

 APOLLO DISPLAY
TECHNOLOGIES



 DISTEC



 DISPLAY
TECHNOLOGY



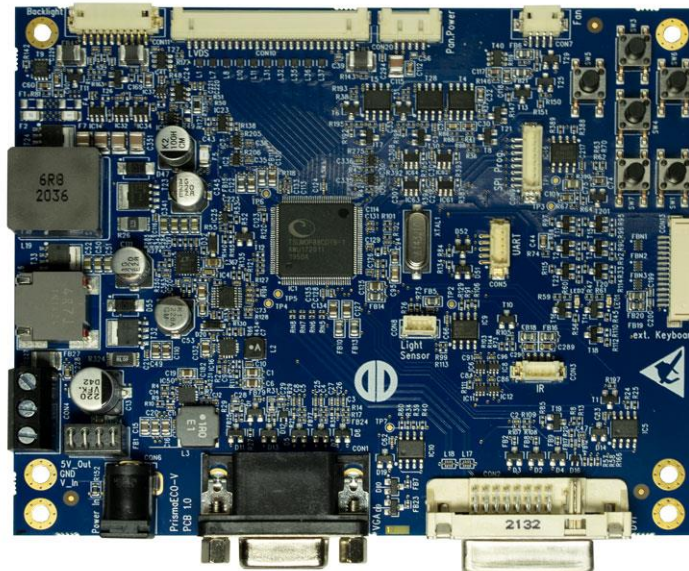
Datasheet

Distec

PrismaECO-V

Economic RGB/DVI Converter Board

- PR-02-230 PrismaECO-V (VCC =+12V, RGB & DVI)
PR-02-231 PrismaECO-V (VCC =+24V, RGB & DVI)



Version 1.3

12.06.2023

The information contained in this document has been carefully researched and is, to the best of our knowledge, accurate. However, we assume no liability for any product failures or damages, immediate or consequential, resulting from the use of the information provided herein. Our products are not intended for use in systems in which failures of product could result in personal injury. All trademarks mentioned herein are property of their respective owners. All specifications are subject to change without notice.

Table of Contents

1	REVISION HISTORY	5
2	OVERVIEW	6
3	GENERAL FEATURES	6
3.1	HARDWARE FEATURES	7
4	POWER CONCEPT	8
5	OSD MENU AND USER CONTROLS	9
5.1	EXTERNAL 4-BUTTON KEYPAD ZU-02-398	9
5.2	OSD CONTROL THROUGH IR REMOTE CONTROL	10
6	ON-SCREEN-MENU	11
6.1	BRIGHTNESS/CONTRAST TAB.....	11
6.2	COLOR SETTINGS TAB	11
6.3	INPUT SOURCE TAB	12
6.4	DISPLAY SETTINGS TAB	12
6.5	OTHER SETTINGS TAB	13
6.6	INFORMATION TAB	13
6.7	EXTERNAL DEVICES TAB.....	14
6.8	AUTO ADJUST TAB.....	16
6.9	INPUT SOURCE WINDOW	17
6.10	BRIGHTNESS CONTROL	17
7	SUPPORTED INPUT MODES	18
7.1	VGA	18
7.2	DVI – GRAPHICS	18
7.3	DVI – VIDEO	18
8	ABSOLUTE MAXIMUM RATINGS	19
9	ELECTRICAL CHARACTERISTICS	19
9.1	MAXIMAL ALLOWED POWER CONSUMPTION FOR TFT PANELS (V_{SVCC})	20
9.2	MAXIMAL ALLOWED POWER CONSUMPTION FOR BACKLIGHT INVERTER (V_{BKLT})	20
9.3	MAXIMAL ALLOWED POWER CONSUMPTION FAN (+12VF).....	20
9.4	MAXIMAL ALLOWED POWER CONSUMPTION FOR EXTENDED DEVICES (V_{EXT})	20
10	MECHANICAL SPECIFICATION	21
10.1	MECHANICAL DRAWING	21
10.2	CON6: MECHANICAL SPECIFICATION	22
10.3	CON1: MECHANICAL SPECIFICATION	22
10.4	CON2: MECHANICAL SPECIFICATION	22
11	CONNECTOR OVERVIEW	23
11.1	CON1: RGB – ANALOG INPUT CONNECTOR	24
11.2	CON2: DVI CONNECTOR	24
11.3	CON3: REMOTE CONTROL IR-AMPLIFIER	25
11.4	CON4: POWER SUPPLY CONNECTOR	25
11.5	CON5: UART CONNECTOR	25
11.6	CON6: POWER SUPPLY CONNECTOR	25
11.7	CON7: FAN CONNECTOR.....	26
11.8	CON8: LIGHT SENSOR CONNECTOR	26
11.9	CON9: SPI PROGRAMMING HEADER	26
11.10	CON10: DUAL LVDS CONNECTOR	26
11.11	CON11: BACKLIGHT SUPPLY CONNECTOR	27

11.12	CON13: EXTERNAL OSD KEYPAD CONNECTOR.....	27
11.13	CON20: PANEL EXTRA POWER CONNECTOR.....	27
12	ACCESSORIES.....	28
12.1	LIGHT SENSOR ZU-02-412	28
12.2	TEMPERATURE SENSOR ZU-02-389.....	28
12.3	FROZEN SCREEN DETECTOR ZU-02-512.....	28
12.4	I/R SENSOR ZU-02-406.....	29
13	PROGRAMMING, CONFIGURATION AND ROSD VIA SERIAL PORT	30
13.1	HW REQUIREMENTS.....	30
13.2	ROSD PROTOCOL.....	31
14	SUPPORTED PANELS AND BACKLIGHTS (INVERTER/CONVERTER).....	32
15	HARDWARE INFORMATION	32

1 Revision History

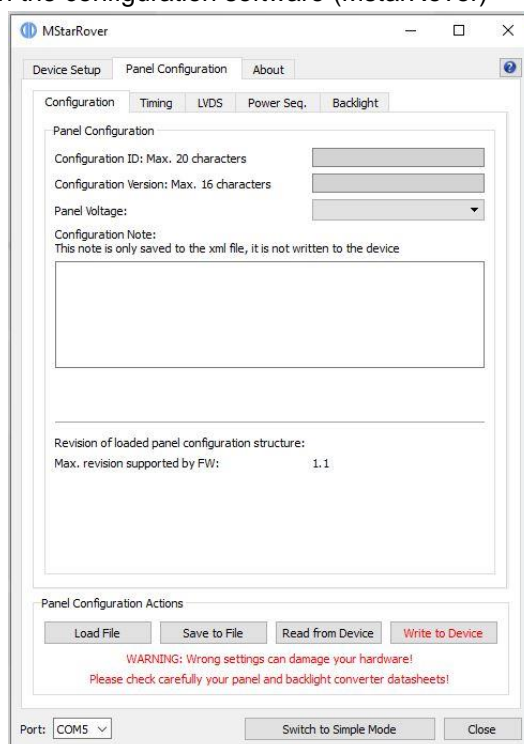
Date	Rev.No.	Description	Page
04.10.2022	1.0	Initial version	All
07.10.2022	1.1	Add Note: Open Drain Output (FAN CON7)	26
10.11.2022	1.2	Mechanical drawing corrected	23
12.06.2023	1.3	Added Note: OSM restrictions	11

2 Overview

The PrismaECO-V is a graphics processing board, providing high-quality images for TFT panels. This converter supports 6/8-bit LVDS panels up to WUXGA (1920 x 1200) and can be used in a variety of systems.

