# MultiLogo

## HD/SD logo keyer

# USER MANUAL

Crystal Vision

# Contents

| Revision 1. | Image converter information added. Software update information added. Board edge menu updated. | 14-11-08 |
| Revision 2. | RM44 information added. RM52 information amended. | 09-01-09 |
| Revision 3. | Information added for MultiLogo V131 & V431 RM44 information removed. No longer supported. PC controller and updater software updated. | 21-04-09 |
| Revision 4. | Paragraph 2 of audio operation amended. Page 6 | 08-07-09 |
| Revision 5. | Reference and comms mode selection added to board edge. Software version 1.33 | 21-07-09 |
| Revision 6. | | 09-10-09 |
| Revision 7. | GPI recall table amended to show preset bit 3. Page 10 | 26-11-09 |
| Revision 8. | GPI information updated to reflect new V1.38 software. Section 3.4 now shows new features of V1.38 software. | 19-01-10 |

| Revision 9. | Appendix 1 VDCP protocol information added.<br>Appendix 2 ML-GPI8 information added. | 03-06-11 |
| Revision 10. | Additional RM52 information added. Page 9. | 30-06-11 |
| Revision 11. | Support added for Quick Text and Preset Import/Export. | 18-01-12 |
| Revision 12. | RM52 diagram amended. Page 9. | 16-11-12 |

# 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 V131 with a single HD/SD video input and the MultiLogo V431 that has four HD/SD video inputs. Both versions are available with either 4 GB of video store or 8 GB of video store.

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 V431 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 100 MB Ethernet directly onto the board via its dedicated rear module RJ45 Ethernet connection.

MultiLogo is designed for branding HD or SD stations, but for people who just need one station ident the V431 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.
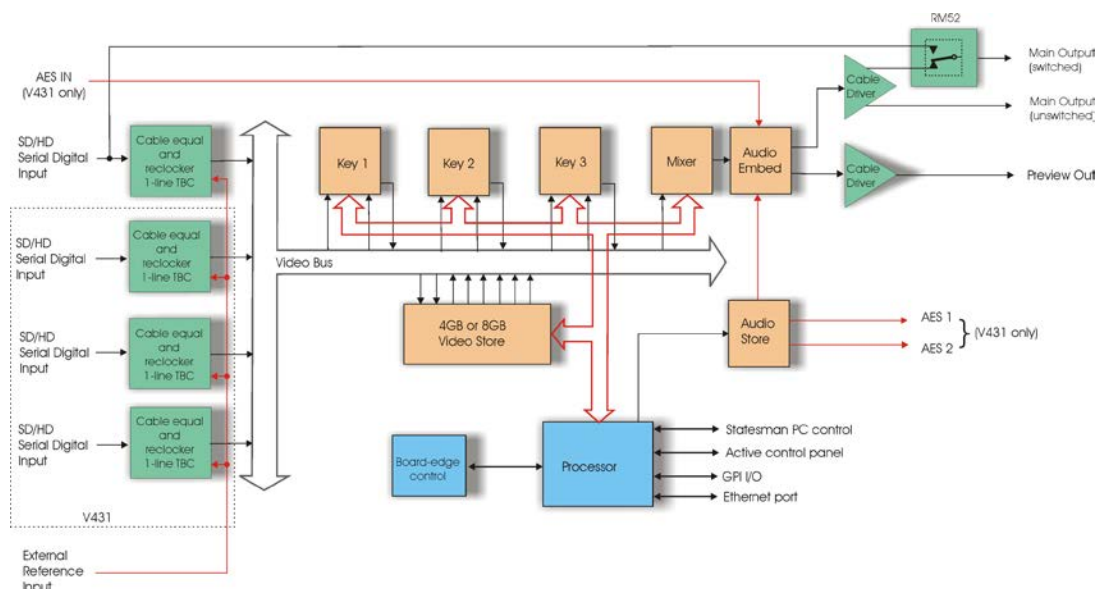
MultiLogo's main features are:

- Modular logo keyer, available in two versions with either 4 GB or 8 GB of video store
- Three layers of keying
- Eight-port video store with DRAM and Flash memory
- Graphics can have separate key signal or be self-keyed
- Additive and multiplicative keying
- Up to four configurable external inputs for live video (MultiLogo V431)
- Drag and drop PC software for auto conversion of graphics from any format
- Fast transfer of graphics from PC to board over 100 MB 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
- Can be used as a dual channel logo keyer where one layer of keying is required (MultiLogo V431)
- Relay bypass protection of main input (RM52)

MultiLogo 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. MultiLogo V131 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 V431 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

The MultiLogo will automatically switch between SD-SDI and HD-SDI inputs.

**Note:**    All inputs of the MultiLogo V431 must be of the same standard and co-timed to within one line.

The output video standard can be fixed so that the 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 the 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 TBCs and external reference ensures that the output will remain stable after a hot cut from an upstream switch.

## Ancillary data

Output ancillary date 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

Audio data can be transferred to and from the board via Ethernet using the PC drag-and-drop software. A single audio group can then be embedded into the video outputs. Audio routing of the stereo pairs will then allow the selection of which of the possible sources are embedded. The 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.

Although not currently supported, the MultiLogo V431 has the facility to take an external stereo AES input to be embedded or recorded. Two audio pairs selected for embedding will also be output as two pair of AES. MultiLogo will only embed a single group of audio into its output video, Audio 1 will be placed as channels 1 and 2, and Audio 2 will be placed as channels 3 and 4. The audio is always embedded as group 1.

# 2 Hardware installation

The MultiLogo V131 single height module uses the RM52 rear connector that will fit into all Crystal Vision rack frames. The MultiLogo V431 is a 'double decker' module that uses an RM52 plus RM34 rear module. The MultiLogo V431 takes up two frame slots. All modules can be plugged in and removed while the frame is powered without damage.

