

**HDMI INTERFACE CONTROLLER
FOR TFT PANEL**

Model: DD-1920-HDMI

Part number: 41730010X-3

INSTRUCTIONS

CONTENTS

Page: **2. Introduction, How to Proceed, Usage Note, Disclaimer**
3. System design – Diagram of a suggested system
4. Assembly notes – Important information about system elements
5. Connection & Operation – How to use the controller
9. Connectors, pinouts & jumpers – Essential connection information
16. Controller dimensions
17. Application notes
19. Troubleshooting
20. Specifications
21. Appendix I – Mode Support Table
22. Appendix II – RS-232 control protocols
26. Appendix III – Appendix III – DDC/CI support at HDMI port
27. Appendix IV - Mapping definition
28. Appendix V – DV remote control unit work for DD-1920-HDMI
30. Warranty, Caution & Limitation of Liability, Trademarks
31. Contact details

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

Introduction

Designed for LCD monitor and other flat panel display applications, the DD-1920-HDMI controller provides easy to use HDMI interface controller for:

- TFT (active matrix) LCDs with LVDS interface of 1920x1200, 1920x1080, 1920x480, 1680x1050, 1600x1200, 1400x1050, 1366x768, 1280x1024, 1280x800, 1280x768, 1024x768, 800x600, 800x480, 640x480, 480x640 resolution
- Support HDMI 1.3 input up to 1080p/WUXGA input resolution

Ordering information :

| Controller | Part number | Ordering part number |
|--------------|-----------------|----------------------|
| DD-1920-HDMI | P/N 41730010X-3 | P/N 4173001XX-3 |

HOW TO PROCEED

- Ensure you have all parts & that they are correct, refer to:
 - Connection diagram (separate document for each panel)
 - Connector reference (in following section)
 - Assembly notes
- Check controller switch & jumper settings (errors may damage the panel)
- Prepare the PC
- Connect the parts
- Understand the operation and functions (in following section)

IMPORTANT USAGE NOTE

This product is for use by system 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:

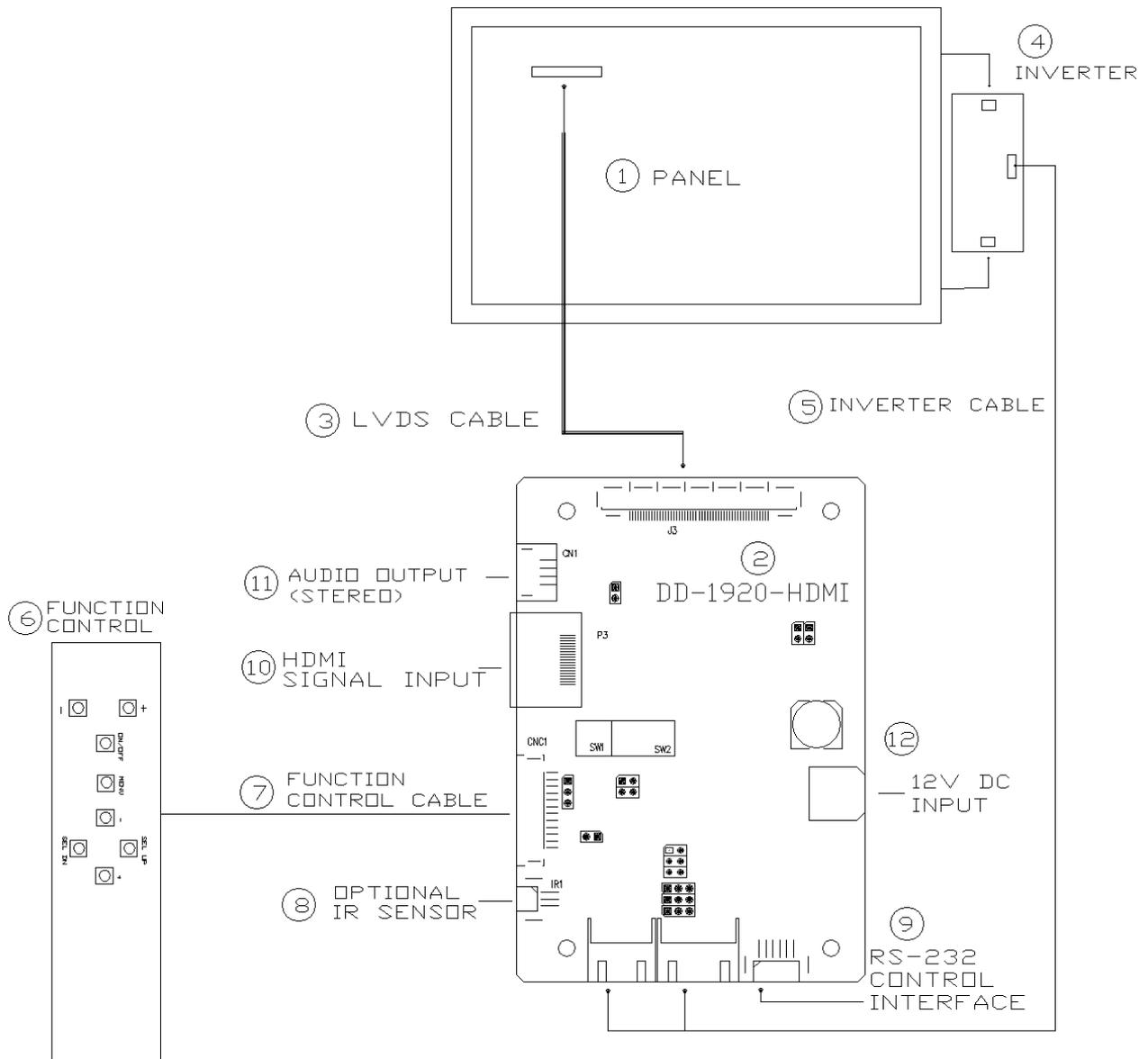
- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- Check power settings to all component parts before connection.
- Understand the operation and connectivity requirements of this controller.

DISCLAIMER

There is no implied or expressed warranty regarding this material.

SYSTEM DESIGN

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



Summary:

1. LCD panel
2. LCD controller card, DD-1920-HDMI
3. LVDS cable (for connection with LVDS panel)
4. Inverter for LCD backlight (if not built into LCD)
5. Inverter cable
6. Function controls
7. Function controls cable
8. IR sensor (Optional)
9. RS-232 control interface
10. HDMI signal source
11. Audio output (Stereo)
12. Power input (12VDC)

Digital View offers a range of accessories such as listed above, to make up complete display solution.

