CALIBRE
CREATING TECHNOLOGY

HQView-500 Series
Operating Instructions

Version 2.42

This manual explains how to operate your HQView-500 Series (HQView-5xx) image scaler. The HQView-500 Series comes in four versions HQView-500S, HQView-510, HQView-520 and HQView-530.

HQView-5xx processors are designed to provide users with a powerful and flexible method of driving large display devices, and multiple screen applications including flexible geometry correction functions, soft edge blending and projection mapping.

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SAFETY WARNING:

1. THERE ARE NO USER SERVICEABLE PARTS WITHIN THE UNIT. REMOVAL OF THE TOP COVER WILL EXPOSE DANGEROUS VOLTAGES. DO NOT OPERATE THE UNIT WITHOUT THE TOP COVER INSTALLED.

2. ENSURE THAT ALL ELECTRICAL CONNECTIONS (INCLUDING THE MAINS PLUG AND ANY EXTENSION LEADS) ARE PROPERLY MADE AND COMPLY WITH ELECTRICAL SAFETY REGULATIONS.

3. ENSURE THAT THE INTEGRITY OF THE EQUIPMENT ISOLATION BARRIER IS MAINTAINED WHEN CONNECTING TO OTHER EQUIPMENT. THIS MEANS THAT ONLY LOW VOLTAGE ISOLATED CIRCUITS MAY BE CONNECTED TO THE SIGNAL INPUTS AND OUTPUTS. IF ANY DOUBT EXISTS CONSULT QUALIFIED SERVICE PERSONNEL.

4. TO PREVENT SHOCK OR FIRE HAZARD DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. IF SUCH EXPOSURE OCCURS, REMOVE THE PLUG FROM THE MAINS OUTLET AND HAVE THE EXPOSED UNIT CHECKED BY QUALIFIED SERVICE PERSONNEL.

5. DO NOT CONTINUE TO OPERATE THE EQUIPMENT IF YOU HAVE ANY DOUBT ABOUT IT WORKING NORMALLY, OR IF IT IS DAMAGED IN ANY WAY. WITHDRAW THE MAINS PLUG FROM THE MAINS OUTLET AND CONSULT QUALIFIED SERVICE PERSONNEL.

6. DO NOT REMOVE ANY FIXED COVERS UNLESS YOU ARE QUALIFIED TO DO SO AND EVEN THEN WITHDRAW THE MAINS PLUG FROM THE MAINS OUTLET BEFORE YOU START.

7. THIS EQUIPMENT CONTAINS NO USER SERVICEABLE PARTS. REFER ALL SERVICING AND MAINTENANCE TO QUALIFIED SERVICE PERSONNEL.

8. TO AVOID EXPLOSION, DO NOT OPERATE THIS EQUIPMENT IN AN EXPLOSIVE ATMOSPHERE

INTRODUCTION

1.1. General Introduction

HQView-5xx is a very flexible image scaler developed specifically for driving large screen displays and multiple screen applications from video or graphics sources.

HQView-5xx features state of the art digital image processor which provides market leading HD & SD per-pixel multiple low-angle motion-adaptive de-interlacing and automatic film pull-down correction for 3:2 and 2:2, significantly outperforming the capabilities of benchmark competitor products. HQView-5xx features excellent image processing algorithms for the very best scaling, film and video noise reduction and MPEG artefact reduction.

HQView-5xx uses a very flexible high performance video input front end including true component video support in analogue YPbPr and RGBS formats and 3GSDI/HDSDI/SDI digital formats as well as composite (CVBS) and YC/S-Video inputs. A very high performance video decoder is utilised with 4x oversampling and 3D Y/C separation for outstanding video image clarity. HDMI and DVI video with HDCP encryption is also supported, as are computer graphics inputs in SVGA analogue and HDMI/DVI digital formats.

The output format can be set to I/O Lock mode where it locks the output frame rate to the input frame rate dynamically without frame rate conversion so as to reduce system latency, or it can be set to a fixed output frame rate for driving basic screens which are not 50Hz-compatible. A Low latency mode with non-motion adaptive reduced processing is available to further reduce latency.

The output format can also be set to lock to an externally provided synchronization signal.

Outputs are available in VGA analogue and DVI digital formats as well as 3GSDI serial digital formats which are useable simultaneously so that one output can drive the screen while the other runs a local monitor.

Note for the SDI output:- not all PC output formats are supported by 3GSDI standards in which case the 3GSDI output is disabled. Also note that if an HDCP encrypted signal is connected to the HDMI or DVI input, the DVI output signal will be similarly HDCP encrypted and the outputs that cannot be encrypted (VGA analogue and the 3GSDI output) will be disabled.

Interlaced outputs are supported, there is a vertical temporal filter facility which greatly reduces interlace flicker.

HQView-5xx supports Pan, Tilt and Zoom to select a ‘region of interest’ portion of the input image, fill the screen and pan/tilt within it.

HQView-5xx can be operated with different firmware. At time of issuing this document four firmware versions are available. Each firmware version provides different feature sets controlled through the menu. Special emphasize is given in the discussion of the OSD (On Screen Display) menu system in the corresponding chapters.

In the basic configuration HQView-500S used for single display installations Picture in Picture functionality is provided.

The next version is the HQView-510 for multi screen or multi projector installations such as geometry correction, Auto Zoom and Edge Blend with elaborate Black Level Uplift.

Edge Blend electronically reduces the brightness level of certain image regions to seamlessly match the brightness of overlapping areas. Auto Zoom automatically crops and zooms the input video image to display a section of the total image on the corresponding projector or screen. Embedded warp allows adjustment of the image in a projection scenario to match a rotated, tilted or curved screen. For 9:16 portrait mode signage special predefined portrait modes are available to rotate and stretch a video image to fill a +/-90° rotated display panel.

HQView-520/530 adds free form warp capability for non-flat screens in single or multi projector installation. Warp maps created with the PC tool “Warp Generator” can be uploaded into HQView-520/530 and processed accordingly.

System control is via an OSD controlled by keys on the front panel or through the inbuilt TCP/IP web server.

HQView-530 features a front panel LCD menu and a jog wheel instead of keys for easier and faster set-up and allows the user immediate access to the menu without the need to use the OSD.

Additionally a free API manual is published on our website at the link given below to allow the use of the LAN or RS232 remote control ports.

http://www.calibreuk.com/documents/led/HQView_LEDView%20API%20Protocol_v3.04%20Generic.pdf

1.2. Packing List

HQView-5xx is supplied with the following:

1) This manual

2) 3 pin plug IEC mains cable

3) DVI-D output cable

4) CD containing manuals and useful applications

HQVIEW-5XX SYSTEM DESCRIPTION

2.1. Product Overview

HQView-5xx is designed to accept the following input signals:

- Composite video via BNC
- Composite video via RCA
- S-Video via 4-way miniDIN
- YPbPr or RGBS or RGsB SD/ED/HD component video via 3 or 4 BNC connectors
- 3G-SDI/HD-SDI/SDI (Serial Digital Interface) via BNC
- VGA/SVGA analogue (computer interface) via 15HDD
- DVI (Digital Visual Interface) via DVI-I (supporting a digital and 2nd analogue VGA input)
- HDMI via HDMI connector

2.2. Product Specification

This section provides technical details for all possible inputs.

Please note that not all possible input options are applicable to all output formats.

2.2.1. Power Supply Requirement

100V-264VAC 50/60Hz connected via a standard IEC connector located on the rear panel.

2.2.2. Video Inputs

Composite via BNC and RCA connector, S-Video via 4-way mini DIN socket

Signal formats	Composite (CVBS), S-Video (Y/C)
Standards	NTSC, PAL, SECAM
Composite (CVBS) input level	1V p-p nominal incl. sync
Luminance (Y) input level	1V p-p nominal incl. sync
Chrominance (C) input level	0.6V p-p nominal
Input Impedance (all inputs)	75 Ohms

2.2.3. Component Video Inputs

Via 3 or 4 BNC connectors

YPbPr (YUV), YPbPrS, RGsB and RGBS component video, menu selectable.

Signal formats 484i (480i) and 576i (SD), 480p, 576p (ED), 720p, 1080i at 50, 59.94 and 60Hz and 1080p at 23.98, 24, 25, 29.97 and 30Hz.

Please note this input does not support Computer SVGA signals which should be connected via the Computer SVGA input, The SVGA input supports the separate H & V syncs.

2.2.4. 3G-SDI Input

Format:	SD-SDI, HD-SDI and 3G-SDI YCbCr 4:2:2 serial digital component video
Input impedance:	75 ohms.

SMPTE 292M, SMPTE 259M-C and SMPTE 424M compliant, accepts 484i, 576i, 720, 1080i and 1080p single link formats at 270Mb, 1.485Gb or 2.97Gb rates.

2.2.5. Computer (SVGA) Inputs VESA formats

Signal formats:	DOS, VGA – WUXGA up to 165MHz pixel clock
RGB video level	0.7V - 1.0V
RGB input impedance	75 Ohms
Sync format	Separate H & V sync at TTL/5V levels.

2.2.6. HDMI & DVI Inputs

HDMI 1.3 with or without HDCP, 36-bit Deep Colour video compatible.

DVI-D input with or without HDCP

Signal formats -video

484i and 576i (SD) in double-rate formats (1440 pixels per line), 480p, 576p (ED), 720p, 1080i at 50, 59.94 & 60Hz, 1080p at 24, 25, 30, 50, 59.94 & 60Hz.

Signal formats – computer
DOS, VGA – WUXGA up to 165 MHz pixel clock

2.2.7. Audio Output

Audio is embedded in HDMI and SDI video streams and brought into the HQView-5xx through the respective input channels. The audio is passed through the system and re-embedded into the HDMI and SDI output signals.

Also, HQView-5xx features a S/PDIF coaxial digital audio output connector for monitoring audio of the HDMI and SDI channel.

When HDMI is selected as the input channel the HDMI EDID is read by a video source such as a Blue Ray Player. HQView-5xx allows the source to provide the formats shown under output formats for HDMI in the below table. (Note: Note: Dolby TrueHD and DTS HD-Master are not in the list of audio formats and thus not supported.)

All formats are re-embedded into the HDMI output data stream, those which are not allowed on the SDI or SPDIF output are muted on the individual channels.