## 2.1  Module configuration
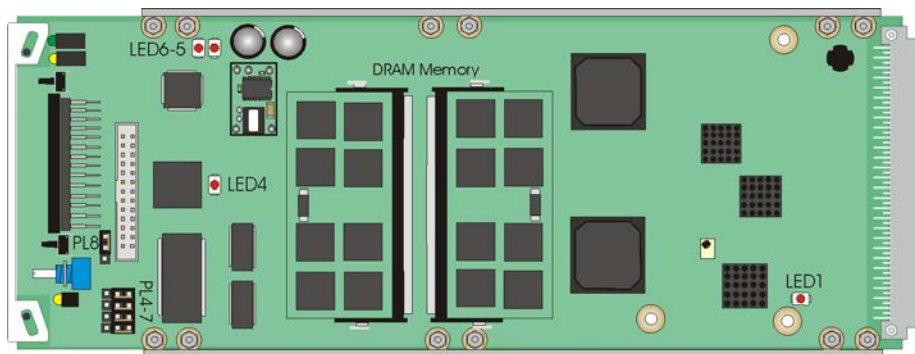


*MultiLogo V131*



*MultiLogo V431*
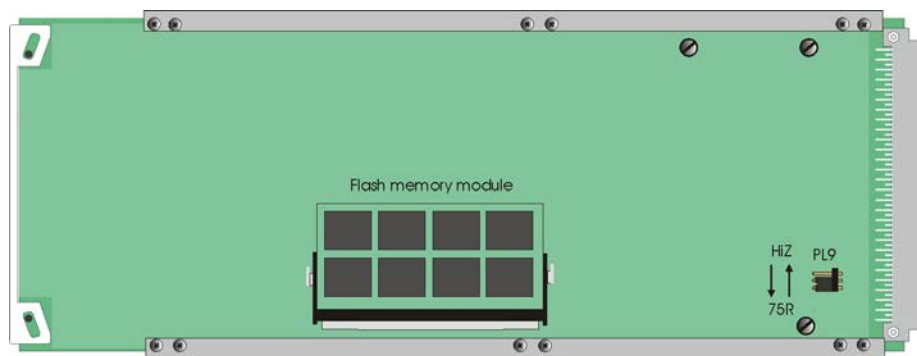
*MultiLogo V131/431 underside showing the Flash memory module fitted*
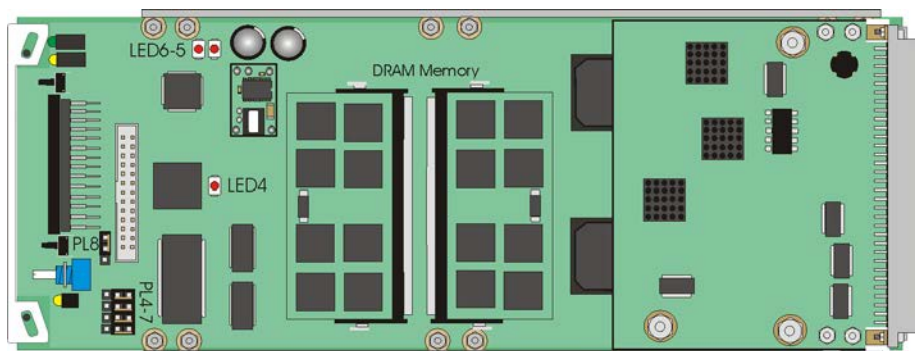
### Link configuration and LEDs

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.

|  | **Comment** |
|---|---|
| PL4, PL5, PL6, PL7 | GPI/RS422 comms |
|  | GP1 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 or 12 double height modules with up to three power supplies. The Indigo 2 2U frame will house up to 12 single height or six double height modules and dual power supplies. The Indigo 1 1U frame will house six single height or three double 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 or one double height modules.

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

## Rear module connections with RM52
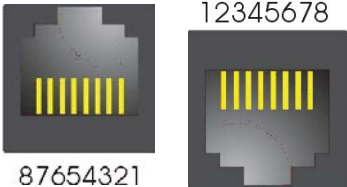
The RM52 is a single height module that is used for the MultiLogo V131 and as the lower rear connector for the MultiLogo V431.

| RM52 rear module connector | Description |
|---|---|
|  | **RM52**<br>• 24 MultiLogo V131 modules per Indigo 4 frame<br>• 12 per Indigo 2 frame<br>• 6 per Indigo 1 frame<br>• 2 per Indigo DT<br>• All frame slots can be used |

| RM52 individually retained rear module connector | Description |
|---|---|
|  | **RM52**<br>• 24 MultiLogo V131 modules per Indigo 4 frame<br>• 12 per Indigo 2 frame<br>• 6 per Indigo 1 frame<br>• 2 per Indigo DT<br>• All frame slots can be used |

| BNC | I/O assignment |
|---|---|
| **Ethernet connector** | Ethernet control from PC |
| **RJ45 connector** | RS422 control from control panel |
| **SYNC IN** | External analogue reference input |
| **PREVIEW OUT** | Preview output (serial digital) |
| **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 | |
|---|---|
|  | **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 V431.

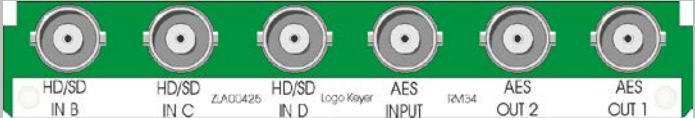| RM34 rear module connector | Description |
|---|---|
|  HD/SD IN B   HD/SD IN C   ZA00425   HD/SD IN D   Logo Keyer   AES INPUT   RM34   AES OUT 2   AES OUT 1 | **RM52 + RM34**<br>• 12 MultiLogo V431 modules per Indigo 4 frame<br>• 6 per Indigo 2 frame<br>• 3 per Indigo 1 frame<br>• 1 per Indigo DT<br>• Alternate frame slots can be used |

| BNC | I/O assignment |
|---|---|
| **AES OUT 1** | Not currently supported |
| **AES OUT 2** | Not currently supported |
| **AES INPUT** | Not currently supported |
| **HD/SD IN D** | Configurable High Definition/Standard Definition serial digital input |
| **HD/SD IN C** | Configurable High Definition/Standard Definition serial digital input |
| **HD/SD IN B** | Configurable High Definition/Standard Definition serial digital input |

# 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.

## GPI functionality for V1.38 software and above

V1.38 software has extensively enhanced the GPI control options on the MultiLogo. 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 V131 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').

The MultiLogo V431 has the same GPI assignment on the main PCB. However, the top PCB has an extra four GPI lines for preset recall control. There are also two additional tally out lines.

## GPI lines for MultiLogo V131 or main board of MultiLogo V431

| 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 V431

| 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** | Tally pulls to ground when key is on |
| 'f' | **Tally 3 out** | |

## Recalling stored presets using the GPIs (V131 or V431 main board)

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.

| Recall Preset | No change/ Power on | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GPI 1 'a' | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| GPI 2 'b' | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| GPI 3 'c' | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| GPI 4 'd' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

'0' = default state of GPI (+5V). Pull to ground to action a change.

If the GPIs are set to be pulse (momentary) driven, no change to the preset recalled will occur when all GPIs are open (0000).

If the GPIs are set to be level (latch) driven, all GPIs open (0000) recalls the power on state.

The top PCB of the MultiLogo V431 provides additional recall preset control lines if more than 15 presets need to be recalled via GPI.

## 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 connections 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 V431 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 V431 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.

If you want to wire GPIs to recall the additional presets the MultiLogo V431 provides, you need to connect to GPIs 'a', 'b', 'c' and 'd' for the slot position that the top PCB of the MultiLogo V431 is located in.

**Note:** The GPI controls need to be enabled using the MultiLogo PC control GUI.

Contact Crystal Vision if your MultiLogo software is earlier than V1.38 as the GPI operation is somewhat different.

## 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 | Upper | 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 | Lower | 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.

Example connections: If a MultiLogo V431 was located in slot position 1 & 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.

# 3 PC control

The MultiLogo is shipped with Crystal Vision's own drag and drop software that allows easy board control and files conversion.
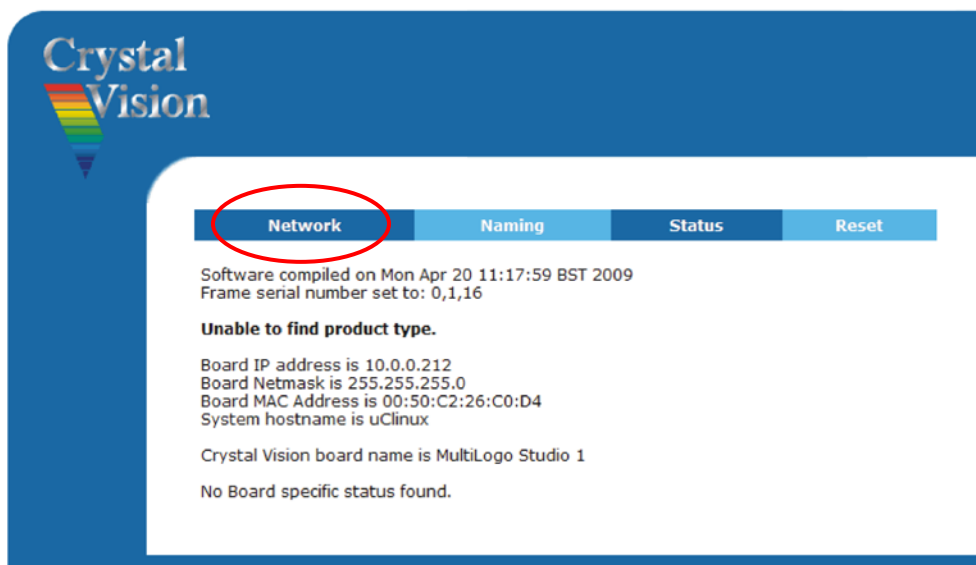
## 3.1  Resetting IP address

