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# **Premier View 4 Technical Manual**

Issue 4.02



***Welcome to the Calibre Premier View Display Driver Manual***

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Issue 4.02

27/03/03

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## PRODUCT DESCRIPTION

### 1.1. Product Overview

The driver is designed to accept the following input signals:

- Composite video
- S-Video
- RGB and YUV component video
- SDI (Serial Digital Interface)
- RGB analogue (VGA-style computer interface)
- DVI (Digital Visual Interface)

These signals can be all displayed on the panel and ALL signals are displayed FULL SCREEN. "Near-optical quality" scaling means that the output signal is scaled with minimal loss of quality or image resolution irrespective of the resolution of the incoming signal.

The make and model of the panel to be driven is factory configured as one of the following:

- UXGA (1600 x 1200)
- SXGA (1280 x 1024)
- XGA (1024 x 768)
- SVGA (800 x 600)
- VGA (640 x 480)
- Plasma or LCD widescreen

If you are unsure as to whether the driver is configured correctly for your panel please contact a sales representative at [sales@calibreuk.com](mailto:sales@calibreuk.com) quoting the Calibre order number, the driver model number and the make and model of the panel you wish to drive.

Several versions of the driver panel are available, providing different options of interface for video and computer inputs to 6- or 8-bit digital panels.

Factory defaults have been carefully chosen such that most users will not need to make any adjustments. A simple user interface (supplied) with On Screen Display allows the user to adjust a wide variety of parameters if necessary. Once the parameters are set they can be stored in non-volatile EEPROM, which ensures the set-up is retained when power to the unit is switched off.

The resolution of input signals that can be displayed is governed by the size of the panel. See section 2 for details.

## 1.2. System Requirements

The interface requires the following parts to create a functioning video monitor:

- 1) A suitable DC supply (see section 2.3)
- 2) A colour display panel with a six or eight bit RGB 5V or 3.3V digital interface or an LVDS daughter board.
- 3) A backlight inverter to suit the panel used; may have a control input to facilitate user control of backlight dimming.
- 4) A suitable interconnection cable to connect the output signal from the driver interface to the display panel.
- 5) Keypad for user controls (see para. 5.1)

## 1.3. Product Architecture

### The Main Interface PCB

The interface PCB can be supplied to accept interlaced or non-interlaced composite video signals in either PAL, SECAM or NTSC formats and computer signals with either separate sync, composite sync or sync on green. In most cases, functions can be supplied or omitted to suit the customer's requirements. Which input is displayed is priority selectable. Inputs are:

- 1) Computer analogue graphics via 15-way HDD or 10-way pin header
- 2) CVBS via BNC socket or 3-pin header
- 3) Y/C signals via mini DIN (Y/C) socket or 4-pin header
- 4) RGB and YUV component video via 10-way header
- 5) SDI via 3-pin header
- 6) DVI via industry standard 24-pin DVI socket

Computer analogue graphics may be input either via an industry standard 15 way hi-density "D" connector or via a 10-pin header, depending on build configuration.

The interface automatically detects the incoming standard and can adjust itself accordingly. After processing input signals the interface supplies the appropriate display data, timing/control and clock signals to drive a colour panel.

The digital output is via one or two standard 0.1" DIL pin headers which are suitable for ribbon cable connection. For displays which require LVDS input signals, a separate LVDS output adapter is available which fits on to the output connectors of the PremierView unit. This unit can be supplied with one or two LVDS driver devices to accommodate panels with single or dual LVDS 6- or 8-bit channels.

An on-screen display is provided for adjustment of set-up parameters; access is via the user controls.

In addition the interface provides a control output to effect backlight brightness via inverter control input.

On certain models, computer analogue graphics and DVI inputs each have an associated EEPROM which are factory programmed to give the plug-and-play function of a monitor.

Some displays require more power input current than the PremierView card can supply. For these panels, an off-board regulated power supply and controller unit can be provided as an optional extra.

#### 1.4. User Control Panel

The user control panel is a small PCB which contains five push buttons. It connects to the Interface Board via a simple 10-way ribbon cable and may be located a short distance (up to 300mm) away from the interface.

The MENU button invokes the OSD (on-screen display); when the OSD appears, pressing the button will cycle through the top level of OSD menu, which may be an individual function or the title of a sub-menu. The BR+/- and CON+/- buttons are dual-function: when OSD is not displayed they adjust the brightness and contrast, and when in OSD mode they are used to move the menu selector highlight or alter the value of the parameter selected. In this mode, BR+ and CON+ have the same effect, as do BR- and CON-.



**PRODUCT PERFORMANCE**

2.1. Input Signal Compatibility

The resolution of input signal that can be displayed is governed by the size of the panel, see table 1 for details. Note that Groups 1-6 refer to the group descriptions in para. 2.1.2.

Input (See below and para. 2.1.2)	Panel Resolution				
	VGA	SVGA	XGA	SXGA	UXGA
PAL Video	•	•	•	•	•
SECAM Video	•	•	•	•	•
NTSC Video	•	•	•	•	•
Group 1	•	•	•	•	•
Group 2	•	•	•	•	•
Group 3	•	•	•	•	•
Group 4		•	•	•	•
Group 5			•	•	•
Group 6				•	•