Output Channel	Output Format
HDMI	PCM up to 8ch, up to 24Bit, up to 192kHz sampling rate (incl. 32kHz,44.1kHz,48kHz,96kHz,192kHz) Dolby Digital (AC3) up to 5.1 channels, up to 640kBit/sec bit stream rate MPEG2 up to 8ch, up to 112kBit/sec bit stream rate DTS up to 6.1 channels, up to 1536kBit/sec bit stream rate
SDI	PCM up to 8ch, up to 24Bit, 48kHz sampling rate
SPDIF	PCM up to 2ch, up to 24Bit, up to 96kHz sampling rate (incl. 32kHz,44.1kHz,48kHz,96kHz) Dolby Digital (AC3) up to 5.1 channels DTS up to 6.1 channels

2.2.8. Display Output

Three output connectors are provided which are useable simultaneously, provided that the input signal is not HDCP encrypted.

When the input signal has HDCP encryption, the DVI-D output connector will carry a similarly HDCP encrypted signal, the VGA and 3G-SDI connectors will be disabled.

When an HDCP encrypted signal is input, but the display device does not support HDCP, the output image will turn black and a message indicating HDCP Signal will come up to indicate this.

There is a DVI-D output and a VGA style output. Both conform to normal VESA standards for connectors and pin outs for these signal types.

The DVI-D connector will support HDMI 1.3 with 36-bit video and audio formats when connected to a suitable HDMI 1.3 receiver. The color depth of the HDMI signal is determined by the set-up of HQView and the capabilities of the monitor. The bit depth per color channel is displayed in the output section of the menu system

The 3G-SDI BNC output supports the same formats as accepted by the 3G-SDI input.

Note: The processor's HDCP compliance can be turned off. This is of importance particularly when using a MAC computer as the source. A MAC will encrypt it's output signal if a compliant device is seen attached to it's output. By turning off the HQView processor's compliance the MAC will see a non-compliant device and therefore will not encrypt its output.

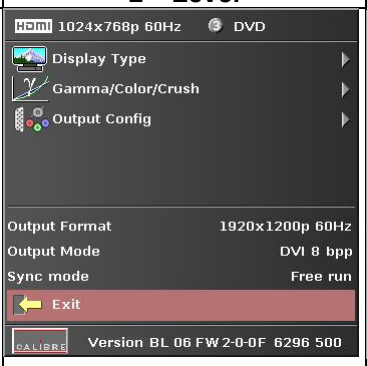
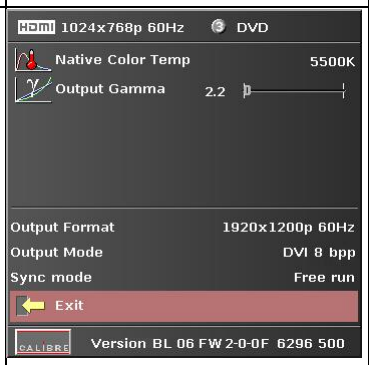
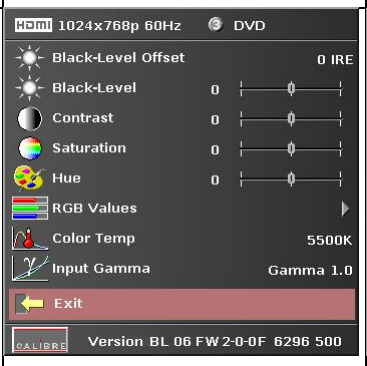
The following output modes can be set up:
(HFP/VFP: horizontal/vertical front porch, HBP/VBP: horizontal/vertical front porch, HS/VS: horizontal/vertical sync, HTot/VTot: horizontal/vertical total pixels)

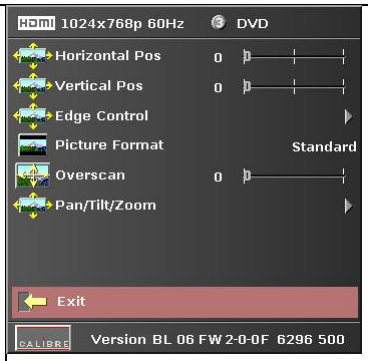
Hor Pix	Ver Pix	HTot	HFP	HS	HBP	VTot	VFP	VS	VBP	Hor Freq	Ver Freq	Pix Clock	Specification
640	480	800	16	96	48	525	10	2	33	31.47	59.94	25.175	VESA DMT
640	480	800	16	96	48	629	62	2	85	31.46	50.02	25.170	proprietary
640	480	800	16	96	48	629	62	2	85	30.19	48.00	24.154	proprietary
800	600	1056	40	128	88	628	1	4	23	37.88	60.31	40.000	VESA DMT
800	600	1056	40	128	88	628	1	4	23	31.40	50.00	33.158	VESA 60 - CLK wind down
800	600	1056	40	128	88	628	1	4	23	30.14	48.00	31.832	proprietary
1024	768	1344	24	136	160	806	3	6	29	48.36	60.00	65.000	VESA DMT
1024	768	1312	40	104	144	793	3	4	18	39.63	49.98	52.000	VESA CVT 001M3
1024	768	1312	40	104	144	793	3	4	18	38.11	48.06	50.000	proprietary
1280	768	1664	64	128	192	798	3	7	20	47.78	59.87	79.500	VESA CVT 001M9/VESA DMT
1280	768	1648	56	128	184	793	3	7	15	39.59	49.93	65.250	VESA CVT001M9
1280	768	1648	56	128	184	793	3	7	15	38.06	48.00	62.730	proprietary
1280	800	1680	72	128	200	831	3	6	22	49.70	59.81	83.500	VESA CVT 001MA/VESA DMT
1280	800	1680	72	128	200	831	3	6	22	41.55	50.00	69.804	propietary
1280	800	1680	72	128	200	831	3	6	22	39.89	48.00	67.012	propietary
1280	1024	1688	48	112	248	1066	1	3	38	63.98	60.02	108.000	VESA DMT
1280	1024	1688	48	112	248	1066	1	3	38	53.32	50.02	90.000	VESA 60 - CLK wind down
1280	1024	1688	48	112	248	1066	1	3	38	51.17	48.00	86.370	proprietary
1360	768	1792	64	112	256	795	3	6	18	47.71	60.02	85.500	VESA AddDMT
1360	768	1744	56	136	192	793	3	5	17	39.56	49.89	69.000	VESA CVT 001M9
1360	768	1688	48	112	248	1066	1	3	38	51.17	48.00	86.370	proprietary
1366	768	1792	26	100	300	795	4	3	20	47.70	60.00	85.478	proprietary
1366	768	1792	26	100	300	795	4	3	20	39.75	50.00	71.232	proprietary
1400	1050	1864	88	144	232	1089	3	4	32	65.31	59.98	121.750	VESA CVT 001M3/VESA DMT
1400	1050	1864	88	144	232	1089	3	4	32	54.43	49.98	101.458	VESA 60 - CLK wind down
1400	1050	1864	88	144	232	1089	3	4	32	52.27	48.00	97.435	proprietary
1440	900	1904	80	152	232	934	3	6	25	55.93	59.89	106.500	CVT 1.30MA/VESA DMT
1440	900	1872	72	144	216	929	3	6	20	46.34	49.88	86.750	VESA CVT 001MA
1600	1200	2160	64	192	304	1250	1	3	46	75.00	60.00	162.000	VESA DMT
1600	1200	2128	96	168	264	1238	3	4	31	61.80	49.92	131.500	VESA CVT 002M3
1600	1200	2128	96	168	264	1238	3	4	31	59.42	48.00	126.450	proprietary
1680	1050	2240	104	176	280	1089	3	6	30	65.29	59.95	146.250	VESA CVT 002MA
1680	1050	2208	88	176	264	1083	3	6	24	54.12	49.97	119.500	VESA CVT 002MA
1680	1050	2208	88	176	264	1083	3	6	24	51.98	48.00	114.780	proprietary
1920	1200	2080	48	32	80	1235	3	6	26	74.04	59.95	154.000	VESA CVT 002MA-R/VESA DMT
1920	1200	2080	48	32	80	1129	3	6	20	61.42	49.97	127.750	VESA CVT calculated
1920	1200	2080	48	32	80	1235	3	6	26	29.64	24.00	61.650	proprietary
1920	1200	2080	48	32	80	1129	3	6	20	59.28	48.00	123.300	proprietary
720	480	858	19	62	57	525	27	3	15	31.47	59.94	13.500	EIA/CEA-861-B Format 6
720	576	864	12	63	69	625	27	3	19	31.25	50.00	13.500	EIA/CEA-861-B Format 24
720	576	864	12	63	69	625	28	3	18	30.00	48.00	12.960	proprietary
720	480	858	16	62	60	525	9	6	30	31.47	59.94	27.000	EIA/CEA-861-B Format 2
720	576	864	12	64	68	625	5	5	39	31.25	50.00	27.000	EIA/CEA-861-B Format 17
720	576	864	12	64	68	625	5	5	39	30.00	48.00	25.920	proprietary
1280	720	1650	110	40	220	750	5	5	20	44.95	59.94	74.176	EIA/CEA-861-B Format 4
1280	720	1980	440	40	220	750	5	5	20	37.50	50.00	74.250	EIA/CEA-861-B Format 19
1280	720	4125	2585	40	220	750	5	5	20	17.98	23.98	74.176	SMPTE 296M-1997 Format 8
1280	720	2063	483	40	260	750	5	5	20	35.97	47.96	74.176	proprietary
1920	1080	2200	88	44	148	1125	25	5	15	67.43	59.94	74.176	EIA/CEA-861-B Format 5
1920	1080	2640	528	44	148	1125	25	5	15	56.25	50.00	74.250	EIA/CEA-861-B Format 20
1920	1080	2750	638	44	148	1125	25	5	15	53.95	47.95	74.176	SMPTE 274-1998 Format 11
1920	1080	2750	638	44	148	1125	25	5	15	53.95	47.95	74.176	SMPTE 274-1998 Format 10
1920	1080	2200	88	44	148	1125	4	5	36	67.43	59.94	148.352	EIA/CEA-861-B Format 16
1920	1080	2640	528	44	148	1125	4	5	36	56.25	50.00	148.500	EIA/CEA-861-B Format 31
1920	1080	2750	638	44	148	1125	4	5	36	26.97	23.98	74.176	EIA/CEA-861-B Format 32
1920	1080	2640	440	88	192	1125	3	5	37	53.95	47.95	142.418	proprietary