3 General Features

- 24V or 12V main power input
- DVI 1.0 compliant receiver
- Single/dual pixel LVDS output
- PWM (3.3V or 5V) and analog (0V – 5V) backlight intensity control
- Analog RGB/VGA input captures 1920 x 1200 @ 60Hz
- Analog RGB Sync On Green Capable
- Supports 18 and 24-bit color depths
- Supports VESA DDC/CI and Full Green Mode VESA DPMS support
- Support OSD Rotation 0, 90, 180, 270 degrees
- DDC/CI-Control on VGA and DVI ports
- Serial remote control capability (Remote OSD via PC)
- PWM or voltage-controlled backlight intensity
- Four and Six-button external OSD - keypad interface and on-screen menus allow adjustments to the system
- Auto Brightness regulation in combination with an ambient light sensor (optional accessory available)
- Supports temperature sensor (optional accessory available)
- Supports I/R sensor/ remote control (optional accessory available)
- PWM controlled fan interface provides MOSFET-Switched +12VDC and control signal using a non-standard small-size connector
- Supports “Frozen-Screen Detection System” (optional accessory available)
- RoHS
- Fully Customizable through the configuration software (MstarRover)



3.1 Hardware Features

Analog RGB Input

- Supports up to 1792x1344@60Hz or 1920x1200@60Hz or 1600x1200@60Hz standard modes
- Captures up to 205MHz

Ultra-Reliable DVI 1.3 Receiver

- Single Link TMDS Rx for up to 225MHz
- Direct connect to all DVI compliant TMDS transmitters
- No HDCP support

LVDS Interface

- Supports up to 8-bit LVDS WUXGA (1920x1200) panel interface
- Spread Spectrum output frequency for EMI suppression

Auto-Configuration / Auto-Detection

- Phase and image positioning
- Input format detection

On Screen Display

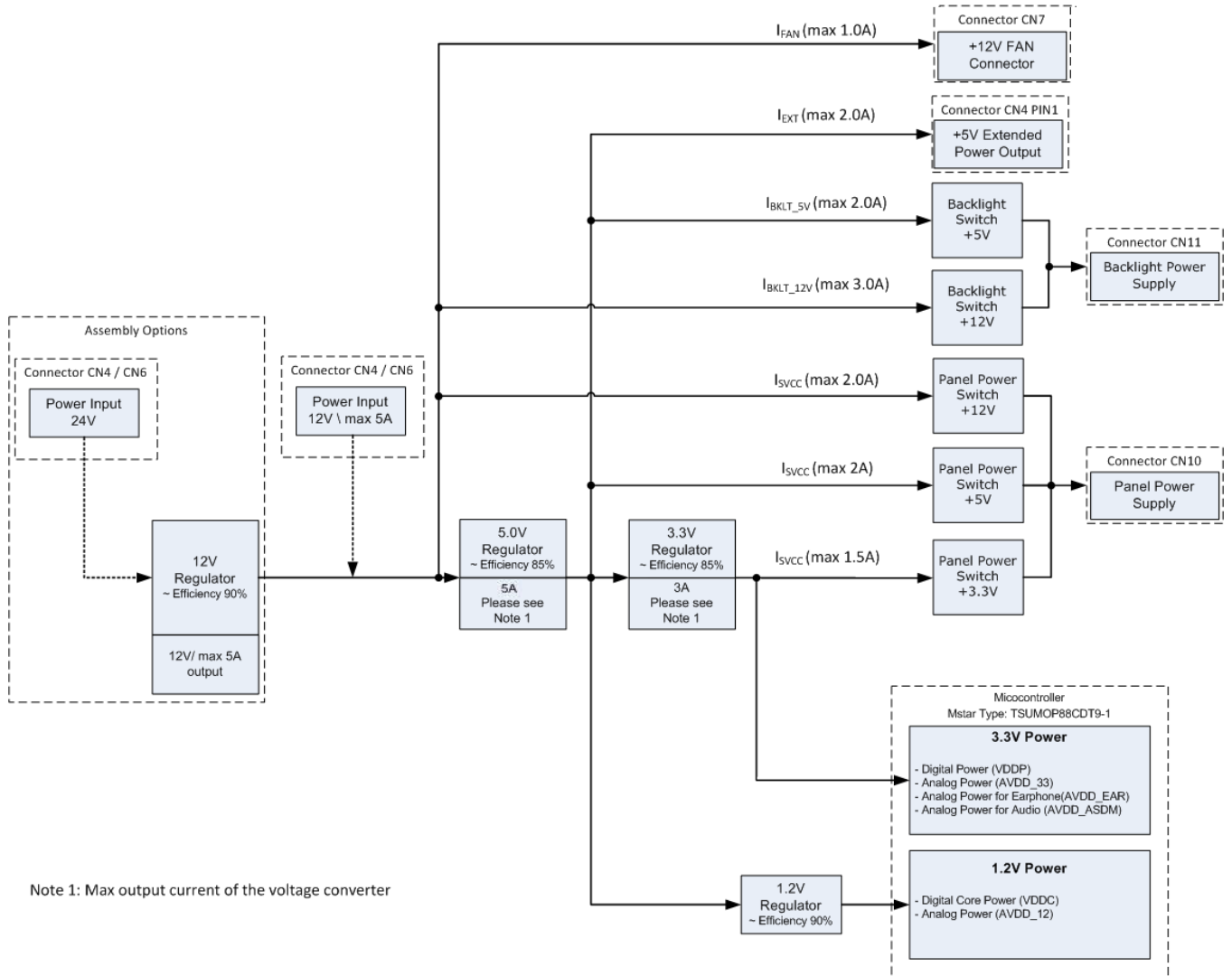
- Supports OSD rotation degree 0°, 90°, 180°, 270°
- Support 2/4/8/16 multi-color font

Output Format

- Single/double wide LVDS up to WUXGA 60Hz output
- Support for 8 or 6-bit panels (with high-quality dithering)

4 Power Concept

PrismaECO-V Power Concept



Note 1: Max output current of the voltage converter

5 OSD Menu and User Controls

The OSD allows selection of input source and fine tuning of various functional parameters like brightness, contrast etc. These parameters can be adjusted by on board push buttons, via an external interface, via an R-Remote control or via Remote OSD. On board buttons can be equipped on top or bottom side of the PrismaECO-V. In that case no external OSD-board is necessary. Depending on the mounting of the PrismaECO-V in the casing, the on board OSD control can simplify the construction of the casing.

