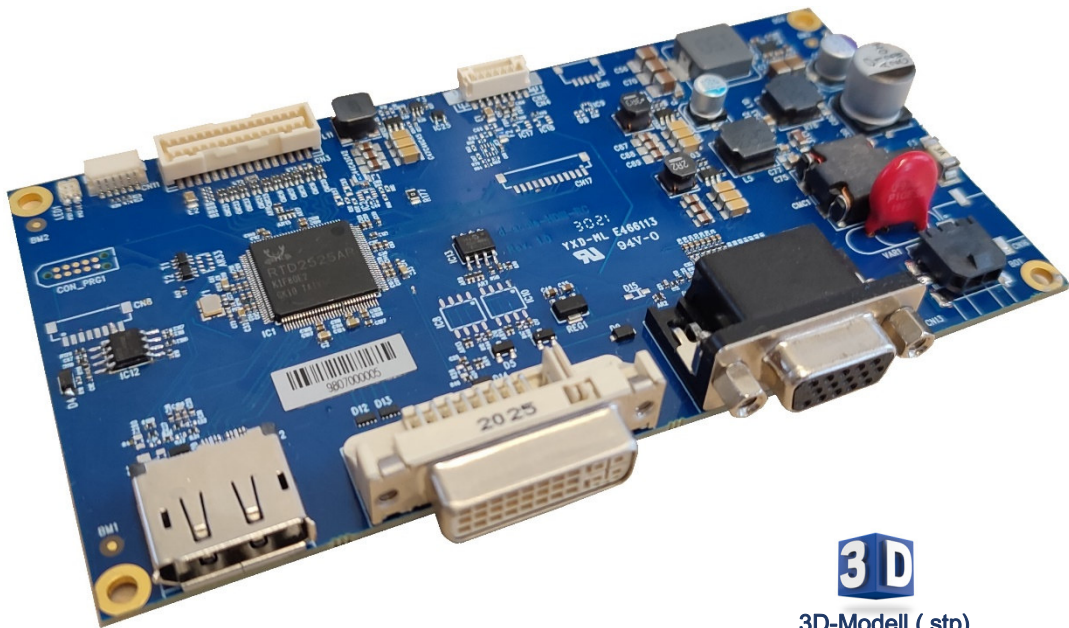


d.scale-HDIII-IN

Datasheet

d.scale-HDIII



3D-Modell (.stp)
available for your
construction

Rev 1.0

PRELIMINARY

June, 2023

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Revision History

Date	Rev	Description	Page
June, 2023	1.0	First draft	

1 General Description

The d.scale-HDIII-IN is a LCD-TFT controller module based on Realtek's scaler-SOC RTD2525AR. It is designed to act as a direct interface between either VGA, DVI or DP and TFT displays from VGA up to Full-HD/WUXGA. The board is available in two versions, either with +12V single-supply or with +24V-single.

2 Features

2.1 Realtek – RTD2525AR Core Features

The d.scale-HDIII-IN is based on Realtek's multi-function display controller RTD2525A which provides the following core features

- Vivicolor™
 - Independent color management (ICM)
 - Dynamic contrast control (DCC)
 - Precise color mapping (PCM)
- Advanced Scaling
 - Advanced zoom algorithm provides high image quality
 - Sharpness/Smooth filter enhancement
 - Support non-linear scaling from 4:3 to 16:9 or 16:9 to 4:3
- Color Processor
 - True 10 bits color processing engine
 - sRGB compliance
 - Dynamic overshoot-smear cancelling engine
 - Brightness and contrast control
 - Peaking/Coring function for video sharpness
- DDC/CI, MCCS (Monitor Control Command Set) support
 - Complete OSD-control via DDC/CI
 - Supports several manufacturer (Display Solution GmbH) specific commands
- Embedded OSD
- Audio support, 2ch Audio DAC

2.2 Video Input Interfaces

- VGA/RGB-analog input
 - Integrated 8-bit triple-channel 210MHz ADC/PLL
 - Support Sync-On-Green (SOG) and various kinds of composite sync modes
 - High resolution true 64 phase ADC PLL
- DVI input
 - Single link on-chip TMDS receiver up to 225MHz
 - Long cable support to 1.65GHz
 - Direct connect to all DVI-compliant digital transmitters
 - Optional HDCP support
- DisplayPort 1.2
 - Support 1/2/4 lanes up to 1.62Gbps / 2.7Gbps each
 - 6-bit, 8-bit, 10-bit and 12-bit color depth transport
 - Optional HDCP 1.3

2.3 LCD-TFT Output Interfaces

The d.scale-HDIII-IN provides interfaces in order to support a wide range of LCD-TFT displays. The connectors are lockable and therefore especially suitable for an industrial environment