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.
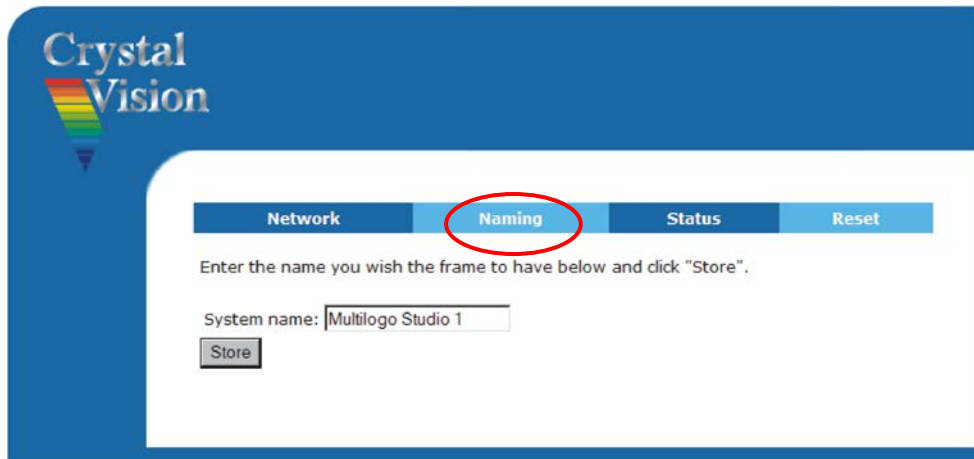
Once the information has been entered click 'Store'. You will then need to reboot the card to complete the update. The card can be rebooted by either using the reset page or withdrawing from the frame and reinserting. Make sure PL8 near the front of the board is not in the Force IP Address position when 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 Viking web browser. This is used on Crystal Vision front panels only.

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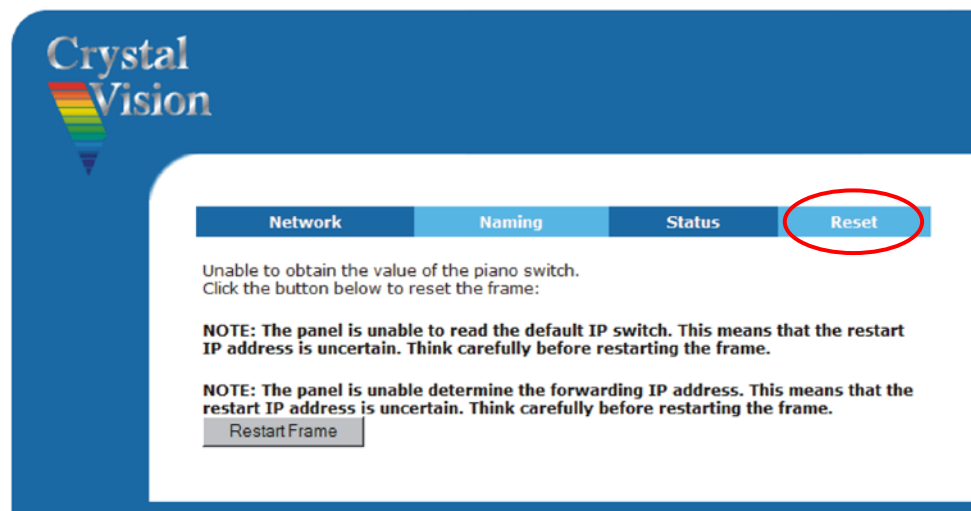
As well as having a discrete IP address it can be useful to give a frame its own unique name, perhaps to reflect its location. The naming tab allows this with up to 20 characters and no spaces.



## 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.

## 3.2  Installing operating software

Run the 'Setup.exe'

Click 'Next'



**Note:**  MultiLogo shares the same operating software as the Clip N Key. Installing this software will automatically place a shortcut for both MultiLogo and Clip N Key on the desktop.

To continue with the default options click 'Next', otherwise change the options to suit your needs.



Click 'Next' to start the installation process.

The software will now be installed to a folder on your computers C: drive. Should a different location be preferred, browse to that location before proceeding to the next step.
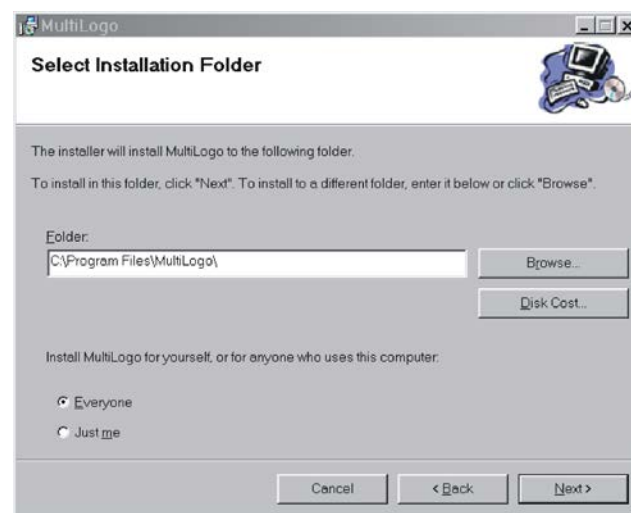


Once the installer has completed click 'Close'
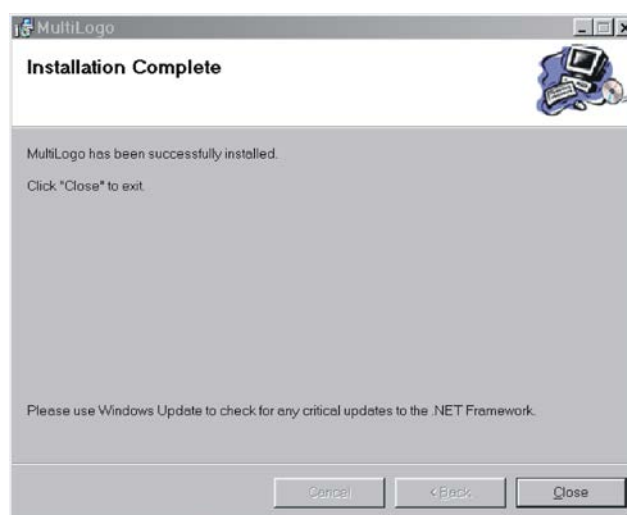
### Pointing the LogoKeyer software at the boards

Upon installation a shortcut is placed on the desktop called LogoKeyer. This shortcut needs to be pointed at the board's IP address in order to communicate. To do this:

1. Right click on the shortcut and select 'Properties'.

2. After the text "C:\Program Files\LogoKeyer\Release\LogoKeyer.exe" in the target field, enter a space followed by the IP address of the board you wish to control.