Table 1 Displayable Inputs

2.1.1. Video Inputs

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

## 2.1.2. Computer (RGB and DVI) Inputs

Signal formats:	Group 1.	DOS	720 x 400 70Hz
	Group 2	VGA	640 x 480 50Hz to 75Hz inclusive
		MAC I	640 x 480 67Hz
	Group 3	SVGA	800 x 600 50Hz to 75Hz inclusive
	Group 4	MAC II	832 x 624 74.7Hz
		XGA	1024 x 768 50Hz to 75Hz inclusive
	Group 5	MAC 2	1152 x 870 75Hz
		SXGA	1152 x 900 50Hz to 75Hz inclusive
		SXGA	1280 x 1024 50Hz to 75Hz inclusive
	Group 6	UXGA	1600 x 1200 50Hz to (TBA)
RGB video level	0.7V - 1.0V		
RGB input impedance	75 Ohms		
Sync formats	<ol style="list-style-type: none"> <li>1. Separate H &amp; V sync at TTL levels.</li> <li>2. Composite -ve sync at TTL levels.</li> <li>3. Sync on green (an extra 0.3V -ve on the 0.7V 75 Ohm Green video signal)</li> </ol>		

## 2.1.3. SDI Input

Format: Serial video data in SMPTE 270Mb/s format  
 Input impedance: 75 ohms.

## 2.1.4. DVI Input

DVI input consists of three colours and a pixel clock connected via a 24-way DVI connector (SK6) of Molex 88741 series or similar. Signals, which are in LVDS form are input via 100-ohm differential lines using TMDS coding. Maximum pixel clock rate is 165MHz, so that the maximum transition rate on the colour signals may exceed 1.5GHz.

## 2.1.5. Component Video Input

This is input via 10-way connector PL7 and may be RGB+sync, YUV+sync, RGB with sync-on-green or YUV with sync-on-Y. The unit will automatically search first for 4-wire (separate sync), then for 3-wire (sync-on-green or sync-on-Y).

### Notes

1. The maximum refresh rate may be limited on certain VGA and SVGA panels.
2. A wide range of display adjustment is possible with the user controls, which makes the interface very tolerant of the incoming video standard. Any signal with any number of lines between 350 and the maximum displayable by the panel can be displayed, with frame rates from 50Hz to 75Hz. For convenience, the interface categorises the signal into groups as above, but wide deviations from the normal standards are allowable.

3. Input channels are automatically scanned in accordance with the selected priority setting. If more than one is active, the active one with highest priority is selected. The user interface can amend the priority setting.
4. The 75-ohm termination on the CVBS input can be removed to allow loop-through of the signal (LK1 – see table 16).

## 2.2. Output Signal Compatibility

2.2.1. Internally, the display interface processes data at a full eight bits per colour. On models for 18-bit panels the output stage is optimised to drive 6 bits per colour, and the two least significant bits for each of R,G,B are disabled. A resolution of eight bits per colour is provided for 24-bit panels. The logic levels are suitable for driving 3.3V or 5V panels. The output resolution is that of the panel irrespective of the input video signal format. As well as data, the interface generates all the necessary control signals to drive the panel. Power is fed to the panel at 3.3V or 5V levels. The interface is custom programmed during manufacture for the particular make and model of panel - contact Calibre for option availability. Certain large or high-resolution panels may require more power than is available from the on-board regulator. For these panels an external power regulator/controller is available as an optional extra.

2.2.2. In addition, the interface provides a control signal to effect backlight dimming via the Lamp Illumination user control. This has to be connected to the control input of the inverter used. Its format and action are determined by the build version of the panel to suit different manufacturers' products.

## 2.3. Power Requirements

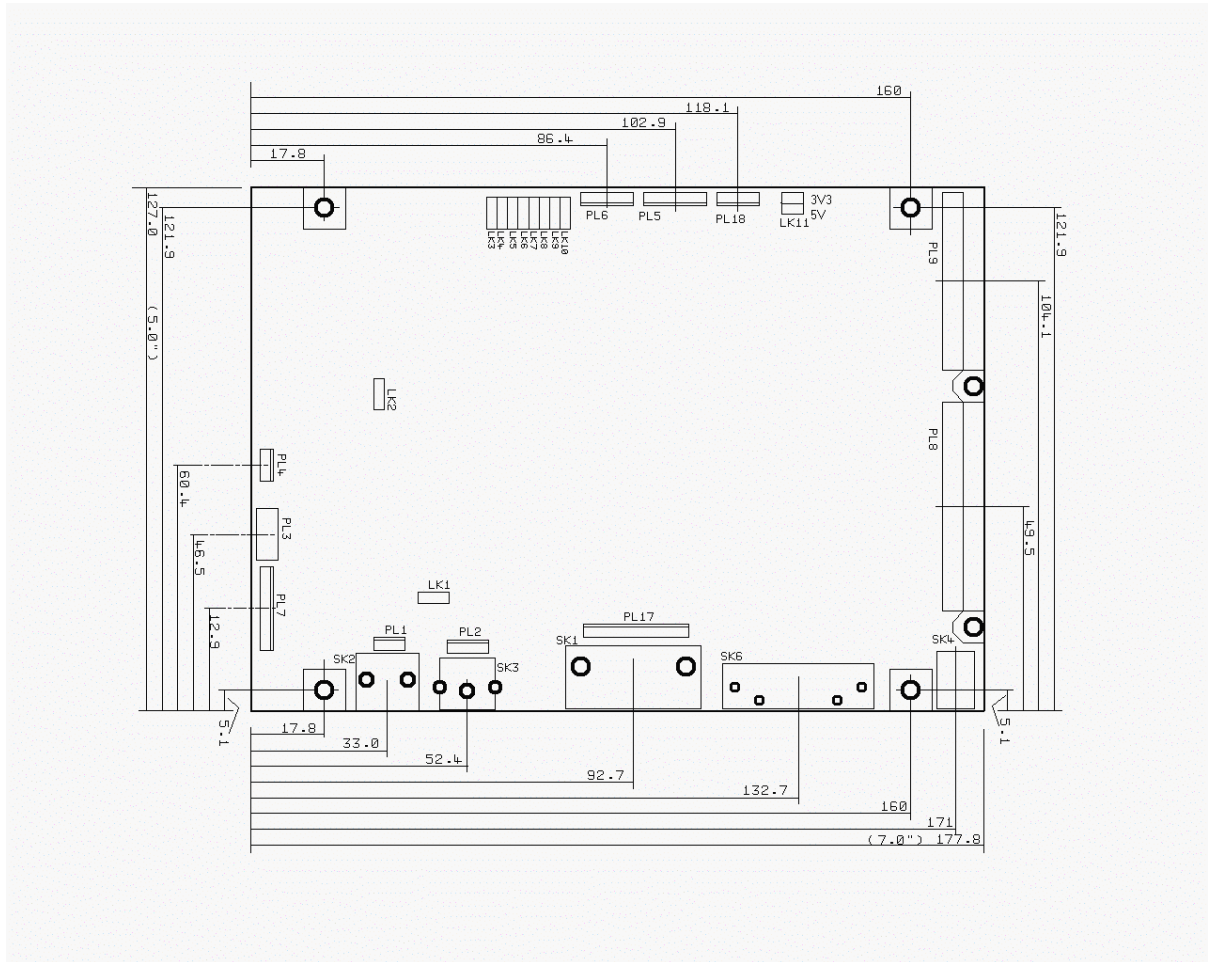
Input voltage	+12V DC nominal. Absolute maximum supply range 10-20VDC.
Current consumption	1 amp at 12V input typical, interface only (PLUS current consumption of display panel).

