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## PC, DVI, HDMI, VIDEO INTERFACE CONTROLLER FOR TFT PANEL

**Model: SVX-1920v2**

Part number : 41744022X-3 or up

### INSTRUCTIONS

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**It is essential that these instructions are read and understood before connecting or powering up this controller.**

## Introduction

Designed for LCD monitor and other flat panel display applications, the SVX-1920v2 is a feature rich interface controller for :

- TFT (active matrix) LCD panels of 1920x1200, 1920x1080, 1920x480, 1680x1050, 1600x1200, 1600x900, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768 1024x768, 1024x600, 800x600, 800x480 and 640x480 resolutions.
- Computer video signals of VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA standard.
- Support true 10 bits panel
- Support image flip function
- Support HDMI, DVI, VGA, Component Video input

### Ordering information :

Controller	Part number	Ordering part number
SVX-1920v2	P/N 41744022X-3	P/N 4174402XX-3

### HOW TO PROCEED

- Ensure you have all parts & that they are correct, refer to:
  - Connection diagram

#### Controller Solution Generator

Full web resource matching controllers & panels with **connection diagrams** for download.  
See at : <http://www.digitalview.com/csg>

- Connector reference (in following section)
- Assembly notes
- Check controller switch & jumper settings (errors may damage the panel)
- Prepare the PC
- Connect the parts
- Understand the operation & functions

### IMPORTANT USAGE NOTE

This equipment is for use by developers and integrators, the manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other user of this product to:

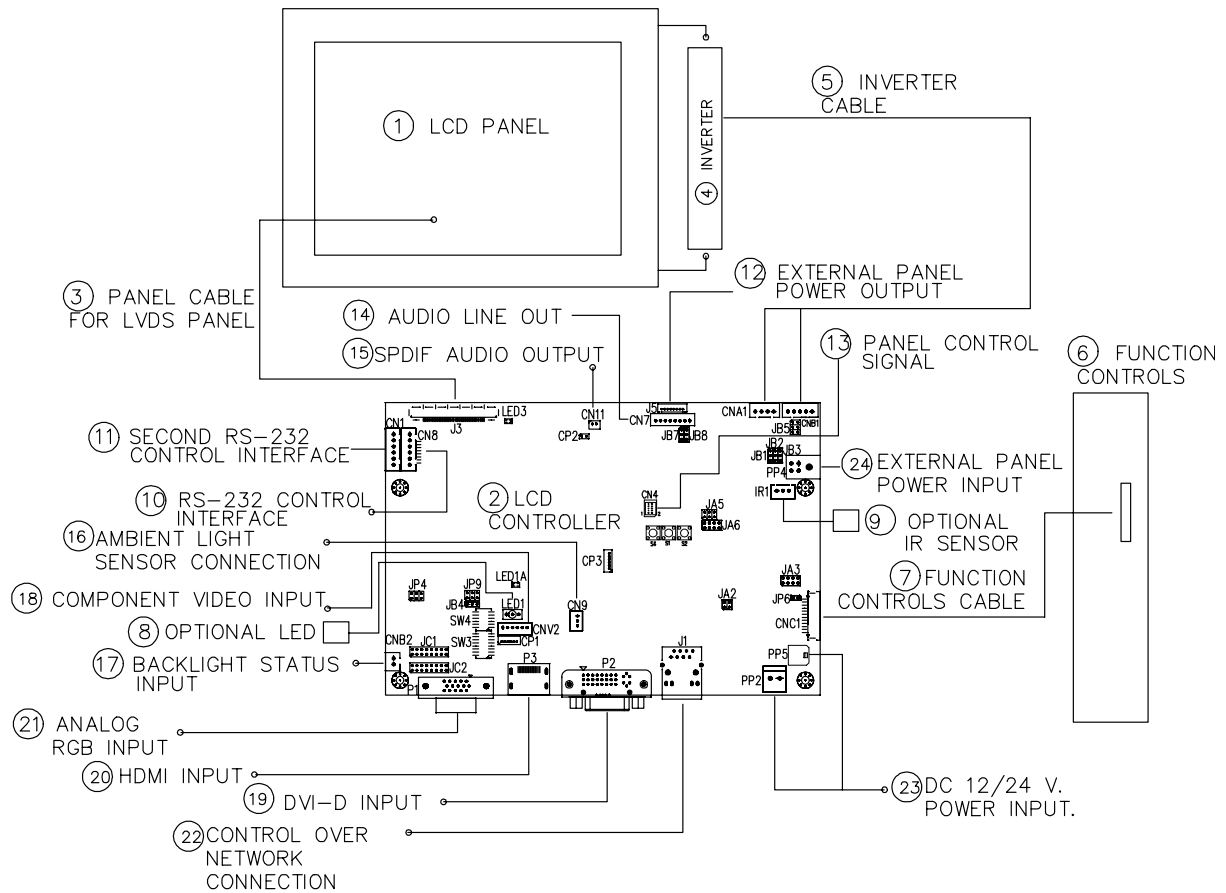
- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- **Check power settings to all component parts before connection.**

### DISCLAIMER

There is no implied or expressed warranty regarding this material.

## SYSTEM DESIGN

A typical LCD based display system utilizing this controller is likely to comprise the following:



### Summary:

1. LCD panel
2. LCD controller card, SVX-1920v2
3. LCD signal cable (use for LVDS panel)
4. Inverter for backlight (if not built into LCD)
5. Inverter cable
6. Function controls
7. Function controls cable
8. Status LED (optional)
9. IR sensor (optional)
10. RS-232 control interface
11. Second RS-232 control interface
12. External panel power output
13. Panel control signal
14. Audio line out
15. SPDIF Audio output
16. Ambient light sensor connection
17. Backlight status input
18. HD/SD Component video input
19. DVI-D input
20. HDMI input
21. Analog RGB input
22. Control over network connection
23. +12V / +24V DC power input
24. External panel power input

Digital View provides a range of parts, such as listed above, to make up complete display solutions.

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## ASSEMBLY NOTES

This controller is designed for monitor and custom display projects using 1920x1200 or 1920x1080 or 1600x1200 or 1680x1050 or 1440x900 or 1366x768 or 1280 x 1024 or 1024 x 768 or 800x600 or 640x480 resolution TFT panels with a VGA, SVGA, WXGA, XGA, SXGA, UXGA or WUXGA signal input. The following provides some guidelines for installation and preparation of a finished display solution.

**Preparation:** Before proceeding it is important to familiarize yourself with the parts making up the system and the various connectors, mounting holes and general layout of the controller. As much as possible connectors have been labeled. Guides to connectors and mounting holes are shown in the following relevant sections.

