

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

Model: SGX-1920

Part number : 41725001X-3 or up

INSTRUCTIONS

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

Specifications subject to change without notice

Introduction

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

- TFT (active matrix) LCD panels of 1920x1200, 1920x1080, 1920x480, 1680x1050, 1600x1200, 1600x900, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768 1024x768, 1024x600, 800x600, 800x480 and 640x480 resolutions.
- > Computer video signals of VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA standard.
- Video signals of NTSC, PAL and SECAM standard.
- > Dual digital input port (DVI / HDMI / Auxiliary digital video inputs) support up to 1920x1200 60Hz input signals
- > Support HDMI input
- Support true 10 bits panel
- Support HDMI, DVI, VGA, S-Video, Composite Video input
- Support on screen marker

Ordering information :

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Controller	Part number	Ordering part number
SGX-1920	P/N 41726001X-3	P/N 4172600XX-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 : <u>http://www.digitalview.com/csg</u>

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

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- 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.

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SYSTEM DESIGN

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



ASSEMBLY NOTES

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

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

- 1. LCD Panel: This controller is designed for typical LVDS interfaced panels with panel voltage 3.3V, 5V, 12V or 18V, External for 12V~18V interface. Due to the variation between manufacturers of panels signal timing and other panel characteristics, factory setup and confirmation should be obtained before connecting to a panel. (NOTE: Check panel power jumper settings before connection)
- 2. Controller: Handle the controller with care as static charge may damage electronic components. Make sure correct jumper and dip switches settings to match the target LCD panel.
- 3. LCD signal cable (LVDS panel): In order to provide a clean signal it is recommended that LVDS signal cables are no longer than 46cm (18 inches). If those wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when placing the cables to avoid signal interference. Additionally it may be necessary in some systems to add ferrite cores to the cable to minimize signal noise.
- 4. **Inverter**: This will be required for the backlight of an LCD, some LCD panels have an inverter built in. As LCD panels may have 1 or more backlight tubes and the power requirements for different panel backlights may vary it is important to match the inverter in order to obtain optimum performance. See Application notes page 27 for more information on connection.
- 5. **Inverter Cables**: Different inverter models require different cables and different pin assignment. Make sure correct cable pin out to match inverter. Using wrong cable pin out may damage the inverter.
- 6. Function Controls: The following section discusses the controls required and the section on connectors provides the detail. The controls are minimal: On/Off, Backlight Brightness (depends on inverter), OSD (5 momentary buttons) analog VR type or (8 momentary buttons) digital type. The 8 momentary buttons OSD switch mount P/N 416100520-3 or OSD membrane interface P/N 416100120-3 must be used when 24VDC input.
- 7. Function controls cable: The cables to the function switches should be of suitable quality and length so that impedance does not affect performance. Generally lengths up to 1 meter (3 feet) should be acceptable.
- 8. Status LED: The pin direction of the LED should be corrected for right colour indication. Red colour stands for standby. Green colours stands for signal on. The status LED is an optional part only, can be unconnected.
- 9. IR sensor: It is an optional part only, can be unconnected if not using IR remote control. See Appendix V in details.
- 10. RS-232 control interface : Firmware upgrade and serial control via this interface port.

11. Second RS-232 control interface : This interface support controlled under "Programming mode" . Press and hold "MENU" button on the OSD switch mount and turn on the controller to enter the "Programming mode". Choose "Set Uart 1 Input Port" shown below :



Set "Uart 1 to IP-50 : Enable Ethernet network (J1) support and disable second RS-232 serial control (CN1) support Set "Uart 1 to CN1 : Enable second RS-232 serial control (CN1) support. Disable Ethernet network (J1) support

- 12. External panel power output : User for specific panel model.
- 13. Panel control signal : Use for specific panel model.
- 14. Audio add-on board P/N 416940020-3: Provide the interface for the audio add-on board P/N 416940020-3 to be connected. The audio add-on board gives the audio input and output signal connection. The volume can 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.
- 15. Auxiliary +5VDC output : 2 ways connector provides +5VDC output.
- **16.** Ambient light sensor connection : 3 ways connector provides interface for ambient light sensor connection by using Kit 70220-3.
- **17. Backlight status input :** 2 ways connector provides interface for connection with the specific panel type which support the panel with backlight status monitoring function.
- 18. Auxiliary video input : It provides alternate video input for S-Video 1, Composite Video 1 & Component Video 1. And it also provide S-Video 2, Composite Video 2 & Component Video 2 input. Plug the auxiliary video cable P/N 426301700-3 on CNV5 connector.
- Auxiliary Digital Input Port HD1 : Support Digital video signal input (e.g HDMI, DVI, HD-SDI (from HD-1000/-2000/-3000/-3000S)). Please refer to Appendix IX to configure this auxiliary digital input port – HD1. Reasonable quality cable should be used to avoid image quality degradation.
- 20. Auxiliary Digital Input Port HD2 : Support Digital video signal input (e.g HDMI, DVI, HD-SDI (from HD-1000/-2000/-3000/-3000S)). Please refer to Appendix IX to configure this auxiliary digital input port – HD2. Reasonable quality cable should be used to avoid image quality degradation.
- **21. Reserved :** No function, reserved for future development.
- 22. HDMI audio output : Support HDMI audio with stereo output. The HDMI audio output can be connected to Audio add-on board P/N 416940020-3 by using the audio cable P/N 426451800-3 (310mm) connected between SGX-1920 (connector : CN10) and Audio add-on board P/N 416940020-3 (connector : CN2).
- 23. SPDIF Audio output : This port support SPDIF audio output from the HDMI audio source inputted.
- 24. DVI-D input cable : Plug the DVI cable to the connector P3 on the controller board.
- 25. HDMI input : Plug the HDMI cable to the connector P2 on the controller board. This port is not supported when CN5 is connected.
- **26.** Analog RGB Input : As this may affect regulatory emission test results and the quality of the signal to the controller a suitably shielded cable should be utilized.
- 27. Control over network connection : This is a network device that allow to control RS-232 enable devices over a TCP/IP based Ethernet and the Internet using a web browser. Please refer to Appendix VIII in details.
- 28. Power Input: 12V/24VDC is required, this should be a regulated supply. The power rating is depending on the panel and

Specifications subject to change without notice

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.

- **29. External panel power input** : Allow to supply external power to the panel separately for max 3.3V (7A) or 5V (7A) or 12V (5A) or 18V (3.5A) via PP4 power input connector. Corresponding jumper setting of JA3, JA5 & JA6 are required for each panel power input by referring to page 17.
- **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):

- LCD panel & Inverter: Connect the inverter (if it is not built-in the panel) to the CCFT lead connector of the LCD panel.
 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 (SW3, SW4) are set correctly. Details referring the connection diagram (a separate document) or the jumpers and switches setting table (in the following section).
- 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.
- HDMI audio output : The HDMI audio output can be connected to Audio add-on board P/N 416940020-3 by using the audio cable P/N 426451800-3 connected between SVX-1920 (connector : CN10) and Audio add-on board P/N 416940020-3 (connector : CN2).
- 15. Auxiliary Digital Input Port HD1 / HD2 : Allow the user to configure the input port configuration for supporting Digital video signal input (e.g HDMI, DVI, HD-SDI (from HD-1000/-2000/-3000/-3000S)). Please refer to Appendix IX to configure this auxiliary digital input port HD1 & HD2.

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	Menu button	Menu button
 Turns OSD menu On or Off (it will auto time 		
off)		
 Back to previous OSD menu page 		
Select down	SEL DN	SEL DN
 Moves the selector to the next function (down) 		
-		
Select up	SEL UP	SEL UP
 Moves the selector to the previous function 		
(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,	Press and hold SEL DN button,
	then power on the controller	then power on the controller
Access "Programming Mode"	Press and hold MENU button,	Press and hold MENU button,
	then power on the controller	then power on the controller



SEL. DN

Digital type

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



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	Source : Select the input video signal					
\sim	Main Port Change					
	VGA					
	HDMI ⁺					
	HD/SD SDI 2					
	Composite 2***					
	S-Video 1 S-Video 2***					
	Component 1					
	Component 2					
	PIP Port change PIP Off / Composite 1 / Composite 2*** / S Video 1 / S Video 2*** / Component 1 / Component					
	2*** / VGA / DVI ⁺ / HDMI ⁺ / HD/SD SDI 1 ⁺⁺ / HD/SD SDI 2 ⁺⁺)					
	PIP Size • : Off / PIP Size/ 1~18 / Size by Size / Size by Size Tall The PIP capability on display input sources refer to Appendix VII – PIP mix table					
	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 Pland Loval - 6 25% 100%					
	PIP Biend Level . 6.25% ~ 100% PIP Swap : Swap between the main window and PIP window					
	PIP Auto Turn off : OFF / ON					
	Window will turn off automatically.					
	+ FUNCTION DISABLE WHEN HD-3000 CONNECTED					
	++ DISPLAY WHEN HD-3000 CONNECTED					
$\mathbf{\mathbf{N}}$	Setup Auto Picture Setun [#] 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					
	- 1280x768					
	- 1360x768 - 1366x768					
	Manual Clock [#] · Adjust the image horizontal size					
	Manual Phase [#] : Fine tune the data sampling position (adjust image					
	quality)					
	ON – Auto source select always enable					
	 OFF – Disable auto source select function Setup Selection for the corresponding input sources detection 					
	HD/SD SDI 2 ⁺⁺					

