Fovea
Remote Control Guide

Version 2.1
(Includes Web Server update in firmware version 1.8.5)

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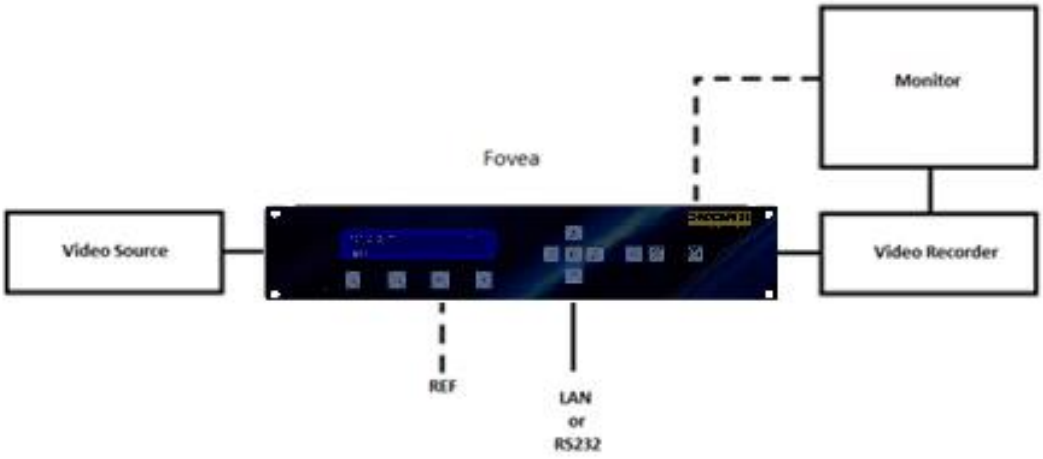
Introduction

This guide is a non-technical introduction to operating Fovea by remote control.

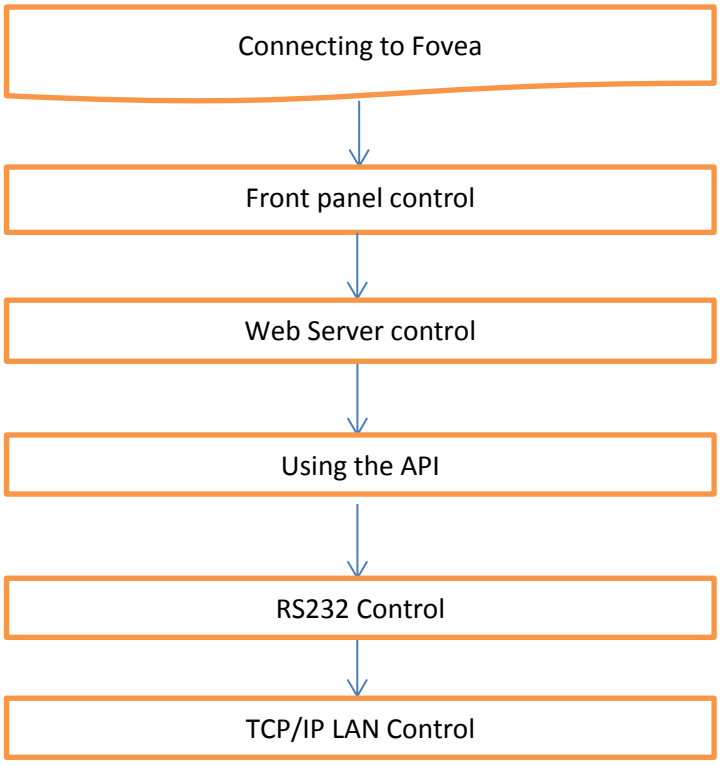
The guide describes how to connect to a network and use the built-in Web Server and alternatively how to control the Fovea by TCP/IP and RS232 API commands.

This guide does not replace the product User Manual, API Manual or the Setup Guide, it covers only the essential functions to get started. For further information refer to the User Manual.



The Basic Setup

The flowchart below represents the options for remote control, additional information can be found further in this guide.



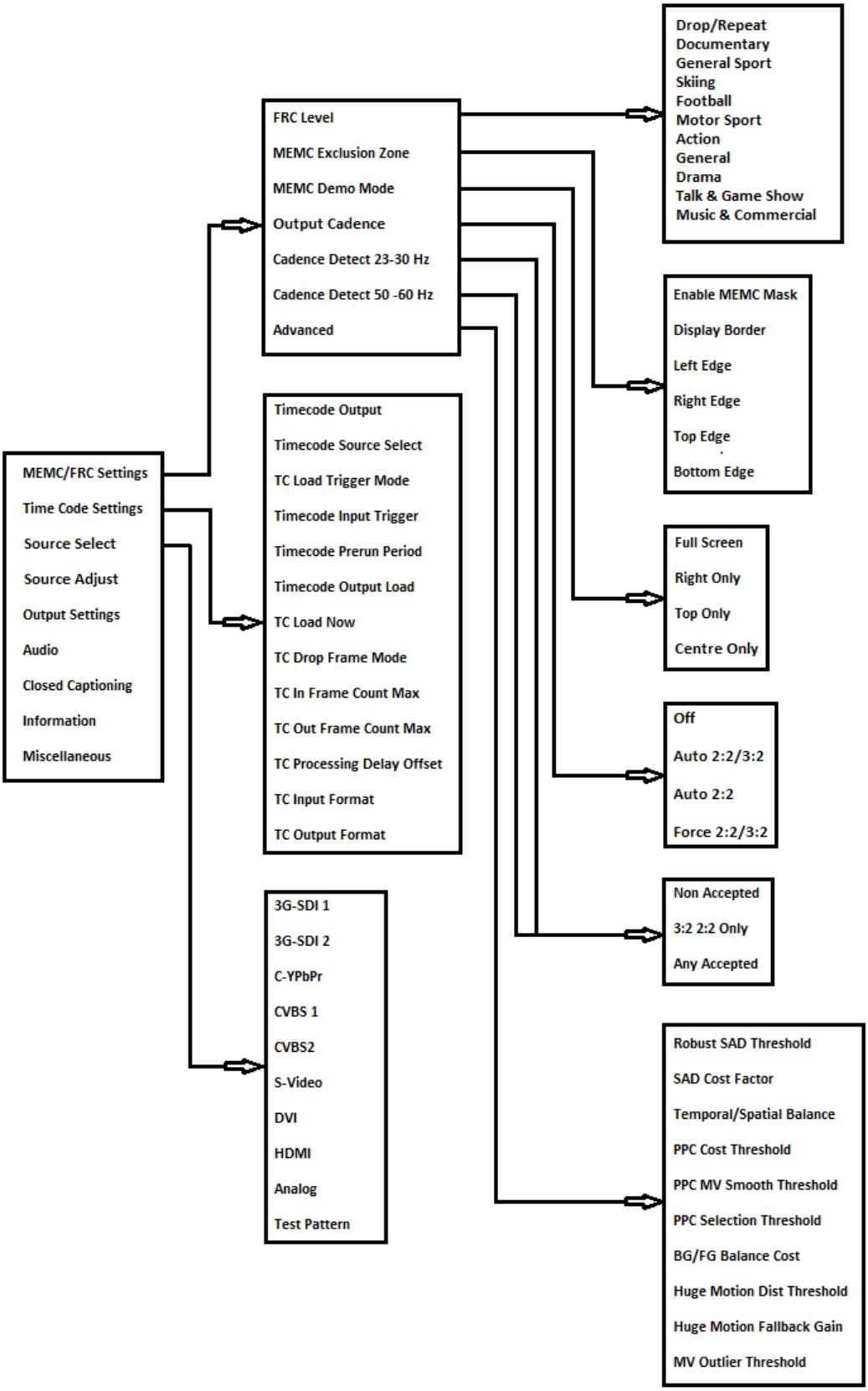
Flexible Connectivity

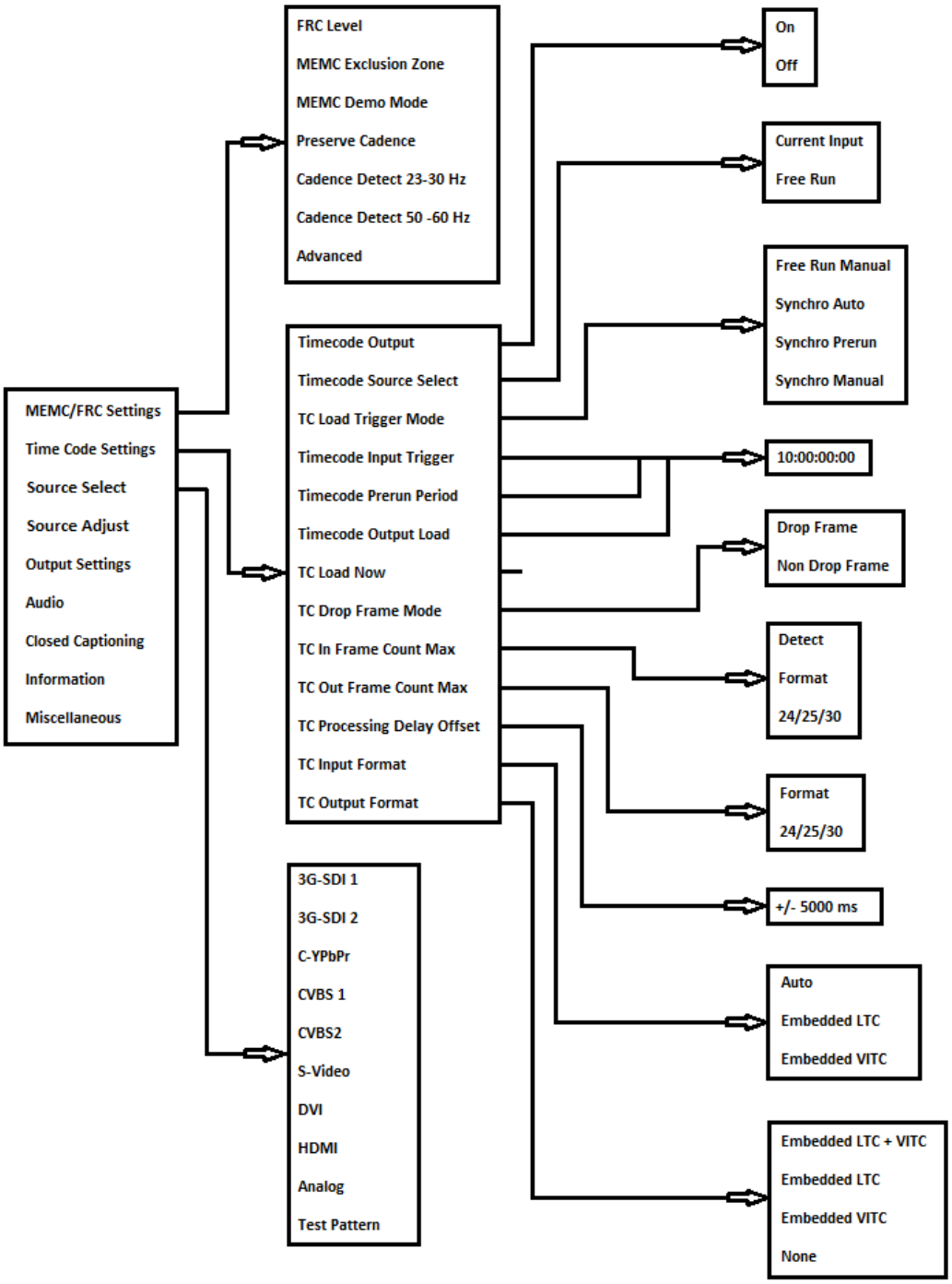
The Fovea can be fully controlled via the front panel buttons and the built in LCD panel. It also has three control ports on the rear panel as marked in the diagram below.

1. The BLUE arrow indicates the RS232 port
2. The RED arrow indicates the LAN TCP/IP port
3. The GREEN arrow indicates the USB service port. This port is for firmware updates only.

Fovea Rear Panel

Menu Tree


MEMC/FRC Settings
Time Code Settings
Source Select
Source Adjust
Output Settings
Audio
Closed Captioning
Information
Miscellaneous
FRC Level
MEMC Exclusion Zone
MEMC Demo Mode
Output Cadence
Cadence Detect 23-30 Hz
Cadence Detect 50 -60 Hz
Advanced
Timecode Output
Timecode Source Select
TC Load Trigger Mode
Timecode Input Trigger
Timecode Prerun Period
Timecode Output Load
TC Load Now
TC Drop Frame Mode
TC In Frame Count Max
TC Out Frame Count Max
TC Processing Delay Offset
TC Input Format
TC Output Format
3G-SDI 1
3G-SDI 2
C-YPbPr
CVBS 1
CVBS2
S-Video
DVI
HDMI
Analog
Test Pattern
Drop/Repeat
Documentary
General Sport
Skiing
Football
Motor Sport
Action
General
Drama
Talk & Game Show
Music & Commercial
Enable MEMC Mask
Display Border
Left Edge
Right Edge
Top Edge
Bottom Edge
Full Screen
Right Only
Top Only
Centre Only
Off
Auto 2:2/3:2
Auto 2:2
Force 2:2/3:2
Non Accepted
3:2 2:2 Only
Any Accepted
Robust SAD Threshold
SAD Cost Factor
Temporal/Spatial Balance
PPC Cost Threshold
PPC MV Smooth Threshold
PPC Selection Threshold
BG/FG Balance Cost
Huge Motion Dist Threshold
Huge Motion Fallback Gain
MV Outlier Threshold


