

PC, DVI, VIDEO INTERFACE CONTROLLER FOR TFT PANEL

Model: SVH-1920

Part number : 41696005X-3 or up

[Firmware version : V0.41.00]

INSTRUCTIONS

CONTENTS

| | |
|-------|--|
| Page: | 2. Introduction, How to Proceed, Usage Note, Disclaimer |
| | 3. System design – Diagram of a suggested system |
| | 4. Assembly notes – Important information about system elements |
| | 6. Connection & Operation – How to use the controller |
| | 12. Connectors, pinouts & jumpers – Essential connection information |
| | 25. Controller dimensions |
| | 26. Application notes |
| | 28. Troubleshooting |
| | 29. Specifications |
| | 30. Appendix I – Supported graphics modes table |
| | 32. Appendix II – RS-232 control protocols |
| | 45. Appendix III – Mapping definition |
| | 47. Appendix IV – Auto Color Gain |
| | 48. Appendix V – DV remote control unit work for SVH-1920 |
| | 49. Appendix VI – Function description for de-interlacing mode AFM, TNR, MADI, LADI |
| | 50. Warranty, Caution & Limitation of Liability, Trademarks |
| | 51. Contact details |
| | 52. Specification for inverter Interface Board P/N 416040010-3 |
| | 55. Specification for audio add-on board P/N 416940020-3 |

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 SVH-1920 is a feature rich interface controller for :

- TFT (active matrix) LCD panels of 1920x1200, 1920x1080, 1600x1200, 1680x1050, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768 1024x768, 800x600, 800x480 and 640x480 resolutions.
- Computer video signals of VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA standard.
- Video signals of NTSC, PAL and SECAM standard.
- DVI input support up to 1920x1200 60Hz input signals
- HD-SDI input support by using optional HD-SDI adaptor board (Kit P/N 546013410-3 / P/N 546013310-3)
- Support Ambient Light Detector Kit (Kit 70220-3)

HOW TO PROCEED

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

Controller Solution Generator

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

- Connector reference (in following section)
- Assembly notes (refer to page 4 – 5)
- Check controller switch & jumper settings (errors may damage the panel)
- Prepare the PC
- Connect the parts
- Understand the operation & functions

IMPORTANT USAGE NOTE

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

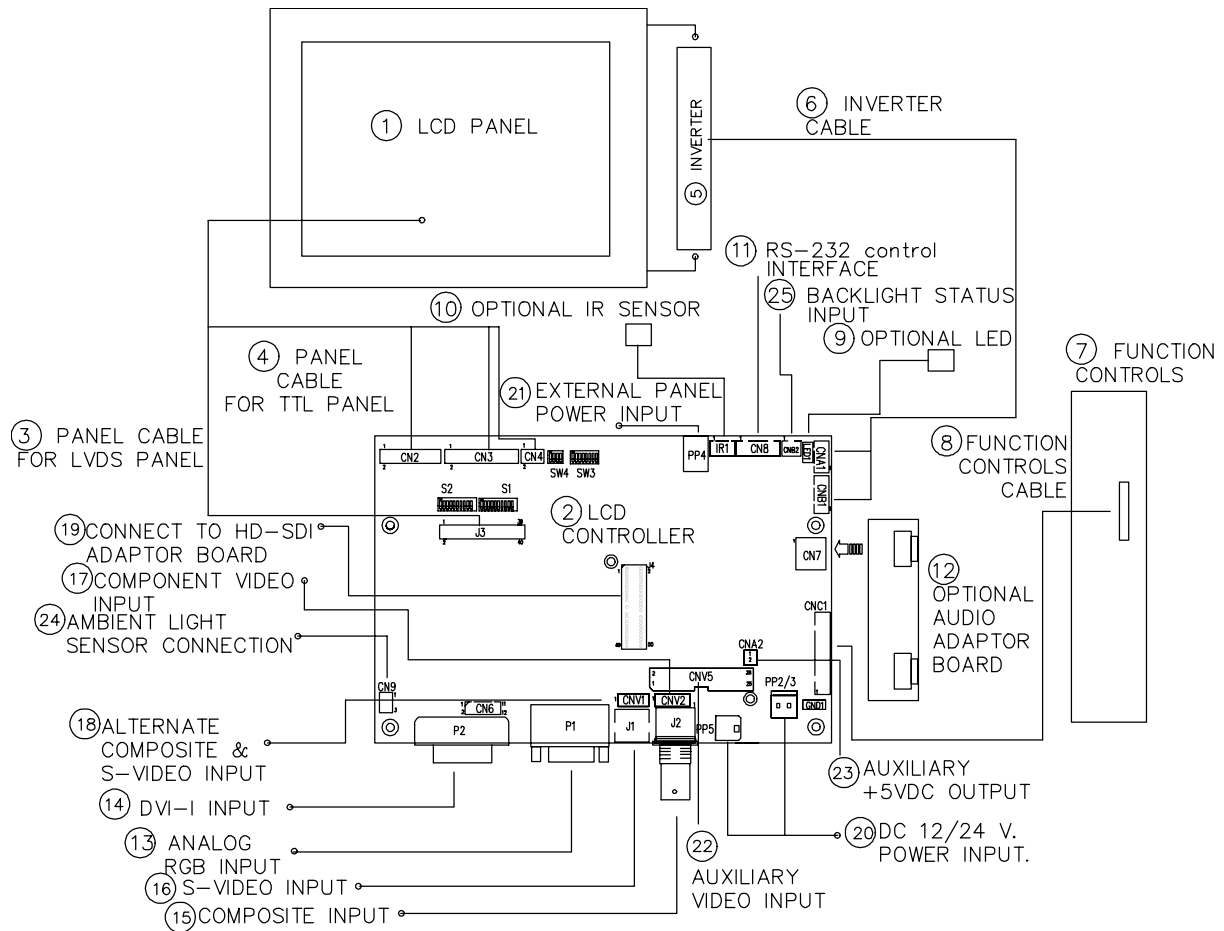
- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- **Check power settings to all component parts before connection.**

DISCLAIMER

There is no implied or expressed warranty regarding this material.

SYSTEM DESIGN

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



Summary:

1. LCD panel
2. LCD controller card, SVH-1920
3. LCD signal cable (use for LVDS panel)
4. LCD signal cable (use for TTL panel)
5. Inverter for backlight (if not built into LCD)
6. Inverter cable
7. Function controls
8. Function controls cable
9. Status LED (optional)
10. IR sensor (optional)
11. RS-232 control interface
12. Audio add-on board (optional)
13. Analog RGB input
14. DVI-I input
15. Composite video input
16. S-Video input
17. Component video input
18. Alternate composite and S-Video input
19. Interface for connection with to HD-SDI adaptor board
20. +12V / +24V DC power input
21. External panel power input
22. Auxiliary video input
23. Auxiliary +5VDC, max 500mA output
24. Ambient light sensor connection
25. Backlight status input

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

ASSEMBLY NOTES

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

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

1. **LCD Panel:** This controller is designed for typical LVDS or TTL interfaced panels with panel voltage 3.3V, 5V or 12V, External for 12V~18V interface. Due to the variation between manufacturers of panels signal timing and other panel characteristics, factory setup and confirmation should be obtained before connecting to a panel. **(NOTE: Check panel power jumper settings before connection)**
2. **Controller:** Handle the controller with care as static charge may damage electronic components. Make sure correct jumper and dip switches settings to match the target LCD panel.
3. **LCD signal cable (LVDS panel):** In order to provide a clean signal it is recommended that LVDS signal cables are no longer than 46cm (18 inches). If those wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when placing the cables to avoid signal interference. Additionally it may be necessary in some systems to add ferrite cores to the cable to minimize signal noise.
4. **LCD signal cable (TTL panel):** In order to provide a clean signal it is recommended that LCD signal cables should not longer than 33cm (13 inches). If loose wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when placing the cables to avoid signal interference. Additionally it may be necessary in some systems to add ferrite cores to the cables to minimize signal noise.
5. **Inverter:** This will be required for the backlight of an LCD, some LCD panels have an inverter built in. As LCD panels may have 1 or more backlight tubes and the power requirements for different panel backlights may vary it is important to match the inverter in order to obtain optimum performance. See Application notes page 18 for more information on connection.
6. **Inverter Cables:** Different inverter models require different cables and different pin assignment. Make sure correct cable pin out to match inverter. Using wrong cable pin out may damage the inverter.
7. **Function Controls:** The following section discusses the controls required and the section on connectors provides the detail. The controls are minimal: On/Off, Backlight Brightness (depends on inverter), OSD (5 momentary buttons) analog VR type or (8 momentary buttons) digital type.
The 8 momentary buttons OSD switch mount P/N 416100520-3 or OSD membrane interface P/N 416100120-3 must be used when 24VDC input.
8. **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.
9. **Status LED:** The pin direction of the LED should be corrected for right colour indication. Red colour stands for standby. Green colours stands for signal on. The status LED is an optional part only, can be unconnected.
10. **IR sensor:** It is an optional part only, can be unconnected if not using IR remote control. See Appendix V in details.
11. **RS-232 control interface.**
12. **Audio add-on board P/N 416040010-3:** Provide the interface for the audio add-on board to be connected. The audio add-on board gives the audio input and output signal connection. But the volume cannot be controlled by the OSD menu on the controller. It is an optional part only, can be unconnected if not using audio.
CAUTION : The Audio Add-on Board P/N 416940020-3 is only operate under 12VDC power input environment.
13. **VGA Input Cable:** As this may affect regulatory emission test results and the quality of the signal to the controller a suitably shielded cable should be utilized.
14. **DVI-D input cable :** Plug the DVI cable to the connector P2 on the controller board.
15. **Composite video input :** Standard Composite cables can be used. Reasonable quality cable should be used to avoid image quality degradation.
16. **S-Video input :** Standard Composite or S-video cables can be used. Reasonable quality cable should be used to avoid image quality degradation.
17. **Component video input :** Plug the component video input cable P/N 426000600-3 on CNV2 connector
18. **Alternate composite and S-video input :** Plug the video input cable P/N 426000500-3 on CNV1 connector

19. Interface for connecting to HD-SDI adaptor board

| | |
|--|------------------------|
| HD-SDI (1-in-1-out) adaptor board, Kit number P/N 546013410-3 includes : | |
| HD-1000 adaptor (1-in-1-out) | P/N 416013410-3 |
| Ribbon cable | P/N 426171120-3, 180mm |

| | |
|--|------------------------|
| HD-SDI (2-in-2-out) adaptor board, Kit number P/N 546013310-3 includes : | |
| HD-2000 adaptor (2-in-2-out) | P/N 416013310-3 |
| Ribbon cable | P/N 426171120-3, 180mm |

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

21. External panel power input : Allow to supply external power to the panel separately for max 3.3V (7A) or 5V (7A) or 12V (5A) or 18V (3.5A) via PP4 power input connector.

22. Auxiliary video input : This port provides Composite video 1 & 2, S-video 1 & 2, SD component 1 & 2. The video input selection can be switched via RS-232 command (0x98).

23. Auxiliary +5VDC output : 2 ways connector provides +5VDC output.

24. Ambient light sensor connection : 3 ways connector provides interface for ambient light sensor connection.

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

- **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.

CONNECTION & OPERATION

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

CONNECTION

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

1. **LCD panel & Inverter:** Connect the inverter (if it is not built-in the panel) to the CCFT lead connector of the LCD panel.
2. **TTL type panels:** Plug the signal cables direct to CN2, CN3 and CN4 (CN4 will not be used for 3x6-bit panel) on the controller board. Plug the other end of cables to the LCD connector board (if connector board is required, otherwise the signal can be direct plug to the LCD panel connector). Then plug the board connector to the LCD panel connector.
LVDS type panels: The controller board has the built-in LVDS transmitter driver. Plug the LVDS cable to J3. Insert the panel end of the cable the LCD panel connector.
3. **Inverter & Controller:** Plug the inverter cable to CNB1 and CNA1 (if necessary). Plug another end to the connector on the inverter.
4. **Function switch & Controller:** Plug the OSD switch mount cable to CNC1 on the controller board and another to the OSD switch mount.
5. **LED & Controller:** Plug in a 3-way with dual colour LED to connector LED1 on the controller board.
6. **IR & Controller:** Plug in a 3-way with IR sensor to connector IR1 on the controller board.
7. **Jumpers & Switches:** Check all jumpers and switches (S1, S1, SW3, SW4) are set correctly. Details referring the connection diagram (a separate document) or the jumpers and switches setting table (in the following section).
8. **Jumpers & Inverter & Panel voltage:** Particularly pay attention to the settings of JA3, JA5, JA6, JB2 and JB3. JB2 & JB3 are used for inverter control (read inverter specification and information on the jumper table to define the correct settings). JA3 & JA5 & JA6 is used for panel voltage input (read panel specification and information on the jumper table to define the correct settings).
9. **VGA cable & Controller:** Plug the VGA cable to the connector P1 on the controller board.
10. **Power supply & Controller:** Plug the DC 12V/24V power in to the connector PP5 or PP2/3. You can consider to use DigitalView mating power cable P/N 426013800-3, 160mm for PP5 connection.
11. **External panel power input :** Plug power cable : P/N 426013700-3 for external panel power input (3.3 (max 7A) / 5V (max 7A) / 12V (max 5A) / 18V (max3.5))
12. **Power on:** Switch on the controller board and panel by using the OSD switch mount.
13. **Audio Board :** The Audio Add-on Board P/N 416940020-3 is only operate under 12VDC power input environment.