ASSEMBLY NOTES

This controller is designed for monitor and custom display projects using 1920 x 1200, 1920 x 1080, 1920 x 480, 1680x1050, 1600x1200, 1400x1050, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768, 1024x768, 1024x600, 800x600, 800x480, 640x480, 480x640 resolution TFT panels with a VGA, SVGA, XGA, SXGA, UXGA, 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 interface TFT panels with panel voltage 3.3V or 5V or 12V LVDS interface. Due to the variation between manufacturers of 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 card:** Handle the controller card with care as static charge may damage electronic components.
3. **LVDS signal cable :** In order to provide a clean signal it is recommended that LVDS signal cables are no longer than 46cm (18 inches). If loose wire cabling is utilized these can be made into a harness with cable ties. Care should be taken when placing the cables to avoid signal interference. Additionally it may be necessary in some systems to add ferrite cores to the cables to minimize signal noise.
4. **Inverter:** This will be required for the backlight of an LCD, some LCD panels have an inverter built in. As panels may have 1 or more backlight tubes and the power requirements for different panel models backlights may vary it is important to match the inverter in order to obtain optimum performance. See page 15 for the Application notes "Inverter connection section for more informations.
5. **Inverter Cables:** Different inverter models require different cables and different pin assignment. Make sure correct cable pin out to match the inverter. Using wrong cable pin out may damage the inverter.
6. **OSD switch mount controls:** The following section discusses the controls required and the section on connectors provides the detail. The controls are minimal: On/Off, Backlight Brightness (depends on inverter), OSD (5 momentary buttons) analog VR type or (8 momentary buttons) digital type.
7. **OSD switch mount 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 metre (3 feet) should be acceptable.
8. **IR sensor:** It is an optional part only, can be unconnected if not using IR remote control. See Appendix V for button definition.
9. **RS-232 control interface :** Firmware upgrade and serial control via this interface port.
10. **HDMI input:** Support HDMI 1.3 input up to 1080p/WUXGA resolution. Plug the HDMI cable to the connector P3 on the controller board.
11. **Audio output (Stereo) from HDMI :** This port support Stereo audio output (no amplification) from the HDMI audio source inputted. It requires to select the audio port "Speakers" via OSD menu under "Sound" > "Output" OSD menu page.
12. **Power Input:** 12VDC is required, this should be a regulated supply. 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.
 - **Power Safety:** Note that although only 12VDC is supplied 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.

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: Plug the LVDS signal cable direct to J3. Insert the panel end of the cable to the LCD panel connector.

Inverter & Controller: Plug the inverter cable to CNB1 and CNA1 (if necessary). Plug another end to the connector on the inverter.

Function switch & Controller: Plug the OSD switch mount cable to CNC1 on the controller board and another end to the OSD switch mount.

LED 1 : Plug in a 3-way with dual colour LED to connector LED1 on the controller board for indicating the controller status.

IR & Controller: Plug in a 3-way with IR sensor to connector IR1 on the controller board.

Jumpers : Check all jumpers are set correctly. Details referring the connection diagram.

Jumpers & Inverter & Panel voltage: Particularly pay attention to the settings of JA3, JB1, JB2, JB3. JB2 & JB3 are used for inverter control (read inverter specification and information on the jumper table to define the correct settings). JA3 is used for panel voltage input (read panel specification and information on the jumper table to define the correct settings).

HDMI cable : Plug the HDMI cable to the connector P3 on the controller board.

SPDIF audio connector : audio output ports CN11 supports audio SPDIF audio output from HDMI audio source inputted. It requires to select the audio port "SPDIF" via OSD menu under "Sound" > "Output" OSD menu page.

Audio output (Stereo) from HDMI : audio output port CN1 supports Stereo audio output (no amplification) from the HDMI audio source inputted. It requires to select the audio port "Speakers" via OSD menu under "Sound" > "Output" OSD menu page.

Power supply & Controller: Plug the DC 12V power in to the connector PP2. You can consider to use DigitalView mating power cable P/N 426013800-3, 160mm.

Power on: Switch on the controller board and panel by using the OSD switch mount.

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

Controller LED status (LED1) :

| State | LED color |
|----------------------------|-----------|
| No signal & backlight off | RED |
| No signal & backlight on | ORANGE |
| With signal & backlight on | GREEN |

General:

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

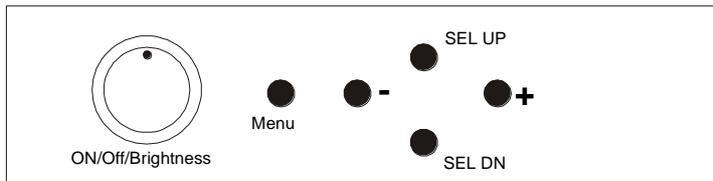
OPERATION

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

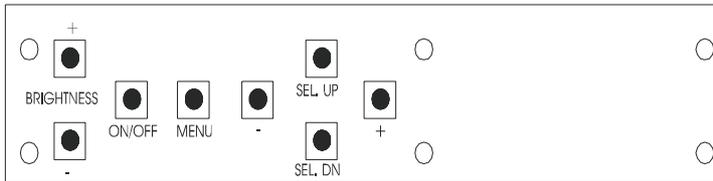
LCD DISPLAY SYSTEM SETTINGS

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

| Controls | Analog VR type | Digital type |
|---|--|--|
| On/Off – turns controller board power on | VR toggle switch | On/Off button |
| Brightness – controls backlight brightness | Rotary VR | Brightness +/- buttons |
| Menu – turns OSD menu On or Off (it will auto time off) (Function with signal input only) | Menu button | Menu button |
| Select – Select function / Confirm (under OSD menu on state) | SEL DN | SEL DN |
| Move up to select individual RGB color level OSD page (under OSD menu on state) | SEL UP | SEL UP |
| + – increase the setting / moves the selector to the next function (under OSD menu on state) | + | + |
| - - decrease the setting / moves the selector to the previous function (under OSD menu on state) | - | - |
| Reset to Factory Defaults | Press and hold SEL DN button, then power on the controller | Press and hold SEL DN button, then power on the controller |
| Switch to next input source (under OSD menu off state) | + | + |



Analog VR type



Digital type



OSD Functions

| Image | | |
|----------------------------|--------------------------|---|
| | Brightness | Increase/decrease brightness level. Press – or + (- <input type="text"/> +) Total : 100 steps |
| | Contrast | Increase/decrease contrast level. Press – or + (- <input type="text"/> +) Total : 100 steps |
| | Sharpness | Increase/decrease sharpness level. Press – or + (- <input type="text"/> +) Total : 8 steps |
| | Color | Color temp ▶ (Adjust the warmness of the image displayed. The higher temperature the coolest image looks like. The lower temperature the warmest image looks like.) 4200k 5000k 6500k 7500k 9300k User ▶ R Press – or + (- <input type="text"/> +) Total : 100 steps G Press – or + (- <input type="text"/> +) Total : 100 steps B Press – or + (- <input type="text"/> +) Total : 100 steps Reset Gamma (0.4/0.6/1.0/1.6/2.2) |
| Display | | |
| | Backlight** ▶ | |
| | Invert | B/L Invert : Invert for the backlight brightness |
| | Control | D/A / PWM : Selection for voltage level dimming control / PWM dimming control |
| | Frequency | Backlight frequency 100 ~ 440Hz in a step of 20 |
| | B/L | Backlight brightness adjustment |
| 1280 1366 | Widescreen mode ▶ | |
| | DDC programming | Video timing CVT timing |

[Please refer to application note for this function details]



| | | | |
|---|---|---|---|
|  | | Sound | |
| |  | Mute | Mute |
| |  | Output | Select audio output port Speakers : via CN1 & J1 connector SPDIF : via CN11 connector |
|  | | System | |
| |  | Timer : OSD Timeout in seconds 3 sec 6 sec 12 sec Always On | |
| |  | Rotation : OSD menu rotation in degree 0 90 180 270 | |
| |  | Position : Adjust OSD menu position | |
| |  | Transparency : Set OSD transparency Press – or + (- <input type="text"/> +) Total : 100 steps | |
| |  | Reset : Load factory default settings. Press down on OSD keypad to factory reset | |