## Notes

1. **The current consumption given above does not include any current passed to the panel - this must be added to make an overall figure.**
2. **Most backlight inverters require a +12V supply at between 1A and 5A depending upon model used.**

## PHYSICAL SPECIFICATION

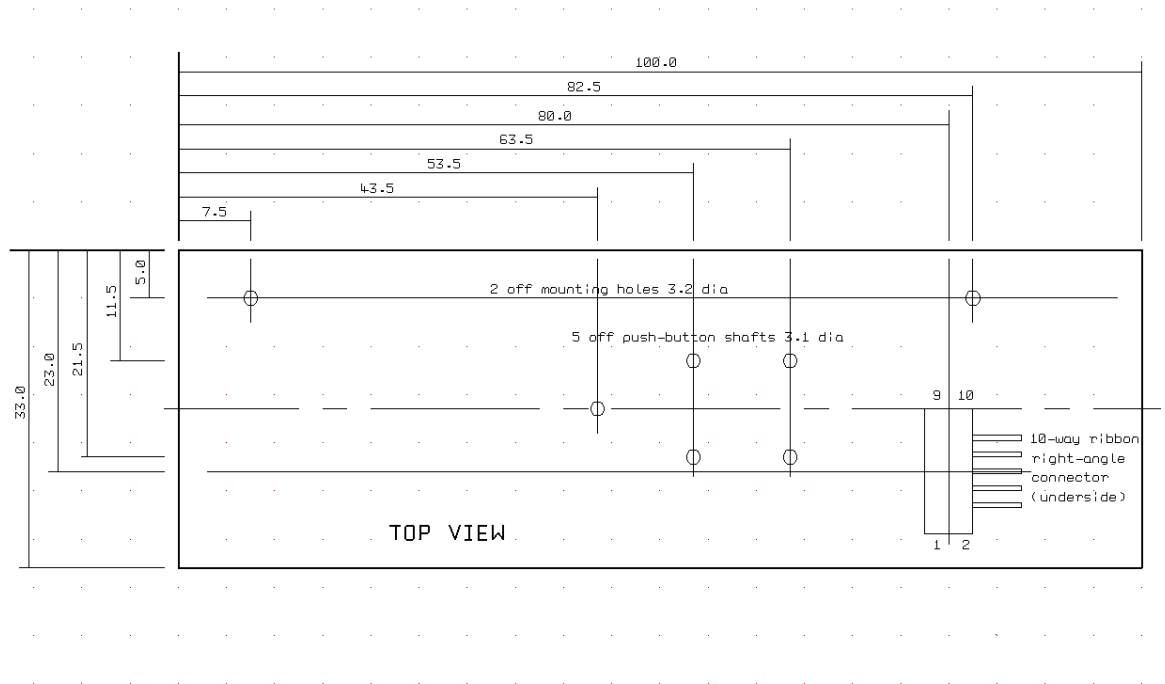
### 3.1. Interface panel



All dimensions are in mm unless otherwise stated.

## 3.2. User control Panel

User control panel dimensions are 100mm x 33mm x 15mm overall height



All dimensions are in mm



## INTERCONNECTION AND CONFIGURATION INFORMATION

### 4.1. Input Signal and Power Connection Details

#### 4.1.1. Computer Video Input - SK1 or PL17

Connector type - 15-way high density 'D' socket, mating type 15-way high density 'D' plug or via 10-way 0.1" male, mating type 10-way 0.1" female.