LED status (LED1) :

| State | LED color |
|---------------|-----------|
| Backlight OFF | RED |
| Backlight ON | GREEN |

General:

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

PC SETTINGS

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

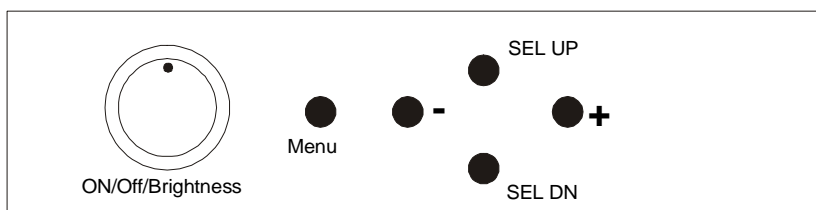
OPERATION

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

LCD DISPLAY SYSTEM SETTINGS

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

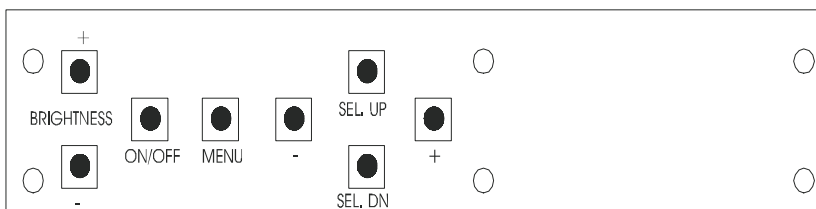
| Controls | Analog VR type | Digital type |
|--|--|--|
| On/Off – turns controller board power on | VR toggle switch | On/Off button |
| Brightness – controls backlight brightness | Rotary VR | Brightness +/- buttons |
| Menu – Turns OSD menu On or Off (it will auto time off) – Back to previous OSD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



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

12VDC power input :

Digital 10K Type OSD switch mount uses
P/N 416100510-3

OSD functions



Picture :

- Volume^{###} Increase/decrease volume level, total: 100 steps
- Brightness Increase/decrease panel brightness level, total: 100 steps
- Contrast Increase/decrease panel contrast level, total: 100 steps
- Saturation Increase/decrease saturation, total: 100 steps
- Hue^{**} Increase/decrease Hue level, total: 100 steps
- Sharpness^{*} Increase/decrease sharpness, total: 30 steps

Position^{##}



Move the image position upward



Move the image position downward



Move the image position to the left



Move the image position to the right

Backlight



Backlight brightness adjustment (Functions when light detector sets OFF)

Aspect / Size ▶

- Fill Screen : Enable full screen expansion for lower resolution Image
- Fill to Aspect Ratio: Enable fill screen expansion for lower resolution image according to aspect ratio
- 4 : 3 : scaling format in 4:3
- 16 : 9 : scaling format in 16:9
- 16 : 10 : scaling format in 16:10
- 2.35 : 1 : scaling format in 2.35:1
- 2 : 1 : scaling format in 2:1
- 1 : 1 : Display the exact image resolution on the screen without image expansion.
- Custom Sizing^{####} :
 - Overscan
 - Normal
 - Custom ▶

H Size

V Size

H Pan

V Pan

Blue Only



ON / OFF : Turn off the "Red" & "Green" channel (i.e. output all zero to Red & Green channel)

[This function will display on OSD menu when JP4 – 5-6 closed]

* : DISPLAY IN VIDEO MODE ONLY

** : FUNCTION IN ARGB/ DVI / VIDEO NTSC MODE ONLY

: DISPLAY IN ARGB / DVI MODE ONLY

: FUNCTION IN ARGB MODE ONLY

: DISPLAY WHEN AUDIO ADD-ON BOARD CONNECTED

: DISPLAY IN VIDEO / HD/SD SDI 1 / HD/SD SDI 2 MODE ONLY



Input : Select the input video signal

HD/SD SDI 1
 HD/SD SDI 2***
 VGA*
 DVI
 Composite 1
 Composite 2***
 S-Video
 SD Component

: Press “-“ key to activate the “Auto Picture Setup” function.

PIP Setup ▶

PIP Source ▶

HD/SD SDI 1 / HD/SD SDI 2 / VGA / DVI // Composite 1 / Composite 2 / S-Video / SD Component / Off

PIP Size : Off / Small / Medium / Large / PBP

4 possible input groups that can be mixed for PIP :

- a) VGA
- b) DVI
- c) HD-SDI
- d) Composite/S-Video/SD-component

It can not allow to select signal source from the same group for PIP.

PIP Position :



Move the PIP position upward



Move the PIP position downward



Move the PIP position to the left



Move the PIP position to the right

PIP Swap : Swap between the main window and PIP window

PIP Auto off :  : OFF / ON

ON : When PIP is no signal input after 30 seconds, the PIP window will turn off automatically.

OFF : PIP window keeps on

*** DISPLAY WHEN SETTING ON UNDER SETUP → AUTO SOURCE SEEK



Utilities :

Setup ▶


Auto Picture Setup# : Auto adjust the image position, phase and size

Auto Color Gain## : Auto Color Calibration (See appendix IV)

Wide Screen Mode detection# ▶ : Recognize the wide screen mode coming from ARGB port

- Off
- 1280x768
- 1366x768

Manual Clock## :  Adjust the image horizontal size

Manual Phase# :  Fine tune the data sampling position (adjust image quality)

Auto Source Seek :

- Auto :  : OFF / ON

ON – Auto source select always enable

OFF – Disable auto source select function

- Setup ▶ Selection for the corresponding input sources detection

HD/SD SDI 1 

HD/SD SDI 2 

VGA 

DVI 

Composite 1 

Composite 2 

S-Video 

SD Component 


The corresponding input port name display on OSD menu will disappear once setting "OFF".

De-interlacing Mode* ▶

AFM  : Auto Film Mode

TNR  : Temporal Noise Reduction

MADI  : Motion Adaptive De-interlacing

LADI  : Low Angled De-interlacing

[See Appendix VI for AFM, TNR, MADI, LADI function description]

Auto Power :  OFF / ON

ON – Enable soft power off function if absence of input signals

OFF – Disable soft power function

Video Standard (SD)* : Auto / NTSC / NTSC 4.43 / PAL / PAL M / SECAM


Image Orientation : Normal / Horizontal flip / Vertical flip / Rotate

Gamma : 1.0 / 1.6 / 2.2

OSD ▶

OSD position :

H POS  : Move the OSD menu image horizontally


V POS  : Move the OSD menu image vertically

OSD Timeout (sec) : ON – 60 : Adjust the OSD menu timeout period in a step of 5 seconds (max 60 seconds)

ON = Continuous to display OSD menu.


60 = 60 seconds later will turn off the OSD menu.

Language : English / Chinese : Select OSD menu language display

Transparency :  ON / OFF : Set OSD transparency

Freeze : Freeze the image (use "+" button)

Zoom ▶

Zoom level :  : Enable the zoom in function on the image displayed.
Use "+" button to zoom in the image
Use "-" button to decrease the zoomed image

Horizontal pan :  : Pan the image horizontally

Vertical pan :  : Pan the image vertically

Reset to Defaults : Restore to default values

Note : Freeze state will be cleared when you using zoom function.

Color Temperature ▶

5000K

R Gain : 

G Gain : 

B Gain : 

Reset to Defaults : Resume to the default values

6500K

R Gain : 

G Gain : 

B Gain : 

Reset to Defaults : Resume to the default values

8000K

R Gain : 

G Gain : 

B Gain : 

Reset to Defaults : Resume to the default values

9300K

R Gain : 

G Gain : 

B Gain : 

Reset to Defaults : Resume to the default values

User setting :

R Gain : 

G Gain : 

B Gain : 

Reset to Defaults : Resume to the default values

Reset All to Defaults : Resume all color temperature settings to the default values.

Hot Key ▶




Hot key 1 : Volume / Brightness / Contrast / Input / Aspect / Zoom / Freeze / PIP Size / PIP Swap / Image Orientation / Saturation / Hue / Backlight / Auto Picture Setup

Hot key 2 : Volume / Brightness / Contrast / Input / Aspect / Zoom / Freeze / PIP Size / PIP Swap / Image Orientation / Saturation / Hue / Backlight / Auto Picture Setup

Monochrome Mode ▶

- Color
- Red Monochrome
- Green Monochrome
- Blue Monochrome

Backlight Setup ▶

- B/L Invert :  : Invert for the backlight brightness
- B/L Control : D/A / PWM : Selection for voltage level dimming control / PWM dimming control
- Backlight Frequency :  100 ~ 440Hz in a step of 20
- Light Detector :  : Enable ambient light detector function by using KIT 70220-3

Reset to Factory Defaults

* : DISPLAY IN VIDEO MODE ONLY

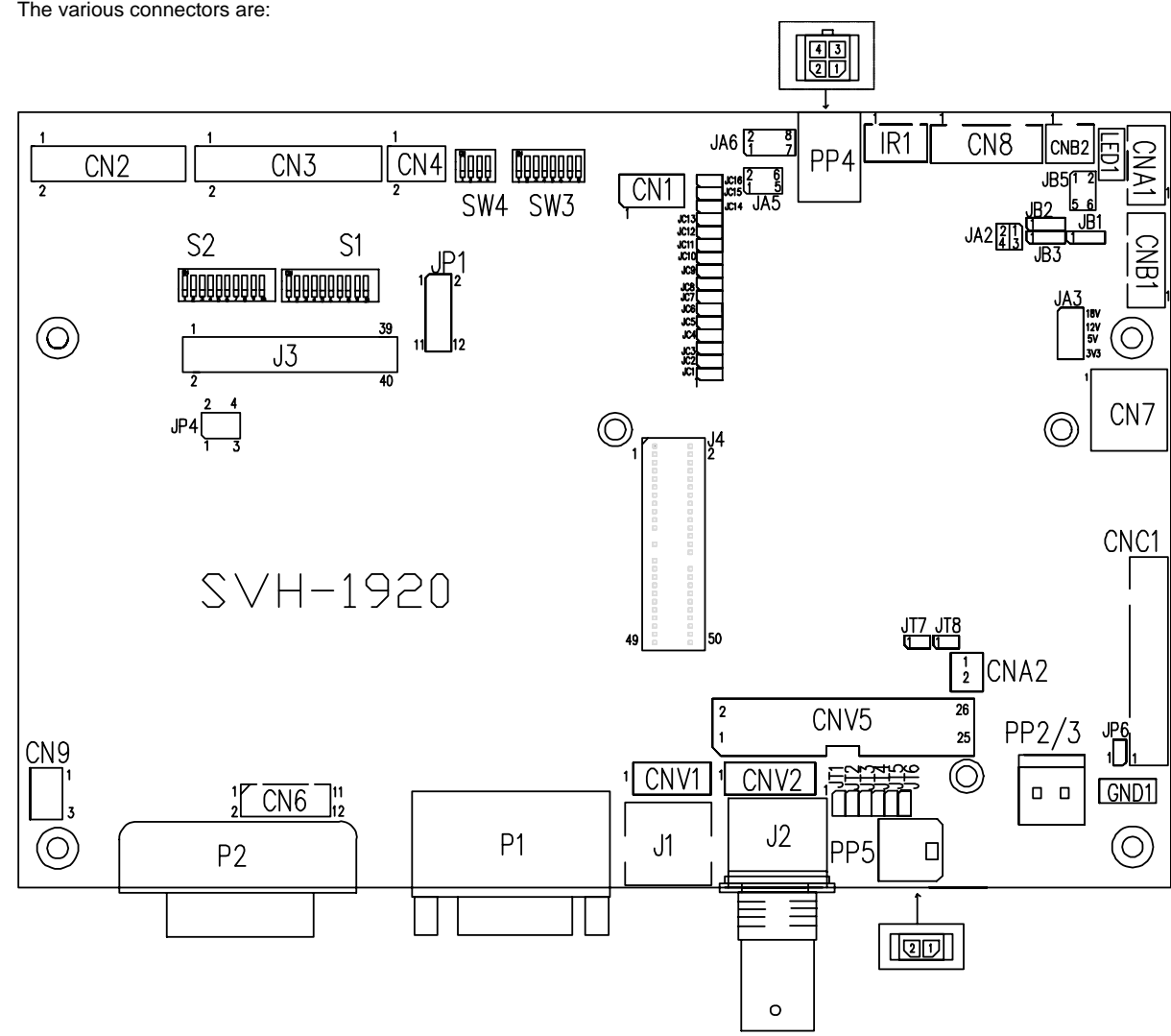
: DISPLAY IN ARGB MODE ONLY

: DISPLAY IN ARGB MODE ONLY

Firmware V0.41.00

CONNECTORS, PINOUTS & JUMPERS

The various connectors are: _____



Summary: Connectors


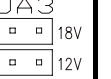



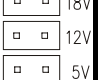
| Ref | Purpose | Description |
|------|--|---|
| CN1 | Reserved | Reserved |
| CN2 | Panel signal for TTL panel | Hirose 40-pin, DF20G-40DP-1V (Matching type : DF20A-40DS-10) |
| CN3 | Panel signal for TTL panel | Hirose 50-pin, DF20G-50DP-1V (Matching type : DF20A-50DS-10) |
| CN4 | Panel signal for TTL panel | Hirose 10-pin, DF20G-10DP-1V (Matching type : DF20A-10DS-10) |
| CN6 | Reserved | Hirose 12-pin, DF11-12DP-2DSA (Matching type : DF11-12DS-20) |
| CN7 | Audio board connector | DIL socket header 5x2 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) |
| CNA1 | Auxiliary power output | JST 4-way, B4B-XH-A (Matching type : XHP-4) |
| CNA2 | Auxiliary +5VDC output | JST 2 way, B2B-PH-K (Matching type : XHP-2) |
| CNB1 | Backlight inverter | JST 5-way, B5B-XH-A (Matching type : XHP-5) |
| CNB2 | Backlight status input connector | JST 2 way, B2B-XH-A (Matching type : XHP-2) |
| CNC1 | OSD controls | JST 12-way, B12B-XH-A (Mating type : XHP-12) |
| CNV1 | Alternate video in | JST 5-way, B5B-PH-K (Matching type : PHR-5) (Matching video cable P/N 426000500-3) |
| CNV2 | Component video in | JST 6-way, B6B-PH-K (Matching type : PHR-6) (Matching video cable P/N 426000600-3) |
| CNV5 | Auxiliary video input | Header pin 13x2 (Matching video cable P/N 426000800-3) |
| J1 | S-video in | Mini din 4-way |
| J2 | Composite video in | BNC connector |
| J3 | Panel signal for LVDS panel | Hirose 40 pin, DF13-40DP-1.25DSA (Matching type : DF13-40DS-1.25C) |
| J4 | HD-SDI adaptor board interface connector | 2 x 25 ways, 2.54x1.27 header (Matching connector type : DF13-40DS-1.25C) (Matching ribbon cable : P/N 426171100-3) |
| IR1 | Infra-Red sensor connector | JST 3-way, B3B-XH-A (Matching type : XHP-3) |
| LED1 | Dual color LED connector | Header pin 3x1 |

| | | |
|---------|----------------------------|--|
| P1 | VGA analog input | DB-15 way high density 3 row |
| P2 | DVI-D | DVI-I connector |
| PP2/PP3 | Power input (alternative) | DC power Molex 2 pin 0.156" pitch |
| PP4 | External panel power input | Molex 43045-0400 compatible (Matching connector type : Molex 43025-0400 compatible) (Matching power cable : P/N 426013700-3) |
| PP5 | Power input | Molex 43650-0200 compatible (Matching connector type : Molex 43645-0200 compatible) (Matching power cable : P/N 426013800-3) |
| S1 | LVDS / TTL panel selection | 10 way DIP Switch |
| S2 | LVDS / TTL panel selection | 10 way DIP Switch |
| SW3 | Panel selection | 8-way DIP Switch |
| SW4 | Function selection | 6-way DIP Switch |