- LCD-TFT connection
 - Single/double pixel LVDS output
 - Open-LDI and PSWG (VESA) data-mapping
 - Supports LCD-TFTs up to Full-HD (1920x1080@60Hz)
 - Support for 8 or 6-bit LVDS
 - Spread-Spectrum DPLL to reduce EMI
 - Supports +3.3V/+5V LCD-TFT logic supply, selected by firmware
 - Supply protected via fuse (optional electronic fuse)
- Backlight supply/control
 - +12V supply
 - Backlight enable +3.3V (+5.0V optional)
 - Brightness control via +3.3V PWM signal (+5.0V optional)
 - Supply protected via fuse (optional electronic fuse)

2.4 Additional Interfaces

For control and extended functionality the d.scale-HDIII-IN supports the following on-board options and interfaces.

- OSD-control, interface for an external keypad and dual status LED
- A dual on-board status LED
- 3.5mm audio jack for direct connection of a stereo-headphone
- Support of I2C peripherals via the MCCS DDC/CI Interface. This interface specified by VESA uses the DDC-channel of DVI/VGA or the AUX-channel of DP, so no additional USB or RS232 etc. connection is required.
 - I²C-interface for external connection, currently supported:
 - 3-axis Gyro-sensor for Pivot-functionality
 - temperature sensor
 - ambient-light sensor
 - Optional on-board temperature sensor

2.5 Power Supply

The d.scale-HDIII-IN is available as +12V version or as a +24V version.

- In case of +12V single supply, the backlight-supply voltage is the same as the input-supply voltage.
- The +24V version provides a +12V backlight supply voltage of up to 2.5A. For more detailed information please see section Electrical Characteristics.

3 Details

3.1 LVDS-Data Channels & Mapping

The d.scale-HDIII-IN provides one or two LVDS data channels and supports 6-bit and 8-bit (per colour) displays.

Single channel

Usually LCD-TFT displays with resolutions from VGA (640x480) up to XGA (1024x768) / WXGA (1366x768) are equipped with a single channel LVDS interface whereas with each clock-cycle the data for one pixel is transmitted

→ These displays have to be connected to the **TXA...- Channel**

Dual channel

LCD-TFT displays with resolutions from SXGA (1280x1024) up to FHD (1280x1080) / WUXGA (1920x1200) are equipped with a dual channel LVDS interface, whereas with each clock-cycle the data for two pixels is transmitted

→ These displays have to be connected to the **TXA...- Channel & TXB...- Channel**

NOTE

TXA...- Channel

This channel provides the data for the 1. / 3. / 5. / ... pixel

TXB...- Channel

This channel provides the data for the 2. / 4. / 6. / ... pixel

Mapping

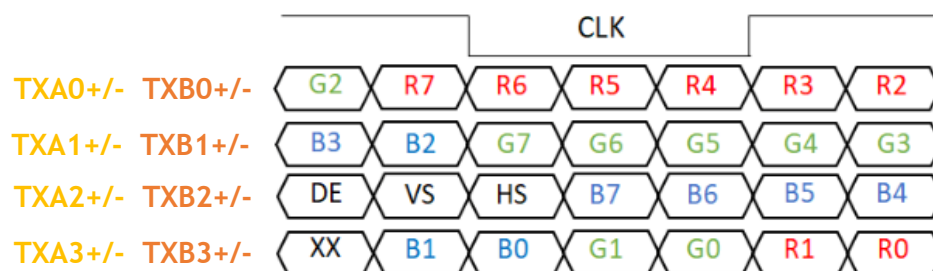
Historically, 2 LVDS data mappings have been established, known by different names

Data-Mapping-1 known as:

- Conventional data-mapping
- Open-LDI data-mapping
- JEIDA data-mapping

Characteristics

The LVDS data-pairs TXA3+/- & TXB3+/- transmits the LSBits of each color namely Red-0/Red-1, Green-0/Green-1, Blue-0/Blue-1



Color-Depth

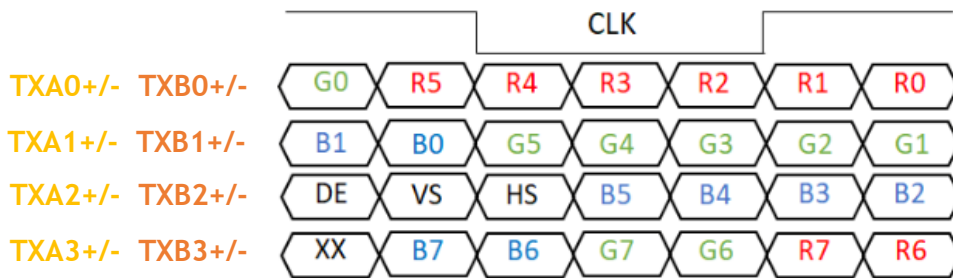
- Displays with 18-bit color-depth (262K colors) requires TX..0+/- to TX..2+/-
- Displays with 24-bit color-depth (16Mio colors) requires TX..0+/- to TX..3+/-