1. **LCD Panel:** This controller is designed for typical LVDS interfaced panels with panel voltage 3.3V, 5V, 12V or 18V, External for 12V~18V interface. Due to the variation between manufacturers of panels signal timing and other panel characteristics, factory setup and confirmation should be obtained before connecting to a panel. **(NOTE: Check panel power jumper settings before connection)**
2. **Controller:** Handle the controller with care as static charge may damage electronic components. Make sure correct jumper and dip switches settings to match the target LCD panel.
3. **LCD signal cable (LVDS panel):** In order to provide a clean signal it is recommended that LVDS signal cables are no longer than 46cm (18 inches). If those wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when placing the cables to avoid signal interference. Additionally it may be necessary in some systems to add ferrite cores to the cable to minimize signal noise.
4. **Inverter:** This will be required for the backlight of an LCD, some LCD panels have an inverter built in. As LCD panels may have 1 or more backlight tubes and the power requirements for different panel backlights may vary it is important to match the inverter in order to obtain optimum performance. See Application notes page 20 for more information on connection.
5. **Inverter Cables:** Different inverter models require different cables and different pin assignment. Make sure correct cable pin out to match inverter. Using wrong cable pin out may damage the inverter.
6. **Function Controls:** The following section discusses the controls required and the section on connectors provides the detail. The controls are minimal: On/Off, Backlight Brightness (depends on inverter), OSD (5 momentary buttons) analog VR type or (8 momentary buttons) digital type.  
The 8 momentary buttons OSD switch mount P/N 416100520-3 or OSD membrane interface P/N 416100120-3 must be used when 24VDC input.
7. **Function controls cable:** The cables to the function switches should be of suitable quality and length so that impedance does not affect performance. Generally lengths up to 1 meter (3 feet) should be acceptable.
8. **Status LED:** The pin direction of the LED should be corrected for right color indication. Red color stands for standby. Green colors stands for signal on. The status LED is an optional part only, can be unconnected.
9. **IR sensor:** It is an optional part only, can be unconnected if not using IR remote control. See Appendix IV in details.
10. **RS-232 control interface :** Firmware upgrade and serial control via this interface port.
11. **Second RS-232 control interface :** This interface port is no function now.
12. **External panel power output :** User for specific panel model.
13. **Panel control signal :** Use for specific panel model.
14. **Audio line out :** This interface port is no function now.
15. **SPDIF Audio output :** This port support SPDIF audio output from the HDMI audio source inputted.
16. **Ambient light sensor connection :** 3 ways connector provides interface for ambient light sensor connection by using Kit 70220-3.
17. **Backlight status input :** 2 ways connector provides interface for connection with the specific panel type which support the panel with backlight status monitoring function.
18. **HD / SD Component video input :** Plug the component video input cable P/N 426000600-3 on CNV2 connector
19. **DVI-D input cable :** Plug the DVI cable to the connector P3 on the controller board.
20. **HDMI input :** Plug the HDMI cable to the connector P2 on the controller board. This port is not supported when CN5 is connected.
21. **Analog RGB Input :** As this may affect regulatory emission test results and the quality of the signal to the controller a suitably shielded cable should be utilized.
22. **Control over network connection :** This is a network device that allow to control RS-232 enable devices over a TCP/IP based Ethernet and the Internet using a web browser. Please refer to Appendix VII in details.

Specifications subject to change without notice

**23. Power Input:** 12V/24VDC is required, this should be a regulated supply. The power rating is depending on the panel and inverter used. Normally, power supply with 3.5Amp current output should be enough for most of 4x CCFT panels. Although the controller provides power regulation for the LCD power this does not relate to the power supplied to the backlight inverter. If an unregulated power supply is provided to an inverter any fluctuations in power may affect operation, performance and lifetime of the inverter and or backlight tubes.

**24. External panel power input :** Allow to supply external power to the panel separately for max 3.3V (7A) or 5V (7A) or 12V (5A) or 18V (3.5A) via PP4 power input connector. Corresponding jumper setting of JA3, JA5 & JA6 are required for each panel power input by referring to page 14.

- **Power output:** Note the controller has an overall 3Amp current limit and the current available from the auxiliary power output will be dependent on the power input and other system requirements.
- **Power Safety:** Note that although only 12V / 24VDC is required as 'power-in' a backlight inverter for panel backlighting produces significantly higher voltages (the inverter does not connect to the ground plane). We strongly advise appropriate insulation for all circuitry.
- **EMI:** Shielding will be required for passing certain regulatory emissions tests. Also the choice of external Controller to PC signal cable can affect the result.
- **Ground:** The various PCB mounting holes are connected to the ground plane.
- **Servicing:** The board is not user serviceable or repairable. Warranty does not cover user error in connecting up to the controller and is invalidated by unauthorized modification or repairs.
- **Controller Mounting:** It is recommended that a clearance of at least 10mm is provided above and 5mm below the controller when mounted. Additionally consideration should be given to:
  - Electrical insulation.
  - Grounding.
  - EMI shielding.
  - Cable management. Note: It is important to keep panel signal cables apart from the inverter & backlight cables to prevent signal interference.
  - Heat & Ventilation: Heat generated from other sources, for example the backlight of a very high brightness panel may generate significant heat which could adversely affect the controller.
  - Other issues that may affect safety or performance.
- **PC Graphics Output:** A few guidelines:
  - Signal quality is very important, if there is noise or instability in the PC graphics output this may result in visible noise on the display.
  - Refer to graphics modes table in specifications section for supported modes.
  - Non-interlaced & interlaced video input is acceptable.

**IMPORTANT: Please read the Application Notes section for more information.**

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## CONNECTION & OPERATION

**CAUTION:** Never connect or disconnect parts of the display system when the system is powered up as this may cause serious damage.

### CONNECTION

Connection and usage is quite straight forward (it is useful to have the relevant connection diagram available at this time):

1. **LCD panel & Inverter:** Connect the inverter (if it is not built-in the panel) to the CCFT lead connector of the LCD panel.
2. **LVDS type panels:** The controller board has the built-in LVDS transmitter driver. Plug the LVDS cable to J3. Insert the panel end of the cable the LCD panel connector.
3. **Inverter & Controller:** Plug the inverter cable to CNB1 and CNA1 (if necessary). Plug another end to the connector on the inverter.
4. **Function switch & Controller:** Plug the OSD switch mount cable to CNC1 on the controller board and another to the OSD switch mount.
5. **LED & Controller:** Plug in a 3-way with dual color LED to connector LED1 on the controller board.
6. **IR & Controller:** Plug in a 3-way with IR sensor to connector IR1 on the controller board.
7. **Jumpers & Switches:** Check all jumpers and switches (SW3, SW4) are set correctly. Details referring the connection diagram (a separate document) or the jumpers and switches setting table (in the following section).
8. **Jumpers & Inverter & Panel voltage:** Particularly pay attention to the settings of JA3, JA5, JA6, JB2 and JB3. JB2 & JB3 are used for inverter control (read inverter specification and information on the jumper table to define the correct settings). JA3 & JA5 & JA6 is used for panel voltage input (read panel specification and information on the jumper table to define the correct settings).
9. **Input signal cable & Controller:** Plug the corresponding signal input to the connector on the controller board.
10. **Power supply & Controller:** Plug the DC 12V/24V power in to the connector PP5 or PP2. You can consider to use DigitalView mating power cable P/N 426013800-3, 160mm for PP5 connection.
11. **External panel power input :** Plug power cable : P/N 426013700-3 for external panel power input (3.3 (max 7A) / 5V (max 7A) / 12V (max 5A) / 18V (max3.5))
12. **Power on:** Switch on the controller board and panel by using the OSD switch mount.

General:

- If you are using supplied cables & accessories, ensure they are correct for the model of panel and controller.
- If you are making your own cables & connectors refer carefully to both the panel & inverter specifications and the section in this manual, "Connectors, Pinouts & Jumpers" to ensure the correct pin to pin wiring.

### PC SETTINGS

The controller has been designed to take a very wide range of input signals however to optimize the PC's graphics performance we recommend choosing 60Hz vertical refresh rate – this will not cause screen flicker.

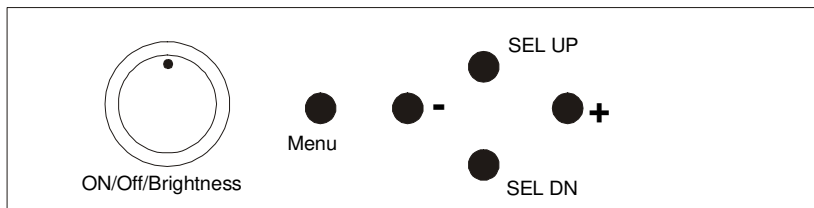
### OPERATION

Once the system has been connected and switched on there are a number of functions available to adjust the display image as summarized in the following sections. The settings chosen will be saved for each mode independently.

