of the three key processors.
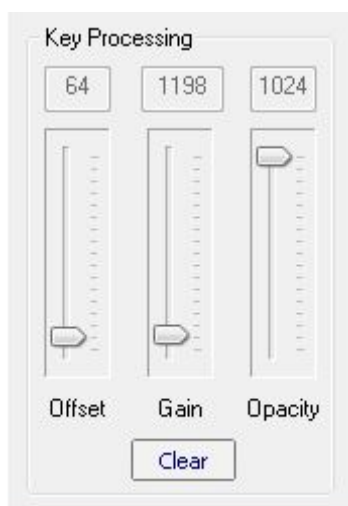
The **Offset** control adds a dc level to the key signal prior to clipping, forcing lower level parts of the key to be more active. The **Gain** control amplifies the key signal overall prior to clipping to ensure that the key has a good level. The **Opacity** control will fade the clipped key from fully on to fully off through degrees of opacity. Selecting **Clear** will return the controls to their default values.

The **Keyers** tab also contains **Key Enable** and **Key Transition** controls which are duplicates of those already explained in the **Mixer** tab description.

7.5 Players tab

The Players tab contains the animation controls. These controls are used to set the manner in which selected files are played out. The position of the graphics on-screen can also be controlled from here.

Animation

The Animation section of the Players tab controls how a stored multi-frame video such as an animated key or captured video is played. The controls are duplicated for all six of the RAM stores:

- **Stop** – Stop playing the video and freeze at the first frame.
- **Pause** – Pause the video.
- **Play** – Resume playing.
- **Normal** – Play the video once and stop at the last frame.
- **Loop** – Play the video over and over continuously.
- **Bounce** – Play the video forward until the last frame then backwards to the first frame continuously.

Stills

An animation can be moved frame-by-frame forwards or backwards, or reset to the start or end position by the controls in the Stills section of the Players tab:

- **Field** – Output repeated field during pause.

- **Frame** – Output complete frame during pause.

- **Previous** – Move backwards one frame.

- **Next** – Move forwards one frame.

- **Start** – Jump to the first frame.

- **End** – Jump to the last frame.

- **Frame Display** – indicates the frame that the animation is currently stopped on.

Mark and Trim

The Mark and Trim controls enable an animation to be trimmed. The start and end frames can be marked 'on the fly' whilst playing or when paused.

- **Mark In** – Mark the frame to be the new start of the animation.

- **Mark Out** – Mark the frame to be the new end of the animation.

- **Clear** – Reset start and end to original frames.

- **Trim** – Permanently trim the stored animation with the new start and end points.
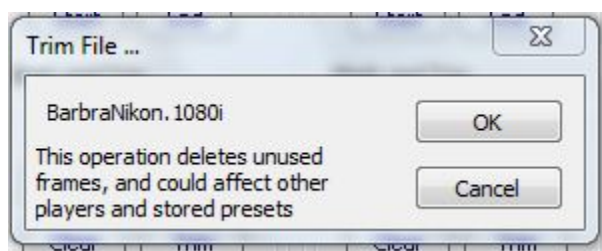
A warning message will be displayed when 'trim' is selected

Position

If any of the contents of the six RAM stores have been stored at less than full screen size, then the displayed position can be moved horizontally and vertically with the Position controls:
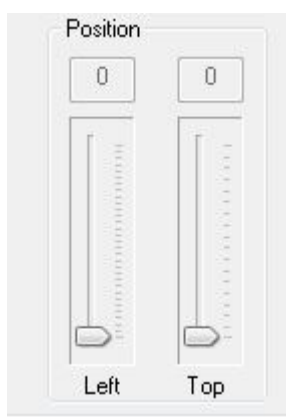
Lock RAM players

MultiLogo has the ability to lock the playout of pairs of RAM stores together.

RAM store pairs 1&2, 3&4 and 5&6 can all be locked so that one of the store pair will follow the other's playout. This is particularly useful if an animated logo key is stored in one RAM store and its fill in the adjacent pair. By locking one to the other it is guaranteed that when playing one animation the other will follow exactly. Note that when one store is locked to another it is not possible to use its **Stills** controls.

7.6 Recorders tab

MultiLogo can record fill and key signals from external video inputs using the Recorders tab.

Note: *Recording from inputs 2, 3 and 4 is available only on the MultiLogo V432.*
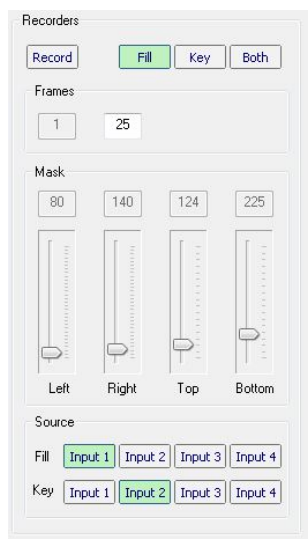
The recorder can be configured to record the fill only, key only or fill and key. Use the 'Source' box to select which inputs are to be used as the fill and key. The number of frames to be recorded should be entered into the 'Frames' box. After entering the number of frames, the 'Enter' key must be pressed to set the value.

The mask controls allow the recorded picture size to be reduced to contain just the part of the image of interest and optimise the file size.

7.7 Audio tab
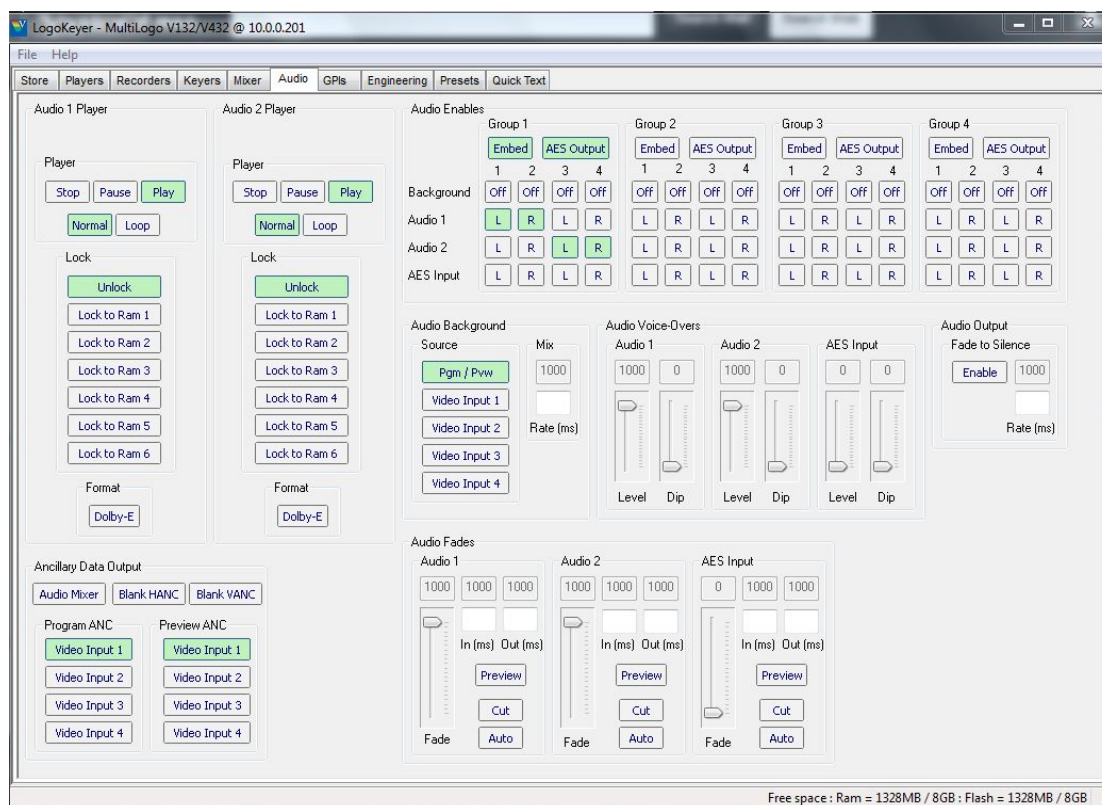
MultiLogo can embed up to four audio groups (eight stereo pairs) of audio into its video outputs. Output audio can be generated from a mix of the audio already embedded into the video input and a voiceover sourced from either the internal audio stores or (V432 models only) from an external AES input. For V432 models, two mixed audio stereo pairs can also be routed to the external AES outputs.