MEMC/FRC Settings
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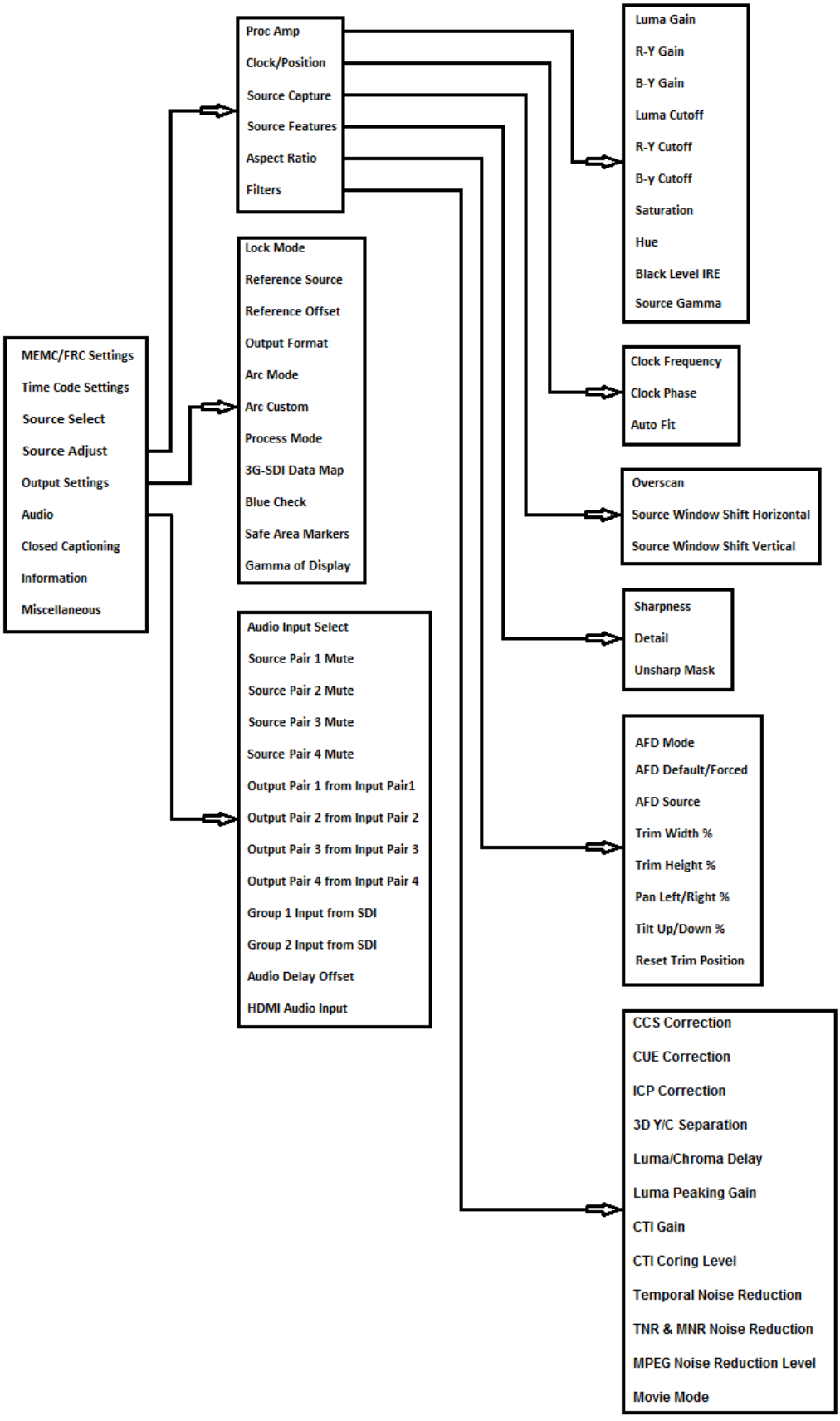
TC Out Frame Count Max
TC Processing Delay Offset
TC Input Format
TC Output Format
3G-SDI 1
3G-SDI 2
C-YPbPr
CVBS 1
CVBS2
S-Video
DVI
HDMI
Analog
Test Pattern
On
Off
Current Input
Free Run
Free Run Manual
Synchro Auto
Synchro Prerun
Synchro Manual
10:00:00:00
Drop Frame
Non Drop Frame
Detect
Format
24/25/30
Format
24/25/30
+/- 5000 ms
Auto
Embedded LTC
Embedded VITC
Embedded LTC + VITC
Embedded LTC
Embedded VITC
None


MEMC/FRC Settings
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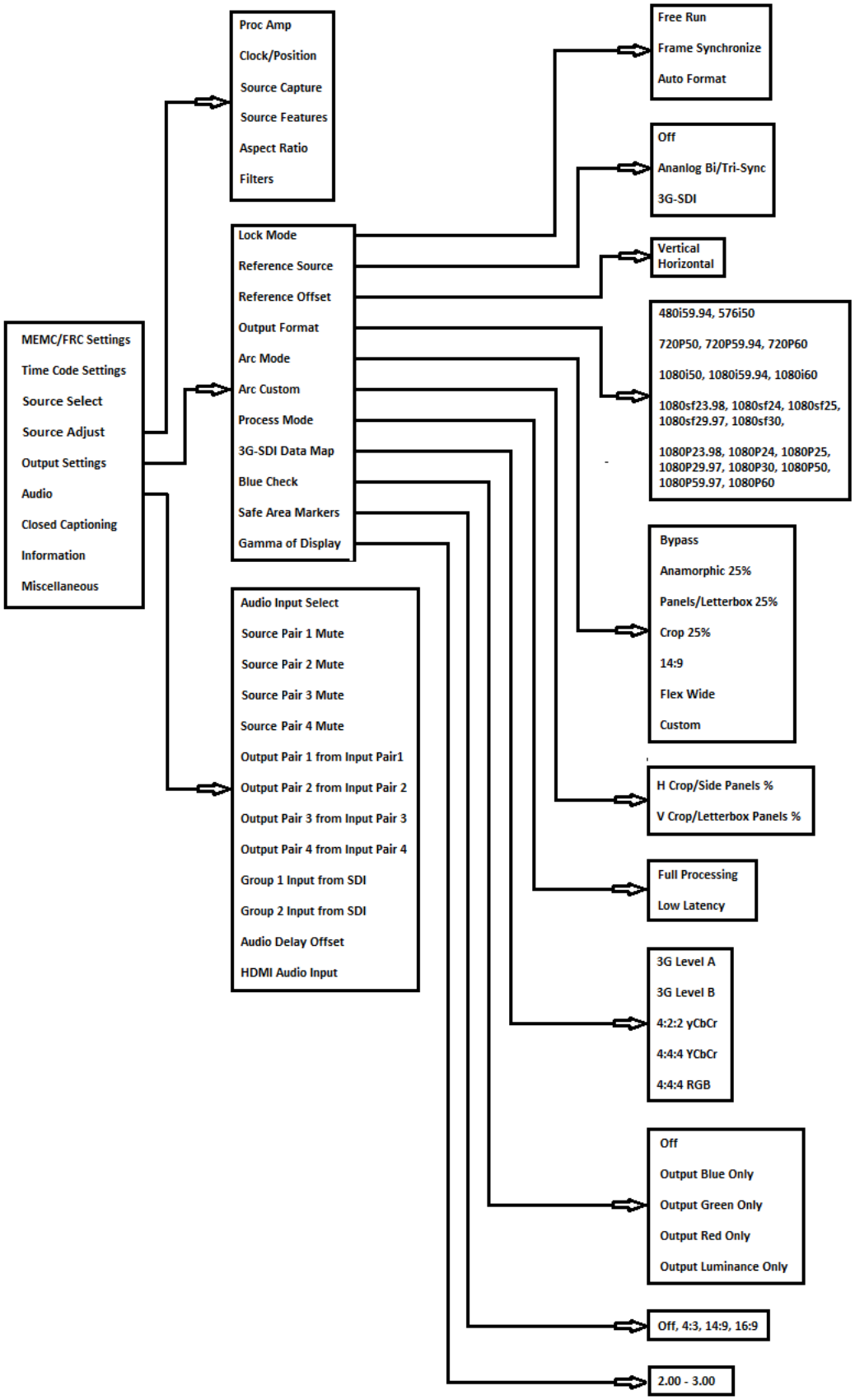
Miscellaneous
Proc Amp
Clock/Position
Source Capture
Source Features
Aspect Ratio
Filters
Lock Mode
Reference Source
Reference Offset
Output Format
Arc Mode
Arc Custom
Process Mode
3G-SDI Data Map
Blue Check
Safe Area Markers
Gamma of Display
Audio Input Select
Source Pair 1 Mute
Source Pair 2 Mute
Source Pair 3 Mute
Source Pair 4 Mute
Output Pair 1 from Input Pair1
Output Pair 2 from Input Pair 2
Output Pair 3 from Input Pair 3
Output Pair 4 from Input Pair 4
Group 1 Input from SDI
Group 2 Input from SDI
Audio Delay Offset
HDMI Audio Input
Luma Gain
R-Y Gain
B-Y Gain
Luma Cutoff
R-Y Cutoff
B-y Cutoff
Saturation
Hue
Black Level IRE
Source Gamma
Clock Frequency
Clock Phase
Auto Fit
Overscan
Source Window Shift Horizontal
Source Window Shift Vertical
Sharpness
Detail
Unsharp Mask
AFD Mode
AFD Default/Forced
AFD Source
Trim Width %
Trim Height %
Pan Left/Right %
Tilt Up/Down %
Reset Trim Position
CCS Correction
CUE Correction
ICP Correction
3D Y/C Separation
Luma/Chroma Delay
Luma Peaking Gain
CTI Gain
CTI Coring Level
Temporal Noise Reduction
TNR & MNR Noise Reduction
MPEG Noise Reduction Level
Movie Mode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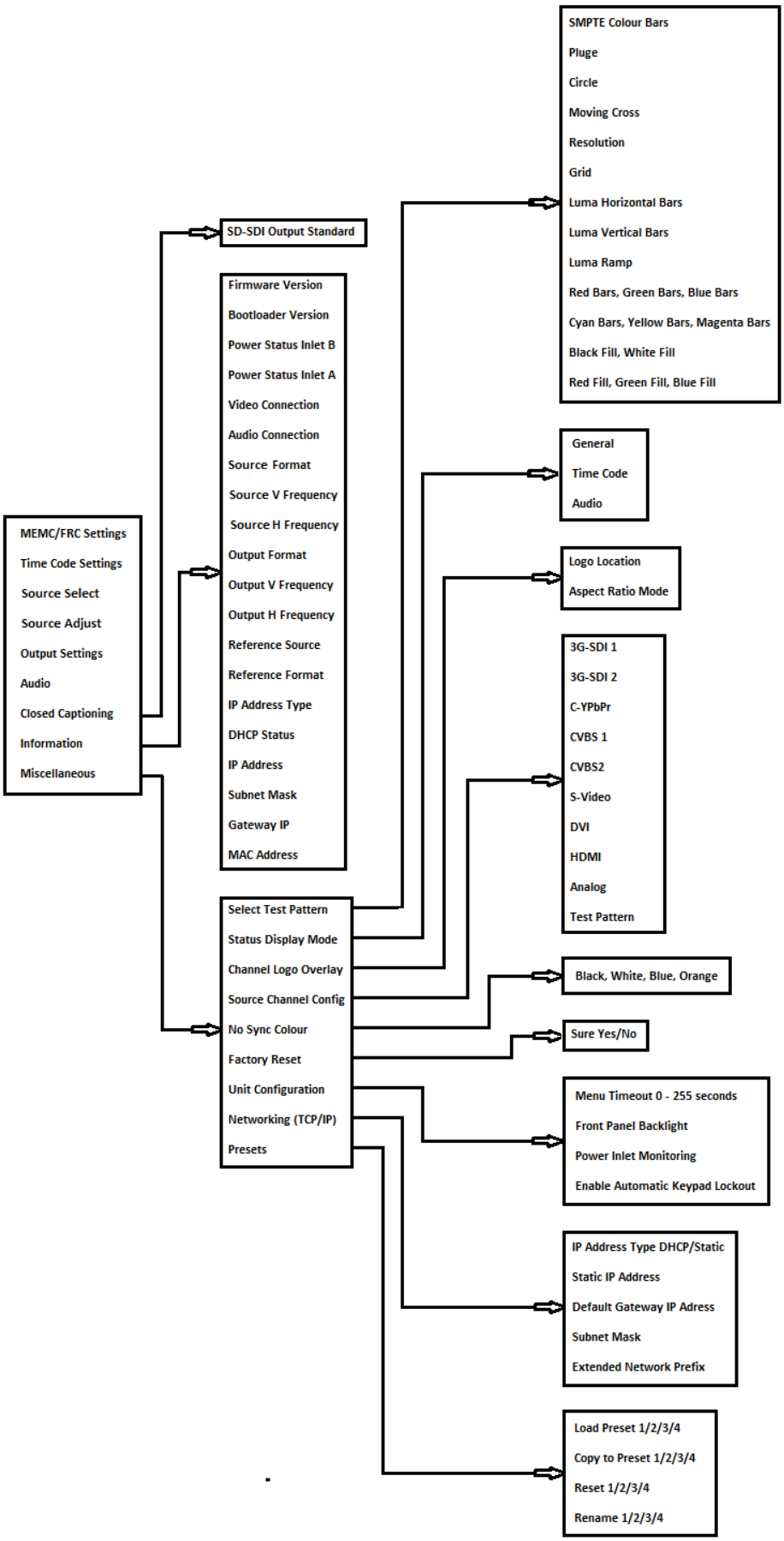
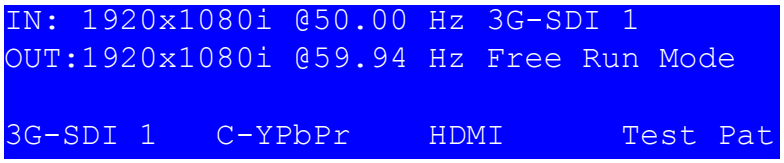
Reference Offset
Output Format
Arc Mode
Arc Custom
Process Mode
3G-SDI Data Map
Blue Check
Safe Area Markers
Gamma of Display
Audio Input Select
Source Pair 1 Mute
Source Pair 2 Mute
Source Pair 3 Mute
Source Pair 4 Mute
Output Pair 1 from Input Pair1
Output Pair 2 from Input Pair 2
Output Pair 3 from Input Pair 3
Output Pair 4 from Input Pair 4
Group 1 Input from SDI
Group 2 Input from SDI
Audio Delay Offset
HDMI Audio Input
Free Run
Frame Synchronize
Auto Format
Off
Ananlog Bi/Tri-Sync
3G-SDI
Vertical
Horizontal
480i59.94, 576i50
720P50, 720P59.94, 720P60
1080i50, 1080i59.94, 1080i60
1080sf23.98, 1080sf24, 1080sf25, 1080sf29.97, 1080sf30,
1080P23.98, 1080P24, 1080P25, 1080P29.97, 1080P30, 1080P50, 1080P59.97, 1080P60
Bypass
Anamorphic 25%
Panels/Letterbox 25%
Crop 25%
14:9
Flex Wide
Custom
H Crop/Side Panels %
V Crop/Letterbox Panels %
Full Processing
Low Latency
3G Level A
3G Level B
4:2:2 yCbCr
4:4:4 YCbCr
4:4:4 RGB
Off
Output Blue Only
Output Green Only
Output Red Only
Output Luminance Only
Off, 4:3, 14:9, 16:9
2.00 - 3.00


MEMC/FRC Settings
Time Code Settings
Source Select
Source Adjust
Output Settings
Audio
Closed Captioning
Information
Miscellaneous
SD-SDI Output Standard
Firmware Version
Bootloader Version
Power Status Inlet B
Power Status Inlet A
Video Connection
Audio Connection
Source Format
Source V Frequency
Source H Frequency
Output Format
Output V Frequency
Output H Frequency
Reference Source
Reference Format
IP Address Type
DHCP Status
IP Address
Subnet Mask
Gateway IP
MAC Address
Select Test Pattern
Status Display Mode
Channel Logo Overlay
Source Channel Config
No Sync Colour
Factory Reset
Unit Configuration
Networking (TCP/IP)
Presets
SMPTE Colour Bars
Pluge
Circle
Moving Cross
Resolution
Grid
Luma Horizontal Bars
Luma Vertical Bars
Luma Ramp
Red Bars, Green Bars, Blue Bars
Cyan Bars, Yellow Bars, Magenta Bars
Black Fill, White Fill
Red Fill, Green Fill, Blue Fill
General
Time Code
Audio
Logo Location
Aspect Ratio Mode
3G-SDI 1
3G-SDI 2
C-YPbPr
CVBS 1
CVBS2
S-Video
DVI
HDMI
Analog
Test Pattern
Black, White, Blue, Orange
Sure Yes/No
Menu Timeout 0 - 255 seconds
Front Panel Backlight
Power Inlet Monitoring
Enable Automatic Keypad Lockout
IP Address Type DHCP/Static
Static IP Address
Default Gateway IP Adress
Subnet Mask
Extended Network Prefix
Load Preset 1/2/3/4
Copy to Preset 1/2/3/4
Reset 1/2/3/4
Rename 1/2/3/4

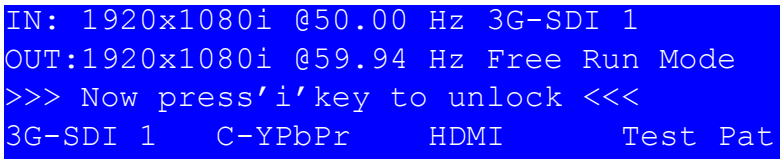
Control via Front Panel LCD and Menu Buttons

The Fovea has front panel LCD display which gives status information and access to the in-built menu system.