[Firmware version : V1.07.00 or up]

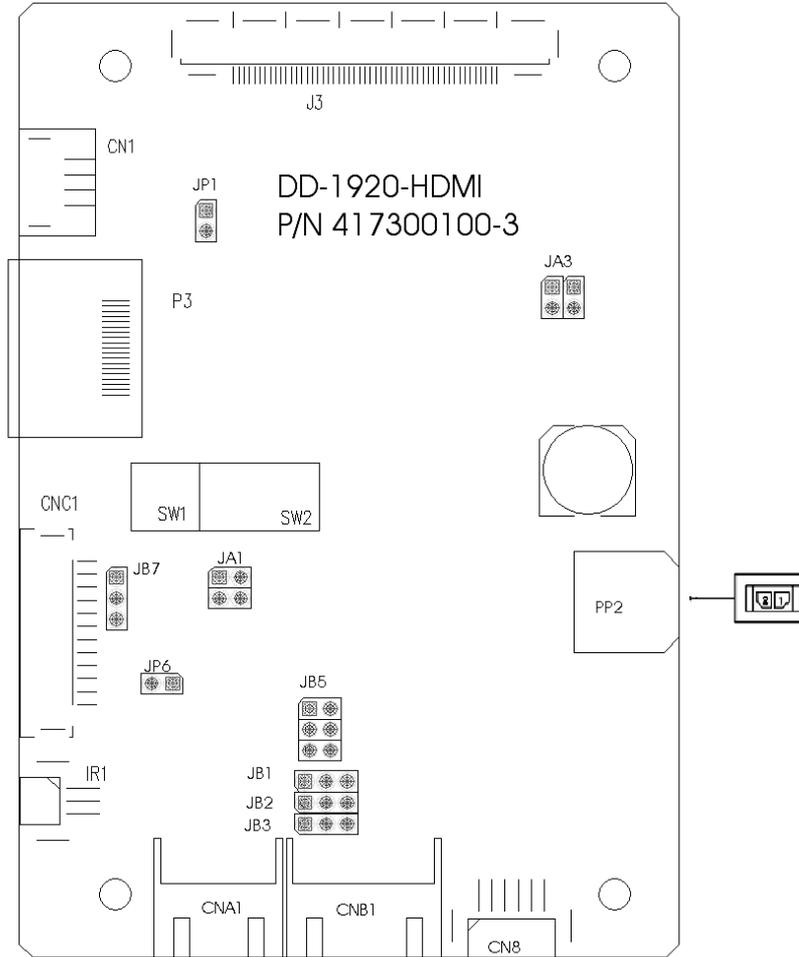
Remark :

Items marked ▶ have sub menus.

Exit the OSD menu to save the setting chosen

CONNECTORS, PINOUTS & JUMPERS

The various connectors are:



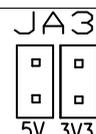
Summary: Connectors

| Ref | Purpose | Description |
|------|---------------------------------|---|
| CN1 | Audio output (Stereo) from HDMI | JST 4-way, S4B-ZR-SM4A (Mating type : ZHR-4) (Matching connection cable P/N 426685400-3) |
| CN8 | Serial control | Molex 53261-0671, 6 ways 1.25mm pitch (Mating type : Molex 51021-0600) (Matching connection cable P/N 426171800-3) |
| CNA1 | Auxiliary power output | JST 4-way, S4B-XH-A (Mating type : XHP-4) (Matching cable P/N 426040200-3) |
| CNB1 | Backlight inverter | JST 5-way, S5B-XH-A (Mating type : XHP-5) (Matching cable P/N 426058300-3) |
| CNC1 | OSD controls | Hirose DF13A-12P-1.25H (Mating type : DF13-12S-1.25C) (Matching OSD switch mount cable P/N 426122200-3 (150mm) or P/N 426122210-3 (250mm)) |
| IR1 | Infra-Red sensor connector | Molex 53261-0371, 3 way 1.25mm pitch (Mating type : 51021-0300) (Matching connection cable P/N 426031500-3) |
| P3 | HDMI signal input | HDMI connector (Type A) |
| J3 | LVDS panel signal | JAE FI-RE51S-HF (Mating type : JAE FI-RE51HL) |
| PP2 | Power input | Molex 43650-0200 compatible (Mating type : Molex 43645-0200 compatible) (Matching power cable : P/N 426013800-3 , 160mm) |

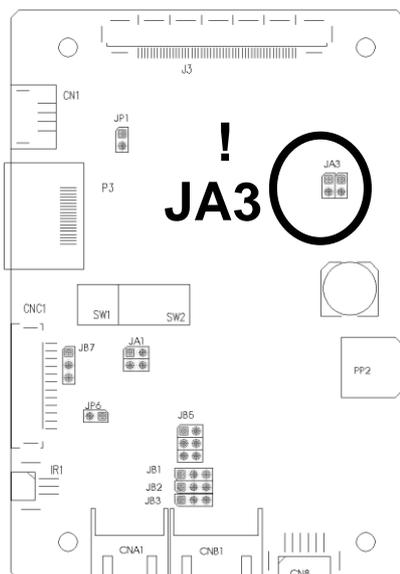
Summary: Jumpers setting

| Ref | Purpose | Note |
|-----|--|---|
| JA1 | On board +5V logic power enable | 1-3 & 2-4 closed, factory set, do not remove |
| JA3 | Panel power voltage select | See panel voltage setting table 1 CAUTION: Incorrect setting will cause panel damage |
| JB1 | Backlight brightness voltage range | 1-2 closed = 3.3V max 2-3 closed = 5V max |
| JB2 | Backlight inverter on/off control – signal level | 1-2 = On/Off control signal 'High' = +12V 2-3 = On/Off control signal 'High' = +5V Open = On/Off control signal 'High' = Open collector CAUTION: Incorrect setting can damage inverter. |
| JB3 | Backlight inverter on/off control – polarity | 1-2 = control signal 'high' = CCFT ON 2-3 = control signal 'low' = CCFT ON |
| JB5 | Backlight control type selection | 1-2 = VR/Digital switch mount control 3-4 = Analog backlight brightness control via RS-232 command (0xe0) – voltage range 0~5V 5-6 = PWM (Pulse Width Modulation) brightness |
| JP1 | Reserved | Reserved for internal programming use (Always 1-2 closed) |
| JP6 | Input power control | Short = External switch control Open = Switch mount control |
| SW1 | Panel selection | See table below |
| SW2 | Panel selection | See table below |

Table 1 : Panel voltage setting table :

| Input voltage via PP2 | Panel Voltage | JA3 | Jumper on board |
|-----------------------|---------------|------------|--|
| 12VDC | 3.3V | 3-4 closed |  JA3 5V 3V3 |
| | 5V | 1-2 closed |  JA3 5V 3V3 |
| | 12V | OPEN |  JA3 5V 3V3 |

