

USER MANUAL

 **Indigo**
SYSTEM



Clip N Key

HD/SD clip and sting store



Contents

1	Introduction	4
1.1	Operating modes	6
	Input and output video standards	6
	External reference	6
	Audio	6
2	Hardware installation	7
2.1	Module configuration	7
2.2	Rear modules and signal I/O	8
	Rear module connections with RM52	9
	Rear module connections with RM34	10
2.3	General Purpose Interface (GPI)	10
	Using Clip N Key GPIs	11
3	PC control	14
3.1	Resetting IP address	14
	Naming	15
	Reset	16
	Remote controller comms mode	16
3.2	Installing Operating Software	17
	Pointing the LogoKeyer Software at the boards	19
3.3	Uploading Files into RAM and Flash Storage	19
	Recording from external video inputs	20
	Audio and ancillary data controls	21
	Animation controls and positioning the graphics from the memory stores	22
	Saving and recalling presets	22

Engineering	22
3.4 Image converter	23
Using the image converter	23
3.5 Updating Clip N Key software	26
Upgrading the Clip N Key software	26
Updating Clip N Key PC software	27
4 Remote control	28
Sony 9-pin remote protocol	28
Video disk communications protocol (VDCP)	29
5 Card edge operation	30
5.1 Card edge switch settings	30
5.2 Card edge rotary controls	30
5.1 Reading card edge LEDs	31
5.2 Navigating card edge menus	31
Menu tree	32
Status menu	32
IP Address	32
Board Mode	33
Reference Mode	33
6 Using the front control panel	34
6.1 Module selected	34
Updating the display	35
6.2 The Clip N Key active panel menu structure	36
Status Menu	37
7 Trouble shooting	38
7.1 Card edge status LEDs	38
Basic fault finding guide	39

8 Appendix 1 40

Clip N Key via VDCP protocol 40

9 Specification 46

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Software version 1.33

Revision 2. RM52 RJ45 connection table added. Page 9. 07/12/09

Revision 3. Additional RM52 information added. Page 9. 30/06/11

Revision 4. RM52 diagram amended Page 9. External audio mention removed Page 6. 21/07/09

Revision 5. Preset recal table amended, page 11. 16/04/13

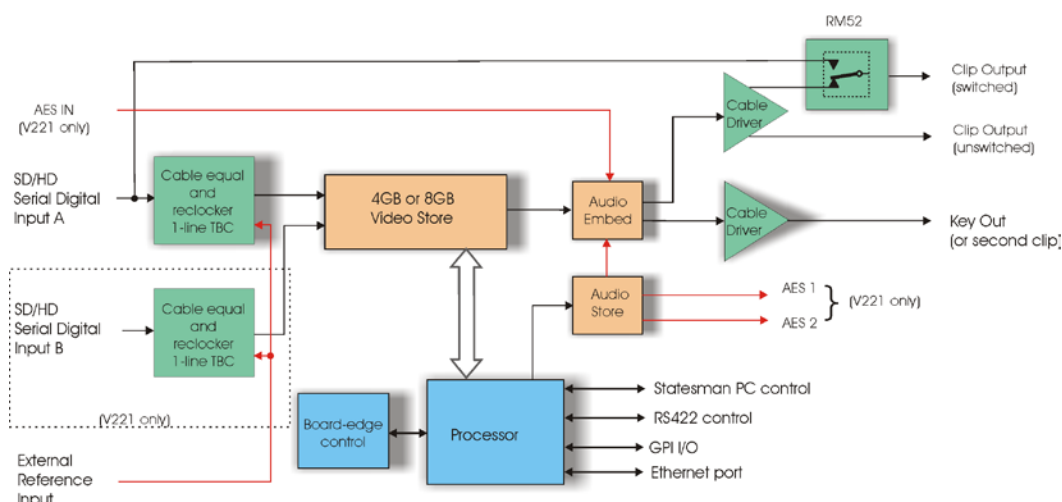
1 Introduction

Clip N Key is a sophisticated modular low-cost clip and sting store based on solid-state fast reading and writing DRAM and permanent Flash picture storage. Clip N Key is a low-cost and most convenient way to add extra video sources to a mixer to enhance transitions. There are two versions of Clip N Key available, the Clip N Key V121 with a single HD/SD video input and the Clip N Key V221 that has two HD/SD video inputs. Both versions are available with either 4 GB of video store or 8 GB of video store.

The on-board multiport video store can store 30 or 60 seconds (8G) of moving HD video (this is reduced by half if it includes a key signal) or five times that length in SD. A number of different clips can be stored dependent on the total time used. If the key output is not required Clip N Key can generate two independent video clips from its two outputs. The first external video source is normally dedicated to the main programme because of its relay bypass protection while the key out may be configured to be the second clip output. The 'double-decker' V221 with two SDI inputs allows the grabbing of a live fill and separate key signal at the same time so that any movement is in synchronisation on the two channels.

Clip N Key runs the uCLinux operating system for sophisticated file handling and stability and with on-board industry standard VTR protocols to record and replay stills or short video clips, allowing it to be used with any standard VTR controller or mixer with VTR type outputs or studio automation systems. Alternatively, Clip N Key can be controlled using a PC running Crystal Vision's own drag and drop software which will auto-convert images of most common file formats required by the Clip N Key and transfer them over 100 MB Ethernet directly onto the board via its dedicated rear module RJ45 Ethernet connection.

Clip N Key has the flexibility to work with named images and timecode. The timecode can be used as a label for each individual clip. Clips can be created either by VTR control, or can be downloaded to the board as a graphics file and then be assigned a timecode label that will be used by the controller to replay the clip. To replay an individual clip the operator simply needs to cue to the relevant timecode and play, while to create a clip the operator should cue to an unused timecode and record. Memory is automatically assigned to the timecode as it is recorded, making it unnecessary to use a continuous range of timecodes. Being a solid-state device, Clip N Key will cue instantly so that any video clip is available to play without the delay that may occur on a disk or tape based device.



Clip N Key's main features are:

- Modular clip and sting store, available in two versions
- Works with both HD and SD
- Multi-port video store with DRAM and Flash memory
- 4 GB version can store 30 seconds of moving HD video (15 seconds with key signal) and 150 seconds of moving SD video (75 seconds with key signal)
- 8 GB version can store 60 seconds of moving HD video (30 seconds with key signal) and 300 seconds of moving SD video (150 seconds with key signal)
- Number of different clips can be stored
- External reference input with 1-line TBC on each input
- AES audio inputs and outputs (Clip N Key V221 only)
- Drag and drop PC software for auto conversion of graphics from any format
- Fast transfer of clips from PC to board over 100 MB Ethernet
- Can work with both named images and timecode
- Industry standard software protocols help use with automation systems
- Relay bypass protection of main input

Clip N Key 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. The Clip N Key V121 is a single height module and is used with the RM52 rear module, which includes relay bypass protection of the input in the event of power failure or board malfunction or removal. The Clip N Key V221 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 Clip N Key will automatically switch between SD-SDI and HD-SDI inputs. The output timing is locked to the input (input 1 on the lower rear module RM52 of a Clip N Key V221).

Note: Both inputs of the Clip N Key V221 must be of the same standard and co-timed to within one line.