## LCD DISPLAY SYSTEM SETTINGS

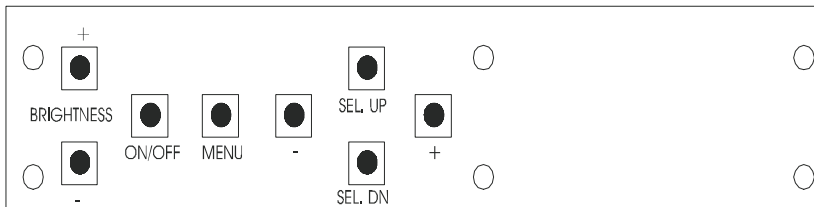
NOTE: By way of explanation the following refers to a set of sample buttons that may be obtained as an option. In addition to power on/off and connection for backlight brightness the controller provides an On Screen Display of certain functions which are controlled by 5 momentary type buttons (analog VR type) or 8 momentary type buttons (digital type):

Controls	Analog VR type	Digital type
On/Off – turns controller board power on	VR toggle switch	On/Off button
Brightness – controls backlight brightness	Rotary VR	Brightness +/- buttons
Menu – Turns OSD menu On or Off (it will auto time off) – Back to previous OSD menu page	Menu button	Menu button
Select down – Moves the selector to the next function (down)	SEL DN	SEL DN
Select up – Moves the selector to the previous function (up)	SEL UP	SEL UP
+ – Increase the OSD parameter values – Go into the sub-menu page from the top – Confirm to select the OSD function	+	+
- – Decrease the OSD parameter values – Go into the sub-menu page from the bottom	-	-
Reset to Factory Defaults	Press and hold SEL DN button, then power on the controller	Press and hold SEL DN button, then power on the controller
Access "Programming Mode"	Press and hold MENU button, then power on the controller	Press and hold MENU button, then power on the controller



Analog VR type

**12V / 24VDC power input :**  
Analog 10K VR Type OSD  
switch mount uses  
P/N 410680550-3 or up


















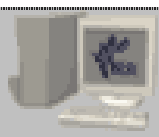


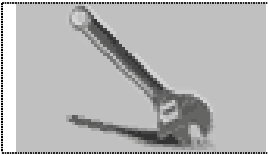
Digital type

**12V / 24VDC power input :**  
Digital 10K Type OSD  
switch mount uses  
P/N 416100520-3 or up



**OSD functions**

	<p><b>Image Settings :</b></p> <p>Brightness  Increase/decrease panel brightness level, total: 100 steps</p> <p>Contrast  Increase/decrease panel contrast level, total: 100 steps</p> <p>Sharpness*  Increase/decrease sharpness, total: 30 steps</p> <p>Color ▶</p> <p>Color Temp</p> <p>6500K</p> <p>7500K</p> <p>9300K</p> <p>User ▶</p> <p>Red Gain : </p> <p>Green Gain : </p> <p>Blue Gain : </p> <p>Red Offset : </p> <p>Green Offset : </p> <p>Blue Offset : </p> <p>Saturation*  Increase/decrease saturation, total: 100 steps</p> <p>Hue*  Increase/decrease Hue level, total: 100 steps</p> <p>VGA Setup ▶</p> <p>Auto Adjustment# : Off/ On : Auto adjust the image position, phase and size</p> <p>Image Position# : Move the image position upward/downward/left/right.</p> <p>Phase# :  Fine tune the data sampling position (adjust image quality)</p> <p>Clocks/Line# :  Adjust the image horizontal size</p> <p>* : DISPLAY IN VIDEO MODE ONLY</p> <p># : FUNCTION IN ARGB MODE ONLY</p>
	<p><b>Display Settings</b></p> <p><b>Main Source :</b> Select the input video signal</p> <p>VGA</p> <p>DVI</p> <p>HDMI1</p> <p>CMPT1 (Component)</p> <p>Aspect Ratio ▶</p> <ul style="list-style-type: none"> <li>- Full screen : Enable full screen expansion for lower resolution Image</li> <li>- Pillar Box: scaling format in 4:3</li> <li>- Letterbox expand : Enable fill screen expansion for lower resolution image according to aspect ratio</li> </ul> <p><b>PIP ▶</b></p> <p>PIP mode ▶ Off / Large PIP / Small PIP / Side by Side</p> <p>The PIP capability on display input sources refer to Appendix VII – PIP mix table</p> <p>PIP Position ▶ Bottom-Right / Top-Left / Top-Right / Bottom-Left</p> <p><b>PIP Source ▶</b> HDMI / DVI</p> <p>Image rotation ▶ Off / H rotation / V rotation / H/V rotation</p>
	<p><b>Audio Settings : (No function)</b></p> <p>Mute ▶ Off /On</p> <p>Volume  Increase/decrease volume level, total : 100 steps</p>
	<p><b>Video :</b></p> <p>DCDi ▶</p> <p>Main DCDi ▶ On / Off</p> <p>Main MADi mode ▶ Normal / Adaptive / Off</p> <p>[See Appendix V for DCDi, MADi function description]</p>

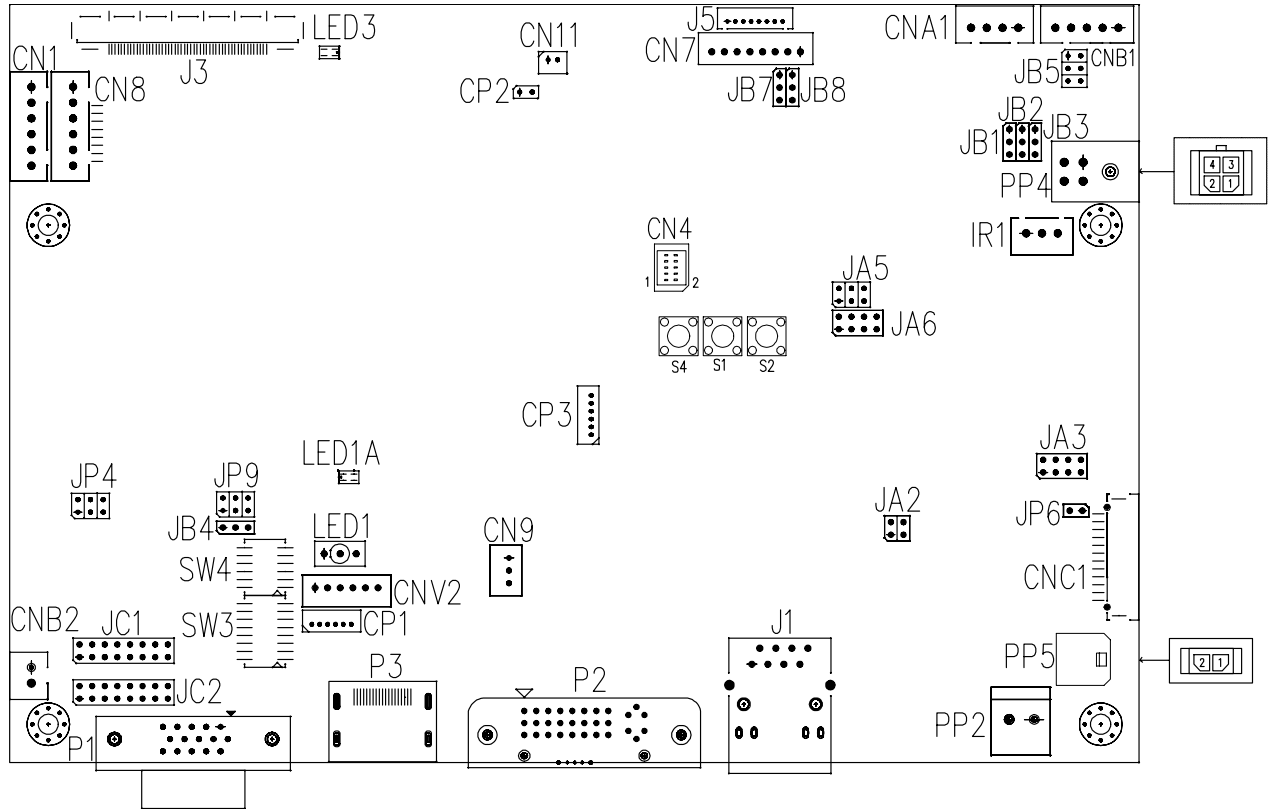


**Setup :**

Smart ISP  
Language : English  
Factory Reset : Yes / No

## CONNECTORS, PINOUTS & JUMPERS

The various connectors are:



### Summary: Connectors

Ref	Purpose	Description
CN1	Reserved for second RS-232 serial control	JST 6-way, B6B-XH-A (Matching type : XHP-6)
CN4	Panel control signal connector	Hirose 10-pin, DF20G-10DP-1V (Matching type : DF20A-10DS-1C)
CN7	Reserved for Audio line out	JST 8-way, B8B-PH-K (Matching type : PHR-8)
CN8	RS-232 serial control	JST 6-way, B6B-XH-A (Matching type : XHP-6)
CN9	Ambient light sensor connector	JST 3-way, B3B-PH-K (Matching type : PHR-3)
CN11	SPDIF Audio output	JST B2B-ZR (Matching type : ZHR-2) (Matching extend cable P/N 426007400-3)
CNA1	Auxiliary power output	JST 4-way, B4B-XH-A (Matching type : XHP-4) (Matching cable P/N 426040200-3)
CNB1	Backlight inverter	JST 5-way, B5B-XH-A (Matching type : XHP-5) (Matching cable P/N 426058300-3)
CNB2	Backlight status input connector	JST 2 way, B2B-XH-A (Matching type : XHP-2) (Matching cable P/N 426020800-3)
CNC1	OSD control	Hirose DF13A-12P-1.25H (Mating type : XHP-12)
CNV2	Component (YPbPr) video input connector	JST 6-way, B6B-PH-K (Matching type : PHR-6) (Matching video cable P/N 426000600-3)
CP1	Reserved for internal programming	Reserved
CP3	Reserved for internal programming	Reserved
IR1	Infra-red sensor connector	JST 3-way, B3B-XH-A (Matching type : XHP-3)
J1	Ethernet	RJ-45 connector
J3	LVDS panel signal output	JAE FI-RE51S-HF (Matching type : FI-RE51HL)
J5	Panel power output	JS-1147A-08 Top 1.25mm (Matching type : JS-1146-08)
LED1	Dual color LED connector (Controller status)	Header pin 3x1
P1	VGA	DB-15 way high density 3 row
P2	DVI-D	DVI-D connector
P3	HDMI	HDMI connector
PP2	Power input (alternative)	DC power Molex 2 pin 0.156" pitch
PP4	External panel power input	Molex 43045-0400 compatible (Matching connector type : Molex 43025-0400 compatible) (Matching power cable : P/N 426013700-3)

Specifications subject to change without notice

PP5	Power input	Molex 43650-0200 compatible (Matching connector type : Molex 43645-0200 compatible) (Matching power cable : P/N 426013800-3)
S1	Reset button (for Ethernet function)	Tact switch button
S2	Reserved	Tact switch button
S4	Config Menu button (for Ethernet function)	Tact switch button
SW3	Panel selection	8-way DIP Switch
SW4	Function selection	6-way DIP Switch

**Summary: Jumpers setting**

Ref	Purpose	Note
JA2	On board +3.3V logic power enable	1-2 & 3-4 closed, factory set, do not remove
JA3	Panel power voltage select <b>CAUTION:</b> Incorrect setting can damage panel	See panel voltage setting table 1
JA5	Panel power voltage select <b>CAUTION:</b> Incorrect setting will cause panel damage	See panel voltage setting table 1
JA6	Panel power voltage select <b>CAUTION:</b> Incorrect setting will cause panel damage	See panel voltage setting table 1
JB1	Backlight brightness voltage range	1-2 closed = 5V max 2-3 closed = 3.3V max
JB2	Backlight inverter on/off control – signal level	2-3 = On/Off control signal 'High' = +5V 1-2 = On/Off control signal 'High' = +3.3V Open = On/Off control signal 'High' = Open collector <b>CAUTION:</b> Incorrect setting can damage inverter.
JB3	Backlight inverter on/off control – polarity	1-2 = control signal 'high' = CCFT ON 2-3 = control signal 'low' = CCFT ON
JB4	GPIO pins voltage selection	1-2 = 3.3V 2-3 = 5V
JB5	Backlight control type selection	1-2 = VR/Digital switch mount control 3-4 = Reserved 5-6 = Reserved
JB7	Reserved for audio voltage control	Reserved
JB8	Reserved for audio logic control	Reserved
JC1	Custom configuration	Reserved
JC2	Custom configuration	Position 1 : Enable J3 – pin 16 (OP1) controlled by JB4 Position 2 : Enable J3 – pin 17 (OP2) controlled by JB4
JP4	Custom configuration	1-2 closed = Reserved 3-4 closed = On-board programming 5-6 closed = Reserved
JP6	Input power control	Short = External switch control Open = Switch mount control
JP9	Factory use	Default Open
S1	Reserved	Reserved
S4	Reserved	Reserved
S5	Reserved	Reserved
SW3	Panel & function selection	See table 2
SW4	Panel & function selection	See table 3

**Table 1 : Panel voltage setting table :**

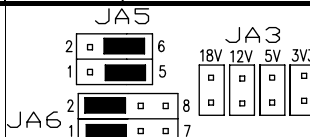
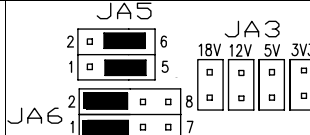
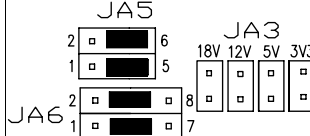
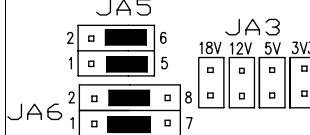
Input voltage via PP2/PP5	Panel Voltage	JA3	JA5	JA6	Jumper on board
12VDC	3.3V	3V3 closed	1-3 & 2-4	1-3 & 2-4	
	5V	5V closed	1-3 & 2-4	1-3 & 2-4	
	12V	OPEN	1-3 & 2-4	5-7 & 6-8	

**CAUTION: Incorrect setting can damage panel & controller**

Input voltage via PP2/PP5	Panel Voltage	JA3	JA5	JA6	Jumper on board
24VDC**	3.3V	3V3 closed	1-3 & 2-4	1-3 & 2-4	
	5V	5V closed	1-3 & 2-4	1-3 & 2-4	
	12V	12V closed	1-3 & 2-4	3-5 & 4-6	
	18V	18V closed	1-3 & 2-4	3-5 & 4-6	

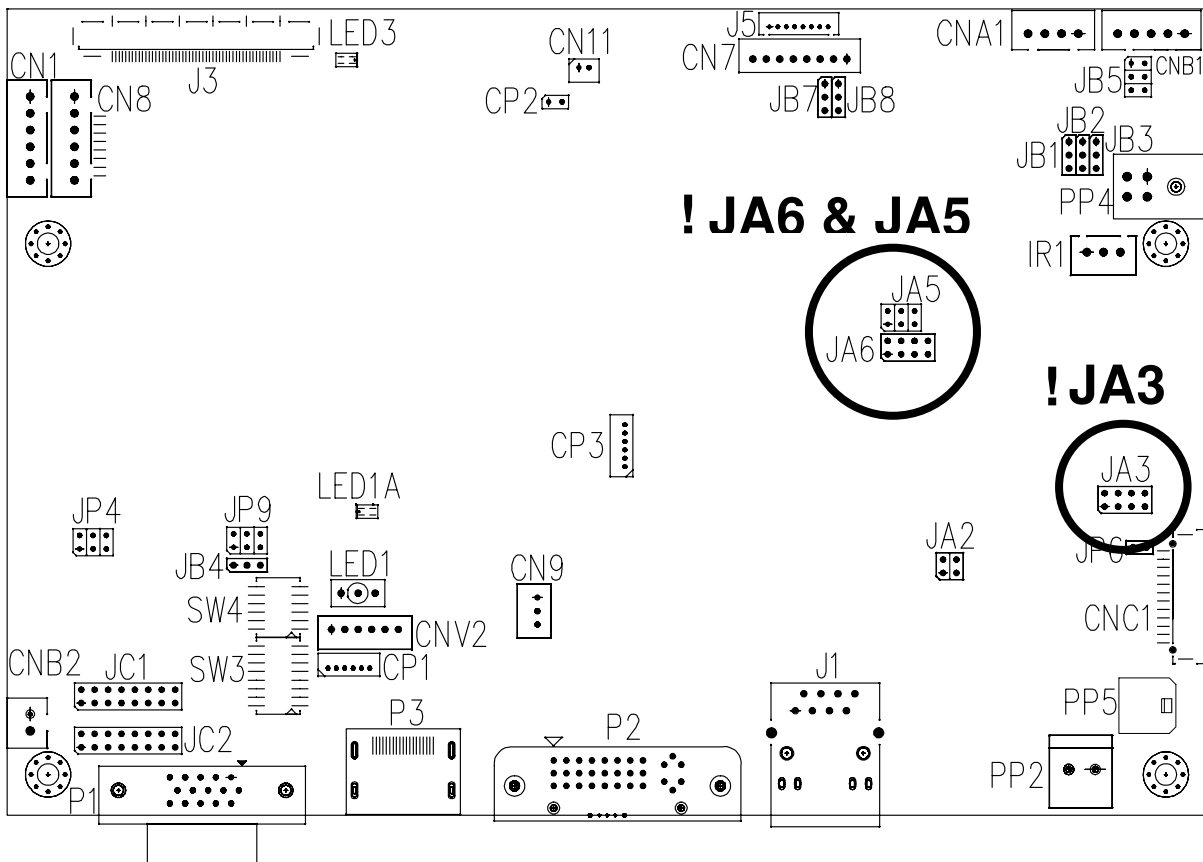
**CAUTION: Incorrect setting can damage panel & controller**