Composite 1DFFONComposite 2DFFONS-Video 1DFFONS-Video 2DFFONComponent 1DFFONComponent 2DFFONThe corresponding input port name display on OSD menu will disappear once setting "OFF".OSD menu will disappear once
De-interlacing Mode* AFM OFF ON : Auto Film Mode TNR OFF ON : Temporal Noise Reduction MADI OFF ON : Motion Adaptive De-interlacing DCDi OFF ON : Low Angled De-interlacing [See Appendix VI for AFM, TNR, MADI, DCDi function description] Auto Power : OFF / ON ON - Enable soft power off function if absence of input signals OFF - Disable soft power function Enable RGB SOG: OFF / ON
Video Standard (SD)* : Auto / NTSC / NTSC 4.43 / PAL / PAL M / SECAM Gamma : 0.6 / 0.7 / 0.8 / 1.0 / 1.6 / 1.8 / 1.9 / 2.0 / 2.1 / 2.2 / 2.3 / 2.4 / 2.5 / 2.6 / User Setting OSD > OSD position : H POS = = = = = = = = = = = = = = = = = = =
60 = 60 seconds later will turn off the OSD menu. Screen Marker Screen Marker : On/Off Center Marker : On/Off Safe Area Enable : On/Off Aspect Marker Enable : On/Off Safe Area Market : 80%~99% Aspect Marker : 4:3 / 16:9 Transparency Level : 0% / 25% / 50% / 75% / 100% Exit menu
Language : English / Spanish / French / German / Chinese :Select OSD menu language display Transparency : DFF ON : OFF / ON : Set OSD transparency Display Input : OFF ON : Display input source info after switching source. IR Remote Control : IR Enable / IR Disable : Enable or disable the IR function control. Real time clock show and edit the real time clock (This function is valid when "Display Input" sets ON.) DATE : DD/MM/YYYY : Date/Month/Year TIME : HH/MM/SS (AM/PM): Hour/Minute/Second SETUP Month / Day / Year
Hour / Minute / AM/PM Display Clock FF F : Disable or enable to display the real time clock when display video source info after switching source. Freeze : Freeze the image (use "+" button)
Zoom Zoom level : The set of the set of
Color Temperature

Red Gain : 🔄 🔲 🖤 🔸
Green Gain : +
Blue Gain · +
Red Offset · -
Reset to Defaults : Resume to the default values
6500K
Red Gain :
Green Gain :
Blue Gain :
Red Offset :
Green Offset :
Blue Offset :
Reset to Defaults : Resume to the default values
Red Gain :
Green Gain :
Blue Gain :
Red Offset :
Green Offset :
Blue Offset :
Reset to Defaults : Resume to the default values 9300K
Red Gain : -
Green Gain +
Reset to Defaults : Resume to the default values
Blue Gain :
Red Offset :
Green Offset :
Blue Offset :
Reset All to Defaults : Resume all color temperature settings to the default values.
Hot Key 🕨
Hot key 1 : Volume / Brightness / Contrast / Inputs / Aspect Ratio/ Zoom / Freeze / PIP Size /
PIP Swap / Saturation / Hue / Backlight / Auto Picture Setup / Markers / No Function
Hot key 2 : Volume / Brightness / Contrast / Inputs / Aspect Ratio / Zoom / Freeze / PIP Size /
PIP Swap / Saturation / Hue / Backlight / Auto Picture Setup / Markers / No Function
Monochrome Mode
- Color - Red Monochrome
- Green Monochrome
- Blue Monochrome Red Only
- Green Only
- Blue Only
Backlight Setup 🕨
- B/L Invert : PFF P C 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: ^{DFF} C Point : Enable ambient light detector function by using KIT 70220-3
Default Setting
Reset to Factory Defaults (Activate when JC1 position 4 sets open) Are you sure ? Yes/No
Reset to Factory Defaults with (Color Temp.) ♦ (Activate when JC1 position 4 sets open) Are you sure ? Yes/No
Save Current Settings as Calibrated Values ► (Activate when JC1 position 2 sets closed) Are you sure ? Yes/No
Recall Stored Calibrated Values
Are you sure ? Yes/No
* : DISPLAY IN VIDEO MODE ONLY
: DISPLAY IN ARGB MODE ONLY
+ FUNCTION DISABLE WHEN HD-3000 CONNECTED
 ++ DISPLAY WHEN HD-3000 CONNECTED
Firmware V0.39.00.00 or up

CONNECTORS, PINOUTS & JUMPERS

The various connectors are:



Summary: Connectors

Ref	Purpose	Description			
CN1	Second RS-232 serial control	JST 6-way, B6B-XH-A	(Matching type : XHP-6)		
CN3	Reserved for factory use	Reserved			
CN4	Panel control signal connector	Hirose 10-pin, DF20G-10DP-1V	(Matching type : DF20A-10DS-1C)		
CN5	Reserved for factory use	Reserved			
CN6	No function	Reserved			
CN7	Audio board connector	DIL socket header 5x2 right angle (Matching au	e dio Add-on Board P/N 416940020-3)		
CN8	RS-232 serial control	JST 6-way, B6B-XH-A	(Matching type : XHP-6)		
CN9	Ambient light sensor connector	JST 3-way, B3B-PH-K	(Matching type : PHR-3)		
CN10	HDMI audio (Stereo) output	JST 4 way, PHD-4	(Matching type : PHR-4)		
		(Matching audio cable P/N 426451800-3 for connection to audio add on board P/N 416940020-3 (connector : CN2))			
CN11	SPDIF Audio output	JST B2B-ZR	(Matching type : ZHR-2)		
		(Matc	hing extend cable P/N 426007400-3)		
CP1	Reserved for factory use	Reserved			
CP2	Reserved for factory use	Reserved			
CNA1	Auxiliary power output	JST 4-way, B4B-XH-A	(Matching type : XHP-4)		
		(Matc	hing cable P/N 426040200-3)		
CNA2	Auxiliary +5VDC output	JST 2 way, B2B-PH-K	(Matching type : PHR-2)		
CNB1	Backlight inverter	JST 5-way, B5B-XH-A	(Matching type : XHP-5)		
		(Matc	hing cable P/N 426058300-3)		
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)		
CNV5	Auxiliary video input	JST B26B-PHDSS, 26 ways (Ma	tching video cable P/N 426301700-3)		
HD1	Auxiliary digital input connector – HD1	JST BM20B-SRDS	(Matching type : SHDR-20V-S-B)		
HD2	Auxiliary digital input connector – HD2	JST BM20B-SRDS	(Matching type : SHDR-20V-S-B)		

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J1	Ethernet for network connection	RJ45 connector			
J3	Panel signal for LVDS panel	JAE FI-RE51S-HF (Matching type : FI-RE51HL)			
J5	External panel power output	Molex 53261-0871 (Matching type : 51021-0800)			
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 input	DVI-I connector			
P3	HDMI input	HDMI 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)			
SW3	Panel selection	8-way DIP Switch			
SW4	Function selection	6-way DIP Switch			

Ref	Purpose	Note
JA2	On board +3.3V logic power enable	1-2 & 3-4 closed, factory set, do not remove
JA3	Panel power voltage select 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 = 5V max 2-3 closed = 3.3V max
JB2	Backlight inverter on/off control – signal level	2-3 = On/Off control signal 'High' = +5V 1-2 = On/Off control signal 'High' = +3.3V Open = On/Off control signal 'High' = Open collector 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
JB4	GPIO pins voltage selection	1-2 = 3.3V 2-3 = 5V
JB5	Backlight control type selection	1-2 = VR/Digital switch mount control 3-4 = Analog backlight brightness - voltage range 0~5V 5-6 = PWM (Pulse Width Modulation) brightness
JC1	Custom configuration	Position 2 : Closed = Enable save Current Settings as Calibrated Values on OSD menu Position 3 : Closed = Enable baud rate selection function in programming mode
JC2	Custom configuration	Position 4 : Closed = Hide "Reset to Factory Defaults" and "Reset to Factory Defaults with (Color Temp.)" from OSD menu. Position 1 : Enable J3 – pin 16 (OP1) controlled by JB4 Position 2 : Enable J3 – pin 17 (OP2) controlled by JB4 Position 3 : Enable J3 – pin 18 (OP3) controlled by JB4
		Position 4 : Enable J3 – pin 19 (OP4) controlled by JB4
JP1	Factory use	Default Open
JP2	Factory use	Default Open
JP4	Custom configuration	3-4 closed = Reserved 3-4 closed = On-board programming 5-6 closed = Display "Blue only", "Green only", "Red only" function on OSD menu
JP6	Input power control	Short = External switch control Open = Switch mount control
JP9	Factory use	Default Open
JP13	Factory use	Default Open
JP14	Factory use	Default Open
JT1	S-Video Chroma -in terminator enable	Open = S-video chroma input is not terminated Close = S-video chromainput 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	Composite video-in terminator enable	Open = composite input is not terminated Close = composite 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 Cb/Pb-in terminator enable	Open = component Cb/Pb input is not terminated Close = component Cb/Pb input is terminated with 75Ω
JT6	Component Cr/Pr-in terminator enable	Open = component Cr/Pr input is not terminated Close = component Cr/Pr input is terminated with 750
JT7	Composite video 2-in terminator enable	Open = composite video 2 input is not terminated Close = composite video 2 input is terminated with 750
JT8	Reserved	Reserved
S1	Reserved	Reserved
S4	Reserved	Reserved
S5	Reserved	Reserved
SW3	Panel & function selection	See table 2
SW4	Panel & function selection	See table 3

Table 1 : Panel voltage setting table :

	0 0				
Input voltage via PP2/PP3, PP5	Panel Voltage	JA3	JA5	JA6	Jumper on board
	3.3V	3V3 closed	1-3 & 2-4	1-3 & 2-4	
12VDC	5V	5V closed	1-3 & 2-4	1-3 & 2-4	$\begin{array}{c c} & JAG \\ 2 & \bullet & \bullet \\ 1 & \bullet & \bullet \\ 1 & \bullet & \bullet \\ JAS_{1}^{2} & \bullet & 6 \\ JAS_{1}^{2} & \bullet & 6 \\ \end{array}$
	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
	3.3V	3V3 closed	1-3 & 2-4	1-3 & 2-4	$\begin{array}{c c} JA6 \\ 2 & \bullet & \bullet \\ 1 & \bullet & \bullet & 7 \\ JA5 & \bullet & 6 \\ JA5 & \bullet & 5 \\ 1 & \bullet & \bullet & 5 \\ \end{array}$
	ſ				
24VDC**	5V	5V closed	1-3 & 2-4	1-3 & 2-4	
	12V	12V closed	1-3 & 2-4	3-5 & 4-6	
	1				
	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
	3.3V	OPEN	3-5 & 4-6	1-3 & 2-4	
	5V	OPEN	3-5 & 4-6	1-3 & 2-4	
3.3 / 5 / 12 / 18VDC*					
10020	12V	OPEN	3-5 & 4-6	3-5 & 4-6	
	18V	OPEN	3-5 & 4-6	3-5 & 4-6	