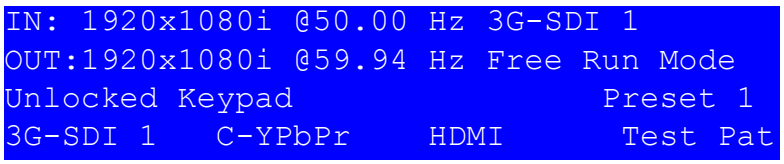


Safe Operation

Fovea features safe operating conditions
1) The front panel ⏻ Standby button must be pressed and held for 4 seconds to activate
2) The front panel channel select and menu buttons are locked by default; to activate the front panel press the Enter button and then the i button



Attempting to operate menu when keypad is locked will prompt this message in the summary screen



When the keypad is un-locked this message will show in the summary screen

This feature can be disabled in Menu>Miscellaneous>Unit Configuration

All menu items can be accessed via the front panel
1) Press 'Select/Enter' to access the menu
2) Use the 'up & down' keys to navigate the required menu item to the top of the screen
3) Press 'Select/Enter' to access that item
4) Repeat 2) and 3) to reach the item of choice
5) Use 'left and right' keys to select chosen mode
6) Press 'Menu/ESC' or 'Info' to back out of menu items

Control via built-in Web Server

Fovea has a built-in Web Server which can be addressed by any current Web Browser connecting to the LAN port.

Please note that the response time to commands sent using a Web browser varies with both the nature of the traffic on the users network and with some versions of Web browser.
Some browsers are better than others, this has been found to be true particularly when connected to a busy network.

Internet Explorer gives good results but preferably with Microsoft's Smart Screen Filter turned **OFF** to give the best performance
The latest versions of Chrome, Firefox and Safari respectively also give good results.

The menu system in the server mirrors the front panel menu having the extra function for uploading a user generated logo.

Users can connect a computer directly to the LAN port with a changeover cable or via a switch or router with normal Ethernet cables. Users can also connect via a local area network.

The TCP/IP address of Fovea can be obtained from DHCP or a Static Address, Gateway Address, Subnet Mask and Extended Network Prefix can be set manually. To set the network address the settings can be made in Menu>Miscellaneous>Networking

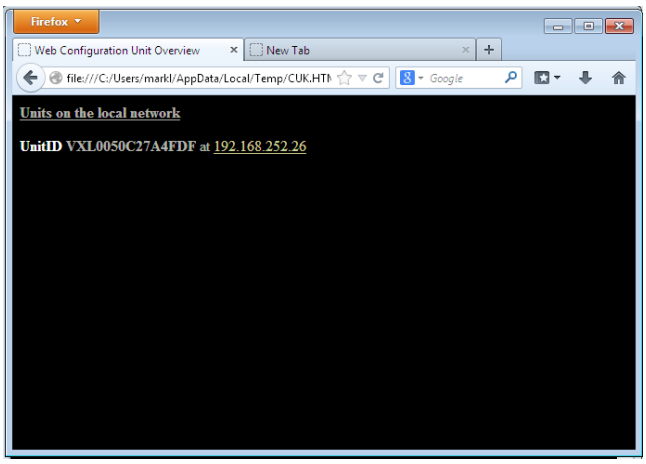
If the user changes from DHCP to Static or from Static to DHCP it is recommended to re-boot the processor to ensure the new state is acknowledged fully.

If the user is operating Fovea's Web Server in DHCP mode, Calibre publish a Discovery Tool which the user can run to find Calibre processors on the user's local area network. It can be downloaded from http://www.calibreuk.com/software/vxl/DiscoveryTool_V1.0.exe
This tool will search the user's network and report any Calibre processors found.

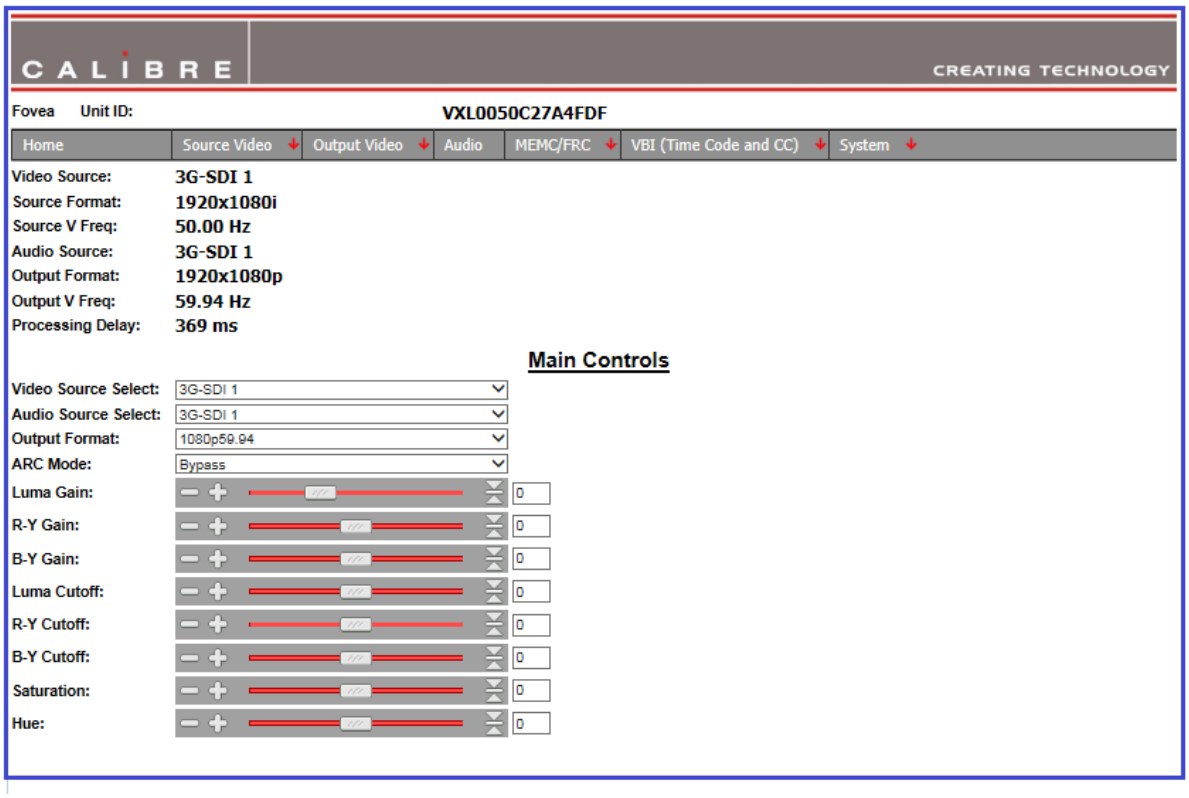
The 'Discovery Tool' will open a window shown below.

In this example there is just a single Fovea attached, it can be seen identified as its parent group title of VXL

Click on the IP address of the unit you wish to access that machine's Web server.



This is the index page when connecting to the Web server via a typical browser

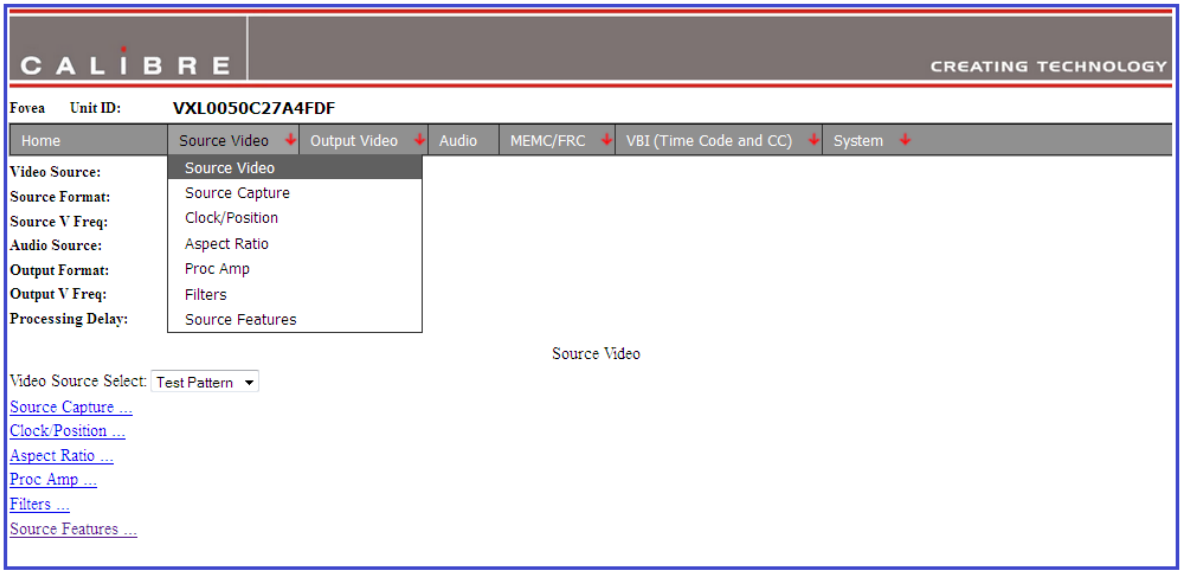


Note on all pages the current source and output formats together with processing delay are constantly monitored and displayed in the top left of the page under the menu bar.

Below are examples of how to navigate within this menu

Source Video Adjustments

From the menu bar hover or click on Source Video

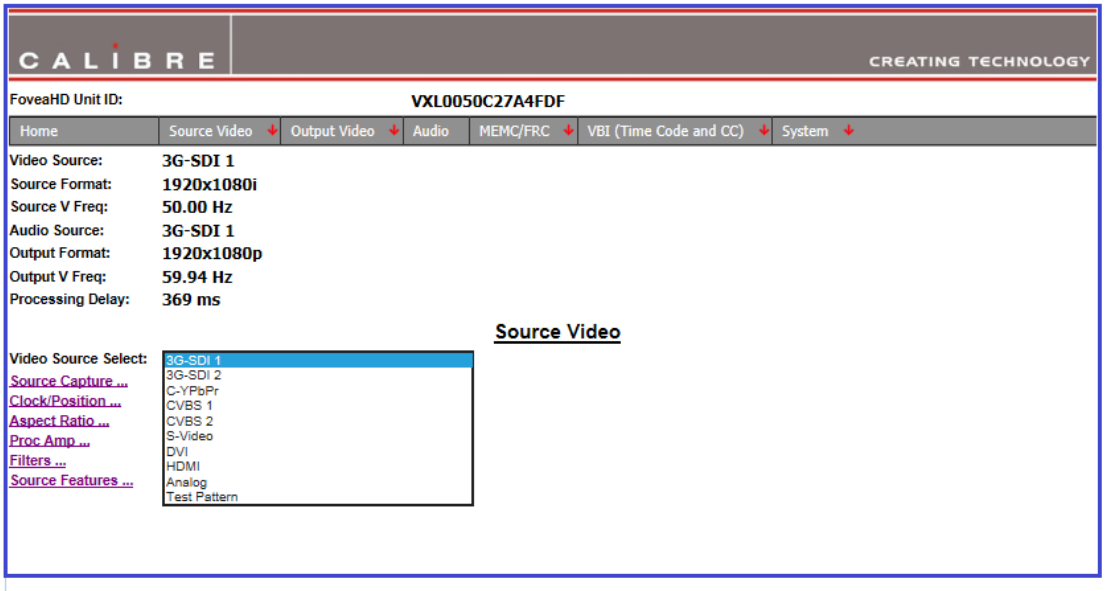


There is a separate independant memory for the adjustments you make to each mode on each source.

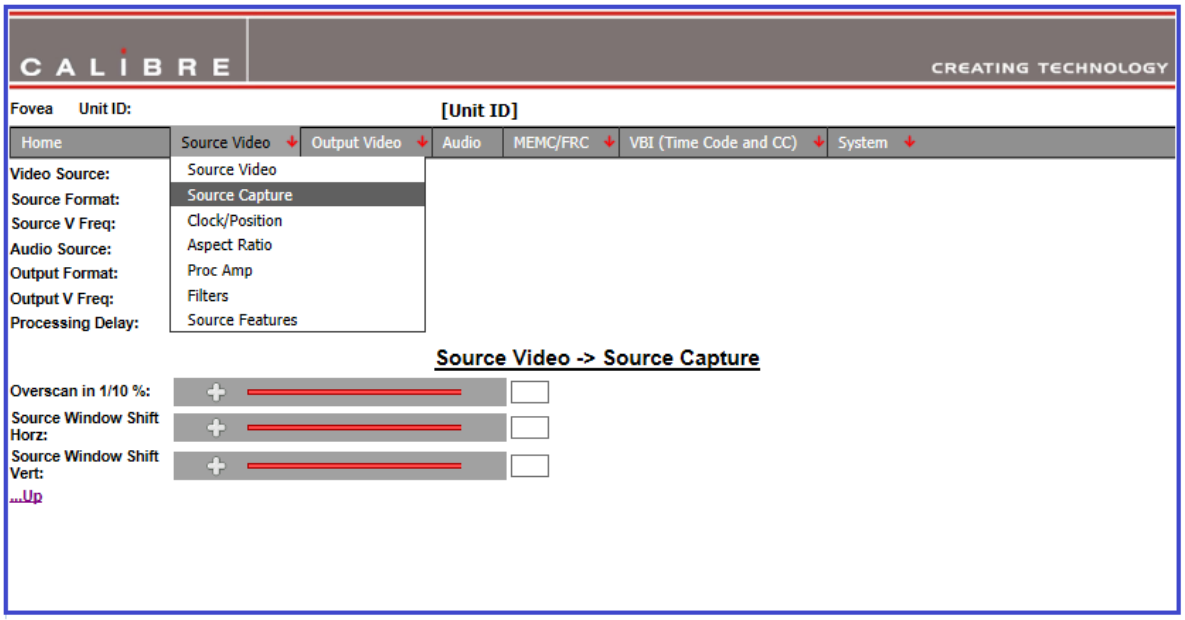
Refer to the User Manual and set-up guide for more detailed instructions on the use of each of the available menu items in this section

Click on the Video Source Select drop down box to reveal the list of available sources, to select click on the required source