Data-Mapping-2 known as:

- Non-Conventional data-mapping
- VESA data-mapping

Characteristics

The LVDS data-pairs TXA3+/- & TXB3+/- transmits the MSBits of each color namely Red-6/Red-7, Green-6/Green-7, Blue-6/Blue-7



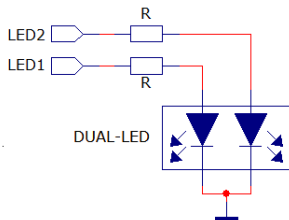
Color-Depth

This data-mappings supports 24-bit color depth (16Mio colors), ONLY.

3.2 Scaler Control & Status

Status LEDs

In order to show different system states two GPIOs are available. These GPIOs are provided on CN11 on pins LED1 and LED2. The table below shows the states.



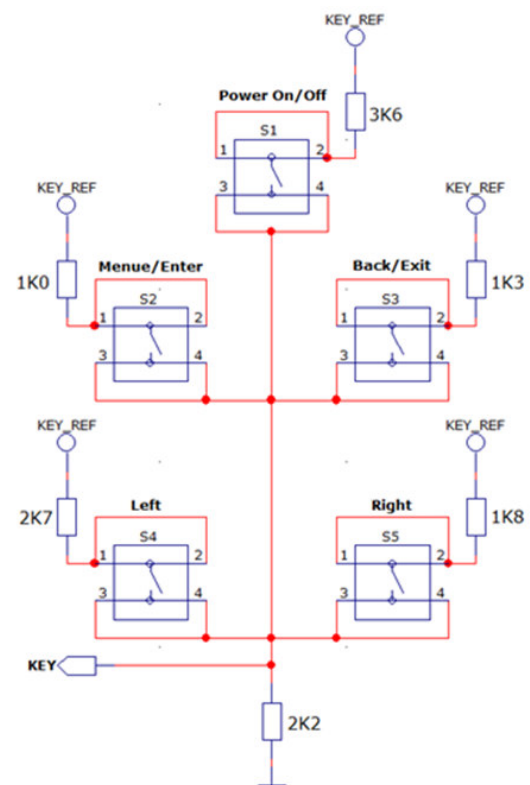
Keypad

The d.scale-HDIII-IN supports an external keypad to control the OSD-menu. It supports the following buttons:

- Button S1 for power on/off the scaler,
- Button S2 to enter the menu respectively confirm selection
- Button S3 to exit the menu respectively to go one step back
- Button S4 to move left/down respectively decrease the selected value depending on the selected menu status
- Button S5 to move right/up respectively increase the selected value depending on the selected menu status

Depending on the key pressed, the voltage value returned via **KEY** is evaluated. Below the required resistor values are shown. The reference voltage **KEY_REF** is +3.3V and can be drawn from the **KEY_REF** pin.

Description	LED1	LED2
Power-off / Standby	Off	Off
Power-on / System start-up, splash-screen is displayed Power-on / No valid video input detected	Off	On
Power-on / Valid video input detected	On	Off
Power-on / no valid video input detected / go to sleep	On	On



3.3 OSD – On Screen Display

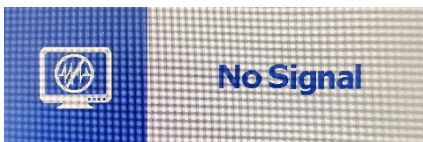
Button / Status LED

The table below shows keypad functions if OSD is active

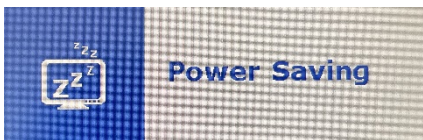
Key 5-Button	Function
POWER	Switch On/Off Display
Back/Exit	One Step back / Exit the menu
Menue/Enter	Open OSD-Menue / confirm selection
Right/Up	Move right or up in the OSD
Left/Down	Move left or down in the OSD

3.3.1 System Messages

If no cable is connected to the board the following message is displayed
If no signal is provided: “No Video Signal”



If no valid video signal can be detected the board is powered down and the following message will be displayed



3.3.2 OSD Short-Cuts

Some of the OSD keypad buttons have an additional functionality as long as the OSD dialogue is not entered.

