# DVI, DISPLAY PORT, HDMI INTERFACE CONTROLLER FOR TFT PANEL

# Model: SVX-4096-VW

Part number : 41762001X-3 or up

# INSTRUCTIONS

## CONTENTS

**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-4096-VW is a feature rich interface controller for :**

- ➢ **TFT (active matrix) LCD panels of 4096x2160 resolutions in 60Hz with V-by-One interface.**
- ➢ **TFT (active matrix) LCD panels of 1920x1080 resolution in 60Hz with LVDS interface.**
- ➢ **Support true 10 bits panel.**
- ➢ **Support HDMI, DVI and Display Port input.**

**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 signal sources
- ➢ 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:
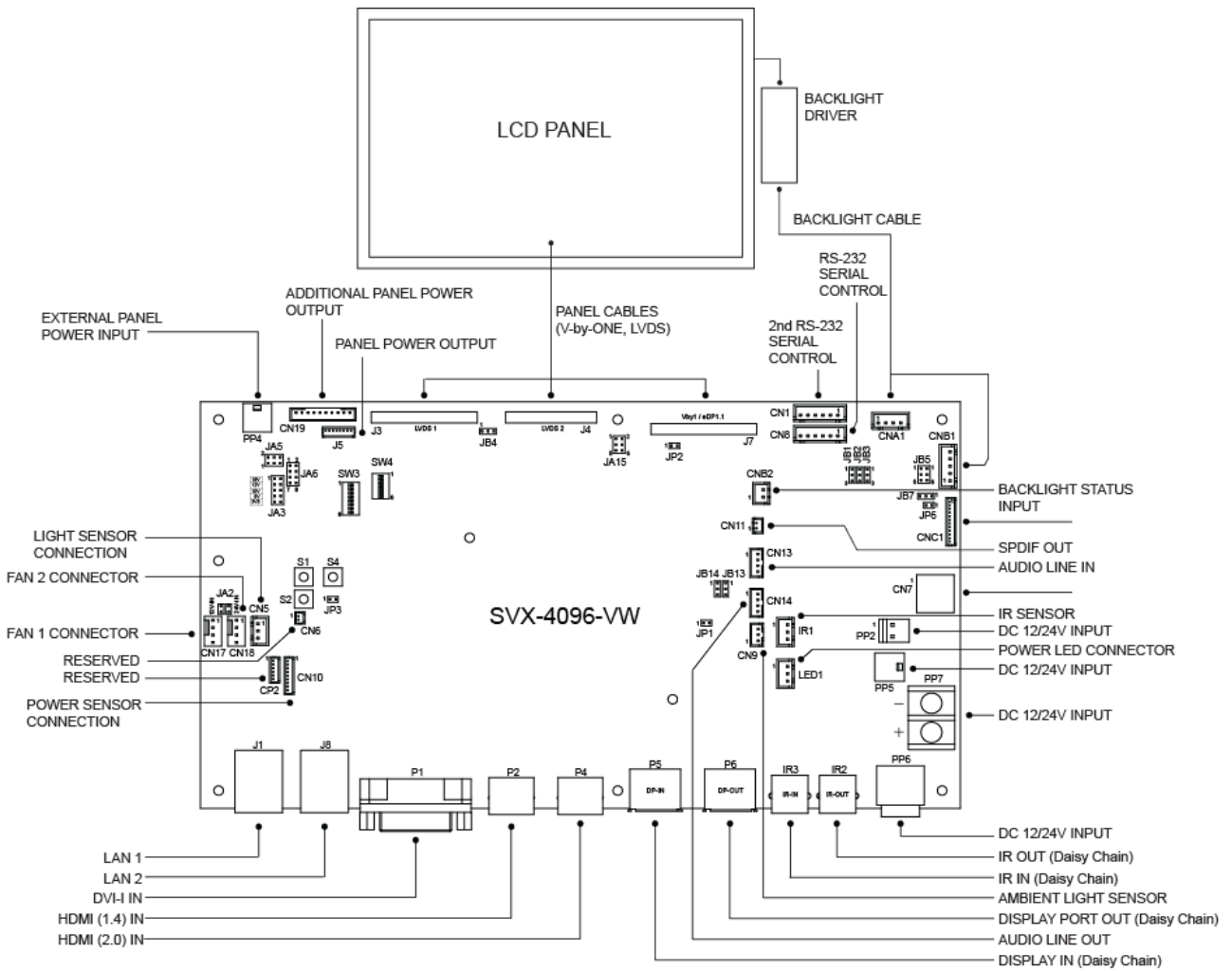
Daisy Chain connection diagram:

To use more SVX-4096-VW connected to each other, connect one end of the signal input cable (DP cable, LAN cable and IR cable) to the 'OUT' connector of SVX-4096-VW board and connect the other end to the 'IN' connector of next SVX-4096-VW board.

This controller is designed for monitor and custom display projects using 4096x2160 resolution with V-by-One interface or LVDS TFT panels. The following provides some guidelines for installation and preparation of a finished display solution.
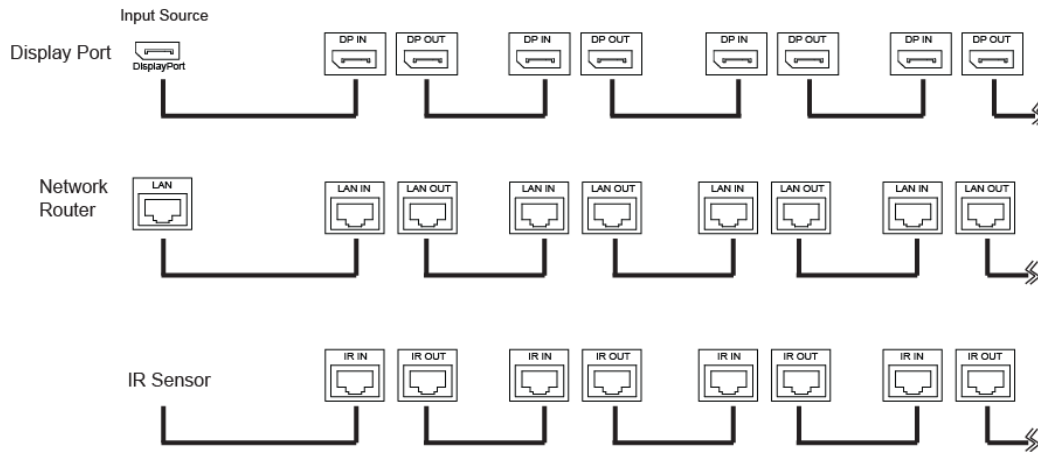
**Preparation**: Before proceeding it is important to familiarize yourself with the parts making up the system and the various connectors, mounting holes and general layout of the controller. As much as possible connectors have been labeled. Guides to connectors and mounting holes are shown in the following relevant sections.

1.  **LCD Panel**: This controller is designed for typical V-by-One (8 lanes) and LVDS interfaced panels with panel voltage 3.3V(4A), 5V(4A), 10V(4A), 12V(4A) or 18V(3A), External for 10V, 12V and 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.  **LCD Controller**: Handle the controller with care as static charge may damage electronic components. Make sure correct jumper to match the target LCD panel.

3.  **Panel cable**: In order to provide a clean signal it is recommended that all panel cables (V-by-One signal and LVDS) supplied by Digital View. Care should be taken when placing the cables to avoid signal interference.

4.  **Inverter/Backlight driver**: This will be required for the backlight of an LCD, some LCD panels have an inverter/backlight driver 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/backlight driver in order to obtain optimum performance. See Application notes page 27 for more information on connection.

5.  **Inverter/backlight cables**: Different inverter/backlight models require different cables and different pin assignment. Make sure correct cable pin out to match the inverter/backlight. Using wrong cable pin out may damage the inverter/backlight.

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.

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.  **Optional 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.  **Optional IR sensor**: It is an optional part only, can be unconnected if not using IR remote control.

10. **RS-232 control interface :** Serial control via this interface port.

11. **External panel power output** : User for specific panel model.

12. **Panel control signal :** Use for specific panel model.

13. **SPDIF Audio output :** This port support SPDIF audio output from the HDMI / Display Port audio source inputted.

14. **Ambient light sensor connection :** 3 ways connector provides interface for ambient light sensor connection by using Kit 70220-3.

15. **Backlight status input :** 2 ways connector provides interface for connection with the specific panel type which support the panel with backlight status monitoring function.

16. **DVI-I input cable :** Plug the DVI cable to the connector P1 on the controller board.

17. **HDMI input :** Plug the HDMI cable to the connector P2(HDMI 1.4) / P4(HDMI 2.0) on the controller board.

18. **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 V in details.

19. **Reserved for Audio adaptor board P/N 416940020-3:** The audio add-on board gives the audio input and output signal connection. It is an optional and reserved part only, can be unconnected if not using audio. It requires an audio cable P/N 426451800-3 to connect SVX-4096-VW (CN14) to the Audio Add-on Board (CN2).
    CAUTION : The Audio Add-on Board P/N 416940020-3 can only operate with 12VDC power input environment.

20. **Reserved for Audio extend cable :** The audio extend cable P/N 426009700-3 designs for connection between audio add on board P/N 416940020-3 and the controller. It is an optional and reserved part only, can be unconnected if not using audio.

21. **Additional panel power input :** Provide additional (+10V/+12V/+18V) panel power input for driving high power consumption panels.

22. **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 3.5A current output should enough for most of 4xCCFT 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.

23. **External panel power input** : Allow to supply external power to the panel separately for max 3.3V (7A) or 5V (7A) or 10V (5A) 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 16.

- **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.**

Specifications subject to change without notice

## 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/Backlight driver (if it is not built-in the panel) to the inverter/backlight connector of the LCD panel.
2.  **V-by-One interface panels:** The controller board supports V-by-One interface 4K panel. Plug the cable to J7 for driving 4K 60Hz panel. And make sure the matching panel timings and correct jumper settings (JA15) by referring to the panel support table and jumper settings table in page 13-18.
3.  **LVDS interface panels:** The controller board supports LVDS interface panel. Plug the cable to J3/J4 for driving FHD 60Hz panel. And make sure the matching panel timings and correct jumper settings by referring to the panel support table and jumper settings table in page 13-18.
4.  **Inverter/Backlight driver:** Plug the inverter/backlight cable to CNB1 and CNA1 (if necessary). Plug another end to the connector on the inverter/backlight of panel side.
5.  **Function switch & Controller:** Plug the OSD switch mount cable to CNC1 on the controller board and another to the OSD switch mount.
6.  **LED & Controller:** Plug in a 3-way with dual color LED to connector LED1 on the controller board.
7.  **IR & Controller:** Plug in a 3-way with IR sensor to connector IR1 on the controller board. For IR daisy chain connection, use RJ-11 cable to connect all monitors with IR in and IR out connectors.
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 PP2, PP5, PP6 and PP7. You can consider to use DigitalView mating power cable P/N 426013710-3, 1000mm for PP5 connection.
11. **External panel power input :** Plug power cable : P/N 426013710-3 for external panel power input (3.3 (max 7A) / 5V (max 7A) / 10V (max. 5A) / 12V (max 5A) / 18V (max3.5)) for PP4 connection.
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<br>• Turns OSD menu On or Off (it will auto time off) | Menu button | Menu button |
| Select up<br>• Moves the selector to the previous level function (up) | SEL UP | SEL UP |
| Select down<br>• Moves the selector to the next level function (down)<br>• Confirm the OSD selection | SEL DN | SEL DN |
| +<br>• Increase the OSD parameter values<br>• Moves the selector to next function (forward) | + | + |
| -<br>• Decrease the OSD parameter values<br>• Moves the selector to previous function (backward) | - | - |
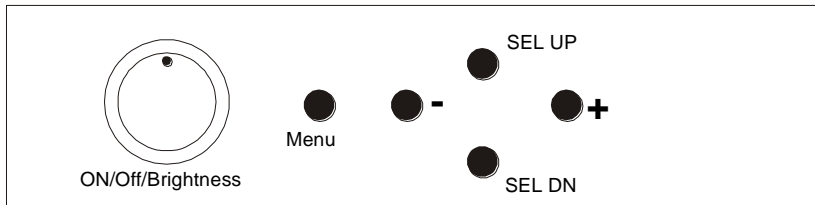


Analog VR type

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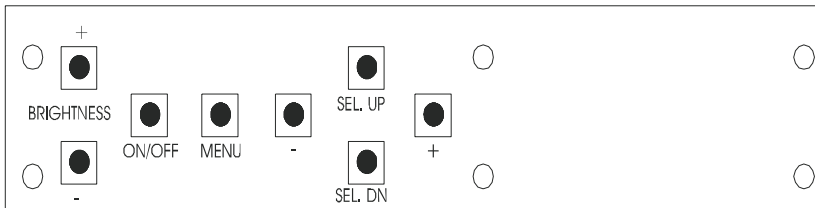