15 way Pin	10 way pin	Signal name	Function
1	1	RIN	Red Video Input
2	3	GIN	Green Video Input
3	5	BIN	Blue Video Input
4	2	N/C	
5	4	GND	
6		GND	Red Gnd
7	6	GND	Green Gnd
8		GND	Blue Gnd
9		+5V PNP	DDC +5V input
10	8	GND	Sync Gnd
11	10	N/C	
12		VGASDA	DDC data
13	7	HSIN	Horizontal/ Comp Sync In
14	9	VSIN	Vertical Sync Input
15		VGASCL	DDC clock

Table 2 Computer Input Connections

#### 4.1.2. CVBS (Composite) Video Input - SK2 or PL1

Connector type - BNC Socket, mating type BNC Plug or via 3-way 0.1" male, mating type 3-way 0.1" female

BNC Pin	3 way Pin	Signal name	Function
Inner	2	COMPIN	Composite (CVBS) Video I/P
Outer	1	GND	
	3	GND	

Table 3 CVBS Input Connections

#### 4.1.3. S-Video (Y/C) Video Input - SK3 or PL2

Connector type - 4-way mini DIN Socket, mating type 4 way mini DIN Plug or via 4-way 0.1" male, mating type 4-way 0.1" female

DIN Pin	4 way Pin	Signal name	Function
1	2	GND	
2	3	GND	
3	4	CHROMA IN	Chroma (C) Video Input
4	1	LUMA IN	Luma (Y) Video Input

Table 4 S-Video Input Connections

#### 4.1.4. SDI Video Input – PL4

Connector type - 3-way 0.1" male, mating type 3-way 0.1" female

3 way Pin	Signal name	Function
1	GND	
2	SDI IN	SDI Video I/P
3	GND	

Table 5 SDI Input Connections

#### 4.1.5. DVI Video Input – SK6

Connector type - 24-way special DVI socket, mating type 24 way DVI Plug eg. Molex 88741 series

DVI Pin	Signal name	Function
1	RED-	} Red video data...
2	RED+	}...balanced pair
3	GND	
4	N/C	
5	N/C	
6	SCLDVI	I2C clock line for DVI
7	SDADVI	I2C data line for DVI
8	VS	N/C
9	GRN-	} Green video data...
10	GRN+	}...balanced pair
11	GND	
12	N/C	
13	N/C	
14	+5V	+5V for DVI
15	GND	
16	HP	Hot-plugging control
17	BLU-	} Blue video data...
18	BLU+	}...balanced pair
19	GND	
20	N/C	
21	N/C	
22	GND	
23	CLK+	} Pixel clock...
24	CLK-	}...balanced pair

Table 6 DVI Input Connections

#### 4.1.6. Component Video Input – PL7

Connector type - 10-way 0.1" male, mating type 10-way 0.1" female.

Pin	Signal name	Function
1	REDIN	Red signal input
2	Gnd	Red signal ground
3	GRNIN	Green signal input
4	Gnd	Green signal ground
5	BLUIN	Blue signal input
6	Gnd	Blue signal ground
7	SYNCIN	Composite sync input
8	Gnd	Sync ground
9	IGP0	Factory test function (do not connect)
10	IGP1	Factory test function (do not connect)

Table 7 Component Video Input Connections

#### 4.1.7. Inverter Control Connector PL18

Connector type - 4-way 0.1" male, mating type 4-way 0.1" female.

Pin	Signal name	Function
1	INVENABLE	Backlight inverter enable
2	INVPWM	Backlight intensity control. PWM or analogue voltage (note 1).
3	+5V	Supply voltage
4	GND	

Table 8 Inverter Control Connections

#### 4.1.8. Power Input / Inverter Brightness Connector - PL5

Connector type - 6-way 0.1" male, mating type 6-way 0.1" female.

Pin	Signal name	Function
1	INVENABLE	Backlight Inverter enable (see note 3)
2	PWM/S+	Backlight Intensity Control (see note 1)
3	VIN	Power Input for Driver - see section 2.3 for details
4	VIN	Power Input for Driver - see section 2.3 for details
5	GND	
6	GND	

Table 9 Power Supply Connections

#### 4.1.9. Power Input Connector SK4

Connector type – 2.5mm coaxial power jack. Mating connector – 2.5mm i/d, 5mm o/d socket

Pin	Signal name	Function
Centre	VIN	Power Input for Driver - see section 2.3 for details
Outer	Gnd	Gnd
Break	N/C	

Table 10 Power Input Connections

4.1.10. External Panel PSU Connector PL6 (optional; see note 4 below).

Connector type - 5-way 0.1" male, mating type 5-way 0.1" female.

Pin	Signal name	Function
1	+V	Power supply to external PSU
2	+VPAN	Panel power supply from external PSU (monitoring only)
3	NPANPWR	Logic output (active-lo) to enable external panel-power supply.
4	GND	
5	GND	

Table 11 External Panel PSU Connections

**Notes**

1. Most inverters require only one connection to control the backlight brightness. Pin 2 (PWM) should be connected to the "dimming" pin on the inverter. Depending on the inverter used, this may be a control voltage or PWM signal. Its format and action depend on the build version of the interface.
2. It is possible to invert the PWM control signal so that decreasing the control voltage or PWM ratio increases the brightness. (LK5 – table 16 refers)
3. INVENABLE (PL5 and 18) Inverter enable: +5V = On, 0V = Off.
4. Some panels consume more current than the main unit can supply. For these panels, an external supply unit can be connected via PL6 (see table 11 above). When this option is used, remove the jumper link from LK11 and apply VPAN directly from the external PSU.

4.1.11. Keypad Connector PL3

Pin	Signal name	Function
1	Gnd	
2	Gnd	
3	+12V	Power rail, do not connect
4	N/C	
5	Menu	Invokes OSD, thereafter takes user down one menu level
6	N/C	
7	Con-	Contrast decrease, also decrement value in current selection
8	Con+	Contrast increase, also increment value in current selection
9	Br+	Brightness increase, also increment value in current selection
10	Br-	Brightness decrease, also decrement value in current selection

Table 12 Keypad Connector

4.2. Display Panel Connection Details

**Warning**

**Before wiring up to the panel, read the section on EMC Compliance and check the setting of LK11 (Display Power Voltage).**

4.2.1. 18/24-bit Digital Video Interconnect to Display – PL8

Connector type – 2 x 20 0.1” pin DIL header. If only 6 bits per colour are required (standard option) then a 2 x 17 header may be fitted instead.