Clip N Key has two output modes, those being auto and fixed, in auto mode the output will be the same as input 1 or the external reference. Should there be no signal connected to input 1 or the external reference, the output will remain in the last used condition or default to 1080i 50. Fixed mode allows the user to select one of 625 PAL, 525 NTSC, 720i 50/59.94 or 1080i 50/59.94. Fixing the output video standard is useful so that the Clip N Key can be used as a standalone video source or cross-locked to its external reference.

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: Clip N Key's memory store can contain images of all supported video standards but they will only be valid in their native standard.

External reference

Each input of the Clip N Key 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.

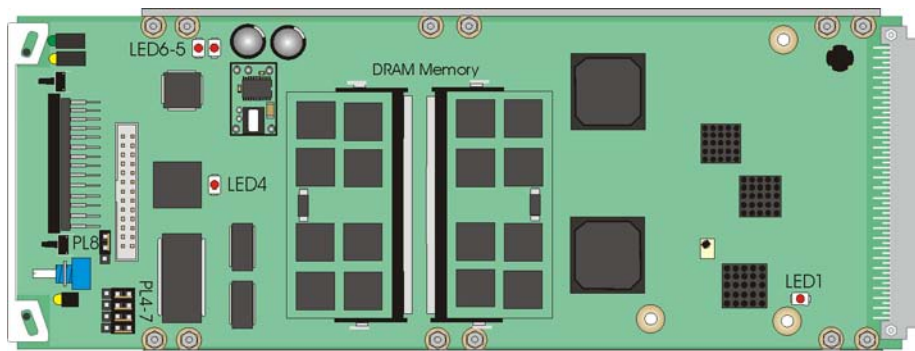
Audio

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.

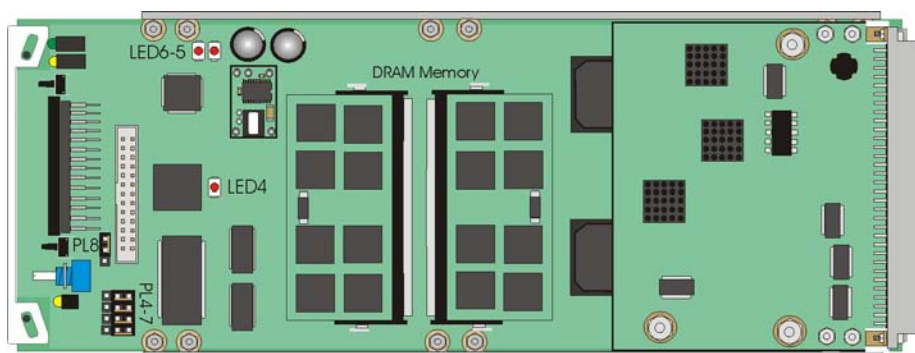
2 Hardware installation

The Clip N Key V121 single height module uses the RM52 rear connector that will fit into all Crystal Vision rack frames. The Clip N Key V221 is a 'double decker' module that uses an RM52 plus RM34 rear module. The Clip N Key V221 takes up two frame slots. All modules can be plugged in and removed while the frame is powered without damage.

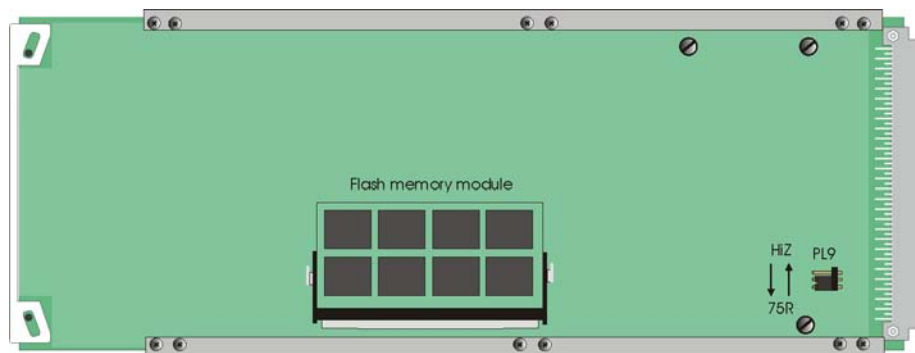
2.1 Module configuration



Clip N Key V121



Clip N Key V221



Clip N Key V121/221 underside showing the Flash memory module fitted

Link configuration and LEDs

There are six jumper links and four surface-mounted LEDs on the Clip N Key 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 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 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.

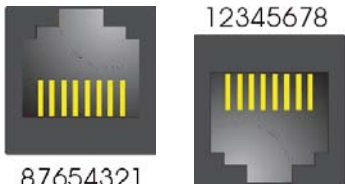
Rear module connections with RM52

The RM52 is a single height module that is used for the Clip N Key V121 and as the lower rear connector for the Clip N Key V221.

RM52 rear module connector	Description
	RM52 <ul style="list-style-type: none"> • 24 Clip N Key V121 modules per Indigo 4 frame • 12 per Indigo 2 frame • 6 per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used
RM52 individually retained rear module connector	Description
	RM52 <ul style="list-style-type: none"> • 24 MultiLogo V131 modules per Indigo 4 frame • 12 per Indigo 2 frame • 6 per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used


BNC	I/O assignment
Ethernet connector (shielded)	Ethernet control from PC
RJ45 connector (unshielded)	RS422 control from control panel
SYNC IN	External analogue reference input
KEY OUT	Configurable serial digital output
CLIP OUT (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 Clip N Key V221.

RM34 rear module connector	Description
	RM52 + RM34 <ul style="list-style-type: none"> 12 Clip N Key V221 modules per Indigo 4 frame 6 per Indigo 2 frame 3 per Indigo 1 frame 1 per Indigo DT Alternate frame slots can be used

BNC	I/O assignment
AES OUT 1	No user connection
AES OUT 2	No user connection
AES INPUT	No user connection
HD/SD IN D	No user connection
HD/SD IN C	No user connection
HD/SD IN B	Second 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.

Note: For Clip N Key V221 the GPIs connect to the lower slot position. E.g. if the Clip N Key V221 was located in slot positions 1 and 2 you would wire to slot 2.

GPI			Low (<1V)	High (+5V)
0	'a'	Recall preset bit 1	The seven user preset configurations can be recalled using binary notation	On transitions toggle the programme and preview control at a rate set by the rate control
1	'b'	Recall preset bit 2		
2	'c'	Recall preset bit 4		
3	'd'	Mix (auto)	On transitions toggle the programme and preview control at a rate set by the rate control	
4	'e'	Not used		
5	'f'	No connection		

As supplied, each GPI output has a 220Ω resistor in series with its output. This allows for an external LED to be driven, connected to a DC voltage of +5V.

The recall presets with GPI control must be enabled from the user controls, i.e. card edge, active front panel or Statesman PC control system.

Using Clip N Key GPIs

There are a total of 225 presets available on the Clip N Key but it is only possible to call the first seven using the GPI inputs. The following table shows the binary weighted code required to recall presets 1 to 7.

A 'H' is an open GPI input and a 'L' is a grounded GPI input. The GPIs are momentary i.e. a pulse to ground is required to action a change rather than a latch to ground.