HQVIEW-5XX CONTROL

3.1. Menu Tree

HQView-500S Menu Tree

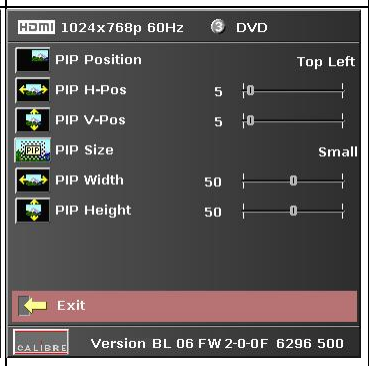
1st Level	2nd Level	3rd Level	4th Level
			
			
			

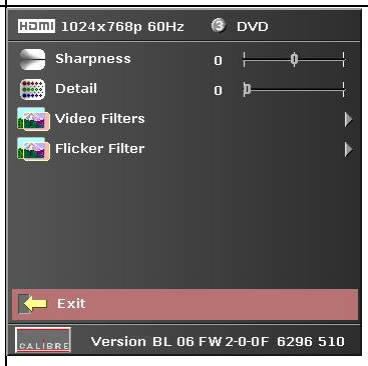

1024x768p 60Hz
DVD
Horizontal Pos 0
Vertical Pos 0
Edge Control
Picture Format Standard
Overscan 0
Pan/Tilt/Zoom
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
Left Edge 0
Right Edge 0
Top Edge 0
Bottom Edge 0
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
PTZ Enable Off
PTZ Setting Use Globally
Pan 0
Tilt 0
Zoom H 100
Aspect Lock On
Zoom V 100
PTZ Reset
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
PIP Input CVBS 1
PIP Mode Off
PIP Adjust
PIP Hide Show
Show/Hide Transition Instantly
Exit
Version BL 06 FW 2-0-0F 6296 500

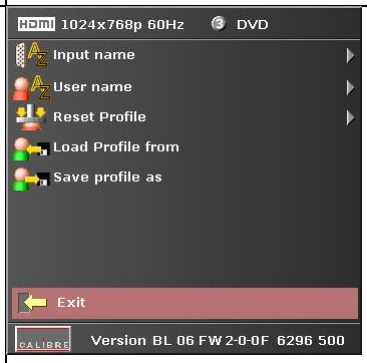

1024x768p 60Hz
DVD
PIP Position Top Left
PIP H-Pos 5
PIP V-Pos 5
PIP Size Small
PIP Width 50
PIP Height 50
Exit
Version BL 06 FW 2-0-0F 6296 500


1024x768p 60Hz
DVD
Sharpness 0
Detail 0
Video Filters
Flicker Filter
Exit
Version BL 06 FW 2-0-0F 6296 510

1024x768p 60Hz
DVD
LTI Level 0
CTI Level 0
TRNR 0
MNR 0
CCS Off
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
Filter Strength
2
Filter Recursion
Off
Exit
Version BL 06 FW 2-0-0F 6296 500

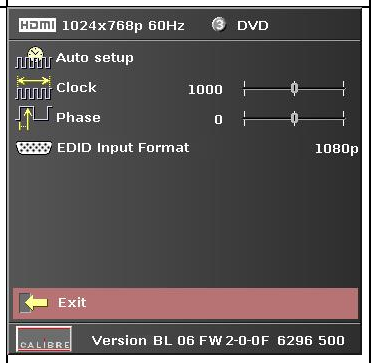
1024x768p 60Hz
DVD
User
USER 1
Names/Profiles
Input Config
Display Mode
Low Latency
Menu Settings
Network Settings
Factory Defaults
Exit
Version BL 06 FW 2-0-0F 6296 500

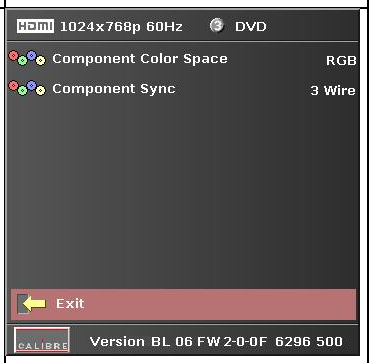

1024x768p 60Hz
DVD
Input name
User name
Reset Profile
Load Profile from
Save profile as
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
CVBS 1
CVBS 2
S-Video
Component
VGA
3G-SDI
DVI
HDMI
DVD
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
User 1
SURGEON 1
User 2
User 3
User 4
Exit
Version BL 06 FW 2-0-0F 6296 500

1024x768p 60Hz
DVD
VGA Setup
DVI Config
HDMI Config
SDI Setup
Component Setup
Test Pattern Setup
HDCP
Off
Switching Transition
Freeze
Exit
Version BL 06 FW 2-0-0F 6296 500


1024x768p 60Hz
DVD
Auto setup
Clock
1000
Phase
0
EDID Input Format
1080p
Exit
Version BL 06 FW 2-0-0F 6296 500

			1024x768p 60Hz DVD DVI-I Port Digital Boost DVI EQ Off DVI Color Space RGB DVI Range Full DVI Port EDID DVI only HDMI Audio Support Full EDID Input Format 1080p Exit Version BL 06 FW 2-0-0F 6296 500
			1024x768p 60Hz DVD HDMI Color Space RGB HDMI Range Full HDMI Audio Support Full EDID Input Format 1080p Exit Version BL 06 FW 2-0-0F 6296 500
			1024x768p 60Hz DVD 3G Level B Stream Stream 1 SDI Audio Group Channels 0,1 SDI Audio Routing HDMI & SDI Exit Version BL 06 FW 2-0-0F 6296 500
			 1024x768p 60Hz DVD Component Color Space RGB Component Sync 3 Wire Exit Version BL 06 FW 2-0-0F 6296 500

<table>
<tr><td></td><td></td><td></td><td>
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<tr><td></td><td></td><td>
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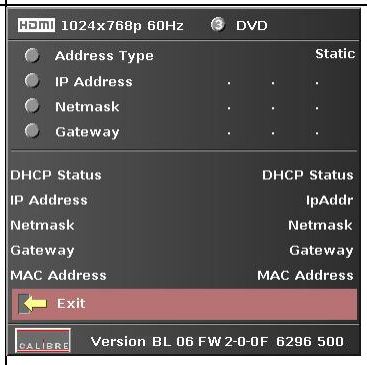
<tr><td></td><td></td><td> 
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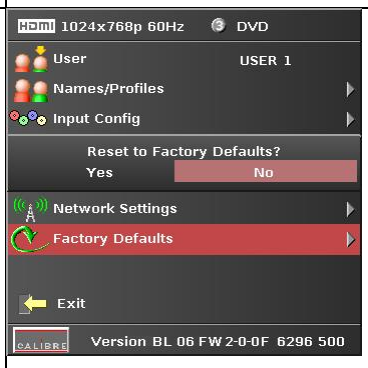
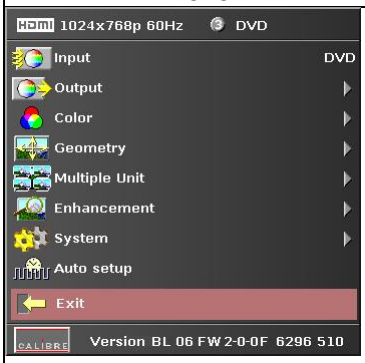
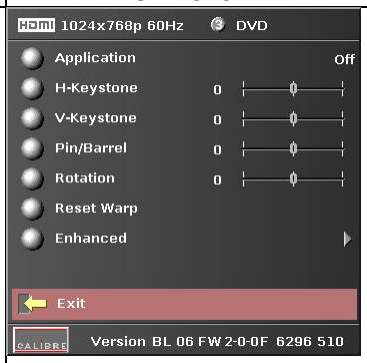
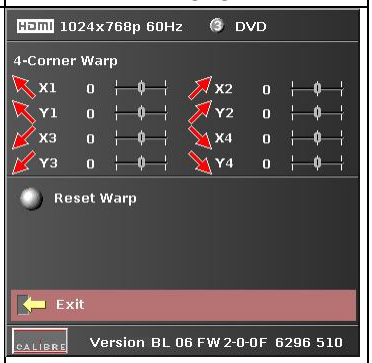
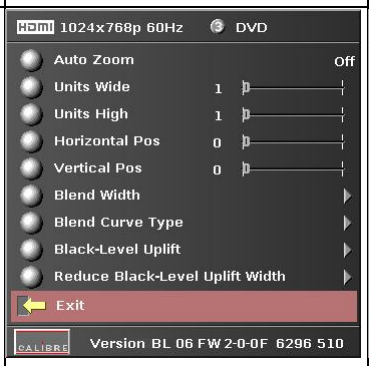
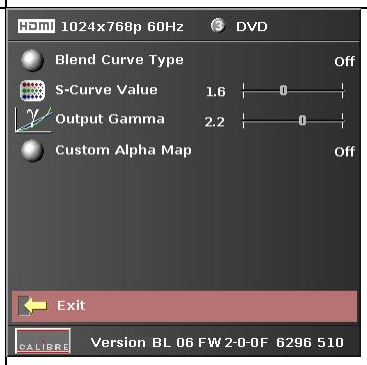
<tr><td></td><td> 
</td><td></td><td></td></tr>
</table>

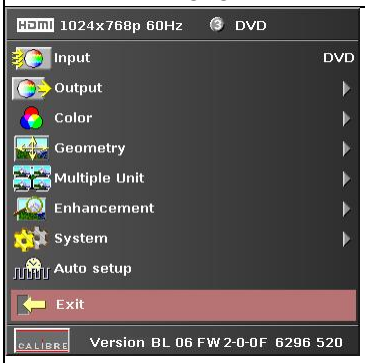
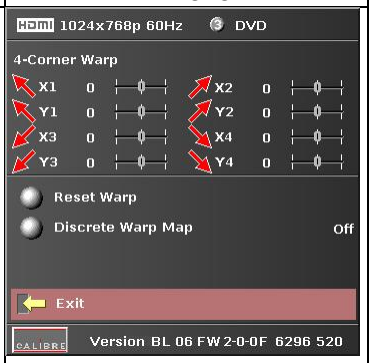
HQView-510, 520 and 530 have a Multiple Unit Menu instead of the HQView-500S PiP Menu and they feature embedded Warp.

Please note : HQView-510, 520 and 530 can however be rebooted in HQView-500S mode with PiP instead of Multiple Unit capability.