**\*\* Ensure that the backlight inverter supports 24V operation prior to connecting a 24VDC input. Because CNA1 pin 1 and CNB1 pin 2 will output 24VDC if input 24VDC via PP2 or PP5.**

Input voltage via PP4	Input voltage via PP2 / PP5	Panel Voltage	JA3	JA5	JA6	Jumper on board
3.3 / 5 / 12 / 18VDC*	12V / 24VDC	3.3V	OPEN	3-5 & 4-6	1-3 & 2-4	
		5V	OPEN	3-5 & 4-6	1-3 & 2-4	
		12V	OPEN	3-5 & 4-6	3-5 & 4-6	
		18V	OPEN	3-5 & 4-6	3-5 & 4-6	

\* Maximum current for 3.3V, 5V = 7A, Maximum current for 12V = 5A, Maximum current for 18V = 3.5A

JA3, JA5 & JA6 location on board : (Please pay attention to the jumper settings on JA3, JA5 & JA6 which are red in color)



**Table 2 : DIP Switch selection – SW3**

Pos #1	Pos #2	Pos #3	Pos.#4	Description	Panel resolution
<b>For WUXGA panels</b>					
OFF	ON	ON	OFF	LG LM260WU1-SLB1/Samsung LTM220CS01	1920x1200
ON	ON	ON	OFF	LG LM240WU2-SLA1	1920x1200
OFF	OFF	OFF	OFF	Sharp LQ445D3LZ19	1920x1080
ON	OFF	OFF	OFF	Samsung LTA460H2-L02	1920x1080
OFF	ON	OFF	OFF	Sharp LQ170M1LZ04	1920x1200
ON	ON	OFF	OFF	Samsung LTA700HH-LH1 (1 <sup>st</sup> trial testing)	1920x1080
OFF	OFF	ON	OFF	Samsung LTA700HH-LH1 (2 <sup>nd</sup> trial testing)	1920x1080
OFF	OFF	ON	ON	AU Optronics P645HW03 V0 (1920x1080)	1920x1080
OFF	OFF	ON	ON	AU Optronics P645HW03 V0	1920x1080
<b>For UXGA panels</b>					
OFF	OFF	OFF	OFF	Fujitsu FLC59UXC8V-02A	1600x1200
ON	OFF	OFF	OFF	Samsung LTM213U6-L01	1600x1200
<b>For WXGA panels</b>					
OFF	OFF	OFF	OFF	LG LC420W02-A4	1366x768
ON	OFF	OFF	OFF	Sharp LQ315T3LZ24	1366x768
ON	ON	OFF	OFF	Samsung LTA320W2-L01 / LTA230W1-L02	1366x768
ON	ON	ON	ON	NEC NL12876BC26-21 / Samsung LTM170W1-L01	1280x768
OFF	ON	ON	ON	CHI MEI N15414-L01	1280x800
OFF	OFF	ON	OFF	AU Optronics M190PW01	1440x900
OFF	OFF	ON	ON	Sharp LQ072K1LA03	1280x768
<b>For SXGA panel</b>					
OFF	OFF	OFF	OFF	Sharp LQ181E1LW31	1280x1024
ON	OFF	OFF	OFF	AU Optronics M170EN05	1280x1024
<b>For XGA panel</b>					
OFF	OFF	OFF	OFF	Sharp LQ150X1LGN2A / LQ150X1LGB1 AUO M150XN07V2	1024x768 1024x768
<b>For SVGA panel</b>					
OFF	OFF	OFF	OFF	Sharp LQ121S1DG11/41 Toshiba LTM08C351	800x600 800x600
<b>For WVGA panel</b>					
OFF	OFF	OFF	OFF	NEC NL8048BC24-01	800x480
ON	OFF	OFF	OFF	Kyocera TCG085WV1AB-G00	800x480
ON	OFF	ON	OFF	Sharp LQ070Y3LG4A	800x480
<b>For VGA panel</b>					
OFF	OFF	OFF	OFF	Sharp LQ104V1DG51	640x480
ON	OFF	OFF	OFF	Sharp LQ104V1DG21	640x480
ON	OFF	ON	OFF	Kyocera TCG075VG2AC-G00	640x480
<b>Others</b>					
OFF	ON	OFF	OFF	AU Optronics M201EW02 V8	1680x1050
ON	OFF	OFF	ON	Samsung LTM201M1-L01	1680x1050
OFF	OFF	ON	OFF	Samsung LTI430LA01	1920x480
OFF	ON	ON	OFF	NEC NL10260BC19-01D	1024x600
ON	ON	ON	OFF	AU Optronics M200RW01 Samsung LTM200KP01	1600x900 1600x900

**Remark : The above panel timings are copy the panel data direct from SVX-1920. Some of the panel timings settings may not exactly to match the panel model we specified in this table.**

Pos #5	Pos #6	Pos #7	Description
OFF	OFF	OFF	WUXGA
ON	OFF	OFF	UXGA
OFF	ON	OFF	SXGA
ON	ON	OFF	WXGA
OFF	OFF	ON	XGA
ON	OFF	ON	SVGA
OFF	ON	ON	VGA
ON	ON	ON	WVGA / Others

Pos. #8	Video lock	ON – Disable : The output refresh rate locks to the input for 50Hz / 60Hz mode (other resolution lock the output be 60Hz. )  OFF – Enable : Always fix the output be 60Hz.
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**Table 3 : DIP switch selection – SW4**

Pos. #	Function	Description
1	Reserved	
2	Panel pixel format	OFF : Double Pixel ON : Single Pixel
3	Panel selection	ON : LVDS panel OFF : Reserved
4	LVDS data mapping select (Refer to Table 2)	If SW4 position 5 = OFF (8 bit) OFF : Mapping B ON : Mapping A Please adjust to get the correct picture. See as Appendix I for details of mapping of A and B. If SW4 position 5 = ON (10 bit) OFF : JEIDA (LVDS panel) ON : VESA (LVDS panel) Please adjust to get the correct picture. See as Appendix I for details of mapping of VESA and JEIDA.
5	Output LVDS display mode selection	OFF : 8 bit ON : 10 bit
6	Reserved	

**CN1 – Slave RS-232 serial control: JST B6B-XH-A (Matching type : XHP-6)**

PIN	SYMBOL	DESCRIPTION
1	EXT_MSTR2_SCL	Reserved
2	EXT_MSTR2_SDA	Reserved
3	VCC	+5V
4	TXD	RS-232 Tx data
5	GND	Ground
6	RXD	RS-232 Rx data

**CN4 – Panel connector: HIROSE DF20G-10DP-1V (Matching type : DF20A-10DS-1C)**

PIN	SYMBOL	DESCRIPTION
1	OP1	Reserved
2	OP2	Reserved
3	OP3	Reserved
4	OP4	Reserved
5	IP1	Reserved
6	IP2	Reserved
7	IP3	Reserved
8	IP4	Reserved
9	EXT_MSTR2_SDA	Reserved
10	EXT_MSTR2_SCL	Reserved