The input to the audio de-embedder can be selected from any of the available video inputs or the Program/Preview bus. The audio level from the stores or the external AES input can be individually controlled as can the level that the de-embedded channel will be dipped to during voice-over. Voiceover dipping of the de-embedded background signal begins as soon as an audio player starts or the external AES input passes a threshold level. If multiple voice-over sources are enabled, the background signal will be dipped to the lowest level set.

The audio tab also contains the ancillary data (ANC) controls where the source of ANC output data is selected. Here, the source of ANC data for the Program and Preview buses can be individually selected from any of the available video inputs and/or the mixer outputs. If the audio mixer is not selected all audio groups selected for the Program and Preview buses will be present on the outputs. If 'Blank HANC' is selected, all auxiliary data (including audio) is blanked before audio mixer embedding at the Program output. If 'Blank HANC' is **not** selected then input auxiliary data will be present on those channels not selected for mixer embedding.

If the background source is set to 'Pgm/Pvw' the ANC data for the Program and Preview outputs will follow the video mixer sources selected by the Mixer tab. ANC data will flip in the same way as the video but for auto transitions will mix at the rate selected by the 'Mix Rate' control. If the Program or Preview buses are switched to matte or a RAM store, the ANC data will come from video input 1.

Stored audio can be locked to any of the six video stores, making it possible to play out both files simultaneously to produce a logo with accompanying audio. If a player's audio was recorded in Dolby E format, then 'Dolby E Format' should be selected which will disable audio level control and fading for that player.

Audio Player
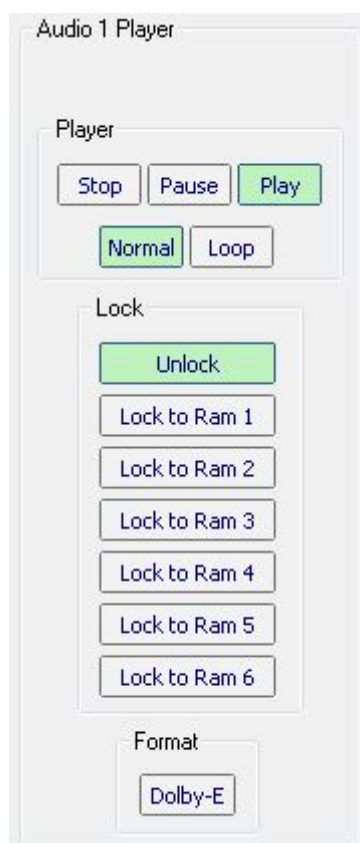
- **Stop** – Stop playout from RAM store.

- **Pause** – Pause play from RAM store.

- **Play** – Play audio from RAM store.

- **Normal** – Play out audio once only until the end then stop.

- **Loop** – Play audio continuously in a loop from beginning to end.

- **Unlock** – Audio player start and stop from Audio Player controls.

- **Lock to Ram** – Audio player start and stop to follow selected video store.

- **Dolby E** – Select if Audio Player contents recorded as Dolby E. This disables audio level control and fades.

Note: *The player controls are inactive when an audio file is locked to a video port.*

Audio Enables
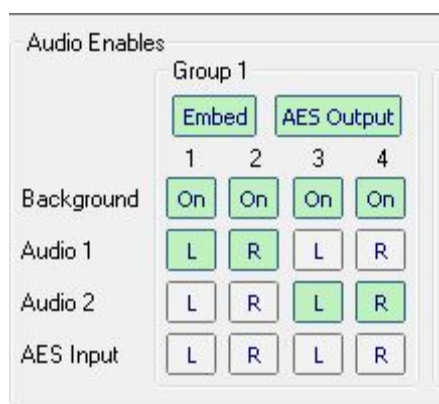
- **Embed** – Route mixer output to embedded group.

- **AES Output** – route mixer output to AES output (V432 models only).

- **Background** – select background output channels as outputs. (See Source controls below.)

- **Audio 1&2** – Select stored audio channels as outputs.

- **AES Input** – Select external AES input channels as outputs (V432 models only)..

Audio Background Source

- **Pgm/Pvw** – Select video Program/Preview selections as audio background source.

- **Video Input** – Select audio embedded in video inputs 1-4 as background source.

- **Mix Rate** – Choose audio auto transition rate (1-5000mS) for when Pgm/Pvw is selected as background source (see Mixer tab). Hit 'enter' on keyboard to load the new value.

Audio Voice-Overs
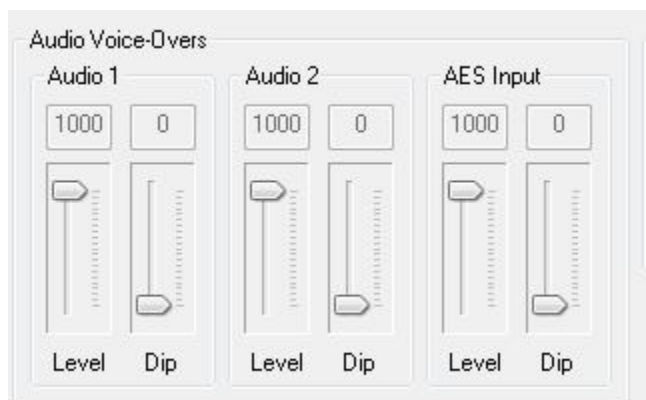
- **Level** – Set the level of playout from the Audio store or external AES input.

- **Dip** – Set the level that the background audio is automatically dipped to when the Audio store playout begins or the external AES input threshold is passed. A value of zero means the background audio will be fully faded out during voice-over.

Audio Output

- **Enable** – Select to make audio output fade to silent when Fade to Black is operated (see Mixer tab).

- **Rate** – Select the fade rate (1-5000mS) that the fade to silent will take. Hit 'enter' on the keyboard to load the new value.

Ancillary Data Output
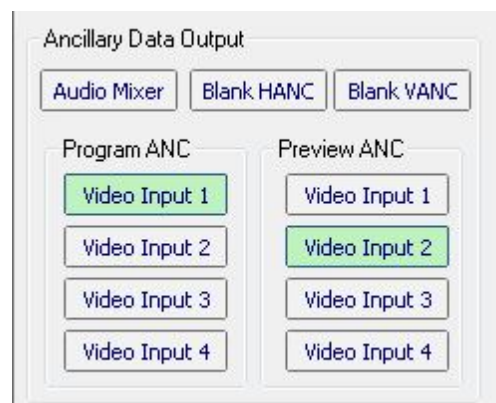
- **Audio Mixer** – Select mixer output as ANC data output.
- **Blank HANC** – Select to blank all HANC data (audio and non-audio) prior to embedding of mixer.
- **Blank VANC** – Select to blank all VANC data prior to embedding of mixer.
- **Program ANC** – Select source of auxiliary data for Program bus prior to embedding.
- **Preview ANC** – Select source of auxiliary data for Preview bus prior to embedding.