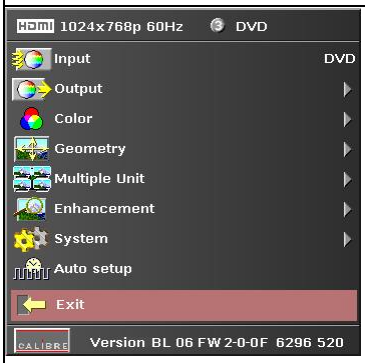
1st Level	2nd Level	3rd Level	4th Level
			
			
			

		1024x768p 60Hz DVD Reduce X1 0 Reduce Y1 0 Reduce X2 0 Reduce Y2 0 Reduce X3 0 Reduce Y3 0 Reduce X4 0 Reduce Y4 0 Exit Version BL 06 FW 2-0-0F 6296 510	
	1024x768p 60Hz DVD User USER 1 Names/Profiles Input Config Display Mode Low Latency Menu Settings Network Settings Factory Defaults Operation Mode PIP/Single Unit Exit Version BL 06 FW 2-0-0F 6296 510		

HQView-520 and HQView530 have extra menu items as there is an additional Discrete Warp Map Item to select PC generated free form warp maps loaded to the unit.

1st Level	2nd Level	3rd Level	4th Level
			

HQView-530 has a front panel LCD which can be used alone to set-up the unit. Consequently, there is a menu item to activate or disable the OSD. Also, the LCD backlight can be adjusted and the push function of the jog well enabled/disabled.

1st Level	2nd Level	3rd Level	4th Level
			

3.2. Introduction

The front panel has keys for OSD menu navigation, input channel selection and often used functions. OSD navigation is through two direction keys and a Menu/Enter key

.

HQView-500S/510/520

1 2 3 4 5a

The HQView530 has a different front panel, the three buttons at position 4 above are replaced with Menu/Enter and Back buttons (4), a local LCD menu display (5) and a rotary item choice jog dial/push to enter control (6).

HQView-530

1 2 3 4 5b 6

1 – Standby key: When applying power to the unit it starts up. This is indicated by the green On LED flashing. Once the unit is operational, the On LED is permanently on. By pressing the Standby Key, the unit is put into standby mode. This is indicated by the red Standby LED being permanently on. The red Keylocked LED indicates a keypad locking condition issued through the OSD menu. If a key on the front panel is now pressed an OSD message comes up and displays the multiple key press to be applied to unlock the front panel keys.

2 – Input channel selection keys: All input channels can be directly selected. The active channel is indicated by the red LED above the corresponding channel key being on.

3 – PiP or Test Pattern key: A HQView-500S has a key to directly activate the PiP mode. The LED is switched on when in PiP mode. HQView-510/520/530 have a key to directly activate a Test Pattern. Use the up/down keys to toggle trough the available test patterns. The LED is switched on when in Test Pattern mode.

4 – OSD navigational keys: With the Menu key the OSD menu is activated.

HQView-500S/510/520: The up/down keys are used for OSD menu navigation. To exit the OSD menu or any submenu press the up and down key simultaneously or navigate to the Exit item and press the menu key. To access a submenu navigate to it and press the menu key. To apply a change go to the menu item, press the menu key and make a parameter change with the up/down key. Confirm the change by pressing the Menu key. This will also bring you back to the submenu.

HQView-530: A jog wheel is used for menu navigation and changing values instead of the up/down keys. To exit the OSD menu or any submenu press the Back key or navigate to the Exit item and press the menu key.

5a – Direct function keys (HQView-500S/510/520 only): Contrast (gain), Black (offset/brightness), Colour (saturation) and Hue can be altered directly from the front panel.

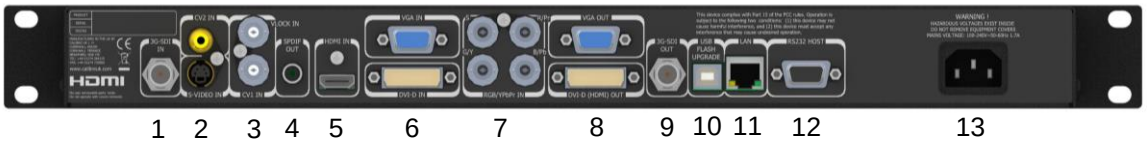
5b – Front Panel LCD (HQView-530 only): The Menu is shown on the LCD front panel.

6 – Jog wheel: The wheel is used for navigating through the menu system and making value changes. The jog wheel has a push function. Pushing the knob has the same effect as pushing the Menu key.

With the following multiple key presses further functions can be applied:

	HQView-500S/510/520	HQView-530
Keypad unlock:	Menu/Up/Down	Back/Menu
Mode reset:	Menu/Black up/Black down	Back/S-Video
Factory reset:	Colour up/Colour down/Hue up/Hue down	Back/YPbPro
	(in live operation or at power up)	(in live operation/ power up)
Set output mode to 720p:	Menu/Contrast up/Contrast down	Back/VGA

The back panel features all the input and output connectors, communication ports and the power supply connector.



1 – SD/HD-SDI/3G-SDI input

2 – Composite Video 1 (RCA) and S-Video input

3 – Composite Video 2 (BNC) and Genlock input (BNC)

4 – Digital audio output 5 – HDMI input

6 – DVI-D and VGA input 7 – YPbPr / RGB(S) video input

8 – DVI-D and VGA output 9 – 3G-SDI output

10 – USB port 11 – TCP/IP port

12 – RS232 port 13 – Power supply connector

3.3. Main Menu

The main menu lists the input channel select item, 6 sub menus, and a menu item for automatic setup of VGA modes. The 6 sub menus are Output, Colour, Geometry, PiP (HQView-500S) or Multiple Unit (HQView-510 and 520/530), Enhancement and System.

On each menu page an Exit menu item is available to leave the menu or submenu.

HQView-500S/510 and 520 also allow to leave (back up) a menu or submenu by pressing the up/down key simultaneously. HQView-530 has a separate back key for this purpose.

Some adjustments are not applicable to all signal types or operating modes, in which case those non-applicable functions will be ghosted (greyed out) and are not accessible.

All menus have a top status line and a bottom firmware revision line.

In the status line the currently selected input channel is indicated and the detected mode is identified. The bottom line shows the revision number of the boot loader behind BL, the revision number of the firmware behind FW and whether it is a 500S, 510, 520 or 530 type HQView unit.

Navigating the menu system or changing values is done with the Menu/Enter and up / down keys in the case of HQView-500S, 510 and 520 or a Menu and Back keys together with a jog wheel/Enter in the case of HQView-530.

In the following sections the set-up method using the up and down keys is described.

To set up your HQView-5xx it is recommended that you follow this procedure:

1/ Choose the correct output mode and parameters to suit your screen or projector.

2/ Select the correct input signal.

3/ Set the input levels and features appropriately to optimize the appearance of your image.

4/ Set any other parameters to suit your application.

Note: The processor is designed to have separate memories for all the settings in each section. All Input parameters are specific to your chosen input channel and input signal type, they are not global to the unit. If you change the settings in for example the composite video channel you will not affect the settings you may have made in for example the DVI channel.

All Output parameters only affect the output, they do not affect any of the inputs but please note that the appearance on the screen because it is the output these adjustments will appear to be global.

3.4. Input

The list of available inputs can be scrolled through using the Up and Down keys or jog wheel. The new input is not selected until the Menu/Enter key is pressed. The list of inputs are: CVBS 1, CVBS 2, S-Video, Component, VGA, 3G-SDI, DVI, HDMI and Test Pattern.

Test patterns can be generated by HQView-5xx without needing an input connected. When Test Pattern is selected as the input, the required test pattern can be chosen with the menu navigation up/down keys or jog wheel when the OSD menu is off or the LCD menu is in its default screen.

3.5. Output

This menu contains adjustments associated with setting up outputs from the unit. The items are organized in three sub menus, Display Type, Gamma/Color/Crush and Output Config. Use the up and down keys or jog dial to scroll to the required item and press the Menu key.

3.5.1. Display Type

Settings: Scaler-Switcher, Projector

The Display Type setting defaults to Projector or to the last set before power down.

Select Projector if you drive a projector and need the warp function and edge blend capability.

Set to Scaler-Switcher if you do not need warp (including Location). The unit defaults to single/unit with PiP functionality. Multiple unit configurations with auto zoom but without edge blend become available when switching over to multiple unit mode. The real value of this mode is that the Flicker Filter becomes available. Also, the default settings for Frame Rate and I/O lock are chosen such that unit has cleanest switching performance.

3.5.2. Output Mode

Settings: 640x480, 800x600, 1024x768, 1280x768, 1280x800, 1280x1024, 1360x768, 1366x768, 1400x1050, 1440x900, 1600x1200, 1680x1050, 1920x1200, 480i, 576i, 480p, 576p, 1080i, 720p, 1080p

Set up the desired output resolution with output mode. The output mode setting should match the native resolution of the imaging device to avoid double scaling.

The 3GSDI output does not feature the PC mode resolutions, This is because PC modes are not part of the international SDI standard. SDI supports only 480i/p, 576i/p, 720p and 1080i/p output modes. Available SDI output modes are indicated by an SDI connector/BNC symbol in the output mode selection list box of the OSD. SDI output modes not supported are indicated with this symbol crossed out red.

The default output resolution as set by the factory or after a user issued factory reset is 720p.

3.5.3. Location

Settings: Front Tabletop, Front Ceiling, Rear Tabletop, Rear Ceiling

The image can be flipped to accommodate different projection scenarios as well as screens mounted upside down.

3.5.4. Frame Rate

Settings: 60 Hz, 50 Hz, 48 Hz, 24 Hz, Auto

In auto mode the output frame rate follows the input frame rate as configured in the Output Config menu.

Signals with 24Hz, 25Hz, 48Hz, 50Hz input modes get special treatment, Modes with other refresh rates are displayed at 60Hz.

24Hz input modes will be output at 24Hz if the output resolution is set to either 720p or 1080p and the Frame Rate setting in the Output Config menu includes 24Hz, otherwise it is displayed at twice the rate if the Frame Rate setting in the Output Config menu includes 48Hz. Otherwise a 24Hz input mode is displayed at 60Hz.

48Hz input modes will be output at 48Hz if the Frame Rate setting in the Output Config menu includes 48Hz. Otherwise it is displayed at 50Hz.

A 25Hz input mode is output at twice the frame rate 50Hz.

An exception to the 24/25Hz input mode treatment is if the output resolution is set to 480i or 480p. 480i and 480p are always run at 60Hz output rate.

50Hz input modes are displayed at 50Hz output rate.

The output frame rate can also manually set to 24Hz, 48Hz, 50Hz or 60Hz if possible, i.e. such output modes are available.