Digital type

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

Specifications subject to change without notice

**OSD functions**

| | |
|---|---|
| **Display Mode** (icon) | **Display Mode:**  1P  2P LR  2P TB  2P PIP  4P<br><br>[Default] |
| **Display Function** (icon) | **Display Function:**<br><br>**1P: Disp Rotate :  0        [Default]**<br>                            **90**<br>                            **180**<br>                            **270**<br><br>**2P LR: Input Swap**<br><br>**2P TB: Input Swap**<br><br>**2P PIP: PIP Position : Top-left**<br>                              **Top-right**<br>                              **Bottom-left**<br>                              **Bottom-right   [Default]**<br><br>        **PIP Transparency : [0 - 10]   [Default 0]**<br>        **PIP Size :              [0 - 10]   [Default 10]**<br>        **Input Swap** |
| **Picture** (icon) | **Picture:**<br><br>**Backlight    [0-100]      [Default 100]**<br>**Brightness  [0-100]      [Default 50]**<br>**Contrast     [0-100]      [Default 50]**<br>**Sharpness   [0-4]        [Default 2]** |
| **VGA Setup** (icon) | **VGA Setup:**<br><br>**Auto Adjust**<br>**H Position   [0-100]  [Default 50]**<br>**V Position   [0-100]  [Default 50]**<br>**Clock         [0-100]  [Default 50]**<br>**Phase        [0-100]  [Default 0]**<br><br>**Color Gain : Set**<br>                 **Reset** |
| **Color** (icon) | **Color:**<br><br>**Gamma :  1.8**<br>           **2.0**<br>           **2.2   [Default]**<br>           **2.4**<br><br>**Temperature: 9300**<br>                  **7500**<br>                  **6500    [Default]**<br>                  **5800**<br>                  **3200**<br>                  **sRGB**<br>                  **User : R [0-255]**<br>                            **G [0-255]**<br>                            **B [0-255]**<br><br>**Color Effect: Standard     [Default]**<br>                 **Game**<br>                 **Movie**<br>                 **Photo**<br>                 **Vivid** |

Specifications subject to change without notice

| | |
|---|---|
| | **User: R:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br>**Y:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br>**G:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br>**C:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br>**B:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br>**M:**<br>    **Hue [0-100]**<br>    **Sat [0-100]**<br><br>**Hue:        [0-100]    [Default 50]**<br>**Saturation  [0-100]    [Default 50]** |
| **Advanced** | **Advanced:**<br><br>**Aspect Ratio: Full     [Default]**<br>              **16:9**<br>              **4:3**<br>              **5:4**<br>              **1:1**<br><br>**Over Scan: ON     [Default]**<br>           **OFF**<br><br>**Over Drive: ONOFF: ON**<br>                 **OFF         [Default]**<br>           **OD Gain  [0-100]    [Default 50]**<br><br>**Communication:  RS-232    [Default]**<br>                 **Network**<br><br>**Auto Source Seek: OFF**<br>                  **ON     [Default]**<br><br>**Hot Key: Hot Key 1 (< \| >) : Input**<br>                 **Backlight**<br>                 **Brightness**<br>                 **Contrast**<br>                 **Sharpness**<br>                 **Hue**<br>                 **Saturation**<br>                 **Aspect Ratio**<br>                 **Display Mode**<br>                 **Input Swap**<br>                 **PIP Size**<br>                 **Auto Adjust**<br>                 **Volume**<br>                 **No Function   [Default]**<br><br>**Hot Key: Hot Key 1 (Up \| Dn) : Input**<br>                 **Backlight**<br>                 **Brightness**<br>                 **Contrast**<br>                 **Sharpness**<br>                 **Hue**<br>                 **Saturation**<br>                 **Aspect Ratio**<br>                 **Display Mode**<br>                 **Input Swap**<br>                 **PIP Size**<br>                 **Auto Adjust**<br>                 **Volume**<br>                 **No Function   [Default]** |

Specifications subject to change without notice

| | |
|---|---|
| | **Power Save: OFF**<br>        **ON   [Default]**<br><br>**Default Power: OFF**<br>        **ON   [Default]** |
| **Input** | **Input:**<br>**(For all display modes: 1P/ 2R LR / 2P TB / 2P PIP / 4P)**<br><br>**A0 : VGA**<br>**D0 : DP**<br>**D1 : HDMI**<br>**D2 : HDMI**<br>**D4 : DVI** |
| **Audio** | **Audio:**<br><br>**Volume  [0-100]    [Default 50]**<br><br>**Mute: ON**<br>        **OFF        [Default]**<br><br><br>**Audio Source (1P) :    Analog                      [Default]**<br>                        **Digital (region 1)**<br><br>**Audio Source (2P LR) : Analog                 [Default]**<br>                        **Digital (region 1) - Left**<br>                        **Digital (region 2) - Right**<br><br>**Audio Source (2P TB) : Analog                 [Default]**<br>                        **Digital (region 1) - Top**<br>                        **Digital (region 2) - Bottom**<br><br>**Audio Source (2P PIP) : Analog                      [Default]**<br>                        **Digital (region 1) - Main**<br>                        **Digital (region 2) - Sub**<br><br>**Audio Source (4P)    : Analog              [Default]**<br>                        **Digital (region 1) - Upper left**<br>                        **Digital (region 2) - Lower left**<br>                        **Digital (region 3) - Upper right**<br>                        **Digital (region 4) - Lower right** |
| **Other** | **Other:**<br><br>**Reset**<br><br>**Menu Time  [On, 11-60]    [Default 11]**<br><br>**OSD H Position  [0-100]    [Default 50]**<br><br>**OSD V Position  [0-100]    [Default 50]**<br><br>**Language**<br><br>**Transparency  [0-255]    [Default 0]**<br><br>**Rotate: 0              [Default 0]**<br>        **90**<br>        **270**<br><br>**Border Width:  [0-10]    [Default 0]**<br><br>**Border Color: R        [Default]**<br>                **G**<br>                **B**<br>                **W**<br><br>**Video Wall: IR ID Assign : [0-254]            [Default 0]** |

| | |
|---|---|
| | **Wall On/Off : ON**<br>**: OFF　　　　　[Default]**<br>**Wall Size : Wall Horizontal: [1-15]　[Default 1]**<br>**: Wall Vertical:　　[1-15]　[Default 1]**<br>**Wall Position : X Position: [0-14]　[Default 0]**<br>**Wall Position : Y Position: [0-14]　[Default 0]**<br>**Bezel On/Off : ON**<br>**: OFF　　　　　[Default]** |
| Information | **Information:**<br><br>D1: HDMI<br>3840x2160@60.1Hz<br>H:135.1KHz　PCLK: 594.4MHz<br>HDCP Disabled |
| Factory | **Factory:**<br><br>**Backlight Setup: Invert : OFF　[Default]**<br>　　　　　　　　　　**ON**<br><br>　　　　　　**D/A / PWM : PWM　[Default]**<br>　　　　　　　　　　　**D/A**<br><br>　　　　　　**Frequency : [100Hz - 440Hz]　[Default 160Hz]**<br><br>　　　　　　**Min. Level : [0% - 50%]　[Default 5%]**<br><br>**VBy1 Setup : Pin 15 : Low　[Default]**<br>　　　　　　　　　**High**<br><br>　　　　　　**Pin 16 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 17 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 18 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 19 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 20 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 21 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 22 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 23 : Low　[Default]**<br>　　　　　　　　**High**<br><br>　　　　　　**Pin 24 : Low　[Default]**<br>　　　　　　　　**High**<br><br>**EDID Setup : Reset** |

## CONNECTORS, PINOUTS & JUMPERS

The various connectors are:
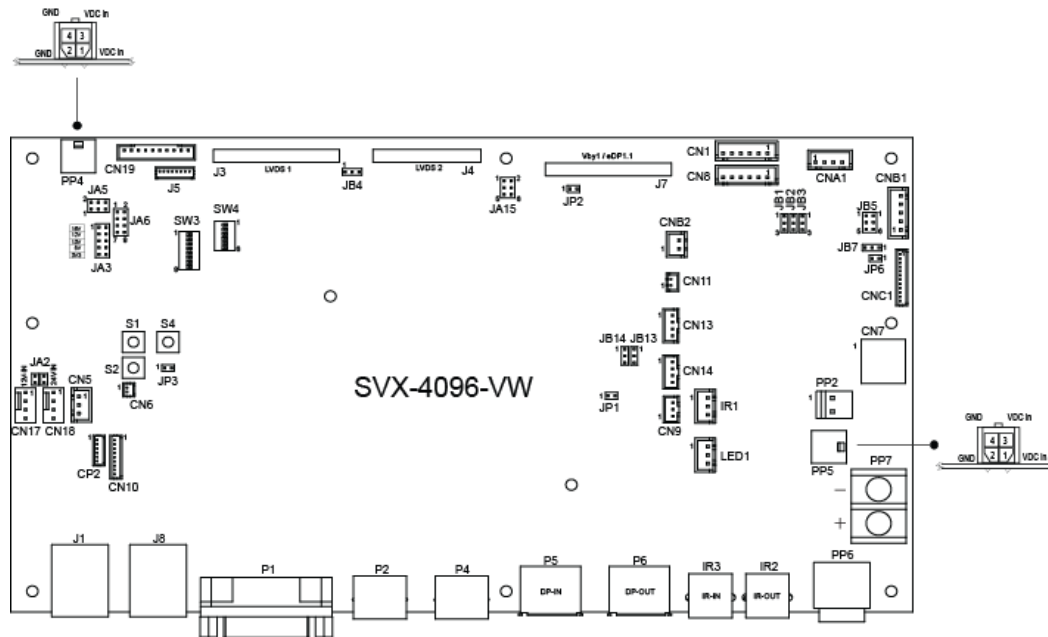


**Summary: Connectors**

| Ref | Purpose | Description |
|---|---|---|
| CN1 | Reserved for second RS-232 serial control | JST 6-way, B6B-XH-A               (Matching type : XHP-6) |
| CN5 | Reserved for external temperature sensor | JST 3-way, B3B-XH-A               (Matching type : XHP-3) |
| CN6 | Reserved for light sensor | DF13 2 ways            (Matching type : DF13-2S-1.25C) |
| CN7 | Audio board connector | Dual pin header 5x2, 0.1" pitch right angle (Matching audio add-on board P/N 416940020-3) |
| 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) |
| CN10 | Reserved for Fan & backlight power monitoring connector | Hirose DF13-9P-1.25 DSA       (Mating type : DF13-9S-1.25C) |
| CN11 | SPDIF Audio output | JST B2B-ZR               (Matching type : ZHR-2)<br>(Matching extend cable P/N 426007400-3) |
| CN13 | Audio line in | JST B4B-ZR               (Matching type : ZHR-4) |
| CN14 | Audio line out | JST B4B-ZR               (Matching type : ZHR-4)<br>(Use audio cable P/N 426451800-3 to connect with audio add-on bard P/N 416940020-3) |
| CN17 | Fan 1 connector | FAN connector, MKL-DP3-04W3-4 |
| CN18 | Fan 2 connector | FAN connector, MKL-DP3-04W3-4 |
| CN19 | Additional panel power output | JST B10B-PH-K             (Matching type : PHR-10) |
| CNA1 | Auxiliary power output | JST 4-way, B4B-XH-A               (Matching type : XHP-4)<br>(Matching cable P/N 426040200-3) |
| CNB1 | Backlight inverter | JST 5-way, B5B-XH-A               (Matching type : XHP-5)<br>(Matching cable P/N 426058300-3) |
| CNB2 | Backlight status input connector | JST 2 way, B2B-XH-A               (Matching type : XHP-2) |
| CNC1 | OSD control | Hirose DF13A-12P-1.25H       (Mating type : DF13-12S-1.25C)<br>(Matching OSD switch mount cable P/N 426122200-3 (150mm) or 426122210-3 (250mm) |
| CP2 | Reserved | Reserved |
| IR1 | Infra-red sensor connector | JST 3-way, B3B-XH-A               (Matching type : XHP-3) |
| IR2 | Infra-red sensor output connector | RJ-11 connector |
| IR3 | Infra-red sensor input connector | RJ-11 connector |
| J1 | Ethernet | RJ-45 connector |
| J3 | LVDS 1 | JAE FI-RE51S-HF               (Matching type : FI-RE51HL) |
| J4 | LVDS 2 | JAE FI-RE41S-HF               (Matching type : FI-RE41HL) |
| J5 | Panel power output | JS-1147A-08 Top 1.25mm       (Matching type : JS-1146-08) |
| J7 | V-by-One panel signal output | JAE FI-RE51S-HF               (Matching type : FI-RE51HL) |
| J8 | Ethernet | RJ-45 connector |
| LED1 | Power LED connector | JST 3-way, B3B-XH-A               (Matching type : XHP-3) |
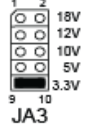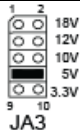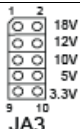
Specifications subject to change without notice

| | | | |
|---|---|---|---|
| P1 | DVI-I -- D4 / VGA -- A0 | DVI-I connector | |
| P2 | HDMI (1.4) -- D3 | HDMI connector | |
| P4 | HDMI (2.0) -- D1 | HDMI connector | |
| P5 | Display Port (1.2) -- D0 | Display Port connector | |
| P6 | Display Port Output | Display Port connector | |
| PP2 | Power input (alternative) | DC power Molex 2 pin 0.156" pitch | |
| PP4 | External panel power input | Molex 43045-0400 compatible<br>(Matching connector type : Molex 43025-0400 compatible)<br>(Matching power cable :  P/N 426013710-3) | |
| PP5 | 12V/24VDC input power | Molex 43045-0400 compatible<br>(Matching connector type : Molex 43025-0400 compatible)<br>(Matching power cable :  P/N 426013710-3) | |
| PP6 | 12V/24VDC input power | 4-way PWR DIN Jack, MDP-JRM-04 | |
| PP7 | 12V/24VDC input power | Terminal block, ETB5302202002 | |
| 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 | |