3. Click 'Apply' then 'OK'.

To run the software simply double-click on the icon.

If you have more than one board in your system you can create multiple icons to control multiple boards. To do so copy the shortcut and follow the instructions above but replace the IP address for the board you wish to control.

# 3.3  Uploading files into RAM and Flash storage

You can upload still and moving images on to both the Flash and RAM storage.

1. Open the LogoKeyer software.

2. 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 simple drag and drop into the lower pane.
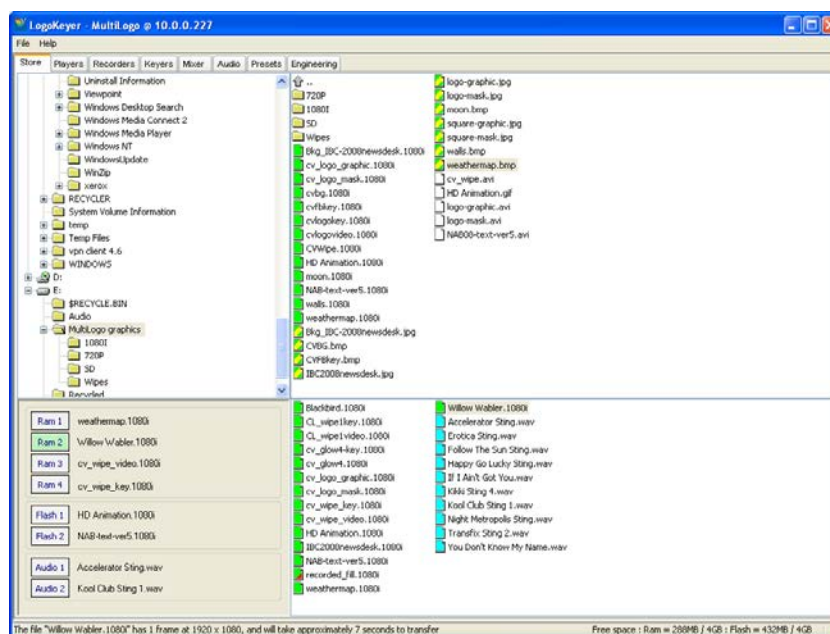
The special drag and drop software will convert most common graphics file formats to the format required by the MultiLogo. The supported file types are: BMP, JPG, WAV (audio), TAGA, PNG and SGI. Other file formats can be supported but require conversion using the image converter software supplied. See section 3.2 for details on how to use the image converter software.

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 the PC folder.

*Red corner*

> Any icon showing a red corner indicates a file in RAM only, this file would be lost should the power be removed. 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;
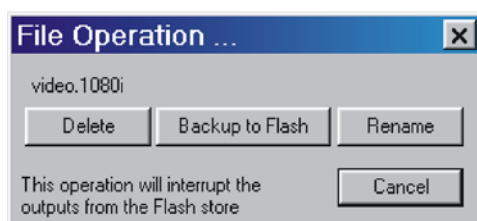


## Viewing the cards' RAM and Flash sources

> Once you have assigned the RAM and Flash stores images you can then assign these to the keys.

> 1.  Click on the 'Mixer' tab.  The mixer tab allows you to switch between multiple sources.
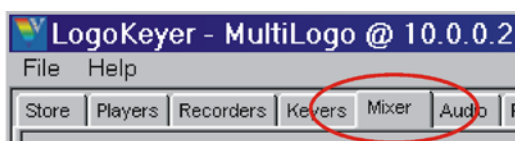


> 2.  Click on the appropriate source under the key you are creating. If it is from the RAM or Flash source the file name is displayed on the right.
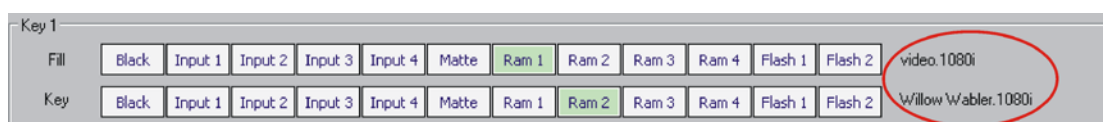


> 3.  You then select this key to be displayed on the foreground for the Program or the Preview by toggling the appropriate button.
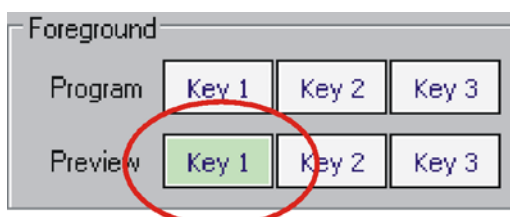
## Setting the Key gains

The Keyers tab contains the controls to set the gain and mode for each of the three keyers. Each of the three keyers has a duplicate set of controls.
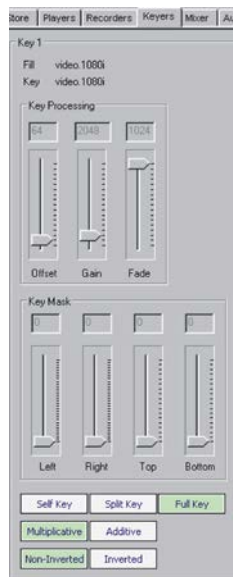


Both the key processing and key mask parameters are set by adjusting the slider controls. To make an adjustment left-click the mouse on the slider bar and drag. The numerical position of the slider control is shown in the window above each slider.

The Key mode is selected by clicking on the required mode button. The available section is Self Key, Split Key and Full Key.

Self Key will use the luminosity in the fill signal to generate the key information. Whereas Split Key uses both the fill and key signal to generate the key.

Full key does not use a key signal but internally generates a full frame peak white signal to force the key.

## Animation controls and positioning the graphics from the memory stores

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

If two adjacent stores are outputting the Fill and Key signal e.g. RAM 1 = Fill & RAM 2 = Key then the stores should be locked together when changing the position e.g. lock the position of RAM 2 to RAM 1 using the 'Lock to RAM 1' control.
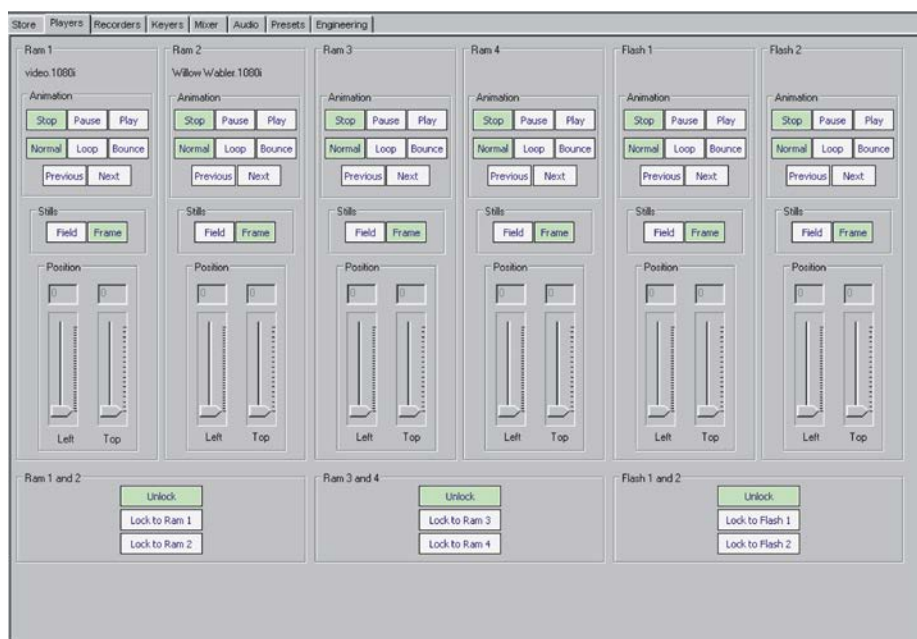
## Recording from external video inputs