GPI input connections have 10kΩ pull-up resistors to the internal chassis +5V.

Recall Preset	No change	1	2	3	4	5	6	7
GPI 'a'	H	L	H	L	H	L	H	L
GPI 'b'	H	H	L	L	H	H	L	L
GPI 'c'	H	H	H	H	L	L	L	L

4U frame GPI connections

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

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

Table shows pin number (Remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 are 26 way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2, Remote 4, Remote 6 and Remote 8 are 26 way high-density D-Type male

plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2 and Remote 6.

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

2U frame GPI connections

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

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

Table shows pin number (remote number)

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

1U frame GPI connections

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

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

Table shows pin number (remote number)

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

Indigo DT desk top box GPI connections

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

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

Table shows pin number (remote number)

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

Example connections: If a Clip N Key V221 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.

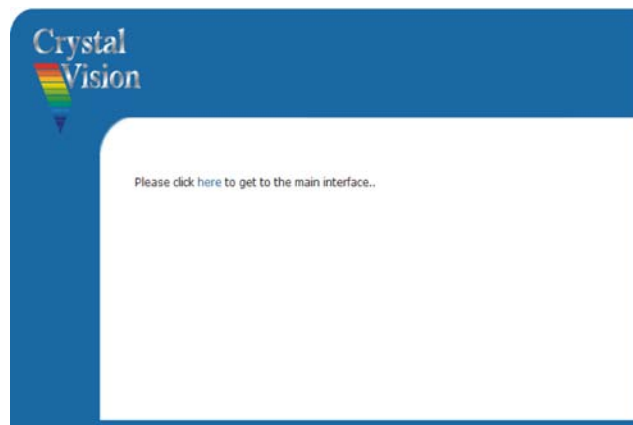
3 PC control

The Clip N Key is shipped with Crystal Vision's own drag and drop software that allows easy board control and files conversion.

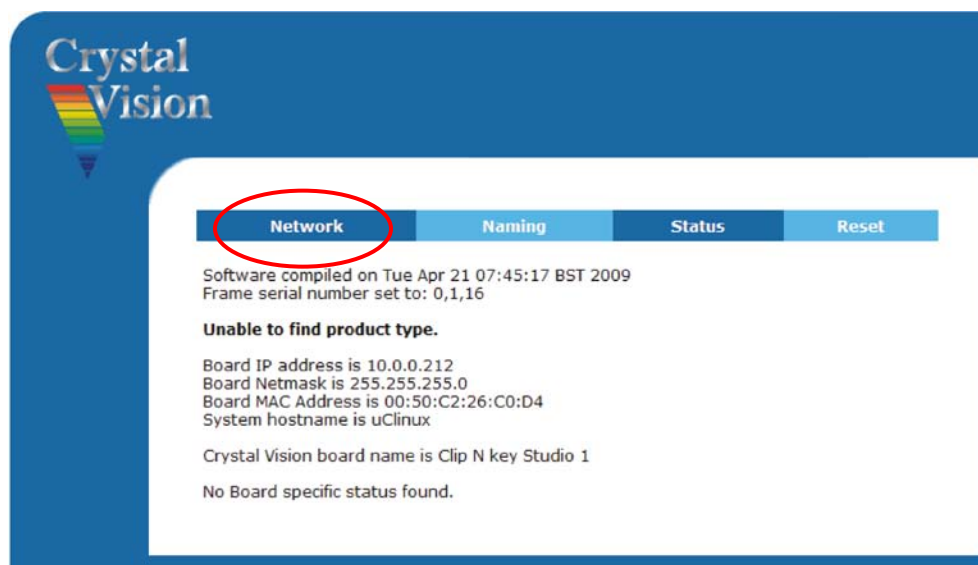
3.1 Resetting IP address

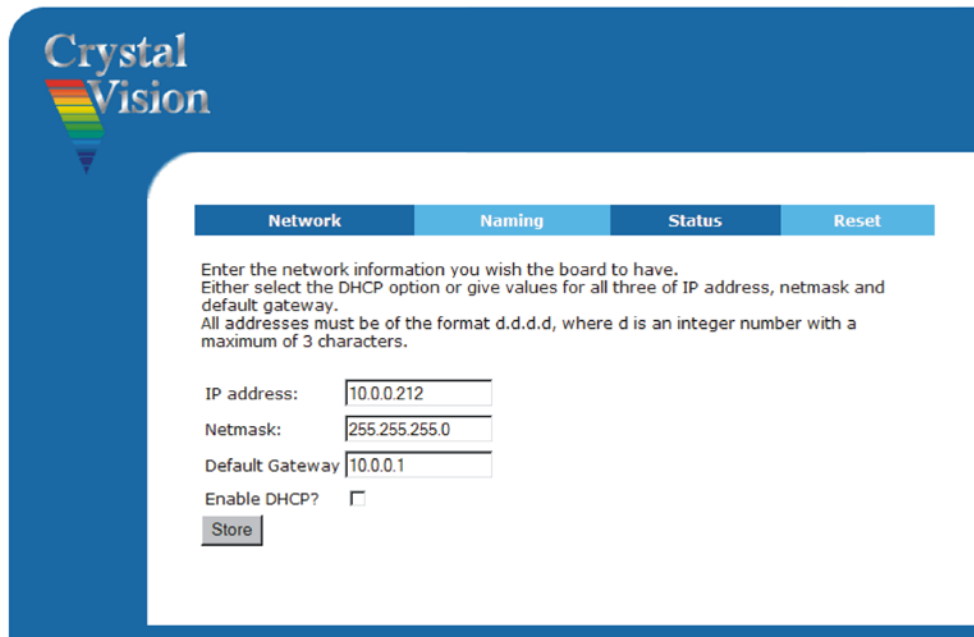
The unit is shipped using the following IP address 10.0.0.201. To set it to the IP of your choice, in your web browser enter the address <http://10.0.0.201/>

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.





The image shows the 'Network' tab of the Crystal Vision web interface. The header has the Crystal Vision logo and a navigation bar with 'Network', 'Naming', 'Status', and 'Reset' tabs. The 'Network' tab is active. Below the tabs, there is instructional text: 'Enter the network information you wish the board to have. Either select the DHCP option or give values for all three of IP address, netmask and default gateway. All addresses must be of the format d.d.d.d, where d is an integer number with a maximum of 3 characters.' There are three input fields: 'IP address' with '10.0.0.212', 'Netmask' with '255.255.255.0', and 'Default Gateway' with '10.0.0.1'. Below these is a checkbox for 'Enable DHCP?' which is unchecked. At the bottom left of the form is a 'Store' button.

Crystal Vision

Network Naming Status Reset

Enter the network information you wish the board to have.
Either select the DHCP option or give values for all three of IP address, netmask and default gateway.
All addresses must be of the format d.d.d.d, where d is an integer number with a maximum of 3 characters.