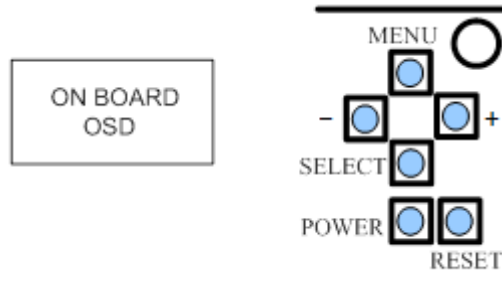


Figure 1: On Board OSD Keypad

5.1 External 4-Button Keypad ZU-02-398

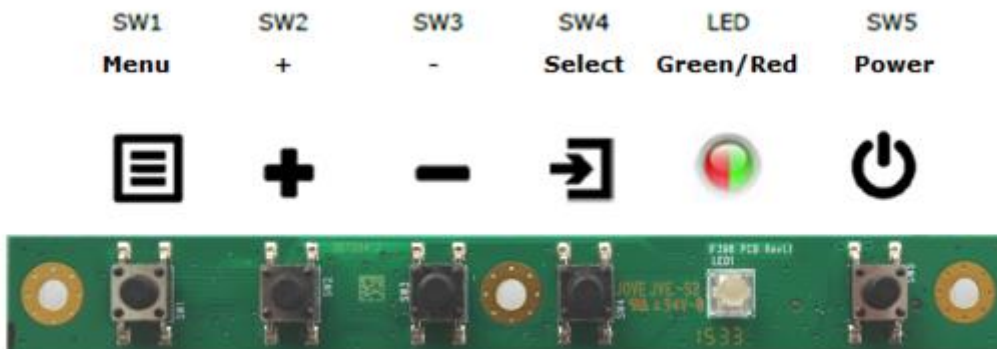


Figure 2: External 4 Button OSD Keypad ZU-02-398

The following tables give you an overview about the functionality.

	Menu	-	+	Exit	LED	Power
General					See below	Power ON/OFF
OSD closed	Open OSD	-	Brightness	Input Select		
OSD open	Select	Down/Left/-	Up/Right/+	Exit/Back		

LED Status:

- Green : Signal Found
- Green flashing : Searching Signal
- Red : Power Safe
- LED OFF : Power OFF
- Red flashing : No Panel Configuration is flashed

5.2 OSD Control through IR Remote Control

Alternative to the external keypads, the PrismaECO-V can also be controlled through a remote-control device. To communicate through IR, an IR-receiver **ZU-02-406** can be attached to connector CON3 (cable: **KA-30-467**) With this receiver you can control the PrismaECO-V with the IR Remote Control **RC-10-006** (see picture below).

NEC code

Customer ID code : **01FE**



Key	HEX	Function		
		General	OSD Closed	OSD Open
Power	01	Power on/off	-	-
Number Keys	00-0E	Not used	-	-
Number „0“	13	Not used	-	-
ID	19	Not used	-	-
Recall/Return	10	Not used	-	-
Disp	1D	Not used	-	-
Mute	12	Not used	-	-
Input	18	-	Input Select	-
Menu	41	-	Opens OSD	-
Exit	09	-	-	Exit /Back
Up	17	-	-	Up/+
Left	0D	-	-	Left
OK	15	-	-	Select
Right	14	-	-	Right
Down	1A	-	-	Down/-

6 On-Screen-Menu

Please note: For technical reasons OSD menu is only available when horizontal output resolution(active) exceeds 696 pixels.

6.1 Brightness/Contrast Tab



Brightness: Brightness of the image can be controlled using this function, with left and right buttons after the brightness slider is selected. This function modifies RGB data or Backlight brightness (depending on configuration) to change the brightness.

Contrast: Allows <Contrast> adjustment in the Y domain. The modification affects all color channels and all input types and is a direct multiplication of the Y data after YUV black level adjustment.

6.2 Color Settings Tab



Color Temp: Allows selection of different color temperature schemes, predefined and custom. Available if the color space of the input is RGB.

Red, Green, Blue: Control the amount of the corresponding color components in the displayed image.

Hue: Allows <Hue> adjustment in the UV domain. The modification affects all color channels and all input types. Available if the color space of an input is not RGB.

Saturation: Allows <Saturation> adjustment in the UV domain. The modification affects all color channels and all input types. Available if the color space of an input is not RGB.

Color Format: Switches between RGB and YUV color spaces.

6.3 Input Source Tab



Enables the manual selection of the input source, **Auto Select** enables / disables input auto-detection

6.4 Display Settings Tab



Gamma: Enables or disables the gamma correction.

H.Position: Allows the horizontal adjustment of the input image. (Available only for the analog input)

V.Position: Allows the vertical adjustment of the input image. (Available only for the analog input)

Sharpness: Allows <Sharpness> adjustment of the image. (Available only for the analog input)

Clock: This function is a slider to adjust the sample clock of the analog interface. This is helpful for improving the image quality for non-standard display modes. (Available only for the analog input)

Phase: This function is a slider to adjust the sampling phase of the analog interface. For optimum image quality, input pixels should be sampled at the ideal sampling points. (Available only for the analog input)

Aspect Ratio: Allows adjustment of the display's width to height proportions.

6.5 Other Settings Tab



OSD Transparency: Sets the transparency level of the OSD Menu on the 0 to 5 scale (0 – not transparent, 5 – barely visible)

OSD H.Position: Sets the horizontal OSD Menu position on the screen (in percent of the horizontal screen resolution)

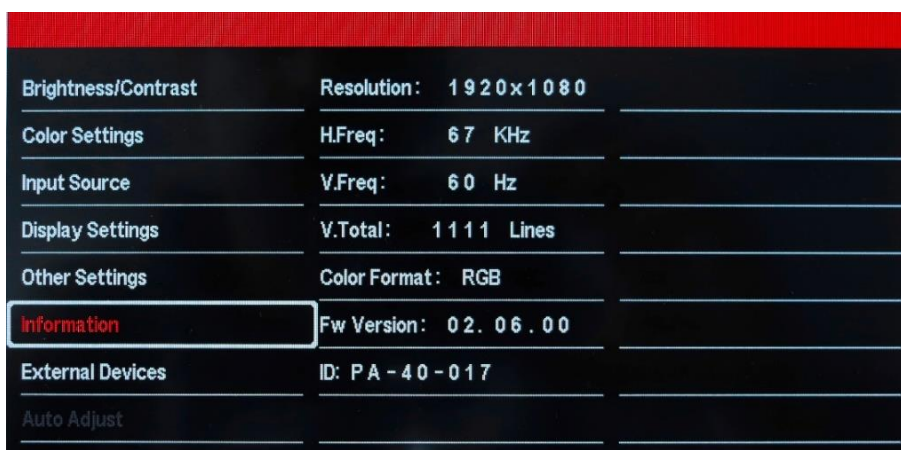
OSD V.Position: Sets the vertical OSD Menu position on the screen (in percent of the vertical screen resolution)

OSD Timeout: Selects how many seconds the OSD will remain active after the last action has been performed.

OSD Rotation: Rotates the OSD Menu by 90, 180 or 270 degrees.

Factory Reset: Resets the display settings to the default ones.

6.6 Information Tab



Shows Input Resolution and FW revision and ID information.

6.7 External Devices Tab



6.7.1 Submenu “Ambient Light Sensor”:



Auto Brightness ON/Off: activates auto brightness function (available when optional [light sensor](#) is connected).

Br. Adjustment Interval[s]: sets the time of Brightness adjustment interval

For more information and activation of detailed settings refer to *“Manual_For_ALS_And_Temperature_Sensor_Integration”* or contact Distec customer service.