The 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 V431.
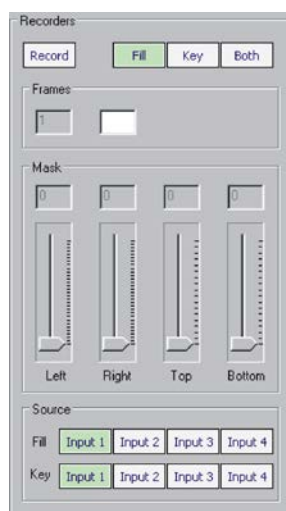


The recorder can be configured to record the fill only, key only or fill and key. Use the 'Source' box to select which inputs are to be used as the fill and key. The number of frames to be recorded should be entered into the 'Frames' box. After entering the number of frames, the 'Enter' key must be pressed 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.

## Audio and ancillary data controls

MultiLogo can embed up to four channels (two stereo pairs) of audio into a single group on its output video. The ability to lock the audio to video makes it possible to play out both files simultaneously to produce a logo with accompanying audio.

As well as the audio controls the audio tab also contains the ancillary data controls. By selecting the source ancillary, data will be passed directly from the selected input to the outputs. If an audio source is selected the ancillary data will be blanked before the audio insertion.
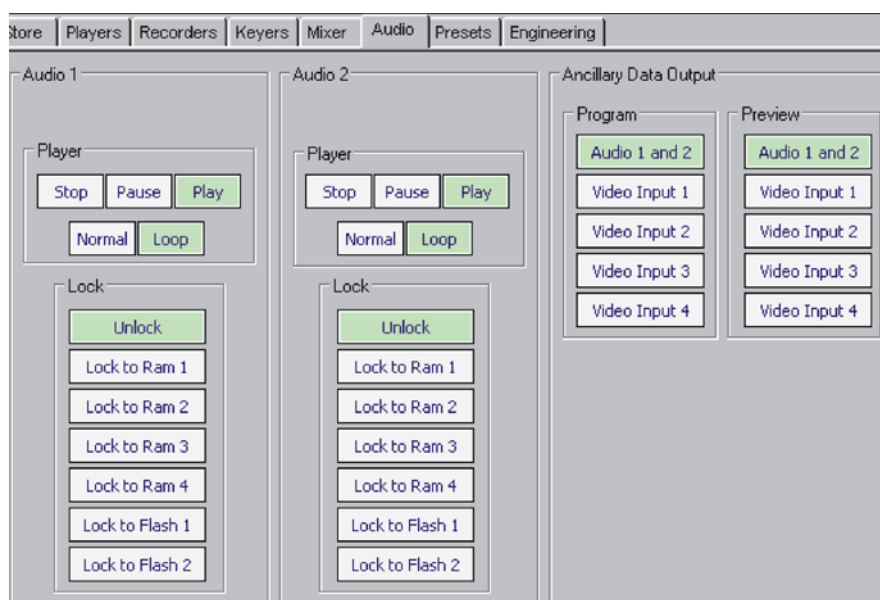


**Note:**       The player controls are inactive when an audio file is locked to a video port.

## Saving and recalling presets



Up to seven presets can be stored allowing recall from the MultiLogo Control Software or GPI. The presets store the current state of the MultiLogo including what files have been assigned to the RAM and Flash memory, the position of the keys and the key gain settings.

The 'Save Power On' control allows you to save the state of the MultiLogo after power up. This can then be recalled using the 'Recall Power On' control, useful if you want to get back to the power on state.

Please note that in later software versions (V1.38 onwards), 255 presets can be saved.

## Engineering

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 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.
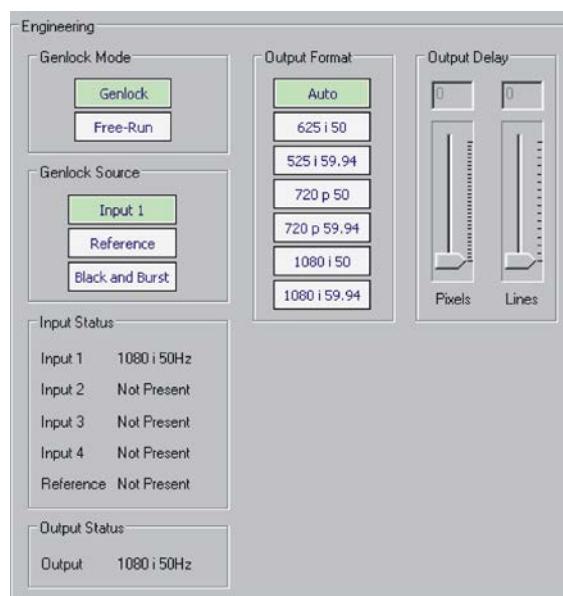
# 3.4  New features added in V1.38 software

## Players Tab

With V1.38 software it is possible to set mark in/out points and trim video clips stored in the RAM and flash memory.
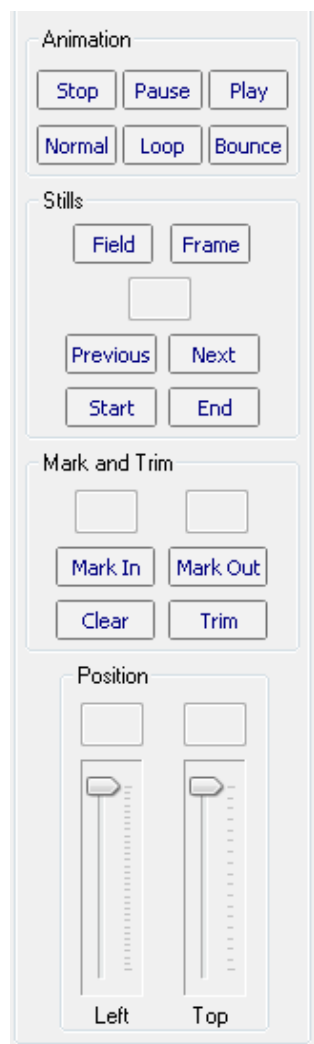
Use the 'Stills' controls to select where you want the clip to start. Set this as the Mark In point using the 'Mark and Trim' controls. Repeat the process for where you want the clip to end i.e. the Mark Out point. The clip will now only play between these markers.

Clicking clear will remove the Mark In/Out points.

Clicking Trim **will permanently trim the clip** to the selected Mark In/Out points.

# Keyers Tab

With V1.38 software the key layers can now also be turned on in the Keyers tab. Key fade controls have also been added to this tab along with the ability to clear the offset, gain and opacity back to its factory default.

Use the 'Key Enable' controls to turn the key on or off on the Program and Preview outputs.

Clicking Clear on the 'Key Processing' controls will set the key gain back to unity.

The 'Key Transition' control allows you to fade or cut the key on and off. You can simulate a manual fade using the slider.

## GPIs Tab

V1.38 software has extensively enhanced the GPI control options on the MultiLogo. 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 V131 has four GPI lines for control. These are GPIs 1, 2, 3 and 4 or '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').