Pin	Signal name	Function
1	GND	GND
2	DCLK	Display Clock
3	GND	
4	DHS	Display Horizontal Sync
5	DVS	Display Vertical Sync
6	DCLK	Display Clock
7	DEN	Display Data Enable
8	GND	
9	+VPAN	Display Power Supply } (5V or 3.3V, depending on panel...
10	+VPAN	Display Power Supply } ...type, and selected by LK11)
11	AR7	Red Data A Bit 7 (MSB)
12	AR6	Red Data A Bit 6
13	AR5	Red Data A Bit 5
14	GND	
15	AR4	Red Data A Bit 4
16	AR3	Red Data A Bit 3
17	AR2	Red Data A Bit 2
18	GND	
19	AG7	Green Data A Bit 7 (MSB)
20	AG6	Green Data A Bit 6
21	AG5	Green Data A Bit 5
22	GND	
23	AG4	Green Data A Bit 4
24	AG3	Green Data A Bit 3
25	AG2	Green Data A Bit 2
26	GND	
27	AB7	Blue Data A Bit 7 (MSB)
28	AB6	Blue Data A Bit 6
29	AB5	Blue Data A Bit 5
30	GND	
31	AB4	Blue Data A Bit 4
32	AB3	Blue Data A Bit 3
33	AB2	Blue Data A Bit 2
34	GND	
35	AR1	Red Data A Bit 1
36	AR0	Red Data A Bit 0 (LSB)
37	AG1	Green Data A Bit 1
38	AG0	Green Data A Bit 0 (LSB)
39	AB1	Blue Data A Bit 1
40	AB0	Blue Data A Bit 0 (LSB)

Table 13 18/24-bit Digital Video Interconnect to Display

#### 4.2.2. 18/24-bit Digital Video Interconnect to panel – PL9

Connector type – 2 x 17 0.1” pin DIL header. If only 6 bits per colour required (standard option) then a 2 x 15 header may be fitted instead. This connector is not normally required for VGA or SVGA panels.

Pin	Signal name	Function
1	GND	
2	DCLK	Display Clock
3	GND	
4	BR7	Red Data B Bit 7 (MSB)
5	BR6	Red Data B Bit 6
6	BR5	Red Data B Bit 5
7	GND	
8	BR4	Red Data B Bit 4
9	BR3	Red Data B Bit 3
10	BR2	Red Data B Bit 2
11	GND	
12	BG7	Green Data B Bit 7 (MSB)
13	BG6	Green Data B Bit 6
14	BG5	Green Data B Bit 5
15	GND	
16	BG4	Green Data B Bit 4
17	BG3	Green Data B Bit 3
18	BG2	Green Data B Bit 2
19	GND	
20	BB7	Blue Data B Bit 7 (MSB)
21	BB6	Blue Data B Bit 6
22	BB5	Blue Data B Bit 5
23	GND	GND
24	BB4	Blue Data B Bit 4
25	BB3	Blue Data B Bit 3
26	BB2	Blue Data B Bit 2
27	GND	
28	BR1	Red Data B Bit 1
29	BR0	Red Data B Bit 0 (LSB)
30	BG1	Green Data B Bit 1
31	BG0	Green Data B Bit 0 (LSB)
32	BB1	Blue Data B Bit 1
33	BB0	Blue Data B Bit 0 (LSB)
34	GND	

Table 14 18/24-bit Digital Video Interconnect to panel

#### 4.2.3. LVDS adapter output connections

Where the LCD interconnect is via LVDS a daughter board is normally supplied. The LVDS daughter board is designed to make connection to the LCD as simple as possible. For details of the LVDS connections, please contact a sales representative at [sales@calibreuk.com](mailto:sales@calibreuk.com), quoting the LVDS daughter board model number. Calibre UK Ltd recommend using proper LVDS cable for all LVDS interconnects.

**Notes**

- 1) Virtually all XGA and SXGA digital input display panels have a dual port interface in order to keep the data transfer rate (dot clock) down to a reasonable level. In this system two pixels of data are presented simultaneously to the panel, one via PL8 and the other via PL9. Both pixels are then clocked in together using DCLK. The standard programming of the XGA or SXGA Driver assumes this dual port arrangement, although it is possible to program the driver to use just PL8 at the full data transfer rate.
- 2) The driver generates either six or eight bits of data for each of red, green and blue making a total of 18 or 24 signals. Most panels have six bits per colour, in which case the two least significant bits from the driver should be left disconnected. For a four bit panel, the four least significant bits from the driver should be left disconnected. For example, connecting up to a six bit panel (repeat for PL8 green and blue, and for PL9 red, green and blue), follow the table below:

Driver Signal	Display Signal
AR0 (LSB)	No Connection
AR1	No Connection
AR2	AR0 (LSB)
AR3	AR1
AR4	AR2
AR5	AR3
AR6	AR4
AR7 (MSB)	AR5 (MSB)

Table 15 Signal Connections

4.3. Option Link Settings

Link	Function
LK1	CVBS termination on/off. ON is left (ie. towards PL7)
LK2	Equalisation for SDI input cable length – see note below
LK3	Narrow } Setting the aspect ratio...
LK4	Tall } ...for wide-screen display
LK5	Brightness PWM polarity invert
LK6-10	Functions are factory set – no user adjustment
LK11	Power output to display panel, 5V or 3.3V

Table 16 Option Links

**Notes:**

- 1) The SDI input receiver device (IC3) incorporates equalisation to compensate for long input co-axial cables (up to 100 metres). This function should be disabled if the input cable is less than 10 metres in length. If LK2 is set to the position next to R27 the equalisation function is disabled; the other position enables the function. **This link must not be left disconnected.**
- 2) LK3-10: Active position is “Down”, i.e. Away from the board edge.