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

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



Table 2 : D	able 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	1920x1200	
ON	ON	ON	OFF	LG LM240WU2-SLA1	1920x1200	
OFF	OFF	OFF	OFF	Sharp LQ445D3LZ19	1920x1080	
ON	OFF	OFF	OFF	Samsung LTA460H2-L02	1920x1080	
OFF	ON	OFF	OFF	Sharp LQ170M1LZ04	1920x1200	
ON	ON	OFF	OFF	Samsung LTA700HH-LH1 (1 st trial testing)	1920x1080	
OFF	OFF	ON	OFF	Samsung LTA700HH-LH1 (2 nd trial testing)	1920x1080	
OFF	OFF	ON	ON	AU Optronics P645HW03 V0 (1920x1080)	1920x1080	
OFF	OFF	ON	ON	AU Optronics P645HW03 V0	1920x1080	
		•	•	For UXGA panels		
OFF	OFF	OFF	OFF	Fujitsu FLC59UXC8V-02A	1600x1200	
ON	OFF	OFF	OFF	Samsung LTM213U6-L01	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 Optronics M190PW01	1440x900	
OFF	OFF	ON	ON	Sharp LQ072K1LA03	1280x768	
	•		•	For SXGA panel		
OFF	OFF	OFF	OFF	Sharp LQ181E1LW31	1280x1024	
ON	OFF	OFF	OFF	AU Optronics M170EN05	1280x1024	
			•	For XGA panel		
OFF	OFF	OFF	OFF	Sharp LQ150X1LGN2A	1024x768	
				Sharp LQ150X1LGB1	1024x768	
				For SVGA panel		
OFF	OFF	OFF	OFF	Sharp LQ121S1DG11/41	800x600	
				Toshiba LTM08C351	800x600	
				For WVGA panel		
OFF	OFF	OFF	OFF	NEC NL8048BC24-01	800x480	
ON	OFF	OFF	OFF	Kyocera TCG085WV1AB-G00	800x480	
ON	OFF	ON	OFF	Sharp LQ070Y3LG4A	800x480	
				For VGA panel		
OFF	OFF	OFF	OFF	Sharp LQ104V1DG51	640x480	
ON	OFF	OFF	OFF	Sharp LQ104V1DG21	640x480	
ON	OFF	ON	OFF	Kyocera TCG075VG2AC-G00	640x480	
				Others		
OFF	ON	OFF	OFF	AU Optronics M201EW02 V8	1680x1050	
ON	OFF	OFF	ON	Samsung LTM201M1-L01 ⁽¹⁾	1680x1050	
OFF	OFF	ON	OFF	Samsung LTI430LA01	1920x480	
OFF	ON	ON	OFF	NEC NL10260BC19-01D	1024x600	
ON	ON	ON	OFF	AU Optronics M200RW01	1600x900	
			1	Samsung LTM200KP01	1600x900	

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

Remark : (1) Effective on V0.50.00.00 firmware version (U12) or up.

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

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

Table 3 : DIP switch selection – SW4

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

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

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

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

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

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	TUNAUDSEL	Reserved
5	CLK/CNT	Reserved
6	GND	Ground
7	+12V/+24V	Audio board power supply, +12V/+24V
8	NC	No connection
9	NC	No connection
10	GND	Ground

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

PIN	SYMBOL	DESCRIPTION
1	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 : PHR-3)

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

CN10 - HDMI Audio out (Matching type : XHP-4)

PIN	SYMBOL	DESCRIPTION
1	GND	GND
2	AUDIO LOUT	HDMI LEFT OUT
3	GND	GND
4	AUDIO ROUT	HDMI RIGHT OUT

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

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

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

PIN	SYMBOL	DESCRIPTION
1	AUX 12V / 24V	+12V / +24V DC, 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 : PHR-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 (470 Ω 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.

CNV5 – Auxiliary Video input connector, JST B26B-PHDSS, 26 ways (Matching video cable P/N 426301700-3)

PIN	DESCRIPTION	
1	S-Video 1 : Chroma in	
2	Ground	
3	S-Video 1 : Luma in	
4	Ground	
5	Composite video 1 in	
6	Ground	
7	Y in_1	
8	Ground	
9	Cb/Pb in_1	
10	Ground	
11	Cr/Pr in_1	
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/Pr in_2	
20	Ground	
21	Y in_2	
22	Ground	
23	Cb/Pb in_2	
24	Ground	
25	Reserved	
26	Ground	

HD1 – Auxiliary Digital input connector – HD1 : JST BM20B-SRDS (Matching type : SHDR-20V-S-B)

PIN	SYMBOL	DESCRIPTION
1	GND	Digital Ground
2	GND	Digital Ground
3	RXC	TMDS Clock+
4	/RXC	TMDS Clock-
5	RX0	TMDS Data 0+

Specifications subject to change without notice

6	/RX0	TMDS Data 0-
7	RX1	TMDS Data 1+
8	/RX1	TMDS Data 1-
9	RX2	TMDS Data 2+
10	/RX2	TMDS Data 2-
11	GND	Ground (+5, Analog H/V Sync)
12	GND	Digital Ground
13	EXT_MSTR2_SCL	Reserved
14	EXT_MSTR2_SDA	Reserved
15	DDC_5V	+5V power supply for DDC (optional)
16	HPD	Hot plug detect
17	IN_SEC1_SCL	DDC Clock
18	IN_SEC1_SDA	DDC Data
19	VCC	Analog horizontal sync
20	VCC	Ground

HD2 – Auxiliary Digital Input connector – HD2 : JST BM20B-SRDS (Matching type : SHDR-20V-S-B)

PIN	SYMBOL	DESCRIPTION
1	GND	Digital Ground
2	GND	Digital Ground
3	RXC	TMDS Clock+
4	/RXC	TMDS Clock-
5	RX0	TMDS Data 0+
6	/RX0	TMDS Data 0-
7	RX1	TMDS Data 1+
8	/RX1	TMDS Data 1-
9	RX2	TMDS Data 2+
10	/RX2	TMDS Data 2-
11	GND	Ground (+5, Analog H/V Sync)
12	GND	Digital Ground
13	EXT_MSTR2_SCL	Reserved
14	EXT_MSTR2_SDA	Reserved
15	DDC_5V	+5V power supply for DDC (optional)
16	HPD	Hot plug detect
17	IN_SEC1_SCL	DDC Clock
18	IN_SEC1_SDA	DDC Data
19	VCC	Analog horizontal sync
20	VCC	Ground

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

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

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

PIN	SYMBOL	DESCRIPTION
1	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
2	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
3	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
4	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
5	VDD (+12/18V)	Panel power supply (+12/18V) (selected by JA3, JA5 & JA6)
6	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
7	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
8	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
9	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
10	VDD (3,3V/5V)	Panel power supply (3,3V/5V) (selected by JA3, JA5 & JA6)
11	GND	Ground
12	GND	Ground
13	GND	Ground
14	GND	Ground
15	GND	Ground
16	OP1	-
17	OP2	-
18	OP3	-
19	OP4	-
20	GND	Ground
21	GND	Ground
22	TXA4+	Positive differential LVDS data bit A4
23	TXA4-	Negative differential LVDS data bit A4

Specifications subject to change without notice

24	TXA3+	Positive differential LVDS data bit A3
25	TXA3-	Negative differential LVDS data bit A3
26	GND	Ground
27	TXAC+	Positive LVDS clock for A channel
28	TXAC-	Negative LVDS clock for A channel
29	GND	Ground
30	TXA2+	Positive differential LVDS data bit A2
31	TXA2-	Negative differential LVDS data bit A2
32	TXA1+	Positive differential LVDS data bit A1
33	TXA1-	Negative differential LVDS data bit A1
34	TXA0+	Positive differential LVDS data bit A0
35	TXA0-	Negative differential LVDS data bit A0
36	GND	Ground
37	TXB4+	Positive differential LVDS data bit B4
38	TXB4-	Negative differential LVDS data bit B4
39	TXB3+	Positive differential LVDS data bit B3
40	TXB3-	Negative differential LVDS data bit B3
41	GND	Ground
42	TXBC+	Positive LVDS clock for B channel
43	TXBC-	Negative LVDS clock for B channel
44	GND	Ground
45	TXB2+	Positive differential LVDS data bit B2
46	TXB2-	Negative differential LVDS data bit B2
47	TXB1+	Positive differential LVDS data bit B1
48	TXB1-	Negative differential LVDS data bit B1
49	TXB0+	Positive differential LVDS data bit B0
50	TXB0-	Negative differential LVDS data bit B0
51	GND	Ground

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

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

LED1 – Status LED connector: 3-pin header

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

P1 - Analog VGA in - 15 way connector

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

P2 – DVI-D in

PIN	SYMBOL	DESCRIPTION
1	/RX2	TMDS Data 2-
2	RX2	TMDS Data 2+
3	GND	Digital Ground
4	NC	No connection

Specifications subject to change without notice

5	NC	No connection
6	DDC_CLK	DDC Clock
7	DDC_DAT	DDC Data
8	NC	No connection
9	/RX1	TMDS Data 1-
10	RX1	TMDS Data 1+
11	GND	Digital Ground
12	NC	No connection
13	NC	No connection
14	DDC_5V	+5V power supply for DDC (optional)
15	GND	Ground (+5, Analog H/V Sync)
16	NC	No connection
17	/RX0	TMDS Data 0-
18	RX0	TMDS Data 0+
19	GND	Digital Ground
20	NC	No connection
21	NC	No connection
22	GND	Digital Ground
23	RXC	TMDS Clock+
24	/RXC	TMDS Clock-
C1	NC	No connection
C2	NC	No connection
C3	NC	No connection
C4	HS_IN	Analog horizontal sync
C5	GND	Ground
C6	NC	No connection

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 <u>http://www.digitalview.com/products/sgx-1920-lcd-controller</u>

The maximum thickness of the controller is 17.67mm 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.
- material is added to the mounting plate sur
 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.