The MultiLogo V431 has the same GPI assignment on the main PCB. However the top PCB has an extra four GPI lines for control. These are GPIs 5, 6, 7 and 8. There are also two additional tally out lines.



Use the GPI Assignments controls to select whether GPIs 1 to 4 will be used to recall presets or directly action a transition. Select whether you want the GPI to act on a momentary pulse to ground or latch level to ground.

If you assign the GPI to perform a transition, use the 'Transition Enables' control to determine what transition will be performed. For example, GPI 1 can be configured to turn Key 1 on, Key 1 and Key 2 on, mix between program and preview or trigger the playout of video and audio clips from the RAM, Flash and Audio stores.

You can simulate the action of the GPI using the Trigger button.

Use the 'Tally Assignments' control to determine which keys on 'States' trigger the tally lines. The MultiLogo V131 only has Tally 1, the V431 has all three tallies.

'Enable GPI Inputs' allows you to enable or disable the external GPI control of the MultiLogo.

Storing a preset will also store the setting of the Transition Enable controls. Therefore different presets may have different Transition Enable settings. 'Recall Transition Enables from Presets' allows you to control whether the Transition Enables settings are updated when a preset is recalled, or whether they maintain their current values.

'Recall Key Fade Levels from Presets' allows you to control whether Key Fade levels are updated when a preset is recalled, or whether they maintain their current values

'Trigger Players from Presets' allows you to trigger the playout of a video or audio clip when recalling it from a preset.

## Engineering Tab

V1.38 features some reset controls.
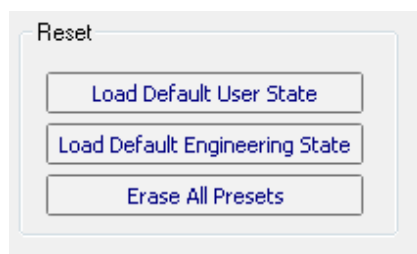


'Load Default User State' sets the keyers, mixer controls etc. back to factory conditions.

'Load Default Engineering State' sets the Genlock Mode, Genlock Source, Output Format and Output Delay back to factory conditions.

'Erase All Presets' erases all stored presets.

## Presets Tab

V1.38 software allows you to label any presets that you save. Up to 255 can be saved.



Once you have saved your preset, type in the name you want to call it and press Enter. The 'Preset Label' is stored on the MultiLogo.

Presets higher than 15 are accessed by typing their number into the 'Extra Preset States' box.

# 3.5  New features added in V1.50 software

## Quick Text

PC Software version V1.50 sees the introduction of text functionality and support for the ML-GPI8 top board that extends the GPI count by a further eight inputs and eight outputs that can be used as tallies. In addition to these the PC software gives control of multiple MultiLogo boards by storing a list of IP addresses at which MultiLogos can be found. Access to this list is via the 'File' drop-down menu 'Change Connection'.

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.
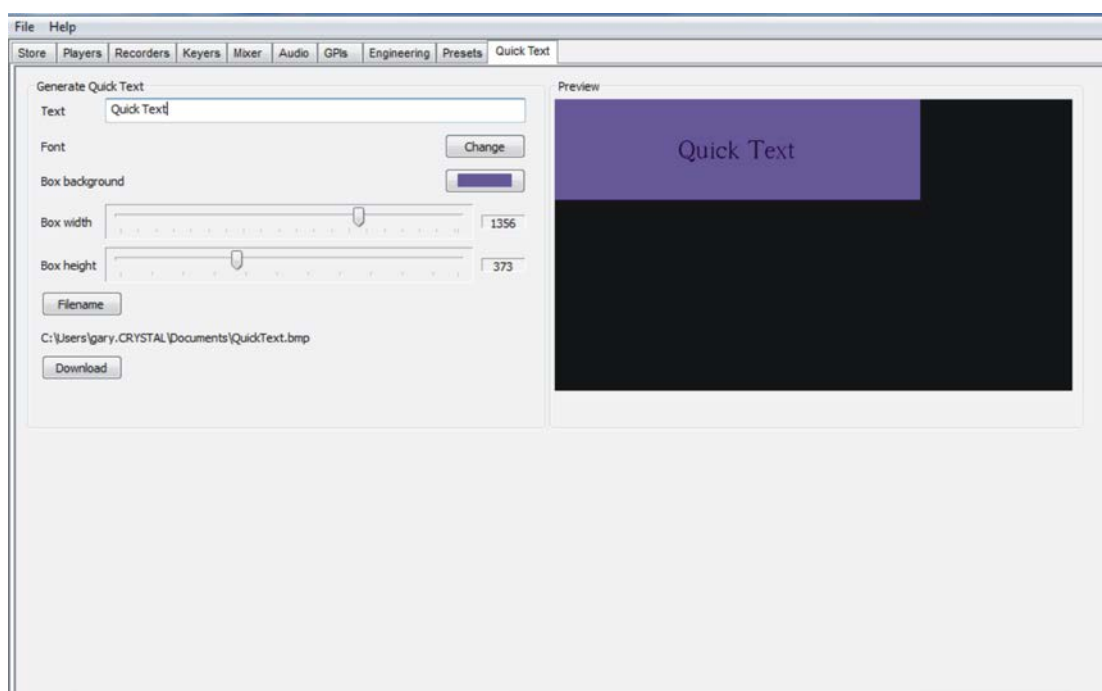
# 3.6  New features added in V1.51 software

## Import/Export Presets

PC Software version V1.51 brings the addition of the Preset Import/Export feature that allows for easy copying of settings from one board to another which is perfect for those systems involving multiple logo keyers.

The number of presets available on MultiLogo – up to 255 – has always been one of its big advantages. This new feature will allow the user to choose to import/export either all presets or an individual one. Presets can also be deleted. The current control state on the board is always saved and exported with the presets.  The presets are copied to a file on the PC, and this file can then be downloaded to another MultiLogo, giving the same controls and presets as the original.

This feature is ideal for users with multiple MultiLogos that want the same settings and make the interchanging of boards very simple.



Pressing 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. Pressing 'Delete All Presets' will delete all the on-board presets. Any locally stored copies will not be deleted.