Specifications subject to change without notice
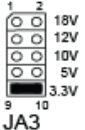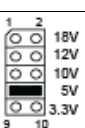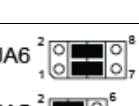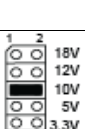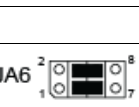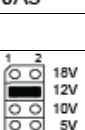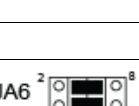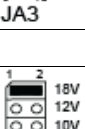
**Summary: Jumpers setting**

| Ref | Purpose | Note |
|---|---|---|
| JA2 | Fans Power select | 24V Power input – Short 24V-IN, Open 12V-IN<br>12V Power input – Open 24V-IN, Short 12V-IN |
| JA3 | Panel power voltage select<br>**CAUTION**: Incorrect setting can damage panel | See panel voltage setting table 1 |
| JA5 | Panel power voltage select<br>**CAUTION:** Incorrect setting will cause panel damage | See panel voltage setting table 1 |
| JA6 | Panel power voltage select<br>**CAUTION:** Incorrect setting will cause panel damage | See panel voltage setting table 1 |
| JA15 | Panel power output control via J7 (pin 1-8) and J6 (pin 5-9) | 1-3, 2-4 = Enable panel power (3.3/5V) output on J7 and J6<br>3-5, 4-6 = Enable panel power (10/12/18/24V) output on J7 and J6<br>Open = Disable panel power output on J7 and J6 |
| JB1 | Backlight brightness voltage range | 1-2 = 5V max<br>2-3 = 3.3V max |
| JB2 | Backlight inverter on/off control – signal level | 2-3 = On/Off control signal 'High' = +5V<br>1-2 = On/Off control signal 'High' = +3.3V<br>Open = On/Off control signal 'High' = Open collector<br>**CAUTION**: Incorrect setting can damage inverter. |
| JB3 | Backlight inverter on/off control – polarity | 1-2 = control signal 'high' = Backlight ON<br>2-3 = control signal 'low' = Backlight ON |
| JB4 | Reserved for LVDS (J3) GPIO pins voltage selection | 1-2 = 3.3V<br>2-3 = 5V |
| JB5 | Backlight control type selection | 1-2 = VR/Digital switch mount control<br>3-4 = Analog backlight brightness - voltage range 0~5V<br>5-6 = PWM (Pulse Width Modulation) brightness |
| JB7 | Backlight control voltage on CNB1 pin 4<br><br>(Function when JB5 sets 1-2 closed) | Open = For OSD switch mount control (Default)<br>1-2 = 0V<br>2-3 = 3.3V / 5V controlled by JB1 |
| JB13 | V-by-One / eDP selection on J7 | 1-2 = V-by-One<br>2-3 = eDP (1.1) |
| JB14 | V-by-One / eDP selection on J7 | 1-2 = V-by-One<br>2-3 = eDP (1.1) |
| JP1 | Factory use | Default Open |
| JP2 | V-by-One power output configuration | 1-2 = All pin 44 ~ pin 51 on J7 have power output<br>Open = Only the upper four pins have power output<br><br>(Refer to power output enabled/disabled on JA15. But not applicable if JA15 is set to OPEN) |
| JP6 | Input power control | Short = External switch control and fix the board ON<br>Open = Switch mount control |

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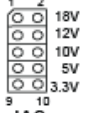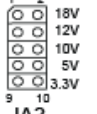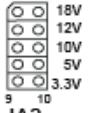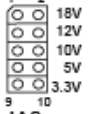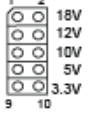
| Input voltage via PP2/PP5 | Panel Voltage | JA3 | JA5 | JA6 | Jumper on board |
|---|---|---|---|---|---|
| 12VDC | 3.3V | 3V3 closed | 1-3 & 2-4 | 1-3 & 2-4 | |
| | 5V | 5V closed | 1-3 & 2-4 | 1-3 & 2-4 | |
| | 12V | OPEN | 1-3 & 2-4 | 5-7 & 6-8 | |

**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 | |
| | 10V | 10V closed | 1-3 & 2-4 | 3-5 & 4-6 | |
| | 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 PP5 or PP2.

| Input voltage via PP4 | Input voltage via PP2 / PP5 | Panel Voltage | JA3 | JA5 | JA6 | Jumper on board |
|---|---|---|---|---|---|---|
| 3.3 / 5 / 10 /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 |  |
| | | 10V | OPEN | 3-5 & 4-6 | 3-5 & 4-6 |  |
| | | 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 10V, 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)



**JA3, JA6 & JA5**

SVX-4096-VW
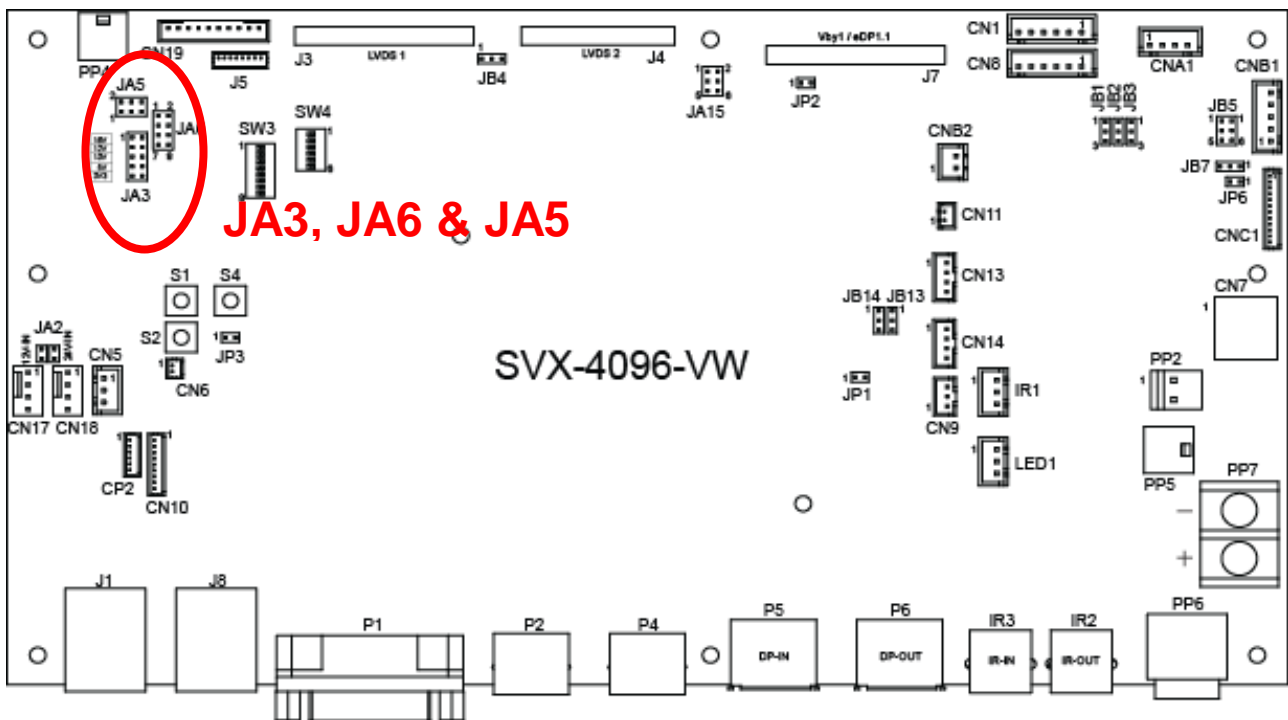
**Table 2 : DIP Switch selection – SW3**

| Pos #1 | Pos #2 | Pos #3 | Pos.#4 | Description | Panel resolution |
|--------|--------|--------|--------|-------------|------------------|
| For 4K UHD panels | | | | | |
| OFF | OFF | OFF | OFF | IE-2000 (120Hz FRC) | 3840 x 2160 |
| OFF | OFF | OFF | OFF | V-By-One panel | 3840 x 2160 |
| ON | OFF | OFF | OFF | Reserved | 3840 x 2160 |
| OFF | ON | OFF | OFF | Reserved | 3840 x 2160 |
| ON | ON | OFF | OFF | Reserved | 3840 x 2160 |
| OFF | OFF | OFF | ON | Reserved | 3840 x 2160 |
| For WUXGA panels | | | | | |
| OFF | OFF | OFF | OFF | LVDS panel | 1920 x 1200 |
| ON | OFF | OFF | OFF | LVDS panel | 1920 x 1080 |

**Remark : The above panel timings are generated based on the panel specification. 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 (1920 x 1200 / 1080) |
| ON | OFF | OFF | Reserved |
| OFF | ON | OFF | Reserved |
| ON | ON | OFF | Reserved |
| OFF | OFF | ON | Reserved |
| ON | OFF | ON | Reserved |
| OFF | ON | ON | 4K UHD (3840 x 2160) |
| ON | ON | ON | Others |

| Pos. #8 | | Reserved |
|---------|--|----------|

**Table 3 : DIP switch selection – SW4**

| Pos # | Function | Description |
|-------|----------|-------------|
| 1 | LVDS data mapping | OFF: VESA<br>ON: JEIDA |
| 2 and 3 | Panel display division | Pos#3   Pos#2<br>OFF   OFF   1 division (Non-division)<br>OFF   ON   2 division<br>ON   OFF   4 division<br>ON   ON   8 division |
| 4 | Output display bit mode | OFF: 10-bit<br>ON: 8-bit |
| 5 | Reserved | Reserved |
| 6 | Reserved | Reserved |

**CN1 – RS-232 serial control (2nd): JST B6B-XH-A   (Matching type : XHP-6)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | NC | No connection |
| 2 | NC | No connection |
| 3 | VCC | +5V |
| 4 | TXD | RS-232 Tx data |
| 5 | GND | Ground |
| 6 | RXD | RS-232 Rx data |

**CN5 – Temperature sensor connector : JST B3B-XH-A   (Matching type : XHP-3)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | VDD | +3.3V |
| 3 | EX_TMP_SENSOR | Temperature sensor input |

**CN6 – Light sensor connector : DF13 2-ways  (Matching type : DF13-2S-1.25C)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | SENSOR | Light sensor input |
| 2 | VDD | +3.3V |

**CN7 -  Audio line out : 2x5 right angled header (Matching audio add-on board P/N 416940020-3 & Audio extend cable P/N 426009700-3)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | VCC | Audio board logic power supply, +5V |
| 2 | VOLSEL0 | Reserved |
| 3 | VOLSEL1 | Reversed |
| 4 | TUNAUDSEL | Reserved |
| 5 | CLK/CNT | Reserved |
| 6 | GND | Ground |
| 7 | +12V/+24V | Audio board power supply, +12V/+24V |
| 8 | NC | No connection |
| 9 | NC | No connection |
| 10 | GND | Ground |

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

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | EXT_SCL | Reserved |
| 2 | EXT_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 |

**CN10 -  Fan and backlight power monitoring connector : Hirose DF13-9P-1.25 DSA  (Matching type : DF13-9S-1.25C)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | TACH1_IN | Tachometer IN of Fan 1 |
| 3 | GND | Ground |
| 4 | TACH2_IN | Tachometer IN of Fan 2 |
| 5 | GND | Ground |
| 6 | PS_V1_IN | Power sense input 1 |
| 7 | GND | Ground |
| 8 | PS_V2_IN | Power sense input 2 |
| 9 | AUX | Reserved |

**CN11 – SPDIF audio output connector : JST B2B-ZR  (Matching type : ZHR-2)**

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

**CN13 -  Audio line in: JST B4B-ZR  (Matching type : ZHR-4)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | LINE_IN_L | Line in (Left) |

Specifications subject to change without notice

| 3 | GND | Ground |
|---|---|---|
| 4 | LINE_IN_R | Line in (Right) |

**CN14 - Audio line out: JST B4B-ZR (Matching type : ZHR-4)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | AUDIO_OUT_L | Audio out (Left) |
| 3 | GND | Ground |
| 4 | AUDIO_OUT_R | Audio out (Right) |

**CN17 - Fan 2 connector**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | +12V | +12V power supply for Fan |
| 3 | TACH1IN | RPM status |
| 4 | PWM1 | Reserved |

**CN18 - Fan 2 connector**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | +12V | +12V power supply for Fan |
| 3 | TACH2IN | RPM status |
| 4 | PWM2 | Reserved |

**CN19 – Additional panel power output : JST B10B-PH-K (Matching type : PHR-10)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | PVLCD_High | Panel power supply (+10V / 12V / 18V)  (selected by JA3, JA5 & JA6) |
| 2 | PVLCD_High | Panel power supply (+10V / 12V / 18V)  (selected by JA3, JA5 & JA6) |
| 3 | PVLCD_High | Panel power supply (+10V / 12V / 18V)  (selected by JA3, JA5 & JA6) |
| 4 | PVLCD_High | Panel power supply (+10V / 12V / 18V)  (selected by JA3, JA5 & JA6) |
| 5 | PVLCD_High | Panel power supply (+10V / 12V / 18V)  (selected by JA3, JA5 & JA6) |
| 6 | GND | Ground |
| 7 | GND | Ground |
| 8 | GND | Ground |
| 9 | GND | Ground |
| 10 | 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 |

**CNB2 – Backlight status input inverter connector: JST B2B-XH-A (Matching type : XHP-2 )**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | BL_STATUS | Backlight status (Normal = High) |
| 2 | GND | Ground |

**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 |

Specifications subject to change without notice

| 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.