Specifications subject to change without notice

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		

Specifications subject to change without notice

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)

 $BVR_WIP = 5 x (Rbc/10.47)$

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

To evaluate, plug in different values of Rbc :

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

So this circuit could provide Brightness adjust voltage ranging from 0V to 5V. Specifications subject to change without notice



TROUBLESHOOTING

General

A general guide to troubleshooting a flat panel display system it is worth considering the system as separate elements, such as: > Controller (jumpers, PC settings)

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

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

No image:

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

Image position:

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

Image appearance:

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

Backlight:

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

- If half the screen is dimmer than the other half:
- Check cabling for the inverter.
- > For a specific backlight tube check the AC pins orientation (CAUTION: Never reverse any DC power pins).
- Also:
- If adjusting brightness control has no effect the chances are that the VR rating or method of adjusting brightness is not compatible or correctly connected to the inverter.
- > If system does not power down when there is a loss of signal

Continued failure:

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

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

SPECIFICATIONS

Panel compatibility	Compatible with 1920x1200, 1920x1080, 1920x480, 1680x1050, 1600x1200, 1600x900, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768 1024x768,
	1024x600, 800x600, 800x480 and 640x480 resolutions of TFT LCD panels.
	A specified BIOS and some factory adjustment may be required for individual panel timings.
No. of colours	Up to 3 x 10 bit providing 1.06 billion colours.
Panel power	DC 3.3V, 5V, 12V, 18V
Panel signal	LVDS
Vertical refresh rate	60Hz at 1920x1200, 60Hz at 1920x1080, 60Hz at UXGA and up to 75Hz other
	lower resolution
Display clock maximum	165MHz
ADC clock maximum	195 MHz
DVI differential input clock maximum	165MHz
Graphics formats	Standard VESA VGA, SVGA, XGA, SXGA, WXGA, UXGA, WUXGA Other special formats through specified BIOS and factory adjustment.
Graphics auto mode detect	VGA, SVGA, XGA, SXGA, WXGA, UXGA & WUXGA interlaced and non-interlaced
Standard input at source (analog RGB)	VGA analog (15 pin) standard with automatic detection of:
	Digital Separate Sync;
	Composite Sync
	Sync On Green.
Video formats	PAL, NTSC & SECAM
Video inputs	ARGB
	DVI-D
	Composite video 1
	Composite video 2
	S-Video 1
	S-Video 2
	Component video 1
	Component Video 2
	HD SDL 1 (with optional adaptor board)
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	1/9mm x 120.4mm (/." x 4./4")
Power consumption	Tow approx. (not including panel power consumption)
	The controller has an overall 3Amp current limit.
Input Voltage	12V/24VDC +/- 5%
On board battery lifetime	o years at storage (without applying power to the unit). The battery is not
Dower protection	Euro fitted (Decettoble)
DC Power bandling	Puse Intel (Resettable)
Storage temporature limite	
Operating temperature limits	

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

Specifications subject to change without notice

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

HDMI / DVI / Auxiliary digital video (HD1&HD2) input port :

Mode	Resolution Clk [MHz]		Horizontal	Vertical
			freq [KHz]	freq [Hz]
T_70	720x400 70Hz	28.322	31.469	70.087
V_60	640x480 60Hz	25.175	31.469	59.940
V_67	640x480 67Hz	31.5	37.5	67
V_75	640x480 75Hz	31.5	37.5	75
SV_56	800x600 56Hz	36	35.156	56
SV_60	800x600 60Hz	40.000	37.879	60.317
SV_72	800x600 72Hz	50	48.077	72
SV_75	800x600 75Hz	49.5	46.875	75
X_60	1024x768 60Hz	65.000	48.363	60.004
X_70	1024x768 70Hz	75	56.476	70
X_75	1024x768 75Hz	78.75	60.023	75
SX_60	1280x1024 60Hz	108	63.81	60.020
SX_75	1280x1024 75Hz	135	79.976	75
UX_60	1600x1200 60Hz	162	75.000	60
WUX_60	1920x1080 60Hz	172.8	67.5	60
WUX_60	1920x1200 60Hz	193.2	74.5	60
1080p60	1920x1080p 60Hz	135	67.5	60
1080p59	1920x1080 59Hz	148.35	67.433	60
1080p50	1920x1080 50Hz	149	62.75	50
1080i60	1920x1080i 60Hz	74.14	33.7	60
1080i50	1920x1080i 50Hz	74.184	28.1	50
1080i24	1920x1080i 24Hz	74.25	27	24
1080i23	1920x1080i 23 Hz	74.25	27	23
720p60	1280x720P 60Hz	74.25	45	60
576p50	720x576P 50Hz	26.9568	31.2	50
480p60	720x480P 60Hz	26.9568	31.4	60

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 / CN1 Mating connector : JST XHP-6

654321		Mating	face of CN8
PIN#	Description		T
4	RS-232 Tx	I	
5	Ground		I
6	RS-232 Rx Data		

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

Mating face of RS-232 DB9 Male

Connector interface : Serial port

Mating connector : DB9 Female

(2)(3)(4)(5)

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.

Computer side

(1)

1. Commands to implement switch mount control buttons

Function	Command	Description	Remark
Menu button	0xf7	Menu button pressed	Button equivalent
Select-down	0xfa	Select-down button pressed	Button equivalent
button			
Select-up button	0xfb	Select-up button pressed	Button equivalent
Right/+ button	Oxfc	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 -	0x80, "a" "A",	Set audio (L+R) volume =	volume
left+right channel	nn "+" ["] -"	value/increment/decrement	
	"r" "R"	Reset	Range : "0""0"-"1""E"
	"?"	Query	Default : "0""F"
Volume control -	0x80, "m" "M",		"0" - audio off (muted).
on/off (mute)	"0"	Disable audio output.	"1" - audio on.
	"1"	Enable audio output.	
	"r" "R"	Reset	
		Query	5.1.1.
Brightness control	0x81,	Set brightness =	Brightness.
	nn "+" "-" "-"	Value/Increment/decrement	
	"T" "K" "0"	Reset	Range : "4""E"-"B""2"
	"m"	Query Current Source	Default : "8""0"
	"n"	Minimum query 1	
	"i" se nn	Set Source value *1	an antenna ha haratan in
	"o" ss	Ouery Source *1	ss - reference by input main
	0,00,		Select(UX98)
Contrast control -	0x82, "a" "A",	Set all contrast =	Contrast
all channels	nn "+" "-"	value/increment/decrement	
	"f" "R" "0"	Reset	Range : "1""C"-"E""4"
	"" "~~"	Query	Default : "8""0"
	"n"	Minimum query 1	
	"i" se nn	Set Source value *1	an antenna ha haratan in
	"o" ee	Ouery Source *1	ss - reference by input main
Coturation control	0,33,		Select(UX98)
Saturation control	UX83,	Set color =	PAL/NTSC color (In video mode
	+ - "r" " P "	Reset	only)
	"2"		
	"m"	Maximum query *1	Range : U I - F F
	"n"	Minimum query *1	Default. 8 0
	"i" . ss. nn	Set. Source. value *1	ss - reference by Input main
	"o", ss,	Query, Source *1	select(0x98)
Hue control	0x84	Set tint =	NTSC tint (In NTSC mode only)
	nn "+" "-"	value/increment/decrement	
	"r"l "R"	Reset	Range : "5""3"-"9""F"
	"?"	Querv	Default : "7""9"
	"m"	Maximum query *1	
	"n"	Minimum query *1	
	"i" , ss, nn	Set, Source, value *1	
	"O", SS,	Query, Source *1	ss - reference by Input main
			select(0x98)
Phase (tuning)	0x85,	Set dot clock phase =	Dot clock phase.
control	nn "+" "-"	value/increment/decrement	(In PC mode only)
	"?"	Query	
Image H position	0x86,	Set img_hpos =	Image horizontal position.

Specifications subject to change without notice

	nnnn "+" "-" "?"	value/increment/decrement	(In PC mode only)
Image V position	0x87, nnnn "+" "-" "?"	Set img_vpos = value/increment/decrement	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""4"-"0""C" 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
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. "2" - French "3" – Spanish "6" - German "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 "0x42,0x32" Composite2 "0x43,0x31" S-video "0x43,0x32" S-video2 "0x44,0x31" Component "0x44,0x32" Component2 "0x45,0x31" HDSDI "0x45,0x32" HDSDI2 "0x46,0x31" DVI "0x48,0x31" HDMI
Auto Source Seek	0x99, nn ,	Set Auto source enable = *1 Source	"nn" = "0x41,0x31"- ARGB