Audio Fades
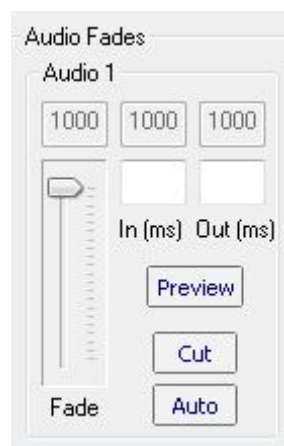
- **In** – Set transition rate (1-5000mS) for fade in of selected audio during auto transition.

- **Out** – Set transition rate (1-5000mS) for fade out of selected audio.

- **Fade** – Manually fade audio in and out.

- **Preview** – Rehearse fade on preview output embedded audio only.

- **Cut** – Make an instantaneous fade.

- **Auto** – Fade audio up or down at selected rate.

7.8 GPIs tab
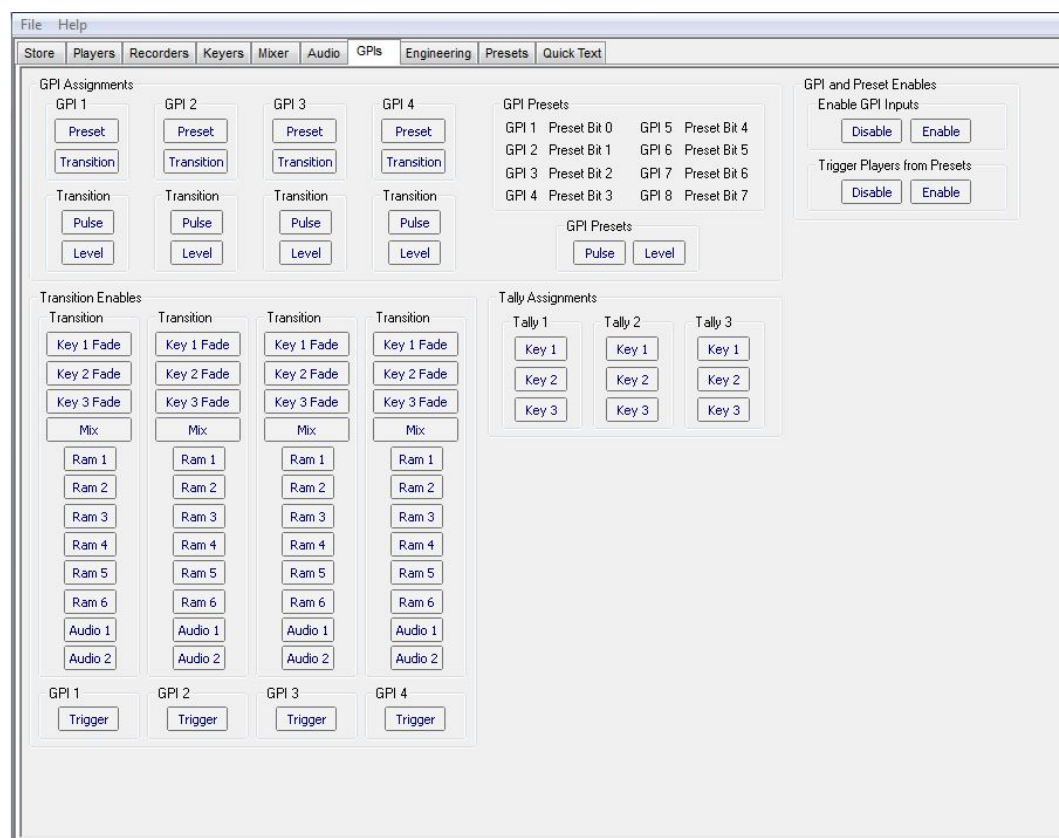
MultiLogo V132 has four GPI input lines of control and one GPI key tally output. MultiLogo V432 has eight GPI inputs and three GPI output lines for key tallies.

The GPI input lines can select either a preset recall or a transition event such as a key fade. Preset recalls are selected by the binary coding of the GPI lines – see *General Purpose Interface* for more information.

If the ML-GPI8 add-on board is fitted to MultiLogo V132 there are extra GPI inputs for the recall of eight presets and eight preset tally outputs - see *MultiLogo GPI module: ML-GPI8*.

GPI Assignments
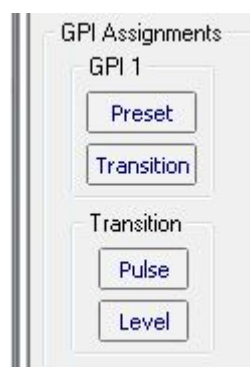
- **Preset –** Select which GPI input lines are to be active in the recalling of presets.

- **Transition –** Select which GPI input lines will trigger a transition event and not form part of the preset recall binary code.

- **Pulse –** Select momentary condition to initiate a transition event.

- **Level –** Select a latched condition to initiate a transition event.

Transition Enables
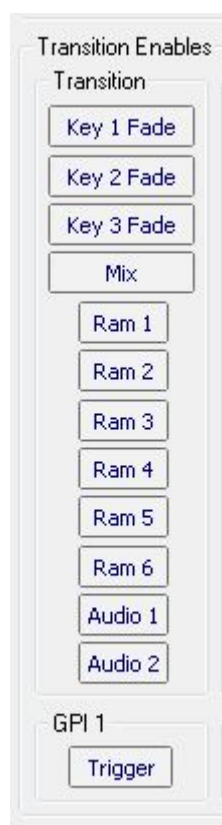
- **Key 1/2/3 Fade –** Select to perform a fade in/out of the key if a transition event is selected for the GPI input line.

- **Mix –** Select to perform a mix between the Program and Preview buses if a transition event is selected for the GPI input line.

- **Ram 1/2/3/4/5/6 –** Select to play the animation loaded into the RAM location if a transition event is selected for the GPI input line.

- **Audio 1/2 –** Select to play the audio file loaded into the RAM location if a transition event is selected for the GPI input line.

GPI Presets

GPI Presets

GPI 1   Preset Bit 0   GPI 5   Preset Bit 4
GPI 2   Preset Bit 1   GPI 6   Preset Bit 5
GPI 3   Preset Bit 2   GPI 7   Preset Bit 6
GPI 4   Preset Bit 3   GPI 8   Preset Bit 7

GPI Presets

[Pulse] [Level]

- **GPI 1/8 –** Displays whether the GPI input line is assigned as a trigger for a transition event or forms part of the binary code for preset recall.

- **Pulse -** Select momentary condition to initiate GPI preset recall.

- **Level -** Select a latched condition to initiate a GPI preset recall.

GPI and Preset Enables

GPI and Preset Enables
Enable GPI Inputs

[Disable] [Enable]

Trigger Players from Presets

[Disable] [Enable]

- **Enable GPI Inputs –** Globally enable or disable GPI inputs.

- **Trigger Players from Presets –** Enable or disable the playing of animations from preset recalls.

Tally Assignments

Tally Assignments
Tally 1   Tally 2   Tally 3

[Key 1]   [Key 1]   [Key 1]
[Key 2]   [Key 2]   [Key 2]
[Key 3]   [Key 3]   [Key 3]

- **Key1/2/3 –** For each of the tally outputs, select which key(s) when faded up will produce an output on the GPI.