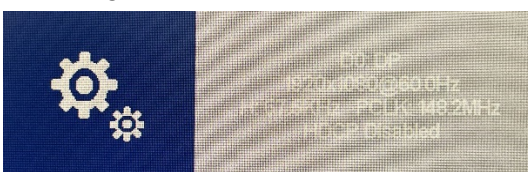
RIGHT / TOP Button

After pressing this button the user will enter the input selector menu. Using this option one of the connected video sources can be selected



LEFT-/ DOWN Button (Blue)

Pressing this button shows the current input

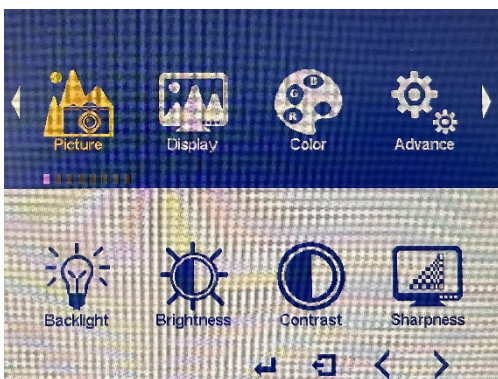


3.3.3 Onscreen Display Menu (OSD)

- To start OSD press the **MENU/ENTER** key.
- Select main/sub menu sections using the **RIGHT** or **LEFT** key.
- Confirm selection by pressing **MENU/ENTER** button again.
- Change values with **RIGHT** or **LEFT** key
- Either confirm with **MENU/ENTER** key or press **EXIT/RETURN** key to dismiss
- Leave OSD using **EXIT/RETURN**

Main Menu Sections

PICTURE

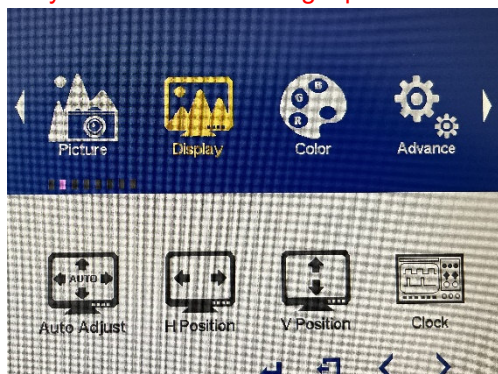


Sub Menu Sections

- **Backlight**
Controls the screen brightness by adjusting the brightness of the backlight (PWM)
- **Brightness**
Controls the screen brightness by adjusting the pixel colour value
- **Contrast**
Controls the contrast of the picture displayed on the screen. Contrast is related to the Y-Domain and affects red, green and blue value.
- **Sharpness**
Controls the sharpness of the picture displayed on the screen

DISPLAY

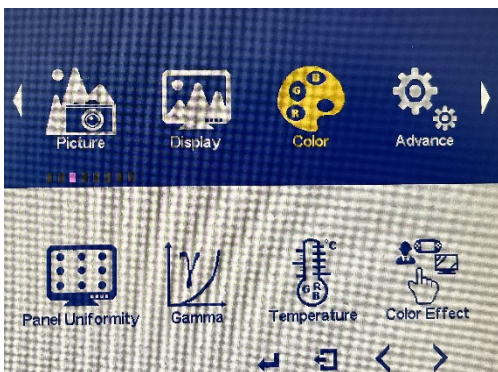
Only available with analog input



Sub Menu Sections

- **Auto Adjust**
Performs an auto adjust if an analog signal is selected as input
- **H Position**
Using this option the image position can be adjusted
- **V Position**
Using this option the image position can be adjusted
- **Clock**
Adjust the sampling phase of the analog input

COLOR



Sub Menu Sections

Panel Uniformity

Can be switched on/off

Gamma

Pre-set Gamma Correction

- 1.8
- 2.0
- 2.2
- 2.4
- Off (default)

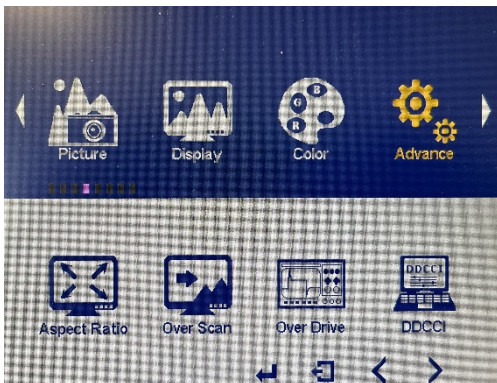
Color Temp

- Off (default)
- sRGB (for colour matching with sRGB compatible peripherals)
- 5800K (pre-defined colour temperature scheme)
- 6500K (pre-defined colour temperature scheme)
- 7500K (pre-defined colour temperature scheme)
- 9300K (pre-defined colour temperature scheme)
- **User** User defined adjustment
Sub-Menu > USER Individual adjustment of R, G and B