Video Source Select



Source Capture

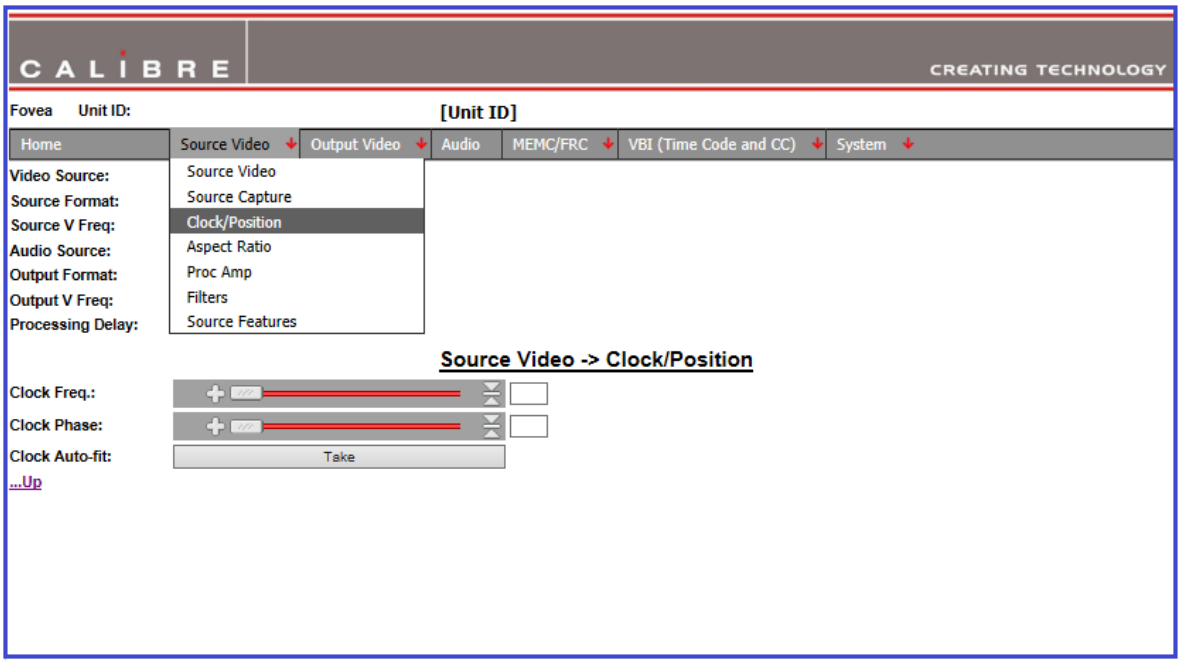


Overscan upscales the source, the maximum overscan is 10%, the minimum is 0%.

Source Window Shift gives horizontal and vertical adjustment of the captured active image area

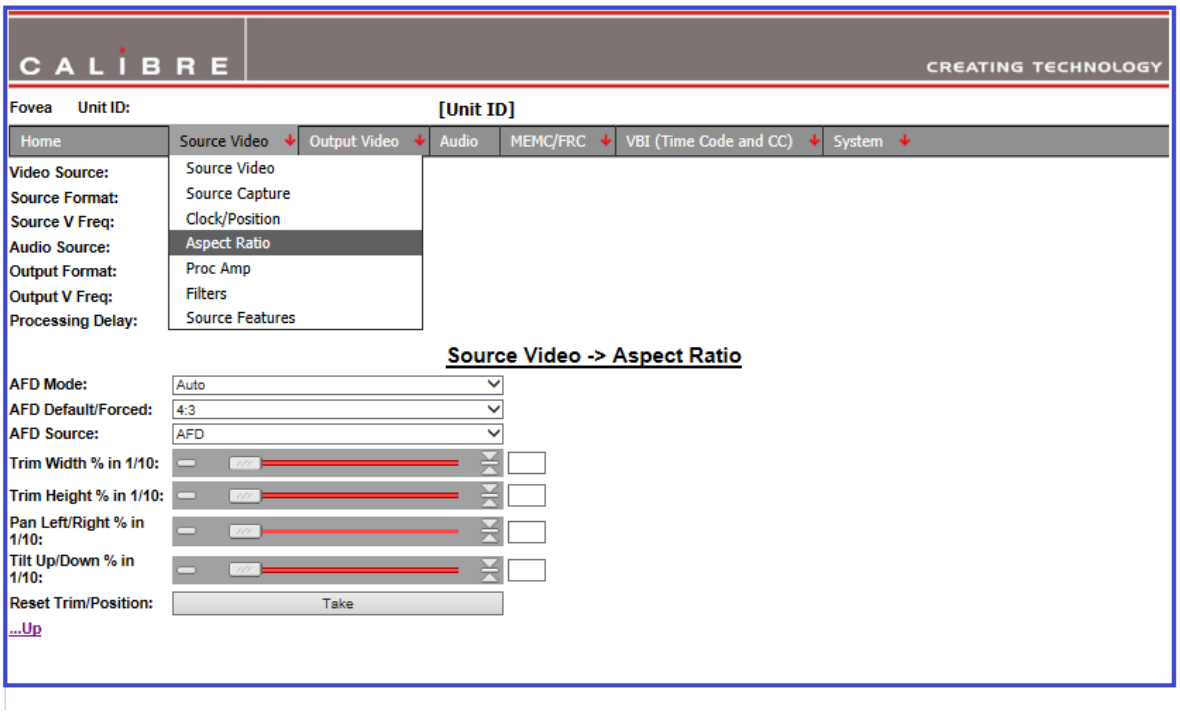
Note: The range of adjustment is limited by the signal timings from the source signal.
The source window shift function should only ever be used to correct source capture discrepancies.

Clock/Position



Although automatic settings for the Analogue (VGA RGBHV) source are recommended, manual adjustment can be made in this menu. Clock Position is for adjustment of this source only.

Aspect Ratio



AFD Mode Fovea detects the aspect ratio of the incoming video signal. The ARC (Aspect Ratio Conversion) settings in the Output Settings menu determine how this information is processed.

AFD Default/Forced determines what aspect ratio has to be assumed for further processing. Keep Last uses whatever was seen before. If nothing was seen before the default is 4:3 for SD modes and 16:9 for HD modes.

AFD Source information for the source channels are as follows:
HDMI: From the AVInfoFrames (see CEA-861-D)
DVI and VGA: none available - all source formats assumed to be square pixel
CVBS/S-Video/YCbCr: WSS or CGMS-A packets, according to format.
PAL/576i uses WSS (BT.1119-2); NTSC/480i,720p,1080i use CGMS-A (CEA-805/IEC 61880/EIAJ CPR-1204/etc)

Trim Width % scales the video image in the horizontal direction
Black bars are added on left and right of the image when a shrink is performed.

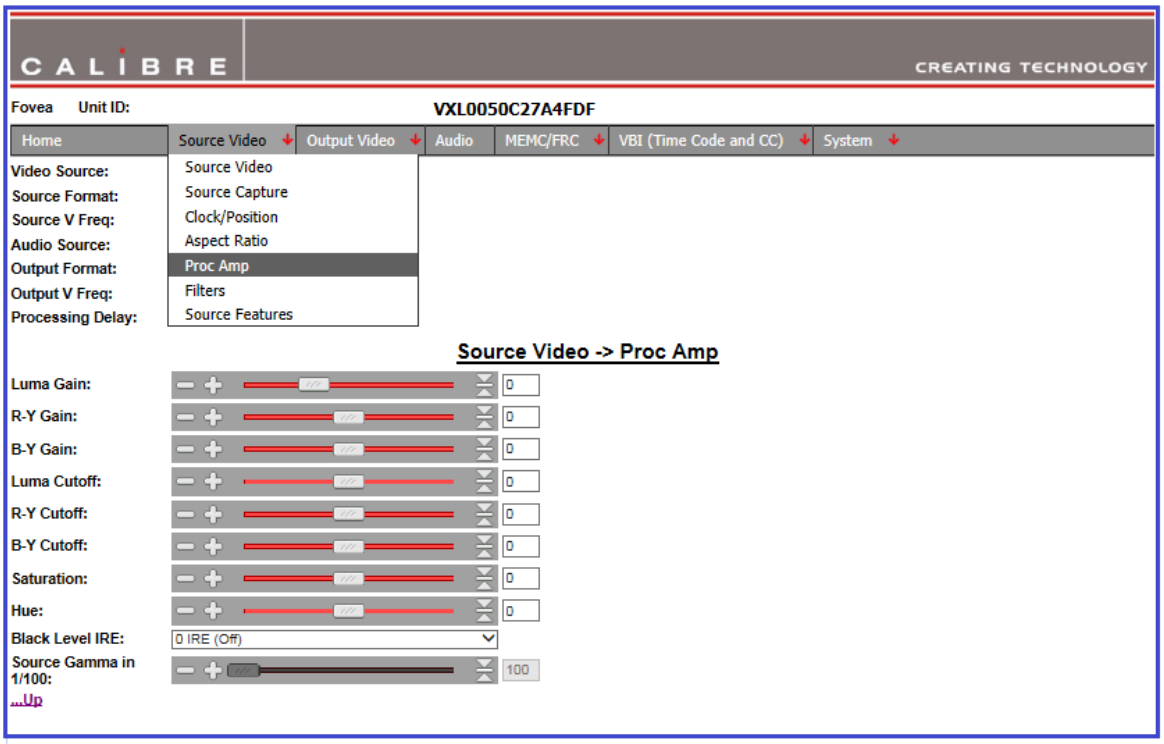
Trim Height % scales the video image in the vertical direction.
Black bars are added on top and bottom of the image when a shrink is performed.

Pan Left/Right % The zoomed image can be paned in the horizontal direction

Tilt Up/Down % The zoomed image can be tilted in the vertical direction

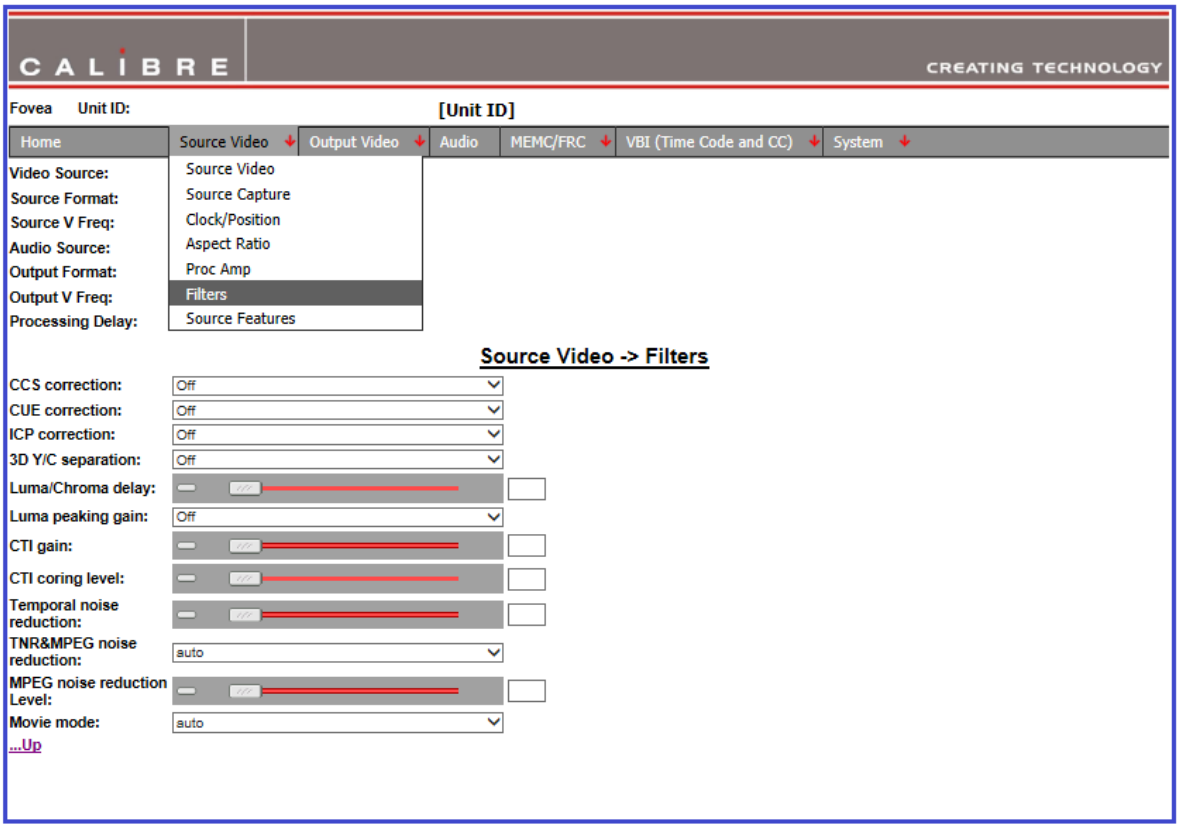
Reset Trim Position Resets all trim and pan settings to zero percent.

Proc Amp



The Proc Amp provides colour correction, saturation, hue and black level adjustments separately for each mode of each source, the memory is recalled when the source is selected or the mode changes.