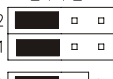
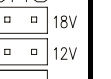



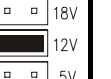


Summary: Jumpers setting

| Ref | Purpose | Note |
|-----------|---|--|
| JA1 | On board +5V logic power enable | 1-2 & 3-4 closed, factory set, do not remove |
| JA2 | On board +3.3V logic power enable | 1-2 & 3-4 closed, factory set, do not remove |
| JA3 | Panel power voltage select CAUTION: Incorrect setting can damage panel | See panel voltage setting table 1 |
| JA5 | Panel power voltage select CAUTION: Incorrect setting will cause panel damage | See panel voltage setting table 1 |
| JA6 | Panel power voltage select CAUTION: Incorrect setting will cause panel damage | See panel voltage setting table 1 |
| JB1 | Backlight brightness voltage range | 1-2 closed = 3.3V max 2-3 closed = 5V max |
| JB2 | Backlight inverter on/off control – signal level | 2-3 = On/Off control signal 'High' = +5V 1-2 = On/Off control signal 'High' = +3.3V Open = On/Off control signal 'High' = Open collector CAUTION: Incorrect setting can damage inverter. |
| JB3 | Backlight inverter on/off control – polarity | 1-2 = control signal 'high' = CCFT ON 2-3 = control signal 'low' = CCFT ON |
| JB5 | Backlight control type selection | 1-2 = VR/Digital switch mount control 3-4 = Analog backlight brightness - voltage range 0~5V 5-6 = PWM (Pulse Width Modulation) brightness |
| JC1– JC16 | Reserved for custom configuration | Reserved |
| JP2 | Reserved | Reserved |
| JP4 | Custom configuration | 1-2 = Reserved 3-4 = On-board programming 5-6 = Display "Blue only" function on OSD menu |
| JP6 | Input power control | Short = External switch control Open = Switch mount control |
| JT1 | Composite video-in terminator enable | Open = composite video input is not terminated Close = composite video input is terminated with 75Ω |
| JT2 | S-Video luma-in terminator enable | Open = S-video luma input is not terminated Close = S-video luma input is terminated with 75Ω |
| JT3 | S-Video chroma-in terminator enable | Open = S-video chroma input is not terminated Close = S-video chroma input is terminated with 75Ω |
| JT4 | Component luma-in terminator enable | Open = component luma input is not terminated Close = component luma input is terminated with 75Ω |
| JT5 | Component Cr-in terminator enable | Open = component Cr input is not terminated Close = component Cr input is terminated with 75Ω |
| JT6 | Component Cb-in terminator enable | Open = component Cb input is not terminated Close = component Cb input is terminated with 75Ω |
| JT7 | Composite video 2-in terminator enable | Open = composite video input is not terminated Close = composite video input is terminated with 75Ω |
| JT8 | Reserved | Reserved |
| S1 & S2 | LVDS or TTL panel selection | LVDS panel : All OFF TTL panel : All ON |
| SW3 | Panel & function selection | See table 2 |
| SW4 | Panel & function selection | See table 3 |

Table 1 : Panel voltage setting table :

| Input voltage via PP2/PP3, 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/PP3, PP5 | Panel Voltage | JA3 | JA5 | JA6 | Jumper on board |
|--------------------------------|---------------|------------|-----------|-----------|---|
| 24VDC** | 3.3V | 3V3 closed | 1-3 & 2-4 | 1-3 & 2-4 |   |
| | 5V | 5V closed | 1-3 & 2-4 | 1-3 & 2-4 |   |
| | 12V | 12V closed | 1-3 & 2-4 | 3-5 & 4-6 |   |
| | 18V | 18V closed | 1-3 & 2-4 | 3-5 & 4-6 |   |

CAUTION: Incorrect setting can damage panel & controller

**** Ensure that the backlight inverter supports 24V operation prior to connecting a 24VDC input. Because CNA1 pin 1 and CNB1 pin 2 will output 24VDC if input 24VDC via PP2/PP3 or PP5.**

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

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

Table 2 : DIP Switch selection – SW3

| Pos #1 | Pos #2 | Pos #3 | Pos.#4 | Description | Panel resolution |
|------------------|--------|--------|--------|--|----------------------|
| For WUXGA panels | | | | | |
| OFF | ON | ON | OFF | LG LM260WU1-SLB1 ⁽¹⁾ | 1920x1200 |
| ON | ON | ON | OFF | LG LM240WU2-SLA1 ⁽¹⁾ | 1920x1200 |
| OFF | OFF | OFF | OFF | Sharp LQ445D3LZ19 | 1920x1080 |
| ON | OFF | OFF | OFF | Samsung LTA460H2-L02 | 1920x1080 |
| OFF | ON | OFF | OFF | Sharp LQ170M1LZ04 | 1920x1200 |
| ON | ON | OFF | OFF | Samsung LTA700HH-LH1 (1 st trial testing) | 1920x1080 |
| OFF | OFF | ON | OFF | Samsung LTA700HH-LH1 (2 nd trial testing) | 1920x1080 |
| For UXGA panels | | | | | |
| OFF | OFF | OFF | OFF | Fujitsu FLC59UXC8V-02A | 1600x1200 |
| ON | OFF | OFF | OFF | Samsung LTM213U6-L01 ⁽²⁾ | 1600x1200 |
| For WXGA panels | | | | | |
| OFF | OFF | OFF | OFF | LG LC420W02-A4 | 1366x768 |
| ON | OFF | OFF | OFF | Sharp LQ315T3LZ24 | 1366x768 |
| ON | ON | OFF | OFF | Samsung LTA320W2-L01 / LTA230W1-L02 | 1366x768 |
| ON | ON | ON | ON | NEC NL12876BC26-21 / Samsung LTM170W1-L01 | 1280x768 |
| OFF | ON | ON | ON | CHI MEI N154I4-L01 | 1280x800 |
| OFF | OFF | ON | OFF | AU Optonics M190PW01 ⁽¹⁾ | 1440x900 |
| For SXGA panel | | | | | |
| OFF | OFF | OFF | OFF | Sharp LQ181E1LW31 | 1280x1024 |
| ON | OFF | OFF | OFF | AU Optonics M170EN05 | 1280x1024 |
| For XGA panel | | | | | |
| OFF | OFF | OFF | OFF | Sharp LQ150X1LGN2A Sharp LQ150X1LGB1 | 1024x768 1024x768 |
| For SVGA panel | | | | | |
| OFF | OFF | OFF | OFF | Sharp LQ121S1DG11/41 Toshiba LTM08C351 | 800x600 800x600 |
| For WVGA panel | | | | | |
| OFF | OFF | OFF | OFF | NEC NL8048BC24-01 | 800x480 |
| ON | OFF | OFF | OFF | Kyocera TCG085WV1AB-G00 ⁽¹⁾ | 800x480 |
| For VGA panel | | | | | |
| OFF | OFF | OFF | OFF | Sharp LQ104V1DG51 | 640x480 |
| ON | OFF | OFF | OFF | Sharp LQ104V1DG21 Kyocera TCG075VG2AC-G00 | 640x480 640x480 |
| Others | | | | | |
| OFF | ON | OFF | OFF | AU Optonics M201EW02 V8 ⁽¹⁾ | 1680x1050 |

For additional and recent added panels, see SVH-1920 panel support table at <http://www.digitalview.com/controllers/csq.php>

(1) Support in V0.36.00 firmware version or up only.

(2) Support in V0.41.00 firmware version or up only.

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

| | | |
|---------|------------|------------------------------|
| Pos. #8 | Video lock | ON – Disable OFF – Enable |
|---------|------------|------------------------------|

Table 3 : DIP switch selection – SW4

| Pos. # | Function | Description |
|--------|---|---|
| 1 | Clock phase | OFF : Normal ON : Invert |
| 2 | Panel pixel format | OFF : Double Pixel ON : Single Pixel |
| 3 | Selection of TTL / LVDS panel connection | ON : LVDS OFF : TTL |
| 4 | LVDS data mapping select (Refer to Table 2) | ON : Mapping A (LVDS panel) OFF : Mapping B (LVDS panel) Please adjust to get the correct picture. See as Appendix III for details of mapping A and B. No function for TTL panels. |

CN2 – Panel connector: HIROSE DG20G-40DP-1V (Matching type : DF20A-40DS-1C)

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|------------------|
| 1 | GND | Ground |
| 2 | GND | Ground |
| 3 | NC | No connection |
| 4 | NC | No connection |
| 5 | ER0 | Even data bit R0 |
| 6 | ER1 | Even data bit R1 |
| 7 | ER2 | Even data bit R2 |
| 8 | ER3 | Even data bit R3 |
| 9 | ER4 | Even data bit R4 |
| 10 | ER5 | Even data bit R5 |
| 11 | ER6 | Even data bit R6 |
| 12 | ER7 | Even data bit R7 |
| 13 | GND | Ground |
| 14 | GND | Ground |
| 15 | NC | No connection |
| 16 | NC | No connection |
| 17 | EG0 | Even data bit G0 |
| 18 | EG1 | Even data bit G1 |
| 19 | EG2 | Even data bit G2 |
| 20 | EG3 | Even data bit G3 |
| 21 | EG4 | Even data bit G4 |
| 22 | EG5 | Even data bit G5 |
| 23 | EG6 | Even data bit G6 |
| 24 | EG7 | Even data bit G7 |
| 25 | GND | Ground |
| 26 | GND | Ground |
| 27 | NC | No connection |
| 28 | NC | No connection |
| 29 | EB0 | Even data bit B0 |
| 30 | EB1 | Even data bit B1 |
| 31 | EB2 | Even data bit B2 |
| 32 | EB3 | Even data bit B3 |
| 33 | EB4 | Even data bit B4 |
| 34 | EB5 | Even data bit B5 |
| 35 | EB6 | Even data bit B6 |
| 36 | EB7 | Even data bit B7 |
| 37 | GND | Ground |
| 38 | GND | Ground |
| 39 | CLK | Dot clock |
| 40 | NC | No connection |

CN3 – Panel connector: HIROSE DF20G-50DP-1V (Matching type : DF20A-50DS-1C)

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-----------------|
| 1 | GND | Ground |
| 2 | GND | Ground |
| 3 | NC | No connection |
| 4 | NC | No connection |
| 5 | OR0 | Odd data bit R0 |
| 6 | OR1 | Odd data bit R1 |
| 7 | OR2 | Odd data bit R2 |
| 8 | OR3 | Odd data bit R3 |
| 9 | OR4 | Odd data bit R4 |
| 10 | OR5 | Odd data bit R5 |
| 11 | OR6 | Odd data bit R6 |
| 12 | OR7 | Odd data bit R7 |
| 13 | GND | Ground |
| 14 | GND | Ground |
| 15 | NC | No connection |
| 16 | NC | No connection |
| 17 | OG0 | Odd data bit G0 |
| 18 | OG1 | Odd data bit G1 |
| 19 | OG2 | Odd data bit G2 |
| 20 | OG3 | Odd data bit G3 |
| 21 | OG4 | Odd data bit G4 |
| 22 | OG5 | Odd data bit G5 |
| 23 | OG6 | Odd data bit G6 |
| 24 | OG7 | Odd data bit G7 |
| 25 | GND | Ground |
| 26 | GND | Ground |
| 27 | NC | No connection |

| | | |
|----|-----------|---|
| 28 | NC | No connection |
| 29 | OB0 | Odd data bit B0 |
| 30 | OB1 | Odd data bit B1 |
| 31 | OB2 | Odd data bit B2 |
| 32 | OB3 | Odd data bit B3 |
| 33 | OB4 | Odd data bit B4 |
| 34 | OB5 | Odd data bit B5 |
| 35 | OB6 | Odd data bit B6 |
| 36 | OB7 | Odd data bit B7 |
| 37 | GND | Ground |
| 38 | GND | Ground |
| 39 | VS | Vertical sync |
| 40 | CLK | Dot clock |
| 41 | HS | Horizontal sync |
| 42 | DE | Display enable |
| 43 | PWR | Power down control signal (5v TTL) |
| 44 | VLCD | Panel power supply (3.3v/5v configurable) |
| 45 | VLCD | Panel power supply (3.3V/5v configurable) |
| 46 | VLCD | Panel power supply (3.3V/5v configurable) |
| 47 | NC | No connection |
| 48 | VLCD12/18 | +12V/+18V panel supply (selected by JA3, JA5 & JA6) |
| 49 | VLCD12/18 | +12V/+18V panel supply (selected by JA3, JA5 & JA6) |
| 50 | VLCD12/18 | +12V/+18V panel supply (selected by JA3, JA5 & JA6) |

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

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|---------------|
| 1 | OP1 | Reserved |
| 2 | OP2 | Reserved |
| 3 | OP3 | Reserved |
| 4 | OP4 | Reserved |
| 5 | OP5 | Reserved |
| 6 | OP6 | Reserved |
| 7 | OP7 | Reserved |
| 8 | OP8 | Reserved |
| 9 | NC | No connection |
| 10 | NC | No connection |

CN7 - Audio connector: DIL socket header 5x2 right angle [OPERATE UNDER 12VDC POWER INPUT ENVIRONMENT]

| PIN | SYMBOL | DESCRIPTION |
|-----|-----------|-------------------------------------|
| 1 | VCC | Audio board logic power supply, +5V |
| 2 | VOLSEL0 | Reserved |
| 3 | VOLSEL1 | Reversed |
| 4 | TUNAUSEL | 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 | SDATA | Reserved |
| 2 | SCLK | 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 : XHP-3)

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

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

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

CNA2 - Auxiliary power output: JST B2B-PH-K (Matching type : XHP-2)

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|-----------------------------|
| 1 | Vcc_5V | +5V DC, 500mA max with fuse |
| 2 | GND | Ground |

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 – Function controls connector: JST B12B-XH-A (Matching type : XHP-12)

| PIN | SYMBOL | DESCRIPTION |
|-----|----------|--|
| 1 | PSWIN | Power switch A |
| 2 | SW_ON | Power switch B |
| 3 | BVR_A | Backlight brightness VR pin A |
| 4 | BVR_WIP | Backlight brightness VR pin WIP |
| 5 | BVR_B | Backlight brightness VR pin B (470Ω resistor to +5V Vcc) |
| 6 | GND | Ground |
| 7 | MENU | OSD menu button |
| 8 | -/LEFT | OSD -/Left button |
| 9 | + /RIGHT | OSD +/Right button |
| 10 | SEL_DN | OSD Select down button |
| 11 | SEL_UP | OSD Select up button |
| 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.