	"0" "1"	Disable/ Enable	"0x42,0x31"- Composite
	"?"	Query	"0x42,0x32"- Composite 2
	"o"	Valid Source query	"0x43.0x31"- S-video
	-		"0x43 0x32"- S-video 2
			"0x44 0x31"- Component
			(0x44,0x37) Component 2
			"0x45,0x31"- HDSDI
			"0x45,0x32"- HDSDI2
			"0x46,0x31"- DVI
			"0x48,0x31" HDMI
Source Layout	0x9a,	Select source layout =	Query:
_	n	Single, PIP, PBP, PBPT	"0"- Single
	"r" "R"	Reset.	"1"- Picture in Picture (PIP)
	"?"	Query	"2"- Picture by Picture (PBP)
		Quory	"3"- Picture by Picture Tall
Video Orietare	0Oh	Catulda a sustan	
Video System	UX9D,	Set video system =	Query
(Composite, S-	"0" "1" "2" "3"	Auto/NTSC/PAL/SECAM	"0" – Auto.
video and	"r" "R"	Reset	"1" – NTSC_M_358
Component Only)	"S" "s"	Video State Query	"2" – PAL_N_443
. ,,	"?"	Query	"3" – SECAM
			"4" – NTSC M 443
			"5" - DAL M 358
			5 - FAL_IVI_556
			$7 - PAL_IVI_443$
			"9" – PAL_N_358
			Video State Query
			"0" – No video.
			"1" – NTSC
			"2" – ΡΔΙ
			$2 = 1 \Lambda L$
			"4" – NISC 443
			"5" – PAL M 358
GAMMA value	0x9d,	Select GAMMA value =	GAMMA value:
select	n	Value	"0" – 1.0, "1" – 1.6
	"r" "R"	Reset	"2" – 2.2, "3" – User Defined
	"?"	Querv	"4" – 1.7. "5" – 1.8.
	-		"6" – 1 9 "7" – 2 0
			"8" - 21 "0" - 23
			0 - 2.1, 3 - 2.0,
			n = 2.4, D = 2.0,
			$\cup -2.0,$
			$^{m}D^{n} - 0.6, \ ^{m}E^{m} - 0.7,$
			"F″ − 0.8, "G″ − 0.9,
			"H" − 1.1, "I" − 1.2,
			"J" − 1.3, "K" − 1.4,
			"L" — 1.5
Auto power off	0x9f,	Set power down option =	"0" – Off.
	"0" "1"	On/Off	"1" – On.
	"r" "R"	Reset	
	"2"	Query	
Hotkey 1	0xa0 "1"	Set Hotkey 1-	"1" – volume
I DIREY I	n l		- volume. "2" – brightnoss
	 """ "O"	Peast	\angle = DHYHHHESS.
		Keset	3 – contrast.
	···?"	Query	"4" – colour.
			"5" – input source.
			"7" – zoom
			"8" – freeze
			"9" – PIP
			"B" – No function
			"D" DID Swoo
	1		u - rir swap

			"E" – Aspect Ratio
			"G" – Hue
			"H" – Backlight
			"I" – Auto Picture Setup
Hotkov 2	0xa0 "2"	Set Hotkov 2 –	
TIOIREY Z			1 – volume. "2" brightness
		Value	2 - Digniness.
		Reset	3 - contrast.
		Query	"4" – colour.
			"5" – input source.
			"7" – zoom
			"8" – freeze
			"9" – PIP
			"B" – No function
			"D" – PIP Swap
			"E" – Aspect Ratio
			"G" – Hue
			"H" – Backlight
			"I" – Auto Picture Setup
Runtime counter	0xa1	runtime counter value –	Runtime - nnnn
		nnnnn (* 0.5 hour)	
	"r" "D"	Posot	
		Resel Outerr	
	· · · · ·		
PIP brightness	Uxa2,	Set PIP window brightness =	PIP window brightness.
control	nn "+" "-"	value/increment/decrement	
	"r" "R"	Reset	Range : "4""E"-"B""2"
	"?"	Query	Default : "8""0"
PIP contrast	0xa3,	Set PIP window contrast =	PIP window contrast.
control	nn "+" "-"	value/increment/decrement	
	"r" l "R" l	Reset	Range : "1""C"-"E""4"
	"?"	Query	Default : "8""0"
PIP H position	0xa4	Set PIP hoos =	PIP window borizontal position
	nnn "+" "-"	value/increment/decrement	
	"r" "D"	Posot	Pange : "0""0""0"-"0""6""4"
	1 IX "O"		Default : "0""F""F"
	۲ ۵۰۰۵ ۲		Default . 0 5 5
PIP v position	Uxa5,	Set PIP_vpos =	PIP window vertical position.
	nnn "+" "-"	value/increment/decrement	
	"f" "R"	Reset	Range : "0""0""0"-"0""6""4"
		Query	Default : "0""1""4"
PIP window size	0xa6,	Select PIP window size =	Main selected.
select	nn	PIP window size value	PIP off if "nn" = "0""0".
	"r" "R"	Reset	"0""0"~"1""2"
	"?"	Query	"0""0" ~ "1""2"
			"1""9" : Size by Size
			"1""A" : Size by Size Tall
PIP source select	0xa7.	Select input main =	Main selected.
	n l	Video source value	0x40 0x30 : PIP OFF
	"r" "R"	Reset	0x41_0x31 · ARGB
	"?"	Query	0x42 $0x31$: Composite
	1	Query	0x42, 0x31: Composite
			0x43, 0x31 · Component 1
			UX46, UX31 : DVI
			0x42, 0x32 : Composite 2
			0x43, 0x32 : S-video 2
			0x44, 0x32 : Component 2
			0x45, 0x32 : HDSDI 2
			"0x48,0x31" HDMI
Zoom level	0xa8,	Set Zoom level =	Zoom level.
	nnnn "+" "-"	value/increment/decrement	
	1	1	1

	" ~ " "D"	Deast	
	T K	Reset	IVIIN : 0x30 0x30 0x30 0x30
	"?"	Query	(Default)
		-	Max : 0x30 0x30 0x41 0x33
Zoom H position	0x00	Sat Zaam braa -	Zoom window borizontal
200m H position	0xa9,	Set Zoom_npos =	
	nnnn "+" "-"	value/increment/decrement	position.
	"r" "R"	Reset	
	"?"	Querv	Default : 0x30 0x30 0x30 0x30
			The min and max values will
			change depends on input
			resolution.
Zoom V position	0x22	Set Zoom voos -	Zoom window vertical position
	nnnn "+" "-"	Value/Increment/decrement	
	"r" "R"	Reset	Default : 0x30 0x30 0x30 0x30
	"?"	Query	The min and max values will
			shanga dananda an input
			change depends on input
			resolution.
Horizontal Size	0xad.	Set horizontal size for	Scalar horizontal stretch
	,	Aspect Size -	
	nnn + -	value/increment/decrement	PAL(576I) / NTSC (480I) :
	"r" "R"	Reset	Min : 0x30 0x30 0x30 (Default)
	"?"	Querv	Max : 0x30 0x46 0x30
Vortical Sizo	0xb0	Set Vertical Size for	Scalar vortical stratch
Vertical Size	UXDU,		
		Aspect Size =	
	nnn "+" "-"	value/increment/decrement	PAL(576i) / NTSC (480i) :
	"r" "R"	Reset	$Min \cdot 0x30 0x30 0x30 (Default)$
	"O"	Query	Max : 0x20 0x46 0x20
	<u>{</u>	Query	1012 1020 0000 0000
Horizontal Pan	0xb1,	Set horizontal pan position	Scalar horizontal pan position
		for Aspect Size =	
	nnn "+" "-"	value/increment/decrement	PAL (576i) / NTSC (480i) ·
	" _r " "D"	React	
		Resel	Assume max H-Size & max v-
	"?"	Query	Size :
			Min : 0x46 0x38 0x38
			Max : 0x30 0x37 0x38
			D_{0}
			The min and max values will
			change depends on different
			value of H-Size, V-Size and input
			recolution
			resolution.
Vertical Pan	0xb2,	Set Vertical pan position	Scalar vertical pan position
		for Aspect Size =	
	nnn "+" "-"	value/increment/decrement	PAL (576i) / NTSC (480i) ·
		Deset	
	"f" "R"	Reset	Assume max H-Size & max V-
	"?"	Query	size :
			Min : 0x46 0x38 0x38
			Max : 0x30 0x37 0x38
			Default : 0x20 0x20 0x20
			The min and max values will
			change depends on different
			value of H-Size V-Size and input
			resolution
	l		resolution.
Colour	0xb3,	Select colour temperature =	Main selected.
temperature select	l n l	value	"0" – 9500K.
	"r" "R"	Reset	"1" – 8000K
	····?"	Query	"2" – 6500K.
			"3" – 5000K
			"4" - User
Pod loval for	0xb4	Sat the lovel of the red channel	Pod lovel for colocted colour
Red level lor	0,04,	Set the level of the red channel	Red level for selected colour
selected colour		for the selected colour temp. =	temperature.
temperature	nn "+" "-"	value/increment/decrement	
· ·	"r" "R"	Reset	Range : "9""C"-"F""F"
	"O"	Quant	Default : "E""C"
	f	Query	

Specifications subject to change without notice

	"m"	Maximum query *1	
	"n"	Minimum query *1	c – reference by Color
	"i" ss c nn	Set Source Temperature	
	1, 33, 6, 111	Group value *1	ss - reference by Input main
	"o" cc. c	Ouory Source *1	soloct(0x08)
Crean layal for	0,55,0	Set the level of the groop	Crean lovel for colocted colour
	UXD5,	Set the level of the green	Green level for selected colour
selected colour		channel for the selected colour	temperature
temperature	nn "+" "-"	temp. =	
	"r" "R"	value/increment/decrement	
		Reset	Range : "9""C"-"F""F"
	"m"	Query	Default : "E""C"
	"n"	Maximum query *1	
	"i" , ss, c, nn	Minimum query *1	 c – reference by Color
		Set, Source, Temperature	Temperature
	"o", ss, c	Group, value *1	ss - reference by Input main
		Query, Source *1	select(0x98).
Blue level for	0xb6.	Set the level of the blue channel	Blue level for selected colour
selected colour	,	for the selected colour temp. =	temperature.
temperature	nn "+" "-"	value/increment/decrement	
tomporataro	"r" "R"	Reset	Range · "9""C"-"F""F"
	"?"	Query	Default : "F""C"
	"m"	Maximum query *1	
	"o"	Minimum query 1	a reference by Color
	11 "?"	Set Source Temperature	C – Teleferice by Color
	T , SS, C, NN	Set, Source, Temperature	
	<i>u</i> 11	Group, value ^{~1}	ss - reference by input main
	"0", SS, C	Query, Source ^1	select(0x98).
Graphic horizontal	0xb7	Horizontal resolution (in pixels)	"nnn" = horizontal resolution
resolution enquiry		in 3 digit hex number	
Graphic vertical	0xb8	Vertical resolution (in lines) in 3	"nnn" = vertical resolution
resolution enquiry		digit hex number	
Graphic horizontal	0xb9	Horizontal sync frequency (in	"nnn" = horizontal frequency
svnc frequency		units of 100Hz) in 3 digit hex	, ,
enquiry		number	
Graphic vertical	0xba	Vertical sync frequency (in units	"nnnn" = vertical frequency
sync frequency	enda	of Hz) in 3 digit bey number and	nnn = 3 digit hex
enquiry		1 char	c = "i" or "p"
onquiry			interlace or Progressive
			intendee of i regressive
			Oxba added the interlace(i)
			or Drogrossive(n) foodback
	0h.h	Otative of OOD	01 Floglessive(p) leeuback.
USD status	UXDD	Status of USD	$^{\circ}0^{\circ}$ – OSD turned off
enquiry			"1" – OSD turned on
			"2" – Text Overlay on
			"3" – Display Mark on
			"4" – Screen Marker on
Display Video	0xbc,	Display Video source select	"0" – Disabled.
Source Select	"?"	Query	"1" – Enabled.
	"0"	Name of video source not	
	"1"	displayed.	
		After switching to a new video	
		source, the name of the video	
		source is displayed for 5	
		seconds.	
OSD turn off	0xbd	Turn off the OSD	"0" – fail.
			"1" – successful.
Set namma data	Oxhf mm c "?"	Query gamma data for color c	"nn" = gamma data
for user defined	0,0, 1111, 0, 1	index mm ($c = 0$ for color Red	···· – gamma data
		c=1 for color Green	
gamma curve		c-1 for color Blue)	
	Outhf "D" "-"		"~ "
		Set user gamma curve to linear	
	UXDT, MM, C, NN	Set gamma data for color c	nn" = gamma data