## OPERATION

### 5.1. Normal Operation

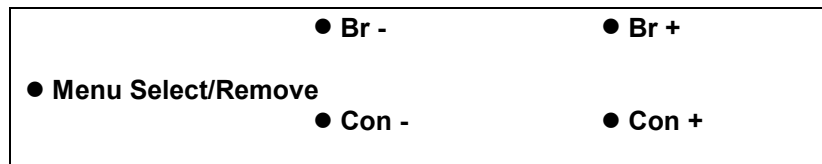
Normal operation of the interface consists of little more than connecting up the power supply, video and computer signals and switching on. Signals are scanned in accordance with the currently selected priority list and the highest priority valid signal is displayed. If the priority or any other picture parameter needs adjustment then the following section describes the user interface.

	VIDEO	GRAPHICS
Brightness	Controls backlight intensity	
Contrast	Controls video gain	
Geometry	Image edge adjust (size and position), Moire correction, aspect ratio. For SXGA, choice of Full scan, overscan or letter-box aspect ratios.	Image edge adjust (size and position), Moire correction, clock (tune), phase (sharpness)
Input Select	RGB, DVI, CVBS, Y/C, Component Video	
Colour	Colour, contrast, black level, hue (NTSC only), gamma correction	Contrast, black level, R+G+B gains, R+G+B levels, gamma correction
System	ESC, Save, Reset, OSD timeout, OSD X/Y position, Auto Centering	
Auto Setup	Not applicable	Yes/No (analogue graphics only)
Miscellaneous	Image flip vertical (if frame-store installed), image flip horizontal	

Table 17: Function-dependent Menu Options.

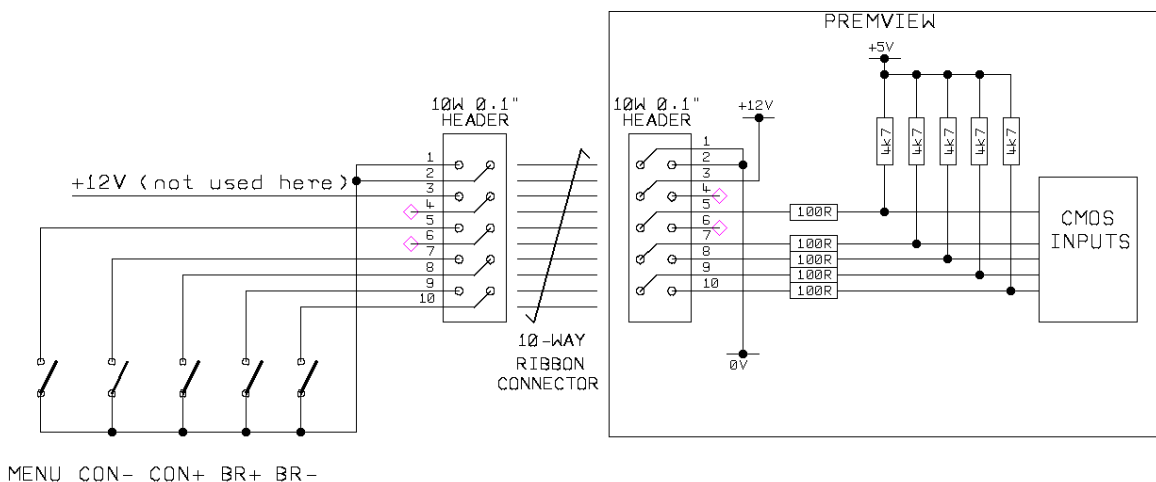
#### 5.1.1. User Interface Buttons

The physical user control panel consists of five push buttons. One of these is dedicated to invoking the OSD Menu while the other four are dual purpose.



## 5.1.2. Keypad Schematic

The OSD keypad can be supplied as an option, but in case users wish to design their own OSD controller, the schematic for the supplied keypad is shown below.



## 5.2. User Controls.

### 5.2.1. Direct Brightness Adjustment

Pressing the Br+ or BR- button controls the intensity of the backlight, assuming the backlight inverter has been correctly wired through to the interface panel. After adjustment, the new Brightness value is displayed on the screen until the OSD timeout period expires (see para. 5.5.3). The new setting is then stored and the display returns to normal.

### 5.2.2. Direct Contrast Adjustment

Pressing the Con+ or Con- button controls the contrast (video gain) of the picture. After adjustment, the new contrast value is displayed on the screen until the OSD timeout period expires. The new setting is then stored and the display returns to normal.

### 5.2.3. Menu Select

Pressing this button displays picture identification information together with a menu of icons. To access lower-level functions, press Con+, Con-, Br+ or Br- to toggle through the menus available for the currently displayed signal type, then press MENU again to select that function. The MENU button has a similar function to the ENTER key on a computer keyboard. Exit from a menu is by selecting BACK which returns to the previous level. If the controls are not touched for a period determined by OSD TIMEOUT in the SYSTEM menu, the on-screen display is cancelled. At this point, any changes made are saved. To discard changes, select "ESC" in the System menu. Note that Con+ and Br+ have identical functions in this mode, as have Con- and Br-.

## 5.3. OSD Menu

At the top of the menu is a line which identifies the type of signal currently displayed. For computer signals the same section displays the signal resolution, together with horizontal and vertical frequencies. If its setup has been saved, the user number of that signal is also displayed. These figures are for guidance only.