CNV1 – Alternate Video in input, JST B5B-PH-K (Matching type : PHR-5)

| PIN | DESCRIPTION |
|-----|---------------------|
| 1 | S-Video : Chroma in |
| 2 | S-Video : Luma in |
| 3 | Ground |
| 4 | Ground |
| 5 | Composite video in |

CNV2 – Component Video in input, JST B6B-PH-K (Matching type : PHR-6)

| PIN | DESCRIPTION |
|-----|-------------------|
| 1 | Luma in /Green in |
| 2 | Ground |
| 3 | Cb in / Blue in |
| 4 | Ground |
| 5 | Cr in / Red in |
| 6 | Ground |

CNV5 – Auxiliary Video input connector, DIL socket header 13x2

| PIN | DESCRIPTION |
|-----|-----------------------|
| 1 | S-Video : Chroma in |
| 2 | Ground |
| 3 | S-Video : Luma in |
| 4 | Ground |
| 5 | Composite video in |
| 6 | Ground |
| 7 | Luma in |
| 8 | Ground |
| 9 | Cb in |
| 10 | Ground |
| 11 | Cr in |
| 12 | Ground |
| 13 | S-Video_2 : Chroma in |
| 14 | Ground |
| 15 | S-Video_2 : Luma in |
| 16 | Ground |
| 17 | Composite video in_2 |
| 18 | Ground |
| 19 | Cr in_2 |
| 20 | Ground |
| 21 | Y in_2 |
| 22 | Ground |
| 23 | Cb in_2 |
| 24 | Ground |
| 25 | Short to CNV5 pin 21 |
| 26 | Ground |

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

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

J3 – LVDS Panel connector: Hirose, DF13A-40DP-1.25DSA (Matching type : DF13-40DS-1.25C)

| PIN | SYMBOL | DESCRIPTION |
|-----|---------------|--|
| 1 | TXA0+ | Positive differential LVDS data bit A0 |
| 2 | TXA0- | Negative differential LVDS data bit A0 |
| 3 | TXA1+ | Positive differential LVDS data bit A1 |
| 4 | TXA1- | Negative differential LVDS data bit A1 |
| 5 | Reserved | - |
| 6 | Reserved | - |
| 7 | TXA2+ | Positive differential LVDS data bit A2 |
| 8 | TXA2- | Negative differential LVDS data bit A2 |
| 9 | TXA3+ | Positive differential LVDS data bit A3 |
| 10 | TXA3- | Negative differential LVDS data bit A3 |
| 11 | GND | Ground |
| 12 | GND | Ground |
| 13 | TXAC+ | Positive LVDS clock for A channel |
| 14 | TXAC- | Negative LVDS clock for A channel |
| 15 | GND | Ground |
| 16 | GND | Ground |
| 17 | TXB0+ | Positive differential LVDS data bit B0 |
| 18 | TXB0- | Negative differential LVDS data bit B0 |
| 19 | TXB1+ | Positive differential LVDS data bit B1 |
| 20 | TXB1- | Negative differential LVDS data bit B1 |
| 21 | Reserved | - |
| 22 | Reserved | - |
| 23 | TXB2+ | Positive differential LVDS data bit B2 |
| 24 | TXB2- | Negative differential LVDS data bit B2 |
| 25 | TXB3+ | Positive differential LVDS data bit B3 |
| 26 | TXB3- | Negative differential LVDS data bit B3 |
| 27 | GND | Ground |
| 28 | GND | Ground |
| 29 | TXBC+ | Positive LVDS clock for B channel |
| 30 | TXBC- | Negative LVDS clock for B channel |
| 31 | GND | Ground |
| 32 | GND | Ground |
| 33 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) |
| 34 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) |

| | | |
|----|-----------------|--|
| 35 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) |
| 36 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) |
| 37 | NC | No connection |
| 38 | VDD +12V / +18V | Panel power supply (+12V/18V) (selected by JA3, JA5 & JA6) |
| 39 | VDD +12V / +18V | Panel power supply (+12V/18V) (selected by JA3, JA5 & JA6) |
| 40 | VDD +12V / +18V | Panel power supply (+12V/18V) (selected by JA3, JA5 & JA6) |

LED1 – Status LED connector: 3-pin header

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

P1 - Analog VGA in - 15 way connector

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

P2 – DVI-I in

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|-------------------------------------|
| 1 | /RX2 | TMDS Data 2- |
| 2 | RX2 | TMDS Data 2+ |
| 3 | GND | Digital Ground |
| 4 | NC | No connection |
| 5 | NC | No connection |
| 6 | DDC_CLK | DDC Clock |
| 7 | DDC_DAT | DDC Data |
| 8 | VS_IN | Analog vertical Sync |
| 9 | /RX1 | TMDS Data 1- |
| 10 | RX1 | TMDS Data 1+ |
| 11 | GND | Digital Ground |
| 12 | NC | No connection |
| 13 | NC | No connection |
| 14 | DDC_5V | +5V power supply for DDC (optional) |
| 15 | GND | Ground (+5, Analog H/V Sync) |
| 16 | NC | No connection |
| 17 | /RX0 | TMDS Data 0- |
| 18 | RX0 | TMDS Data 0+ |
| 19 | GND | Digital Ground |
| 20 | NC | No connection |
| 21 | NC | No connection |
| 22 | GND | Digital Ground |
| 23 | RXC | TMDS Clock+ |
| 24 | /RXC | TMDS Clock- |
| C1 | R | Red or Pr |
| C2 | G | Green or Y |
| C3 | B | Blue or Pb |
| C4 | HS_IN | Analog horizontal sync |
| C5 | GND | Ground |
| C6 | NC | No connection |

PP2/PP3 – Alternate 12V/24VDC power supply

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

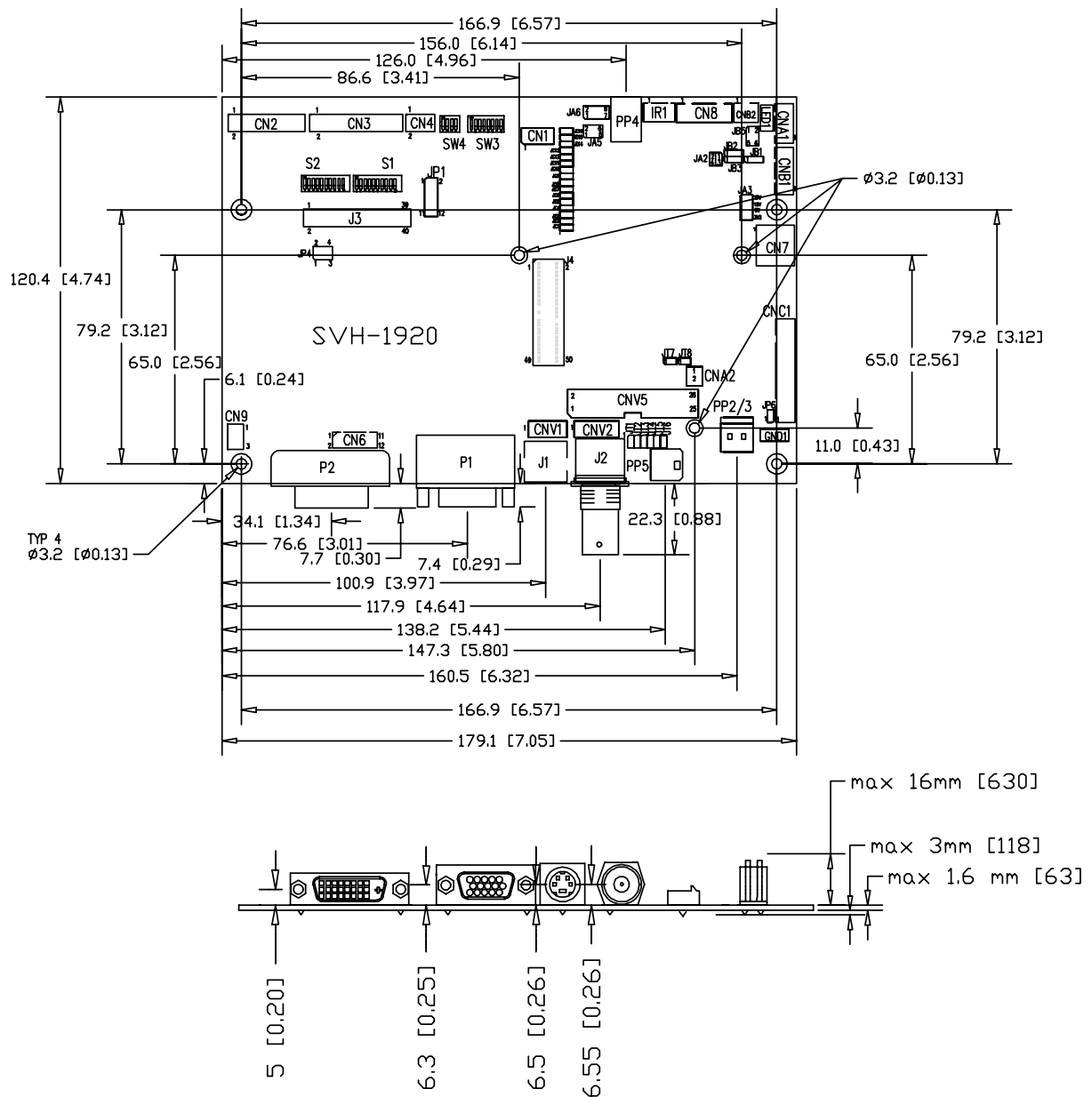
PP4 – External panel power input

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

PP5 - 12VDC power supply

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

CONTROLLER DIMENSIONS



Ready-made 3D Pro-E (SLDPRT) drawing files - Save time and effort for your system volumetric analysis design. Includes jpg file previews. Please go to download at <http://www.digitalview.com/drawing/SVH-1920%203D%20Drawing.zip>.

The maximum thickness of the controller is 20.6mm 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 colour, tint and image position as required then switch everything off.
- Remove the control switches, the 12-way (CNC1) cable.
- Use a jumper or similar to connect pins 1 & 2 on CNC1, this will fix the board On.
- Refer to inverter specifications for details as to fixing brightness to a desired level, this may require a resistor, an open circuit or closed circuit depending on inverter.

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

INVERTER CONNECTION

There are potentially 3 issues to consider with inverter connection:

- Power
- Enable
- Brightness

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

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

CNB1

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

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

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

CNB1

| PIN | DESCRIPTION |
|-----|-------------|
| 3 | Enable |

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

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

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

- Brightness can control by using a resistor or VR (Variable Resistor).
- Brightness controlled by adding a circuit such as PWM (Pulse Width Modulation).
- No adjustment of brightness is possible.

CNB1 pins 4 & 5 are available for connecting to an inverter or circuit where VR control is supported.

CNB1

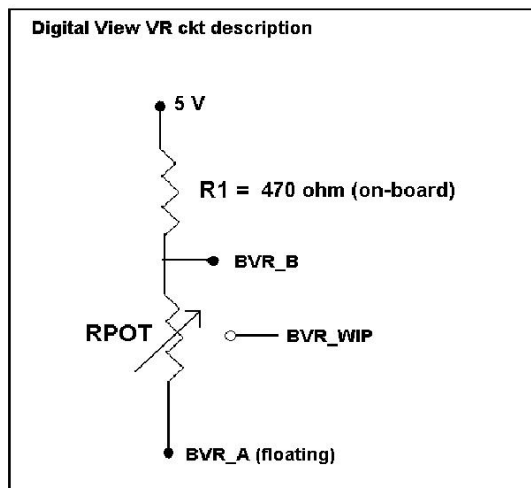
| PIN | DESCRIPTION |
|-----|-------------|
| 4 | VR WIP |
| 5 | VR A |

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

CNC1

| PIN | DESCRIPTION |
|-----|-------------|
| 3 | VR A |
| 4 | VR WIP |
| 5 | VR B |

Design Guideline for making VR circuitry :



Signal description / Notes :

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

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

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

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

CNC1 – Control switch, JST B12B-XH-A (Matching type : XHP-12)

| 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)

$$BVR_WIP = 5 \times (R_{bc}/10.47)$$

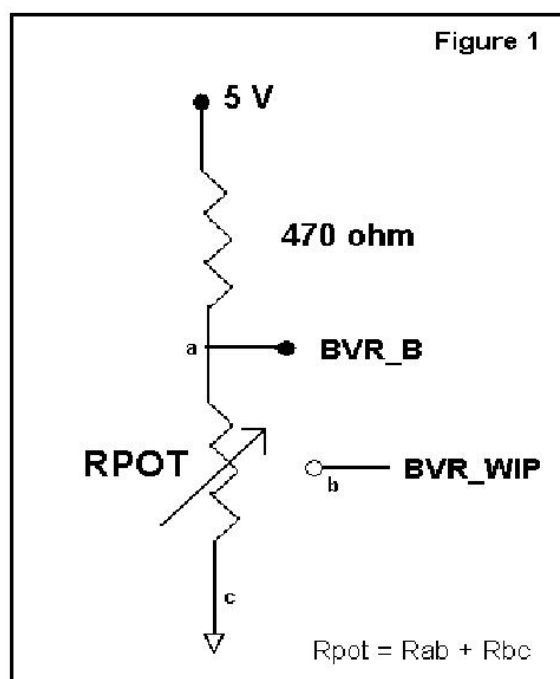
where BVR_WIP is in Volts.

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.