Only 720p and 1080p output modes are available with 24Hz refresh rate.

480i and 480p output modes are only available at 60Hz refresh rate.

For all other modes 48Hz, 50Hz and 60Hz refresh rate is available.

3.5.5. I/O Lock

Available settings: Off, Source, Genlock, Auto

If I/O Lock is switched off the output is run with a fixed refresh rate determined by the frame rate setting. This setting will result in the output vertical refresh rate deviating from the input refresh rate, even if both are nominally at the same rate. This causes occasional frame dropping or repeat.

If I/O Lock is set to Source the output refresh rate is following the input video refresh rate if possible. If not, the output is operated with a fixed refresh rate determined by the frame rate setting. (When Frame Rate is set to Auto a frame rate matching the nominal frame rate of the source is chosen.)

If I/O Lock is set to Genlock the output refresh rate is following the vertical sync of an externally provided signal (GENLOCK BNC) if locking is possible. If not the output is operated with a fixed refresh rate determined by the frame rate setting. (When Frame Rate is set to Auto a frame rate matching the nominal frame rate of the source is chosen.)

Locking is achieved by modulating the output clock and works if input and output refresh rate are nominally at the same rate, e.g. when frame rate is set to 60Hz and the video input is also 60Hz. If e.g. the video input rate is 50 Hz and Frame rate is set to 60Hz, the output will enter free run mode.

When I/O lock is set to Auto and a Genlock source is present to the GENLOCK BNC. The processor will lock with the external genlock signal if possible. If genlocking is not achievable, locking to the video source frame rate is tried. If that is not possible the output is running in free-run mode.

The status line of the OSD window under Sync Mode indicates if the output signal is locked to the input signal (I/O Locked or Genlocked) or in free run mode (Free Run).

If the unit is to be used as a clean switcher the settings for Frame Rate and I/O lock need to be chosen carefully. Obviously, clean switching cannot be achieved if output frame rate locking to input video (Source) is selected. Even if the to be switched input channels have signals attached with nominally the same frame rate they always differ slightly and a new lock has to be established causing disturbances.

The following combinations of Frame Rate and I/O Lock settings determine the switching behaviour:

	I/O Lock = Source (Lock to i/p video)	**I/O Lock = Genlock**	**I/O Lock = Off (Free Run)**
Auto Frame Rate	Never Clean	Always Clean	Depends on Inputs
Fixed Frame Rate (any)	Never Clean	Always Clean	Always Clean

Note 1: The Auto Frame Rate vs Fixed Frame Rate function determines Genlock behaviour as well as I/O Lock and Free Run behaviour. In Auto Frame Rate mode Genlock signals of 50Hz or 59.94/60Hz are accepted, but in Fixed Frame Rate mode only a Genlock signal which matches the chosen Frame Rate is accepted. So for example if the unit is fixed at 60Hz frame rate output it will not lock to a 50Hz genlock reference, but will only lock to a 60Hz genlock reference.

Note 2: In Auto Frame Rate mode with Free Run Mode selected input switching may or may-not be clean, this depends on how close the frame rates of the current and next input channel are.

3.5.6. Native Color Temp

Settings: 5500, 6500, 7500, 9300, 10000

Native Colour Temp allows the user to select from pre-configured colour temperatures to match the display. If both Native Colour Temp set here in the Output menu and Colour Temp set in the Colour menu are set to the same value, no conversion is performed.

3.5.7. Output Gamma

Settings: 1.0 to 3.0 in steps of 0.1

Output gamma allows to re-gamma video signals with pre-configured gamma values to match the display. Input gamma and output gamma both default to 2.2. If they are both set to the same value, there is no effect on the image.

Note: If e.g. an adjustment to reduce the level of red in the image is required, select a higher number for the (input) Colour Temp in the Colour menu, or a lower number for the Native Colour Temp in the Output menu.

3.5.8. Output Config

This Menu provides items to configure the output ports.

Sync Mode

The VGA output port can be operated with separate syncs, composite syncs and Sync-On-Green.

Internally, the display interface processes data at a full ten bits per colour.

Optimize for Display

Settings: DVI forced, Optimized, DVI/HDMI

Internally, the display interface processes data at a full ten bits per colour. A resolution of ten bits per colour is provided for the VGA output. The colour depth on the DVI-D output is determined by the supported standard of the attached monitor or device when set to DVI/HDMI.

For DVI 1.0 and HDMI 1.1/1.2 devices it is 24 bit, for HDMI 1.3 compliant devices it is up to 36 bit.

DVI forced will output with 24 bit colour depth irrespective of the supported standard of the attached monitor.

When the Optimized setting is enabled the output resolution is automatically set to the native screen resolution of the attached display. The colour depth is determined in the same way as when set to DVI/HDMI.

DVI Colour Space and DVI Range

The colour space of the DVI output port can be set to RGB or YPbPr.

The range can be set to Default, Limited, and Full. When set to Default CEA output modes have limited range, and VESA modes have full range. Therefore, an incoming limited range mode is either passed through when the output is set to a CEA output mode or expanded when the output is set to a VESA mode. An incoming full range mode is either compressed when the output is set to a CEA output mode or passed through when the output is set to a VESA mode.

If the HDMI/DVI output does not behave as expected, e.g. because the HDMI display is not evaluating AVInfoFrames properly, the range can be changed manually.

A limited video range is only using the following greyscale for video information - 8 Bit System: 0x10 .. 0xEF, 10 Bit System: 0x040 .. 0x03BF, 12 Bit System: 0x100 .. 0xEFF.

Frame Rates

Settings: 60/50 Hz, 60/50/24 Hz, 60/50/48, 60/50/24/48

Limits the possible output frame rates that can be selected. It is primarily to be able to limit the choices available for the Auto refresh rate configuration discussed in paragraph 3.5.3.

3G-SDI Data Map

720p and 1080i HD-SDI data can be output in YCbCr 4:2:2, YCbCr 4:4:4 or RGB 4:4:4 mode.

3GSDI data can be output as Level A or B data.

3.6. Colour

This menu contains adjustments associated with setting up inputs to the unit. Use the Up and Down keys to scroll to the required item and press the Menu key or use the jog wheel.

3.6.1. Black-Level Offset

Settings: 0 IRE, 7.5 IRE

Used to select 7.5 IRE black level set-up adjustment. Used for NTSC type video signals. Should always be set to 7.5 IRE for HDMI video inputs and should usually be off for PAL type analog video inputs.

3.6.2. Black-Level

Settings: -50 to 50 in steps of 1

Black level controls the offset applied to the video signal.

3.6.3. Contrast

Settings: -50 to 50 in steps of 1

Contrast controls the gain applied to the video signal.

3.6.4. Saturation

Settings: -50 to 50 in steps of 1

Control of video saturation, applies to all video inputs but not computer input signals or formats.

3.6.5. Hue

Settings: -50 to 50 in steps of 1

Control of video hue, applies to all video inputs but not computer input signals or formats.

3.6.6. RGB values

This is a user-defined colour temperature setting whereby individual R,G,B gain and RGB black level offset (bias) can be set so as to accurately calibrate a particular input to the display device.

3.6.7. Colour Temp

Settings: 5500, 6500, 7500, 9300

Colour Temp allows the user to select from pre-configured color temperatures to match the colour temperature of the incoming signal. If both Colour Temp set here in the Colour menu and Native Colour Temp set in the Output menu are set to the same value, no conversion is performed.

3.6.8. Input Gamma

Settings: Gamma 1.0, Gamma 1.5, Gamma 2.2, Gamma 2.8

Set this value to match the native gamma of the input signal. Input gamma and output gamma both default to 2.2. If they are both set to the same value, there is no effect on the image.

3.7. Geometry

This menu contains adjustments associated with setting up position, aspect ratio and scale of the input signal. Scale can be as simple as an overscan up to arbitrarily warping the image.

3.7.1. Horizontal/Vertical Position

Settings: in steps of 1 pixel/line

Change the positional values to match the display boarders.

3.7.2. Edge Control

Submenu for changing the position of the image edges, effectively scaling the image in horizontal and vertical direction. If Pan Tilt Zoom is activated Edge Control is disabled. It does effectively the same, but has greater range.

3.7.3. Warp

Note: Warp is only available for HQView-510, 520 and 530. PC Warp is only available on HQView520 and 530

Details of the submenu for warping the image and defining projection condition.

The projection condition can be Front Tabletop, Front Ceiling, Rear Tabletop or Rear Ceiling. The corresponding image flip is applied in addition to the following warp applications.

The warp applications are Keystone, 4-Corner, Rotation, Portrait and PC.

In the **Keystone** application the image can be adjusted to match a horizontally and vertically tilted screen. Also, Pin/Barrel distortion of the lens or screen can be adjusted simultaneously.

Under the **4-Corner** application all corners can be moved and the image linearity is calculated to fit into the given trapezoid. Please note that this function is designed to be used on Flat rectangular screens only. For more complex shapes please use the PC mode.

The **Rotation** application rotates the image from -180 to 180 degree (one full circle) one degree at a time.. At the same time Pin/Barrel distortion of the lens or screen can be adjusted again.

Special **Portrai**t warp applications for clockwise (90°) and counter-clockwise (270°) rotation with scaling are provided. These functions cut out the centre of a normal landscape video signal, rotate it by 90 degrees and then scales that centre portion of the signal to fit a portrait mounted screen. Predefined warp maps for portrait mode act on a 16:9 input image. The area is rotated and scaled such that is fills a 9:16 screen.

With **PC** application activated the HQView-520 and 530 communicate with the PC tool Warp Generator.

http://www.calibreuk.com/software/hqv/CUK%20Warp%20Generator%20Installer%20V2-50-8337.msi

Warp Generator allows you to define an arbitrary screen in live operation by projecting a grid on the surface and move the grid points to get a rectangular output. This grid information can then be downloaded in one of eight slots used for real-time processing of image data which make the image appear rectangular on a curved screen.

For convenience all settings can be reset with one button provided in the submenus.

3.7.4. Picture Format

Settings: Standard, Full Screen, Crop, Anamorphic

Picture Format allows a user to select the displayed aspect ratio where the signal input is different to the display panel's natural aspect ratio.

Note that some aspect ratios may not be applicable to all signal types, in which case selecting a non-applicable aspect ratio conversion will have no effect on the displayed image. E.g. when a 16:9 image is displayed on a 16:9 panel all settings give an identical full screen image.