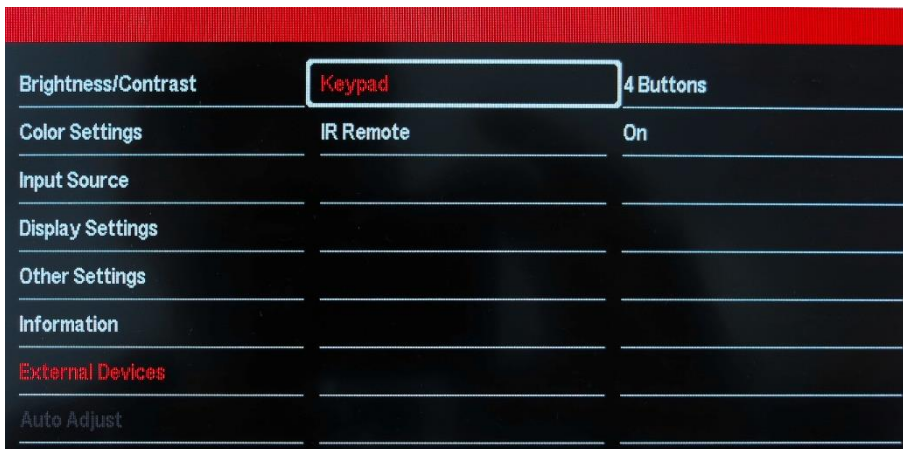
6.7.2 Submenu “Temperature Sensor”:



Temp. Ctrl ON/Off: activates temperature control (available when optional [temperature sensor](#) is connected)
Current Temp [°C]: displays current temperature

For more information and activation of detailed settings refer to “[Manual_For_ALS_And_Temperature_Sensor_Integration](#)” or contact Distec customer service.

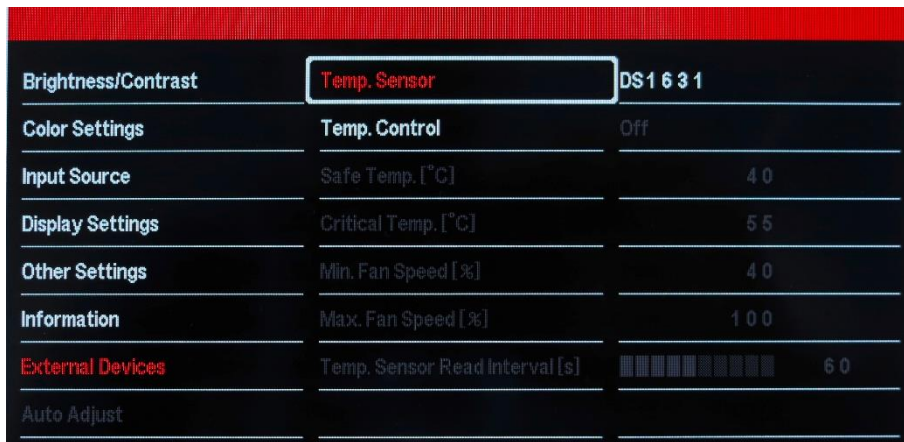
6.7.3 Submenu “Controllers”:



Keypad: switches between [4 Buttons](#) and 6 Buttons keypad.
IR Remote: activates remote control. (Available when optional [I/R Sensor](#) is connected)

For more information and activation of detailed settings refer to “[Manual_For_ALS_And_Temperature_Sensor_Integration](#)” or contact Distec customer service.

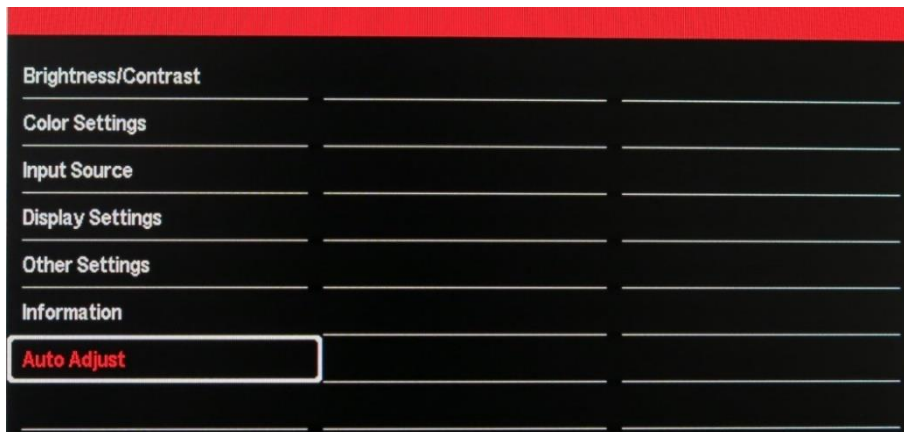
6.7.4 Submenu “Fan Ctrl”:



Temp.Sensor: displays sensor type (available when optional [temperature sensor](#) is connected).
Temp. Control: activates temperature-controlled fan control (when optional fan is connected on CON7)

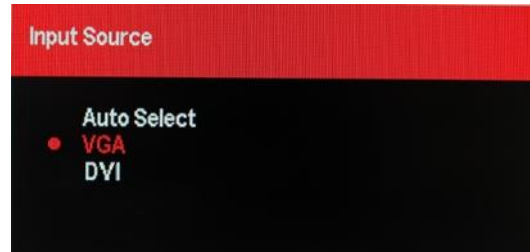
For more information and activation of detailed settings refer to *“Manual_For_ALS_And_Temperature_Sensor_Integration”* or contact Distec customer service.

6.8 Auto Adjust Tab



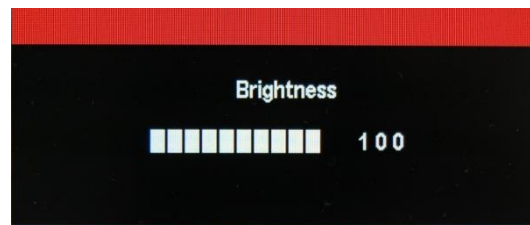
Performs the auto adjust (**available only for the analog input**).

6.9 Input Source Window



Select the input signal source without going into the main menu.

6.10 Brightness Control



Controls the brightness of the display.

7 Supported Input Modes

The PrismaECO-V can support the following input modes.

7.1 VGA

The PrismaECO-V is equipped with one VGA connector CON1. The factory preset supported input modes include:

Resolution	Resolution
640 x 480 @ 60 Hz (VESA)	1360 x 768 @ 60 Hz
800 x 600 @ 60 Hz (VESA)	1366 x 768 @ 60 Hz
1024 x 768 @ 60 Hz (VESA)	1368 x 768 @ 60 Hz
1280 x 768 @ 60 Hz	1600 x 1200 @ 60 Hz (VESA)
1280 x 800 @ 60 Hz	1920 x 1200 @ 60 Hz
1280 x 1024 @ 60 Hz (VESA)	1920 x 1080 @ 60 Hz

7.2 DVI – Graphics

The PrismaECO-V is equipped with the DVI connector, CON2. The factory preset supported input modes include:

Resolution	Resolution
640 x 480 @ 60 Hz (VESA)	1360 x 768 @ 60 Hz
800 x 600 @ 60 Hz (VESA)	1366 x 768 @ 60 Hz
1024 x 768 @ 60 Hz (VESA)	1368 x 768 @ 60 Hz
1280 x 768 @ 60 Hz	1600 x 1200 @ 60 Hz (VESA)
1280 x 800 @ 60 Hz	1920 x 1200 @ 60 Hz
1280 x 1024 @ 60 Hz (VESA)	1920 x 1080 @ 60 Hz

7.3 DVI – Video

The factory preset supported input modes include:

Resolution	Resolution
720 x 480 @ 60	1280 x 720 @ 60
720 x 576 @ 50	1920 x 1080 @ 50
1280 x 720 @ 50	1920 x 1080 @ 60

8 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Note
Supply Voltage (12V Version) [PR-02-230]	$V_{in(12V)}$	0	16	VDC	1, 2, 3, 4
Supply Voltage (24V Version) [PR-02-231]	$V_{in(24V)}$	0	30	VDC	1, 2, 3
Storage Temperature	T_{St}	-20	+85	°C	
Operating Temperature	T_{Op}	-20	+70	°C	5

Note (1) Within operating temperature range.