**CP2 - Reserved**

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

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 1 | GND | Ground |
| 2 | VCC | +3.3V |
| 3 | IR Data | IR data |

**IR2 – Infra-Red sensor connector output: RJ11 connector**

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 1 | NC | No connection |
| 2 | NC | No connection |
| 3 | NC | No connection |
| 4 | GND | Ground |
| 5 | Signal out | IR signal ouput |
| 6 | NC | No connection |

**IR3 – Infra-Red sensor connector input: RJ11 connector**

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 1 | NC | No connection |
| 2 | Signal Out | IR Signal output |
| 3 | GND | Ground |
| 4 | NC | No connection |
| 5 | Signal in | IR signal in |
| 6 | NC | No connection |

**J1 – Ethernet connector: RJ-45 connector**

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 1 | TX+ | Transmit data + |
| 2 | TX- | Transmit data - |
| 3 | RX+ | Receive data + |
| 4 | CMT1 | Network use |
| 5 | CMT1 | Network use |
| 6 | RX- | Receive data - |
| 7 | CMT3 | Network use |
| 8 | CMT3 | Network use |

**J3 – LVDS_1 output connector: JAE FI-RE51S-HF (Matching type : JAE FI-RE51HL)**

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-------------|
| 1 | VLCD_HV | Panel power supply (+10V / 12V / 18V) |
| 2 | VLCD_HV | Panel power supply (+10V / 12V / 18V) |
| 3 | VLCD_HV | Panel power supply (+10V / 12V / 18V) |
| 4 | VLCD_HV | Panel power supply (+10V / 12V / 18V) |
| 5 | VLCD_HV | Panel power supply (+10V / 12V / 18V) |
| 6 | VLCD_LV | Panel power supply (3,3V/5V) |
| 7 | VLCD_LV | Panel power supply (3,3V/5V) |
| 8 | VLCD_LV | Panel power supply (3,3V/5V) |
| 9 | VLCD_LV | Panel power supply (3,3V/5V) |
| 10 | VLCD_LV | Panel power supply (3,3V/5V) |
| 11 | GND | Ground |
| 12 | GND | Ground |
| 13 | GND | Ground |
| 14 | GND | Ground |
| 15 | GND | Ground |
| 16 | OP1 | - |
| 17 | OP2 | - |
| 18 | OP3 | - |
| 19 | OP4 | - |
| 20 | GND | Ground |
| 21 | GND | Ground |
| 22 | LVDS_OUT1_A4+ | Positive differential LVDS data bit A4 |
| 23 | LVDS_OUT1_A4- | Negative differential LVDS data bit A4 |
| 24 | LVDS_OUT1_A3+ | Positive differential LVDS data bit A3 |
| 25 | LVDS_OUT1_A3- | Negative differential LVDS data bit A3 |
| 26 | GND | Ground |
| 27 | LVDS_OUT1_AC+ | Positive LVDS clock for A channel |

Specifications subject to change without notice

| 28 | LVDS_OUT1_AC- | Negative LVDS clock for A channel |
|---|---|---|
| 29 | GND | Ground |
| 30 | LVDS_OUT1_A2+ | Positive differential LVDS data bit A2 |
| 31 | LVDS_OUT1_A2- | Negative differential LVDS data bit A2 |
| 32 | LVDS_OUT1_A1+ | Positive differential LVDS data bit A1 |
| 33 | LVDS_OUT1_A1- | Negative differential LVDS data bit A1 |
| 34 | LVDS_OUT1_A0+ | Positive differential LVDS data bit A0 |
| 35 | LVDS_OUT1_A0- | Negative differential LVDS data bit A0 |
| 36 | GND | Ground |
| 37 | LVDS_OUT1_B4+ | Positive differential LVDS data bit B4 |
| 38 | LVDS_OUT1_B4- | Negative differential LVDS data bit B4 |
| 39 | LVDS_OUT1_B3+ | Positive differential LVDS data bit B3 |
| 40 | LVDS_OUT1_B3- | Negative differential LVDS data bit B3 |
| 41 | GND | Ground |
| 42 | LVDS_OUT1_BC+ | Positive LVDS clock for B channel |
| 43 | LVDS_OUT1_BC- | Negative LVDS clock for B channel |
| 44 | GND | Ground |
| 45 | LVDS_OUT1_B2+ | Positive differential LVDS data bit B2 |
| 46 | LVDS_OUT1_B2- | Negative differential LVDS data bit B2 |
| 47 | LVDS_OUT1_B1+ | Positive differential LVDS data bit B1 |
| 48 | LVDS_OUT1_B1- | Negative differential LVDS data bit B1 |
| 49 | LVDS_OUT1_B0+ | Positive differential LVDS data bit B0 |
| 50 | LVDS_OUT1_B0- | Negative differential LVDS data bit B0 |
| 51 | GND | Ground |

**J4 – LVDS_2 output connector: JAE FI-RE41S-HF (Matching type : JAE FI-RE41HL)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | GND | Ground |
| 2 | LVDS_OUT2_B0- | Negative differential LVDS data bit B0 |
| 3 | LVDS_OUT2_B0+ | Positive differential LVDS data bit B0 |
| 4 | LVDS_OUT2_B1- | Negative differential LVDS data bit B1 |
| 5 | LVDS_OUT2_B1+ | Positive differential LVDS data bit B1 |
| 6 | LVDS_OUT2_B2- | Negative differential LVDS data bit B2 |
| 7 | LVDS_OUT2_B2+ | Positive differential LVDS data bit B2 |
| 8 | LVDS_OUT2_BC- | Negative LVDS clock for B channel |
| 9 | LVDS_OUT2_BC+ | Positive LVDS clock for B channel |
| 10 | GND | Ground |
| 11 | LVDS_OUT2_B3- | Negative differential LVDS data bit B3 |
| 12 | LVDS_OUT2_B3+ | Positive differential LVDS data bit B3 |
| 13 | GND | Ground |
| 14 | LVDS_OUT2_B4- | Negative differential LVDS data bit B4 |
| 15 | LVDS_OUT2_B4+ | Positive differential LVDS data bit B4 |
| 16 | GND | Ground |
| 17 | LVDS_OUT2_A0- | Negative differential LVDS data bit A0 |
| 18 | LVDS_OUT2_A0+ | Positive differential LVDS data bit A0 |
| 19 | LVDS_OUT2_A1- | Negative differential LVDS data bit A1 |
| 20 | LVDS_OUT2_A1+ | Positive differential LVDS data bit A1 |
| 21 | LVDS_OUT2_A2- | Negative differential LVDS data bit A2 |
| 22 | LVDS_OUT2_A2+ | Positive differential LVDS data bit A2 |
| 23 | LVDS_OUT2_AC- | Negative LVDS clock for A channel |
| 24 | LVDS_OUT2_AC+ | Positive LVDS clock for A channel |
| 25 | GND | Ground |
| 26 | LVDS_OUT2_A3- | Negative differential LVDS data bit A3 |
| 27 | LVDS_OUT2_A3+ | Positive differential LVDS data bit A3 |
| 28 | GND | Ground |
| 29 | LVDS_OUT2_A4- | Negative differential LVDS data bit A4 |
| 30 | LVDS_OUT2_A4+ | Positive differential LVDS data bit A4 |
| 31 | GND | Ground |
| 32 | GND | Ground |
| 33 | GND | Ground |
| 34 | GND | Ground |
| 35 | GND | Ground |
| 36 | GND | Ground |
| 37 | NC | No connection |
| 38 | NC | No connection |
| 39 | NC | No connection |
| 40 | NC | No connection |
| 41 | NC | No connection |

**J5 – Panel power output connector: JS-1147A-08 Top 1.25mm  (Matching type : JS-1146-08)**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | PVLCD_Low (3,3V/5V) | Panel power supply (3,3V/5V) |

Specifications subject to change without notice

| 2 | PVLCD_Low (3,3V/5V) | Panel power supply (3,3V/5V) |
|---|---|---|
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | GND | Ground |
| 6 | PVLCD_High | Panel power supply (+10V / 12V / 18V) |
| 7 | PVLCD_High | Panel power supply (+10V / 12V / 18V) |
| 8 | PVLCD_High | Panel power supply (+10V / 12V / 18V) |

**J7 – V-by-One panel signal output connector: JAE FI-RE51S-HF (Matching type : JAE FI-RE51HL)**

| PIN | | SYMBOL | DESCRIPTION |
|---|---|---|---|
| 1 | (51) | GND | Ground |
| 2 | (50) | VB1_TX7P | V-by-One HS Data Lane 7 |
| 3 | (49) | VB1_TX7N | V-by-One HS Data Lane 7 |
| 4 | (48) | GND | Ground |
| 5 | (47) | VB1_TX6P | V-by-One HS Data Lane 6 |
| 6 | (46) | VB1_TX6N | V-by-One HS Data Lane 6 |
| 7 | (45) | GND | Ground |
| 8 | (44) | VB1_TX5P | V-by-One HS Data Lane 5 |
| 9 | (43) | VB1_TX5N | V-by-One HS Data Lane 5 |
| 10 | (42) | GND | Ground |
| 11 | (41) | VB1_TX4P | V-by-One HS Data Lane 4 |
| 12 | (40) | VB1_TX4N | V-by-One HS Data Lane 4 |
| 13 | (39) | GND | Ground |
| 14 | (38) | VB1_TX3P | V-by-One HS Data Lane 3 |
| 15 | (37) | VB1_TX3N | V-by-One HS Data Lane 3 |
| 16 | (36) | GND | Ground |
| 17 | (35) | VB1_TX2P | V-by-One HS Data Lane 2 |
| 18 | (34) | VB1_TX2N | V-by-One HS Data Lane 2 |
| 19 | (33) | GND | Ground |
| 20 | (32) | VB1_TX1P | V-by-One HS Data Lane 1 |
| 21 | (31) | VB1_TX1N | V-by-One HS Data Lane 1 |
| 22 | (30) | GND | Ground |
| 23 | (29) | VB1_TX0P | V-by-One HS Data Lane 0 |
| 24 | (28) | VB1_TX0N | V-by-One HS Data Lane 0 |
| 25 | (27) | GND | Ground |
| 26 | (26) | LOCKN | V-by-One LOCK |
| 27 | (25) | HTPDN | V-by-One HTPDN |
| 28 | (24) | OP10 | High/Low state control |
| 29 | (23) | OP9 | High/Low state control |
| 30 | (22) | OP8 | High/Low state control |
| 31 | (21) | OP7 | High/Low state control |
| 32 | (20) | OP6 | High/Low state control |
| 33 | (19) | OP5 / PANEL_SCL | High/Low state control / Panel $I^2C$ SCL |
| 34 | (18) | OP4 / PANEL_SDA | High/Low state control / Panel $I^2C$ SDA |
| 35 | (17) | OP3 | High/Low state control |
| 36 | (16) | OP2 | High/Low state control |
| 37 | (15) | OP1 | High/Low state control |
| 38 | (14) | GND | Ground |
| 39 | (13) | GND | Ground |
| 40 | (12) | GND | Ground |
| 41 | (11) | GND | Ground |
| 42 | (10) | GND | Ground |
| 43 | (9) | NC | No Connection |
| 44 | (8) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 45 | (7) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 46 | (6) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 47 | (5) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 48 | (4) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 49 | (3) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 50 | (2) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |
| 51 | (1) | PVLCD_High | Panel power supply (selected by JA15 & JP2) |

(1) - (51): Pin# read on panel side.

**J8 – Ethernet connector: RJ-45 connector**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | TX+ | Transmit data + |
| 2 | TX- | Transmit data - |
| 3 | RX+ | Receive data + |
| 4 | CMT1 | Network use |
| 5 | CMT1 | Network use |
| 6 | RX- | Receive data - |
| 7 | CMT3 | Network use |
| 8 | CMT3 | Network use |

Specifications subject to change without notice

**LED1 – Status LED connector: JST 3-way B3B-XH-A     ~~3-pin header~~**

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

**P1 – DVI-I (Dual link) in**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | /RX2 | TMDS Data 2- |
| 2 | RX2 | TMDS Data 2+ |
| 3 | GND | Digital Ground |
| 4 | /Rx4 | TMDS Data 4- |
| 5 | Rx4 | TMDS Data 4+ |
| 6 | DDC_CLK | DDC Clock |
| 7 | DDC_DAT | DDC Data |
| 8 | VS_IN | Analog Vertical Sync |
| 9 | /RX1 | TMDS Data 1- |
| 10 | RX1 | TMDS Data 1+ |
| 11 | GND | Digital Ground |
| 12 | /Rx3 | TMDS Data 3- |
| 13 | Rx3 | TMDS Data 3+ |
| 14 | DDC_5V | +5V power supply for DDC (optional) |
| 15 | GND | Ground |
| 16 | HPD | Hot Plug Detect |
| 17 | /RX0 | TMDS Data 0- |
| 18 | RX0 | TMDS Data 0+ |
| 19 | GND | Digital Ground |
| 20 | /Rx5 | TMDS Data 5- |
| 21 | Rx5 | TMDS Data 5+ |
| 22 | GND | Digital Ground |
| 23 | RXC | TMDS Clock+ |
| 24 | /RXC | TMDS Clock- |
| C1 | RIN | Analog Red |
| C2 | GIN | Analog Green |
| C3 | BIN | Analog Blue |
| C4 | HS_IN | Analog horizontal sync |
| C5 | GND | Ground |
| C6 | NC | No connection |

**P2 – HDMI (1.4) 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 | NC | No connection |
| 14 | NC | No connection |
| 15 | SCL | SCL (I²C Serial Clock for DDC) |
| 16 | SDA | SDA (I²C Serial Data Line for DDC) |
| 17 | GND | Ground |
| 18 | +5V | +5 V Power (max 50 mA) |
| 19 | HPDET | Hot Plug Detect |

**P4 – HDMI (2.0) 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 | NC | No connection |
| 14 | NC | No connection |
| 15 | SCL | SCL (I²C Serial Clock for DDC) |
| 16 | SDA | SDA (I²C Serial Data Line for DDC) |
| 17 | GND | Ground |
| 18 | +5V | +5 V Power (max 50 mA) |
| 19 | HPDET | Hot Plug Detect |