IP address: 10.0.0.212

Netmask: 255.255.255.0

Default Gateway: 10.0.0.1

Enable DHCP? ☐

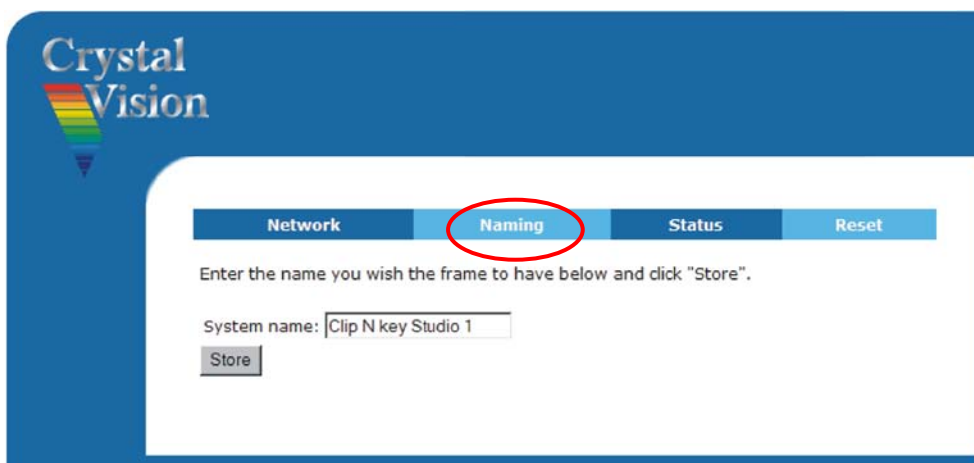
Store

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

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

Naming

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



The image shows the 'Naming' tab of the Crystal Vision web interface. The header has the Crystal Vision logo and a navigation bar with 'Network', 'Naming', 'Status', and 'Reset' tabs. The 'Naming' tab is active and highlighted with a red circle. Below the tabs, there is instructional text: 'Enter the name you wish the frame to have below and click "Store".' There is one input field labeled 'System name:' with the text 'Clip N key Studio 1'. At the bottom left of the form is a 'Store' button.

Crystal Vision

Network Naming Status Reset

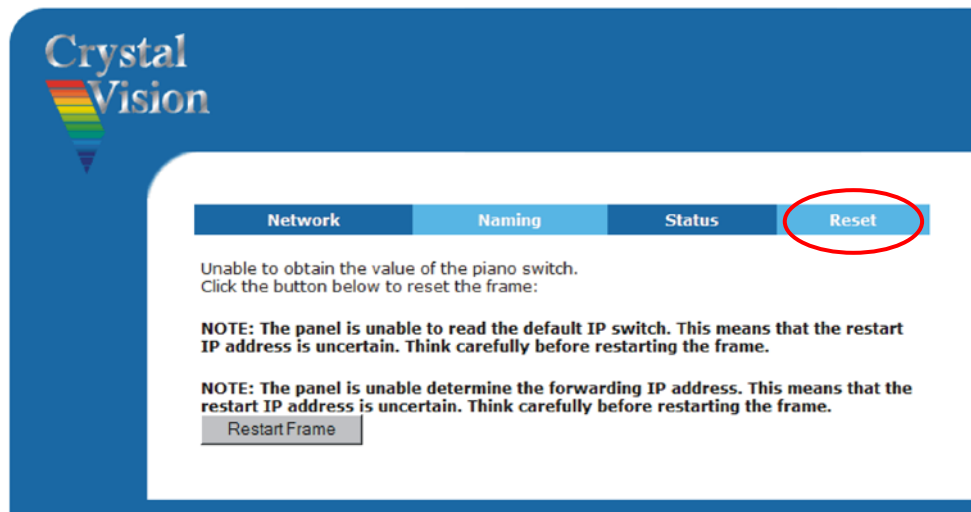
Enter the name you wish the frame to have below and click "Store".

System name: Clip N key Studio 1

Store

Reset

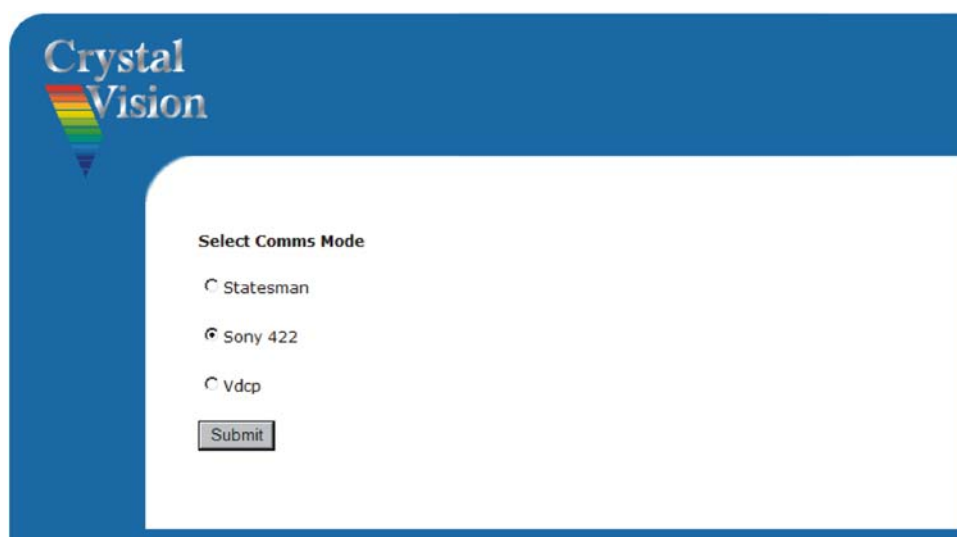
The reset button allows the board to be rebooted remotely, such as is required when the IP address is changed.



Note: Performing a reset will restore all current settings to their defaults but leave any configurations stored as presets unchanged.

Remote controller comms mode

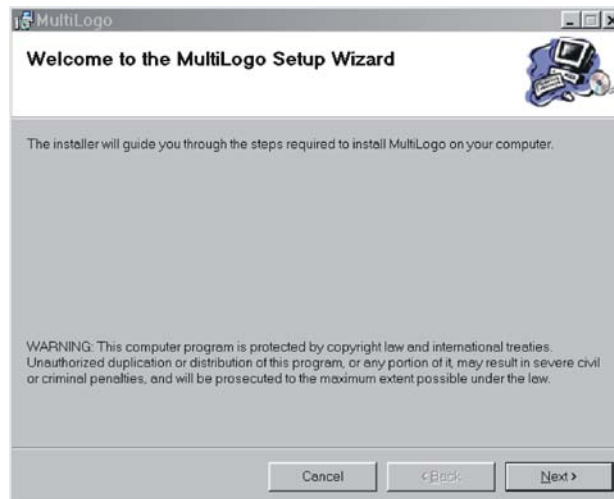
To set the remote controller comms mode, change the web address to the following: http://10.0.0212/cgi-bin/comms_mode.cgi and press go. Select between Sony 422 and VDCP. Note Statesman mode is not currently supported.