TROUBLESHOOTING

General

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

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

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

No image:

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

Image position:

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

Image appearance:

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

Backlight:

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

If half the screen is dimmer than the other half:

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

Also:

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

Continued failure:

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

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

SPECIFICATIONS

| | |
|---------------------------------------|--|
| Panel compatibility | Compatible with 1920x1200, 1920x1080, 1680x1050, 1600x1200, 1440x900 1366x768, 1280x1024, 1024x768, 800x600 & 640x480 resolutions of TFT LCD panels. A specified BIOS and some factory adjustment may be required for individual panel timings. |
| No. of colours | Up to 3 x 8 bit providing 16.7 million colours. |
| Panel power | DC 3.3V, 5V, 12V, 18V |
| Panel signal | TTL / LVDS |
| Vertical refresh rate | 60Hz at 1920x1200, 60Hz at 1920x1080, 60Hz at UXGA and up to 75Hz other lower resolution |
| Display clock maximum | 165MHz |
| ADC clock maximum | 195 MHz |
| DVI differential input clock maximum | 165MHz |
| Graphics formats | Standard VESA VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA Other special formats through specified BIOS and factory adjustment. |
| Graphics auto mode detect | VGA, SVGA, XGA, SXGA, WXGA, UXGA & WUXGA interlaced and non-interlaced |
| Standard input at source (analog RGB) | VGA analog (15 pin) standard with automatic detection of: Digital Separate Sync; Composite Sync Sync On Green. |
| Video formats | PAL, NTSC & SECAM |
| Video inputs | ARGB DVI-D Composite video 1 Composite video 2 S-Video S-Video 2 SD Component video (YCbCr) SD Component video 2 (YCbCr) HD-SDI HD-SDI 2 |
| Functions display | On screen display (OSD) of functions |
| OSD menu functions | Image controls: Panel brightness/contrast, Saturation, Hue, Color temperature, Sharpness, Video Scaling, PIP, OSD position, OSD timeout, Image orientation, Auto Source Seek, etc. |
| OSD menu controls available | Power On/Off Backlight brightness OSD Menu OSD Select up OSD Select down Setting + Setting - |
| Control interface | Buttons, RS-232, Remote control |
| Settings memory | Settings are stored in non volatile memory |
| PC Connectivity | VGA / SVGA / XGA / SXGA / UXGA / WUXGA analog or digital |
| Controller dimensions | 179mm x 120.4mm (7." x 4.74") |
| Power consumption | 10w approx. (not including panel power consumption) |
| Power load maximum | The controller has an overall 3Amp current limit. |
| Input voltage | 12V/24VDC +/- 5% |
| Power protection | Fuse fitted (Resettable) |
| DC Power handling | Reverse power polarity protection is equipped on the board |
| Storage temperature limits | -40°C to +70°C |
| Operating temperature limits | 0°C to +60°C |

NOTES

Please note the following:

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

APPENDIX I – SIGNAL SUPPORT MODE TABLE

ARGB (P1) PORT :

| Mode | Resolution | Clk [MHz] | Horizontal freq [KHz] | Vertical freq [Hz] | Sync Mode |
|-------|------------------|-----------|--------------------------|-----------------------|-----------------------|
| T_70 | 720x400 70Hz | 28.322 | 31.469 | 70.087 | Digital Separate Sync |
| T_70 | 720x400 70Hz | 28.322 | 31.469 | 70.087 | Sync On Green |
| V_60 | 640x480 60Hz | 25.175 | 31.469 | 59.940 | Digital Separate Sync |
| V_60 | 640x480 60Hz | 25.175 | 31.469 | 59.940 | Sync On Green |
| V_60 | 640x480 60Hz | 25.175 | 31.469 | 59.940 | Composite Sync |
| V_72 | 640x480 72Hz | 31.500 | 37.861 | 72.809 | Digital Separate Sync |
| V_72 | 640x480 72Hz | 31.500 | 37.861 | 72.809 | Sync On Green |
| V_72 | 640x480 72Hz | 31.500 | 37.861 | 72.809 | Composite Sync |
| V_75 | 640x480 75Hz | 31.500 | 37.500 | 75.000 | Digital Separate Sync |
| V_75 | 640x480 75Hz | 31.500 | 37.500 | 75.000 | Sync On Green |
| V_75 | 640x480 75Hz | 31.500 | 37.500 | 75.000 | Composite Sync |
| SV_56 | 800x600 56Hz | 36.000 | 35.156 | 56.250 | Digital Separate Sync |
| SV_56 | 800x600 56Hz | 36.000 | 35.156 | 56.250 | Sync On Green |
| SV_56 | 800x600 56Hz | 36.000 | 35.156 | 56.250 | Composite Sync |
| SV_60 | 800x600 60Hz | 40.000 | 37.879 | 60.317 | Digital Separate Sync |
| SV_60 | 800x600 60Hz | 40.000 | 37.879 | 60.317 | Sync On Green |
| SV_60 | 800x600 60Hz | 40.000 | 37.879 | 60.317 | Composite Sync |
| SV_72 | 800x600 72Hz | 50.000 | 48.077 | 72.188 | Digital Separate Sync |
| SV_72 | 800x600 72Hz | 50.000 | 48.077 | 72.188 | Sync On Green |
| SV_72 | 800x600 72Hz | 50.000 | 48.077 | 72.188 | Composite Sync |
| SV_75 | 800x600 75Hz | 49.500 | 46.875 | 75.000 | Digital Separate Sync |
| SV_75 | 800x600 75Hz | 49.500 | 46.875 | 75.000 | Sync On Green |
| SV_75 | 800x600 75Hz | 49.500 | 46.875 | 75.000 | Composite Sync |
| X_60 | 1024x768 60Hz | 65.000 | 48.363 | 60.004 | Digital Separate Sync |
| X_60 | 1024x768 60Hz | 65.000 | 48.363 | 60.004 | Sync On Green |

| | | | | | |
|--------|-------------------|--------|--------|--------|-----------------------|
| X_60 | 1024x768 60Hz | 65.000 | 48.363 | 60.004 | Composite Sync |
| X_70 | 1024x768 70Hz | 75.000 | 56.476 | 70.069 | Digital Separate Sync |
| X_70 | 1024x768 70Hz | 75.000 | 56.476 | 70.069 | Sync On Green |
| X_70 | 1024x768 70Hz | 75.000 | 56.476 | 70.069 | Composite Sync |
| X_75 | 1024x768 75Hz | 78.750 | 60.023 | 75.029 | Digital Separate Sync |
| X_75 | 1024x768 75Hz | 78.750 | 60.023 | 75.029 | Sync On Green |
| X_75 | 1024x768 75Hz | 78.750 | 60.023 | 75.029 | Composite Sync |
| SX_60 | 1280x1024 60Hz | 108 | 63.81 | 60.020 | Digital Separate Sync |
| SX_60 | 1280x1024 60Hz | 108 | 63.81 | 60.020 | Sync On Green |
| SX_60 | 1280x1024 60Hz | 108 | 63.81 | 60.020 | Composite Sync |
| SX_75 | 1280x1024 75Hz | 135 | 79.976 | 75 | Digital Separate Sync |
| SX_75 | 1280x1024 75Hz | 135 | 79.976 | 75 | Sync On Green |
| SX_75 | 1280x1024 75Hz | 135 | 79.976 | 75 | Composite Sync |
| UX_60 | 1600x1200 60Hz | 162 | 75.000 | 60 | Digital Separate Sync |
| UX_60 | 1600x1200 60Hz | 162 | 75.000 | 60 | Sync On Green |
| UX_60 | 1600x1200 60Hz | 162 | 75.000 | 60 | Composite Sync |
| WUX_60 | 1920x1080 60Hz | 172.8 | 67.5 | 60 | Digital Separate Sync |
| WUX_60 | 1920x1080 60Hz | 172.8 | 67.5 | 60 | Sync On Green |
| WUX_60 | 1920x1080 60Hz | 172.8 | 67.5 | 60 | Composite Sync |
| WUX_60 | 1920x1200 60Hz | 193.2 | 74.5 | 60 | Digital Separate Sync |
| WUX_60 | 1920x1200 60Hz | 193.2 | 74.5 | 60 | Sync On Green |
| WUX_60 | 1920x1200 60Hz | 193.2 | 74.5 | 60 | Composite Sync |

Remark :

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. To support on higher refresh rate over 60Hz, the LCD panel may not support.

COMPOSITE, S-VIDEO & COMPONENT VIDEO INPUT PORT :

| System | Resolution | Horizontal freq [KHz] | Vertical freq [Hz] |
|-----------|------------|--------------------------|-----------------------|
| NTSC | 720x480i | 15.7 | 60 |
| NTSC 4.43 | 720x480i | 15.7 | 60 |
| PAL | 720x576i | 15.6 | 50 |
| PAL M | 720x576i | 15.6 | 50 |
| SECAM | 720x576i | 15.6 | 50 |

Appendix II – RS-232 control protocols

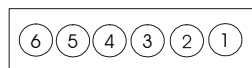
RS-232 Serial control (Baud rate 2400, 8 bits, 1 stop bit and no parity)

Physical connection :

Controller side

Connector interface : CN8

Mating connector : JST XHP-6



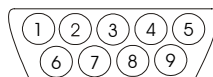
Mating face of CN8

| PIN# | Description |
|------|----------------|
| 4 | RS-232 Tx Data |
| 5 | Ground |
| 6 | RS-232 Rx Data |

Computer side

Connector interface : Serial port

Mating connector : DB9 Female



Mating face of RS-232 DB9 Male

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

Remark :

(1) : RS-232 connection cable, 600mm P/N 4260902-00 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 Reset Query | volume Range : "0"0-"1"E" Default : "0"F" |
| Volume control - on/off (mute) | 0x80, "m" "M", "0" "1" "r" "R" "?" | Disable audio output. Enable audio output. Reset Query | "0" - audio off (muted). "1" - audio on. |
| Brightness control | 0x81, nn "+" "-" "r" "R" "?" | Set brightness = value/increment/decrement Reset Query | Brightness. Range : "4"E-"B"2" Default : "8"0" |
| Contrast control - all channels | 0x82, "a" "A", nn "+" "-" "r" "R" "?" | Set all contrast = value/increment/decrement Reset Query | Contrast Range : "1"C-"E"4" Default : "8"0" |
| Saturation control | 0x83, nn "+" "-" "r" "R" "?" | Set saturation = value/increment/decrement Reset Query | PAL/NTSC color (In video mode only) Range : "0"1-"F"F" Default : "8"0" |
| Hue control | 0x84, nn "+" "-" "r" "R" "?" | Set hue = value/increment/decrement Reset Query | NTSC tint (In NTSC mode only) Range : "5"3-"9"F" Default : "7"9" |
| Phase (tuning) control | 0x85, nn "+" "-" "?" | Set dot clock phase = value/increment/decrement Query | Dot clock phase. (In PC mode only) |
| Image H position | 0x86, nnnn "+" "-" "?" | Set img_hpos = value/increment/decrement Query | Image horizontal position. (In PC mode only) |
| Image V position | 0x87, nnnn "+" "-" "?" | Set img_vpos = value/increment/decrement Query | Image vertical position. (In PC mode only) |
| Sharpness | 0x8a, nn "+" "-" "r" "R" "?" | Set sharpness = value/increment/decrement Reset Query | Sharpness. (Video Mode Source only) Range : "F"1-"0"F" Default : "0"0" |
| Frequency | 0x8b, nnnn "+" "-" "?" | Set frequency = Value/increment/decrement Query | Graphic mode H active size (in pixels) |
| Scaling Mode | 0x8c, "0" "1" "2" "3" "9" "A" "B" "C" "D" "r" "R" "?" | Set graphic image scaling mode = value Reset Query | Image expansion on/off. "0" – 1:1 "1" – fill screen "2" – fill to aspect ratio "9" – 4:3 "A" – 16:9 "B" – 16:10 |

| | | | |
|--|---|--|---|
| | | | "C" – 2.35:1 "D" – 2:1 |
| Set display orientation | 0x8e, n "r" "R" "?" | Set display orientation = value/increment/decrement Reset Query | "0" – normal. "1" – vertical inverse. "2" – horizontal inverse. "3" – inverted. |
| OSD H position | 0x90, nnn "+" "-" "r" "R" "?" | Set osd_hpos = value/increment/decrement Reset Query | OSD horizontal position. Range : "0""0"-“F”"F" Default : "8""0" |
| OSD V position | 0x91, nnn "+" "-" "r" "R" "?" | Set osd_vpos = value/increment/decrement Reset Query | OSD vertical position. Range : "0""0"-“F”"F" Default : "8""0" |
| OSD Transparency | 0x92, n "+" "-" "r" "R" "?" | Set OSD transparency = value/increment/decrement Reset Query | OSD transparency. "0" – ON "1" – OFF |
| OSD menu timeout | 0x93, nn "+" "-" "r" "R" "?" | Select menu timeout = value/increment/decrement Reset Query | OSD menu timeout value. "0""0" – Continuous. value – Round up to nearest available step. if value > max available step, set it to the max available step. Range : "0""5"-“3”"C" Default : "0""A" |
| Select OSD language | 0x95, n "r" "R" "?" | Select language = English, Chinese,... Reset Query | "0" – English. "8" – Chinese |
| Input main select | 0x98, nn "+" "-" "r" "R" "?" | Select input main = PC or VIDEO or next available Reset Query | Main selected. 0x41, 0x31 : ARGB 0x42, 0x31 : Composite 0x43, 0x31 : S-video 0x44, 0x31 : SD Component 0x45, 0x31 : HDSOI 0x46, 0x31 : DVI 0x47, 0x31 : HD Component 0x42, 0x32 : Composite 2 0x43, 0x32 : S-video 2 0x44, 0x32 : SD Component 2 0x45, 0x32 : HDSOI 2 (Source sequence : S-Video → SD component → HD/SD SDI1 → HD/SD SDI2 → ARGB → DVI → Composite → Composite 2 → S-Video) |
| Auto Source Seek | 0x99, "0" "1" "r" "R" "?" | Set Auto source seek = OFF/ON Reset Query | "0" – OFF "1" – ON |
| Video System (Composite, S-video and Component Only) | 0x9b, "0" "1" "2" "3" "r" "R" "S" "s" "?" | Set video system = Auto/NTSC/PAL/SECAM Reset Video State Query Query | Query "0" – Auto. "1" – NTSC_M_358 "2" – PAL_N_443 "3" – SECAM "4" – NTSC_M_443 "5" – PAL_M_358 "6" – NTSC_N_358 "7" – PAL_M_443 |

| | | | |
|------------------------|--|--|--|
| | | | <p>"8" – NTSC_N_443 "9" – PAL_N_358</p> <hr/> <p>Video State Query "0" – No video. "1" – NTSC "2" – PAL "3" – SECAM</p> |
| GAMMA value select | 0x9d, n "r" "R" "?" | Select GAMMA value = Value Reset Query | GAMMA value: "0" – 1.0, "1" – 1.6 "2" – 2.2 "3" – User Defined |
| Auto power off | 0x9f, "0" "1" "r" "R" "?" | Set power down option = On/Off Reset Query | "0" – Off. "1" – On. |
| Hotkey 1 | 0xa0, "1", n "r" "R" "?" | Set Hotkey 1= Value Reset Query | <p>"1" – volume. "2" – brightness. "3" – contrast. "4" – colour. "5" – input source. "7" – zoom "8" – freeze "9" – PIP "D" – PIP Swap "E" – Aspect "F" – Orientation "G" – Hue "H" – Backlight</p> |
| Hotkey 2 | 0xa0, "2", n "r" "R" "?" | Set Hotkey 2 = value Reset Query | <p>"1" – volume. "2" – brightness. "3" – contrast. "4" – colour. "5" – input source. "7" – zoom "8" – freeze "9" – PIP "D" – PIP Swap "E" – Aspect "F" – Orientation "G" – Hue "H" – Backlight</p> |
| Runtime counter | 0xa1, nnnnn "r" "R" "?" | runtime counter value = nnnnn (* 0.5 hour) Reset Query | Runtime = nnnnn. |
| PIP brightness control | 0xa2, nn "+" "-" "r" "R" "?" | Set PIP window brightness = value/increment/decrement Reset Query | PIP window brightness. Range : "4""E"-"B""2" Default : "8""0" |
| PIP contrast control | 0xa3, nn "+" "-" "r" "R" "?" | Set PIP window contrast = value/increment/decrement Reset Query | PIP window contrast. Range : "1""C"-"E""4" Default : "8""0" |
| PIP H position | 0xa4, nnn "+" "-" "r" "R" "?" | Set PIP_hpos = value/increment/decrement Reset Query | PIP window horizontal position. Range : "0""0""0"-"0""6""4" Default : "0""5""5" |
| PIP V position | 0xa5, nnn "+" "-" "r" "R" | Set PIP_vpos = value/increment/decrement Reset | PIP window vertical position. Range : "0""0""0"-"0""6""4" |