**CN8 – RS-232 serial control: JST B6B-XH-A (Matching type : XHP-6)**

PIN	SYMBOL	DESCRIPTION
1	EXT_MSTR2_SCL	Reserved
2	EXT_MSTR2_SDA	Reserved
3	VCC	+5V
4	TXD	RS-232 Tx data
5	GND	Ground
6	RXD	RS-232 Rx data

**CN9 – Ambient light sensor connector : JST B3B-PH-K (Matching type : PHR-3)**

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	VCC_5V	VCC 5V
3	ALSF	Ambient light sensing feedback

**CN11 – SPDIF audio output connector : JST B3B-PH-K (Matching type : PHR-3)**

PIN	SYMBOL	DESCRIPTION
1	SPDIF	SPDIF Digital audio output
2	GND	Ground

**CNA1 - Auxiliary power output: JST B4B-XH-A (Matching type : XHP-4)**

PIN	SYMBOL	DESCRIPTION
1	AUX 12V / 24V	+12V / +24V DC
2	GND	Ground
3	GND	Ground
4	AUX 5V	+5V DC, 500mA max

**CNB1 – Backlight inverter connector: JST B5B-XH-A (Matching type : XHP-5)**

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	VBKL	+12V / +24V DC, backlight power supply
3	BLCTRL	On/Off control (enable) – see JB2 & JB3
4	BVR_WIP	Brightness VR – WIP
5	BVR_A	Brightness VR A

**CNC1 – OSD switch mount control, Hirose DF13A-12P-1.25H (Mating type : DF13-12S-1.25C)**

PIN	SYMBOL	DESCRIPTION
1	PSWIN	Power button A
2	SW_ON	Power button B
3	BVR_A	Backlight Brightness VR pin A
4	BVR_WIP	Backlight Brightness R pin WIP
5	BVR_B	Backlight Brightness VR pin B (470 ohm resistor to +5V Vcc)
6	GND	Ground
7	MENU	OSD menu
8	-/LEFT	OSD -/Left
9	+/RIGHT	OSD +/Right
10	SEL_DN	OSD Select down
11	SEL_UP	OSD Select up
12	NC	No connection

The VR for brightness depends on the inverter. The main power load for On/Off is handled by a relay on the controller.

**CNV2 – Component (YPbPr) video input connector: JST 6-way, B6B-PH-K (Matching type : XHP-6)**

PIN	SYMBOL	DESCRIPTION
1	A_Y1	Luma in / Green in
2	GND	Ground
3	A_CB1	Cb in / Blue in
4	GND	Ground
5	A_CR1	Cr in / Red in
6	GND	Ground

**IR1 – Infra-Red sensor connector: JST B3B-XH-A (Matching type : XHP-3)**

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	STDBY_Vcc	Stand by voltage
3	IR Data	IR data

**J3 – LVDS output connector: JAE FI-RE51S-HF (Matching type : JAE FI-RE51HL)**

PIN	SYMBOL	DESCRIPTION
1	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
2	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
3	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
4	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
5	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
6	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
7	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
8	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
9	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
10	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	GND	Ground
16	OP1	-
17	OP2	-
18	NC	No function
19	NC	No function
20	GND	Ground
21	GND	Ground
22	TXA4+	Positive differential LVDS data bit A4
23	TXA4-	Negative differential LVDS data bit A4
24	TXA3+	Positive differential LVDS data bit A3
25	TXA3-	Negative differential LVDS data bit A3
26	GND	Ground
27	TXAC+	Positive LVDS clock for A channel
28	TXAC-	Negative LVDS clock for A channel
29	GND	Ground
30	TXA2+	Positive differential LVDS data bit A2
31	TXA2-	Negative differential LVDS data bit A2
32	TXA1+	Positive differential LVDS data bit A1
33	TXA1-	Negative differential LVDS data bit A1
34	TXA0+	Positive differential LVDS data bit A0
35	TXA0-	Negative differential LVDS data bit A0
36	GND	Ground
37	TXB4+	Positive differential LVDS data bit B4
38	TXB4-	Negative differential LVDS data bit B4

Specifications subject to change without notice

39	TXB3+	Positive differential LVDS data bit B3
40	TXB3-	Negative differential LVDS data bit B3
41	GND	Ground
42	TXBC+	Positive LVDS clock for B channel
43	TXBC-	Negative LVDS clock for B channel
44	GND	Ground
45	TXB2+	Positive differential LVDS data bit B2
46	TXB2-	Negative differential LVDS data bit B2
47	TXB1+	Positive differential LVDS data bit B1
48	TXB1-	Negative differential LVDS data bit B1
49	TXB0+	Positive differential LVDS data bit B0
50	TXB0-	Negative differential LVDS data bit B0
51	GND	Ground

**J5 – LVDS Panel connector: Molex 53261-0871, (Matching type : 51021-0800)**

PIN	SYMBOL	DESCRIPTION
1	VDD (3,3V/5V)	Panel power supply (3,3V/5V)
2	VDD (3,3V/5V)	Panel power supply (3,3V/5V)
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	VDD (12V/18V)	Panel power supply (12V/18V)
7	VDD (12V/18V)	Panel power supply (12V/18V)
8	VDD (12V/18V)	Panel power supply (12V/18V)

**LED1 – Status LED connector: 3-pin header**

PIN	DESCRIPTION
1	Green LED pin (anode)
2	LED pin common (cathode)
3	Red LED pin (anode)

**P1 - Analog VGA in - 15 way connector**

PIN	SYMBOL	DESCRIPTION
1	PCR	Red, analog
2	PCG	Green, analog
3	PCB	Blue analog
4	ID2	Reserved for monitor ID bit 2 (grounded)
5	DGND	Digital ground
6	AGND	Analog ground red
7	AGND	Analog ground green
8	AGND	Analog ground blue
9	DDC_5V	+5V power supply for DDC (optional)
10	DGND	Digital ground
11	ID0	Reserved for monitor ID bit 0 (grounded)
12	DDC_SDA	DDC serial data
13	HS_IN	Horizontal sync or composite sync, input
14	VS_IN	Vertical sync, input
15	DDC_SCL	DDC serial clock

**P2 – DVI-D in**

PIN	SYMBOL	DESCRIPTION
1	/RX2	TMDS Data 2-
2	RX2	TMDS Data 2+
3	GND	Digital Ground
4	NC	No connection
5	NC	No connection
6	DDC_CLK	DDC Clock
7	DDC_DAT	DDC Data
8	NC	No connection
9	/RX1	TMDS Data 1-
10	RX1	TMDS Data 1+
11	GND	Digital Ground
12	NC	No connection
13	NC	No connection
14	DDC_5V	+5V power supply for DDC (optional)
15	GND	Ground (+5, Analog H/V Sync)
16	NC	No connection
17	/RX0	TMDS Data 0-
18	RX0	TMDS Data 0+
19	GND	Digital Ground

Specifications subject to change without notice

20	NC	No connection
21	NC	No connection
22	GND	Digital Ground
23	RXC	TMDS Clock+
24	/RXC	TMDS Clock-
C1	NC	No connection
C2	NC	No connection
C3	NC	No connection
C4	HS_IN	Analog horizontal sync
C5	GND	Ground
C6	NC	No connection

**P3 – HDMI connector**

PIN	SYMBOL	DESCRIPTION
1	DATA2+	TMDS Data2+
2	DATA2S	TMDS Data2 Shield
3	DATA2-	TMDS Data2-
4	DATA1+	TMDS Data1+
5	DATA1S	TMDS Data1 Shield
6	DATA1-	TMDS Data1-
7	DATA0+	TMDS Data0+
8	DATA0S	TMDS Data0 Shield
9	DATA0-	TMDS Data0-
10	CLK+	TMDS Clock+
11	CLK@	TMDS Clock Shield
12	CLK-	TMDS Clock-
13	CEC	CEC
14	NC	No connection
15	SCL	SCL (I <sup>2</sup> C Serial Clock for DDC)
16	SDA	SDA (I <sup>2</sup> C Serial Data Line for DDC)
17	CEC/GND	Ground
18	+5V	+5 V Power (max 50 mA)
19	HPDET	Hot Plug Detect