7.9 Preset tab
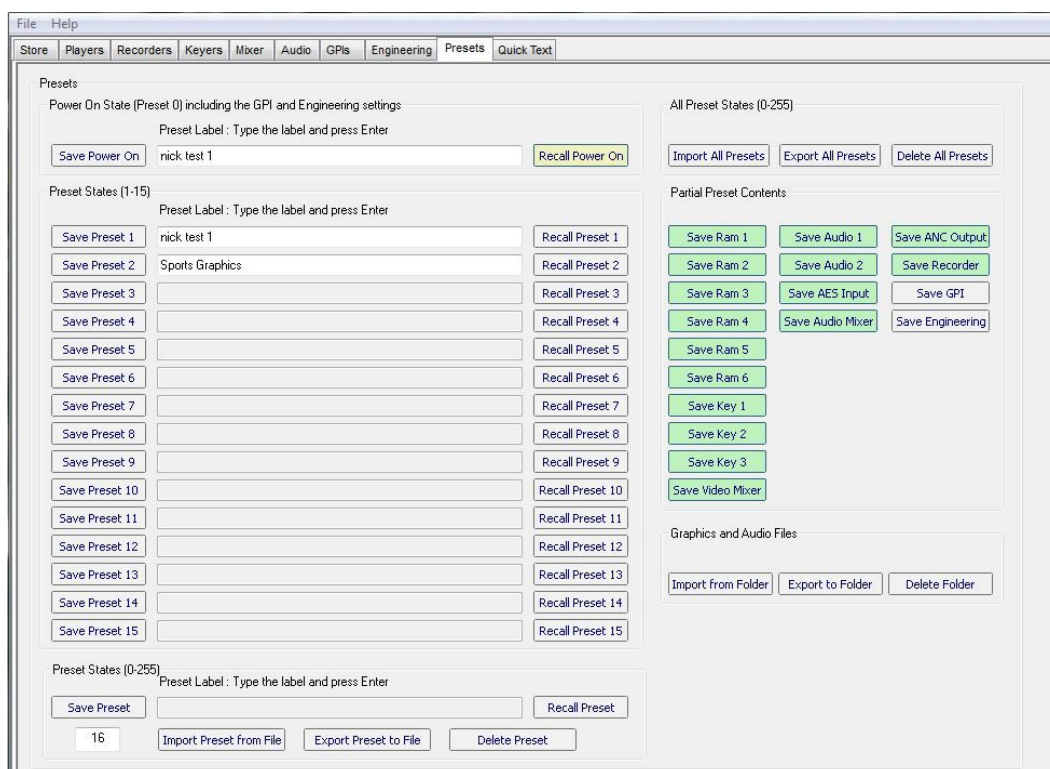
Up to 256 presets can be stored and recalled from the MultiLogo Control Software or GPI. Individual presets or the entire preset memory can also be exported to PC disk storage to be imported later.

The preset stores contain all the settings of MultiLogo including which files have been assigned to the RAM memory, the position of the keys and the key gain settings.

Some of the preset contents are labelled 'partial' and are optional as to whether they are saved or not. For instance, if a number of presets were saved with 'Save Key 1' option de-selected, then recalling them would update the other parameters but leave Key 1 settings unchanged.

The 'Save Power On' control allows you to store the state of MultiLogo as 'Preset 0' to be automatically recalled on power up. The power on state can be recalled at any time by using the 'Recall Power On' control.

To save an individual preset, first enter the desired preset location number. Press 'Save Preset', then type in the text box a label. Press 'enter' on the keyboard to save the preset. At this point the preset could be exported to PC disk by selecting 'Export Preset to File – the software will give you the option of naming the file with the 'mlp' extension. Any exported file

can be imported by firstly entering a preset location number, selecting 'Import Preset from File' and browsing to the desired, previously exported file. Once the preset has loaded selecting 'Recall Preset' will update MultiLogo's settings with the new settings. To recall a preset, simply type in the preset's location number and select 'Recall Preset'.

Clicking either the 'Import All Presets' or 'Export All Presets' buttons will open a box that prompts for a location to send the preset file to or retrieve the file from. All preset files have the extension 'mlp'. Pressing 'Delete All Presets' will delete all the on-board presets. Any locally stored copies will not be deleted.

The 'Graphics and Audio Files' panel allows a user to copy graphics and audio files from MultiLogo's RAM area to and from a PC folder.

Files that have been dragged and dropped into the lower pane of the 'Store' window can be exported in their converted state to a user-selectable PC folder by clicking on 'Export to Folder'. These and other files can be imported from the same or other PC folder by clicking on 'Import from Folder'. The 'Delete Folder' button will delete all the files currently stored in MultiLogo, including those backed up in Flash memory.
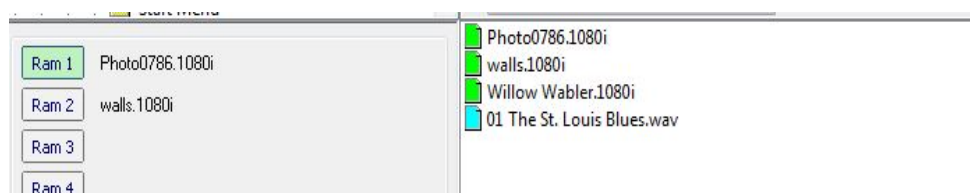
Example showing three stored graphic files and an audio file.

Windows Explorer view of files exported to PC folder.

The 'Import from Folder' button is a useful way of quickly recovering MultiLogo's graphics store after power fail. Graphics files that are backed up in Flash memory will remain, but those graphics files and audio files that reside in non-Flash memory can be copied back into the

bottom pane of the 'Store' window by importing them from a PC folder. Once the files are back in the bottom pane of the 'Store' window they can be copied to the appropriate RAM1-6 and Audio1-2 memory locations. A quick way of doing this is to recall a preset that has the latest set-up. Graphics files that reside in Flash memory will need to be re-allocated to the appropriate RAM1-6 location by manually recalling a preset, or automatically on power-up by preset 0.

7.10 Engineering tab

The engineering tab is where the genlock controls and status information can be found.
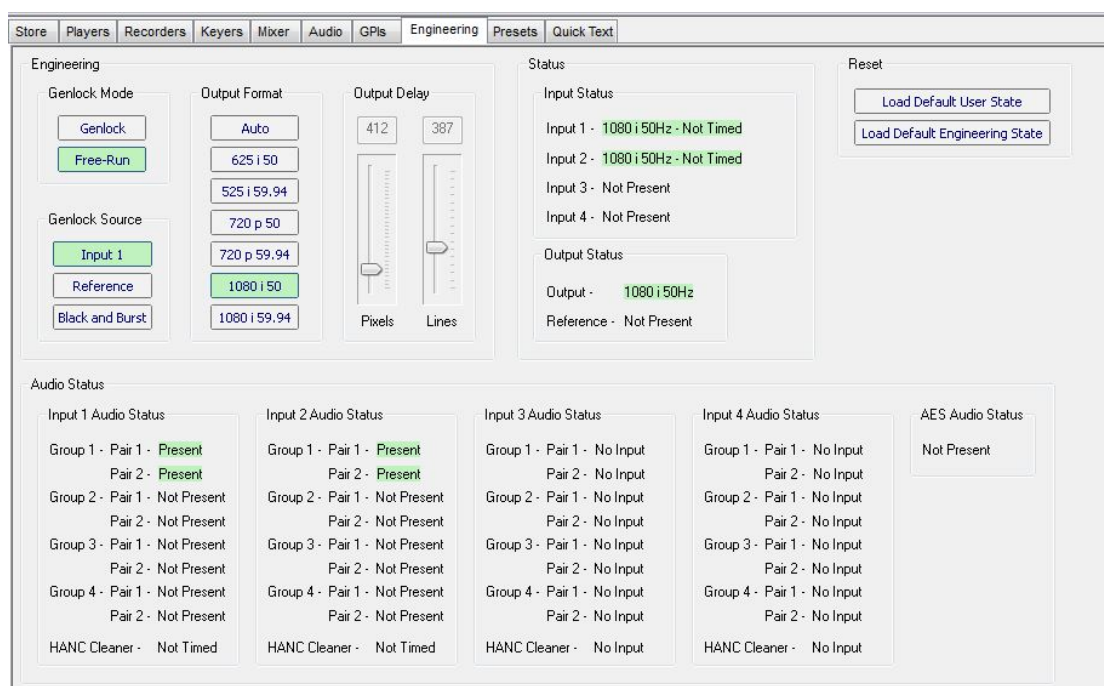
Genlock mode

MultiLogo can be left to free-run or be genlocked to the digital video connected to input 1 or to an external reference connected to the SYNC input. The SYNC input will accept bi-level, tri-level or composite Black and Burst timing reference signals. Use the Genlock source buttons to select the required source and type of reference to be used.