Note (2) Supply voltage limits are for the PrismaECO-V, panel/inverter supply limits must be met as well, if the panel is +12V and the inverter is to be powered through the PrismaECO-V board.

Note (3) Permanent damage to the device may occur if maximum values are exceeded.

Note (4) Supply voltage limits are for the PrismaECO-V; inverter supply limits must be met as well if the inverter is to be powered through the PrismaECO-V board.

Note (5) All power drawn from the board [PR-02-231] must not exceed 70W (Supply Voltage 24V)

9 Electrical Characteristics

All measurements done at 25°C ambient temperature.

Item	Condition	MIN.	TYP.	MAX.	Unit	Note
Supply Voltage (12V Version) [PR-02-230]		10.8	12	13.2	VDC	
Input Current (12V Version) [PR-02-230]	$V_{in(12V)}$			5	A	
Supply Voltage (24V Version) [PR-02-231]		20	24	28	VDC	1
Input Current (24V Version) [PR-02-231]	$V_{in(24V)}$			3	A	1
Current Consumption (12V) [PR-02-230]	Power-OFF	-	28	40	mA	
	Sleep Mode	-	38	45	mA	
	Board only	-	129	140	mA	
Current Consumption (24V) [PR-02-231]	Power-OFF	-	39	50	mA	
	Sleep Mode	-	45	55	mA	
	Board only]	-	88	95	mA	

Note (1) All power drawn from the board must not exceed 70W (Supply Voltage 24V), 60W (Supply Voltage 20V)

9.1 Maximal allowed power consumption for TFT Panels (V_{SVCC})

Item	Symbol	Max.	Unit	Note
3.3V, (5V), [12V] (V_{SVCC}) Panel power	I_{SVCC}	1.5, (2), [2]	A	1,2

Note (1) Total current drawn from 5V must not exceed 5A (Panel power(5V), Backlight Power(5V) and Power for extended devices(5V))

Note (2) Please make sure total current of board must not exceed 5A (12V)/3 A (24V) as described under [9](#)

9.2 Maximal allowed power consumption for backlight inverter (V_{BKLT})

Item	Symbol	Max.	Unit	Note
+5V Backlight power on CON11	I_{BKL}	2.0	A	1
+12V Backlight power on CON11	I_{BKL}	3.0	A	2

Note (1) Total current drawn from 5V must not exceed 5A (Panel power(5V), Backlight Power(5V) and Power for extended devices(5V))

Note (2) Please make sure total current of board must not exceed 5A (12V)/3 A (24V) as described under [9](#)

9.3 Maximal allowed power consumption Fan (+12VF)

Item	Symbol	Max.	Unit	Note
+12V Fan power on CON7	I_{FAN}	1.0	A	1

Note (1) Please make sure total current of board must not exceed 5A (12V)/3 A (24V) as described under [9](#)

9.4 Maximal allowed power consumption for extended devices (V_{EXT})

Item	Symbol	Max.	Unit	Note
+5V Extended Power Output, CON4/Pin1	I_{EXT}	2.0	A	1,2

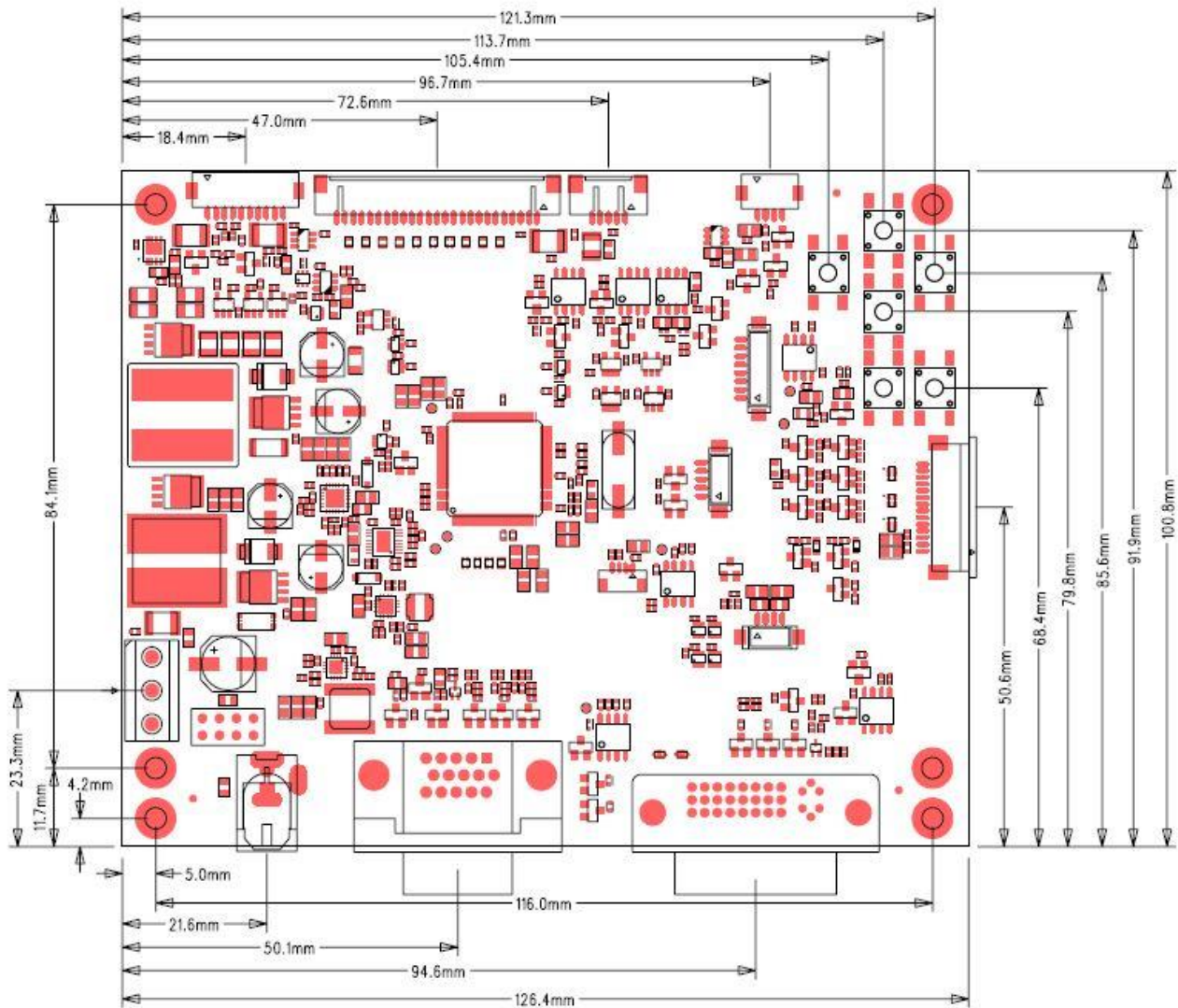
Note (1) Total current drawn from 5V must not exceed 5A (Panel power(5V), Backlight Power(5V) and Power for extended devices(5V))