**P5 – Display Port (1.2) connector**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | ML_Lane 0 (p) | Lane 0 (positive) |
| 2 | GND | Ground |
| 3 | ML_Lane 0 (n) | Lane 0 (negative) |
| 4 | ML_Lane 1 (p) | Lane 1 (positive) |
| 5 | GND | Ground |
| 6 | ML_Lane 1 (n) | Lane 1 (negative) |
| 7 | ML_Lane 2 (p) | Lane 2 (positive) |
| 8 | GND | Ground |
| 9 | ML_Lane 2 (n) | Lane 2 (negative) |
| 10 | ML_Lane 3 (p) | Lane 3 (positive) |
| 11 | GND | Ground |
| 12 | ML_Lane 3 (n) | Lane 3 (negative) |
| 13 | CONFIG1 | connected to Ground |
| 14 | CONFIG2 | connected to Ground |
| 15 | AUX CH (p) | Auxiliary Channel (positive) |
| 16 | GND | Ground |
| 17 | AUX CH (n) | Auxiliary Channel (negative) |
| 18 | Hot Plug | Hot Plug Detect |
| 19 | GND | Ground |
| 20 | DP_PWR | Power for connector (3.3 V 500 mA) |

**P6 – Display Port out connector**

| PIN | SYMBOL | DESCRIPTION |
|---|---|---|
| 1 | ML_Lane 0 (p) | Lane 0 (positive) |
| 2 | GND | Ground |
| 3 | ML_Lane 0 (n) | Lane 0 (negative) |
| 4 | ML_Lane 1 (p) | Lane 1 (positive) |
| 5 | GND | Ground |
| 6 | ML_Lane 1 (n) | Lane 1 (negative) |
| 7 | ML_Lane 2 (p) | Lane 2 (positive) |
| 8 | GND | Ground |
| 9 | ML_Lane 2 (n) | Lane 2 (negative) |
| 10 | ML_Lane 3 (p) | Lane 3 (positive) |
| 11 | GND | Ground |
| 12 | ML_Lane 3 (n) | Lane 3 (negative) |
| 13 | CONFIG1 | connected to Ground |
| 14 | CONFIG2 | connected to Ground |
| 15 | AUX CH (p) | Auxiliary Channel (positive) |
| 16 | GND | Ground |
| 17 | AUX CH (n) | Auxiliary Channel (negative) |
| 18 | Hot Plug | Hot Plug Detect |
| 19 | GND | Ground |
| 20 | DP_PWR | Power for connector (3.3 V 500 mA) |

**PP2 – Alternate 12V/24VDC input power: Molex 2 pin 0.156" pitch**

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

**PP4 – External panel power input: Molex 43045-0400 or compatible  (Matching type : Molex 43025-0400 or compatible)**

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

Specifications subject to change without notice

**PP5 – 12V/24VDC input power: Molex 43045-0400 or compatible  (Matching type : Molex 43025-0400 or compatible**

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | +12VDC / 24VDC in |
| 2 | Ground |
| 3 | +12VDC / 24VDC in |
| 4 | Ground |

**PP6 – Alternate 12V/24VDC input power: 4-way PWR DIN Jack MDP-JRM-04**

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

**PP7 – Alternate 12V/24VDC input power: Terminal block ETB5302202002**

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | External panel power |
| 2 | Ground |

## CONTROLLER DIMENSIONS
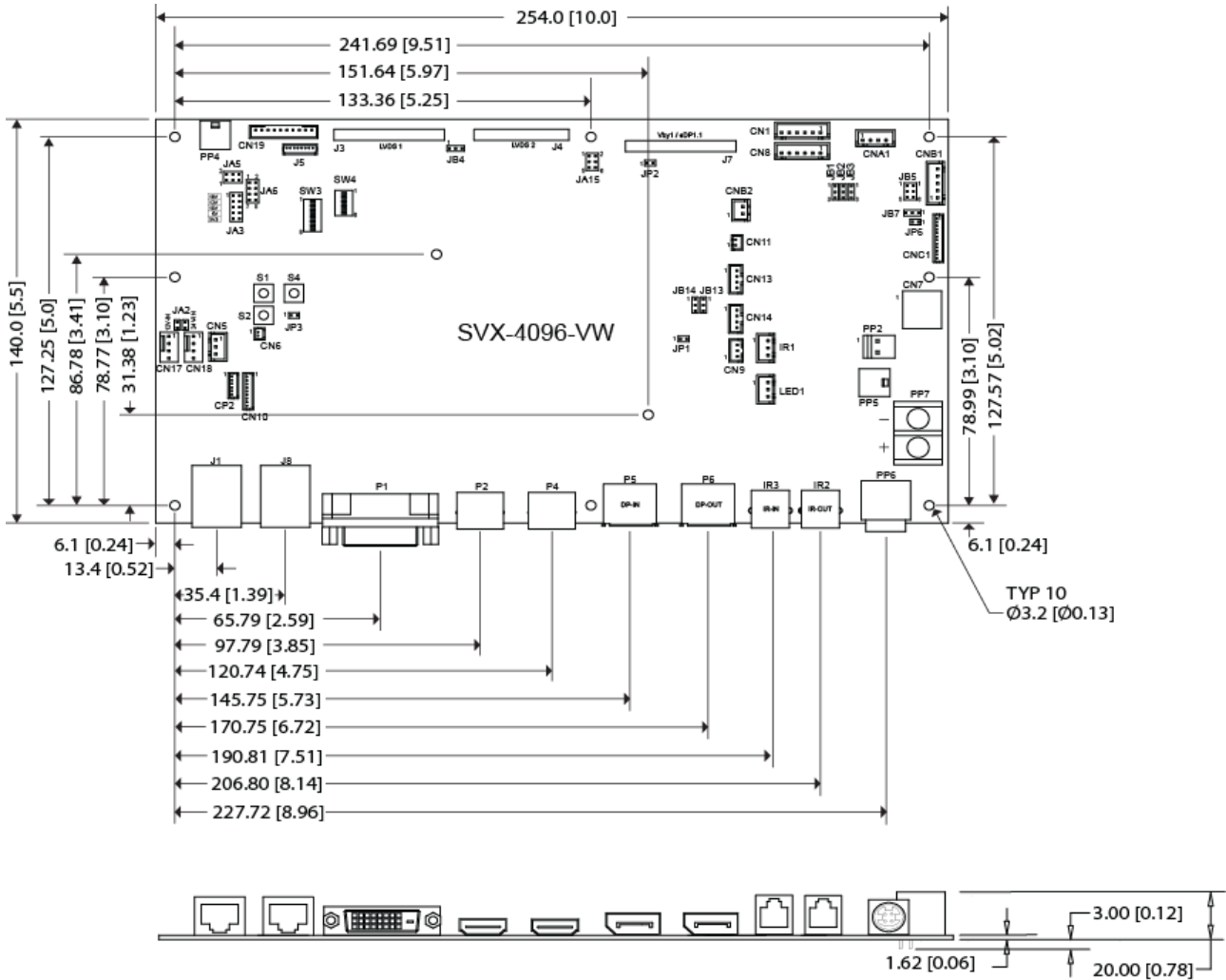


**Ready-made 3D Pro-E (SLDPRT) drawing files -** Save time and effort for your system volumetric analysis design. Includes jpg file previews. Please go to download at http://www.digitalview.com/products/SVX-4096-VW-lcd-controller

The maximum thickness of the controller is 18.93mm 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 JP6, 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 = 3.3V, 2-3 H = 5V, 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 |

Specifications subject to change without notice

## Design Guideline for making VR circuitry :

**Digital View VR ckt description**
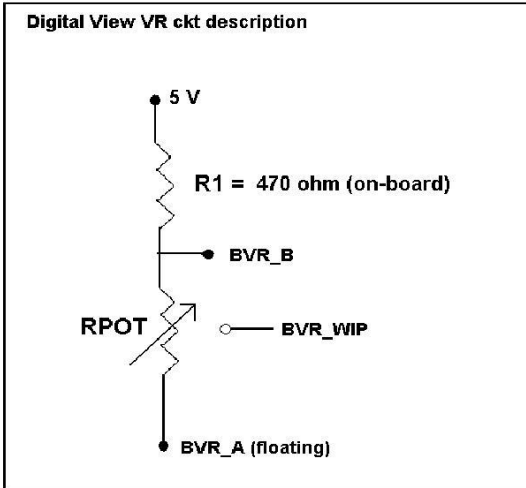


**Signal description / Notes :**
1) R1 : 470ohm on board
2) RPOT is an external potentiometer (in-line dip style) that can be plugged directly into CNC1 pins 3,4,5. RPOT must be supplied / installed by user.
3) BVR_B : Voltage tapped from "top" of potentiometer, the node of R1 and RPOT.
4) BVR_WIP : 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.



Figure 1

Rpot = Rab + Rbc

Specifications subject to change without notice
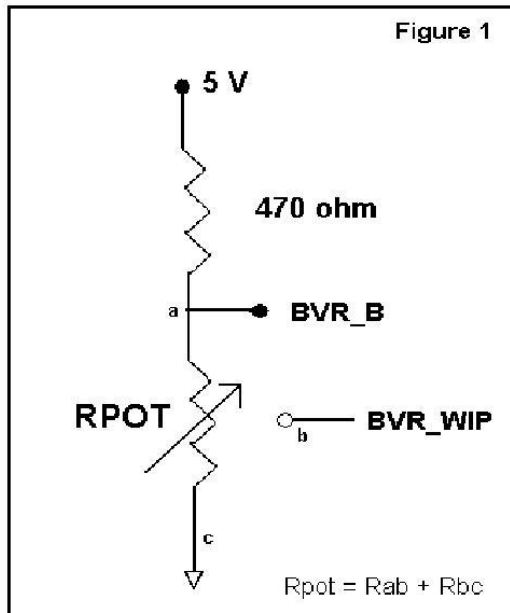
## TROUBLESHOOTING

**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.

The following are some of LED indicators onboard that can help to know the health status of the controller board:

LED1A
- Green : Valid video signal received on the selected input port.
- Red : No video signal received on the selected input port.
- Green + Red : The board is fail to boot up. Suggest to send it back to factory for check.
- Off : The board is not powered on.

LED2
- Green : +3.3V / +5V power is supplied to panel.
- Red : +10V / +12V / +18V power is supplied to panel.
- Off : No power is supplied to panel.

D2 (for V-by-One panel only)
- Green : V-by-One LOCKN signal is set to LOW by panel when CDR (clock data recovery) training is done and CDR is locked.

## SPECIFICATIONS

| | |
|---|---|
| Panel compatibility | Compatible with 4096x2160 resolutions of TFT LCD panels with V-by-One /LVDS panel interface. <br><br> A specified BIOS and some factory adjustment is 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, 10V, 12V, 18V |
| Panel signal | V-by-One (8 Lane) <br> LVDS (4 channel) |
| Video inputs | DVI-I (Dual Link) <br> Display Port 1.2 <br> HDMI 1.4 <br> HDMI 2.0 |
| Video output (Daisy chain) | Display Port 1.2 out |
| Functions display | On screen display (OSD) of functions |
| OSD menu functions | Image controls: <br> Panel brightness/contrast, Saturation, Hue, Color temperature, Sharpness, Aspect ratio, Rotate, Gamma, PIP/PBP. |
| OSD menu controls available | Power On/Off <br> OSD Menu <br> OSD Select up <br> OSD Select down <br> Setting + <br> Setting – |
| Control interface | Buttons, RS-232, IR Remote control (Daisy chain), Ethernet control (Daisy chain) |
| Audio | Digital audio line out (from header) with OSD volume control. (not amplified) |
| Settings memory | Settings are stored in non volatile memory |
| PC Connectivity | VGA / SVGA / XGA / SXGA / UXGA / WUXGA  analog or digital |
| Controller dimensions | 254mm x 140mm (10" x 5.5") |
| 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$^{o}$C to +70$^{o}$C |
| Operating temperature limits | 0$^{o}$C to +60$^{o}$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.

## Appendix I – Network connection (Daisy chain)

The SVX-4096-VW LCD interface controller has an RJ-45 Ethernet port (Daisy chain) for control and monitoring over a network. This application note introduces the two user interface modes:

- Command line direct mode
- Browser based web server mode

There is also a short overview of the command set and how it is implemented.

### QUICK GUIDE

For experienced users the following quick guide to trying out the network connection and functions may be useful.

**Command line direct mode**:  This is relevant when a PC application is used to send and receive commands over the network port.

**Browser based web server mode :** The network port will require an alternative firmware version if the browser based web server mode is required.
- Works with a normal network with DHCP, i.e. must use a router.
- Connect the SVX-4096-VW to the network and ensure power is on.
- Use the IP Locator utility available from the IP-60 web-page.
   http://www.digitalview.com/media/downloads/IPLocator.zip   (Windows only)
- Double click on the IP address in the IP Locator window, it will open the SVX-4096-VW browser page in your default browser. Alternatively copy the IP address into your browser address line.
- Test the functions that come up on the browser. The function list on browser can be found in Appendix VII.

For details, please refer to the separate application note.