Output format

The output format in auto mode will follow the input format or, when an external reference is applied, the format of the external reference. In certain cases, this is not desirable, such as when the output required is an HD format and the available reference is a composite Black and Burst. To overcome this shortcoming, it is possible to force the MultiLogo to cross-lock by selecting the output format with the output format buttons. It is important to note that when cross-locking it is necessary to ensure the output format selected has the same line rate as the external reference. Output format selection will also be useful if the MultiLogo is required to work in standalone mode as a test pattern generator or logo player.

Output delay

The output delay sliders can be used to add an offset delay between the input, or external reference, to the output for system timing purposes. With both sliders set to zero the delay

between the external reference and the output will be zero, but with no external reference present the input to output delay will be the minimum processing delay through the MultiLogo.

The minimum delay from the input to the output is 6.5us for SD and 1.7us for HD. When locked to an external reference the delay through the MultiLogo 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.

Reset

- **Load Default User State** – Reset all non-Engineering Tab settings to default state leaving preset memories untouched.

- **Load Default Engineering State** – Reset all Engineering Tab settings to default state.

7.11 Quick Text tab

The simple text insertion function – Quick Text – allows text to be typed in for internal use, such as for a studio ident. The text is converted to a graphic format for sending to the MultiLogo board. Quick Text can be used with an unlimited number of characters and with any available Windows font. The text background can be any 24-bit colour and can be sized up to full screen 1080p using the box width and box height slider controls.
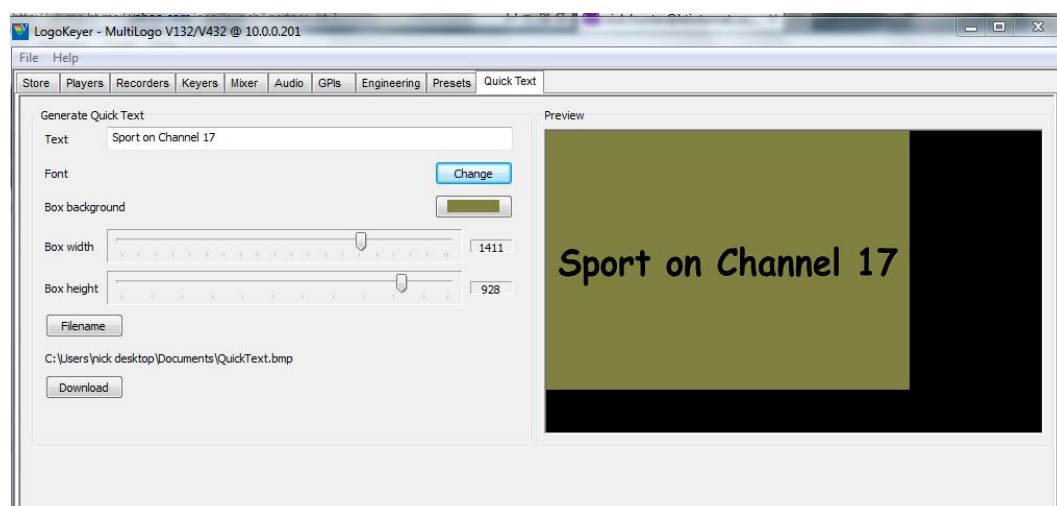
7.12 Image Converter

When installing the MultiLogo software, a programme called Image Converter is also installed. This programme will convert image sequences to the native file format required by the MultiLogo. It can also be used to extract the alpha channel from file formats that support it. During installation an Image Converter icon will have been placed on your desktop.

Using the Image Converter

Launch the Image Converter software by using either the desktop icon or the MultiLogo Control Software file menu. Once the Image Converter window has opened, the required files for conversion can be displayed by pointing the browser at the folder containing the image files.
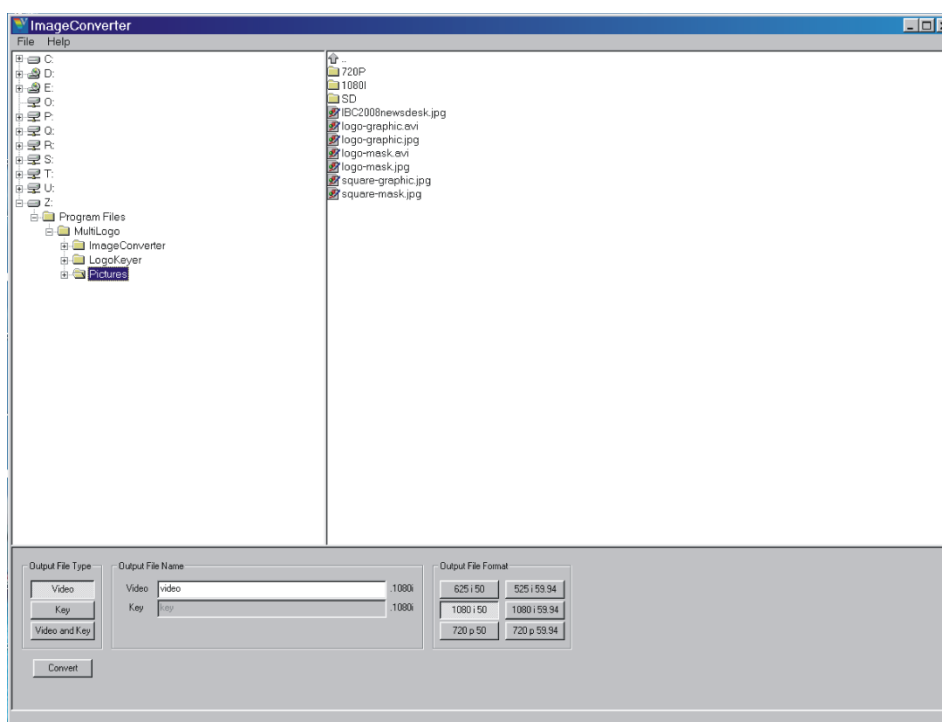
Image converter main screen

Output File Type

To make the necessary conversion, highlight the selected file. You are then required to select the proposed 'Output File Type' from the three available types. These are Video, Key and Video and Key.

- **Video** - This option is selected if the file to be converted contains the background or fill in the colour channels.

- **Key** - This option is selected if the file to be converted contains the key in the alpha channel.

- **Video and Key** - This option is selected if the file to be converted contains the fill in the colour channels and the key in the alpha channel. The conversion automatically extracts these channels and creates separate files for the video and key.

The next step is to choose a file name for the output file. This step is optional as default names will be used depending on the output file type previously selected. These will be Video and/or Key.
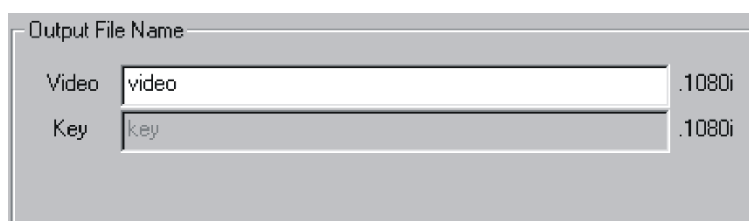
Note: *If an individual name is not applied, any previous file of the same default name will be overwritten.*

Output file format

Once the file type and name has been input, the format must be selected.