Standard preserves the aspect ratio of the incoming image and scales the image to fit into the size of the panel. Dependant on the aspect ratio of the panel the image is either bordered by the right/left side or bottom/top of the panel. Non-used areas of the panel are displayed black (letterboxed).

Full Screen scales the image to the size of the panel without preservation of the aspect ratio.

Crop preserves the aspect ratio and scales the image to fit the screen. Dependant on the aspect ratio of the panel either the top/bottom or right/left areas of the image are cropped.

Anamorphic scales the input image such that it is displayed with a 16:9 aspect ratio when displayed on the screen. The image is further scaled to fit into the size of the panel. Dependant on the aspect ratio of the panel the image is then either bordered by the right/left side or bottom/top of the panel. Non-used areas of the panel are displayed black (letterboxed).

3.7.5. Overscan

Settings: 0 to 10 in steps of 1

Overscan is used to slightly zoom into the image. Thus, the border area of an image is no longer displayed on the screen. This cuts off unwanted features at the top or bottom from e.g. head switching in legacy video images.

3.7.6. Pan Tilt Zoom

This menu provided settings to zoom and shrink the image, as well as panning within the image.

Pan Tilt Zoom (PTZ) can be switched on or off.

When switched on the latency of the system is increased by one frame. Thus, there is a difference of a PTZ setting off or on with no zoom.

PTZ settings can be saved per mode or globally, i.e. if applied globally the same PTZ settings are applied when switching input channels or changing the input mode.

The Zoom slider allows to zoom into the image or shrink it.

When Aspect Lock is set to On the separate slider for zooming vertically is greyed out and the horizontal zoom or shrink factor is used as vertical factor as well. The aspect ratio is preserved.

When Aspect Lock is Off horizontal and vertical scaling factors can be chosen separately.

With the Pan and Tilt sliders panning within the image in horizontal and vertical direction is possible. Off raster panning is allowed, i,e, the image can be shifted outside the active area of the display.

For convenience the PTZ settings can be reset with one button.

3.8. PiP

The HQView-500S has a PiP menu. It contains adjustments associated with setting up source, position and size of a picture in picture video image.

HQView-510/520/530 have a Multiple Unit menu instead. However, HQView-510/520/530 can be re-booted as an HQView-500S through the menu system.

3.8.1. PiP Input

Selects the video source for the PiP window.

The available PiP video sources depend on the currently displayed (main) video source.

If the main video source is HDMI, DVI, DVI-A, VGA or COMPONENT the available PiP sources are CVBS1, CVBS2, S-VIDEO and HD-SDI.

If the main video source is CVBS1, CVBS2, S-VIDEO or HD-SDI the available PiP sources are HDMI, DVI, DVI-A, VGA and COMPONENT.

3.8.2. PiP Mode

Settings: Off, PIP, PAP, POP

Three picture in picture modes can be invoked.

PIP displays a second channel within the main image.

PAP displays both pictures side by side scaled to the vertical size of the panel.

POP displays both images side by side preserving the aspect ratio of each source. The unused areas of the panel are displayed black.

Note: PaP is not available with test pattern and also not available with PTZ activated. PoP has the same limitation and the output resolution needs to have greater or equal to 768 lines.

3.8.3. PiP Adjust

Menu proving controls for sizing and positioning the PiP.

The quadrant for the PiP display can be chosen to be Top Left, Top Right, Bottom Left, Bottom Right and Free H/V.

The PiP size can be chosen to be Small, Medium, Large, and Free W/H.

Note: Large is always available. Small and Medium are only available if the output resolution is greater or equal to 768 lines and the PiP mode has less than 1920 horizontal active pixels.

When **Free H/V** is selected sliders for setting up PiP position are activated.

When **Free W/H** is selected width and height of the PiP can be controlled.

Note: The maximum PiP width is 960 pixels, i.e. if an output resolution with more than 960 pixel in horizontal direction is chosen the PiP cannot be enlarged to a full image.

3.8.4. PiP Show/Hide

Settings: Show, Hide

When activating and deactivating PiP processing, i.e PiP Mode changed from Off to PiP or from PiP to off the video processing off the main image is halted for a short period. This can be avoided by activating PiP (PiP Mode set to PiP at all time) and showing or hiding the PiP window. The drawback of this method is that when PiP is hidden and a PiP source mode change is detected, e.g. because it is not stable, the main image is halted for a short period which may be irritating.

3.8.5. PiP Show/Hide Transition

Settings: Instantly, Fast Fade, Slow Fade

The fade in an out method for PiP show/hide can be controlled through this menu item.

3.9. Multiple Unit

The HQView-510/520/530 have a Multiple Unit menu to set up each unit for use in a multi screen application.

Multiple screens are stitched together to provide a bigger display with higher resolution than a single display.

Each display is driven by a separate HQView unit.

The processors in a multi screen system application can be used in two ways

1/ Auto zoom on:- processers cut out the specified section of the image and scale this section to fill the projected area.

2/ Auto zoom off:- processors do not cut the image, the correct portion of the image including overlapping blend region must be supplied to each processor independently.

When using the Auto Zoom function explained below, each HQView unit gets the same graphics or video input signal through a distribution amplifier. The HQView unit cuts out and resizes the image to display the part of the image assigned to the corresponding screen.

In a multi projection display the individual projections typically are chosen to overlap to give seamless transitions.

Overlapping regions are illuminated by multiple projectors and are brighter than non-overlapping regions. These can be Soft Edge Blended for a uniform brightness over the total display the brightness in the overlapping regions has to be reduced electronically.

PiP functionality is not supported due to higher bandwidth requirements of the video processing.

Important: When using multiple HQView units to drive one single large screen, it is essential that all HQView units are I/O locked, otherwise motion tear will be observed at the boundaries of the image processed by each HQView unit. It is also essential that all HQView units are setup for the same processing latency (for example, either all units are in Best Picture mode or all units are in Low Latency mode).

3.9.1. Auto Zoom

Settings: On, Off

Switches on the auto zoom resizing the video image to display the assigned part of the total image.

The default is AutoZoom is off

When Auto zoom is turned on the processor will cut and scale the portion of the picture selected by the matrix size and position selected – described below

Note The menu is scaled by the warp engine and may exceed the size of the screen. Also, only the active video area can be used for the on-screen menu. This would crop the menu and make it impossible to navigate. In this case auto zoom is deactivated and a message will indicate such situations. After changes are made to correct the situation AutoZoom can be reactivated.

3.9.2. Units Wide/Units High

Settings: 1, 2, 3, 4/ 1, 2, 3, 4 for the maximum matrix size of 16

Provides the HQView unit information of the multi screen installation. The number of horizontally and vertically installed screens or projectors is entered.

Note:- This function can be used in conjunction with the item below to select the blend regions to be provided even when auto zoom is turned off

3.9.3. Horizontal Pos/Vertical Pos

Settings: 0 to 3 indicating co-ordinates 0,0, to 3.3 for the maximum matrix size of 16

With Auto zoom turned on this provides the HQView unit information of which window portion of the total image it is assigned to and has to process (cut out and resize).

Note:- This function can be used in conjunction with the item above to select the blend regions to be provided even when auto zoom is turned off

3.9.4. Blend Width

The blend width menu provides sliders to set up the overlap region for left, right, top and bottom blend region.

Note With the 5xx models when changing the slider value from within the OSD the blend area is not updated 'live' immediately. An update is forced when pressing the menu/enter button, thus the slider is replaced by the menu. This is not ideal, but excessive blend area write time suggested this approach.

The overlap is set up in output pixels with a range of up to one third of the output resolution. For a configuration with two projectors in horizontal direction the overlap can be higher to allow 16:9 images to fit on two combined projectors with an aspect ratio of 4:3 or 5:4.

An offset for the blend region can be set-up as well. The region between the edge and the start of the blend area is black. The total pixels of blend area and offset region is limited by the same amount of pixels as for an offset of zero.

Note: Each HQView unit needs to be provided with the exact same value for left and right blend region. Top and bottom blend region have to be identical as well, but don´t need to have the same value as left and right. The HQView units do not communicate between each other and thus they have to make an assumption for auto zoom calculations and that is overlap of the neighbouring (and those beyond) projectors is identical.

3.9.5. Blend Curve Type

The blend curve type menu sets the blending characteristics.

For setting up the overlap the Align Pattern should be used. Align Patter reduces the image intensity of each pixel in the blend area by half.

When the blend region set up through the blend width menu and the physical blend match the S-Curve characteristics can be switched on. The image intensity is gradually reduced from the start of the blend to the edge of the respective projector image.

The S-Curve Value slider allows to control the steepness of the S-Curve. For convenience in this Blend Curve menu a duplicate of the Output Gamma slider can be found to match the grey scale of the images.

When a custom alpha map was loaded into the file system of the unit it is recognized and the Custom Alpha Map menu item becomes available. Custom alpha maps can be uploaded through the web or remote control API interface of HQView. The map can be switched on and off. The map is combined with the Align or S-curve map internally generated.

3.9.6. Black-Level Uplift

This enables the user to provide a black level uplift to compensate for the additional light leakage from multiple projectors in overlap regions. The black level uplift can be set for the 9 possible regions of the image. Setting the black level uplift for the middle of an edge also sets the black level uplift for the two adjacent corners, and if needed the corners can then be set individually.

The sliders for all regions which are not involved in edge blending for a given multiple unit configuration are greyed out, and the black level uplift for all these regions can be set together using the Non-Blend Region parameter.

3.9.7. Reduce Black-Level Uplift Width

The Black Level Uplift field may need to be adjusted to achieve a perfect result. There may be an area of light leakage beyond the edge of the active image from the projector. With these controls the edges of the black uplift region can be moved so they can be aligned with the edges of the area of light leakage. In the case of projection under non-rectangular conditions the projection fields of adjacent projectors are not aligned with the blend region. The corners of the non-blend region can be moved to allow tracking of the edge of the projection field of adjacent projectors.

3.10. Enhancement

The enhancement menu provides image enhancement functions. Note that the enhancement settings apply to video input signals only, not computer graphics signals.

3.10.1. Sharpness

Settings: -50 to 50 in steps of 1

Control of the sharpening enhancement filters' levels. These are peaking filters to improve high-frequency response.

Note that setting this control too high on a signal which already has good high frequency response will cause ringing or ghosting.

3.10.2. Detail

Settings: 0, 1, 2, 3

This filter provides powerful 2D image enhancement 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 detail enhance filter can make SD signals look virtually indistinguishable from true HD.
At setting 0 the filter is switched off, with setting 3 providing the highest effect.