**PP2 – Alternate 12V/24VDC input power supply**

PIN	DESCRIPTION
1	+12VDC / 24VDC in
2	Ground

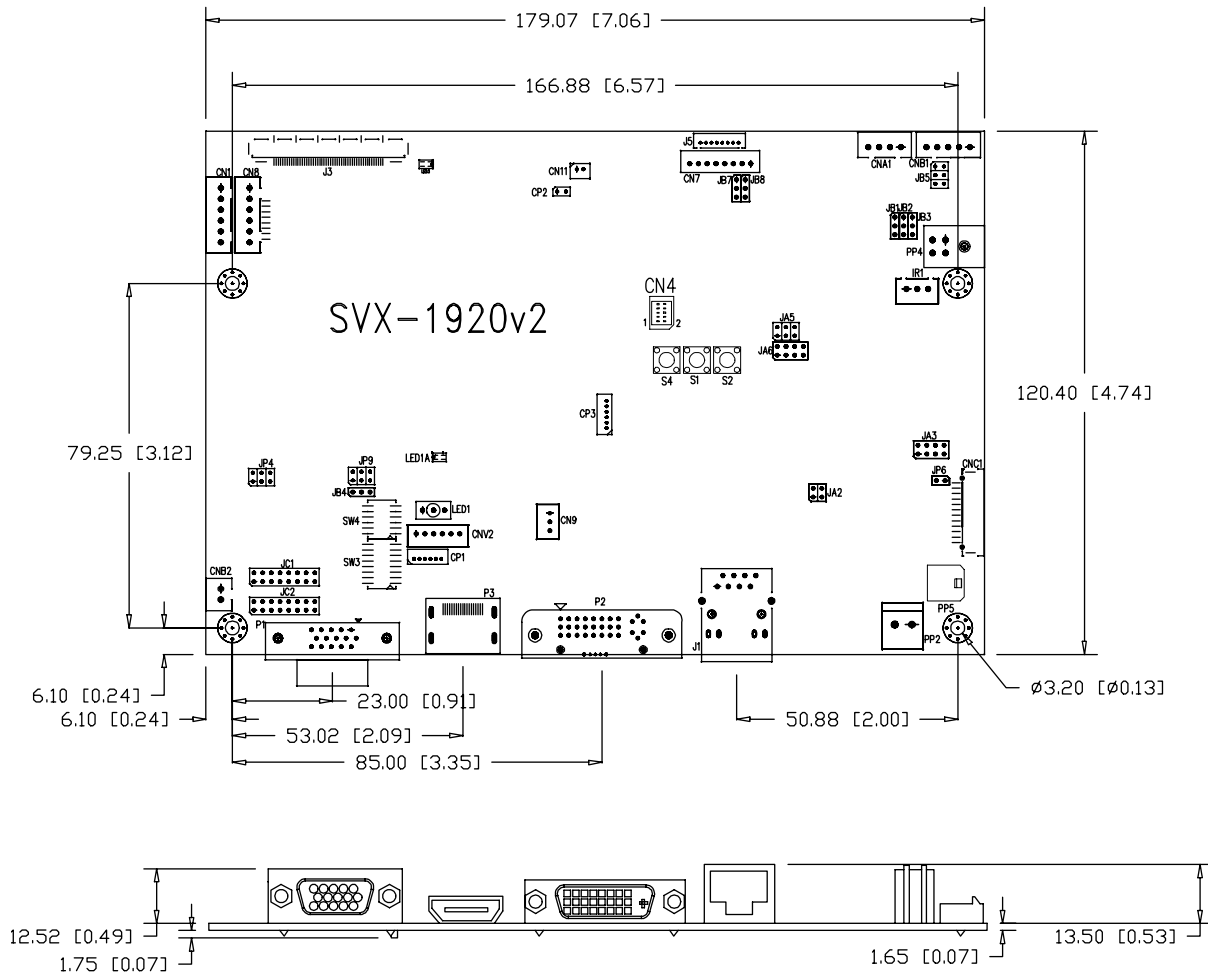
**PP4 – External panel power input**

PIN	DESCRIPTION
1	External panel power
2	Ground
3	External panel power
4	Ground

**PP5 – 12V/24VDC input power supply**

PIN	DESCRIPTION
1	+12V / +24VDC
2	Ground

## CONTROLLER DIMENSIONS



**Ready-made 3D Pro-E (SLDPRT) drawing files** - Save time and effort for your system volumetric analysis design. Includes jpg file previews. Please go to download at <http://www.digitalview.com/products/svx-1920v2-lcd-controller>

The maximum thickness of the controller is 16.9mm with or without video add-on board (measured from bottom of PCB to top of components, including any underside components & leads). We recommend clearances of:

- 5mm from bottom of PCB - if mounting on a metal plate we also recommend a layer of suitable insulation material is added to the mounting plate surface.
- 10mm above the components
- 3~5mm around the edges

Any of the holes shown above can be used for mounting the PCB, they are 3.2mm in diameter.

**CAUTION: Ensure adequate insulation is provided for all areas of the PCB with special attention to high voltage parts such as the inverter.**

## APPLICATION NOTES

### USING THE CONTROLLER WITHOUT BUTTONS ATTACHED

This is very straightforward:

- Firstly setup the controller/display system with the buttons. With controls attached and display system active make any settings for color, tint and image position as required then switch everything off.
- Remove the control switches, the 12-way (CNC1) cable.
- Use a jumper or similar to connect pins 1 & 2 on CNC1, this will fix the board On.
- Refer to inverter specifications for details as to fixing brightness to a desired level, this may require a resistor, an open circuit or closed circuit depending on inverter.

**Summary:** On CNC1 the only pins that are used are for On/Off and Brightness (if controller mounted inverter is used). On CNC1 the pins are for momentary type buttons so it doesn't matter that no buttons are attached.

### INVERTER CONNECTION

There are potentially 3 issues to consider with inverter connection:

- Power
- Enable
- Brightness

Please read the following sections for a guide to these issues.

**Inverter Power:** As per the table for CNB1 pin 1 is ground and pin 2 provides 12V/24V DC. This should be matched with the inverter specification: see table.

#### CNB1

PIN	DESCRIPTION
1	Ground
2	+12V/+24VDC

Remark: For higher power inverter, more current (for 12V/24V) can be taken from CNA1 pin 1.

**Enable:** This is a pin provided on some inverters for On/Off function and is used by this panel controller for VESA DPMS compliance. If the inverter does not have an enable pin or the enable pin is not used then DPMS will not be operational. Pin 3 should be matched to the inverters specification for the 'enable' or 'disable' pin.

#### CNB1

PIN	DESCRIPTION
3	Enable

Further, jumpers JB2 & JB3 should be set to match the inverters specification for the enable pin power and High or Low setting: see table.

Ref	Purpose	Note
JB2	Inverter enable voltage	1-2 H = 12V/24V, 2-3 H = 5V (Vcc), OPEN H = open collector
JB3	Inverter control	1-2 H = On, 2-3 L = On

**Brightness:** There are various methods for brightness control and it is important to consider the specifications for the inverter to be used. Generally the situation is:

- Brightness can control by using a resistor or VR (Variable Resistor).
  - Brightness controlled by adding a circuit such as PWM (Pulse Width Modulation).
  - No adjustment of brightness is possible.
- CNB1 pins 4 & 5 are available for connecting to an inverter or circuit where VR control is supported.

#### CNB1

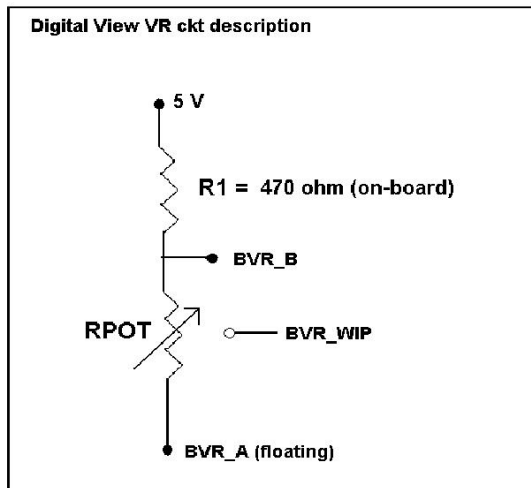
PIN	DESCRIPTION
4	VR WIP
5	VR A

This can then be matched with function controls connected to CNC1 pins 4 & 3 or 5: see table.