These six options are:

625i50, 720p50, 1080i50, 525i59.94, 720p59.94 and 1080i59.94.
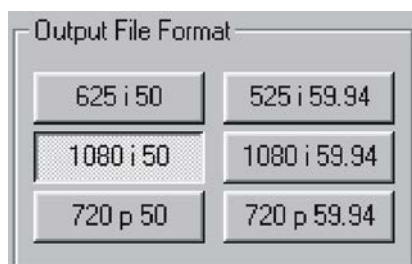
Once all selections have been made, click on 'Convert' to begin the conversion process. Upon completion a file will output using the naming that you have stipulated followed by the

output format that you have selected, e.g. video.1080i. This can then be transferred to the MultiLogo card via the MultiLogo Control Software.

Multiple image conversion

If converting multiple images into a single file you will need to highlight the entire selection:
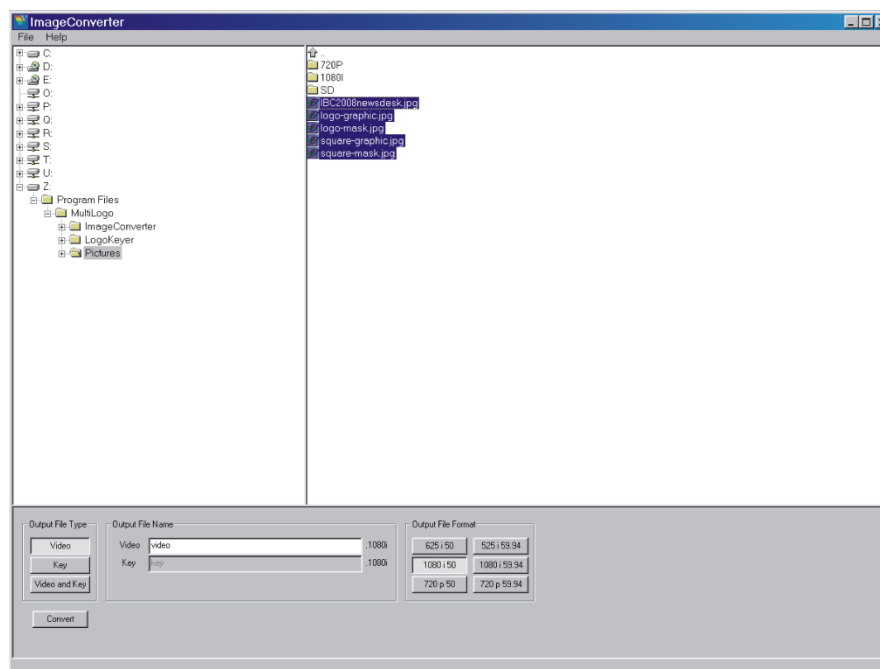
7.13 Updating MultiLogo software

On occasion new software may be released to add new features or enhance performance of the MultiLogo. All upgrades to the MultiLogo board can be carried out from a PC connected to the Ethernet connector situated on the frame rear module connected to the MultiLogo board.

Upgrading the MultiLogo board software

Note: *Before you upgrade your board you should note that during the upgrade process all items stored in the Flash and RAM will be overwritten. It is strongly recommended that you back up copies of all items stored on your board to your PC and note their assignment to the stores on the board.* ***The ability to keep files and presets during a software upgrade depends on the hardware level and the software version the card is at. Contact Crystal Vision support for further information if you need to maintain your files and settings.***

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 'File by board type' box. This will then only search for and list boards of the selected type.
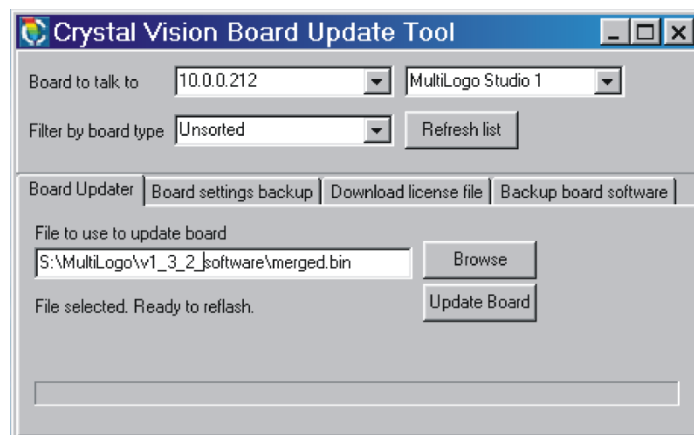
Once the board to be updated has been located, the new merged.bin file has to be located by using the browse function.

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'.*

Once the board has been upgraded you can copy back over the files needed. If you assign them back to the same storage spaces (Ram 1 etc.), all your previous presets and players should be as before the software upgrade.

Updating MultiLogo Control Software

It is first necessary to uninstall your current version of MultiLogo Control Software. To do this open your control panel and remove using the 'Add and remove programs' facility.

To install the new software, insert the disc and run the 'setup.exe' and follow the instructions as they appear. See *Installing the software* for more details.

8 Card edge operation

Once the startup initialisation procedure is complete, the MultiLogo 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.

8.1 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.

8.2 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.*

8.3 Reading card edge LEDs

Card edge LEDs may be used in conjunction with status information from any connected remote status panel display or from VisionWeb 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)	Input not present
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	

8.4 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
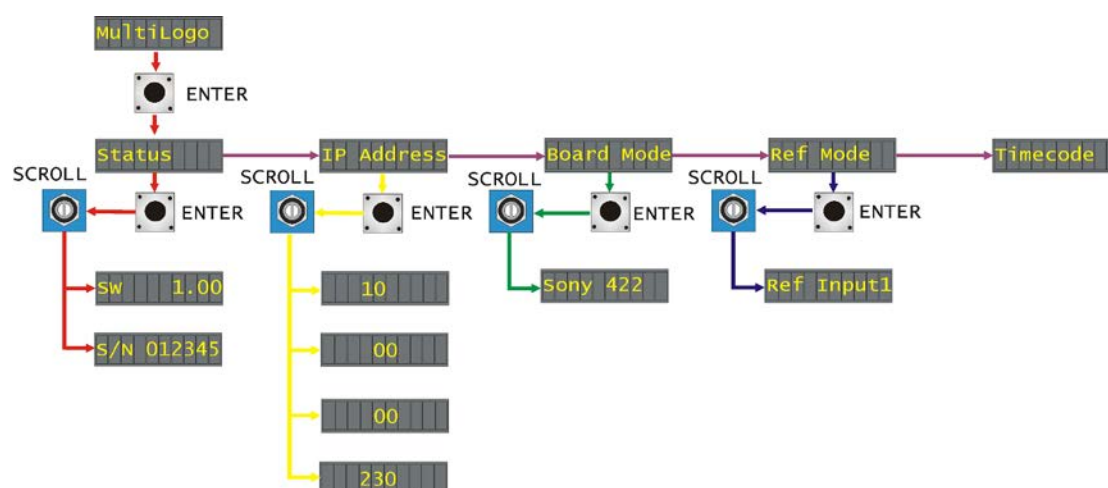
MultiLogo board edge menu structure

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 MultiLogo is currently set to.