Note (2) Please make sure total current of board must not exceed 5A (12V)/3 A (24V) as described under [9](#)

10 Mechanical Specification

ITEM	DESCRIPTION	REMARKS
Length	126.4 mm	± 0.5 mm
Width	100.8 mm	± 0.2 mm
Height (PCB)	1.6mm	± 0.1 mm
Height (Bottom side)	2 mm	± 0.2 mm
Height (Top side)	12.5mm	± 0.25 mm
Weight [PR-02-230_1.0_01]	87g	± 3 g
Weight [PR-02-231_1.0_01]	103g	± 3 g

10.1 Mechanical Drawing



10.2 CON6: Mechanical Specification

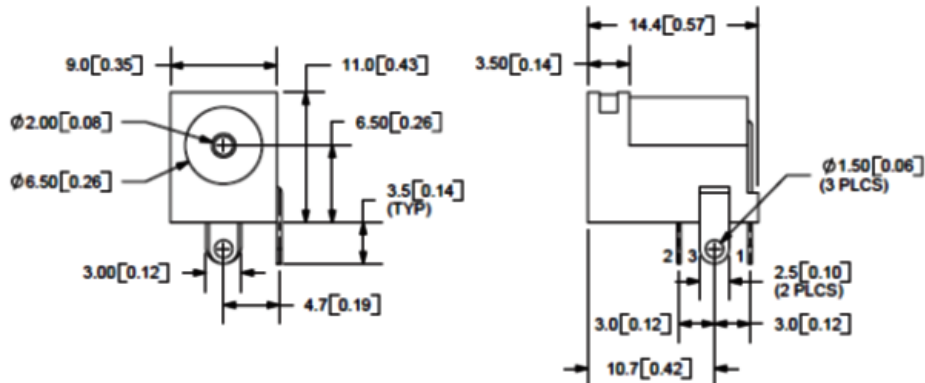


Figure 4: CON6 Power Connector: Units: mm [inches]

10.3 CON1: Mechanical Specification

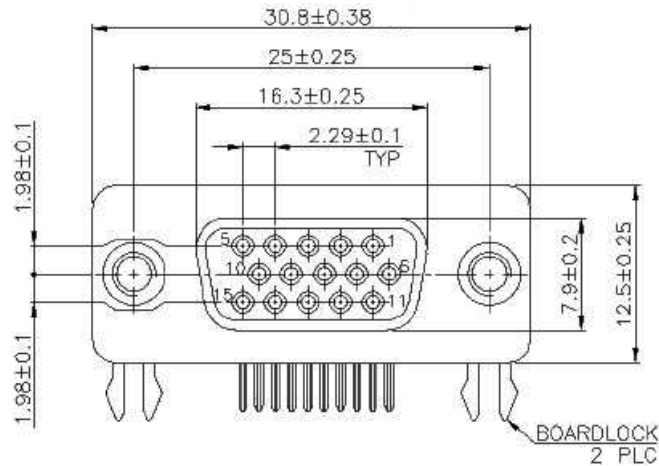


Figure 5: CON1 RGB Connector: Units: mm

10.4 CON2: Mechanical Specification

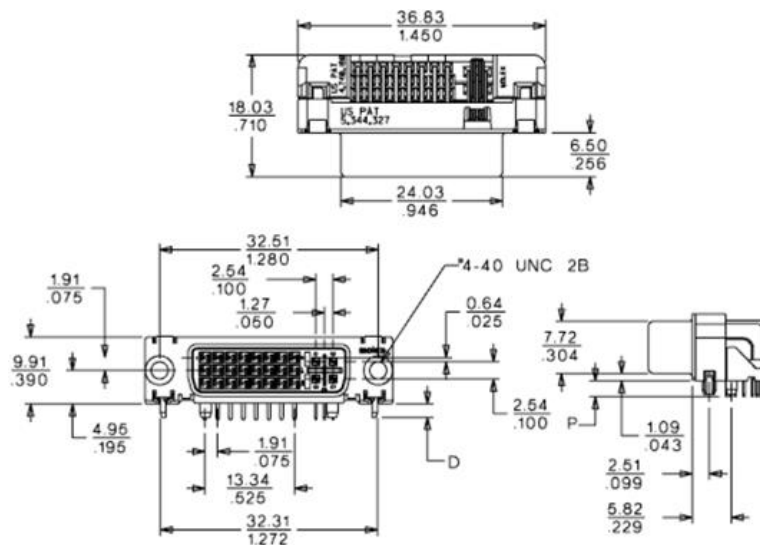
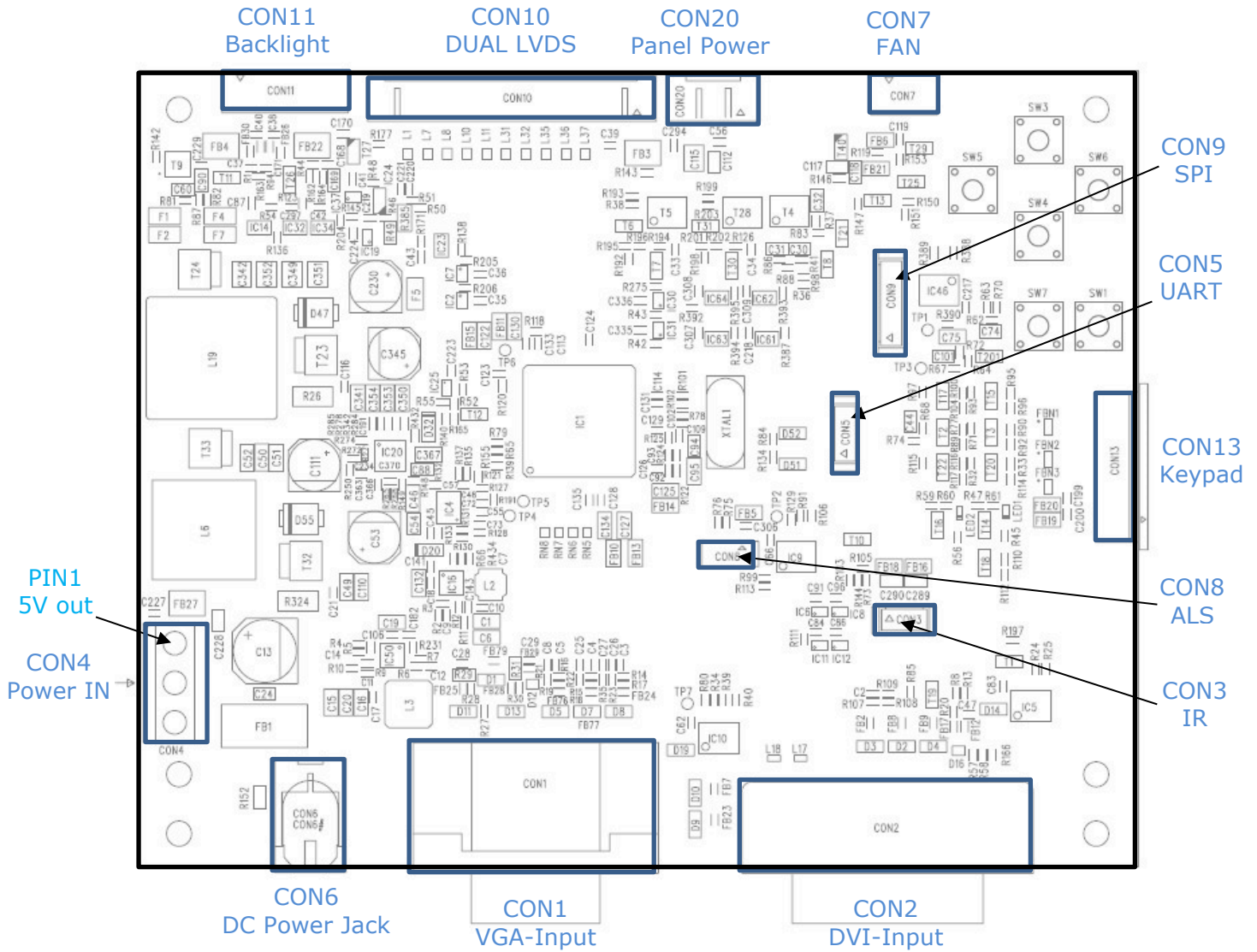