3.2 Installing Operating Software

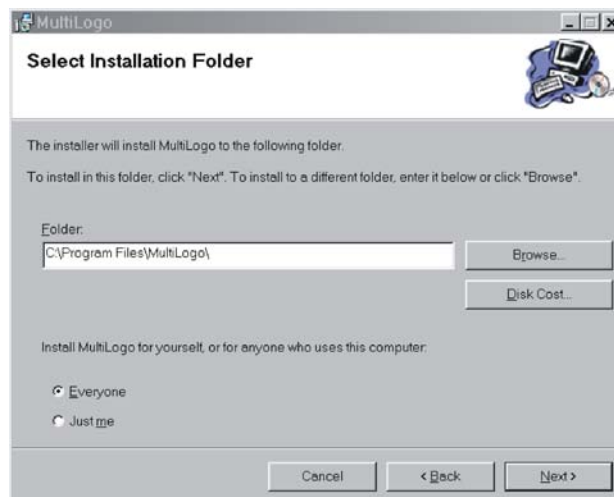
Run the 'Setup.exe'

Click 'Next'

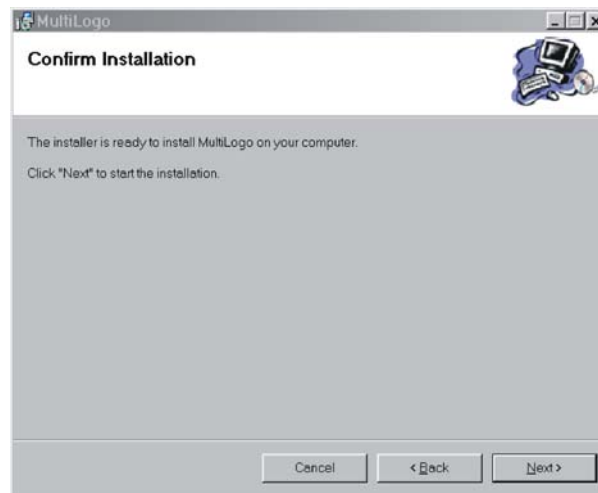


Note: Clip N Key shares the same operating software as the MultiLogo. Installing this software will automatically place a shortcut for both Clip N Key and MultiLogo on the desktop.

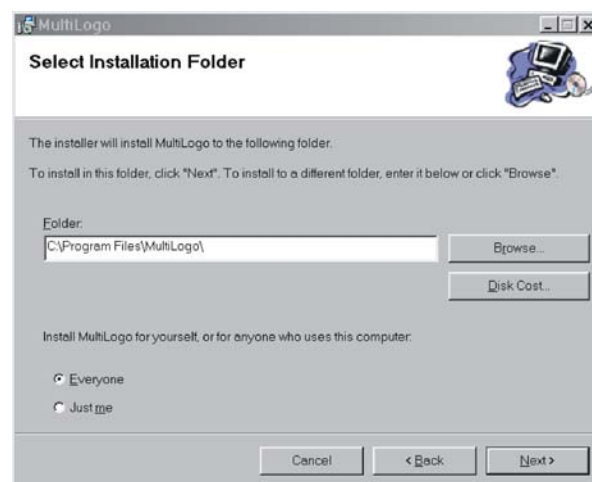
To continue with the default options click 'Next', otherwise change the options to suit your needs.



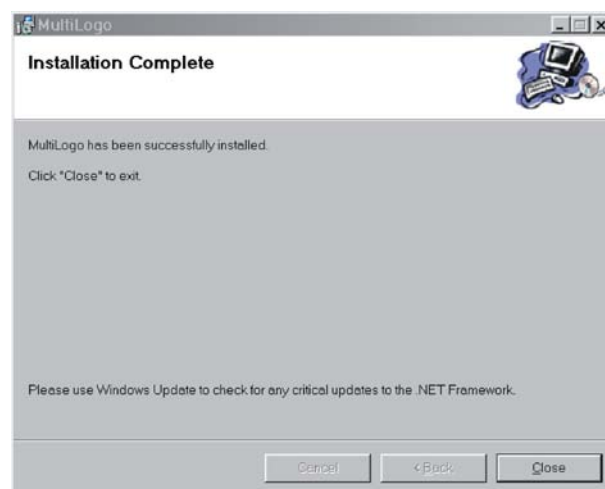
Click 'Next' to start the installation process.



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 Clip N Key. 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'

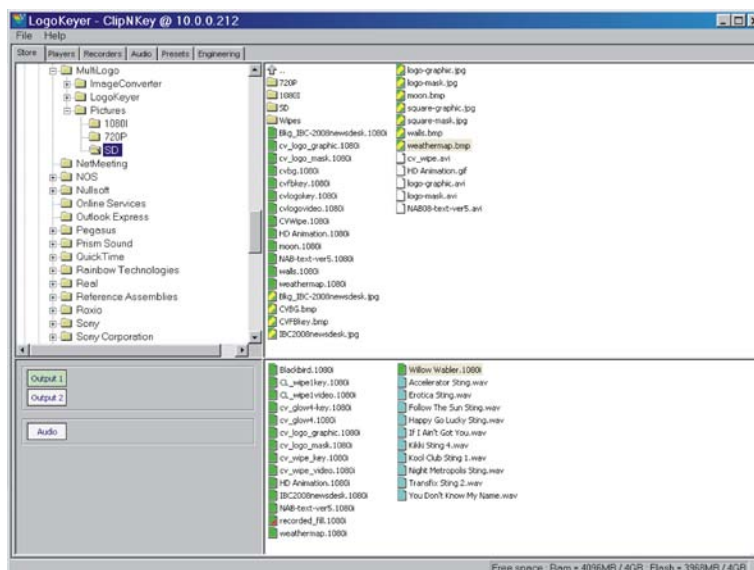
To run the software simply double-click on the icon.

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.



The special drag and drop software will convert most common graphics file formats to the format required by the Clip N Key. 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 three 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

Files that have been converted to the Crystal Vision's proprietary file format required by Clip N Key. 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 Clip N Key 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

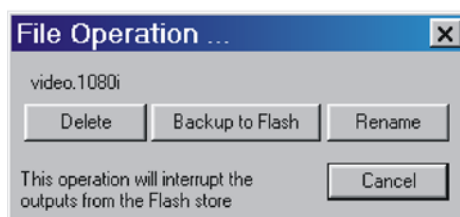
A white file is any file that requires converting to the format required by Clip N Key by both drag and drop or by image converter.

Green with yellow flash

Files of this type are already in the required Clip N Key format and have been directly copied into the PC folder.

Red corner

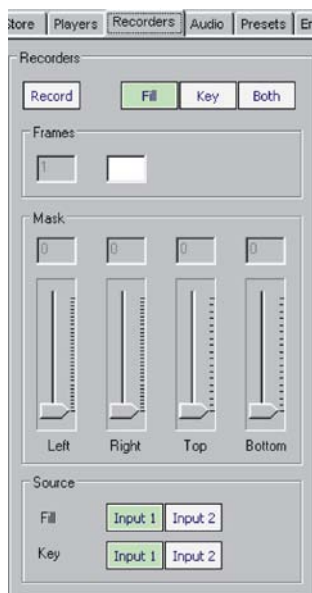
Any icon showing a red corner indicates a file in RAM only, this file would be lost should the power be removed. To back-up these files to Flash memory hold the mouse cursor over the file and right-click. The following pop-up box will appear:



Recording from external video inputs

The Clip N Key can record fill and key signals from external video inputs using the Recorders tab.