CAUTION: Incorrect setting can damage panel & controller





DIP Switch selection – SW2

| Pos #1 | Pos #2 | Pos #3 | Pos.#4 | Description | Panel resolution |
|------------------------|--------|--------|--------|---|--|
| For WUXGA panel | | | | | |
| OFF | OFF | OFF | OFF | Samsung LTM220CS01 AU Optronics B170UW02 V0 | 1920x1200 1920x1200 |
| ON | OFF | OFF | OFF | AU Optronics M215HW01 Samsung LTM230HT01 | 1920x1080 1920x1080 |
| OFF | ON | OFF | OFF | Samsung LTI400HA01 | 1920x1080 |
| For UXGA panel | | | | | |
| ON | OFF | OFF | OFF | NEC NL160120BC27-14 | 1600x1200 |
| For WXGA panel | | | | | |
| ON | OFF | OFF | OFF | Samsung LTA260W2-L01 | 1366x768 |
| ON | ON | OFF | OFF | Samsung LTA460WS-L03 | 1366x768 |
| OFF | OFF | ON | OFF | Sharp LQ315T3LZ24 / AU Optronics M156XW01 V0 | 1366x768 |
| ON | OFF | ON | OFF | LG LC420W02-A4 | 1366x768 |
| OFF | ON | ON | OFF | NEC NL12880BC20-02D | 1280x800 |
| OFF | ON | OFF | OFF | NEC NL12876BC26-21 | 1280x768 |
| ON | ON | ON | OFF | AU Optronics M220EW01 | 1680x1050 |
| For SXGA panels | | | | | |
| ON | OFF | OFF | ON | NEC NL128102BC29-01B | 1280x1024 |
| ON | ON | ON | OFF | Fujitsu FLC48SXC8V | 1280x1024 |
| OFF | ON | OFF | ON | Sharp LQ181E1LW31 | 1280x1024 |
| ON | ON | OFF | ON | Samsung LTM170ET01 | 1280x1024 |
| OFF | OFF | ON | ON | AU Optronics M190EG01 | 1280x1024 |
| For XGA panel | | | | | |
| OFF | OFF | ON | ON | AUO M150XN07 V2 | 1024x768 |
| OFF | ON | ON | OFF | LG LM151X2 | 1024x768 |
| ON | ON | OFF | ON | Sharp LQ150X1LGB1 Sharp LQ150X1LGN2A | 1024x768 1024x768 |
| ON | OFF | ON | ON | NEC NL10276BC12-02 | 1024x768 |
| OFF | ON | ON | ON | NEC NL10276BC13-01C | 1024x768 |
| ON | ON | ON | ON | NEC NL10276BC30-18/ 30-18C NEC NL10276BC20-08 | 1024x768 1024x768 |
| For SVGA panel | | | | | |
| OFF | OFF | ON | OFF | PrimeView PD104SL5H2 Sharp LQ121S1DG11 Sharp LQ104S1DG21 Sharp LQ121S1DG41 | 800x600 800x600 800x600 800x600 |
| ON | OFF | ON | OFF | Toshiba LTM12C289 | 800x600 |
| OFF | ON | ON | OFF | Sharp LQ084S3DG01 | 800x600 |
| ON | ON | OFF | OFF | Sharp LQ121S1LG41 NEC NL8060BC21-02 | 800x600 800x600 |
| ON | ON | ON | OFF | Sharp LQ104S1DG21 | 800x600 |
| OFF | OFF | OFF | ON | PrimeView PD104SL5 | 800x600 |
| ON | OFF | OFF | ON | NEC NL8060BH18-02 | 800x600 |
| For WVGA panel | | | | | |
| ON | OFF | ON | OFF | NEC NL8048BC19-02 | 800x480 |
| ON | OFF | OFF | ON | Sharp LQ070Y3LG4A | 800x480 |
| Others | | | | | |
| ON | OFF | OFF | ON | Samsung LTI430LA01 | 1920x480 |
| ON | ON | ON | OFF | AU Optronics M200RW01 V1 | 1600x900 |
| ON | OFF | OFF | OFF | Sharp LQ150F1LH22 | 1400x1050 |
| ON | ON | OFF | OFF | Samsung LTM190M2-L31 | 1440x900 |
| ON | OFF | ON | OFF | LG LM171WX3-TLA1 | 1440x900 |
| OFF | ON | ON | OFF | LG LM171WX3 | 1440x900 |
| OFF | OFF | ON | OFF | CPT CLAA102NA0ACW | 1024x600 |

For additional and recent added panels, please contact us to support.



| 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 / WVGA |
| ON | ON | ON | Others |

SW1 Pos 8 = Reserved.

DIP switch selection – SW1

| Pos. # | Function | Description |
|--------|--------------------------|--|
| 1 | Panel pixel format | OFF : Double Pixel ON : Single Pixel |
| 2 | LVDS data mapping select | ON : Mapping A (LVDS panel) OFF : Mapping B (LVDS panel) Please adjust to get the correct picture. See as Appendix III for details of mapping A and B. |
| 3 | Reserved | Reserved |
| 4 | Operating mode selection | OFF : General application ON : Work with RM-DN5 (firmware version E1.12.10a) from HDMI port [#] |

Remark :

- # Assign SW1 position 4 to ON for connection to RM-DN5 (Firmware version : E1.12.10a) from HDMI port with the following changes :
- Add "Loading..." message on screen while startup and stay until the valid signal.
 - Changed the default Auto Source Seek to Off
 - Changed the IR key from "Display" key to "OSD Next" key for menu function
 - Extend longer delay time approx. (4 secs) to detect signal for "No Signal" state
 - Only HDMI input and disabled all other "Source" selections in OSD, IR hotkeys & RS-232 for RM-DN5 mode



CN1 – Audio output (Stereo) from HDMI : JST 4-way, S4B-ZR-SM4A

(Mating type : ZHR-4)

| PIN | SYMBOL | DESCRIPTION |
|-----|--------|--------------------------------|
| 1 | AMP L- | Audio Left channel (Negative) |
| 2 | AMP L+ | Audio Left channel (Positive) |
| 3 | AMP R- | Audio Right channel (Negative) |
| 4 | AMP R+ | Audio Right (Positive) |

CN8 – RS-232 serial control: Molex 53261-0671, 6 ways 1.25mm pitch (Matching type : Molex 51021-0600)

| 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 |

CNA1 - Auxiliary power output: JST S4B-XH-A

(Matching type : XHP-4)

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

CNB1 – Backlight inverter connector: JST S5B-XH-A

(Matching type : XHP-5)

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|--|
| 1 | GND | Ground |
| 2 | VBKL | Backlight power supply, +12VDC, 3A max |
| 3 | BLCTRL | Backlight On/Off control signal (refer to JB2 & JB3) |
| 4 | BVR_WIP | Backlight brightness VR pin WIP |
| 5 | BVR_A | Backlight brightness VR pin A |

CNC1 – OSD switch mount control, Hirose DF13A-12P-1.25H

(Mating type : DF13-12S-1.25C)

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

IR1 – Infra-Red sensor connector: Molex 53261-0371, 3 way 1.25mm pitch (Matching type : Molex 51021-0300)