### 5.3.1. Brightness and Contrast

These perform the same functions as the direct button operations in para. 5.2.1 and 5.2.2 above.

### 5.3.2. The Geometry Menu

Geometry adjustments can be made for all types of input individually, so that if the input type changes, the geometry adjustment will change with it. Saved settings include one each for PAL, NTSC, SECAM, SDI and component video.

Additionally, a total of 25 settings may be stored for analogue graphics (RGB and DVI). If this graphics table is full, further stored settings will over-write the earliest so that the settings complement contains the latest 25.

- 1) Edge Adjustment – Picture Size and Position Controls. The four “Edge” controls shift each edge within available limits. Note that the maximum available shift depends on the incoming video standard and the display panel type, and may be restricted vertically. This provides very flexible and easy to use image size and position control.
- 2) Moire correction The user can choose from one of four correction tables.
- 3) Clock (Graphics and Analogue only). This sets the total number of input pixels per line to correspond with the input source, and will normally require adjustment only for unusual signals.
- 4) Phase (Graphics only) This adjusts the internal clock to sample each pixel as near as possible to the centre. Note that the maximum available shift depends on the incoming video standard and the display panel type. It will normally require adjustment for unusual types of signal.
- 5) Aspect Ratio (Video signals only for SXGA panels) This allows a user to select the displayed aspect ratio where the signal input is at variance with the display panel's natural aspect ratio. The format may be adjusted to either “Letter Box” (4:3 LB) or “Overscan” (4:3 OS). “Letter Box” effectively adjusts the height of the displayed image and “Overscan” effectively adjusts the width to achieve the desired 4:3 aspect ratio.

### 5.3.3. Input Select

This allows the user to configure the preferred input selections. If a facility is not fitted, it will be displayed but not selectable. By pressing the Br+/Con+ and Br-/Con- keys, the following choices can be made:

- 1) Signal type priority: Video-graphics or Graphics-video
- 2) Video priority search order –
  - CVBS – Y/C – SDI – Component
  - Y/C – CVBS – SDI – Component
  - SDI – Component – CVBS – Y/C
  - Component – SDI – CVBS – Y/C
- 3) Graphics search – RGB-DVI or DVI-RGB
- 4) Component video type – RGB or YUV. Incorrect colours may be due to wrong selection here.

### 5.3.4. The Colour Menu

- 1) Video Inputs - The contrast (video gain) and brightness (black level) parameters, also colour saturation for PAL, NTSC and SECAM inputs can be accessed from this menu. For NTSC signals, there is an additional HUE option.
- 2) Computer Inputs – Individual Colour Adjustments - Colour level adjustment is particularly useful for reducing noise when a four-bit rather than six or eight bit panel is being used. A grey scale is a suitable test picture if available. If not, use a screen which has as many different colours and shades of grey as possible.

Red, green and blue levels can be thought of as individual brightness controls for each of red, green and blue. They should be adjusted for the desired colour balance and to minimise noise on low intensity colours and greys. Colour tints can be added as required, but the primary function of the feature is to help disguise quantisation errors on panels of less than eight bits per colour.

Gains can be thought of as individual contrast controls for each of red, green and blue. They should be adjusted for the desired colour balance and lack of noise on high intensity colours and whites. For example, a block of white can be changed to a blue-tinge (clean) white or to a red-tinge (warm) white.

### 5.3.5. The System Menu

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

- 1) Esc: The Esc option returns to the last saved setup. It is useful if an adjustment has been made in error. After an Esc the menu is removed.
- 2) Save: The Save option saves all the user adjustments for the displayed signal type. The new adjustments are stored in non-volatile memory and so are still valid when powered down. After a Save the menu is removed.
- 3) Reset: There are two types of Reset option:

Simultaneously pressing all four buttons Br+, Br-, Con+, Con- restores to factory default state all the user adjustments for the signal currently being displayed. This is useful if a picture set-up has become hopelessly lost or confused. The Reset option can also be accessed even if the OSD has been lost. After a Reset the menu is removed.

If the user wishes to restore all settings to their factory defaults, this can be done by pressing MENU and BR+ buttons simultaneously while the unit is being powered up. The facility should be used only after due consideration that **all user setups will be lost, being over-written by the factory default settings.** The process may take up to 20 seconds to complete.

- 4) OSD Timeout: This selection enables the user to control the time after which the OSD display is cancelled. It can be adjusted in 15-sec increments from 1 (=15 sec) to 4 (=1 min) approximately.
- 5) OSD X and OSD Y: These functions control the position of the OSD display on the screen. Its default setting is such as to place the OSD in the centre of the screen, but the user can adjust its position with these functions.
- 6) Auto Centering: This is simply a Yes/No selection. If an input signal changes, it is first measured and compared with stored selections. If its parameters are already stored, they are installed. If they are not stored, the "Auto Centering" selection is checked and if set to "No" the best fit is displayed. The user can then centre the picture using OSD auto setup. If Auto Centering is set to "Yes", centering is performed automatically, which may take more than 15 seconds. This could cause a problem if using Windows, wherein a resolution change is displayed only for 15 seconds and reverts to its previous selection if no acknowledgement is entered. For this reason, the default state is "No".
- 7) Computer / AV Mode: This option is only available on units fitted with the professional decoder and is valid when the input is RGB(S) connected via the component input port or an interlace graphics signal is connected via the analog computer input port. Computer Mode should be selected when the input comes from a computer generated source, this option provides reduced flicker for predominantly static data. AV Mode should be selected when the input comes from any source which contains moving images as it provides a smoother output.

#### 5.3.6. The Miscellaneous Menu

This selection offers several options the availability of these functions is dependant on the particular build configuration and the signal input.