Note: Recording from input 2 is available only on the Clip N Key V221.



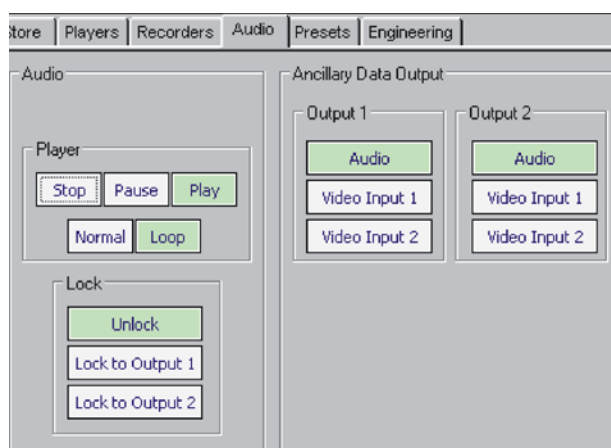
The recorder can be configured to record the fill only, key only or fill and key. Use the “Source” box to select which inputs are to be used as the fill and key. The number of frames to be recorded should be entered into the “Frames” box. After entering the number of frames, the “Enter” key must be pressed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

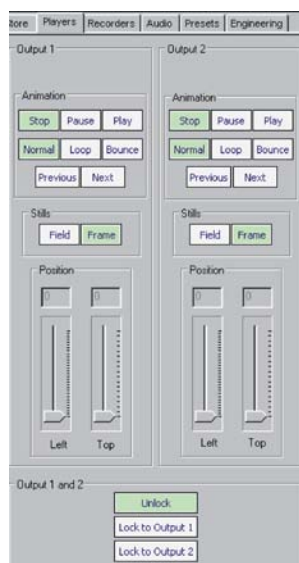
Clip N Key can embed up to four channels (two stereo pairs) of audio into a single group on its output video. The ability to lock the audio to video makes it possible to play out both files simultaneously to produce a logo with accompanying audio.

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.

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. Output 1 = Fill and Output 2 = Key, then the stores should be locked together when changing the position. E.g. lock the position of Output 2 to Output 1 using the “Lock to Output 1” control.

Saving and recalling presets



Up to seven presets can be stored allowing recall from the Clip N Key Control Software or GPI. The presets store the current state of the Clip N Key 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 Clip N Key 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.

Engineering

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

Genlock mode

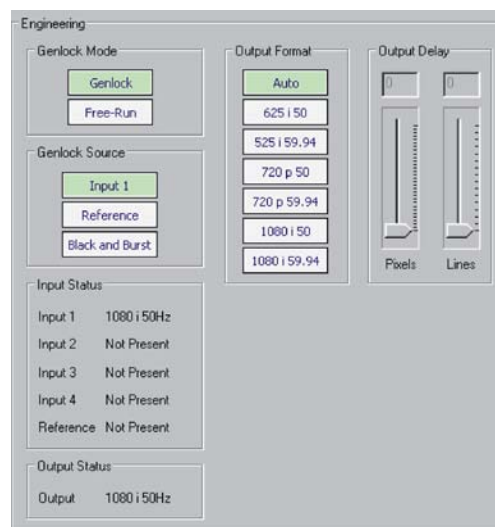
Clip N Key can be left to free-run or be genlocked to the digital video connected to input 1 or to an external reference connected to the SYNC input. The SYNC input will accept bi-level, tri-level or composite black and burst timing reference signals. Use the Genlock source buttons to select required 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 Clip N Key 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 Clip N Key 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 Clip N Key. The maximum delay available will be dependent on the video format.

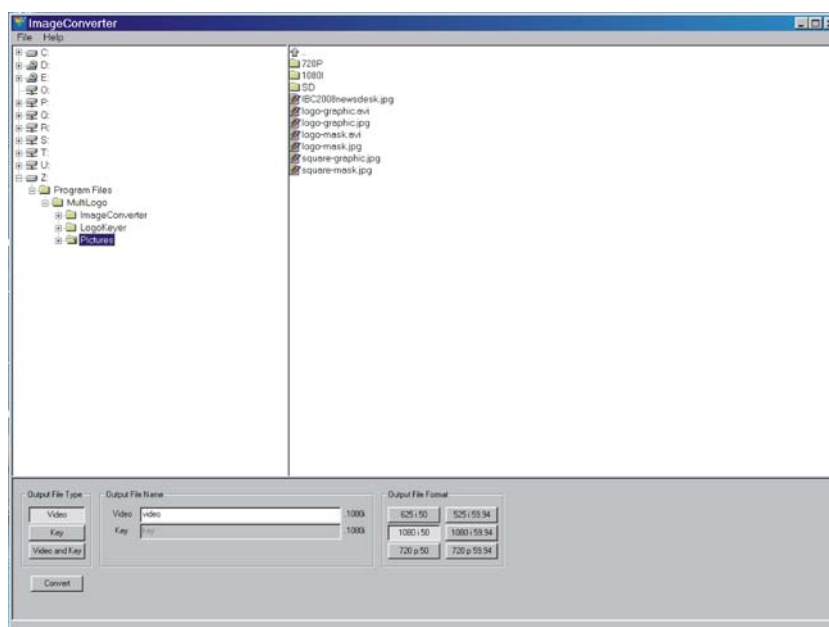


3.4 Image converter

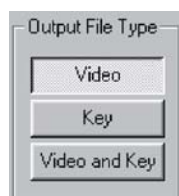
When installing the LogoKeyer GUI a program called Image Converter is also installed. This program will convert image sequences to the native file format required by the Clip N Key. It can also be used to extract the alpha channel from file formats that support it. During installation an Image Converter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

Using the image converter

Launch the image converter software by either using the desktop icon or from the Clip N Key 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.



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

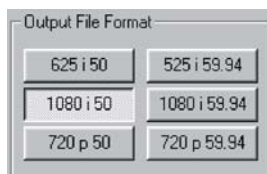
- Video - This option is selected if the file to be converted contains the background or fill in the colour channels.
- Key – This option is selected if the file to be converted contains the key in the alpha channel.
- Video and Key - This option is selected if the file to be converted contains the fill 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.



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.

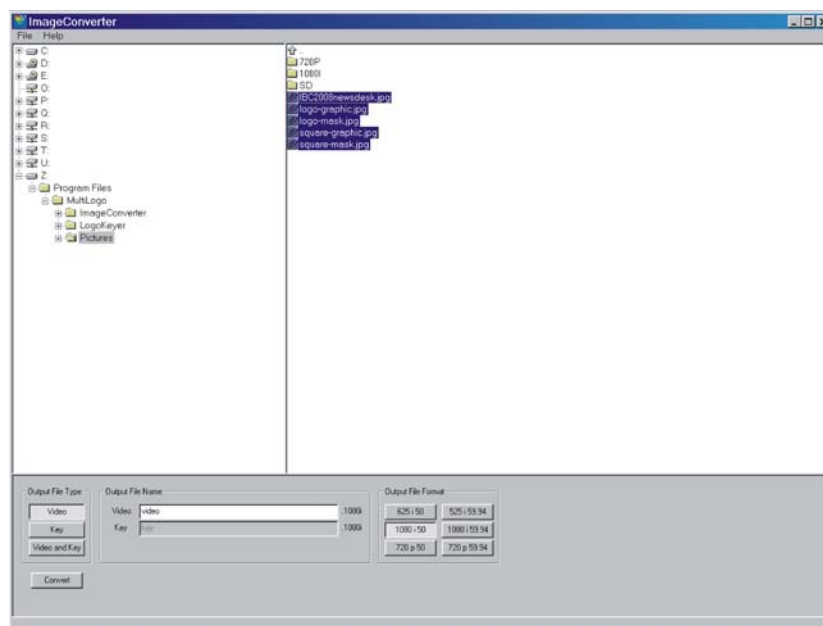
These six options are:

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 Clip N Key card via the Clip N Key control software.