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

J1 – HDMI connector: JST SM20B-SRDS (Matching type : JST SHDR-20V-S-B)

| PIN | SYMBOL | DESCRIPTION |
|-----|-----------|-------------------------------------|
| 1 | GND | Ground |
| 2 | GND | Ground |
| 3 | RXC+ | TMDS Data C+ |
| 4 | RXC- | TMDS Data C- |
| 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 |
| 12 | GND | Ground |
| 13 | MSTR2_SCL | Reserved |
| 14 | MSTR2_SDA | Reserved |
| 15 | DDC_5V | +5V power supply for DDC (optional) |
| 16 | HPD | Hot plug detection |
| 17 | DDC_SCL | DDC serial clock |
| 18 | DDC_SDA | DDC Data |
| 19 | VCC1 | VCC 5V output |
| 20 | VCC2 | VCC 5V output |

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

| PIN | SYMBOL | DESCRIPTION |
|-----|---------------|--|
| 1 | VDD (+12V) | Panel power supply (+12V) (selected by JA3) |
| 2 | VDD (+12V) | Panel power supply (+12V) (selected by JA3) |
| 3 | VDD (+12V) | Panel power supply (+12V) (selected by JA3) |
| 4 | VDD (+12V) | Panel power supply (+12V) (selected by JA3) |
| 5 | VDD (+12V) | Panel power supply (+12V) (selected by JA3) |
| 6 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) (selected by JA3) |
| 7 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) (selected by JA3) |
| 8 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) (selected by JA3) |
| 9 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) (selected by JA3) |
| 10 | VDD (3,3V/5V) | Panel power supply (3,3V/5V) (selected by JA3) |
| 11 | GND | Ground |
| 12 | GND | Ground |
| 13 | GND | Ground |
| 14 | GND | Ground |
| 15 | GND | Ground |
| 16 | NC | No connection |
| 17 | NC | No connection |
| 18 | NC | No connection |
| 19 | NC | No connection |
| 20 | GND | Ground |
| 21 | GND | Ground |
| 22 | NC | No connection |
| 23 | NC | No connection |
| 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 | NC | No connection |
| 38 | NC | No connection |
| 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 |

LED1 – Dual color LED connector for controller status, JST 3-way, S3B-ZR-SM4A (Mating type : JST ZHR-3)

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

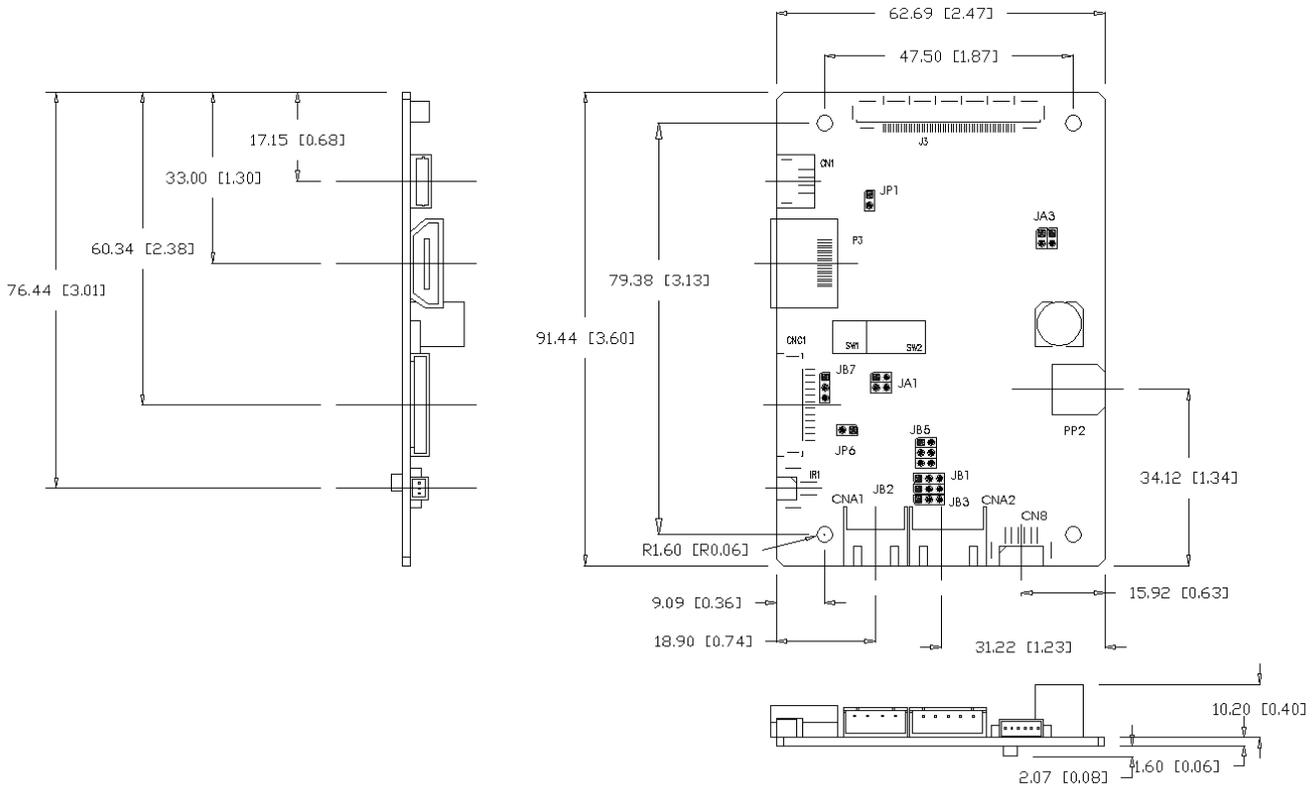
PP2 - Power supply (Mating type : Molex 43645-0200 compatible)

| PIN | DESCRIPTION |
|-----|---------------|
| 1 | +12VDC 5A max |
| 2 | Ground |

P3 – HDMI connector

| PIN | SYMBOL | DESCRIPTION |
|-----|---------|---|
| 1 | DATA2+ | TMDS Data2+ |
| 2 | DATA2S | TMDS Data2 Shield |
| 3 | DATA2- | TMDS Data2– |
| 4 | DATA1+ | TMDS Data1+ |
| 5 | DATA1S | TMDS Data1 Shield |
| 6 | DATA1- | TMDS Data1– |
| 7 | DATA0+ | TMDS Data0+ |
| 8 | DATA0S | TMDS Data0 Shield |
| 9 | DATA0- | TMDS Data0– |
| 10 | CLK+ | TMDS Clock+ |
| 11 | CLK@ | TMDS Clock Shield |
| 12 | CLK- | TMDS Clock– |
| 13 | CEC | CEC |
| 14 | NC | No connection |
| 15 | SCL | SCL (<u>I²C</u> Serial Clock for <u>DDC</u>) |
| 16 | SDA | SDA (<u>I²C</u> Serial Data Line for <u>DDC</u>) |
| 17 | CEC/GND | Ground |
| 18 | +5V | +5 V Power (max 50 mA) |
| 19 | HPDET | Hot Plug Detect |

CONTROLLER DIMENSIONS



The maximum thickness of the controller is 13.95mm (measured from bottom of PCB to top of components, including any underside components & leads). We recommend clearances of:

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

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

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

APPLICATION NOTES

USING THE CONTROLLER WITHOUT BUTTONS ATTACHED

This is very straightforward by following the steps below :

- Firstly setup the controller/display system with the buttons. With controls attached and display system active make any settings for colour and image position as required then switch everything off.
- Use a jumper to close JP6 jumper, 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.

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 12VDC. This should be matched with the inverter specification: see table.