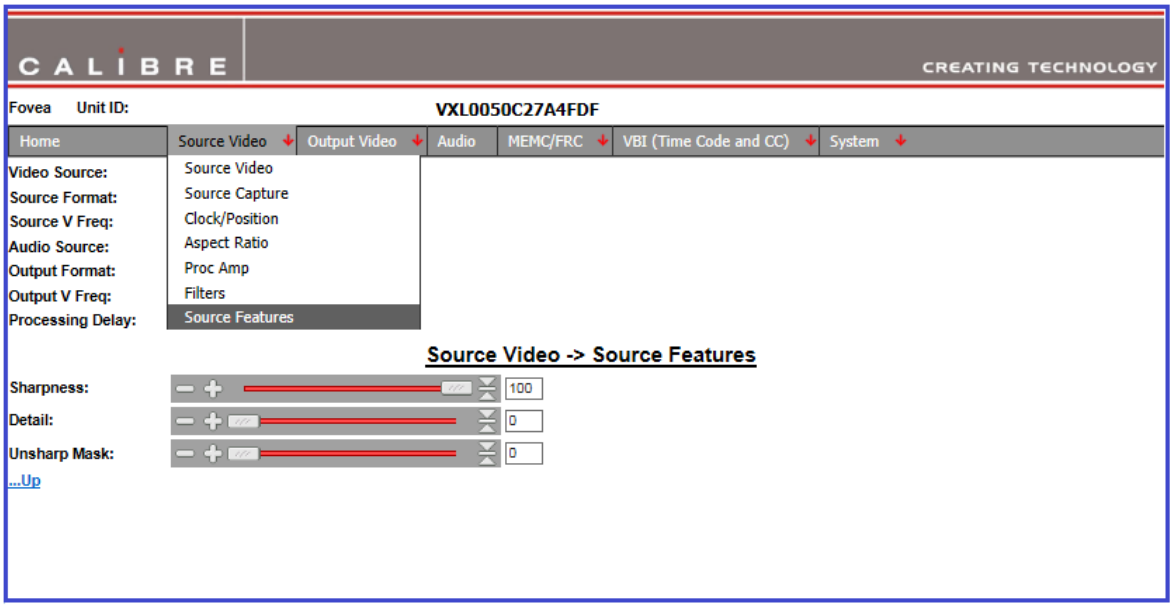
Filters



Fovea has a range of image clean-up filters to help re-master poor images

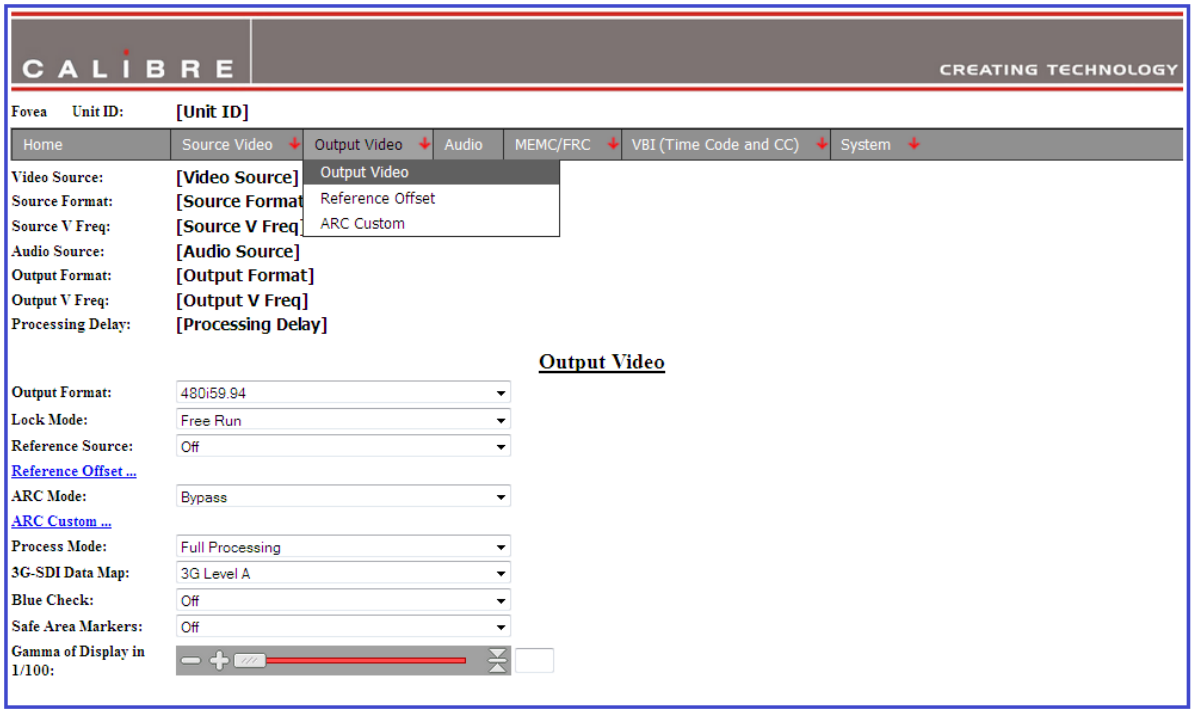
CCS	Cross Chrominance Suppression filter (reduction of chroma-crawl) – SD only
CUE	Chroma Up sampling Error correction filter
ICP	Interlace Chroma Problem filter, reduces interlace errors on diagonals & curves
3D Y/C	Filter to reduce luminance to chrominance cross talk of composite video signals which appears as a coarse rainbow pattern or random colours in regions of fine details.
Luma/Chroma delay	Adjustable delay between chroma and luma of +/- 3 pixels.
Luma peaking gain	Luma transient steepening.
CTI gain	Chroma transient steepening.
CTI coring level	Threshold to CTI to avoid noise being amplified
TNR	Temporal Noise Reduction (removes "electronic" noise found on broadcasts, film material)
TNR & MNR	Selects which noise reduction filters are applied – TNR only, TNR+MNR, or Auto for automatic image content and noise based selection of filters.
MPEG NR Level	Adjusts the level of MNR (MPEG Noise Reduction) for SD signals. Not applicable to HD formats – use TNR for removal of all types of noise from HD formats.
Movie Mode	When set to Auto, detects film content converted to video and applies the inverse telecine process. When set to video, motion adaptive de-interlacing is applied. The Film setting will apply an inverse telecine process no matter the content. This will give great detail for film originated content video. If the content is video this setting shows unacceptable feathering. When such artefacts are observed the Video or Auto setting is more appropriate.

Source Features



Sharpness	a peaking filter to improve high-frequency response. Note, setting this control too high will cause ringing or ghosting.
Detail	provides an additional level of detail enhancement beyond that provided by the Unsharp Mask
Unsharp Mask	a powerful function which can be used to greatly improve detail definition and clarity without causing image ringing or ghosting. It improves both horizontal and vertical detail. Correct setting of the Unsharp Mask filter can make SD signals look virtually indistinguishable from true HD.

Output Video



Refer to the user manual for a full explanation of the functions in this menu

Output Format

The unit can be set to operate at a fixed output format. The following output formats can be chosen: 480i59.94, 576i50, 720p50, 720p59.94, 720p60, 1080i50, 1080i59.94, 1080i60, 1080sf23.98, 1080sf24, 1080sf25, 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60

Lock Mode

Free run	uses internal synch clocks set under Output Format.
Frame synchronize	uses the genlock signal. The phase can be controlled allowing adjustment for a desired latency.
Auto Format	chooses the mode provided on the genlock input regardless of the setting under Output Format.
Genlock	status is shown via the front panel status indication on the right-hand side of the screen, provided it has been enabled on the menu.

Reference Source

The source for the frame synchronisation signal can be either an analogue bi- or tri-level signal or derived from an SDI signal. Note: this needs to be set to the genlock input you are using.

Reference Offset

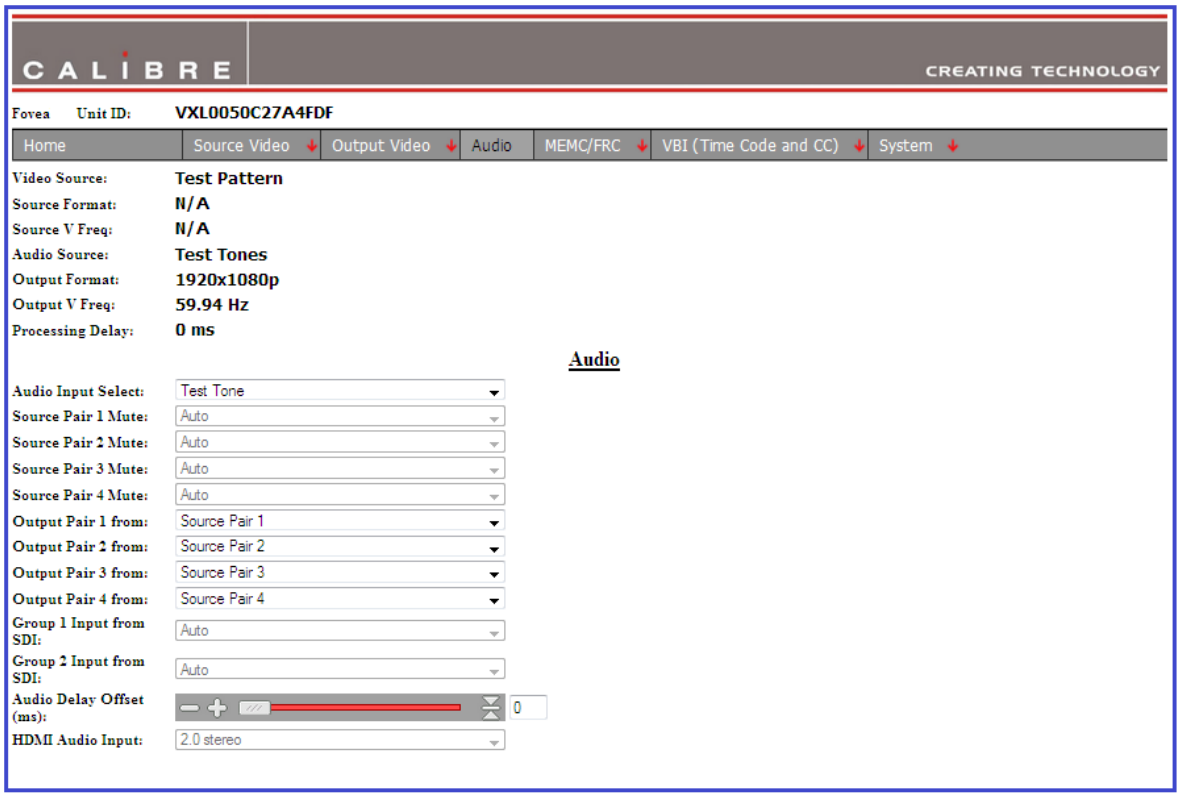
Vertical	Increase the latency in multiples of lines.
Horizontal	Increase the latency in multiples of pixels.

ARC Mode

Bypass	will scale the image to full screen.
Crop	25% makes a 4:3 fit a 16:9 by chopping off top and bottom; or makes a 16:9 fit a 4:3 by chopping off (25% off) left and right.
Anamorphic	is for 4:3 SD outputs only, it linearly compresses a 16:9 image into 4:3 without cropping or added bars.

Panels/Letterbox	will add bars above and below a 16:9 image for a 4:3 SD output, or add bars at the sides of a 4:3 image on a 16:9 output.
14:9	will crop or add bars to produce a 14:9 image
Flex Wide	is applying a non-linear stretch horizontally to convert a 4:3 into 16:9 with the emphasis of aspect ratio conversion in the centre of the image.
Custom	allows the user to specify a zoom horizontally and/or vertically starting with full screen scaling.
ARC Custom	H Crop/Side Panels and V Crop/Letterbox Panels When ARC mode is set to Custom this menu becomes available. The output image can be scaled up and down individually in horizontal and vertical direction.
Process Mode	
Full Processing	Noise reduction and motion-adaptive de-interlacing operate in this mode to give the best quality picture.
Low Latency	In this mode noise reduction and motion-adaptive de-interlacing are disabled which allows the delay through the unit to be reduced to 3 frames in free run mode or 2 frames when frame synchronising.
3G-SDI Data Map	Choose the required format for the SDI output
Blue Check	The live video output image blue, green, red and white (luma) content can be separated and displayed individually when selecting the respective component through this menu.
Safe Area Markers	Safe area markers will show available aspect ratios are 4:3, 14:9 and 16:9.
Gamma of Display	Change the gamma correction to match the gamma of the display.

Audio



Refer to the user manual for a full description of each item in this menu

The audio streams from the AES, HDMI and SDI source can be routed or muted here
Choose between channels 1 to 8 or 9 to 16 in group 1 or 2

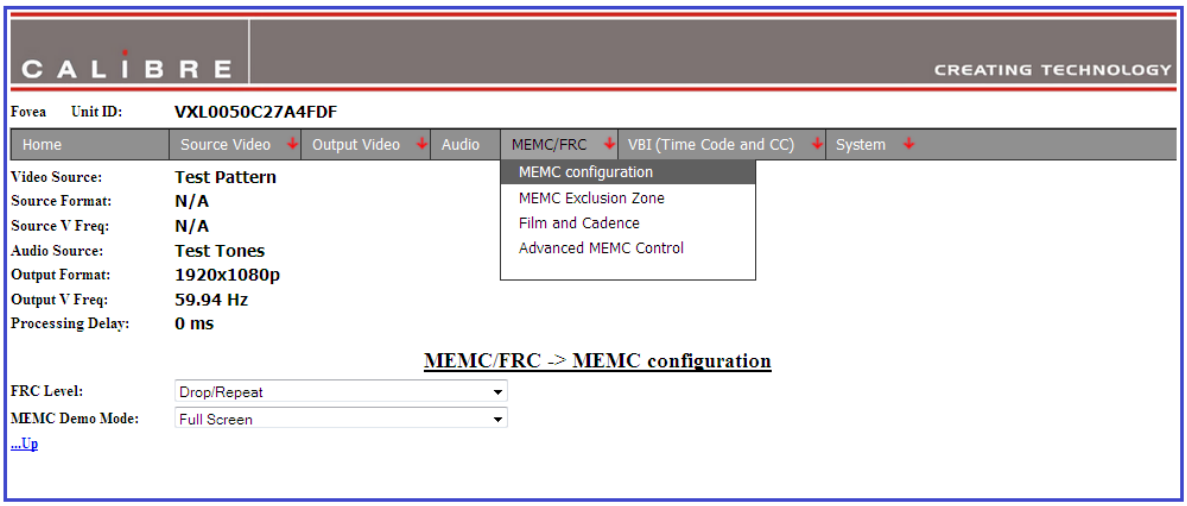
Audio Delay is automatically set to compensate for the latency through the unit.

The Audio Delay adjustment allows fine calibration of the audio delay in steps of approximately 1mS, to advance or retard the audio so as to compensate for further delays in your display device or your audio system.

MEMC/FRC Adjustments

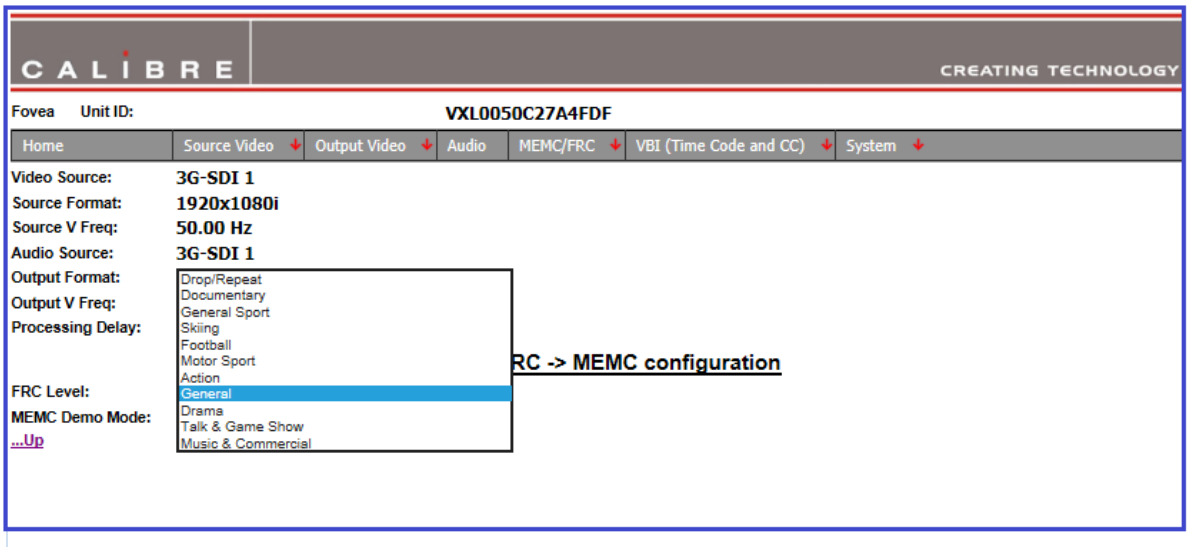
From the menu bar hover over or click on MEMC/FRC