		index mm. (If c= 3, then gamma data for red, green & blue will be set at the same time.)	
Query External Memory	0xcb, "2"	Check External Menory 24c256	"0" – Not Installed "1" – Installed "?" – Not Support
Query Revision Number	0xcb, "3"	Read Revision Number	"nn" = Revision number
Backlight control	0xe0, nn "+" "-" "R" "r" "?"	Set Backlight = value/increment/decrement Reset Query	Backlight. Range: D/A : "0""0" ~ "1""F" 100Hz : "0""0" ~ "B""F" 120Hz : "0""0" ~ "9""F" 140Hz : "0""0" ~ "9""F" 140Hz : "0""0" ~ "6""A" 160Hz : "0""0" ~ "6""A" 200Hz : "0""0" ~ "5""F" 220Hz : "0""0" ~ "5""F" 240Hz : "0""0" ~ "4""F" 260Hz : "0""0" ~ "4""F" 260Hz : "0""0" ~ "4""4" 300Hz : "0""0" ~ "3""F" 320Hz : "0""0" ~ "3""F" 320Hz : "0""0" ~ "3""F" 340Hz : "0""0" ~ "3""A" 380Hz : "0""0" ~ "3""4" 380Hz : "0""0" ~ "2""F" 420Hz : "0""0" ~ "2""F"
Backlight On/Off	Oxe1, "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","8","C" 180Hz : "0","B","4" 200Hz : "0","C","8" 220Hz : "0","C","8" 240Hz : "0","F","0" 260Hz : "1","0","4" 280Hz : "1","1","8" 300Hz : "1","2","C"

			320Hz : "1","4","0"
			340Hz : "1","5","4″
			300HZ:1,0,0 200Hz:"1" "7" "C"
			Δ00Hz · "1" "9" "0"
			400Hz · "1" "A" "4"
			440Hz : "1","B","8"
Backlight Invert	0xe7	Set On or Off	"0" – Off
-	"0" "1"		"1" – On
	"R" "r"	Reset	
	"?"	Query	
Red Offset for	0xe8,	Set the Offset of the red channel	Red Offset for selected colour
selected colour		for the selected colour temp. =	temperature.
temperature	nn "+" "-" "	value/increment/decrement	
	"r" "R" "o"	Reset	
	" <u>'</u> "	Query	
	[[] "ຕ"	Minimum query *1	a reference by Color
	li "i" ee c nn	Set Source Temperature	C - Telefelice by Color Temperatura
	1,33,0,111	Group value *1	ss - reference by Input main
	"o". ss. c	Query, Source *1	select(0x98)
Green Offset for	0xe9.	Set the Offset of the green	Green Offset for selected colour
selected colour	0,000,	channel for the selected colour	temperature.
temperature	nn "+" "-"	temp. =	
	"r" "R"	value/increment/decrement	
	"?"	Reset	
	"m"	Query	
	"n"	Maximum query *1	c – reference by Color
	"i" , ss, c, nn	Minimum query *1	Temperature
		Set, Source, Temperature	ss - reference by Input main
	"O", SS, C	Group, value *1	select(0x98)
Dive Offect for	0	Query, Source "1	DL - Offset for selected colour
Blue Oliset Iol	0xea,	Set the Offset of the selected colour	Blue Offset for selected colour
tomperature	nn "⊥" "_"	temp -	
lemperature	"r" "R"	value/increment/decrement	
	"?"	Reset	
	"m"	Query	
	"n"	Maximum query *1	c – reference by Color
	"i" , ss, c, nn	Minimum query *1	Temperature
		Set, Source, Temperature	ss - reference by Input main
	"O", SS, C	Group, value *1	select(0x98)
		Query, Source *1	
PIP Window Blena	0xed,	Select PIP Transparency Level	PIP Transparency
Levei	nn "+" "-" "O" "+"	PIP Transparency value	"0"F" = 6.25% "0"E" = 12.5% "0"D" 49.750/ "0"C" = 259/
	"Х Г "?"		$"0"D = 18.75\% \ 0 \ C = 25\%$ $"0"R" = 31.25\% \ "0"\Delta" = 37.5\%$
	f .	Query	$0^{\circ}D = 31.23\% 0^{\circ}D = 31.3\%$
			"0"7" = 56 25% "0"6" = 62.5%
			"0"5" = 68.75% "0"4" = 75%
			"0"3" = 81.25% "0"2" = 87.5%
			"0"1" = 93.75% "0"0" <u>= 100%</u> .
PIP Window Auto	"0xee", "0x41"	Auto Off / Auto On	"0"- Off
Off	"0" "1"		"1"- On
	"?"	Query	
ScreenMarker	"0xee", "0x42"		"0"- Off
	"0" "1"	Screen Marker Off / Screen	"1"- On
CantanMarkar	"0x00" "0x40"	Marker On	"o" Off
Centermarker	"UXEE, UX45 "0" "1"	Conter Marker Off / Center	"0"- OII "1"- Op
	0 1	Marker On	1-01

AspectMarker	"0xee", "0x44" "0" I"1"	Preliminary	"0"- 4:3 "1"- 16:9
	0 1	4.3710.9	1 - 10.9
Marker Background Transparency	"0xee", "0x45" "0" "1" "2" "3"	Preliminary 0% /25%/50%/95%	"0"- 0% "1"- 25% "2"- 50% "3"- 95%
Safe Area Marker*	"0xee", "0x47" "0x53"~"0x63"	Preliminary 80%~99%	"36", "33"- 99% "36", "32"- 98% "36", "31"- 97% "36", "30"- 96% "35", "46"- 95% "35", "45"- 94% "35", "44"- 93% "35", "44"- 93% "35", "44"- 91% "35", "44"- 91% "35", "44"- 91% "35", "41"- 90% "35", "41"- 90% "35", "39"- 89% "35", "39"- 89% "35", "37"- 87% "35", "36"- 86% "35", "36"- 86% "35", "35"- 85% "35", "34"- 84% "35", "32"- 82% "35", "31"- 81% "35", "30"- 80%
IR Lock*	"0xee", "0x48" n "0" "1" "r" "R" "?"	IR Lock Disable / IR Lock Enable Reset Query	"0" – IR Lock Disable "1" – IR Lock Enable
Light Detector	"0xee", "0x4A" "0" "1" "R" "r" "?" "S" "s"	Light Detector Off / Light Detector On Light Detector On/Off Query Light Detector Value Query	"0" –Light Detector Off "1" –Light Detector On. "?" – Light Detector On/Off Query "S"]"s" –Light Detector Value Query 0x00~0xFF
Safe Area Marker Enable	"0xee", "0x4B" "0" "1"	Safe Area Marker Off / Safe Area Marker On	"0"- Off "1"- On
Aspect Marker Enable	"0xee", "0x4C" "0" "1"	Aspect Marker Off / Aspect Marker On	"0"- Off "1"- On
Display real time clock	"0xee", "0x4D" "0" "1"	Real Time Clock Display Off / Real Time Clock Display	"0"- Off "1"- On
Custom Sizing	0xef, "0" "1" "2" "?"	Custom sizing selection : Overscan / Normal / Custom Query	"0" – Overscan "1" – Custom / Underscan "2" – Normal

Function	Command	Description	Acknowledge (if enabled)	
Send Display Mark	0xF1, "S" "0x21" "0x40" "0x60" "0x7E" Return "1"	"S" = "0x53 or 0x73" ASCII "0x21,0x40,0x60,0x7E" Return " 0x31"	"S" – Send Command "Text" – Character "1" - successful.	
e.g Send Display Mark RS232 Code: "0xF1 0x53 0x21" Return Code: "0xF1 0x53 0x21 0x31"				
Clear Display Mark	0xF1, "C" Return "1"	"C" = "0x43 or 0x63" Return " 0x31"	"C" – Clear command "1" - successful.	