- 1) Image flip Horizontal: This is available on the majority of options and allows the user to flip the output image horizontally.
- 2) Image Flip Vertical: This can only be used if the Frame Store option is fitted and the input signal resolution is either video or computer graphics (SVGA or lower).
- 3) Text Enhanced / Normal: This text enhancement option can improve the appearance of fine text from a computer generated analog input signal. Please note this function will only be effective if the signal resolution is close to the resolution of the panel, no harm will be done to the unit by trying the enhanced and normal text options for other input resolutions.

## REGULATORY APPROVALS

### 6.1. EMC Approvals

Whilst the interface sold as a component and as such compliance to EN89/336/EEC is not mandatory, it is appreciated that many customers will be using the interface as part of a system which will have to be CE marked. The interface has been carefully designed to maximise its EMC performance in terms of both emissions and susceptibility. When correctly installed and interfaced to a compliant display panel, conformance to EN55022 part A is achievable. System integration should be done by an EMC competent person, following the advice in the next section.

### 6.2. EMC Installation Guidelines

If you are unsure about your ability to design with EMC in mind then please ASK US FOR ADVICE NOW - EMC compliance is much easier to design in than to retrofit.

The multi-way cables between the interface and the display panel carry high speed digital signals and as such are potentially major EMC emitters. Keep these as short as possible and make sure there is a substantial earth between the interface and display panel. If the final assembly is to be housed in a plastic rather than metal enclosure this is doubly important and the use of screened cables should be considered.

If a plastic case is being used consider the use of either internal metal-spraying or a tinfoil screening can to cover the interconnect to the display panel.

Make sure there is a substantial GND connection between the interface and the chassis plate (the mounting screws do well) and the chassis plate and the display panel.

Keep any signal leads to the outside world (such as the CVBS, Computer input and power supply wires) as short as possible and DO NOT bundle or tie-wrap them to each other or any other wires carrying digital signals. It may be beneficial to put ferrite snubber rings or cylinders around the wires of digital panel interconnects.



## ENVIRONMENTAL AND SAFETY

### 7.1. Operating

Temperature 0°C to 50°C

Humidity (non condensing) 0% to 95%

### 7.2. Storage

Temperature -25°C to 85°C

Humidity (non condensing) 0% to 95%

### 7.3. Safety Issues

The display interface and keyboard are low voltage devices which do not generate any hazardous voltages. However, when designing an installation, bear the following points in mind:

Any mains operated power supply should comply with safety and EMC legislation in the country of operation. Any mains wiring should comply with the safety standards applicable in the country of operation.

The backlight inverter in most display panels generates potentially lethal voltages. Ensure that the installation offers adequate protection to the operator from this hazard.



## ABBREVIATIONS

This section expands abbreviations peculiar to video applications which may be used in this manual. Signal-name mnemonics are not included.

<b>CVBS</b>	Composite Video Baseband Signal (alternatively Chroma, Video, Blanking and Sync)
<b>DDC</b>	Data Display Channel
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended display identification data
<b>LVDS</b>	Low-voltage differential signalling
<b>NTSC</b>	National Television Systems Committee (USA, Canada, Japan TV standard)
<b>PAL</b>	Phase Alternating Line
<b>RGB</b>	Red, Green, Blue analogue video
<b>SDI</b>	Serial Digital Interface
<b>SECAM</b>	Systeme Electronique Couleur Avec Memoire - TV broadcast standard used in France, Middle East and most of Eastern Europe.
<b>SMPTE</b>	Society of Motion Picture Television Engineers
<b>SOG</b>	Sync on Green
<b>SVGA</b>	Super VGA – 800x600 pixels
<b>SXGA</b>	Super XGA – 1280x1024 pixels
<b>TMD5</b>	Transition-minimised differential signalling
<b>UXGA</b>	Ultra XGA – 1600x1200 pixels
<b>VGA</b>	Video graphics array – 640x480 pixels
<b>XGA</b>	Extended graphics array – 1024x768 pixels
<b>Y/C</b>	Luminance (Y) and Chrominance (C), also called S-video

### **IMPORTANT NOTES**

1. PLEASE CONFIRM WITH CALIBRE THAT THE INTERFACE AND INTERCONNECT ARE SUITABLE FOR THE PANEL YOU INTEND TO USE. IN GENERAL MOST MANUFACTURERS ARE CONSISTENT WITH PINOUTS ETC. ACROSS THEIR RANGE BUT THIS IS NOT ALWAYS THE CASE.
2. THE INTERFACE IS SPECIALLY CONFIGURED FOR USE WITH SPECIFIC MANUFACTURERS PANELS. THIS IS DUE TO THE VARIOUS DIFFERENCES IN CONTROL SIGNALS, TIMING PARAMETERS AND INVERTER CONTROL CONNECTIONS. CALIBRE UK LTD ACCEPT NO RESPONSIBILITY FOR INCORRECTLY MATCHED INTERFACES AND PANELS IF CALIBRE UK LTD ARE NOT NOTIFIED IN ADVANCE OF THE INTENDED USE. IF IN DOUBT - CHECK!
3. CALIBRE UK LTD ACCEPT NO LIABILITY FOR DAMAGE TO DISPLAY PANELS DUE TO INCORRECT CONNECTION WHEN THE CUSTOMER USES AN INTERCONNECTION CABLE OF HIS OWN, OR A THIRD PARTY'S, DESIGN.
4. THE INTERFACE IS SELECTABLE VIA LK11 TO DRIVE 5V OR 3.3V DISPLAY PANELS. CALIBRE UK LTD ACCEPT NO LIABILITY FOR DAMAGE TO 3.3V POWERED DISPLAY PANELS IF LK11 IS INCORRECTLY SET.