Click on MEMC Configuration



FRC Level

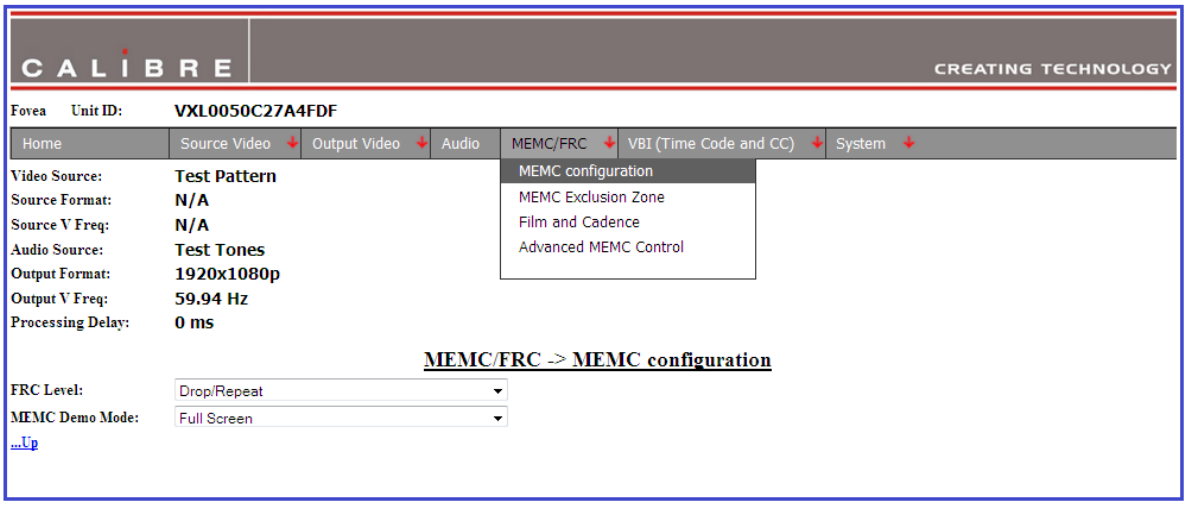
Click on the FRC level drop down box



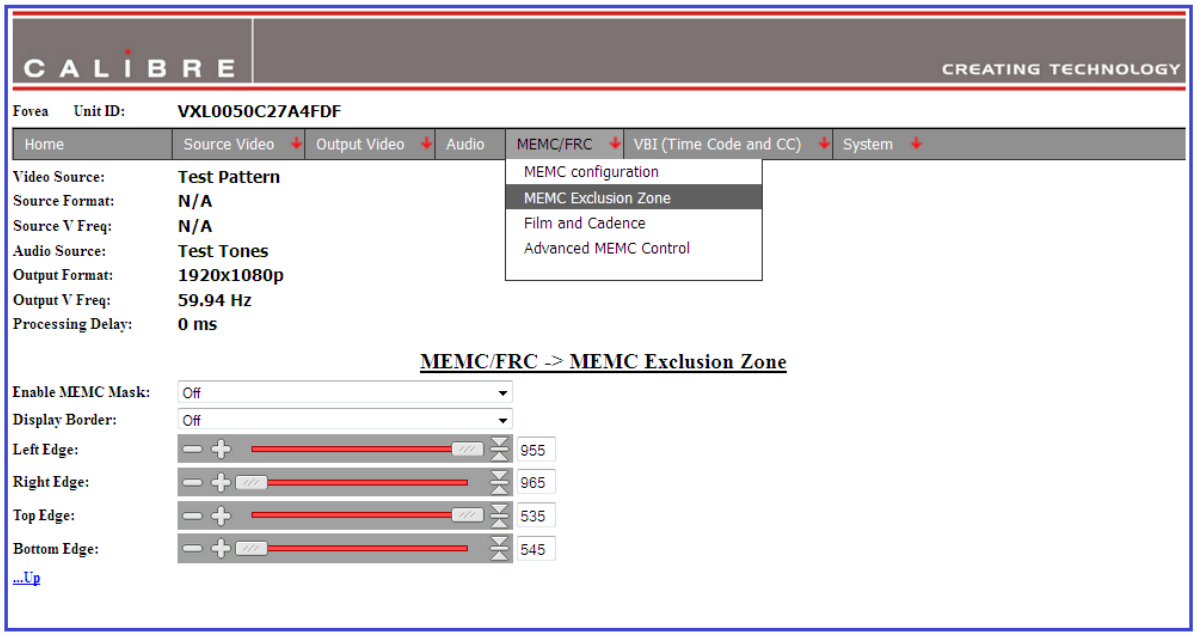
A range of customised settings arranged under names intended to indicate typical applications are available – note Drop/Repeat turns off the Motion Compensation

MEMC Demo Mode

The user can choose to apply MEMC correction to one portion of the screen whilst the rest of the screen is not processed. This is primarily for demonstration but can also be a useful tool when analysing picture artefacts

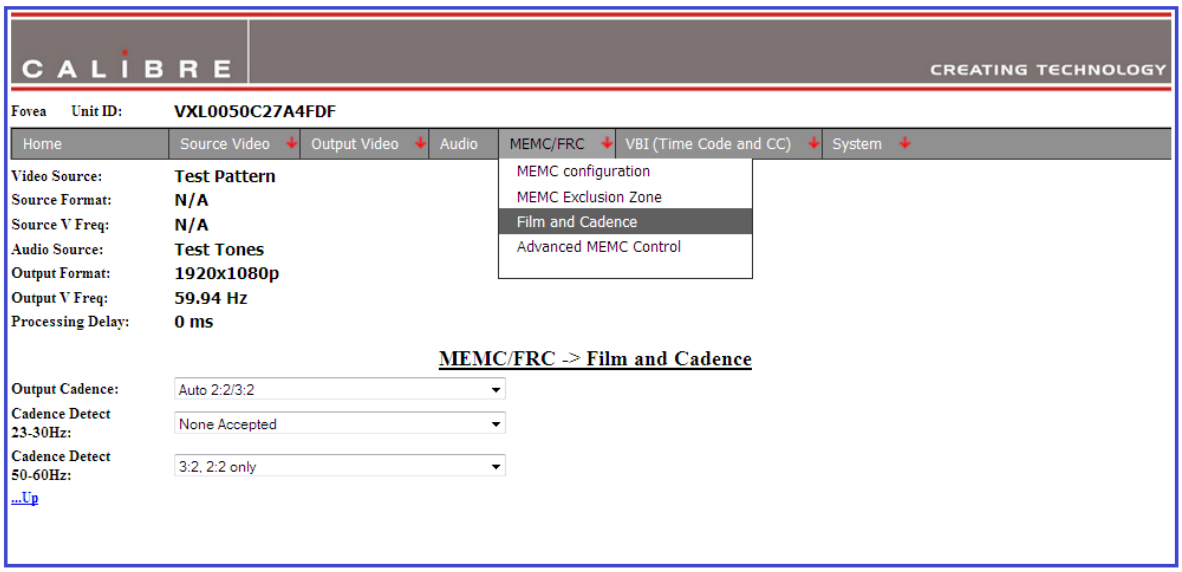


Exclusion Zone



In this menu section an area of the screen can be excluded from the Motion Compensation for applications such as ticker tape data at the bottom of the screen.

Film and Cadence



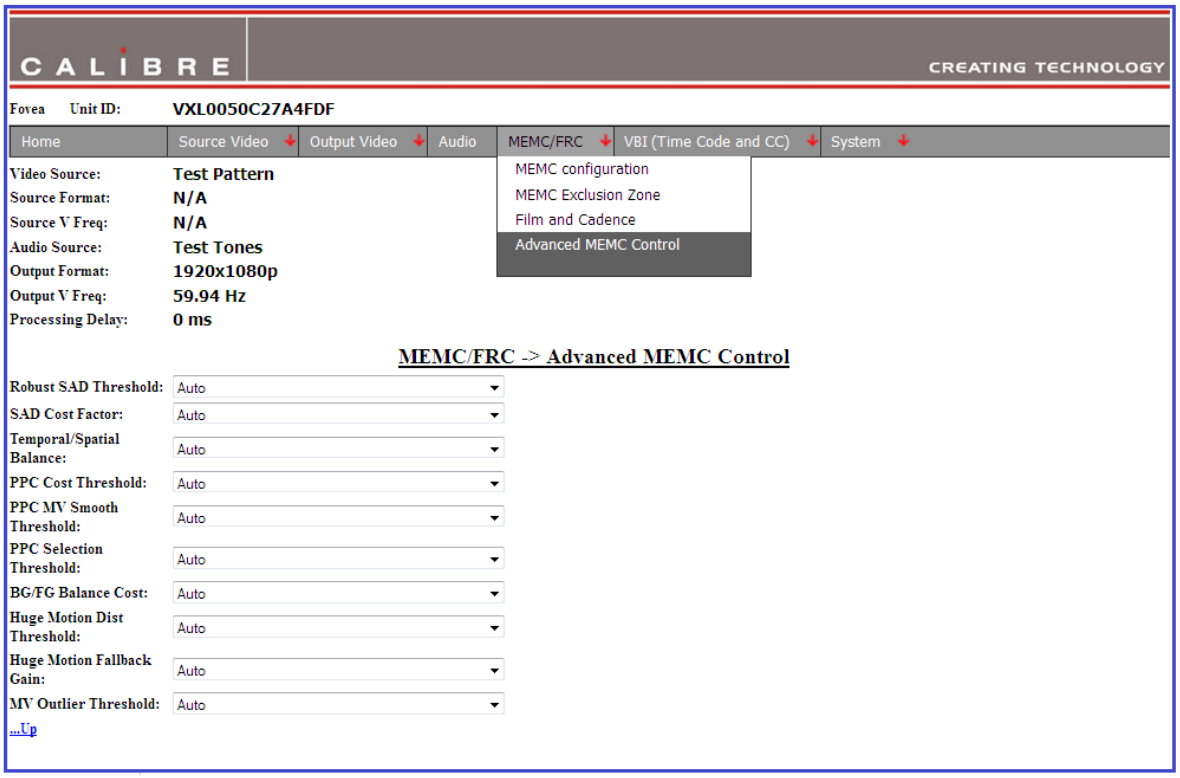
Cadence Detect

Cadence Detection can be switched off (none accepted), limited to 3:2/2:2 or set to full detection (any accepted) mode.
This can be set up independently for the two groups of 23.98Hz to 30Hz and 50Hz to 60Hz video modes.

Output Cadence

Output Cadence can be switched off or the incoming video signal cadence will be used to determine an output cadence. When set to Auto 2:2/3:2 filmic stutter of 3:2 or 2:2 or 23.98/24Hz material is preserved by applying a 2:2 (50Hz o/p) or 3:2 (50.94/60Hz o/p) cadence to the converted material. When set to Auto 2:2 only 2:2 material is preserved.
Setting up Forced 2:2/3:2 will force a 2:2 cadence for 50Hz o/p and a 3:2 cadence for 59.94/60Hz o/p no matter if there is a cadence on the incoming video signal.
Forced 2:2 will apply a 2:2 cadence regardless of the o/p mode, i.e. for 50/50.94/60Hz.

Advanced MEMC Control



By default, these settings are set to ‘Auto’ which means the values are selected internally according to the MEMC/FRC level setting, and sometimes changed dynamically according to various statistics that are measured frame by frame.

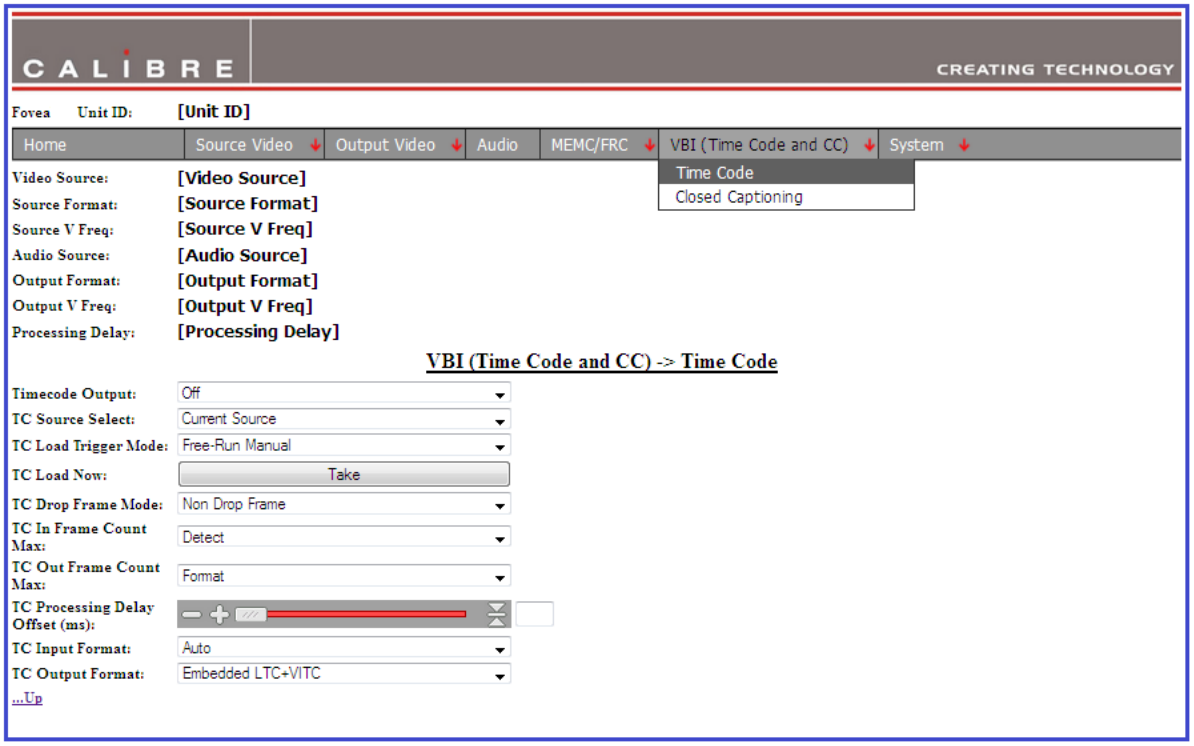
These parameters allow user optimisation of the Motion Estimation, Motion Compensation process, according to the nature of the video being converted.

The settings and threshold values can be individually overridden from the automatic value to stages denoted as Minimum, Very Low, Low, Medium, High, Very High, Maximum.