IP Address	Menu	Comment
10	IP address 1st digits	Rotate SCROLL/ADJ to show the stored IP address. This will show the 1st three digits in the IP address. ***10**.0.0.230*
00	IP address 2nd digits	Rotate SCROLL/ADJ to show the stored IP address. This will show the 2nd three digits in the IP address. *10.**0**.0.230*
00	IP address 3rd digits	Rotate SCROLL/ADJ to show the stored IP address. This will show the 3rd three digits in the IP address. *10.0.**0**.230*
230	IP address last digits	Rotate SCROLL/ADJ to show the stored IP address. This will show the 4th three digits in the IP address. *10.0.0.**230***

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
Sony 422	2nd serial port comms mode setting	Rotate SCROLL/ADJ to show the 2nd serial port comms mode setting. Press ENTER to select ***Sony 422, Statesman, VDCP 422***

Reference Mode

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

Ref Mode	Menu	Comment
Ref Input1	Reference options	Rotate SCROLL/ADJ to show the reference options. Press ENTER to select ***Ref Input1, Ref ExtRef, Ref B & B***

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

9 Using the front control panel

At power up, the LEDs of all eight control panel keys will illuminate briefly. Once the panel has completed its power up and configuration sequence the panel will enter its status mode and display the current software version and frame IP address.

'Status' menu showing current software version and IP address

Selecting a MultiLogo

To continue with control panel operation or configuration, press the 'Device' key once. 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. Rotate the Shaft control to poll through the available cards. Use the F2 soft key to toggle between the card's serial number and issue number with modification level.

'Device' menu showing MultiLogo in slot 1.01

In the example above, the card displayed is located in the first frame in slot number 1.
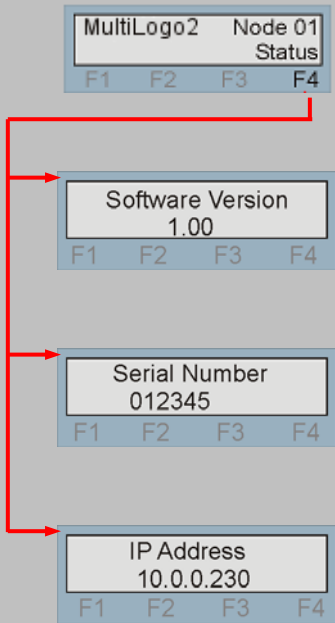
When the desired card is selected press the ENTER key to access that card's HOME menu.

MultiLogo home menu

MultiLogo has only one menu which is the Status menu. This can be reached by pressing the F4 key from the Home menu.

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

MultiLogo status menu	Description
MultiLogo2 Node 01 / Status / F1 F2 F3 F4	From the Home menu, press F4 to select the Status menu, which is then traversed by rotating the shaft control.
Software Version / 1.00 / F1 F2 F3 F4	Rotate the shaft control to view the currently fitted software version.
Serial Number / 012345 / F1 F2 F3 F4	Rotate the shaft control to view the electronically stored board serial number.
IP Address / 10.0.0.230 / F1 F2 F3 F4	Rotate the shaft control to view the current IP address.

Control Panel keys overview

The functions assigned to the control panel keys are:

- DEVICE – enters 'device' menu to select a card or show available cards.
- ASTERISK (*) – selects 'network configuration' menu.
- F1 to F4 – soft keys, only F4 currently used by MultiLogo.
- HOME – returns to top of MultiLogo's menu structure.
- ENTER – accept current selection.
- Up arrow – used to move up through the menu structure.
- Rotary control – shaft encoder used to select sub-menus or variable data.

10 Troubleshooting

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

10.1 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)	Input not present
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 reset 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

11 Appendix 1

11.1 MultiLogo via VDCP protocol

Unless noted, these commands directly affect Ram 1 only.

Transport Commands, no parameters

Play

0x1x 0x01

Plays the pre cued file/preset, if no file/preset is cued up nothing happens

Stop

0x1x 0x00

Stops the current file playing

Record

0x1x 0x02

Records the incoming video on input 1 into a file named *_clip. Recorded files only get stored into RAM and not Flash. If you want the file available after a board reboot the file will need to be saved to Flash with the Save command. Files downloaded onto the board via the PC software are automatically saved to RAM

Still

0x1x 0x04

Pauses the current clip

Commands with parameters

Jog Forwards/Backwards

0x1x 0x07

Jog forwards/backwards

A one-byte data field contains the number of frames as an 8-bit 2's complement number, or a four-byte data field contains the number of frames as a 32-bit 2's complement number

Shuttle Forwards/Backwards

0x1x 0x08

Variable speed play forwards and backwards

A three-byte data field contains the number of frames as an 8-bit 2's complement number

Jump to clip start/end

0x9x 0x08 (Crystal Vision extension)

This has one data byte with the following values:

0x00 = clip start

0x01 clip end

ID List

0x3x 0x11

Returns a list of files stored in the RAM and all presets that are available for recall. This can contain 2 to 82 data bytes

Data Byte 0x01	IDs left to send MSB
Data Byte 0x02	IDs left to send LSB
Data Byte 0x03-0xXX	Available filenames or presets (eight characters per)

up to a maximum of ten per message

Play Cue

0x2x 0x24

Cues a clip or preset ready to play when the next play command is received. An eight-byte data field contains the clip ID

If the clip ID is "Prestxxx" the previously stored preset given by the value xxx will be cued, xxx range is 1 to 255. If the given clip ID 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. The '_k' file will be played on Ram 2, with Ram 2 locked to Ram 1

If the given clip ID 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, with the audio player locked to Ram 1

Note this will only work if the filename including the suffix is not more than eight characters

Clip Length

0x3x 0x14

An eight-byte data field contains the clip ID

Returns length of a clip in four data bytes as follows:

Data Byte 0x01 Frames
Data Byte 0x02 Seconds
Data Byte 0x03 Minutes
Data Byte 0x04 Hours

Delete

0x2x 0x26

Delete a file. You cannot delete presets or active files. An eight-byte data field contains the clip ID

Save

0x2x 0x2A

Saves a file from RAM to Flash. An eight-byte data field contains the clip ID. Recorded clips only go into RAM, files downloaded onto the board via the PC software are automatically saved to RAM

Rename Clip

0x2x 0x1D

This changes the name of a clip from the existing name to a new name (eight characters max). Data bytes 0 to 8 contain the name of the existing valid ID. Data bytes 9 to 16 are the new ID. You cannot rename presets

Cue With Data

0x9x 0x25 (Crystal Vision extension)

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
Fill and Key	0x02

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 Ram 1. If Data Byte 1 is Key Only these contain the file ID of the Key. This will be played from Ram 2, locked to Ram 1

The times are all offset from the start of the clip

    Data Byte 0x0B Start Frames
    Data Byte 0x0C Start Seconds
    Data Byte 0x0D Start Minutes
    Data Byte 0x0E Start Hours
    Data Byte 0x0F Duration Frames
    Data Byte 0x10 Duration Seconds
    Data Byte 0x11 Duration Minutes
    Data Byte 0x12 Duration Hours BCD

Play with Data

0x9x 0x24 (Crystal Vision extension)

This is an extension of the play cue 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 Ram 1. If data byte 1 is key only, these bytes contain the file ID of the Key, which will be played from Ram 2. 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 Ram 2, locked to Ram 1. 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

Trim

0x9x 0x50 (Crystal Vision extension)

This has the following data bytes:

Data Byte 0x01 to 0x08 Clip ID

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

Data Byte 0x09 New Start Frames
Data Byte 0x0A New Start Seconds
Data Byte 0x0B New Start Minutes
Data Byte 0x0C New Start Hours
Data Byte 0x0D New Duration Frames
Data Byte 0x0E New Duration Seconds
Data Byte 0x0F New Duration Minutes
Data Byte 0x10 New Duration Hours