3.10.3. Video Filters

The video filters menu provides LTI/CTI filters, TRNR/MNR noise reduction filters and a CCS cross color suppression filter.

The LTI filter enhances the sharpness of the luminance component.

The CTI filter enhances the color sharpness of the chrominance signal by increasing the steepness of color edges.

TRNR (Temporal Recursive Noise Reduction) and MNR (Mosquito Noise Reduction) are available for SD input signals only. These filters reduce spatial and temporal noise as well as block artifacts.

CCS is a filter to reduce luminance to chrominance cross talk of composite video signals (only) which appears as a coarse rainbow pattern or random colors in regions of fine details.

3.10.4. Flicker Filter

By default the filters are off.

The Flicker Filter reduces interlace horizontal line edge bounce or flicker when scan converting from a computer progressive input format to an interlaced output signal. By choosing the filter strength and recursion mode it is possible to choose between higher levels of flicker reduction or better motion reproduction.

The Flicker Filter when turned on is applied to the computer input ports DVI and HDMI. It is not applied to inputs which are video (Composite, S-Video, Component and 3G-SDI) or to interlaced modes on DVI and HDMI.

Filter Strength controls the filter weighting of prior field versus current field. Recursion chooses between vertical filtering of current and prior input fields, or current field and recursive data output from filter during prior field.

3.11. System

This Menu selection contains functions which are more applicable to system operation than to picture adjustment.

3.11.1. User

Settings: USER 1, 2, 3, 4

A predefined setting stored under a user name can be selected. Several settings of the HQView5xx can be stored under a user name. Thus, different users can store their preferred HQView5xx settings and recall these profiles by picking up their user name from this menu.

Note: Using the Web interface, (any number of) settings can also be stored/restored to/from a PC disc drive.

The below listed settings are stored per user. All other settings are global and are not stored under a user name, i.e. they remain in their present state when switching to a different user mode.

Per user settings
"Input", "PIP Input", "PIP Hide", "PIP Size", "PIP Position", "PIP H-Pos", "PIP V-Pos", "Component Color Space", "Menu Display Time", "OSD Messaging", "Menu Position", "Language", "Optimize for Display", "Output Mode", "Frame Rate", "Frame Rates", "3G-SDI Data Map", "I/O Lock", "Native Color Temp", "Output Gamma", "PTZ Enable", "PTZ Setting", "Aspect Lock", "Filter Strength", "Filter Recursion", "Sync mode", o/p "DVI Color Space", o/p "DVI Range", "3G Level B Stream", "SDI to HDMI Audio Map", "SDI Audio Routing", "DVI-I Port", "HDCP", "Switching Transition", "OSD Enable", "DVI Port EDID", "HDMI Audio Support", "PIP Width", "PIP Height"

Per channel per user settings
"Color Temp", "Red Gain", "Green Gain", "Blue Gain", "Red Bias", "Green Bias", "Blue Bias", "Display Mode", "CCS", i/p "DVI Color Space", i/p "DVI Range", "HDMI Color Space", "HDMI Range", "Pan", "Tilt" "Zoom H", "Zoom V"

Per mode per user settings (VGA channel only)
"Clock", "Phase"

Per mode per user settings (RGB/YBbPr channel only)
"Component Sync"

Per channel per mode per user settings
"Black-Level", "Contrast", "Hue", "Saturation", "Input Gamma", "Picture Format", "Horizontal Pos", "Vertical Pos", "Overscan", Geometry "Left Edge", Geo. "Right Edge", Geo. "Top Edge", Geo. "Bottom Edge", "Sharpness", "Detail", "LTI Level", "CTI Level", "TRNR", "MNR"

Per channel per mode per user settings (and depending on component type setting)
"Black-Level Offset"

3.11.2. Names/Profiles

The Names/Profiles menu provides input masks to rename the generic input channels and user names. User names and input channel names can be changed to any word with a maximum of 12 alpha numeric characters with a value range of 0-9, A-Z and blank.

The Names/Profiles menu allows the user to store profiles under a certain user name. It also allows to copy user profiles by loading a profile stored under one user name and save it under another user name.

Reset Profile allows to restore default HQView-5xx settings for the currently selected user.

3.11.3. Input Config

Inputs can be configured through the following sub-menus:

VGA Setup:

Submenu for adjusting analogue computer video.

A button for automatic setup of frequency and phase of the sampling clock is provided. This automatic adjustment is strongly recommended.

Frequency (Clock) and phase can also be altered manually.

The preferred video mode can be selected in the EDID Input Format menu. This setting can force the source to output a certain video mode.

DVI Setup:

The DVI-I connector will accept either DVI-D or VGA analogue inputs. The DVI-I channel can be configured for either.

The equalisation of the DVI interface can be boosted to allow for extended cable length.

The automatic DVI Color Space and Range settings can be overwritten in this menu. Range can be set to limited video mode or full range. The color space can be set to RGB or YCbCr.

The DVI Port EDID by default is a DVI EDID, but can be overwritten by a HDMI EDID. Thus, audio and more video modes also with deep color become available.

When in HDMI mode (HDMI EDID loaded) the audio capabilities of the port can be configured by means of overwriting the EDID yet again. HQView is part of an audio/video processing chain and devices behind HQView may not be able to cope with advanced audio. HQView can signal the source to match with the audio capabilities of the display, or to be S/PDIF friendly or to be SDI friendly.

The preferred video mode can be selected in the EDID Input Format menu. This setting can force the source to output a certain video mode.

HDMI Setup:

The automatic HDMI Color Space and Range settings can be overwritten in this menu. Range can be set to limited video mode or full range. The color space can be set to RGB or YCbCr.

The audio capabilities of the HDMI port can be configured by means of overwriting the EDID. HQView is part of an audio/video processing chain and devices behind HQView may not be able to cope with advanced audio. HQView can signal the source to match with the audio capabilities of the display, or to be S/PDIF friendly or to be SDI friendly.

The preferred video mode can be selected in the EDID Input Format menu. This setting can force the source to output a certain video mode.

SDI Setup:

For 3GSDI Level A or B type input modes can be chosen.

SDI audio input is routed to the HDMI and 3GSDI output connector by default.

HQView-5xx can also be set to monitor audio on the SPDIF connector. Audio on the HDMI/3GSDI connector and SPDIF connector are mutually exclusive.

Two consecutive SDI audio channels can be output on the HDMI/3GSDI output interface. The group can be chosen. Or all eight SDI audio channels can be transmitted.

Component Setup:

The component interface of the HQView-5xx is configured through this submenu.

The Colour Space can be set to YPbPr or RGB.

The sync signal can be stripped from the Green or Y channel with the setting 3 Wire or from the separate sync line with the setting 4 Wire.

The Auto setting will automatically detect a sync signal and set-up the HQView-5xx accordingly. This is setup in under Synchronisation.

Test Pattern:

When the OSD menu is off the test pattern can be toggled through by pressing the up or down keys of the keypad. For unit control through a web browser or to set up a certain default test pattern please use the input configuration menu.

Custom test patterns loaded into the file system of the unit through the web interface, can be accessed through the same means.

The speed of the moving cross test pattern can be changed. Also, the foreground and background colour and the line width of the moving cross test pattern can be changed in this menu.

Note: Most test patterns are scaled in multiple unit configurations with Autozoom enabled since they are useful for setting up the blend and warp of the system. The SMPTE, and Pluge Patterns are not scaled.

HDCP:

The DDC can be taken off line. When setting HDCP Input to off HQView pretends to be non HDCP compliant forcing the source to not encrypt data which is not copy protected.

Switching Transition:

When switching input channels by default the last frame of the prior displayed image is frozen and displayed until a stable image of the new input channel can be shown.

The switchover process is supposed to be as seamless as possible. The source and monitor add switching noise due to unforeseeable activity of the firmware in said devices. By default HQView is in auto frame rate switching and I/O lock mode. In order to get a best smooth switching result with the source and monitor I/O lock and auto frame rate switching have to be switched off in the Output/Display Type menu.

The switching transition of HQView can be set to **Freeze, Blank, Fast Fade and Slow Fade**.

Freeze halts the prior channel image until the new channel image is stable.

Blank switches the output to show a black screen instead of the last channel image.

Fast and slow fade have the prior channel image faded out and fade into the new channel video image once it is stable.

3.11.4. Display Mode

The “Display Mode” can be set to either Low Latency or Best Picture.

In Best Picture optimum image processing is applied, whereas in Low Latency mode the lowest latency is achieved.

The flicker of interlaced video is not suppressed totally for the latter setting. It has the disadvantage of conventional CRT TVs, but also their advantage of almost no delay in response, which is important for applications such as gaming, simulation or imaging in medical treatment.

The latency of the system is ¼ of a frame for progressive input and progressive output when I/O locked. If the output is free running the latency is oscillating between ¼ of a frame and 1 frame. Switching on PTZ adds one frame of latency. Switching on warp adds another frame of latency. If an interlaced video signal is processed in Best Picture mode, this will add one more field of latency. In Low Latency mode this extra field of latency is avoided.

3.11.5. Menu Settings

This menu provides items to change the menu position and menu display time, i.e. the time after which the OSD is switched off again with no user interaction. OSD Messages can be activated and deactivated.

The menu language can be altered and the keypad can be locked.

To unlock the keypad a combination of keys has to be pressed at the same time. The locking of the keyboard is accompanied by the message (HQView-500S/510/520): Keypad is locked. Press Menu/Up/Down to unlock. When successfully unlocking the keypad the message shows up: Keypad unlocked.

HQView-530 has an additional menu item to switch on/off the OSD menu. The LCD menu – which is a copy of the OSD menu – then serves as the only menu navigation monitoring device.

3.11.6. Network Settings

The factory default is DHCP.

The Network Settings menu allows to configure the HQView-5xx TCP/IP address. Under Address Type a static or DHCP leased address can be chosen. The static address, Netmask and Gateway needs to be entered manually.

The Network Settings menu has a section with information on the DHCP Status and IP address assigned to the board, as well as the fixed MAC Address programmed into the HQView-5xx. The DHCP status is Off when static assignment is used or it displays an address when DHCP has leased an address accordingly or it is None assigned if the lease was not successful.

Note: When changing from DHCP to Static mode or vice versa it is strongly recommended that HQView-5xx is powered down after such a change, then powered back up, so that it is properly recognised by other devices on the network.

3.11.7. Factory Defaults

This button lets you restore all settings to the default values of the HQView-5xx, this, provide a means to get back to a known (good) system state. A request will come up and ask to confirm prior to actual restore.