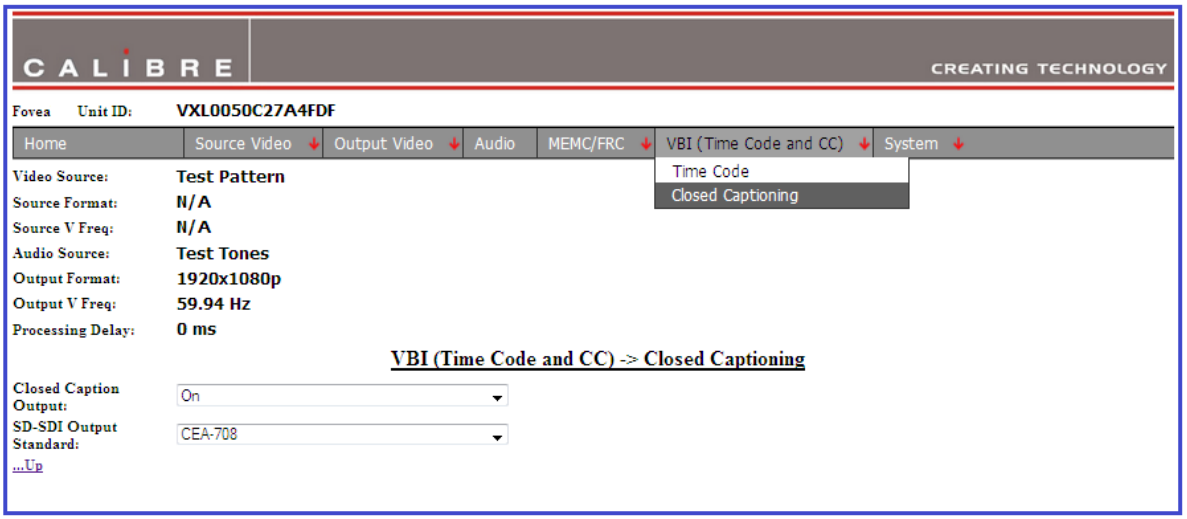
Refer to the user manual section 3.5.2 Advanced settings for a full explanation of the the items in this section of the menu.

Time Code and Closed Captioning

Click on Time Code

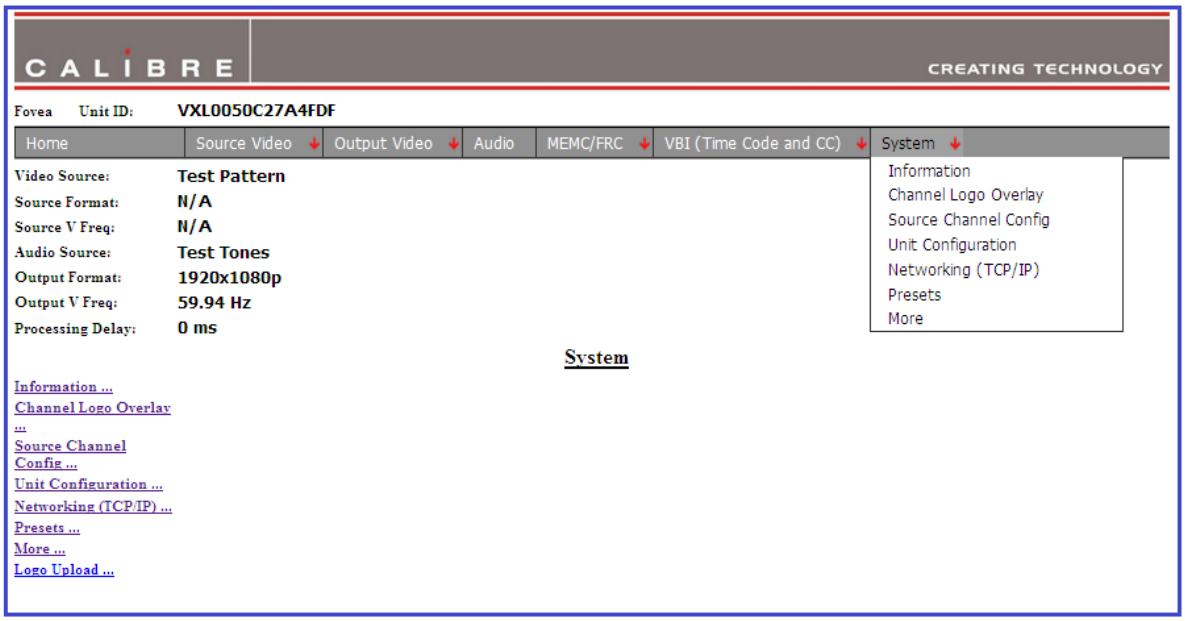


In this section of the menu all the settings for free run or source referenced time code can be accessed



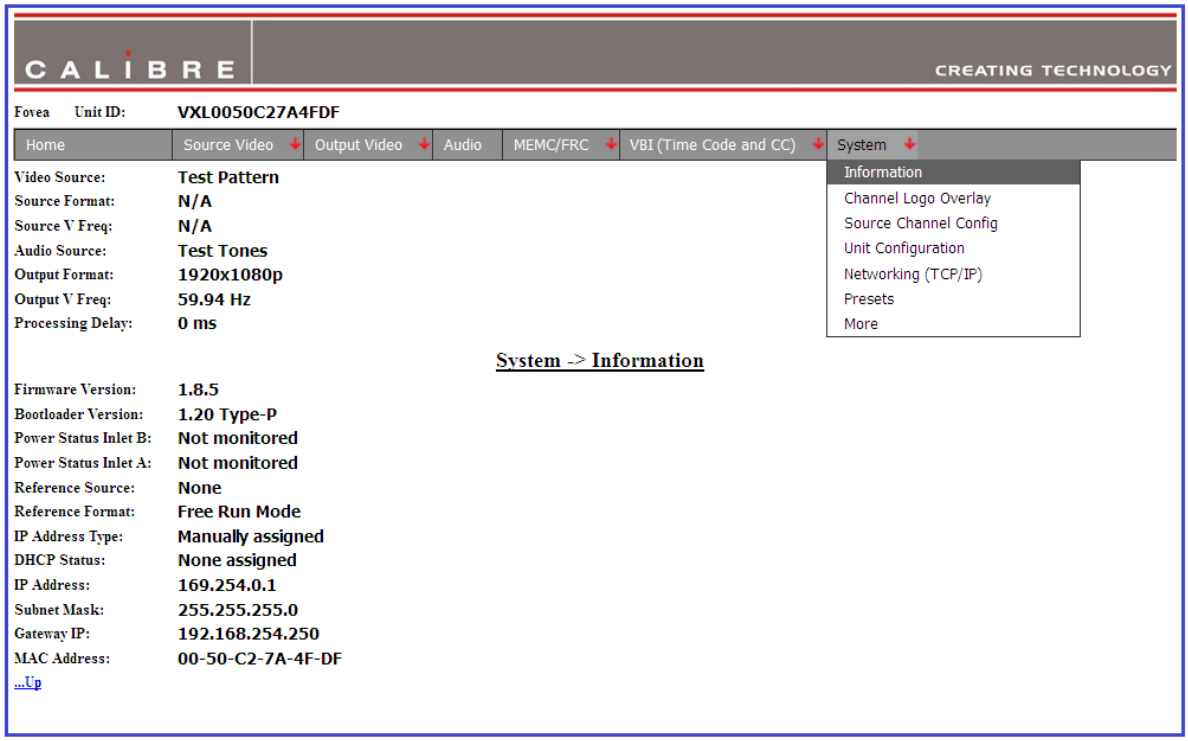
Closed caption information can be detected and included in the output data. For a full explanation please refer to 4.11 of the user manual

System



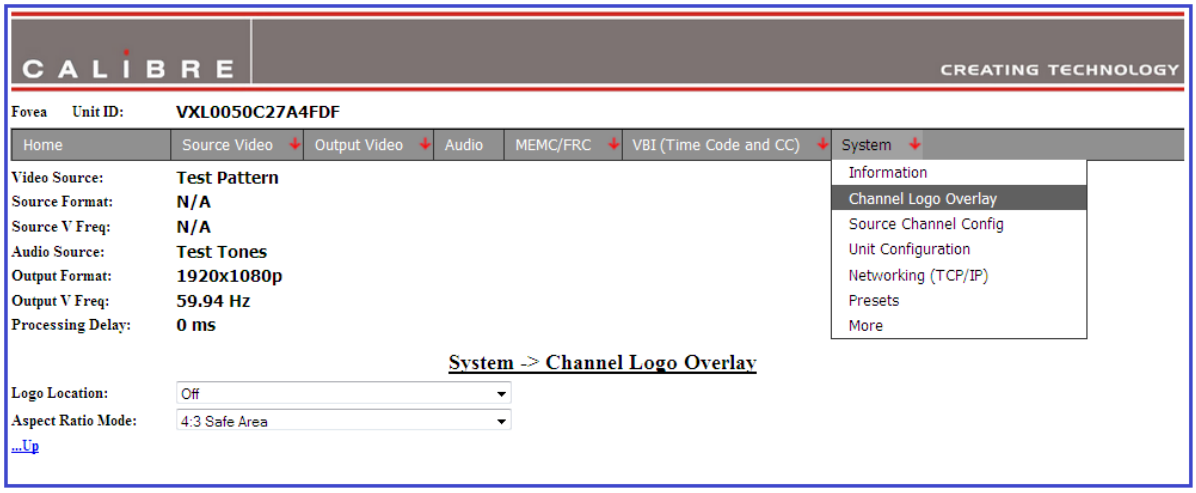
Load the top menu of System by clicking on System in the menu bar
Note '**Logo Upload**' is the bottom item on the left of the page.

Information



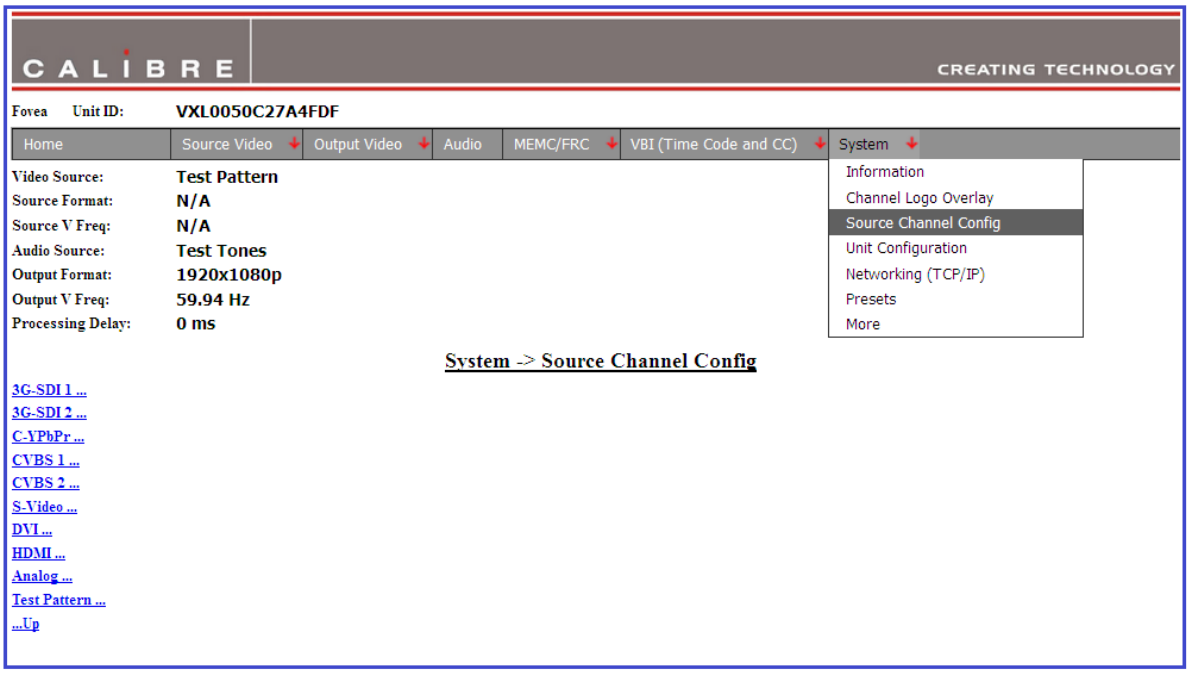
This is a list of information, no adjustments can be made in this menu

Chanel Logo Overlay



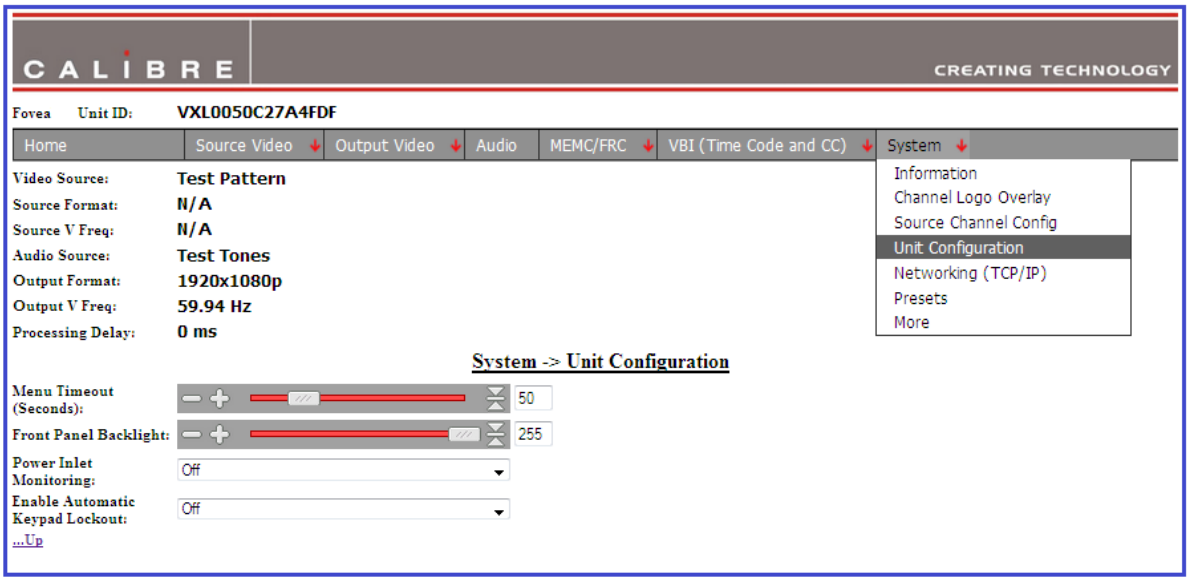
Channel Logo Overlay logo can be overlaid on the video image. Logo location can be set to be in the top left, top right, bottom left or bottom right corner.

Source Channel Config



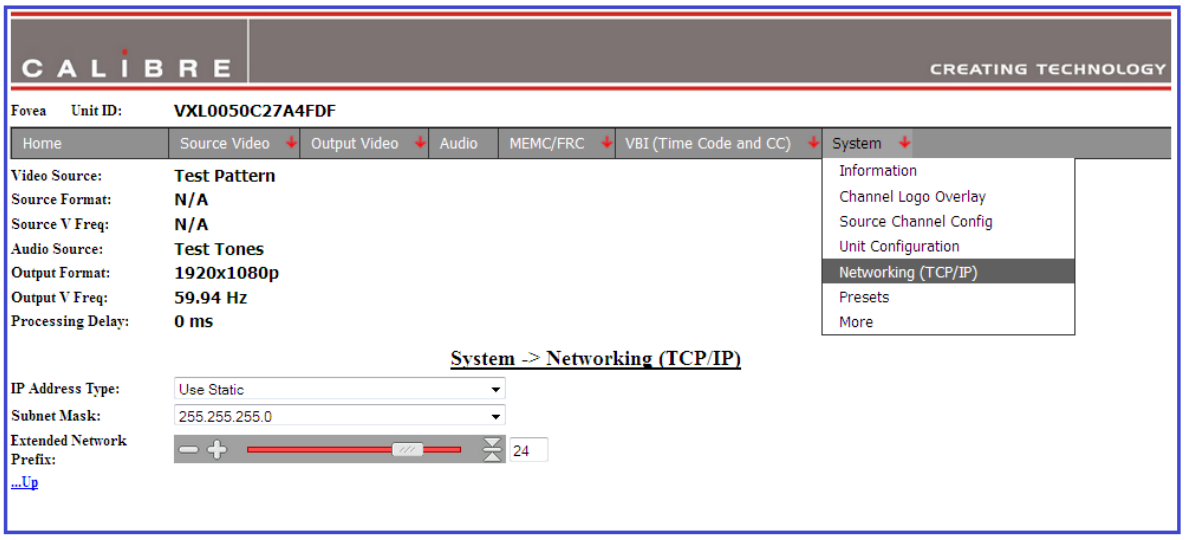
The 4 source select buttons on the front of the unit can be associated with the user's choice of source. Select the source channel form the list on the lower left and then choose the 'source select key'.