Multiple image conversion

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



3.5 Updating Clip N Key software

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

Upgrading the Clip N Key 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.

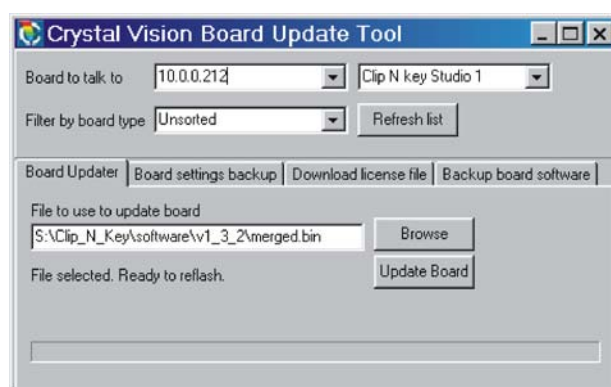
Note: If upgrading from software version v1.0 it will be necessary to change the installation directory from c:\program files\logokeyer to c:\program files\Clip N Key as anything previously stored there after installation will not be copied across into the new 'Clip N Key' directory.

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 Clip N Key PC software

It is first necessary to uninstall your current version of Clip N Key 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 Remote control

Clip N Key supports both the Sony and VDCP controller protocols. The required protocol is selected by using Clip N Key's internal web page. See Chapter 3.1 for information about accessing this web page.

See Chapter 2.2 and 2.3 for controller wiring details.

Sony 9-pin remote protocol

The following table lists the commands that are available to control Clip N Key.

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

Status data

Clip N Key supports a limited amount of status data. The following table lists the returned data.

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

Video disk communications protocol (VDCP)

The following table lists the main commands that are available to control Clip N Key.

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

Additional controls have been added to allow previously stored multiple files to be cued and played simultaneously as required. This is particularly useful for separate clip, key and audio files.

- Preset method: A single file can be renamed and played by calling a preset (Prestxxx).
- Fill_key: The associated key file is given the suffix _k so that when the given file is played out as fill, the _k file will be simultaneously played out as the key. Likewise an audio file is given the suffix _a.
- Play with data: This allows files to be ganged and also allows the setting of the play loop bounce parameter.

Status data

Clip N Key supports a limited amount of status data. The following table lists the status bits implemented.

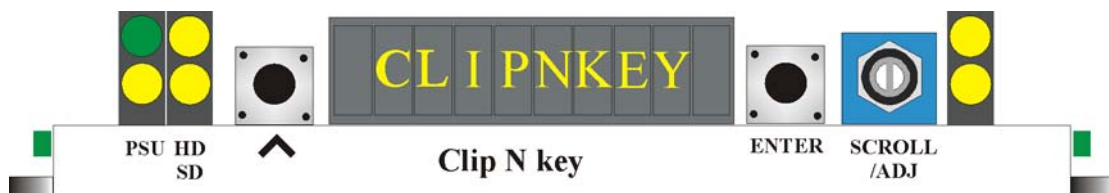
Port Status 0x01		Port Status 0x02		Port Status 0x03	
Bit 0x00	Stopped	Bit 0x00	No used	Bit 0x00	No used
Bit 0x01	No used	Bit 0x01	No used	Bit 0x01	No used
Bit 0x02	Play or Record	Bit 0x02	No used	Bit 0x02	No used
Bit 0x03	Still	Bit 0x03	No used	Bit 0x03	No used
Bit 0x04	Jog	Bit 0x04	No used	Bit 0x04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

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

5 Card edge operation


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

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



5.1 Card edge switch settings

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

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

5.2 Card edge rotary controls

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

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

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

5.1 Reading card edge LEDs

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

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

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

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

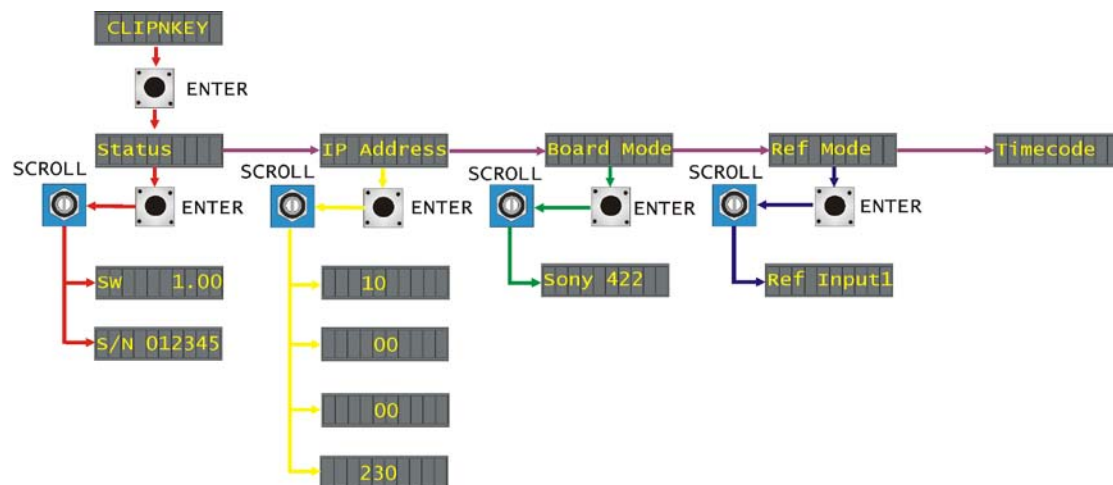
5.2 Navigating card edge menus

To access the card edge menu system proceed as follows:


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

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

Menu tree


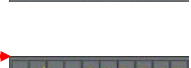
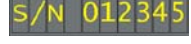


Clip N Key board edge menu structure

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


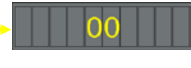



Status menu

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

Menu	Comment
	
	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.
	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 Clip N Key is currently set to.

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


Board Mode

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

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

Reference Mode

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

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

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

6 Using the front control panel

6.1 Module selected

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

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

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



Statesman mode is entered by default

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

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

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

Navigating the display

The functions assigned to control panel keys are:

- **DEVICE** – enters Device menu to select a card or show cards available / enters Panel 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 Clip N Key

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.