Figure 6: CON2 DVI Connector: Units: mm/inches

11 Connector Overview



Note: Pin 1 of each connector is marked with dot on PCB.

Connectors	Description	Type (Ref only)	Manufacture (Ref only)
CON1	VGA Input	15-pin H-DSUB female	Zhenqin
CON2	DVI Input	DVI-I female	
CON3	Infrared	DF13B-4P-1.25V	Hirose
CON4	Power Supply Input	Screw Terminal (5mm)	
CON5	UART/GProbe	DF13-5P-1.25V	Hirose
CON6	DC Power Jack (5A)	PJ-002AH	CUI Incorporated
CON7	Fan Connector	DF13-4P-1.25H	Hirose
CON8	Light Sensor	501331-0407	Molex
CON9	SPI Programming	DF13-8P-1.25V	Hirose
CON10	Dual LVDS	DF14-25P-1.25H	Hirose
CON11	Backlight Power Supply	DF13-10P-1.25H	Hirose
CON13	OSD Control	52271-1479	Molex
CON20	Additional LVDS power	DF14-5P-1.25H	Hirose

11.1 CON1: RGB – ANALOG INPUT CONNECTOR

Pin	Signal	Description
1	RED	Analog Red
2	GREEN	Analog Green
3	BLUE	Analog Blue
4	NC	Not connected
5	VGA_PLUG	Connect it to GND for cable detection
6	GND	Ground
7	GND	Ground
8	GND	Ground

Pin	Signal	Description
9	VGA_5V	Fused VCC
10	GND	Ground
11	NC	Not Connect
12	VGA_SDA	DDC Data
13	HSYNC	Horizontal Sync Input
14	VSYNC	Vertical Sync Input
15	VGA_SCL	DDC Clock

11.2 CON2: DVI Connector

Pin	Signal	Description
1	TMDS2-	Differential TMDS Data 2-
2	TMDS2+	Differential TMDS Data 2+
3	GND	TMDS Shield
4	NC	Not connected
5	NC	Not connected

Pin	Signal	Description
16	DISPDET	Hot Plug Detection
17	TMDS0-	Differential TMDS Data 0-
18	TMDS0+	Differential TMDS Data 0+
19	GND	TMDS Shield
20	NC	Not connected

Pin	Signal	Description
6	DVI_SCL	DDC data clock
7	DVI_SDA	DDC data
8	NC	Not connected
9	TMDS1-	Differential TMDS Data 1-
10	TMDS1+	Differential TMDS Data 1+
11	GND	TMDS Shield
12	NC	Not connected
13	NC	Not connected
14	DVI_5V	+5V DDC Supply
15	GND	Ground

Pin	Signal	Description
21	NC	Not connected
22	GND	TMDS Clock Shield
23	TMDSCL+	Differential TMDS Clock +
24	TMDSCL-	Differential TMDS Clock -
C1	NC	Not connected
C2	NC	Not connected
C3	NC	Not connected
C4	NC	Not connected
C5	NC	Not connected

11.3 CON3: REMOTE CONTROL IR-AMPLIFIER

Pin	Signal	Description
1	IR	Amplified IR signal
2	+3.3V	3.3V Power supply

Pin	Signal	Description
3	+5V	5V Power supply
4	GND	Ground

11.4 CON4: POWER SUPPLY CONNECTOR

Pin	Signal	Description
1	+5V	5V output (up to 2A), shared with Backlight power on CON11)
2	GND	Ground
3	V _{IN}	12V/ 24V Power supply input

11.5 CON5: UART CONNECTOR

Pin	Signal	Description
1	TX	Serial Output
2	RX	Serial Input
3	+3.3V	3.3V Power supply

Pin	Signal	Description
4	+5V	5V Power supply
5	GND	Ground

11.6 CON6: POWER SUPPLY CONNECTOR

Pin	Signal	Description
Center	V _{IN}	12V/24V Power supply input (Up to 5A)

Pin	Signal	Description
Bottom	GND	Ground

11.7 CON7: FAN CONNECTOR

Pin	Signal	Description
1	GND	Ground
2	+12VF	+12V MOSFET-Switched Fan Power Output

Pin	Signal	Description
3	FAN_SENSE	Not connected
4	FAN_CONTROL	PWM Output (1)

Note (1) Open Drain PWM Output.

11.8 CON8: LIGHT SENSOR CONNECTOR

Pin	Signal	Description
1	+3.3V	+3.3V power
2	GND	Ground

Pin	Signal	Description
3	SCL	I2C clock
4	SDA	I2C data

11.9 CON9: SPI PROGRAMMING HEADER

Pin	Signal	Description
1	SPI_PROG_EN#	Enable Signal
2	SPI_CLK_FLASH	SPI Clock
3	SPI_SI_FLASH	SPI_SI
4	SPI_SO_FLASH	SPI_SO

Pin	Signal	Description
5	SPI_CS_FLASH	SPI_CS
6	MSTAR_RESET_N	MSTAR_RESET_N
7	GND	GND
8	+3.3V Output	+3.3V Output

11.10 CON10: DUAL LVDS CONNECTOR

Pin	Signal	Description
1	SVCC	Switched panel power supply +3.3V/ +5V/ +12V (fused)
2		
3	GND	Ground
4		
5	TXB3+	LVDS data 1st pixel
6	TXB3-	LVDS data 1st pixel
7	TXBCL+	LVDS clock 1st pixel
8	TXBCL-	LVDS clock 1st pixel
9	TXB2+	LVDS data 1st pixel
10	TXB2-	LVDS data 1st pixel
11	TXB1+	LVDS data 1st pixel
12	TXB1-	LVDS data 1st pixel
13	TXB0+	LVDS data 1st pixel