## Appendix II – RS-232 control protocols and command set

**RS-232 Serial control (Baud rate 2400), 8 bits, 1 stop bit and no parity**

*Physical connection :*

Controller side
Connector interface : CN8
Mating connector : JST XHP-6

Computer side
Connector interface : Serial port
Mating connector : DB9 Female

(6)(5)(4)(3)(2)(1)    Mating face of CN8

(1)(2)(3)(4)(5)
(6)(7)(8)(9)    Mating face of RS-232 DB9 Male
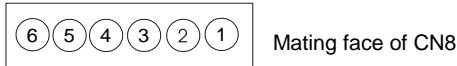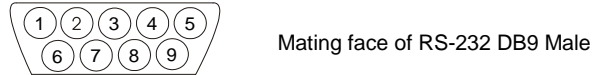
| PIN# | Description |
|------|-------------|
| 4 | RS-232 Tx Data |
| 5 | Ground |
| 6 | RS-232 Rx Data |

| PIN# | Description |
|------|-------------|
| 2 | RS-232 Rx Data |
| 3 | RS-232 Tx Data |
| 5 | Ground |

Remark :
(1) : RS-232 connection cable, 600mm P/N 426090200-3 can be ordered separately for connection.

*Software connection :*

The OSD function can be controlled through sending the RS-232 protocol.
The RS-232 program can be custom-made to fit for application or it can be used the serial control program, like Accessport, Telix or Serial Utility program developed by DigitalView. Please contact your local support for information.

## 1. Commands to implement switch mount control buttons

| Function | Command | Description | Remark |
|----------|---------|-------------|--------|
| Menu button | 0xf7 | Menu button pressed | Button equivalent |
| Select-down button | 0xfa | Select-down button pressed | Button equivalent |
| Select-up button | 0xfb | Select-up button pressed | Button equivalent |
| Right/+ button | 0xfc | Right/+ button pressed | Button equivalent |
| Left/- button | 0xfd | Left/- button pressed | Button equivalent |

## 2. Parameter setting - immediate, relative, reset and query

| Function | Command | Description | Acknowledge (if enabled) |
|----------|---------|-------------|--------------------------|
| Volume control - left+right channel | 0x80, "a" \| "A", nn \| "+" \| "-" \| "r" \| "R" \| "?" | Set audio (L+R) volume = value/increment/decrement<br>Reset<br>Query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x32 (50%) |
| Volume control - on/off (mute) | 0x80, "m" \| "M", "0" \| "1" \| "r" \| "R" \| "?" | Disable audio output.<br>Enable audio output.<br>Reset<br>Query | "0" - audio off (mute).<br>"1" - audio on. (Default) |
| Audio selection | 0x80, "P", "n" "?" "r" \| "R" | Select Audio Output<br>Query<br>Reset | "n" =<br>"0" - P1 (upper left picture) (Default)<br>"1" - P2 (lower left picture)<br>"2"- P3 (upper right picture)<br>"3" - P4 (lower right picture)<br>"A/a" – Analog source<br>Note: P1~P4 audio source is available when video source is either DP or HDMI |
| Brightness control | 0x81, nn \| "+" \| "-" \| "r" \| "R" \| "?" "m" "n" | Set brightness = value/increment/decrement<br>Reset<br>Query Current Source<br>Maximum query<br>Minimum query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x32 (50%) |
| Contrast control | 0x82, "a" \| "A", nn \| "+" \| "-" \| "r" \| "R" \| "?" "m" "n" | Set contrast = value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x32 (50%) |
| Color saturation control | 0x83, nn \| "+" \| "-" \| "r" \| "R" \| "?" "m" "n" | Set color saturation = value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x32 (50%) |
| Hue control | 0x84, nn \| "+" \| "-" \| "r" \| "R" \| "?" "m" "n" | Set tint = value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x32 (50%) |
| Phase control (only for VGA port) | 0x85, nn \| "+" \| "-" \| "?" | Set phase = value/increment/decrement<br>Query | nn = 0x00~ 0x64 (0~100%) |
| Image H position | 0x86, | Set horizontal position = | nn = 0x00~ 0x64 (0~100%) |

| | | | |
|---|---|---|---|
| (only for VGA port) | nn | "+" | "-" | <br> "r" | "R" | <br> "?" | value/increment/decrement <br> Reset <br> Query | |
| Image V position <br> (only for VGA port) | 0x87, <br> nnnn | "+" | "-" | <br> "r" | "R" | <br> "?" | Set vertical position = <br> value/increment/decrement <br> Reset <br> Query | nn = 0x00~ 0x64 (0~100%) <br><br> Default: 0x32 (50%) |
| Sharpness | 0x8a, <br> n | "+" | "-" | <br> "r" | "R" | <br> "?" | Set sharpness = <br> value/increment/decrement <br> Reset <br> Query | nn = 0x00~ 0x64 (0~100%) <br><br> Default: 0x32 (50%) |
| Clock control (only for VGA port) | 0x8b, <br> nn | "+" | "-" | <br> "?" | Set VGA clock= <br> Value/increment/decrement <br> Query | nn = 0x00~ 0x64 (0~100%) |
| Aspect Ratio | 0x8c, <br> "0" | "1" | "9" | "A" | <br> "F" <br> "r" | "R" | <br> "?" | Set video aspect ratio= <br> Value <br> Reset <br> Query | "0" – 1:1 <br> "1" – fill screen (Default) <br> "9" – 4:3 <br> "A" – 16:9 <br> "F" – 5:4 |
| Set display orientation | 0x8e, <br> n | <br> "r" | "R" | <br> "?" | Set display orientation = <br> value <br> Reset <br> Query | "0" – normal (0 degree) (Default) <br> "4" – rotated 90 <br> "5" – rotated 180 <br> "6" – rotated 270 <br> Note: Rotation is only allowed in 1P mode |
| Rotate OSD | 0x8f, <br> "0" | <br> "1" | <br> "3" | <br> "?" | <br><br> Normal OSD rotate <br> rotated 90 <br> rotated 270 <br> Query | "0" – normal OSD. (Default) <br> "1" – rotated 90 OSD. <br> "3" – rotated 270 OSD. |
| OSD H position | 0x90, <br> nn | "+" | "-" | <br> "r" | "R" | <br> "?" | Set OSD horizontal position = <br> value/increment/decrement <br> Reset <br> Query | nn = 0x00~ 0x64 (left ~ right) <br><br> Default: 0x32 (middle) |
| OSD V position | 0x91, <br> nn | "+" | "-" | <br> "r" | "R" | <br> "?" | Set OSD vertical position = <br> value/increment/decrement <br> Reset <br> Query | nn = 0x00~ 0x64 (top ~ bottom) <br><br> Default: 0x32 (middle) |
| OSD transparency | 0x92, <br> nn | "+" | "-" | <br> "r" | "R" | <br> "?" | Set OSD transparency = <br> value/increment/decrement <br> Reset <br> Query | nn = 0x00~ 0x64 (0~100%) <br><br> Default: 0x00 (No transparency) |
| OSD menu timeout | 0x93, <br> nn | "+" | "-" | <br><br> "r" | "R" | <br> "?" | Select menu timeout = <br> value/increment/decrement <br><br> Reset <br> Query | OSD menu timeout value. <br> nn = 0x0A – Always on <br> nn = 0x0B - 0x3C (11~60sec) <br> Default: 0x0B (11sec) |
| Input main video (P1) select | 0x98, <br> nn | "+" | "-" | <br> "r" | "R" | <br> "?" | Select P1 video input = <br> value/next input/previous input <br> Reset <br> Query | "nn" = <br> "0x41,0x31" A0: VGA <br> "0x50, 0x31"D0: DP (Default) <br> "0x48,0x31" D1: HDMI <br> "0x48,0x32" D2: HDMI <br> "0x46,0x31" D4: DVI |
| Auto source seek | 0x99, <br> "0" | "1" | <br> "r" | "R" | <br> "?" | Set auto source seek = <br> Disable/Enable <br> Reset <br> Query | <br><br><br> Default: "1" (Enable) |
| Source Layout | 0x9a, <br> n | <br> "r" | "R" | <br> "?" | Select video source layout = <br> Single, PIP , PBP, 4P <br> Reset, <br> Query | "n": <br> "0"- 1P (Single) (Default) <br> "1"- 2P PIP <br> "2"- 2P PBP (Left Right) |

| | | | "3"- 2P PBP (Top Bottom) <br> "4"- 4P |
|---|---|---|---|
| GAMMA value select | 0x9d, <br> n \| <br> "r" \| "R" <br> "?" | Select GAMMA value = <br> Value <br> Reset <br> Query | "n": <br> "5" – 1.8, <br> "7" – 2.0, <br> "2" – 2.2,  (Default) <br> "A" – 2.4 |
| Auto power off | 0x9f, <br> "0" \| "1" \| <br> "r" \| "R" \| <br> "?" | Set auto power save option = <br> Disable/Enable <br> Reset <br> Query | "n": <br> "0" – Disable auto power off <br> "1" – Enable auto power off  (Default) |
| Hot key 1 (plus and minus keys) | 0xa0,  "1", <br> n \| <br> "r" \| "R" \| <br> "?" | Set Hot key 1= <br>  Value <br> Reset <br> Query | "n": <br> "1" – volume <br> "2" – brightness <br> "3" – contrast <br> "4" – color saturation <br> "5" – input source (P1 source) <br> "9" – PIP size <br> "B" – No hot key function (Default) <br> "D" – PIP Swap <br> "E" – Aspect ratio <br> "G" – Hue <br> "H" – Backlight level <br> "I" –  VGA Auto picture adjust <br> "L" - Sharpness <br> "M" - Display mode (select 1P, 2P PIP, 2P PBP or 4P) |
| Hot key 2 (up and down keys) | 0xa0,  "2", <br> n \| <br> "r" \| "R" \| <br> "?" | Set Hot key 2= <br>  Value <br> Reset <br> Query | "n": <br> "1" – volume <br> "2" – brightness <br> "3" – contrast <br> "4" – color saturation <br> "5" – input source (P1 source) <br> "9" – PIP size <br> "B" – No hot key function (Default) <br> "D" – PIP Swap <br> "E" – Aspect ratio <br> "G" – Hue <br> "H" – Backlight level <br> "I" –  VGA Auto picture adjust <br> "L" - Sharpness <br> "M" - Display mode (select 1P, 2P PIP, 2P PBP or 4P) |
| Runtime counter | 0xa1, <br> nnnnn \| <br> "r" \| "R" \| <br> "?" | Set runtime counter value = <br>  nnnnn (* 0.5 hour) <br> Reset to zero <br> Query | Runtime = nnnnn. <br> Max. input = 0x1fffe  (0x1fffe * 0.5 hour = 65535 hours) <br> Runtime counter counts when backlight is on |
| PIP H position | 0xa4, <br> nn \| "+" \| "-" \| <br> "r" \| "R" \| <br> "?" | Set PIP horizontal position= <br>  value/go right/go left <br> Reset <br> Query | PIP window horizontal position. <br> nn: 0x00(left)~0x64(right) <br> Default: 0x64 |
| PIP V position | 0xa5, <br> nn \| "+" \| "-" \| <br> "r" \| "R" \| <br> "?" | Set PIP vertical position= <br>  value/go down/go up <br> Reset <br> Query | PIP window vertical position. <br> nn: 0x00(top)~0x64(bottom) <br> Default: 0x64 |
| PIP window size select | 0xa6, <br> nn \| <br> "r" \| "R" \| <br> "?" | Select PIP window size = <br>  PIP window size value <br> Reset <br> Query | nn: <br> 0x00(smallest)~0x0A (largest) <br> Default: 0x0A |

| PIP /P2 source select | 0xa7,<br>nn \|<br>"r" \| "R" \|<br>"?" | Select PIP or P2 video source =<br>Video source value<br>Reset<br>Query | P2 is:<br>2P PBP left right: right window<br>2P PBP top bottom: bottom window<br>4P: lower left window<br><br>"nn" =<br>"0x41,0x31" A0: VGA<br>"0x50,0x31" D0: DP<br>"0x48,0x31" D1: HDMI (Default)<br>"0x48,0x32" D2: HDMI<br>"0x45,0x31" D3: HD-SDI (for custom code only)<br>"0x46,0x31" D4: DVI<br><br>Please note that PIP or PBP mode should be enabled first before select video source. |
|---|---|---|---|
| P3 source select | 0xa7, "c"<br>nn \|<br>"r" \| "R" \|<br>"?" | Select P3 video source =<br>Video source value<br>Reset<br>Query | P3 is upper right window in 4P mode<br><br>"nn" =<br>"0x41,0x31" A0: VGA<br>"0x50,0x31" D0: DP<br>"0x48,0x31" D1: HDMI<br>"0x48,0x32" D2: HDMI (Default)<br>"0x45,0x31" D3: HD-SDI (for custom code only)<br>"0x46,0x31" D4: DVI<br><br>Please note that 4P PBP mode should be enabled first before select video source. |
| P4 source select | 0xa7, "d"<br>nn \|<br>"r" \| "R" \|<br>"?" | Select P4 video source =<br>Video source value<br>Reset<br>Query | P4 is lower right window in 4P mode<br><br>"nn" =<br>"0x41,0x31" A0: VGA<br>"0x50,0x31" D0: DP<br>"0x48,0x31" D1: HDMI<br>"0x48,0x32" D2: HDMI<br>"0x45,0x31" D3: HD-SDI (Default, for custom code only)<br>"0x46,0x31" D4: DVI<br><br>Please note that 4P PBP mode should be enabled first before select video source. |
| Colour temperature select | 0xb3,<br>n \|<br>"r" \| "R" \|<br>"?" | Select colour temperature =<br>value<br>Reset<br>Query | "n" =<br>"2" – 6500K. (Default)<br>"4" – User<br>"5" – 9300K<br>"6" – 7500K<br>"7" – 5800K<br>"8" – sRGB<br>"9" – 3200K<br>"A" – 2600K (custom code) |
| Red level of User colour temperature | 0xb4,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?"<br>"m"<br>"n" | Set the level of the red channel for the user colour temp. =<br>value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn: 0x00~ 0xff  (0~255)<br><br><br>Default: 0x80 |