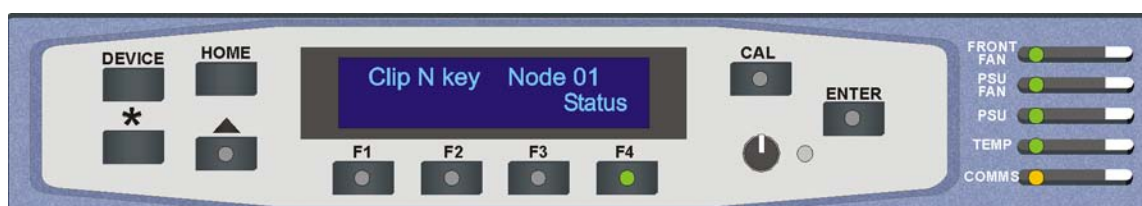


The Available Cards menu

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 Clip N Key has been selected.



The Clip N Key Home menu

Updating the display

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

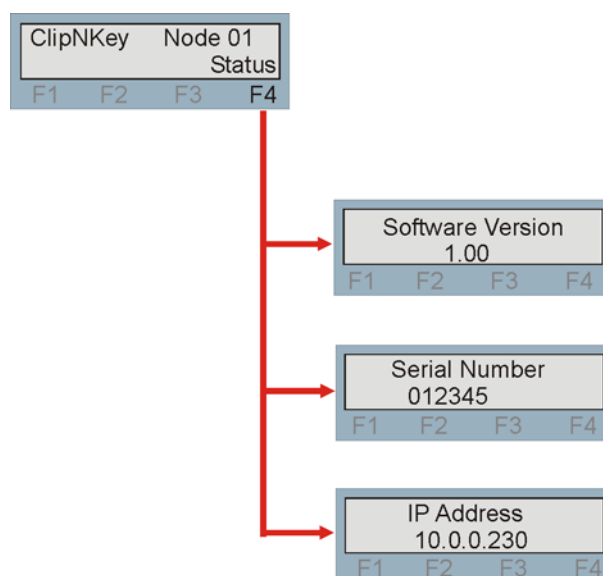
6.2 The Clip N Key active panel menu structure

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 Clip N Key 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 Clip N Key menu. The actual menu available may vary slightly as software is updated.

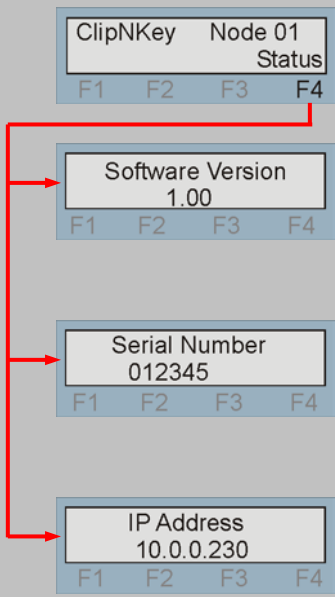


The Clip N Key menu tree

Note: Function key LEDs are illuminated when active.

Status Menu

The status menu contains useful information about the board.

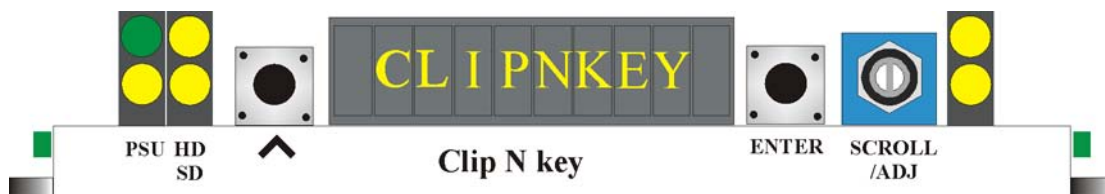
Clip N Key status menu	Description
	<p>From the Home menu, press F1 to select the Status menu, which is then traversed by rotating the shaft control.</p> <p>Rotate the shaft control to view the currently fitted software version.</p> <p>Rotate the shaft control to view the electronically stored board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

7 Trouble shooting

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

7.1 Card edge status LEDs

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



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

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

Basic fault finding guide

The Power OK LED is not illuminated

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

There is no video output

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

The video output exhibits jitter

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

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

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

Check any active control panel cabling

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

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

8 Appendix 1

Clip N Key via VDCP protocol

Parameter less transport commands VDCP Command No

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

The following parametered commands are also implemented

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

Play a clip by Filename	0x2x	0x24
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Note. This cues the clip and immediately plays it.

1. Altered on board so that if filename is

“Prestxxx”

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

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

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

Delete	0x2x 0x26
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If supplied ID is in the system and not active, the file will be deleted from RAM and Flash.

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

Get Clip Length 0x3x 0x14

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

Rename ID 0x2x 0x1d

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

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

Data bytes 9 to 16 are the new ID

Play with Data 0x9x 0x24

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

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

The data bytes are as follows

Data Byte 0x01

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

Data Byte 0x02

Play Once	0x00
Loop	0x01
Bounce	0x02

Data Bytes 0x03 to 0x0A First Clip ID

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

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

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

Data Bytes 0x0B to 0x12 Second Clip ID

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

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

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

Data Bytes 0x13 to 0x1A Audio Clip ID

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

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

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

Formerly Set Mark In, Set Mark Out

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

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

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

Data Byte 0x01

Operation	Value
Fill Only	0x00
Key Only	0x01

Data Byte 0x02

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

Data Bytes 0x03 to 0x0a First Clip ID

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

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

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

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

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

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

Output Select 0x9x 0x38

Selects the channel to be controlled.

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

Data Byte 0

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

Jump To Beginning of Clip Jump To End Of Clip

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

Data Byte 0x01

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

Jump To Mark In 0x2x 0x25**Jump To Mark Out (VDCP Cue with data)****Save 0x2x 0x2a**

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

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

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

Trim 0x9x 0x50 (new extension)

This has the following data bytes.

0x01 to 0x08 Clip ID

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

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

Status 0x3x 0x05

The following status bits are implemented

Port Status 0x01

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

Port Status 0x02

Bit 0x00	Not Used
Bit 0x01	Not Used
Bit 0x02	Not Used
Bit 0x03	Not Used
Bit 0x04	Not Used
Bit 0x05	No Video Input
Bit 0x06	Not Used
Bit 0x07	Not Used

Port Status 0x03

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

9 Specification

General

Clip N Key V121

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

Clip N Key V221

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

Inputs

Clip N Key V121	One SD/HD input One external analogue reference input
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Clip N Key V221	Two SD/HD inputs One external reference input One AES input (future enhancement)
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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 Clip 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 Clip N Key V221 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 2GB multi-port video store DRAM

HD video can store 30 seconds in 50Hz and 25 seconds in 59.94Hz

SD video can store 150 seconds in 50Hz and 150 seconds in 59.94Hz
(15 and 75 seconds with separate key)

8 GB version:

2 x 4GB multi-port video store DRAM

HD video can store 60 seconds in 50Hz and 25 seconds in 59.94Hz

SD video can store 300 seconds in 50Hz and 150 seconds in 59.94Hz
(30 and 150 seconds with separate key)

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

Operating system uCLinux

Delay through board Up to one video line. Each input has a one-line TBC to align the input signal timing. User settable offset to reference

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

Sony and VDCP protocols supported

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

Graphics software

Drag and drop software running on graphics PC

Auto convert most common graphics file formats to required Clip N Key format