# 3.7  Image converter

When installing the LogoKeyer GUI a program called Image Converter is also installed. This program 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.
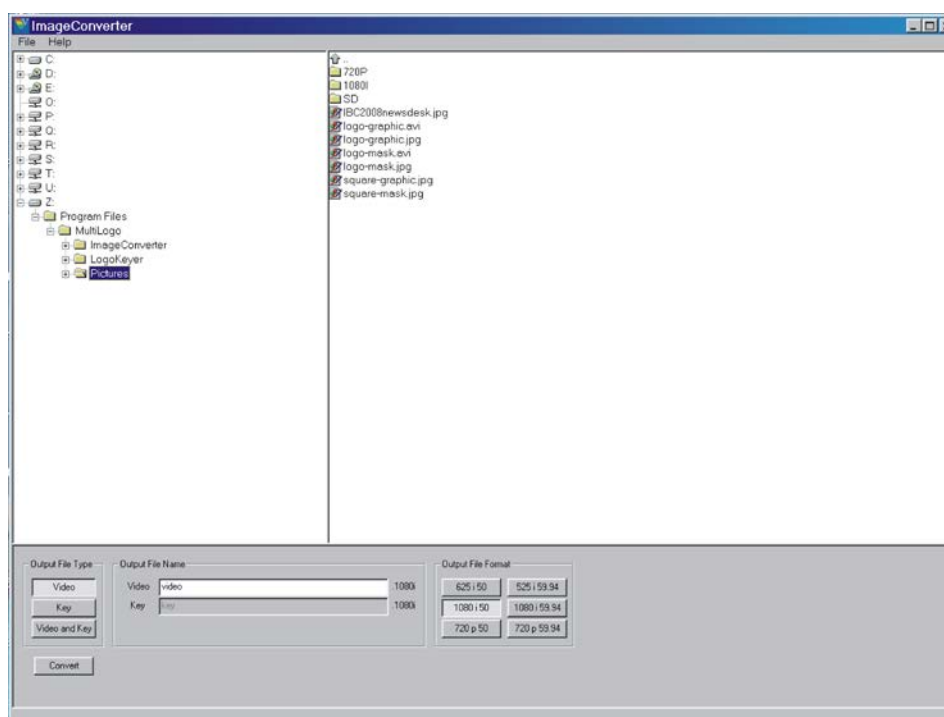
*Image converter main screen*
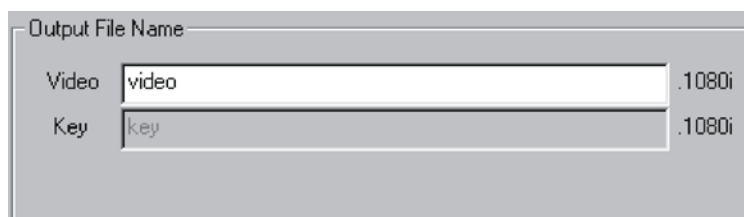
To make the necessary conversion, highlight the selected file. You are then required to select the proposed 'Output File Type' from the three available types. These are Video, Key and Video and Key.



## Output File types

- 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.

```
┌─ Output File Name ──────────────────────────────────┐
│                                                      │
│  Video  │video                              │ .1080i │
│                                                      │
│  Key    │key                                │ .1080i │
│                                                      │
└──────────────────────────────────────────────────────┘
```
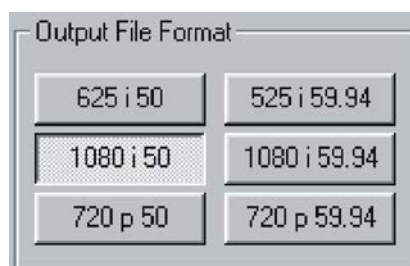
**Note:**       If an individual name is not applied, any previous file of the same default name will be overwritten.

## 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

```
┌─ Output File Format ──────────────┐
│                                    │
│   │ 625 i 50 │    │ 525 i 59.94 │  │
│                                    │
│   │ 1080 i 50 │   │ 1080 i 59.94 │ │
│                                    │
│   │ 720 p 50 │    │ 720 p 59.94 │  │
│                                    │
└────────────────────────────────────┘
```

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:
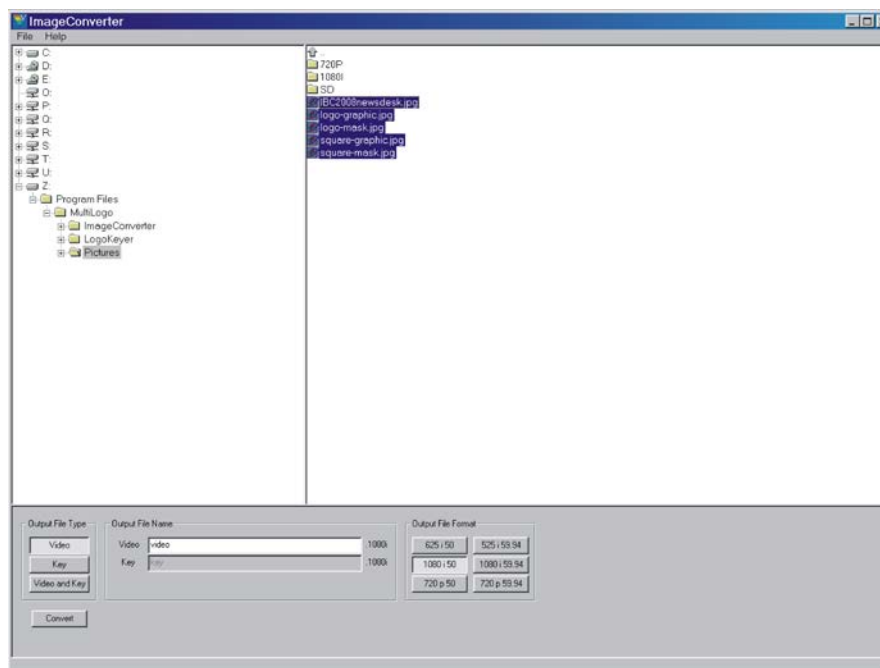
# 3.8  Updating MultiLogo software

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 backup copies of all items stored on your board to your PC and note their assignment to the stores on the board.

**Note:**     If upgrading from software version v1.0 it will be necessary to change the installation directory from c:\program files\logokeyer to c:\program files\MultiLogo as anything previously stored there after installation will not be copied across into the new 'MultiLogo' directory.

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.
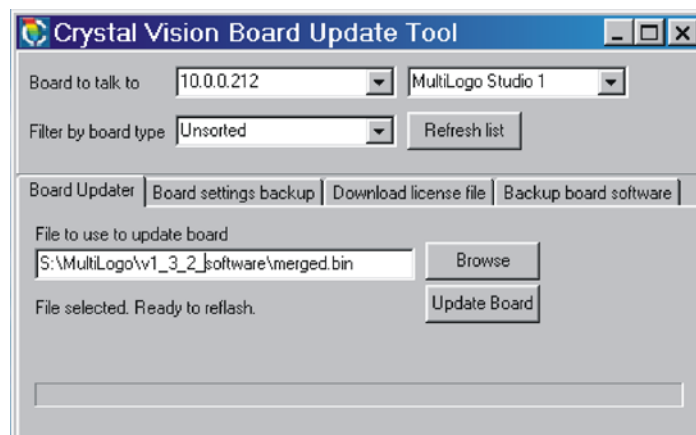


Once the board to be updated has been located, the new merged.bin file has to be located by using the browse function.

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 (Flash 1, Flash 2, RAM 1 etc.) all your previous presets and player should be as before the software upgrade.

## Updating MultiLogo PC software

It is first necessary to uninstall your current version of MultiLogo 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 section 3.2 'Installing operating software' for more details.

# 4 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.



## 4.1 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. |

## 4.2 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.

# 4.1  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 | |

# 4.2  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
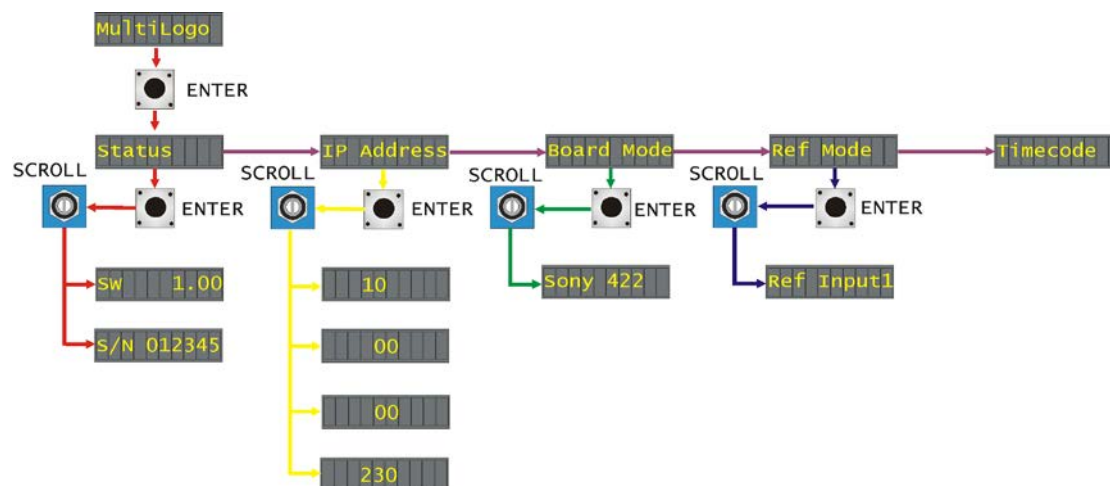


*MultiLogo board edge menu structure*

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.

| | 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.