CNB1

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

Remark: For higher power inverter, more current for 12V can be taken from CNA1 pin 1. Maximum current drawn on CNA1 pin 1 and CNB1 pin 2 is 3A(12V)

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, 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 controlled 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.

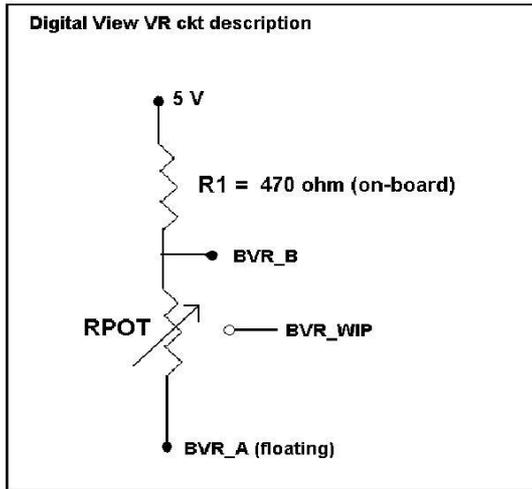
CNB1

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

This can then be matched with function controls (OSD switch mount) pins 3 & 4: see cable design below .



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 | +12VDC, backlight power supply (selected by JA3 & JA6) |
| 3 | BLCTRL | On/Off control (enable) – see JB2 & JB3 |
| 4 | BVR_WIP | Brightness VR - WIP |
| 5 | BVR_A | Brightness VR A |

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

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

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

Example for circuit design :

- 1.) Choose RPOT = 10K
- 2.) Tie BVR_A to GND
- 3.) Circuit analysis gives BVR_WIP as the following (see Figure 1)

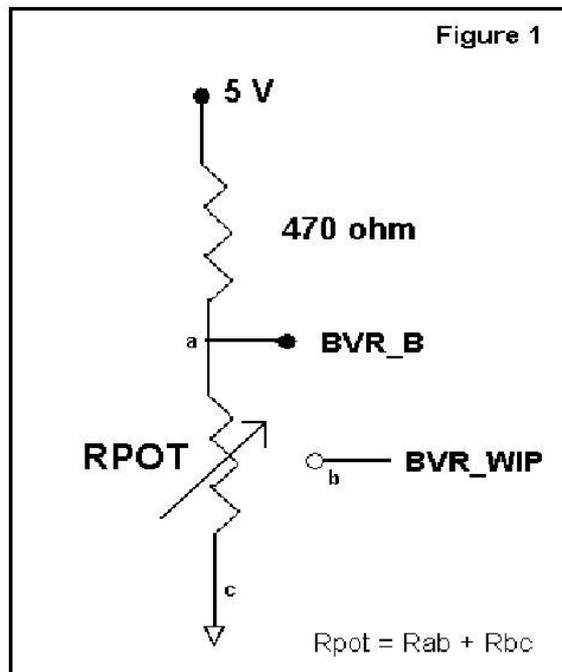
$$BVR_WIP = 5 \times (Rbc/10.47)$$

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.



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 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 | 1920x1200, 1920x1080, 1680x1050, 1600x1200, 1400x1050, 1440x900, 1366x768, 1280x1024, 1280x800, 1280x768, 1024x768, 1024x600, 800x600, 800x480, 640x480, 480x640 resolution TFT LVDS LCD's support. |
| No. of colours | Up to 3 x 8 bit providing 16.7 million colours. |
| Vertical refresh rate | WUXGA, UXGA, WXGA, SXGA, XGA, SVGA, VGA resolution up to 60Hz. |
| Dot clock (pixel clock) maximum | 165 MHz |
| Graphics formats | Standard WUXGA, UXGA, SXGA, XGA, SVGA, VGA |
| Standard input at source | - HDMI |
| Controls available | - On/Off - Brightness (inverter) - OSD menu - OSD select - OSD setting + - OSD setting - |
| Control interface | - Buttons, RS-232, IR remote control |
| Settings memory | Settings are stored in non volatile memory |
| Language OSD support | Graphics OSD icons |
| Voltage output for LCD | +3.3V, +5V, +12V The current drawn for 3.3V, 5V or 12V panel from 12VDC power input is limited to 3A. |
| Input voltage | 12VDC , 5A max +/- 5% |
| Controller power consumption | Approx 4W (controller logic only, no panel and inverter are involved) |
| Controller dimensions | 62.7mm x 91.4mm x 13.8mm |
| Storage temperature limits | -40°C to +70°C |
| Operating temperature limits | 0°C to +60°C |

NOTES

Please note the following:

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

Appendix I – Mode Support Table

HDMI (P3) port :

| Mode | Resolution | Clk [MHz] | Horizontal freq [KHz] | Vertical freq [Hz] |
|---------|-----------------|-----------|-----------------------|--------------------|
| V_60 | 640x480 60Hz | 25.175 | 31.469 | 59.940 |
| SV_60 | 800x600 60Hz | 40.000 | 37.879 | 60.317 |
| X_60 | 1024x768 60Hz | 65.000 | 48.363 | 60.004 |
| SX_60 | 1280x1024 60Hz | 108 | 63.81 | 60.020 |
| 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 |
| 1080i60 | 1920x1080i 60Hz | 74.14 | 33.7 | 60 |
| 1080i50 | 1920x1080i 50Hz | 74.184 | 28.1 | 50 |
| 720p60 | 1280x720P 60Hz | 74.25 | 45 | 60 |
| 576p50 | 720x576P 50Hz | 26.9568 | 31.2 | 50 |
| 480p60 | 720x480P 60Hz | 26.9568 | 31.4 | 60 |

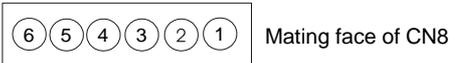
Appendix II – RS-232 control protocols

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

Physical connection :

Controller side
Connector interface : CN8
Mating connector : Molex 51021-0600

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



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

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

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 program provided by Digitalview on request. Please contact your local sales for informations.

1. Commands to implement switch mount control buttons

| Function | Command | Description | Acknowledge (if enabled) |
|--------------------|---------|----------------------------|--------------------------|
| Menu | 0xf7 | Menu button pressed | Button equivalent |
| Select-down button | 0xfa | Select down button pressed | Button equivalent |
| Select-up button | 0xfb | Select up button pressed | Button equivalent |
| Right/+ button | 0xfc | Right/+button pressed | Button equivalent |
| Left/- button | 0xfd | Left/- button pressed | Button equivalent |