Pin	Signal	Description
14	TXB0-	LVDS data 1st pixel
15	TXA3+	LVDS data 2nd pixel
16	TXA3-	LVDS data 2nd pixel
17	TXACL+	LVDS clock 2nd pixel
18	TXACL-	LVDS clock 2nd pixel
19	TXA2+	LVDS data 2nd pixel
20	TXA2-	LVDS data 2nd pixel
21	TXA1+	LVDS data 2nd pixel
22	TXA1-	LVDS data 2nd pixel
23	TXA0+	LVDS data 2nd pixel
24	TXA0-	LVDS data 2nd pixel
25	EBKL	Enable backlight signal

11.11 CON11: BACKLIGHT SUPPLY CONNECTOR

Pin	Signal	Description
1	BKLT_+12V	Backlight power supply
2	GND	Ground
3	BKLT_EN	Enable backlight signal
4	BRT_ADJ	Brightness control signal
5	+5V	Backlight power supply (Shared with +5V Power Supply output on CON4)

Pin	Signal	Description
6	+5V	Backlight power supply (Shared with +5V Power Supply output on CON4)
7	+12V	Backlight power supply
8	+12V	
9	GND	Ground
10	GND	

11.12 CON13: EXTERNAL OSD KEYPAD CONNECTOR

Pin	Signal	Description
1	GND	GND
2	+5V	+5V supply
3	+3.3V	+3.3V supply
4	POWER_ON/OFF	System power on/off
5	LED_GREEN	Status LED green (signal good)
6	LED_RED	Status LED red (no signal)
7	LBADC_IN1	For use with voltage-controlled keypad
8	EXT-GPIO	GPIO
9	KEY_RIGHT	OSD-Key RIGHT *
10	KEY_LEFT	GPIO-Key LEFT *
11	KEY_UP	OSD – Key UP (+)
12	KEY_DOWN	OSD – Key DOWN (-)
13	KEY_EXIT	OSD – Key EXIT
14	KEY_MENU	OSD – Key MENU

(*) For Customized 6 Button Keypad, Not used with standard 4 Button Keypad

11.13 CON20: PANEL EXTRA POWER CONNECTOR

Pin	Signal	Description
1	LVDS_OPT_0	FW selectable option pin +3.3V/ +5V/ GND
2	SVCC	Panel power supply +3.3V/ +5V/ +12V
3	SVCC	

Pin	Signal	Description
4	GND	Ground
5	GND	Ground

12 Accessories

12.1 Light Sensor ZU-02-412

This light sensor can be connected to the scaler chip to automatically adjust the panel brightness according to the ambient light.

Fitting cable to CON7: **KA-30-786**.



12.2 Temperature Sensor ZU-02-389

A temperature sensor is available to check the temperature of a TFT panel or any other hardware.

FW support is provided upon request.

Fitting cable to CON7: **KA-30-323**.



Remark: When both light and temperature sensors are used, please connect light sensor ZU-02-412 directly to temperature sensor ZU-02-389 via cable: **KA-30-959**

12.3 Frozen Screen Detector ZU-02-512

A Frozen-Screen Detector can be connected to CON7. This feature can detect if the content of the display is being updated.

FW support is provided upon request. Also refer to datasheet and technical details for this feature. Please contact Distec customer service if you need more information.

Fitting cable to CON7: **KA-30-786**



12.4 I/R Sensor ZU-02-406

As an alternative to the external keypad, the scaler chip can be controlled through infrared.
Fitting cable to CON3: **KA-30-467**.

Refer to chapter [5.2](#) for details of remote control



13 Programming, configuration and ROSD via serial port

Preconfigured ("ready to run") HW is also available, please contact customer service for information.

Please refer to MStarRover Manual for details of configuration.

- If PrismaECO-V is blank and without any Firmware the DediProg SF100 SPI programmer is mandatory for initial flashing of Firmware. After that Firmware can be flashed also via Serial Port.
- For configuration of Display settings/EDID configuration or for usage of ROSD its sufficient to use the USB to Serial UART Converter IF430.

13.1 HW requirements

- Standard PC with Windows OS
- 1x USB port for serial programmer
- 1x USB port for DediProg SF100 SPI programmer

DediProg SF100 SPI Programmer (optional) *		
Part#	Part description	Additional info
KI-90-035**	DediProg SF100 USB-SPI Programmer	
KI-90-035**	IF399-00-SPI Buffer interface for PIIIA	
KI-90-035**	Cable SPI-Buffer-Interface 8pol. 150mm	Cable between SPI Buffer CON1 and SPI connector CON9

- (*) mandatory for initial FW-flashing of blank PrismaECO-V
- (**) KI-90-035 consists of DediProg SF100 USB-SPI Programmer, buffer interface and cable (as shown below).



USB to serial adapter		
Part#	Part description	Additional info
ZU-02-430	IF430-00 USB to Serial UART Converter	RS232 programming adapter
KA-30-101	Cable Service & Remote 80cm	Cable from RS-232 adapter to PrismaECO-V (CON5)
KA-30-051	USB-Cable, Highspeed, type A/B m/m 2m	



13.2 ROSD Protocol

PrismaECO-V can be fully controlled via Remote OSD Protocol.

Details can be found in "MStar-ROSD.pdf" or contact Distec customer service.

14 Supported Panels and Backlights (Inverter/Converter)

Panels and Backlights Options	Item
Panel Voltage	3.3V
	5V
	12V
Pixel Per Clock	1
	2
Option Pin 0 Voltage Level (CON20, LVDS_OPT)	0V
	3.3V
	5.0V
Backlight Voltage	12V
	5V
Backlight Control Type	Analog
	PWM
Voltage Level of PWM Signal	3.3V
	5V
Analog Voltage Level Range	0V - 5V
Voltage Level of Backlight Enable Signal	3.3V
	5V

15 Hardware Information

Part Number	24V Input Voltage	12V Input Voltage	Operating Temperature Range	Status
PR-02-230	O	X	-20°C – 70°C	Active
PR-02-231	X	O	-20°C – 70°C	Active

X = Available, O = Not available

Our company network supports you worldwide with offices in Germany, Austria, Switzerland, the UK and the USA. For more information please contact:

Headquarters

Germany



FORTEC Elektronik AG

Augsburger Str. 2b
82110 Germering

Phone: +49 89 894450-0
E-Mail: info@fortecaq.de
Internet: www.fortecaq.de

Fortec Group Members

Austria



Distec GmbH Office Vienna

Nuschinggasse 12
1230 Wien

Phone: +43 1 8673492-0
E-Mail: info@distec.de
Internet: www.distec.de

Germany



Distec GmbH

Augsburger Str. 2b
82110 Germering

Phone: +49 89 894363-0
E-Mail: info@distec.de
Internet: www.distec.de

Switzerland



ALTRAC AG

Bahnhofstraße 3
5436 Würenlos

Phone: +41 44 7446111
E-Mail: info@altrac.ch
Internet: www.altrac.ch

United Kingdom



Display Technology Ltd.

Osprey House, 1 Osprey Court
Hichingbrooke Business Park
Huntingdon, Cambridgeshire, PE29 6FN

Phone: +44 1480 411600
E-Mail: info@displaytechnology.co.uk
Internet: www.displaytechnology.co.uk

USA



Apollo Display Technologies, Corp.

87 Raynor Avenue,
Unit 1 Ronkonkoma,
NY 11779

Phone: +1 631 5804360
E-Mail: info@apolloDisplays.com
Internet: www.apolloDisplays.com