| | | | |
|------------------------|--|--|--|
| | "?" | Query | Default : "0""1""4" |
| PIP window size select | 0xa6, nn "r" "R" "?" | Select PIP window size = PIP window size value Reset Query | Main selected. "0""0" - PIP off (Default) "0""1" - PIP small "0""2" - PIP medium "0""3" - PIP large "0""4" - PBP |
| PIP source select | 0xa7, n "r" "R" "?" | Select input main = Video source value Reset Query | Main selected. 0x41, 0x31 : ARGB 0x42, 0x31 : Composite 0x43, 0x31 : S-video 0x44, 0x31 : SD Component 0x45, 0x31 : HDSDI 0x46, 0x31 : DVI 0x47, 0x31 : HD Component 0x42, 0x32 : Composite 2 0x43, 0x32 : S-video 2 0x44, 0x32 : SD Component 2 0x45, 0x32 : HDSDI 2 |
| Zoom level | 0xa8, nnnn "+" "-" "r" "R" "?" | Set Zoom level = value/increment/decrement Reset Query | Zoom level. Min : 0x30 0x30 0x30 0x30 (Default) Max : 0x30 0x30 0x41 0x33 |
| Zoom H position | 0xa9, nnnn "+" "-" "r" "R" "?" | Set Zoom_hpos = value/increment/decrement Reset Query | Zoom window horizontal position. Default : 0x30 0x30 0x30 0x30 The min and max values will change depends on input resolution. |
| Zoom V position | 0xaa, nnnn "+" "-" "r" "R" "?" | Set Zoom_vpos = value/increment/decrement Reset Query | Zoom window vertical position. Default : 0x30 0x30 0x30 0x30 The min and max values will change depends on input resolution. |
| Horizontal Size | 0xad, nnn "+" "-" "r" "R" "?" | Set horizontal size for Aspect Size = value/increment/decrement Reset Query | Scalar horizontal stretch PAL(576i) / NTSC (480i) : Min : 0x30 0x30 0x30 (Default) Max : 0x30 0x46 0x30 |
| Vertical Size | 0xb0, nnn "+" "-" "r" "R" "?" | Set Vertical Size for Aspect Size = value/increment/decrement Reset Query | Scalar vertical stretch. PAL(576i) / NTSC (480i) : Min : 0x30 0x30 0x30 (Default) Max : 0x30 0x46 0x30 |
| Horizontal Pan | 0xb1, nnn "+" "-" "r" "R" "?" | Set horizontal pan position for Aspect Size = value/increment/decrement Reset Query | Scalar horizontal pan position PAL(576i) / NTSC (480i) : Assume max H-Size & max V-size : Min : 0x46 0x38 0x38 Max : 0x30 0x37 0x38 Default : 0x30 0x30 0x30 The min and max values will change depends on different value of H-Size, V-Size and input resolution. |
| Vertical Pan | 0xb2, nnn "+" "-" | Set Vertical pan position for Aspect Size = value/increment/decrement | Scalar vertical pan position PAL(576i) / NTSC (480i) : |

| | | | |
|---|--|--|---|
| | "r" "R" "?" | Reset Query | Assume max H-Size & max V-size : Min : 0x46 0x38 0x38 Max : 0x30 0x37 0x38 Default : 0x30 0x30 0x30 The min and max values will change depends on different value of H-Size, V-Size and input resolution. |
| Colour temperature select | 0xb3, n "r" "R" "?" | Select colour temperature = value Reset Query | Main selected. "0" – 9500K. "1" – 8000K. "2" – 6500K. "3" – 5000K "4" - User |
| Red level for selected colour temperature | 0xb4, nn "+" "-" "r" "R" "?" | Set the level of the red channel for the selected colour temp. = value/increment/decrement Reset Query | Red level for selected colour temperature. Range : "9" C - "F" F Default : "E" C |
| Green level for selected colour temperature | 0xb5, nn "+" "-" "r" "R" "?" | Set the level of the green channel for the selected colour temp. = value/increment/decrement Reset Query | Green level for selected colour temperature. Range : "9" C - "F" F Default : "E" C |
| Blue level for selected colour temperature | 0xb6, nn "+" "-" "r" "R" "?" | Set the level of the blue channel for the selected colour temp. = value/increment/decrement Reset Query | Blue level for selected colour temperature. Range : "9" C - "F" F Default : "E" C |
| Graphic horizontal resolution enquiry | 0xb7 | Horizontal resolution (in pixels) in 3 digit hex number | "nnn" = horizontal resolution |
| Graphic vertical resolution enquiry | 0xb8 | Vertical resolution (in lines) in 3 digit hex number | "nnn" = vertical resolution |
| Graphic horizontal sync frequency enquiry | 0xb9 | Horizontal sync frequency (in units of 100Hz) in 3 digit hex number | "nnn" = horizontal frequency |
| Graphic vertical sync frequency enquiry | 0xba | Vertical sync frequency (in units of Hz) in 3 digit hex number and 1 char | "nnnn" = vertical frequency nnn = 3 digit hex c= "i" or "p" interlace or Progressive 0xba added the interlace(i) or Progressive(p) feedback. |
| OSD status enquiry | 0xbb | Status of OSD | "0" – OSD turned off "1" – OSD turned on |
| OSD turn off | 0xbd | Turn off the OSD. | "1" – successful. |
| Set gamma data for user defined gamma curve | 0xbf, mm, c, "?" 0xbf, "R" "r" 0xbf, mm, c, nn | Query gamma data for color c index mm (c = 0 for color Red, c=1 for color Green, c=2 for color Blue) Set user gamma curve to linear Set gamma data for color c index mm. (If c= 3, then gamma data for red, green & blue will be set at the same time.) | "nn" = gamma data "1" "nn" = gamma data |
| Backlight control | 0xe0, nn "+" "-" "R" "r" "?" | Set Backlight = value/increment/decrement Reset Query | Backlight. Range: D/A : "0" "0" ~ "1" "6" 100Hz : "0" "0" ~ "8" "A" 120Hz : "0" "0" ~ "7" "3" 140Hz : "0" "0" ~ "6" "3" |

| | | | |
|---|---|---|---|
| | | | 160Hz : "0" "0" ~ "5" "6" 180Hz : "0" "0" ~ "4" "D" 200Hz : "0" "0" ~ "4" "5" 220Hz : "0" "0" ~ "3" "E" 240Hz : "0" "0" ~ "3" "9" 260Hz : "0" "0" ~ "3" "5" 280Hz : "0" "0" ~ "3" "1" 300Hz : "0" "0" ~ "2" "E" 320Hz : "0" "0" ~ "2" "B" 340Hz : "0" "0" ~ "2" "8" 360Hz : "0" "0" ~ "2" "6" 380Hz : "0" "0" ~ "2" "4" 400Hz : "0" "0" ~ "2" "2" 420Hz : "0" "0" ~ "2" "0" 440Hz : "0" "0" ~ "1" "F" |
| Backlight On/Off | 0xe1, "0" "1" "R" "r" "?" "S" "s" | Backlight Off / Backlight On /Status | "0" – Backlight Off "1" – Backlight On. "?" – Backlight On/Off Query "S" "s" – Backlight Status Query |
| Color Monochrome mode selection (Output Channel Select) | 0xe2 "0" "1" "2" "3" "4" "5" "6" "R" "r" "?" "?" | Off/ Blue Only/ Red Only/ Green Only/ Blue Mono/ Red Mono/ Green Mono/ | "0" – Off "1" – Blue Only "2" – Red Only "3" – Green Only "4" – Blue Mono "5" – Red Mono "6" – Green Mono |
| PIP Swap | 0xe3 | Swap Main and PIP source | "0" - Fail. "1" - Successful. |
| Backlight D/A / PWM | 0xe5 "0" "1" "R" "r" "?" "?" | Set : PWM or D/A Reset Query | "0" – PWM "1" – D/A |
| Backlight PWM Frequency | 0xe6, nnn "+" "-" "R" "r" "?" "?" | Set Backlight PWM Frequency = value/increment/decrement Reset Query | +/- 20Hz Value 100Hz : "0", "6", "4" 120Hz : "0", "7", "8" 140Hz : "0", "8", "C" 160Hz : "0", "A", "0" 180Hz : "0", "B", "4" 200Hz : "0", "C", "8" 220Hz : "0", "D", "C" 240Hz : "0", "F", "0" 260Hz : "1", "0", "4" 280Hz : "1", "1", "8" 300Hz : "1", "2", "C" 320Hz : "1", "4", "0" 340Hz : "1", "5", "4" 360Hz : "1", "6", "8" 380Hz : "1", "7", "C" 400Hz : "1", "9", "0" 420Hz : "1", "A", "4" 440Hz : "1", "B", "8" |
| Backlight Invert | 0xe7 "0" "1" "R" "r" "?" "?" | Set On or Off Reset Query | "0" – Off "1" – On |
| Red Offset for selected colour temperature | 0xe8, nn "+" "-" "r" "R" "?" "?" | Set the Offset of the red channel for the selected colour temp. = value/increment/decrement Reset Query | Red Offset for selected colour temperature. |

| | | | |
|--|---|--|--|
| Green Offset for selected colour temperature | 0xe9, nn "+" "-" "r" "R" "?" | Set the Offset of the green channel for the selected colour temp. = value/increment/decrement Reset Query | Green Offset for selected colour temperature. |
| Blue Offset for selected colour temperature | 0xea, nn "+" "-" "r" "R" "?" | Set the Offset of the blue channel for the selected colour temp. = value/increment/decrement Reset Query | Blue Offset for selected colour temperature. |
| PIP Window Auto Off | "0xee", "0x41" "0" "1" "?" | Auto Off / Auto On Query | "0"- Off "1"- On |
| Custom Sizing | 0xef, "0" "1" "2" "?" | Custom sizing selection : Overscan / Normal / Custom Query | "0" – Overscan "1" – Custom "2" – Normal |

3. Other control

| Function | Command | Description | Acknowledge (if enabled) |
|---------------------------|--|--|--|
| Select RS-232 acknowledge | 0xc1, "0" "1" | Disable/enable command acknowledge. | "0" – acknowledge disabled. "1" – acknowledge enabled. |
| Auto-setup | 0xc3 | Start auto-setup of current vmode. | "0" – fail. "1" – successful. |
| Command availability | 0xc4, n | Check whether a command is available. | "0" – not available. "1" – available. |
| Auto-calibration | 0xc5 | Start auto-calibration of gain of the RGB amplifier. | "0" – fail. "1" – successful. |
| Freeze frame | 0xc6, "0" "1" | Unfreeze / freeze frame | "0" – unfreeze. "1" – freeze. |
| Soft Power On/Off | 0xc8, "0" "1" "?" | Soft power off/on query | "0" – Turn off the LCD power and backlight. Turn off memory controller, Power down DVI Power down ADC, Power down Fclk PLL "1" – Turn on the unit |
| Query video input status | 0xc9 | Query the status of the primary & pip status | "nn,nn" = input status "nn,xx" digit = primary status: "0", "0" : invalid "A", "1" ARGB "B", "1" Composite "B", "2" Composite2 "C", "1" S-video "C", "2" S-video2 "D", "1" SD Component "D", "2" SD Component2 "E", "1" HDSDI "E", "2" HDSDI2 "F", "1" DVI "xx,nn"= PIP input status: "0", "0": invalid "A", "1" ARGB "B", "1" Composite "B", "2" Composite2 "C", "1" S-video "C", "2" S-video2 "D", "1" SD Component "D", "2" SD Component2 "E", "1" HDSDI "E", "2" HDSDI2 "F", "1" DVI |
| Video de-interlace method | 0xca, "0" "1" "I" "R" "?" | De-interlace mode Reset Query | "3" "1" - enable AFM "3" "0" - disable AFM "4" "1" - enable TNR "4" "0" - disable TNR "5" "1" - enable MADI "5" "0" - disable MADI "6" "1" - enable LADI "6" "0" - disable LADI |
| Query BIOS version | 0xcb, "0" | Read BIOS version | BIOS version "VV.YY.ZZ" VV = V0 or E0, V0 = Release version E0 = Engineering Sample YY= Version Number ZZ= Customer Number |
| Query PCBA | 0xcb, "1" | Read PCBA number | "nnnnn" = PCBA number |

| | | | |
|----------------------------|--|---------------------------------------|---|
| number | | | SVH-1920= "41696" |
| Reset parameter | 0xce | Reset all parameters to default value | "1" – successful. |
| Wide Screen Mode Selection | 0xd9, "0" "1" "2" "r" "R" "?" | Wide Screen Mode Reset Query | "0" – Normal Mode "1" – 1280x768 "2" – 1366x768 |

The following commands for sending texts by using RS-232 command.