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

| Function | Command | Description | Acknowledge (if enabled) |
|--------------------|--|---|--|
| Brightness control | 0x81, nn "+" "-" "r" "R" "?" | Set brightness = value/increment/decrement Reset Query | Brightness. Range: "0"0"-6"4" Default: "3"2" |
| Contrast control | 0x82, "a" "A", nn "+" "-" "r" "R" "?" | Set all contrast = value/increment/decrement Reset Query | Contrast. Range: "4"0"-6"4" Default: "3"2" |
| Sharpness | 0x8a, nn "+" "-" "r" "R" "?" | Set sharpness= value/increment/decrement Reset Query | Sharpness Range: "F"0"-0"4" Default: "0"0" |
| OSD H position | 0x90, nnn "+" "-" "r" "R" "?" | Set osd_hpos = value/increment/decrement Reset Query | OSD horizontal position Range: "0"0"0"-3"E"8" Default: "1"F"4" |
| OSD V position | 0x91, nnn "+" "-" "r" "R" "?" | Set osd_vpos = value/increment/decrement Reset Query | OSD vertical position Range: "0"0"0"-3"E"8" Default: "1"F"4" |
| Select menu | 0x93, | Select menu timeout = | OSD menu timeout value. |



| | | | |
|---|---|---|---|
| timeout | nn "+" "-" "r" "R" "?" | value/increment/decrement Reset Query | "00" – Continuous. Value – Round up to nearest available step. If value > max available step, set it to the max available step. "0" "0" – Always On. "0" "C" – 12 seconds (Default) "0" "6" – 6 seconds "0" "3" – 3 seconds |
| GAMMA value select | 0x9d, n "r" "R" "?" | Select GAMMA value = Value Reset Query | GAMMA value: "0" – 0.4, "1" – 0.6 "2" – 1.0 (Default), "3" – 1.6 "4" – 2.2 |
| Colour temperature select | 0xb3, n "r" "R" "?" | Select colour temperature = value Reset Query | Main selected. "0" – user defined RGB values. "1" – 4200K. "2" – 5000K. "3" – 6500K. "4" – 7500K. (Default) "5" – 9300K. |
| Red level for selected colour temperature | 0xb4, nn "+" "-" "r" "R" "?" | Set the level of the red channel for the selected colour temp. = value/increment/decrement Reset Query | Red level for selected colour temperature. Range: "0" "0" – "6" "4" Default: "6" "4" |
| Green level for selected colour temperature | 0xb5, nn "+" "-" "r" "R" "?" | Set the level of the green channel for the selected colour temp. = value/increment/decrement Reset Query | Green level for selected colour temperature. Range: "0" "0" – "6" "4" Default: "6" "4" |
| Blue level for selected colour temperature | 0xb6, nn "+" "-" "r" "R" "?" | Set the level of the blue channel for the selected colour temp. = value/increment/decrement Reset Query | Blue level for selected colour temperature. Range: "0" "0" – "6" "4" Default: "6" "4" |
| Backlight brightness control | 0xe0, nn "+" "-" "?" | Set backlight brightness = value/increment/decrement Query | Backlight brightness. Range: "0" "0" – "6" "4" e.g "1" "0" → 0xe0 0x31 0x30 * This control can only |



| | | | |
|---------------------------|--|---|---|
| | | | function when JB5 sets 3-4 closed * Apply for inverter control voltage in range of 0~5V. Each step interval is in 1 |
| Backlight on/off control | 0xe1, "0" "1" "r" "R" "?" | Set backlight brightness = Disable backlight Enable backlight Reset Query | Backlight on "1" / off "0". Default "1" = On |
| Backlight PWM** | 0xe5, "0" "1" "?" | Set backlight type D/A or PWM Query | "1" – PWM "0" – D/A |
| Backlight PWM Frequency** | 0xe6, nnn "+" "-" "?" | Set Backlight PWM Frequency = Value/ increment/ decrement Query | +/- 20Hz Value 100Hz : "0", "6", "4" 120Hz : "0", "7", "8" 140Hz : "0", "8", "C" 160Hz : "0", "A", "0" 180Hz : "0", "B", "4" 200Hz : "0", "C", "8" 220Hz : "0", "D", "C" 240Hz : "0", "F", "0" 260Hz : "1", "0", "4" 280Hz : "1", "1", "8" 300Hz : "1", "2", "C" 320Hz : "1", "4", "0" 340Hz : "1", "5", "4" 360Hz : "1", "6", "8" 380Hz : "1", "7", "C" 400Hz : "1", "9", "0" 420Hz : "1", "A", "4" 440Hz : "1", "B", "8" |
| Backlight Invert** | 0xe7, 0" "1" "?" | Set backlight invert Normal or Invert Query | "1" – Invert "0" – Normal |
| OSD menu lock | 0xf6, n "0" "1" "r" "R" "?" | OSD menu lock Off/ On Reset Query | "0" – OSD menu lock Off "1" – OSD menu lock On Default "0" = off |

** - Only effective on V1.07.00 or version.



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. |
| Command availability | 0xc4, n | Check whether a command is available. | "0" – not available. "1" – available. |
| Soft Power On/Off** | 0xc8, "0" "1" "?" | Soft power On/off query | "0" – soft power off. "1" –soft power on. |
| Query BIOS version | 0xcb, "0" | Read BIOS version | "nnnn" = BIOS ver. "nn.nn" |
| Query PCBA number | 0xcb, "1" | Read PCBA number | "nnnn" = PCBA number DD-1920="41730" |
| Load factory defaults | 0xce | Reset all parameters to factory default value | "1" – successful. |

** - Only effective on V1.07.00 or up version.

Hex to ASCII conversion table

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

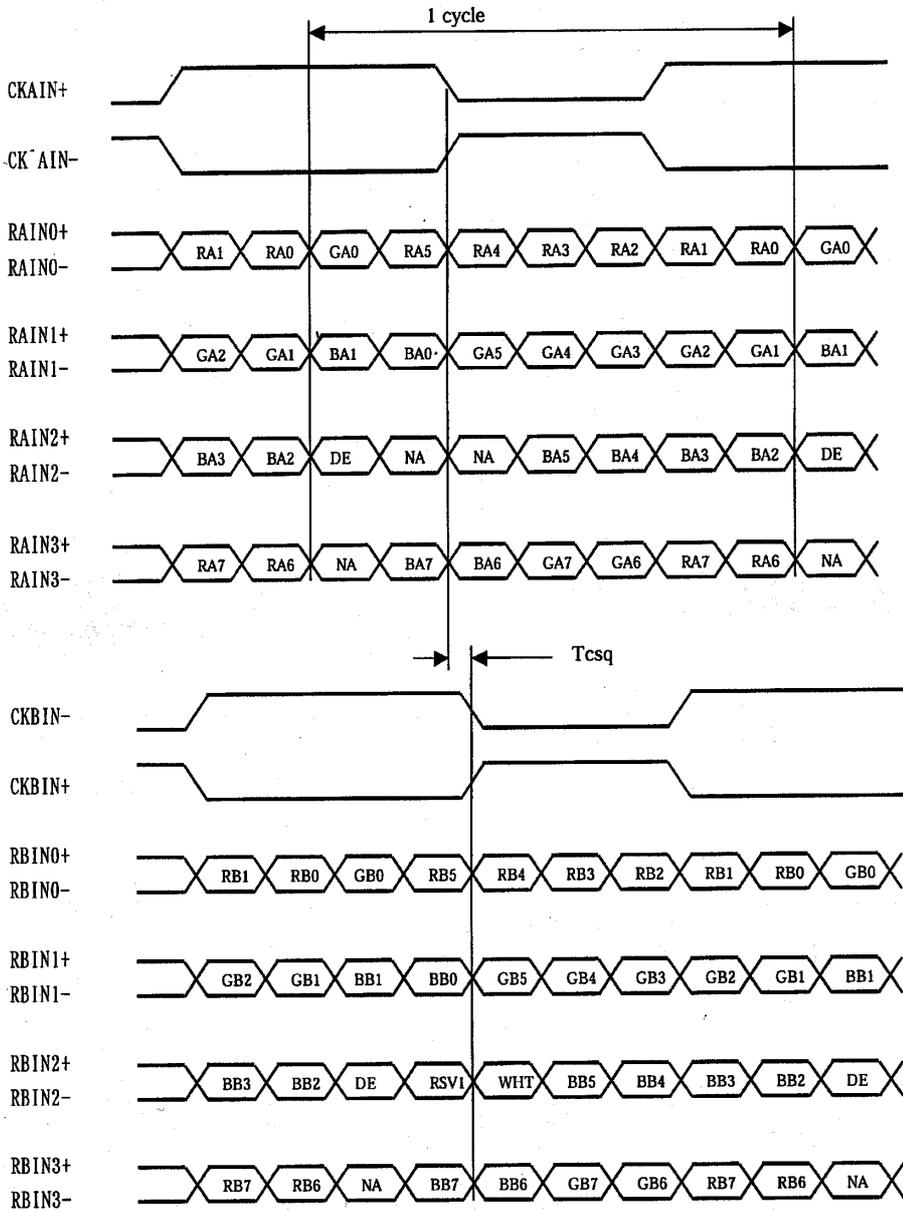
Appendix III – DDC/CI support at HDMI port