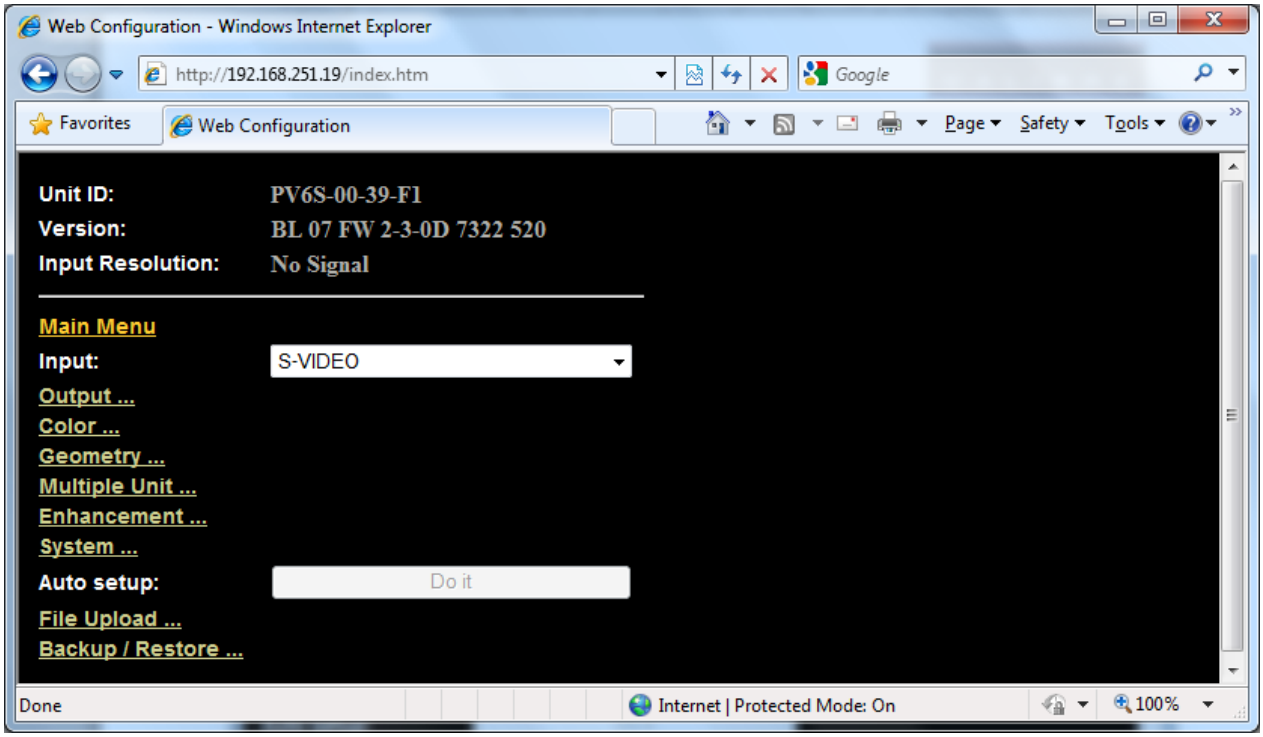
3.11.8. Operation Mode

This menu item is only available on a HQView-510/520/530. It allows to choose between the regular multiple unit mode with blend and warp and a PiP mode. Selecting the PiP mode will effectively boot the HQView-510/520/530 to emulate a HQView-500S. A HQView-500S has PiP/PaP/PoP capability but no edge blend. The Operation Mode can be switched back to Multiple Unit.

REMOTE CONTROL WEB SERVER

4.1. Introduction

HQView-5xx features a web server which connects to a PC web browser via TCP/IP. The menu system of HQView-5xx is mirrored into the web browser and all menu items can be accessed and controlled through the keyboard or mouse of the PC.



4.2. Installing the Software

No extra software needs to be installed on a PC. The PC web browser is used as the graphical user interface for all control items. To connect to the HQView-5xx the TCP/IP address of the unit has to be entered into the address list box of the web browser in the following format http://xxx.xxx.xxx.xxx. The TCP/IP address assigned to HQView-5xx can be found in the System/Network Settings menu.

4.3. Discovery Tool

Calibre provides a DiscoveryTool.exe Windows application to identify Calibre boxes in the network.

http://www.calibreuk.com/software/ledview/DiscoveryTool_V1.0.exe

Clicking on the link of the recognized box will open a browser and make a connection to the corresponding box. The box identifier is made up of “PV6S” in the case of HQView-5xx followed by the 6 least significant digits of the MAC address. The MAC address of the box can be found in the System/Network Settings menu.

Note: This is for use on a network not on a single wire connection.

4.4. Software Operation

Once the address has been entered into the web browser starts to load pages from the HQView-5xx mirroring the menu system of the unit. All menu items are shown as their respective buttons, sliders and list boxes and can be accessed and altered with the PC mouse or corresponding navigational key presses.

Note:- When changes within a submenu make other menu items available immediately when using the on-screen menu of the HQView-5xx this has to be either done manually by clicking on the refresh button of the web browser or is done with the next periodic auto refresh.

Various values are set by sliders. For fine increment of a slider value click on the slider and use the mouse wheel to change the value in steps of 1. Click again and the value is applied.

4.4.1. File Upload

A page for file uploads is provided.

Test patterns can be created and stored on the PC. Four such custom test patterns can be uploaded to and stored by the HQView unit. Each of the test patterns in the four slots can be deleted and replaced by another test pattern.

The test patterns need to be in RGB 24bit .PNG format as e.g. supported by MS Paint®. For best detail the test patterns should be created with the output resolution HQView will be operated at. Non matching resolution test patterns will be scaled to the output resolution.

A single alpha map can be uploaded to the HQView unit.

The alpha map format is B/W 16bit .PNG as e.g. supported by Adobe Paintshop®. Only the most significant 10 bits are used.

Also a Calibre proprietary format without compression is supported. This format is intended for uploads in proprietary calibration systems directly controlling the HQView unit. Thus, a .PNG encoder does not have to be implemented on the host side. If the alpha map size exceeds the available storage space on the HQView unit the .PNG (lossless compression) has to be used.

The Calibre format is as follows:

```
// Custom Alpha Map File Format
//
// Offset Size Purpose
//  00     4   Header field used to identify custom alpha map file ('AM30')
//  04     2   Horizontal resolution in pixels (big endian)
//  06     2   Vertical resolution in pixels (big endian)
//  08     s   Image data
//
// Each line of image data is built like this:
// One 32-bit unsigned (four bytes, big endian) for every three pixels of image data
// Bits[31..30] - unused
// Bits[20..20] - leftmost pixel of three
// Bits[19..10] - middle pixel of three
// Bits[09..00] - rightmost pixel of three
// Each line has to be zero-padded to make up an integer number of 32-bit unsigned values
//
// e.g. 1280 pixels horizontally needs 427 values (1024/3 = 426.67, rounded up)
//
// So the size (s) of the image data is calculated like this:
// s = CEILING(ImageWidth /3 ) * 4 * ImageHeight
//
```

```
// Example of a 1920x1200 custom alpha map (all alpha values set to 1):
//
// 000000 41 4D 33 30 07 80 04 B0 (header)
// 000008 3F FF FF FF 3F FF FF FF (beginning of first line)
// ...
// 000A08 3F FF FF FF 3F FF FF FF (beginning of second line)
// ...
// 2ED608 3F FF FF FF 3F FF FF FF (beginning of last line)
//
// s = CEILING(1920 /3 ) * 4 * 1200 = 3072000 bytes
```

FIRMWARE UPDATE

5.1. Introduction

HQView-5xx has a USB port which allows a PC connection. With the Calibre PC Updater tool new firmware can be installed on HQView-5xx for feature upgrades and bug fixes.

http://www.calibreuk.com/software/CalibreUK%20Universal%20Updater%20Installer%20V2.3.0.msi

The latest firmware version for your processor is published on our website:

http://www.calibreuk.com/product_pages/scalers/hqv-downloads.php

Save the correct file for your 5xx model number to your computer.

5.2. Updating Firmware

HQView-5xx accepts firmware downloads only in a dedicated Updater mode.

First disconnect the USB lead.

The unit is put in Updater mode by pressing and keeping the Menu key pressed at power up. If the Menu key is released within 10 seconds after power up HQView-5xx is in Updater mode. Otherwise, HQView-5xx is started normally.

Whilst the Menu key is still pressed the On LED is flashing. When in Updater mode the On LED is flashing two times, then switched off, then flashing two times again, then switched off and so forth.

Now the USB connection between PC and HQView-5xx needs to be established and the Calibre PC Updater tool to be started.

The PC Updater tool allows to browser and select a firmware file in BREC format. Once a BREC is selected the Update Firmware button has to be pressed and the firmware download to the HQView-5xx into non volatile flash RAM starts.

After completion of the download HQView-5xx needs to be restarted normally (without pressing the Menu key) for the change to take effect.

This user manual complies with firmware revision 292E build 9914. Prior or later firmware revisions may deviate in details or lacking of newly introduced features.

ENVIRONMENTAL AND EMC

6.1. Recommended Operating Conditions

Temperature	0^{O}C to 40^{O}C
Humidity (non condensing)	5% to 95%

6.2. Storage

Temperature	-25^{O}C to $+85^{O}$C
Humidity	0% to 95%

6.3. CE and FCC Compliance

CE: This product complies with the requirements of 2004/108/EC Electromagnetic Compatibility Directive, and 2006/95/EC Low Voltage Directive. Compliance is to EN55022 Class A.

FCC: **WARNING:** This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at their own expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

It is suggested that the user use only shielded and grounded signal cables to ensure compliance with FCC rules.

6.4. PAT Testing

Earth continuity testing under PAT regulations shall be done to the HQView/LEDView with 8A or 10A only. A test with 25A may damage the unit.

In fact, HQView/LEDView is IT equipment and the IEE Code of Practise to check earth continuity suggests an alternative 20-200mA test. If the PAT tester does not provide this method and a high current test is to be used instead a 8A or 10A test will be acceptable under the same IEE Code of Practise (a minimum of 1.5 times of the HQView/LEDView internal 5A fuse).

You have to be careful where you connect the earth bond test lead when using 8A or 10A. It is to the metal chassis that you must connect the test lead (mains earth). DO NOT CONNECT to the connectors of the rear panel (signal earth). The HQView/LEDView may never work again.