| | | | |
|---|---|---|---|
| Green level of User colour temperature | 0xb5,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" \|<br>"m"<br>"n" | Set the level of the green channel for the user colour temp.<br>= value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn: 0x00~ 0xff  (0~255)<br><br>Default: 0x80 |
| Blue level of User colour temperature | 0xb6,<br><br>nn \| "+" \| "-" \|<br>"r" \| "R" \|<br>"?" \|<br>"m"<br>"n" | Set the level of the blue channel for the user colour temp. =<br>value/increment/decrement<br>Reset<br>Query<br>Maximum query<br>Minimum query | nn: 0x00~ 0xff  (0~255)<br><br>Default: 0x80 |
| Video horizontal resolution enquiry | 0xb7 | Horizontal resolution (in pixels) in 3 to 4 digit hex number | |
| Video vertical resolution enquiry | 0xb8 | Vertical resolution (in lines) in 3 digit hex number | |
| Video horizontal sync frequency | 0xb9 | Horizontal sync frequency (in units of 100Hz) in 3 digit hex number | |
| Video vertical sync frequency | 0xba | Vertical sync frequency (in units of Hz) in 3 digit hex number and 1 char | "nnnc" = vertical frequency<br>nnn = 3 digit hex<br>c= "i" (interlace) or "p" (progressive) |
| OSD status enquiry | 0xbb | Status of OSD | "0" – OSD turned off<br>"1" – OSD turned on |
| Display video information box | 0xbc,<br>"?" \|<br>"0" \|<br>"1" | Query<br>No video info box shown<br>After switching to a new video source, the video info box is displayed for 5 seconds. | "0" – disabled.<br>"1" – enabled. (Default) |
| OSD turn off | 0xbd | Turn off the OSD. | "0" – fail.<br>"1" – successful. |
| Saving the Calibrated default | 0xd7 | Saving all parameters to user default value | "1" – successful |
| Loading the Calibrated default | 0xd8 | Loading all parameters to user default value | "1" – successful<br>"0" – not successful |
| Display Video Wall ID | 0xdd,0x41<br>"0" \|<br>"1" \|<br>"?" | Clear ID on Panel<br>Display ID on Panel<br>Query. | "0"<br>"1"<br>"0" \| "1" |
| Video Wall Enable | 0xdd,0x43<br>"0" \|<br>"1" \|<br>"R" \| "r"<br>"?" | Enable Video Wall =<br>Enable<br>Disable<br>Reset (Default Disable)<br>Query | "1" Enable<br>"0" Disable |
| Video Wall Bezel Enable | 0xdd 0x44,<br>"0" \|<br>"1" \|<br>"r" \| "R"<br>"?" | Command<br>Disable Bezel Compensation<br>Enable Bezel<br>Reset<br>Query | |
| Video Wall horizontal active dimension | 0xdd 0x45,<br>"nnnn"<br>? | Command<br>Value<br>Query | |
| Video Wall vertical active dimension | 0xdd 0x46<br>"nnnn"<br>? | Command<br>Value<br>Query | |
| Video Wall horizontal bezel dimension | 0xdd 0x47<br>"nnnn"<br>? | Command<br>Value<br>Query | |

| Video Wall vertical bezel dimension | 0xdd 0x48 "nnnn" ? | Command<br>Value<br>Query | |
|---|---|---|---|
| Backlight control | 0xe0,<br>nn \| "+" \| "-" \|<br>"R" \| "r" \|<br>"?" \| | Set Backlight level =<br>value/increment/decrement<br>Reset<br>Query | nn = 0x00~ 0x64 (0~100%)<br><br>Default: 0x64 (100%) |
| Backlight On/Off | 0xe1,<br>"0" \| "1" \|<br>"R" \| "r"<br>"?" | Backlight Off / Backlight On<br>Reset<br>Query | "0" – Backlight Off<br>"1" – Backlight On. (Default) |
| Swap PIP / 2P PBP video source | 0xe3 | Swap Main and PIP Source (PIP mode), left & right source (PBP LR) or Top & Bottom (PBP TB) | "0" – fail.<br>"1" – successful. |
| Backlight DA/PWM | 0xe5<br>"0" \| "1" \|<br>"R" \| "r" \|<br>"?" | Set backlight control method:<br>PWM / DA<br>Reset<br>Query | "0" – PWM (Default)<br>"1" – D/A |
| Backlight PWM frequency | 0xe6,<br>nnn \| "+" \| "-" \|<br>"R" \| "r" \|<br>"?" | Set backlight PWM frequency =<br>value/increase 20Hz/decrease 20Hz<br>Reset<br>Query | Value<br>100Hz : "0","6","4"<br>120Hz : "0","7","8"<br>140Hz : "0","8","C"<br>160Hz : "0","A","0" (Default)<br>180Hz : "0","B","4"'<br>200Hz : "0","C","8"<br>220Hz : "0","D","C"<br>240Hz : "0","F","0"<br>260Hz : "1","0","4"<br>280Hz : "1","1","8"<br>300Hz : "1","2","C"<br>320Hz : "1","4","0"<br>340Hz : "1","5","4"<br>360Hz : "1","6","8"<br>380Hz : "1","7","C"<br>400Hz : "1","9","0"<br>420Hz : "1","A","4"<br>440Hz : "1","B","8" |
| Backlight Invert | 0xe7<br>"0" \| "1" \|<br>"R" \| "r"<br>"?" | Set invert backlight level :<br>Off / On<br><br>Reset<br>Query | "0" – Off (Default)<br>"1" – On |
| PIP window transparency Level | 0xed,<br>nn \| "+" \| "-" \|<br>"R" \| "r" \|<br>"?" | Select PIP transparency level =<br>value/increase/decrease<br>Reset<br>Query | nn:<br>0x00~0x0A (no ~ total transparency)<br>Default: 0x00 |
| Set IR ID | "0xee","0x5A"<br>nn \| "+" \| "-" \|<br>"R" \| "r" \|<br>"?" | Set IR ID<br>Reset<br>Query | IR ID 1~255<br>nn = "0" "1" ~ "46" "46"<br>Reset ID is 0<br>nn = "30" "30" |
| Minimum backlight level | 0xee, "0x5C"<br>nn \| "+" \| "-" \|<br>"R" \| "r" \|<br>"?" | Set minimum backlight level=<br>value/increment/decrement<br>Reset<br>Query | Minimum Backlight value.<br>nn: 0x00 ~ 0x32 (0~50%)<br>Default: 5% |
| OSD switch mount Lock | "0xee", "0x62"<br>"0" \|"1"<br>"?" | Unlock / Lock<br>Query | "0"- Unlock (Default)<br>"1"- Lock, no response to OSD switch mount keys |
| Default Power | "0xee", "0x6B",<br>"0x50" | Default power state after supplying power to controller | |

| | | | |
|---|---|---|---|
| | "0"\|<br>"1"\|<br>"?" | Off<br>On<br>Query | "0" - default power off<br>"1" - default power on |
| Color Effect | "0xee", "0x71",<br>"0x30"<br>"0"\|"1"\|"2"\|"3"\|"4"<br>\|"5"<br>"?"<br>"r" \| "R" | Select Color Effect<br><br>Value<br><br>Query<br>Reset | "0" = Standard (Default)<br>"1" = Game<br>"2" = Movie<br>"3" = Photo<br>"4" = Vivid<br>"5" = User |
| Vby1 pin setting | "0xee", "0x73",<br>0x30\|0x31\|...\|0x39,<br><br>"0" \| "1" | Set Vby1 pin state<br>Pin no.: 0x30=pin15,<br>0x31=pin16,..., 0x39=pin24<br>Pin logic level | "0" = set to low  (Default)<br>"1" = set to high |
| Panel timing setting | "0xee", "0x74",<br><br><br><br><br>0x30, nnn \|<br>0x31, nnn \|<br>0x32, nnn \|<br>0x33, n \|<br>0x34, n \|<br>0x35, n \|<br>0x36, nnnn \|<br>0x37, nnnn \|<br>0x38, nnnn \|<br>0x39, nnnn \|<br>0x3A, nnnn \|<br>0x3B, nnnn \|<br>0x3C, nnnn \|<br>0x3D, nnnn \|<br>0x3E, nnnn \|<br>0x3F, nnnn \|<br>0x40, nn \|<br>0x41, nn \|<br>0x42, nnn \|<br>0x43, nnn \|<br>0x44, nnn\|<br>0x45, nnnn \|<br>0x46, nnnn \|<br>0x47, nnnn \|<br>0x48, nnnn \|<br>0x49, nnnn \|<br>0x4A, nnnn \|<br><br>0x4B<br><br><br>0x4C<br><br><br><br>0x57 | Panel timing setting<br><br><br><br><br>0x30= typical frame rate<br>0x31= max frame rate<br>0x32= min frame rate<br>0x33= panel style<br>0x34= eDP phy rate<br>0x35=LVDS/Vx1 output ports<br>0x36=Hsync back porch<br>0x37=Display horizontal width<br>0x38=Vertical total typical<br>0x39=Vertical total max<br>0x3A=Vertical total min<br>0x3B=Vsync back porch<br>0x3C=Display vertical height<br>0x3D=Horizontal total typical<br>0x3E=Horizontal total max<br>0x3F=Horizontal total min<br>0x40=Hsync width<br>0x41=Vsync height<br>0x42 = Pixel clock typical<br>0x43 = Pixel clock max<br>0x44 = Pixel clock min<br>0x45 = Panel power on time T1<br>0x46 = Panel power on time T2<br>0x47 = Panel power on time T3<br>0x48 = Panel power off time T4<br>0x49= Panel power off time T5<br>0x4A = Panel power off time T6<br><br>Read all panel timing checksum<br><br>Read all panel timing parameter<br><br><br>Write all panel timing parameters from SRAM into EEPROM | Set panel timing to SRAM of SVX-4096-VW. If cmd 2$^{nd}$ parameter is n = 0x3F, it dumps the values of SRAM Please note "n" is BCD decimal value in ASCII. e.g. 610 is set as 0x36 0x31 0x30<br><br><br>1=Lvds, 3=Vx1, 4=eDP1.1, 5=eDP1.2<br>1=HBR, 2=HBR2<br>0=1ports,1=2ports,2=4ports,3=8ports<br><br><br><br><br><br><br><br><br><br><br><br><br>in MHz<br>in MHz<br>in MHz<br>in ms<br>in ms<br>in ms<br>in ms<br>in ms<br>in ms<br><br>checksum, which is found by adding values of parameter 0x30 to 0x4A<br><br>Read all parameters from SRAM and dump each timing starting with 0xEE 0x74 0xYY nnnn to facilitate saving dump data to file for send back to SVX-4096-VW later<br><br>"1": Success<br>"0": Fail |

| User EDID | "0xee", "0x76", "nn", | Command Select Port | "nn" = "0x41,0x31" A0: VGA "0x50, 0x31"D0: DP "0x48,0x31" D1: HDMI "0x48,0x32" D2: HDMI "0x48,0x33" D3: HDMI "0x45,0x31" D3: HD-SDI (custom code) "0x46,0x31" D4: DVI |
|---|---|---|---|
| EDID Block map for blocks 0 – 128 | "S" \|"s" "n,n+1....(256 BYTE) " | Send 128 BYTE EDID in ASCII Code Format (256BYTE) | return "1" Success return "0" Fail |
| EDID Block map for blocks 129 – 254 if more than 128 blocks used | "E" \|"e" "n,n+1....(256 BYTE) " | Send 128 BYTE EDID in ASCII Code Format (256BYTE) | return "1" Success return "0" Fail |
| Reset | "R" \| "r" | Reset to use pre-defined EDID instead of user EDID of selected port | return "1" Success return "0" Fail |
| | | | |
| | | | |

### 3. Other control

| Function | Command | Description | Acknowledge (if enabled) |
|---|---|---|---|
| Select RS-232 acknowledge | 0xc1, "0" \| "1" | Disable/enable command acknowledge. | "0" – acknowledge disabled.<br>"1" – acknowledge enabled. (Default) |
| VGA auto adjust | 0xc3 | Start VGA auto adjust | "0" – fail.<br>"1" – successful. |
| Command availability | 0xc4, nn / nnnn | Check whether a command is available. | "0" – not available.<br>"1" – available.<br><br>e.g "0x81" command<br>send<br>"0xc4 0x38 0x31"<br>feedback<br>"0xc4 0x38 0x31 0x31"<br><br>e.g "0xee 0x5c" command<br>send<br>"0xc4 0x45 0x45 0x35 0x43"<br>feedback<br>"0xc4 0x45 0x45 0x35 0x43 0x31" |
| VGA auto color gain | 0xc5 | Start VGA auto-calibration of gain of the RGB amplifier. | "0" – fail.<br>"1" – successful. |
| Power On/Off | 0xc8,<br>"0" \| "1" \|<br>"?" | Soft power on/off<br>off/on<br>query | "0" – soft power off.<br>"1" – soft power on. |
| Query video input status | 0xc9 | Query the status of the displaying video windows source | Input status nn nn:<br>"0","0" : no video source / disabled<br>"A","1" A0: VGA<br>"F","1" D4: DVI<br>"H,"1" D1: HDMI<br>"H,"2" D2: HDMI<br>"H,"3" D3: HDMI<br>"E,"1" D3: HD-SDI (for custom code)<br>"P,"1" D0: DP<br><br>Feedback 4 video windows status in form of:<br>nn nn, nn nn, nn nn, nn nn  (P1, P2, P3, P4) |
| Query BIOS version | 0xcb, "0" | Read BIOS version | BIOS version "VV.YY.ZZ"<br>VV = Vx or Ex, (x is version digit)<br>V = Release version<br>E = Engineering Sample<br><br>YY= Version Number<br><br>ZZ= Customer Number |
| Query PCBA number | 0xcb, "1" | Read PCBA number | "nnnnn" = PCBA number<br>SVX-4096-VW-120= "41759" |
| Query Revision Number | 0xcb, "3" | Read Revision Number | "nn" = Revision number AA in firmware version no. "VV.YY.ZZ.AA" |
| Reset parameters | 0xce | Reset all parameters to default value | "1" – successful. |
| Reset all parameters | 0xcf | Reset all parameters, including user color temperature setting, for all video modes to default value | "1" - successful. |

n = 1-byte ascii-coded hex number, e.g., parameter value of 0x1 is represented by "1" (0x31).
mn or nn = 2-byte ascii-coded hex number, e.g., parameter value of 0x1e is represented by "1", "e" | "E" (0x31, 0x6e|0x4e).