Port Status Request

0x3x 0x05

The following status bits are implemented

Data Byte 0x01 Bitmap specifying which data bytes will be returned

Bit 0x01	Port Status 1
Bit 0x02	Port Status 2
Bit 0x04	Port Status 3
Bit 0x08	Port Status 4
Bit 0x10	Port Status 5
Bit 0x20	Extended port status 3, if set get extended status for port 3
Bit 0x40	Extended port status 2, if set get extended status for port 2

The remaining data bytes depend on what is set in byte 0x01

Port Status 1

Status Byte 0x01 State and flag status

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   File/preset cued but not yet played

Status Byte 0x02 Port ID is the port open or closed

Port Status 2 Media status (short option)

Status Byte 0x01

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 2 Media status (extended option)

Status Byte 0x01

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

Status Byte 0x02

Bit 0x00   No timecode input (currently always 1)

Port Status 3 Error Status (short option)

Status Byte 0x01

Bit 0x00   unsupported
Bit 0x01   unsupported
Bit 0x02   unsupported
Bit 0x03   unsupported
Bit 0x04   unsupported
Bit 0x05   Disk Full
Bit 0x06   unsupported
Bit 0x07   unsupported
Status Byte 0x02 unsupported
Status Byte 0x03 unsupported

Port Status 3 Error Status (extended option)

Status Byte 0x01

Bit 0x00   unsupported
Bit 0x01   unsupported
Bit 0x02   unsupported

Bit 0x03   unsupported
Bit 0x04   unsupported
Bit 0x05   Disk Full
Bit 0x06   unsupported
Bit 0x07   unsupported

Status Byte 0x02 unsupported
Status Byte 0x03 unsupported
Status Byte 0x04 unsupported
Status Byte 0x05 unsupported
Status Byte 0x06 unsupported

Port status 4 Port settings

Status Byte 0x01 returns 0x10 digital input

Port status 5 Video compression

Status Byte 0x01 returns 0x00 all file types may be played

Position Request

0x3x 06

Returns current time code of clip playing in Ram 1. This has the following data bytes:

Data Byte 0x01 Time type (this is always 0x02 which is zero-based time code of the current frame expressed as an offset from the start)

Data Byte 0x02 Frames
Data Byte 0x03 Seconds
Data Byte 0x04 Minutes
Data Byte 0x05 Hours

Sense

0x3x 10

Returns system status. This has the following data bytes:

Data Byte 0x01 Bitmap specifying which data bytes will be returned

Bit 0x00   SYSTEM_STATUS_1
Bit 0x02   SYSTEM_STATUS_2
Bit 0x04   SYSTEM_STATUS_3
Bit 0x08   SYSTEM_STATUS_4
Bit 0x10   SYSTEM_STATUS_5
Bit 0x20   SYSTEM_STATUS_6
Bit 0x40   Extended bit if set SYSTEM_STATUS_1 and SYSTEM_STATUS_2
will return the extended options otherwise the short options

The remaining data bytes depend on what is set in byte 0x01

SYSTEM_STATUS_1 Storage time remaining (short option)

Status Byte 0x01   Frames
Status Byte 0x02   Seconds
Status Byte 0x03   Minutes

Status Byte 0x04   Hours
Largest contiguous block
Status Byte 0x05   Frames
Status Byte 0x06   Seconds
Status Byte 0x07   Minutes
Status Byte 0x08   Hours

SYSTEM_STATUS_1 Storage time remaining (extended option)

Status Byte 0x01   Frames
Status Byte 0x02   Seconds
Status Byte 0x03   Minutes
Status Byte 0x04   Hours
Status Byte 0x05   Hours x 100
Status Byte 0x06   Hours x 10000
Largest contiguous block
Status Byte 0x07   Frames
Status Byte 0x08   Seconds
Status Byte 0x09   Minutes
Status Byte 0x0A   Hours
Status Byte 0x0B   Hours x 100
Status Byte 0x0C   Hours x 10000

SYSTEM_STATUS_2 Number of IDs stored (short option)

Status Byte 0x01   Presets stored MS Byte
Status Byte 0x02   Presets stored LS Byte

SYSTEM_STATUS_2 Number of IDs stored (extended option)

Status Byte 0x01   Presets stored MS Byte
Status Byte 0x02   Presets stored Byte 2
Status Byte 0x03   Presets stored Byte 3
Status Byte 0x04   Presets stored LS Byte

SYSTEM_STATUS_3 Disk status

Status Byte 0x01

Bit 0x00   Disk full
Bit 0x01   System Down (unsupported)
Bit 0x02   Disk down (unsupported)
Bit 0x04   Remote control disabled (unsupported)

SYSTEM_STATUS_4 Subsystem status (unsupported)

Status Byte 0x01

Bit 0x00   Archive available
Bit 0x01   Archive full

Status Byte 0x02

Bit 0x00   Local offline storage available
Bit 0x01   System offline storage available
Bit 0x02   Local offline storage full
Bit 0x04   System offline storage full

SYSTEM_STATUS_5 Standard time (unsupported)

Status Byte 0x01   Frames
Status Byte 0x02   Seconds
Status Byte 0x03   Minutes
Status Byte 0x04   Hours

SYSTEM_STATUS_6 Signal full level (unsupported)

Status Byte 0x01   % to signal full level

12 Specification

General

MultiLogo V132

Dimensions	100mm x 266mm module with DIN 41612 connector
Weight	200g
Power consumption	12.5W

MultiLogo V432

Dimensions	'Double decker' 100mm x 266mm module with DIN 41612 connector
Weight	300g
Power consumption	16W

Inputs

MultiLogo V132

One SD/HD input

One external analogue reference input

MultiLogo V432

Four SD/HD inputs

One external reference input

One AES input

Video	HD or SD SDI 270Mb/s to 1.485Gb/s serial digital compliant to SMPTE 259 and SMPTE 292-1
	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
External reference	Composite Black and Burst, bi-level and tri-level syncs
Return loss	-15dB for 50MHz to 1.5GHz

Outputs

Number and type:	One main and one preview output, reclocked SDI 270Mb/s - 1.485Gb/s to SMPTE 259 and SMPTE 292-1
	Output follows input format
	Belden 8281 or equivalent
	HD (1.485Gb/s) – 100m
	SD (270Mb/s) >250m
	Two AES stereo MultiLogo V432 with RM34
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	4 GB version: 2 x 2 GB multi-port video store DRAM and Flash
	8 GB version: 2 x 4 GB multi-port video store DRAM and Flash
GPIs	Three GPIs are available to provide eight different recalls of board setup
	One is available to provide Program/Preview mix
	Active pull to ground, pulled up to +5V through 10k resistor
Look-ahead preview	Duplicate keyer functions allow the Aux output to be used to preview the next state and the translation to that state before being applied to the main output
Operating system	uCLinux

Keying

Three keyers can independently bring up three graphics and associated keys from the internal or external sources

Separate gain, lift and opacity controls for each keyer

Additive and multiplicative keying

Separate key signal or self keyed

Delay through board

The minimum delay from the input to the output is 6.5us for SD and 1.7us for HD. When locked to an external reference the delay through the MultiLogo will be 0.0us plus any user set delay. Using input 1 as the reference source will give the minimum day plus any user set delay.User set offset delay, up to one video line

Status

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

Remote control

MultiLogo Control Software allows advanced control of the logo keyer

Basic control from frame active panel and remote panel

VisionWeb Control is available via the web server on the frame and allows basic operation using a standard web browser on a PC or tablet

Statesman Lite allows basic control from any PC on a network

SNMP control and monitoring via frame CPU and Ethernet connection

Graphics software

Drag and drop software running on graphics PC

Auto convert most common graphics file formats to required MultiLogo format