This controller (start from V1.07.00 or later firmware revision) supports the following DDC/CI commands at HDMI port :

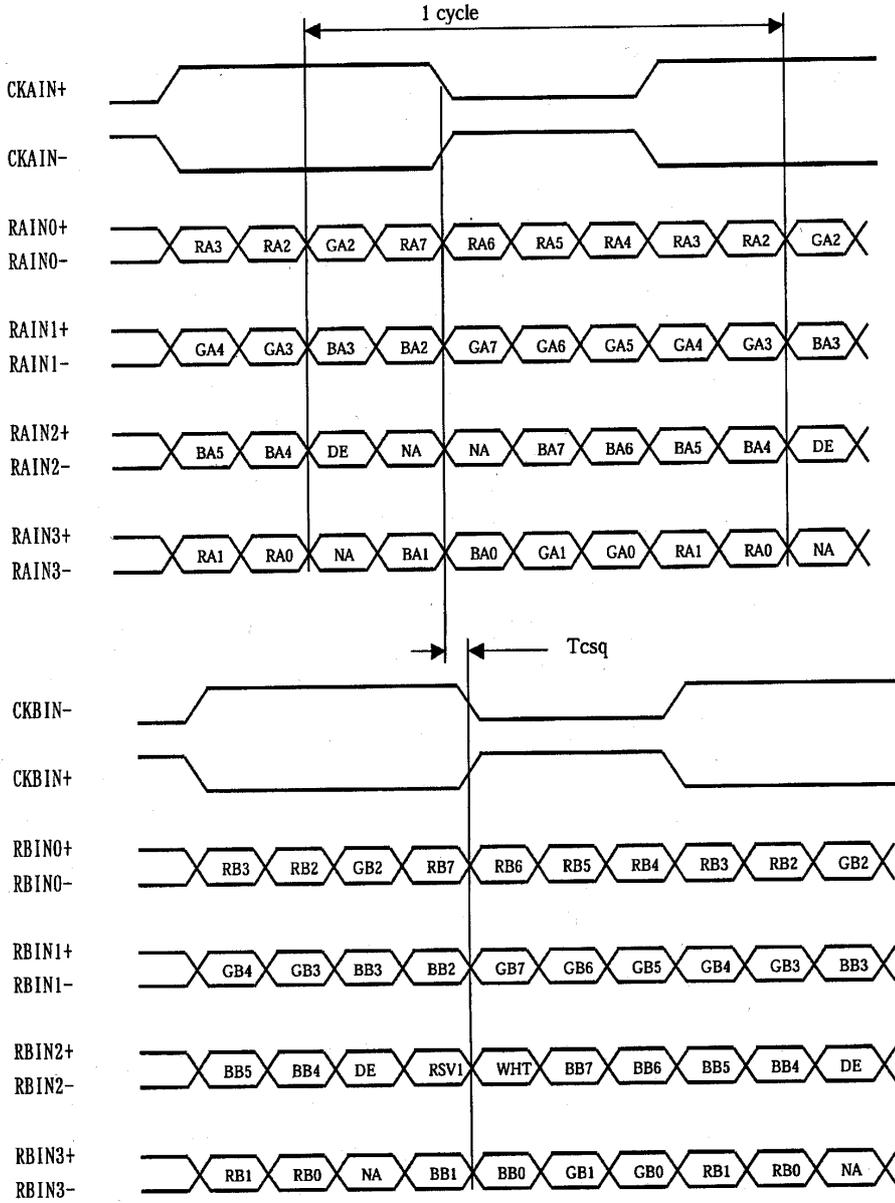
- Brightness
- Contrast
- RGB Color
- Input Source (HDMI)
- Power States (On, Standby, Sleep)
 - On mode: Always on. Display No sync message and never goes off when no signal
 - Standby mode: Off backlight & Off panel power when no signal
 - Reduced power off / Sleep mode: Screen saver on = Always On; Screen saver off = Backlight off. Display "No sync" message for 10sec, then off backlight

Appendix IV – Mapping definition

- Definition of Mapping A :



• Definition of Mapping B :



Appendix V – DV remote control unit work for DD-1920-HDMI

P/N 559000106-3 :

DigitalView remote control unit
(without DV logo silk screen
printing)

P/N 559000105-3 :

DigitalView remote control unit
(with DigitalView logo silk screen
printing)



| BUTTON | FUNCTION |
|-------------------------|---|
| POWER BUTTON | Soft power ON/OFF button. |
| ATTENTION BUTTON | Use combined with digit keys to enable/disable the IR function. DD-1920-HDMI : "Attention" + "1" |
| MUTE BUTTON (M) | Switch to mute on/off mode. |
| SEL UP (▲) / SEL DN (▼) | Press this button to select the items in the OSD menu. |
| + / - BUTTON | Use "+" button to direct control the hotkey function for switching to next input source. In OSD menu, pressing this button to adjust the settings. |
| DISPLAY BUTTON | Activate the OSD menu display on screen. |
| HDMI BUTTON | Press this button in the non OSD menu display mode to select DVI source. |

WARRANTY

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

The warranty does not apply to:

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

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

CAUTION

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

LIMITATION OF LIABILITY

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

TRADEMARKS

The following are trademarks of Digital View Ltd:

- Digital View
- DD-1920-HDMI

CONTACT DETAILS

USA

Digital View Inc.
18440 Technology Drive
Building 130
Morgan Hill,
California, 95037
USA
Tel: (1) 408-782 7773 **Fax:** (1) 408-782 7883
Sales: ussales@digitalview.com

EUROPE

Digital View Ltd.
The Lake House
Knebworth Park
Herts, SG3 6PY
UK
Tel: +44-(0)20-7631-2150 **Fax:** +44-(0)20-7631-2156
Sales: uksales@digitalview.com

ASIA

Digital View Ltd
2nd Floor Bamboos Center
52 Hung To Road
Kwun Tong
Hong Kong
Tel: (852) 2861 3615 **Fax:** (852) 2520 2987
Sales: hksales@digitalview.com

WEBSITE

www.digitalview.com

Brand names belong to their respective owners. Specification subjects to change without notice.