+

| | 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. _010.**0**.0.230_ |
| **00** | IP address 3rd digits | Rotate SCROLL/ADJ to show the stored IP address. This will show the 1st three digits in the IP address. _010.0.**0**.230_ |
| **230** | IP address last 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**_ |

## 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<br>Press ENTER to select<br>***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<br>Press ENTER to select<br>***Ref Input1, Ref ExtRef, Ref B & B*** |

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

# 5 Using the front control panel

## 5.1 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.
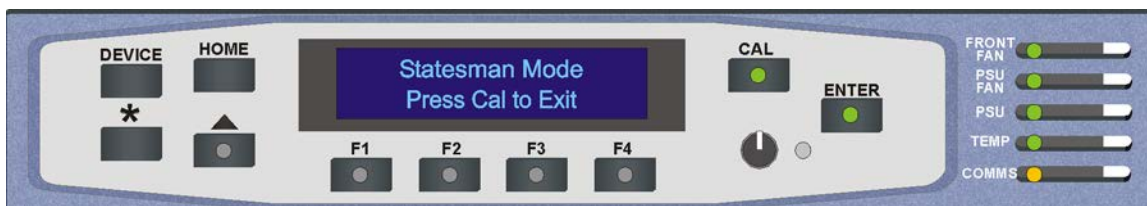


*Statesman mode is entered by default*

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 Setup 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 MultiLogo

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 2.

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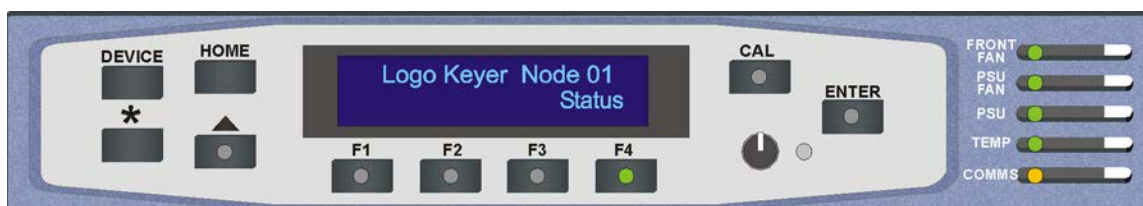


*The MultiLogo Home menu*

## 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.

# 5.2  The MultiLogo 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 MultiLogo 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 MultiLogo menu. The actual menu available may vary slightly as software is updated.
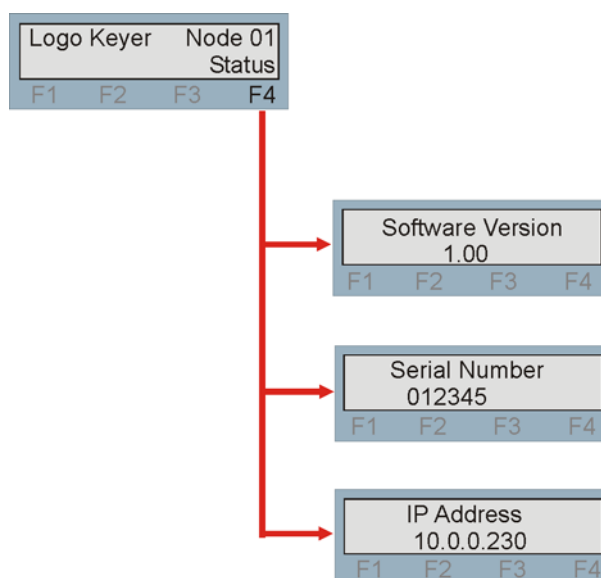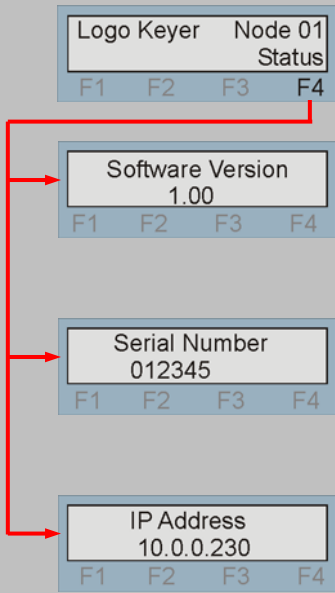


*The MultiLogo menu tree*

**Note:**   Function key LEDs are illuminated when active.

## Status Menu

The Status menu contains useful information about the board.

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

# 6 Trouble shooting

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

## 6.1  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

# 7   Appendix 1

## 7.1  MultiLogo via VDCP protocol

Unless noted, these commands directly affect RAM1 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 flash and 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/Flash 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 (8 characters per) up to a maximum of 10 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 RAM2, with RAM2 locked to RAM1.

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 RAM1.

Note this will only work if the filename including the suffix is not more than 8 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 can't 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 flash and RAM.

## Rename Clip

0x2x 0x1D

This changes the name of a clip from the existing name to a new name (8 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 can't 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 RAM1. If Data Byte 1 is Key Only these contain the file ID of the Key. This will be played from RAM2, locked to RAM1.

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 RAM1. If data byte 1 is key only, these bytes contain the file ID of the Key, which will be played from RAM2. 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 RAM2, locked to RAM1. 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

# 8   Appendix 2

## MultiLogo GPI module: ML-GPI8

This hardware option consists of an addition PCB that plugs onto a MultiLogo V131.
When fitted the addition PCB 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.

**Notes :**   The ML-GPI8 option is not available for the MultiLogo V431.
This option requires ML-GPI8 firmware/software.

| GPI output | | 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 |

## Rear module connections with RM33

The RM33 is used as the upper rear connector for the MultiLogo with ML-GPI8 option.

| RM33 rear module connector | Description |
|---|---|
|  | **RM52 + RM33**<br>• 12 MultiLogo with ML-GPI8 modules per Indigo 4 frame<br>• 6 per Indigo 2 frame<br>• 3 per Indigo 1 frame<br>• 1 per Indigo DT<br>• Alternate frame slots can be used |

**Notes :**   All four BNC connectors are no-connections.

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

# 9 Specification

## General

**MultiLogo V131**

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

**MultiLogo V431**

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

## Inputs

**MultiLogo V131**    One SD/HD input
One external analogue reference input

**MultiLogo V431**    Four SD/HD inputs
One external reference input
One AES input (future enhancement)

| | |
|---:|:---|
| 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 |
| 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 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 |
| | Two AES stereo (future enhancement on MultiLogo V431 only) |
| 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 6.5μs for SD and 1.7μs 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

RS422/485

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

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

Basic control from frame active panel and remote panel

Statesman. Basic control from any PC on a network

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

## Graphics software

Drag and drop software running on graphics PC

Auto convert most common graphics file formats to required MultiLogo format