| Function | Command | Description | Acknowledge (if enabled) |
|--|--|---|---|
| Send Line | 0xF0, "S" "LL" "TEXT" "0x0A" Return "1" | "S" = "0x53 or 0x73" Send command ----- "LL" = "0x30,0x31~0x30,0x34" Line number (Rang 0~4 lines) ----- "Text"= ASCII code, "0x20~0x7E" Character(Rang 0~34) ----- 0x0A = End of line | "S" – Send Command "LL" – Line Number "Text" – Character "0x0A" – End of Line "1" - successful. |
| e.g Display "Send Text" message on screen: RS232 Code: "0xF0 0x53 0x30 0x31 0x53 0x65 0x6E 0x64 0x20 0x54 0x65 0x78 0x74 0x0A" Return Code: "0xF0 0x53 0x30 0x31 0x53 0x65 0x6E 0x64 0x20 0x54 0x65 0x78 0x74 0x0A 0x31" | | | |
| Clear Line | 0xF0, "C" "LL" Return "nn" | "C" = "0x43 or 0x63" Clear command ----- "LL" = "0x30,0x31~0x30,0x34" Line number (Rang 0~4 lines) | "C" – Clear command "LL" – Line Number "nn" – Return Line number |
| e.g. Clear Line 1 RS232 Code: "0xF0 0x43 0x30 0x31" Return Code: "0xF0 0x43 0x30 0x31 0x30 0x31" | | | |
| Text Window Horizontal Position | 0xF0, "H" "ss" Return "nn" | "H" = "0x48 or 0x68" ----- "nn" = "0x30,0x30~0x46,0x46" | "H" – Horizontal Position command "ss" – Set Horizontal Position number "nn" – Return Position number |
| e.g. Set Text Window Horizontal Position RS232 Code: "0xF0 0x48 0x30 0x31" Return Code: "0xF0 0x48 0x30 0x31 0x30 0x31" | | | |
| Text Window Vertical Position | 0xF0, "V" "ss" Return "nn" | "V" = "0x56 or 0x76" ----- "nn" = "0x30,0x30~0x46,0x46" | "V" – Vertical Position command "ss" – Set Vertical Position number "nn" – Return Position number |
| e.g. Set Text Window Vertical Position RS232 Code: "0xF0 0x56 0x30 0x31" Return Code: "0xF0 0x56 0x30 0x31 0x30 0x31" | | | |
| Left offset* | 0xF0, "O" "SSS" Return "nnn" | "O" = "0x4F or 0x6F" Set Left Offset command ----- "SSS" = "0x30,0x30,0x30~ 0x33,0x46,0x46" Offset Value (Rang 000~3ff) | "O" – Left Offset Command "SSS"- Offset Value (pixels) "nnn"- Return Value(pixels) |
| e.g. Set Left Offset = 100 pixels (0x64 (HEX)) RS232 Code: "0xF0 0x4F 0x30 0x36 0x34" Return Code: "0xF0 0x4F 0x30 0x36 0x34 0x30 0x36 0x34" | | | |
| Background Transparency* | 0xF0, "B" "N" Return "n" | "B" = "0x42 or 0x62" Set Transparency command ----- "N" = "0x30~0x46" Transparency Value | "B" - Transparency command "N" – Transparency Value "n"- Return Value 0x00 =opaque |

| | | | |
|--|--|--------------|--|
| | | (Rang 00~0F) | |
| Set background Transparency value is 8 RS232 Code: "0xF0 0x42 0x38" Return Code: "0xF0 0x42 0x38 0x38" | | | |

* Note :

Please set the "Background Transparency" and "Left offset" commands before the "Send Line" command.

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).

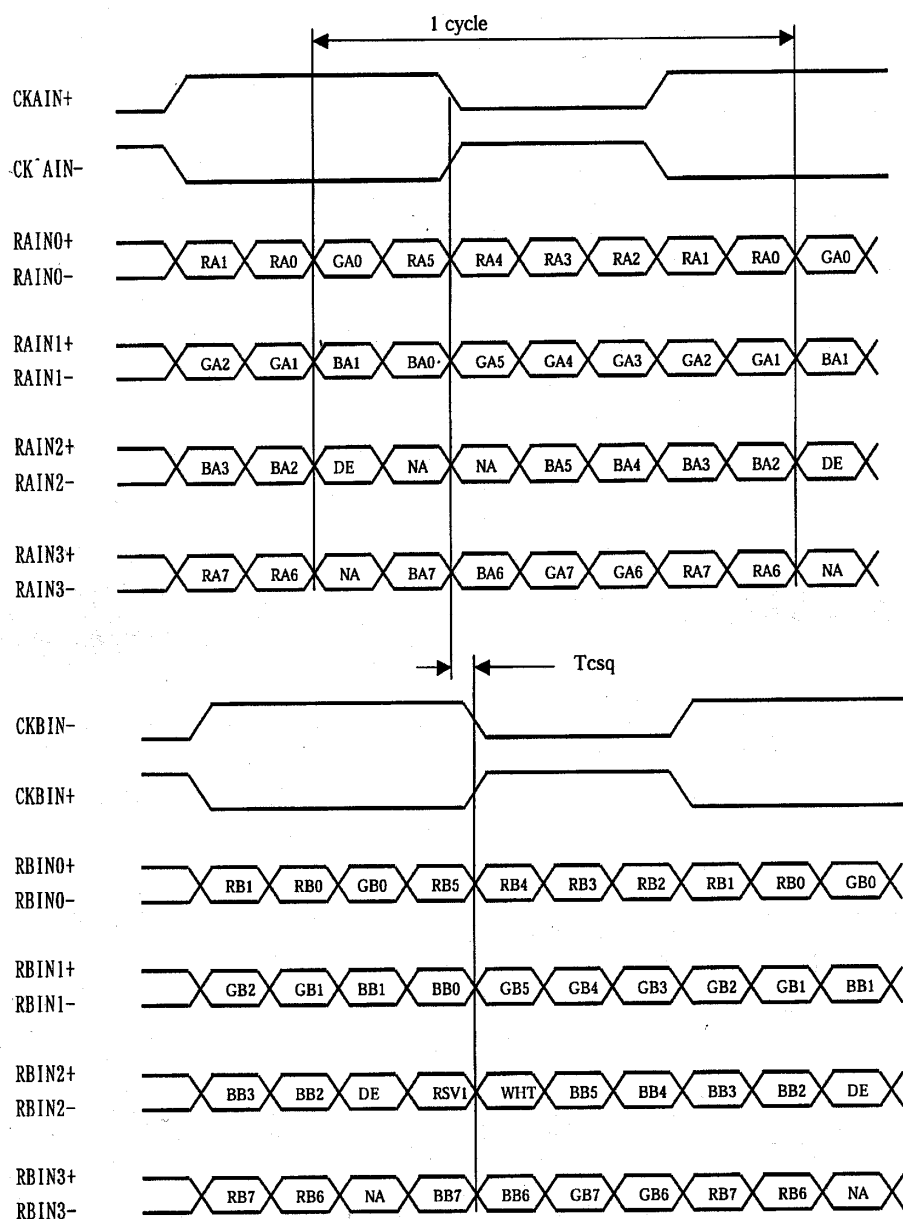
Please refer to the ASCII to Hex convert table in page 45.

Hex to ASCII conversion table

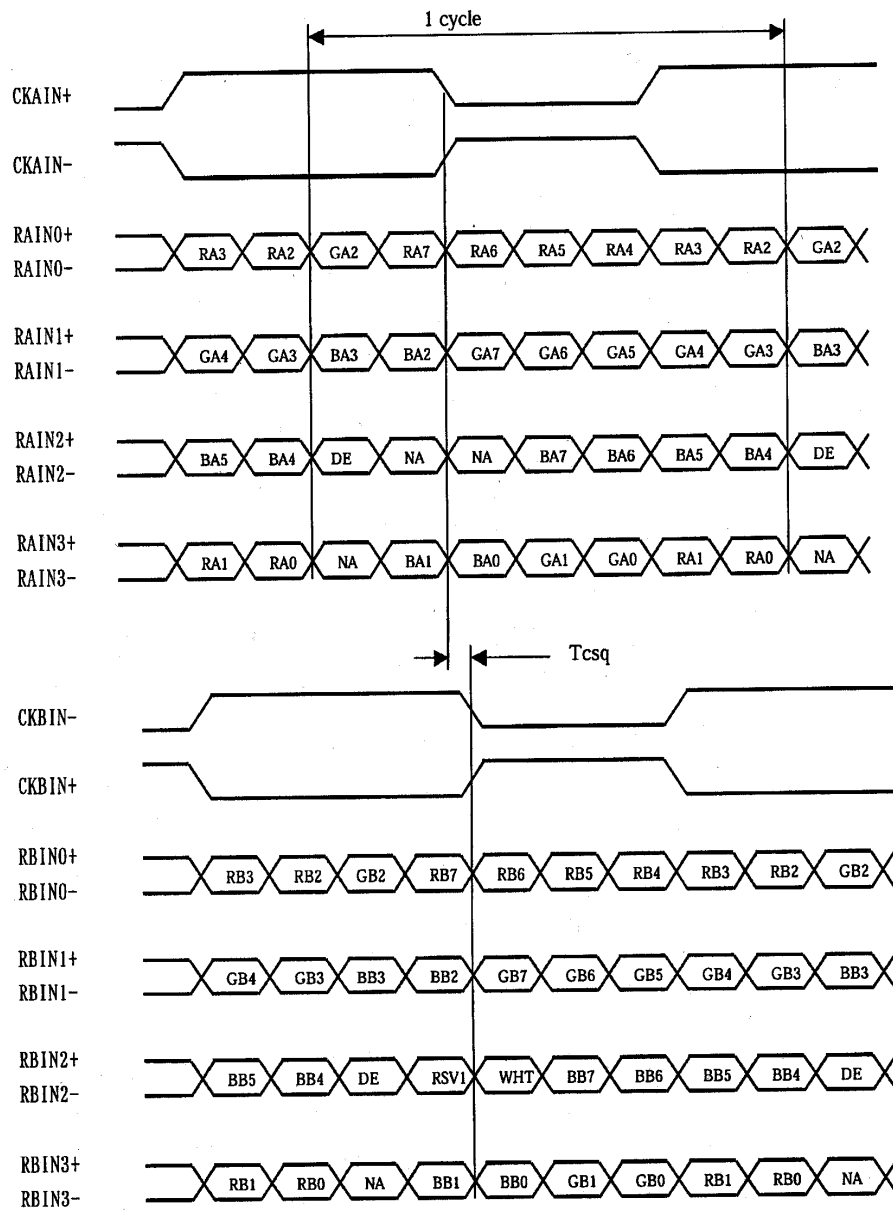
| Hex | ASCII | Hex | ASCII | Hex | ASCII | Hex | ASCII |
|------|-------|------|-------|------|-------|------|-------|
| 0x30 | 0 | 0x41 | A | 0x61 | a | 0x2B | + |
| 0x31 | 1 | 0x42 | B | 0x62 | b | 0x2D | - |
| 0x32 | 2 | 0x43 | C | 0x63 | c | 0x3F | ? |
| 0x33 | 3 | 0x44 | D | 0x64 | d | | |
| 0x34 | 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 Mapping A :



- Definition of Mapping B :



Appendix IV – Auto Color Gain

The Auto Color Gain function is supported in the ARGB mode only and is designed to calibrate the controller to the incoming video signal. In order to calibrate correctly, the display must be displaying an image containing both black and white data (see illustration below) when the function is used. The internal processor of the video controller chip will then execute a process to adjust the relative values of the RGB signals to achieve the best performance. The parameters of the corrected RGB values are then stored in the controller and are unaffected by the Reset Factory Defaults function.



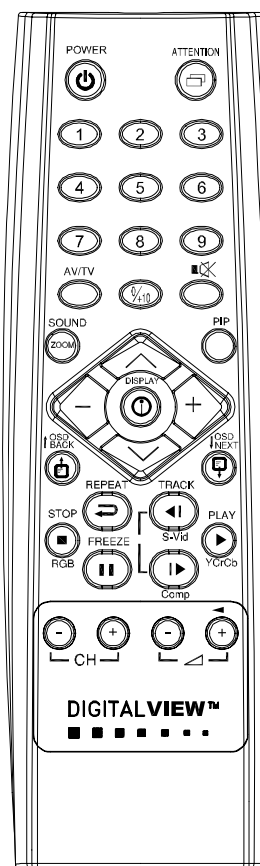
Warning - If the Auto Color Gain is executed without an appropriate image being displayed, then the process will set incorrect values and the display colors will be distorted. If this occurs, then it can either be corrected by performing the process correctly or if this is not possible then the Reset Color Gain function can be used. This function will reset the stored RGB values to a set of approximate values.

Appendix V – DV remote control unit work for SVH-1920

9-2. Key Arrangement (Key No.)

P/N 559000104-3 :
DigitalView remote control unit
(without DV logo silk screen
printing)

P/N 559000103-3 :
DigitalView remote control unit
(with DigitalView logo silk
screen printing)



| BUTTON | FUNCTION |
|-------------------------|--|
| POWER BUTTON | Soft power ON/OFF button. |
| ATTENTION BUTTON | Use combined with digit keys to enable/disable the IR function. SVH-1920 : "Attention" + "1" |
| MUTE BUTTON (M) | Switch to mute on/off mode. |
| AV/TV BUTTON | Use to select the input source. (RGB/Composite/S-Video/Component/..) |
| SOUND (ZOOM) BUTTON | Use to display the zoom menu. Press the "+" to zoom in the picture and the "-" to zoom out the picture. |
| SEL UP (▲) / SEL DN (▼) | Use this button to direct control the hotkey function. Press the "SEL UP" button to increase the pre-set hotkey parameter value and the "SEL DN" button to decrease the pre-set hotkey parameter value. In OSD menu, pressing this button to select the items. |
| VOLUME (-/+) BUTTON | Press the "+" button to increase the volume and the "-" to decrease the volume. |
| + / - BUTTON | Use this button to direct control the hotkey function. Press the "+" button to increase the pre-set hotkey parameter value and the "-" button to decrease the pre-set hotkey parameter value. In OSD menu, pressing this button to adjust the settings. |
| PIP BUTTON | Use to display the PIP (picture in picture) window on screen. |
| OSD BACK BUTTON | Use to display the OSD menu and go to the previous OSD screen. |
| OSD NEXT BUTTON | Use to display the OSD menu and go to the next OSD screen. |
| DISPLAY BUTTON | Use to view an on-screen information. When OSD menu displayed, press this button to turn it off. |
| STOP (RGB) BUTTON | In input source selection mode, pressing this button to select RGB source. |
| PLAY (YCrCb) BUTTON | In input source selection mode, pressing this button to select Component (YCrCb) source. |
| TRACK (S-Vid) BUTTON | In input source selection mode, pressing this button to select S-Video source. |
| TRACK (Comp) BUTTON | In input source selection mode, pressing this button to select Composite source. |
| FREEZE BUTTON | Use this button to freeze and release the picture on your screen. |

Appendix VI – Function description for de-interlacing mode AFM, TNR, MADI, LADI

AFM = Auto Film Mode :

It is a frame based method which used for the input ODD and EVEN fields have a fixed relation between each other, such as static image, 3:2 pull down mode.

If two fields are correctly merged, it can get the best quality. But if it merges two wrong fields, it will have artifact and get the worst quality.

TNR = Temporal Noise Reduction :

It is a frame based method which assume field to field have a fixed relationship.

If the object moving too fast, it will have image artifact and get worst quality.