Unit Configuration



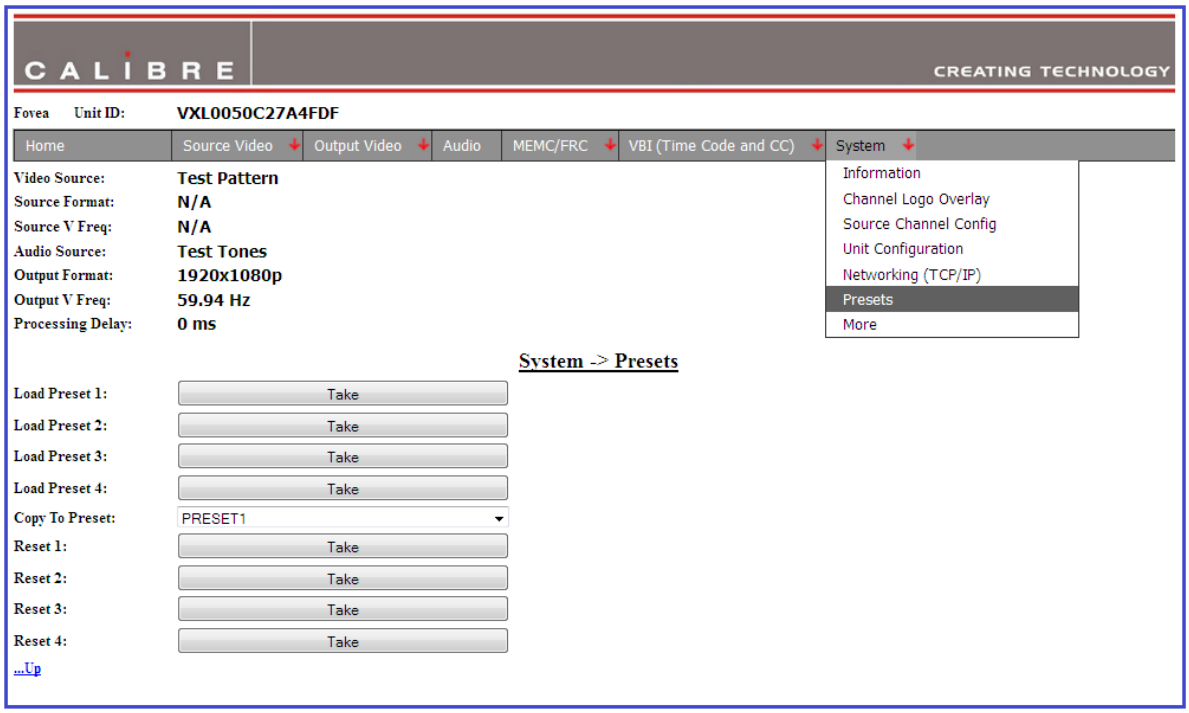
Menu Timeout	sets the time for the front panel to go back to the top level menu
Front Panel Backlight	sets the brightness of the front panel backlight
Power Inlet Monitoring	determines whether the power inlets are monitored for dual supply
Enable Auto Keypad Lockout	By default the keypad is locked. It can always be unlocked by pressing the sequence of Enter and Information keys.

Networking



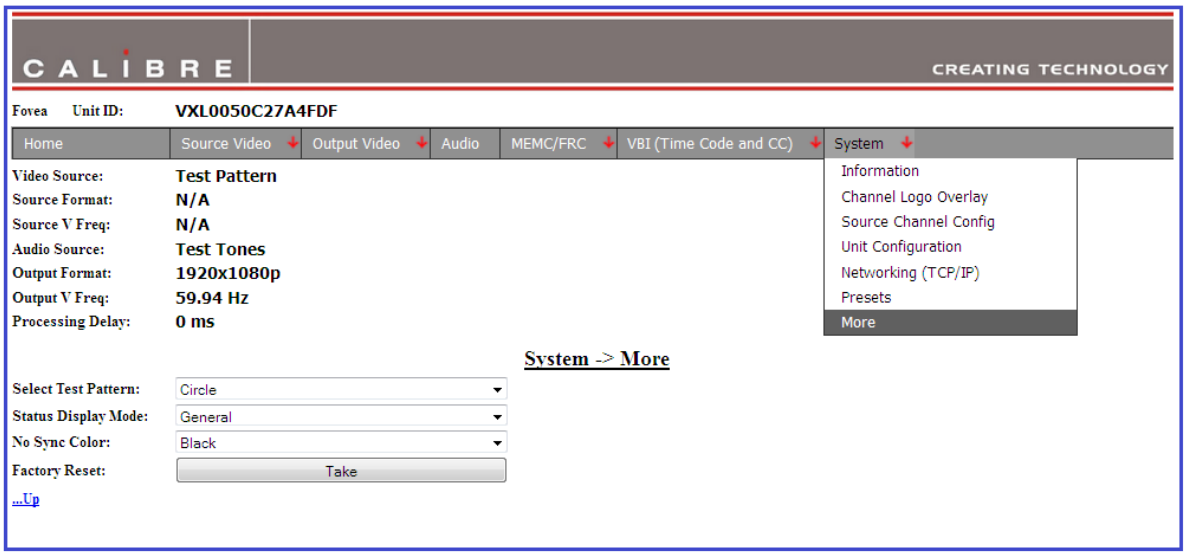
Networking(TCP/IP) The IP address type (static or DHCP), static IP address, default gateway IP address, subnet mask and extended network prefix can all be entered here.

Presets



The current system configuration can be stored using Copy to Preset and can then be recalled later using Load Preset. There are 4 presets available including the current one. Any preset can be reset using the Reset command and renamed using the Rename command.
Note the current preset is 'live' menu adjustments are stored in the live preset immediately overwriting the previous state.

More



Select Test Pattern	Selects which test pattern will be displayed when test pattern is selected as the source
Status Display Mode	Selects which items are displayed on the LCD when menu is not selected
No Sync Color	Selects the colour of the output when the source signal fails
Factory Reset	Performs a factory reset

Control via API

The API manual is available to download from:-
http://www.calibreuk.com/documents/vxl/VXL%20API%20Protocol_v1.40%20Generic.pdf
Please refer to this manual for detailed description of control parameters and for lists of codes for each type of action required for remote control using either the RS232 port or the TCP/IP LAN port

Control via RS232 Remote Control Port

a. Here is an example of how to use the API control information:-

1. Open HyperTerminal or similar application on your computer
Set the parameters for the serial port to:-
baud rate - 9600
parity - none
data bits - 8
stop bits - 1

2. Send an identify request string to see if the user can talk to the box. Send 16x A, i.e. AAAAAAAAAAAAAAAA. If successful communication is established the answer VXL500HD is returned.

3. This example is used to provide easily visible changes:-
To change the active source to 3G-SDI 2 send the following string: APCAAA2AEAAAAABA

This string is made up of the following:-
Please note that items ii. Iii. and iv. are listed in the API manual.

i. AP - always start the application string with these characters
ii. C - this is the function identifier, in this case:- C = set a value)
iii. AAA2 – this is the parameter identifier, in this case:- AAA2 = select source)
iv. AE – this is the attribute, in this case:- AE = change it live
(Change it live means – change source but don´t store the change in the EEPROM. If the user wants Fovea to remember this source then use the attribute AF instead)
v. AAAAAB - is the value in BASE64 alphabet
AAAAAA = 3G-SDI 1, AAAAAB = 3G-SDI 2, AAAAAC = Component YPbPr, AAAAAD = CVBS 1, AAAAAE = CVBS 2, AAAAAF = S-Video, AAAAAG = DVI, AAAAAH = HDMI, AAAAAI = Analog, AAAAAJ = Test Pattern.
In this case AAAAAB = change to source 3G-SDI 2
vi. A - always end the string with this character

b. In this second example, change the assigned source to the front panel source buttons
This example is used to provide easily visible changes:-

To change source button 1 to 3G-SDI 1
Send the string APCAABaAEAAAAAABA
Note that the parts of the string that have changed are highlighted in red or blue
AABa = 3G-SDI 1
AAAAAB = Source Button 1

To change source button 2 to C-YPbPr
Send the string APCAABVAEAAAAACA
Note that the parts of the string that have changed are highlighted in red or blue
AABV = C-YPbPr
AAAACB = Source Button 2

To change source button 4 to Test Pattern
Send the string APCAABXAEAAAAAEA
Note that the parts of the string that have changed are highlighted in red or blue
AABX = Test Pattern
AAAAAE = Source Button 4

C. Understanding the range of data of the 'Value'

The value ranges are not listed for each function, instead the user can send a request for the maximum and minimum valid values thereby establishing the operating range of the value segment of the command string.

An ON/OFF command will only have two valid values

A setting such as audio delay will have a wide range of valid range settings.

Requesting the available range of the 'Value'

Care is needed when making requests and in receiving replies to such requests

After sending a request and before receiving the reply, it is necessary to have a delay.

Section 2.3 of the API manual shows a table providing a list of delays for specific parameters. For parameters that are not listed in the table the delay should be 10 milliseconds.

Note:- Failing to observe this requirement for a delay can cause serious adverse effects such as lock-ups and data corruption which may require a power cycle and possibly a factory reset to clear.

Example value range requests and replies:-

This example is used to provide easily visible changes:-

To request the range of valid values when setting the LCD panel back light send the following:-

APBAAC8ACAAAAAAA to ask for the minimum valid value
i. AP - always start the application string with these characters
ii. B - this is the function identifier, in this case:- B = Get a value
iii. AAC8 – this is the parameter identifier, in this case:- AAC8 = Front panel backlight brightness
iv. AC – this is the attribute, in this case:- AC = Minimum valid parameter value
v. AAAAAA - is the enquiry value in BASE64 alphabet
vi. A - always end the string with this character

The answer will be returned OK:AAAAAA

APBAAC8ADAAAAAA to ask for the maximum valid value
i. AP - always start the application string with these characters
ii. B - this is the function identifier, in this case:- B = Get a value
iii. AAC8 – this is the parameter identifier, in this case:- AAC8 = Front panel backlight brightness
iv. AC – this is the attribute, in this case:- AD = Maximum valid parameter value
v. AAAAAA - is the enquiry value in BASE64 alphabet
vi. A - always end the string with this character

The answer will be returned OK:AAAAD/

The Base64 number system is outlined in the API manual in section 3.4.1

So the valid range of settings for this function are between AAAAAA and AAAAD/ (0 – 255)

If the user now sends the command APCAAC8AEAAAABBA, as described in the previous examples in this guide, the LCD window will be set to brightness 65 of 255.

Control via TCP/IP LAN Remote Control Port

Connect to the LAN port.

Users can connect directly to the LAN port with a changeover cable or via a switch or router with normal Ethernet cables.

Users can also connect via a local area network.

The TCP/IP address of the Fovea can be obtained from a DHCP server or set manually in Menu>Miscellaneous>Networking

If the user changes from DHCP to Static or from Static to DHCP it is recommended to re-boot the processor to ensure the new state is acknowledged fully.

Note:- port number is 30001

Examples of code

The code structure is the same as in the RS232 examples given in the previous section of this guide.

Send an identify request string to see if the user can talk to the box. Send 16x A, i.e. AAAAAAAAAAAAAAAA. If successful communication is established the answer VXL500HD is returned.
The answer is in the form of a much longer string than for RS232, as described in the API manual – it looks like this:-

VXL500HD¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Zª²øª¬°Z¥ZKÜ(¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥[Z¥¥Z¥Z¥Z[¥¥Z¥Z¤ZZ
¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZÚ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z
¥Z¥ZZ¥µZ¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥ZµZZ¥¥[¥Z¥Z
Z¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Ú¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZJ¥¥ZµZ¥ZZ¥¥Z
¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥µZ¥Z¥ZZ¥¤Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥[¥Z
Z¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ§¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ

Understanding the range of data of the 'Value'

The value ranges are not listed for each function, instead the user can send a request for the maximum and minimum valid values thereby establishing the operating range of the value segment of the command string.
An ON/OFF command will only have two valid values
A setting such as audio delay will have a wide range of valid range settings.

Requesting the available range of the 'Value'

This example is used to provide easily visible changes:-
To request the range of valid values when setting the LCD panel back light send the following
APBAAC8ACAAAAAAA to ask for the minimum valid value
i. AP - always start the application string with these characters
ii. B - this is the function identifier, in this case:- B = Get a value
iii. AAC8 – this is the parameter identifier, in this case:- AAC8 = Front panel backlight brightness
iv. AC – this is the attribute, in this case:- AC = Minimum valid parameter value
v. AAAAAA - is the enquiry value in BASE64 alphabet
vi. A - always end the string with this character

The answer will be returned OK:AAAAAA
This is how the answer is shown

OK:AAAAAA¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Zª²øª¬°Z¥ZKÜ(¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥[Z¥¥Z¥Z¥Z
[¥¥Z¥Z¤ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZÚ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥
Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥µZ¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z
¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥ZµZZ¥¥[¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Ú¥Z¥ZZ
¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZJ¥¥ZµZ¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥ZµZ
¥Z¥ZZ¥¤Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥[¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ§¥Z¥Z¥ZZ¥¥Z¥Z
ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z

APBAAC8ADAAAAAA to ask for the minimum valid value
i. AP - always start the application string with these characters
ii. B - this is the function identifier, in this case:- B = Get a value
iii. AAC8 – this is the parameter identifier, in this case:- AAC8 = Front panel backlight brightness
iv. AC – this is the attribute, in this case:- AD = Maximum valid parameter value
v. AAAAAA - is the enquiry value in BASE64 alphabet
vi. A - always end the string with this character

The answer will be returned OK:AAAAD/
This is how the answer is shown:-

OK:AAAAD/¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Zª²øª¬°Z¥ZKÜ(¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥[Z¥¥Z¥Z¥Z[¥¥Z¥Z¤ZZ
¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZÚ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z
¥Z¥ZZ¥µZ¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥ZµZZ¥¥[¥Z¥Z
Z¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Ú¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZJ¥¥ZµZ¥ZZ¥¥Z
¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥µZ¥Z¥ZZ¥¤Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥[¥Z
Z¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ§¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z¥Z¥ZZ¥¥Z

Non Valid Commands and Queries

If a non valid command or request is made the Fovea HD will return the answer
ER: followed by a string such as ER:AAAAADAAAAAA = Function is not implemented
Error codes can be found in the API manual section 3.2.2.4

END

E&OE