#### CNC1

PIN	DESCRIPTION
3	VR A
4	VR WIP
5	VR B

**Design Guideline for making VR circuitry :**



**Signal description / Notes :**

- 1) R1 : 470ohm on board
- 2) RPOT is an external potentiometer (in-line dip style) that can be plugged directly into CNC1 pins 3,4,5. RPOT must be supplied / installed by user.
- 3) BVR\_B : Voltage tapped from “top” of potentiometer, the node of R1 and RPOT.
- 4) BVR\_WIP : Voltage tapped from wiper arm of RPOT.
- 5) BVR\_A : Voltage tapped from “bottom” of RPOT.

**Note : BVR\_A voltage is left floating on the controller board. To use this circuit, you need to tie this point to a potential (usually GND, available at CNC1 pin 6).**

**CNB1 – Backlight inverter connector: JST B5B-XH-A (Matching type : XHP-5)**

PIN	SYMBOL	DESCRIPTION
1	GND	Ground
2	VBKL	+12V/24VDC, backlight power supply
3	BLCTRL	On/Off control (enable) – see JB2 & JB3
4	BVR_WIP	Brightness VR - WIP
5	BVR_A	Brightness VR A

**CNC1 – OSD switch mount control, Hirose DF13A-12P-1.25H (Mating type : DF13-12S-1.25C)**

PIN	SYMBOL	DESCRIPTION
1	PSWIN	Power button A
2	SW_ON	Power button B
3	BVR_A	Backlight Brightness VR pin A
4	BVR_WIP	Backlight Brightness R pin WIP
5	BVR_B	Backlight Brightness VR pin B (470 ohm resistor to +5V Vcc)
6	GND	Ground
7	MENU	OSD menu
8	-/LEFT	OSD -/Left
9	+ /RIGHT	OSD +/Right
10	SEL_DN	OSD Select down
11	SEL_UP	OSD Select up
12	NC	No connection

The VR for brightness depends on the inverter. The main power load for On/Off is handled by a relay on the controller.

**Example for circuit design :**

- 1.) Choose RPOT = 10K
- 2.) Tie BVR\_A to GND
- 3.) Circuit analysis gives BVR\_WIP as the following (see Figure 1)

$$BVR\_WIP = 5 \times (Rbc/10.47)$$

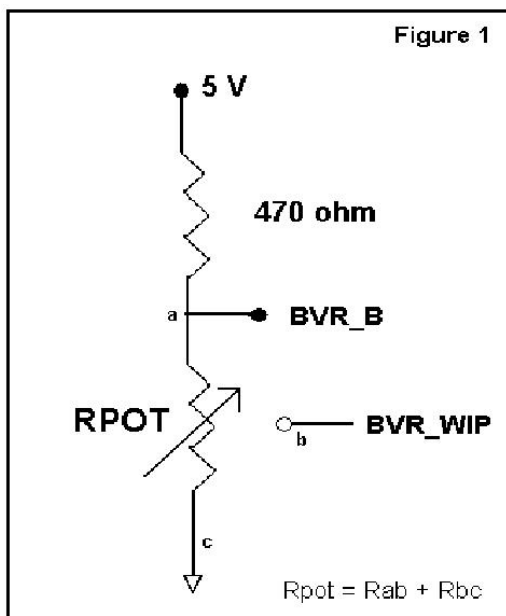
where BVR\_WIP is in Volts.  
And Rbc is the resistance from the wiper arm to bottom of pot in Kohms.

To evaluate, plug in different values of Rbc :

Rbc	BVR_WIP
0	0 V
2.5 K	1.2 V
5 K	2.4 V
7.5 K	3.6 V
10 K	4.8 V

So this circuit could provide Brightness adjust voltage ranging from 0V to 5V.

Specifications subject to change without notice





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## TROUBLESHOOTING

### General

A general guide to troubleshooting a flat panel display system it is worth considering the system as separate elements, such as:

- Controller (jumpers, PC settings)
- Panel (controller, cabling, connection, panel, PC settings)
- Backlight (inverter, cabling, backlight tubes)
- Cabling
- Computer system (display settings, operating system)

Through step by step cross checking with instruction manuals and a process of elimination to isolate the problem it is usually possible to clearly identify the problem area.

### No image:

- If the panel backlight is not working it may still be possible to just see some image on the display.
- A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a signal or incorrect graphic card settings.

### Image position:

If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test using another graphics card. This situation can occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal such as a signal splitter (please note that normally a signal splitter will not have any adverse effect).

### Image appearance:

- A faulty panel can have blank lines, failed sections, flickering or flashing display
- Incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll, flicker badly or possibly even no image.
- Incorrect jumper settings on the controller may cause everything from total failure to incorrect image. CAUTION: Do not set the panel power input incorrectly.
- Sparkling on the display: faulty panel signal cable.

### Backlight:

Items to check include: Power input, Controls, Inverter and Tubes generally in this order.

If half the screen is dimmer than the other half:

- Check cabling for the inverter.
- For a specific backlight tube check the AC pins orientation (CAUTION: Never reverse any DC power pins).

Also:

- If adjusting brightness control has no effect the chances are that the VR rating or method of adjusting brightness is not compatible or correctly connected to the inverter.
- If system does not power down when there is a loss of signal

### Continued failure:

If unit after unit keeps failing consider and investigate whether you are short circuiting the equipment or doing something else seriously wrong.

Generally after common sense issues have been resolved we recommend step by step substitution of known working parts to isolate the problem.

## SPECIFICATIONS

Panel compatibility	Compatible with 1920x1200, 1920x1080, 1920x480, 1680x1050, 1600x1200, 1600x900, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768, 1024x768, 1024x600, 800x600, 800x480 and 640x480 resolutions of TFT LCD panels.  A specified BIOS and some factory adjustment may be required for individual panel timings.
No. of colors	Up to 3 x 10 bit providing 1.06 billion colors.
Panel power	DC 3.3V, 5V, 12V, 18V
Panel signal	LVDS
Vertical refresh rate	60Hz at 1920x1200, 60Hz at 1920x1080, 60Hz at UXGA and up to 75Hz other lower resolution
Display clock maximum	165MHz
ADC clock maximum	195 MHz
DVI differential input clock maximum	165MHz
Graphics formats	Standard VESA VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA Other special formats through specified BIOS and factory adjustment.
Graphics auto mode detect	VGA, SVGA, XGA, SXGA, WXGA, UXGA & WUXGA interlaced and non-interlaced
Standard input at source (analog RGB)	VGA analog (15 pin) standard with automatic detection of: Digital Separate Sync; Composite Sync Sync On Green.
Video formats	PAL, NTSC & SECAM
Video inputs	ARGB DVI-D Component video HDMI
Functions display	On screen display (OSD) of functions
OSD menu functions	Image controls: Panel brightness/contrast, Saturation, Hue, Color temperature, Sharpness, Aspect ratio, PIP, Image orientation, etc.
OSD menu controls available	Power On/Off Backlight brightness OSD Menu OSD Select up OSD Select down Setting + Setting -
Control interface	Buttons, RS-232, Remote control
Settings memory	Settings are stored in non volatile memory
PC Connectivity	VGA / SVGA / XGA / SXGA / UXGA / WUXGA analog or digital
Controller dimensions	179mm x 120.4mm (7.1" x 4.74")
Power consumption	10w approx. (not including panel power consumption)
Power load maximum	The controller has an overall 3Amp current limit.
Input voltage	12V/24VDC +/- 5%
On board battery lifetime	3 years at storage (without applying power to the unit). The battery is not rechargeable.
Power protection	Fuse fitted (Resettable)
DC Power handling	Reverse power polarity protection is equipped on the board
Storage temperature limits	-40°C to +70°C
Operating temperature limits	0°C to +60°C

### NOTES

Please note the following:

- For specific panel setup a sample of an LCD may be required (this will be returned) and a copy of the full technical specifications for the panel from the manufacturer.
- Re-layout and custom development services are available.