The RS-232 command strings sent in one time can support up to 380 bytes via CN8 port
The RS-232 command string sent in one time can support up to 50 bytes via CN1 or J1 port.

n = 1-byte ascii-coded hex number, e.g., parameter value of 0x1 is represented by "1" (0x31).
mn or nn = 2-byte ascii-coded hex number, e.g., parameter value of 0x1e is represented by "1", "e" | "E" (0x31, 0x6e|0x4e).
Please refer to the ASCII to Hex convert table below.


### Hex to ASCII conversion table

| Hex  | ASCII | Hex  | ASCII | Hex  | ASCII | Hex  | ASCII |
|------|-------|------|-------|------|-------|------|-------|
| 0x30 | 0     | 0x41 | A     | 0x61 | a     | 0x2B | +     |
| 0x31 | 1     | 0x42 | B     | 0x62 | b     | 0x2D | -     |
| 0x32 | 2     | 0x43 | C     | 0x63 | c     | 0x3F | ?     |
| 0x33 | 3     | 0x44 | D     | 0x64 | d     |      |       |
| 0x34 | 4     | 0x45 | E     | 0x65 | e     |      |       |
| 0x35 | 5     | 0x46 | F     | 0x66 | f     |      |       |
| 0x36 | 6     | 0x47 | G     | 0x67 | g     |      |       |
| 0x37 | 7     | 0x48 | H     | 0x68 | h     |      |       |
| 0x38 | 8     | 0x49 | I     | 0x69 | i     |      |       |
| 0x39 | 9     | 0x4A | J     | 0x6A | j     |      |       |
|      |       | 0x4B | K     | 0x6B | k     |      |       |
|      |       | 0x4C | L     | 0x6C | l     |      |       |
|      |       | 0x4D | M     | 0x6D | m     |      |       |
|      |       | 0x4E | N     | 0x6E | n     |      |       |
|      |       | 0x4F | O     | 0x6F | o     |      |       |
|      |       | 0x50 | P     | 0x70 | p     |      |       |
|      |       | 0x51 | Q     | 0x71 | q     |      |       |
|      |       | 0x52 | R     | 0x72 | r     |      |       |
|      |       | 0x53 | S     | 0x73 | s     |      |       |
|      |       | 0x54 | T     | 0x74 | t     |      |       |
|      |       | 0x55 | U     | 0x75 | u     |      |       |
|      |       | 0x56 | V     | 0x76 | v     |      |       |
|      |       | 0x57 | W     | 0x77 | w     |      |       |
|      |       | 0x58 | X     | 0x78 | x     |      |       |
|      |       | 0x59 | Y     | 0x79 | y     |      |       |
|      |       | 0x5A | Z     | 0x7A | z     |      |       |

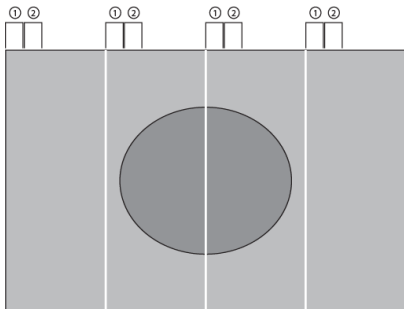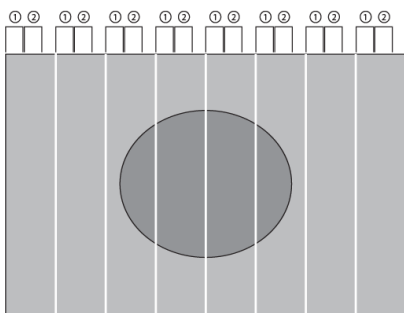## Appendix III – Mapping definition

Definition of division
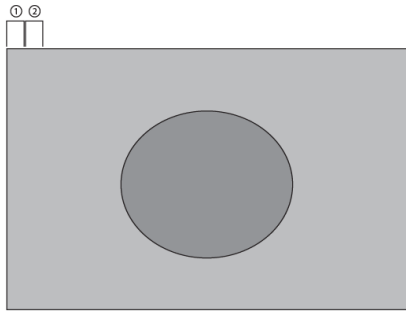
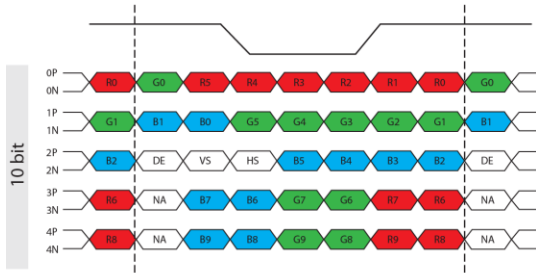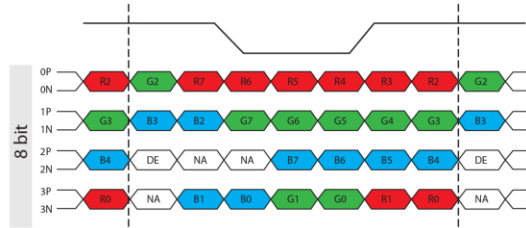1 Division
(Non-Division)
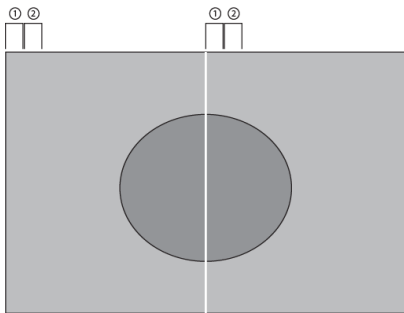
2 Division

4 Division
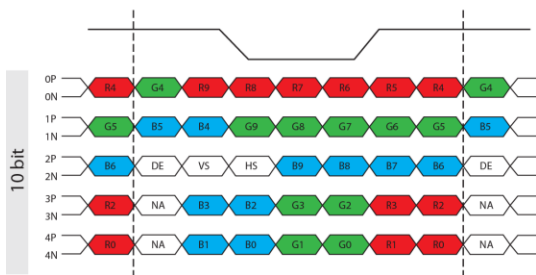
8 Division

Input data mapping

## VESA Format (LVDS)
### (Mapping A)



## VESA Format (LVDS)
### (Mapping B)



## JEIDA Format (LVDS)

## Appendix IV – DV remote control unit work for SVX-4096-VW

**P/N 559000106-3 :**
DigitalView remote control unit
(without DV logo silk screen
printing)

**P/N 559000105-3 :**
DigitalView remote control unit
(with DigitalView logo silk screen
printing)

| BUTTON | FUNCTION |
|---|---|
| POWER BUTTON | Soft power ON/OFF button. |
| SEL UP (∧) / SEL DN (∨) | 1. In OSD menu, pressing "SEL UP" button to move previous level of selection.<br>2. In OSD menu, pressing "SEL DN" button to move next level of selection or to CONFIRM the selection. |
| + BUTTON | 1. When OSD menu displayed, press this button to select functions (forward) or increase the values. |
| - BUTTON | 1. When OSD menu displayed, press this button to select functions (backward) or decrease the values. |
| AV/TV | 1. Show input source selection menu. |
| OSD NEXT BUTTON | 1. Use to turn on/off the OSD menu. |
| Mute | 1. Mute / Un-mute audio (if external audio board is connected) |
| PIP | 1. Toggle between PIP mode and 1P mode. |

Specifications subject to change without notice

## Appendix V – Functions list on browser page

Below is a summary of functions list on IP-60's browser page.

**Main**
**Network**

|  | *Network Configure* |  |
|---|---|---|
|  | | Firmware Version |  |
|  | | MAC Address |  |
|  | | Host Name |  |
|  | | DHCP | On /Off |
|  | | IP Address |  |
|  | | Subnet Mask Address |  |
|  | | Default Gateway Address |  |
|  | | Primary DNS Address |  |

**Sensor Setting**

|  | *Fan Setting* |  |
|---|---|---|
|  | | Fan 1 | On / Off |
|  | | Fan 2 | On /Off |
|  | | Fan 1 min rpm |  |
|  | | Fan 2 min rpm |  |

|  | *Light Sensor Setting* |  |
|---|---|---|
|  | | Light Sensor | On / Off |
|  | | Min. Value |  |

|  | *Power Detect Setting* |  |
|---|---|---|
|  | | Power Source 1 (PS1) | On / Off |
|  | | Power Source 2 (PS2) | On / Off |
|  | | PS1 Value |  |
|  | | PS2 Value |  |

|  | *Temperature Setting* |  |
|---|---|---|
|  | | Internal Temp. Sensor | On /Off |
|  | | External Temp. Sensor | On /Off |
|  | | Int. Temp. Warning Value | Value |
|  | | Ext. Temp. Warning Value | Value |

|  | *Monitor Status* |  |
|---|---|---|
|  | | Fans Monitor (Fan 1) |  |
|  | | Fans Monitor (Fan 2) |  |
|  | | Temperture Monitor (Int. Temp.) |  |
|  | | Temperture Monitor (Ext. Temp.) |  |
|  | | Power Monitor (PS 1) |  |
|  | | Power Monitor (PS 2) |  |
|  | | Light Monitor (Light1) |  |

**Direct Control**

*Picture Setting*

| | | |
|---|---|---|
| | Brightness | Value |
| | Contrast | Value |
| | Saturation | Value |
| | Sharpness | Value |
| | Hue | Value |

*Backlight Control*

| | | |
|---|---|---|
| | Soft Power | On / Off |
| | Backlight Status | On / Off |
| | Backlight Control | Value |
| | Backlight PWM Frequency | PWM (100Hz-440Hz) |

*Display Mode*

1P / 2P_LR / 2P_TB / 2P_PIP / 4P

*Input Source Selection*

| | | |
|---|---|---|
| | P1 Input Source | Display Port/HDMI 1/HDMI 2/DVI/VGA |
| | P2 Input Source | Display Port/HDMI 1/HDMI 2/DVI/VGA |
| | P3 Input Source | Display Port/HDMI 1/HDMI 2/DVI/VGA |
| | P4 Input Source | Display Port/HDMI 1/HDMI 2/DVI/VGA |

*Check Input Status*

| | | |
|---|---|---|
| | Check Main & PIP Source | Invalid/ARGB/HD/SD Component/DVI/HDMI/Display Port |

*Audio Setting*

| | | |
|---|---|---|
| | Mute | On / Off |
| | Volume | Value |
| | Source Selection | P1/P2/P3/P4/Analog |

*Color Setting*

| | | |
|---|---|---|
| | Color Temperature | 3200K/5800K/6500K/7500K/9300K/sRGB/User |
| | User - Red Level Color Temp. | Value |
| | User - Green Level Color Temp. | Value |
| | User - Blue Level Color Temp. | Value |
| | Color Effect | Standard/Game/Movie/Photo/Vivid/User |
| | Gamma | Off/1.8/2.0/2.2/2.4 |

*Advanced Setting*

| | | |
|---|---|---|
| | Aspect Ratio | Full/16:9/4:3/5:4/1:1 |
| | Display Orientation | Normal/Anti-Clockwise 90/Rotate 180/Anti-Clockwise 270 |

*PIP Setting*

        Swap

        PIP Size                     (0 - 10)

        PIP Horizontal Position    Value

        PIP Vertical Position      Value

*OSD Setting*

        OSD Status               On  / Off

        OSD Turn                On  / Off

        OSD Horizontal Position   Value

        OSD Vertical Position     Value

        OSD Menu Timeout      Value

*Key Control*

        Menu/Down/Up/Left(-)/Right(+)

*Display Information*

        BIOS Version

        Horizontal Resolution

        Vertical Resolution

        Horizontal Frequency

        Vertical Frequency

*Load Default*

        Reset All Parameters      Reset all parameters to default value

        Reset Parameters         Reset all parameters for all video mode to defualt value

## WARRANTY

The products are warranted against defects in workmanship and material for a period of three (3) year from the date of purchase provided no modifications are made to it and it is operated under normal conditions and in compliance with the instruction manual.

The warranty does not apply to:
- Product that has been installed incorrectly, this specifically includes but is not limited to cases where electrical short circuit is caused.
- Product that has been altered or repaired except by the manufacturer (or with the manufacturer's consent).
- Product that has subjected to misuse, accidents, abuse, negligence or unusual stress whether physical or electrical.
- Ordinary wear and tear.

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**Revision History**

| Date | Rev No. | Page | Summary |
|---|---|---|---|
| 24 August 2017 | 1.0 | All | First issued. |