Specifications subject to change without notice

e.g Clear Display Mark RS232 Code: "0xF1 0x43" Return Code: "0xF1 0x43 0x31"					
Display Mark Horizontal Position	0xF1, "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 Display RS232 Code: "(Return Code: "(/ Mark Horizontal Po 0xF1 0x48 0x30 0x3 0xF1 0x48 0x30 0x3	sition 1" 1 0x30 0x31"			
Display Mark Vertical Position	0xF1, "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 Display Mark Vertical Position RS232 Code: "0xF1 0x56 0x30 0x31" Return Code: "0xF1 0x56 0x30 0x31 0x30 0x31"					
Display Mark Background Transparency	0xF1, "B" "N" Return "n"	"B" = "0x42 or 0x62" Set Transparency command "N" = "0x30~0x46" Transparency Value (Rang 00~0F)	"B" - Transparency command "N" – Transparency Value "n"- Return Value 0x00 =opaque		
Set Display Mark background Transparency value is 8 RS232 Code: "0xF1 0x42 0x38" Return Code: "0xF1 0x42 0x38 0x38"					

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	<pre>"nn,nn" = input status "nn,xx" digit = primary status: "0","0" : invalid "A","1" ARGB "B","1" Composite "B","2" Composite 2 "C","1" S-video "C","2" S-video 2 "D","1" Component "D","2" Component 2 "E","1" HDSDI "E","2" HDSDI 2</pre>

		1	
			"F","1" DVI
			"H" "1" HDMI
			"xx,nn"= PIP input status:
			"0","0": invalid
			"A". "1" ARGB
			"B"."1" Composite
			"B", "2" Composite 2
			"C" "1" S-video
			"C" "2" S-video 2
			"D" "1" Component
			"D" "2" Component 2
			E, Z HDSDIZ "E" "4" DV/I
Affala a da latada a	0	De l'ateria e servite	
Video de-Interiace		De-Interlace mode	
method		Reset	
	"f" "R"	Query	
	"' <i>?"</i>		
			"5" "1"- enable MADI
			"5" "0"- disable MADI
			"7" "1"- enable DCDi
			"7" "0"- disable DCDi
Query BIOS	0xcb, "0"	Read BIOS version	BIOS version "VV.YY.ZZ"
version			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			SVX-1920= "41721"
Reset to Factory	0xce	Reset all parameters to	"1" – successful.
Defaults		default value	
Reset to Factory	0xcf	Reset all parameters for all	"1" - successful.
Defaults with		video modes to default value	
(color temp)			
Saved Calibrated	0xd7	Saving all parameters to user	"1" - successful
default	UNUT	default value	
Load Calibrated	0vd8	Loading all parameters to	"1" - successful
default	0,00	user default value	"0" - not successful
uciduit			"E" – Checksum Error
Wide Screen	OvdQ		"0" Normal Mode
Mode Scieetian	UXUS, "()" "1" "0"	Wide Screen Mede	
wode Selection	U I ∠ "∽" "D"	Reast	1 - 1200X/00
	K "0"	Reset	2 - 1300X/08
	f (

ScreenMarker	"0xee", "0x42" "0" "1"	Screen Marker Off / Screen Marker On	"0"- Off "1"- On
CenterMarker	"0xee", "0x43"		"0"- Off
	"0" "1"	Center Marker Off / Center Marker On	"1"- On
AspectMarker	"0xee", "0x44"	Preliminary	"0"- 4:3
	"0" "1"	4:3 /16:9	"1"- 16:9
Marker	"0xee", "0x45"	Preliminary	"0"- 0%
Background	"0" "1" "2" "3"	0% /25%/50%/95%	"1"- 25%
Transparency			"2"- 50%
Specifications subject to	change without notice		

			"3"- 95%
Safe Area Marker	"0xee", "0x46"	Preliminary	"36", "33"- 98%
	"0x53"~"0x63"	64%~98%	"36", "32"- 96%
			"36", "31"- 94%
			"36", "30"- 92%
			"35", "46"- 90%
			"35", "45"- 88%
			"35", "44"- 86%
			"35", "43"- 84%
			"35", "42"- 83%
			"35", "41"- 81%
			"35", "39"- 79%
			"35", "38"- 77%
			"35", "37"- 76%
			"35", "36"- 74%
			"35", "35"- 72%
			"35", "34"- 71%
			"35", "33"- 69%
			"35", "32"- 67%
			"35", "31"- 66%
			"35", "30"- 64%

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 	"S" – Send Command "LL" – Line Number "Text" – Character "0x0A" – End of Line "1" - successful.
e.g Display "Send RS232 Code:"0xF0 Return Code: "0xF0	Text" message on scre 0x53 0x30 0x31 0x53 (0x53 0x30 0x31 0x53	een: 0x65 0x6E 0x64 0x20 0x54 0x65 0x 0x65 0x6E 0x64 0x20 0x54 0x65 0x	78 0x74 0x0A" ‹78 0x74 0x0A 0x31"
Clear Line	0xF0, "C" "LL" Return "nn"	"C" = "0x43 or 0x63" Clear command 	"C" – Clear command "LL" – Line Number "nn" – Return Line number
e.g Clear Line 1 RS232 Code: "0xF0 Return Code: "0xF0	0x43 0x30 0x31" 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 Windov RS232 Code: "0xF0 Return Code: "0xF0	w Horizontal Position 0x48 0x30 0x31" 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 Windov RS232 Code: "0xF0 Return Code: "0xF0	w Vertical Position 0x56 0x30 0x31" 0x56 0x30 0x31 0x30	0x31"	

Left offset	0xF0, "O" "SSS" Return "nnn"	"O" = "0x4F or 0x6F" Set Left Offset command 	"O" – Left Offset Command "SSS"- Offset Value (pixels) "nnn"- Return Value(pixels)			
e.g Set Left Offset = RS232 Code: "0xF0 Return Code: "0xF0	= 100 pixels (0x64 (HE 0x4F 0x30 0x36 0x34 0x4F 0x30 0x36 0x34	X)) " 0x30 0x36 0x34"				
Text Window Horizontal Size	0xF0, "X" "SSS" Return "nnn"	"X" = "0x58" Set Horizontal Size command 	"X" –Horizontal Size "SSS"- Size Value (pixels) "nnn"- Return Value(pixels)			
e.g Set Text Windov RS232 Code: "0xF0 Return Code: "0xF0	w Horizontal Size = 64 0x58 0x32 0x38 0x30 0x58 0x32 0x38 0x30	40 pixels (0x280 (HEX)) , 0x32 0x38 0x30"				
Background Transparency	0xF0, "B" "N" Return "n"	"B" = "0x42 or 0x62" Set Transparency command "N" = "0x30~0x46" Transparency Value (Rang 00~0F)	"B" - Transparency command "N" – Transparency Value "n"- Return Value 0x00 =opaque			
Set background Tra RS232 Code: "0xF0 Return Code: "0xF0	nsparency value is 8 0x42 0x38" 0x42 0x38 0x38"	L				
Text Overlay Background On or Off	0xF0, "Q" "N" Return "n"	"Q" = "0x51 or 0x71" Set Background Enable or Disable "N" = "0x30~0x31"	 "B" - command "1" Turn On Text Overlay Background "0" Turn Off Text Overlay Background "n"- Return Value 			
Set background Transparency value is 8 RS232 Code: "0xF0 0x51 0x31" Return Code: "0xF0 0x51 0x31 0x31"						

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

Specifications subject to change without notice

Display Mark Command

Function	Command	Description	Acknowledge (if enabled)
Send Display Mark	0xF1,	"O" "O.:FO == 0 70"	"S" – Send Command
	″S″ "0x21" "0x40"	$S^{*} = UX53 \text{ or } UX73^{*}$ ASCIL "0x21 0x40 0x60 0x7E"	"Text" – Character
	"0x60" "0x7E"		
	Return "1"	Return " 0x31"	"1" - successful.
e.g Send Display M	lark		
RS232 Code: "0xF1	0x53 0x21"		
Return Code. UXF1	0855 0821 0851		
Clear Display Mark	0xF1,		
	"C"	"C" = "0x43 or 0x63"	"C" – Clear command
	Return	Return 0x31	1 - successiui.
e.g Clear Display Ma	ark		
RS232 Code: "0xF1	0x43"		
Return Code: UXF1	0x43 0x31		
Display Mark	0xF1,	"H" = "0x48 or 0x68"	"H" – Horizontal Position
Horizontal Position	"H" "ss" Dat ::::::::::::::::::::::::::::::::::::		command
	Return "nn"	"nn" = "0x30,0x30~0x46,0x46"	"ss" – Set Horizontal Position
			"nn" – Return Position number
e.g Set Display Mar	k Horizontal Position		
RS232 Code: "0xF1 Return Code: "0xF1	0x48 0x30 0x31"	0x31"	
Return Code. OXI I	0,40 0,30 0,31 0,30	0.01	
Display Mark	0xF1,	"V" = "0x56 or 0x76"	"V" - Vertical Position command
Vertical Position	"V" "ss" Deture "ee"	"pp" "0x20 0x20 0x46 0x46"	"ss" – Set Vertical Position
	Return nn	111 = 0.00000000000000000000000000000000	"nn" – Return Position number
e.g Set Display Mar	k Vertical Position		
RS232 Code: "0xF1	0x56 0x30 0x31"	004"	
Return Code: UXF1	0x56 0x30 0x31 0x30	0x31	
Display Mark	0xF1,	"B" = "0x42 or 0x62"	"B" - Transparency command
Background	"B" "N"	Set Transparency command	"N" – Transparency Value
Iransparency	Return "n"	 "N" – "0x30~0x46"	"n"- Return Value
		Transparency Value	0x00 =opaque
		(Rang 00~0F)	
Set Display Mark ba	ackground Transparer	L ncy value is 8	
RS232 Code: "0xF1	0x42 0x38"		
Return Code: "0xF1	0x42 0x38 0x38"		

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

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

Please refer to the ASCII to Hex convert table below.