MADI = Motion adaptive de-interlacing :

It is a pixel based method which used for the input fields have no fixed relation between them

If the object moving very too fast, it will get worst quality.

LADI = Low angled diagonal interpolation :

This process involves the detection of low angled diagonal pattern in an image and special interpolation process to the local area with diagonal pattern. The result is a smooth edge on moving objects with diagonal pattern.

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.

Except for the above express warranties, the manufacturer disclaims all warranties on products furnished hereunder, including all implied warranties of merchantability and fitness for a particular application or purpose. The stated express warranties are in lieu of all obligations or liabilities on the part of the manufacturer for damages, including but not limited to special, indirect consequential damages arising out of or in connection with the use of or performance of the products.

CAUTION

Whilst care has been taken to provide as much detail as possible for use of this product it cannot be relied upon as an exhaustive source of information. This product is for use by suitably qualified persons who understand the nature of the work they are doing and are able to take suitable precautions and design and produce a product that is safe and meets regulatory requirements.

LIMITATION OF LIABILITY

The manufacturer's liability for damages to customer or others resulting from the use of any product supplied hereunder shall in no event exceed the purchase price of said product.

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The following are trademarks of Digital View Ltd:

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- SVH-1920

CONTACT DETAILS

Digital View has offices in Asia, Europe and USA :

ASIA

Digital View Ltd
16 th Floor Millennium City 3
370 Kwun Tong Road
Kwun Tong
Hong Kong

Tel: (852) 2861 3615

Fax: (852) 2520 2987

Sales: hksales@digitalview.com

EUROPE

Digital View Ltd.
6 Marylebone Passage,
London, W1W 8EX,
UK.

Tel: +44-(0)20-7631-2150

Fax: +44-(0)20-7631-2156

Sales: uksales@digitalview.com

USA

Digital View Inc.
18440 Technology Drive
Building 130
Morgan Hill,
California, 95037
USA

Tel: (1) 408-782 7773

Fax: (1) 408-782 7883

Sales: ussales@digitalview.com

WEBSITE

www.digitalview.com

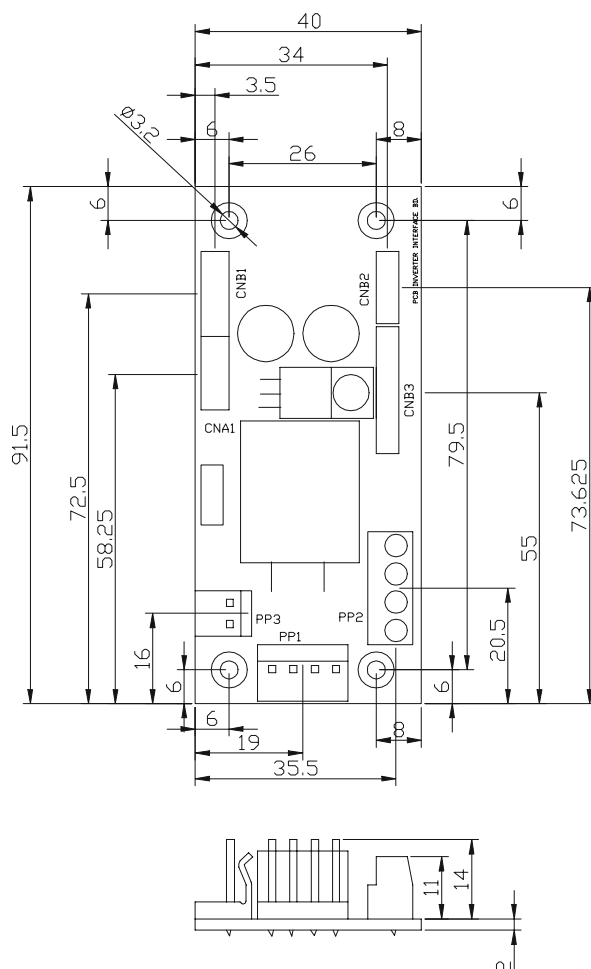
Specifications subject to change without notice
20th issue: 3 March, 2009 (SVH-1920.doc)

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Inverter Interface Board P/N 416040010-3

[OPERATE UNDER 12VDC POWER INPUT ENVIRONMENT]

The Inverter interface board provides interface to drive up the high current consumption panel inverter in excess of 3.5A. This board enables current of up to 8 Amps to be managed safely while retaining the capability for inverter dimming and management of the inverter enable signal according to VESA DPMS standards. Additionally, the inverter interface board provides over-voltage protection via a resettable fuse when the input voltage exceeds 13V and reverse polarity protection against accidental misconnection.



Connector Type :

CNA1, CNB2 : JST 4 ways, B4B-XH-A

CNB1 : JST 5 ways, B5B-XH-A

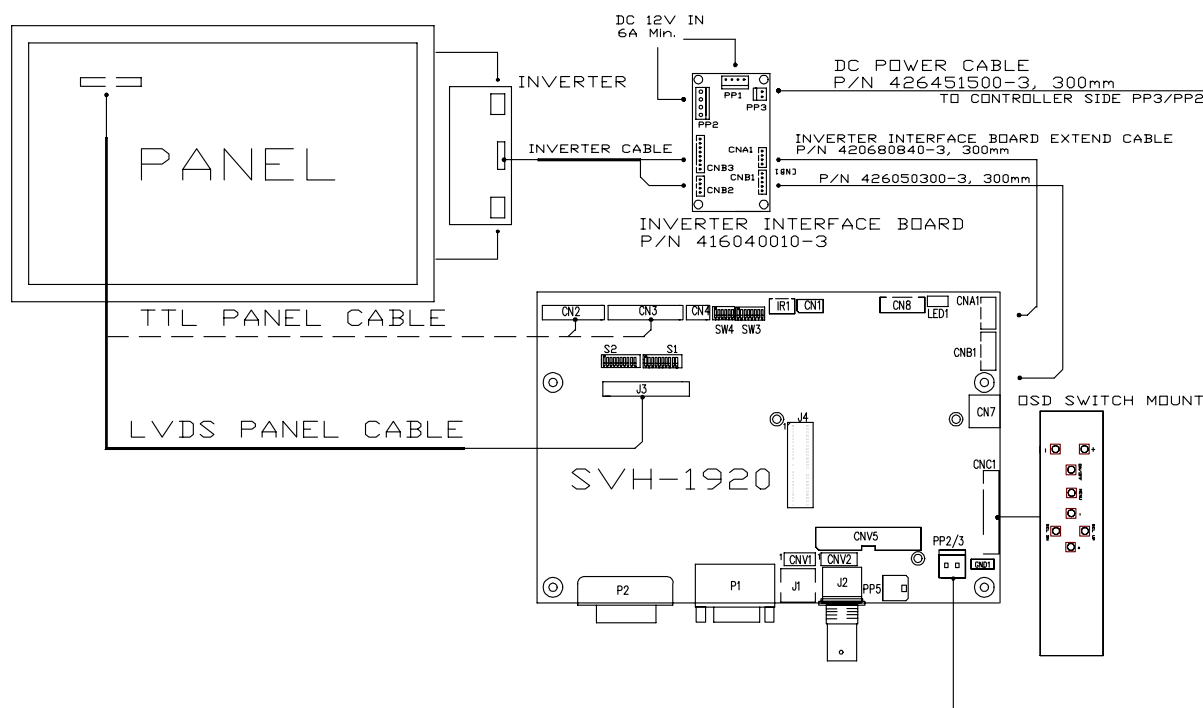
CNB3 : JST 8 ways, B8B-XH-A

PP1 : PWR 4 way

PP2 : Terminal Block 2 poles x 2

PP3 : PWR 2 ways

Illustrated Diagram



PP1 - 12VDC power supply – input, Power header 4 ways 0.156” pitch

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

PP2 – Alternate 12VDC power supply – input, Terminal Block 2 poles

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

PP3 – 12VDC power supply to controller – Output, Power header 2 ways, 0.156” pitch

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | +12VDC |
| 2 | Ground |

CNA1 - Inverter interface to controller, JST B4B-XH-A

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|-------------------|
| 1 | NC | No connection |
| 2 | AUX_GND | Ground |
| 3 | AUX_GND | Ground |
| 4 | AUX_Vcc | +5V DC, 500mA max |

CNB1 – Inverter interface to controller, JST B5B-XH-A

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|---------------------------------|
| 1 | GND | Ground |
| 2 | BL_ON | Backlight power |
| 3 | BLCTRL | Backlight on/off control signal |
| 4 | BVR_WIP | Backlight brightness VR pin WIP |
| 5 | BVR_A | Backlight brightness VR pin A |

CNB2 – Inverter interface to backlight inverter, JST B4B-XH-A

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|-------------------|
| 1 | VLCD12 | Panel power |
| 2 | AUX_GND | Ground |
| 3 | AUX_GND | Ground |
| 4 | AUX_Vcc | +5V DC, 500mA max |

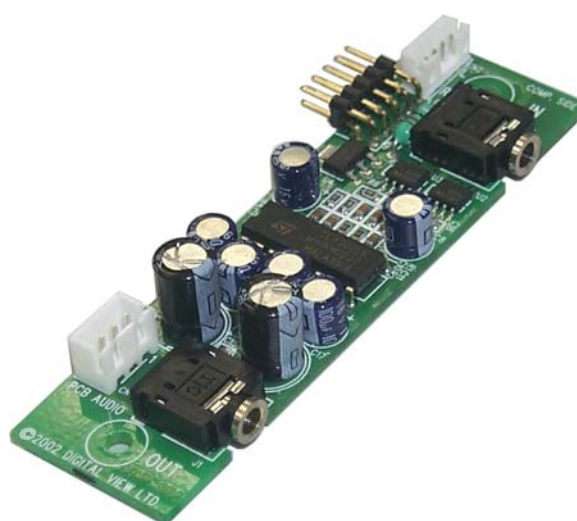
CNB3 – Inverter interface to backlight inverter, JST B8B-XH-A

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|---------------------------------|
| 1 | VLCD12 | Panel power |
| 2 | VLCD12 | Panel power |
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | VLCD12 | Panel power |
| 6 | BLCTRL | Backlight on/off control signal |
| 7 | BVR_WIP | Backlight brightness VR pin WIP |
| 8 | BVR_A | Backlight brightness VR pin A |

Audio Add-on Board P/N 416940020-3

[OPERATE UNDER 12VDC POWER INPUT ENVIRONMENT]

The Audio add-on board P/N 416940020-3 design for connection with DV controllers on the audio connector CN7. It provides audio input ports and output port for sound amplification.



Electrical Specification :

Supply Voltage : +12V, +5V

Supply current : 35mA for +12V, 6mA for +5V

Input impedance 6.8kohm

Output power : 2.0W for 4ohm load

1.0W for 8ohm load

Distortion : <2%

Voltage gain : 0 to 21 dB

Use of connectors :

| Connector | Connector type |
|-----------|--|
| CN1 | JST B3B-XH-A |
| CN2 | JST B4B-PH-K |
| CN3 | 0.1 inches 2 row x 5 pin header strips (right angle) |
| J1 | Ø3.5mm stereo jack socket |
| J2 | Ø3.5mm stereo jack socket |

Pin Assignments :

CN1: Output alternate connector

| Pin Number | Description |
|------------|-------------------|
| 1 | Speaker out left |
| 2 | Ground |
| 3 | Speaker out right |

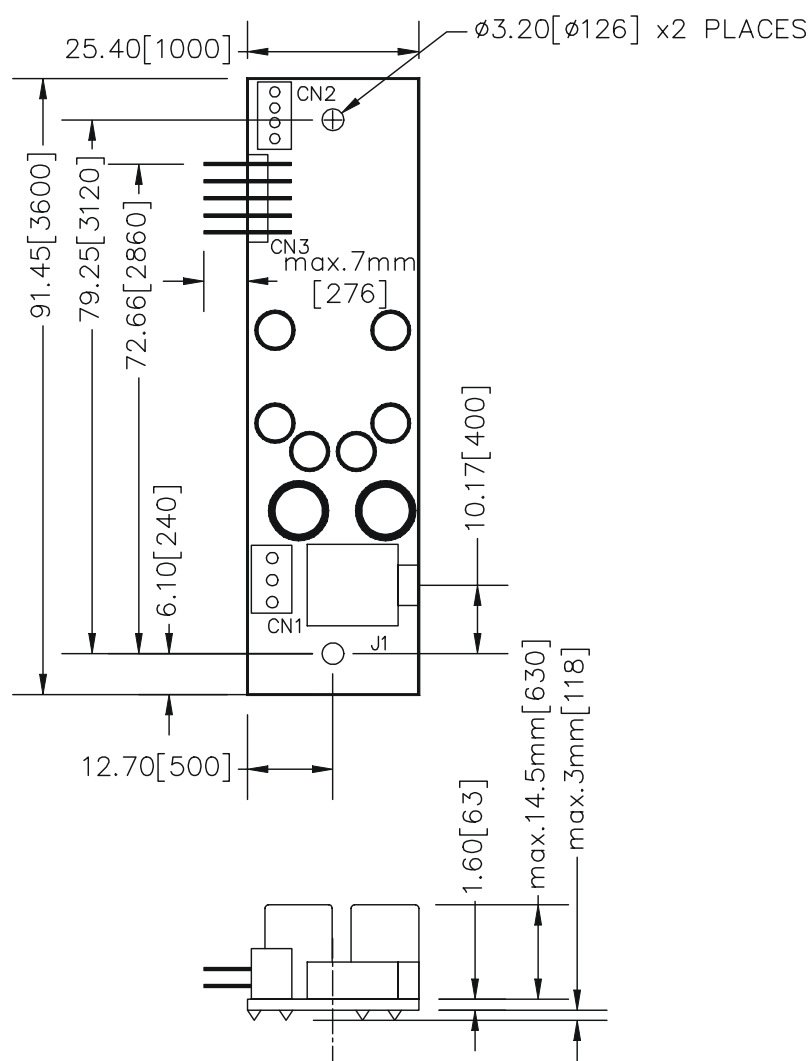
CN2: Input alternate connector

| Pin Number | Description |
|------------|-------------------|
| 1 | Ground |
| 2 | Audio input left |
| 3 | Ground |
| 4 | Audio input right |

CN3 : Controller interface connector

| Pin Number | Description |
|------------|---------------------------|
| 1 | +5V |
| 2 | Left trimpot chip select |
| 3 | Right trimpot chip select |
| 4 | Trimpot serial data |
| 5 | Trimpot serial clock |
| 6 | Digital Ground |
| 7 | +12V |
| 8 | Audio input left |
| 9 | Audio input right |
| 10 | Audio Ground |

Mechanical Drawing :



Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9