Hex to ASCII conversion table

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
0x30	0	0x41	А	0x61	а	0x2B	+
0x31	1	0x42	В	0x62	b	0x2D	-
0x32	2	0x43	С	0x63	С	0x3F	?
0x33	3	0x44	D	0x64	d		
0x34	4	0x45	E	0x65	е		
0x35	5	0x46	F	0x66	f		
0x36	6	0x47	G	0x67	g		
0x37	7	0x48	Н	0x68	h		
0x38	8	0x49	Ι	0x69	i		
0x39	9	0x4A	J	0x6A	j		
		0x4B	К	0x6B	k		
		0x4C	L	0x6C	1		
		0x4D	М	0x6D	m		
		0x4E	Ν	0x6E	n		
		0x4F	0	0x6F	0		
		0x50	Р	0x70	р		
		0x51	Q	0x71	q		
		0x52	R	0x72	r		
		0x53	S	0x73	S		
		0x54	Т	0x74	t		
		0x55	U	0x75	u		
		0x56	V	0x76	V		
		0x57	W	0x77	W		
		0x58	Х	0x78	Х		
		0x59	Y	0x79	у		
		0x5A	Z	0x7A	Z		

Appendix I – Mapping definition

• Definition of Mapping A :

I



• Definition of Mapping B :



• Definition of VESA :

DPort Output Pair	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DB[7:6] / TXDEC							
DB[3:2] / TXDE0	GE0	RE5	RE4	RE3	RE2	RE1	RE0
DB[5:4] / TXDE1	BE1	BE0	GE5	GE4	GE3	GE2	GE1
DB[9:8] / TXDE2	EN	VS	HS	BE5	BE4	BE3	BE2
DG[3:2] / TXDE3	field/prg	BE7	BE6	GE7	GE6	RE7	RE6
DG[5:4] / TXDE4	low	BE9	BE8	GE9	GE8	RE9	RE8
DG[7:6] / TXDO0	GO0	RO5	RO4	RO3	RO2	RO1	ROO
DG[9:8] / TXDO1	BO1	BO0	GO5	GO4	GO3	GO2	GO1
DR[5:4] / TXDO2	EN	VS	HS	B05	BO4	BO3	BO2
DR[7:6] / TXDO3	field/prg	BO7	BO6	G07	GO6	RO7	RO6
DR[9:8] / TXDO4	low	BO9	BO8	GO9	GO8	RO9	RO8
DR[3:2] / TXDOC			-	-			



• Definition of JEIDA :

DPort Output Pair	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DB[7:6] / TXDEC							
DB[3:2] / TXDE0	GE4	RE9	RE8	RE7	RE6	RE5	RE4
DB[5:4] / TXDE1	BE5	BE4	GE9	GE8	GE7	GE6	GE5
DB[9:8] / TXDE2	EN	VS	HS	BE9	BE8	BE7	BE6
DG[3:2] / TXDE3	field/prg	BE3	BE2	GE3	GE2	RE3	RE2
DG[5:4] / TXDE4	low	BE1	BEO	GE1	GE0	RE1	REO
DG[7:6] / TXDO0	GO4	R09	RO8	R07	R06	R05	RO4
DG[9:8] / TXDO1	BO5	BO4	GO9	GO8	G07	GOE	GO5
DR[5:4] / TXDO2	EN	VS	HS	BO9	BO8	BO7	BO6
DR[7:6] / TXDO3	field/prg	BO3	BO2	GO3	GO2	RO3	RO2
DR[9:8] / TXDO4	low	BO1	BO0	G01	GO0	R01	ROO
DR[3:2] / TXDOC							
and the second							



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 <u>must</u> 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.



The reference pattern can be downloaded at : http://www.digitalview.com/support/downloads/TestPattern_1280.BMP

This reference pattern is for 1280x1024 resolution and it needs to set your ARGB input source to 1280x1024 resolution before performing the Auto Color Gain function. The position of the black vertical bar in the pattern at the right side is important. It will affect the calibration result if you are setting the ARGB input to other resolution.

<u>Warning</u> - 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 SGX-1920

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

I

P/N 559000105-3 : DigitalView remote control unit (with DigitalView logo silk

screen printing)



BUTTON	FUNCTION
POWER BUTTON	Soft power ON/OFF button.
	Use combined with digit keys to enable/disable the IR function.
ATTENTION BUTTON	
	SGX-1920 : "Attention" + "1"
MUTE BUTTON (Switch to mute on/off mode.
AV/TV BUTTON	Use to select the input source. (VGA/DVI/HDMI/)
SOUND (ZOOM) BUTTON	Use to display the zoom menu. Press the "+" to zoom in the picture and the "-" to zoom out the picture.
PIP BUTTON	Use to select the PIP (Picture in Picture) setting
SEL UP (Λ) / SEL DN (\vee)	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.
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.
TRACK (S-Video) BUTTON	Press this button in the non OSD menu display mode to select S-Video 1 source.
TRACK (Composite 1) BUTTON	Press this button in the non OSD menu display mode to select Composite 1 source.
Composite 2 BUTTON	Press this button in the non OSD menu display mode to select Composite 2 source.
PLAY (YPbPr) BUTTON	Press this button in the non OSD menu display mode to select Component 1 source.
STOP (VGA) BUTTON	Press this button in the non OSD menu display mode to select VGA source.
FREEZE (II) BUTTON	Use this button to freeze and release the picture on your screen.
DVI BUTTON	Press this button in the non OSD menu display mode to select DVI source.
HDMI BUTTON	Press this button in the non OSD menu display mode to select HDMI source.
HDSDI1 BUTTON	Press this button in the non OSD menu display mode to select HD-SDI 1 source.
HDSDI2 BUTTON	Press this button in the non OSD menu display mode to select HD-SDI 2 source.

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

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.

DCDi = Directional Correlation Deinterlacing :

It is a digital enhancement method developed by Faroudja. DCDi technology is primarily used for improving the image quality of low resolution images. This is done by deinterlacing the image and blending rough edges occurring in diagonal lines.

Appendix VII – PIP mix table

						INPUT SO	URCES			
		VGA	Composite 1	Composite 2	S-Video 1	S-Video 2	Component 1	Component 2	DVI / Auxiliary port HD1	HDMI / Auxiliary port HD2
	VGA	Х	1	~	~	✓	1	~	~	1
	Composite 1	~	Х	~	~	~	1	~	~	~
	Composite 2	~	~	X	~	~	1	~	✓	~
JRCE	S-Video 1	~	✓	~	X	~	✓	✓	✓	~
SOL	S-Video 2	1	✓	✓	✓	Х	✓	✓	✓	1
IPUT	Component 1	~	*	~	*	~	Х	1	✓	~
≤	Component 2	*	*	1	*	*	*	х	*	~
	DVI / Auxiliary port HD1	1	✓	~	~	✓	✓	✓	х	1
	HDMI / Auxiliary port HD2	~	4	~	4	~	4	4	*	х

Appendix VIII – Network connection

The SGX-1920 LCD interface controller has an RJ-45 Ethernet port for control and monitoring over a network. This application note introduces the two user interface modes:

- Browser based web server mode
- Command line direct mode (this is the default mode)

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

QUICK GUIDE

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

- The SGX-1920 ships with the browser based web-server mode installed as default.
- Works with a normal network with DHCP, i.e. must use a router.
- Connect the SGX-1920 to the network and ensure power is on.
- Use the IP-50 IP Locator utility available from the IP-50 web-page. <u>http://www.digitalview.com/media/downloads/IPLocator.zip</u> (Windows only)
- Double click on the IP address in the IP Locator window, it will open the SGX-1920 browser page in your default browser. Alternatively copy the IP address into your browser address line.
- Test the functions that come up on the browser.

Command line direct mode: This is relevant when a PC application is used to send and receive commands over the network port. The network port will require an alternative firmware version if the Command line direct mode is required.

For details, please refer to the separate application note.

Appendix IX – Digital Ports selection on SGX-1920

Port definition : P2 : DVI P3 : HDMI HD1 : Auxiliary digital input port HD2 : Auxiliary digital input port



(1) SGX-1920 without connect any I^2C control on CN8 (i.e : HD-1000/-2000/-3000S/-3000)

(i) The board allows the user to configure the digital signal path via P2, P3, HD1, HD2.

Press and hold "MENU" button on the OSD switch mount and turn on the controller to enter the "Programming mode".

Choose "Auxiliary Port Select" shown below :



(ii) Choose Digital signal port path :





(iii) Choose the Auxiliary port HD1/HD2 configuration selection :

Auxiliary port HD1 :

- 1. Set DVI Input from HD1 : Input DVI signal from HD1 port and disable P2 (DVI) port.
- 2. Set DVI Input from P2 : Input DVI signal from P2 (DVI) port and disable HD1.



Auxiliary port HD2 :

- 1. Set HDMI input from HD2 : Input HDMI signal from HD2 port and disable P3 (HDMI) port.
- 2. Set HDMI Input from P3 : Input HDMI signal from P3 (HDMI) port and disable HD2.

(2) SGX-1920 connect with HD-1000/-2000/-3000S via I²C control on CN8

(i) The board allows the user to configure the digital signal path via P2, P3, HD1, HD2.

Press and hold "MENU" button on the OSD switch mount and turn on the controller to enter the "Programming mode".

Choose "Auxiliary Port Select" shown below :



(ii) Choose Digital signal port path :





(iii) Choose the Auxiliary port HD1/HD2 configuration selection :

Auxiliary port HD1 :

- 1. Set HD/SDI Input from HD1 : Input digital signal coming from HD-1000/-2000/-3000S to HD1 port and disable P2 (DVI) port.
- 2. Set HD/SDI Input from P2 : Input digital signal coming from HD-1000/-2000/-3000S to P2 (DVI) port and disable HD1 port.
- 3. Set DVI Input from P2 : Input DVI signal from P2 (DVI) and disable HD1 port.

Auxiliary port HD2 :

- 1. Set HD/SDI Input from HD2 : Input digital signal coming from HD-1000/-2000/-3000S to HD2 port and disable P3 (HDMI) port.
- 2. Set HD/SDI Input from P3 : Input digital signal coming from HD-1000/-2000/-3000S to P3 (HDMI) port and disable HD2 port.
- 3. Set HDMI Input from P3 : Input DVI signal from P3 (HDMI) port and disable HD2 port.

*** The controller will factory default to HD2 for digital signal coming from HD-1000/-2000/-3000S

(3) SGX-1920 connect with HD-3000 via I²C control on CN8

The controller will disable P2 (DVI) & P3 (HDMI) port and enable HD1 for HD-SDI 1 input & enable HD2 for HD-SDI 2 input automatically when connect with HD-3000 via I^2C control on CN8.

Specifications subject to change without notice

Appendix X - 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	nower	sunnly -	- input	Power	header	4 way	vs 0.156"	nitch
	12100	power	suppiy	- mpui,	1 0 10 0	neauci	- way	30.150	piton

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

Appendix XI - 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

Specifications subject to change without notice

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 :



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