Color Effect

- Standard (pre-defined colour effect scheme)
- Game (pre-defined colour effect scheme)
- **Movie** (pre-defined colour effect scheme)
- **Photo** (pre-defined colour effect scheme)
- **Vivid** (pre-defined colour effect scheme)
- **User** User defined adjustment
 - **Sub-Menu >USER** Individual adjustment of Hue and Saturation separately for R,Y,G, B,M
- **Color Demo** Shows area with special settings
- **Color Format**
 - RGB (default)
 - YUV
- **PCM** Performance Counter Monitor – can be switched on/off
- **Hue** Set this in user mode Colour Effect
- **Saturation** Set this in user mode Colour Effect

ADVANCE

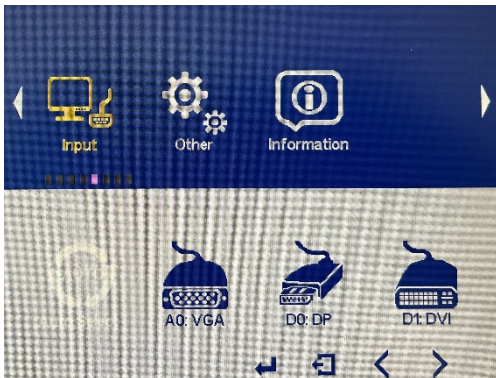


Sub Menu Sections

- **Aspect Ratio**
 - 1:1
 - Full
 - 16:9
 - 4:3
 - 5:4
- **Overscan**
 - On stretches image just beyond the border of display
 - Off
- **Overdrive** Off (always)
- **Energy Star** TBD
- **DDCCI**
 - On Enable external DDCCI access
 - Off Disable external DDCCI access
- **Ultra Vivid**
 - Off
 - Low
 - Medium

- High
- **DP Option**
 - Version 1.1
 - Version 1.2
 - Version 1.3

INPUT



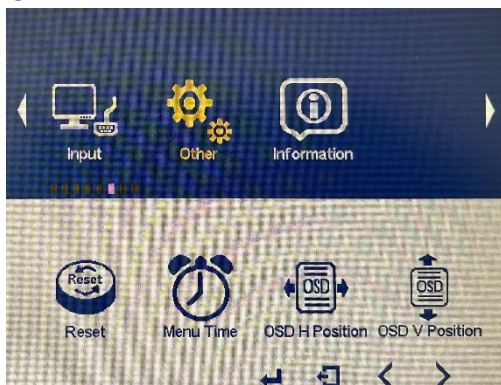
Sub Menu Sections

Using this option one of the connected video sources can be selected

- **Auto Select** This option will select the next active video source automatically
- **VGA** This connected VGA analog signal will be selected as scaler input
- **HDMI** The connected HDMI signal will be selected as scaler input
- **DP** The connected Display Port signal will be selected as scaler input

SOUND (currently not supported)

OTHER



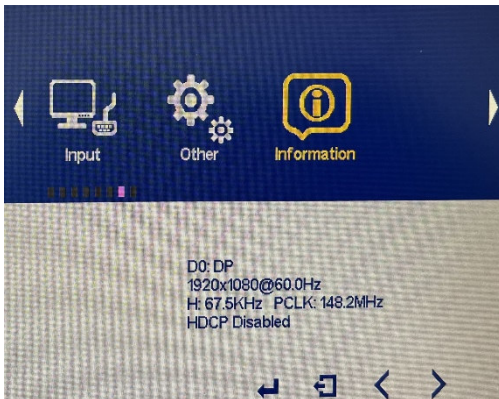
Sub Menu Sections

- **Reset** Select this option to restore the default factory settings
- **Menu Time** OSD menu lasting on screen time Defaults to 10s
- **OSD H Position** Horizontal start of OSD Menu on screen
- **OSD V Position** Vertical start of OSD Menu on screen
- **Language** **OSD** Menu language (for now “English” only)
- **Transparency** Use option to adjust transparency of the active OSD

- **Rotate**

- 0°
- 90°
- 270°
- 360°

INFO



Shows

- Current Mode
- Horizontal and Vertical Frequencies
- Pixel Clock

3.4 DDC/CI (MCCS) Support

OSD defaults

```
code StructOsdUserDataTypes g_stOSDDefaultData =
{
    0xFF,          // ucBackLight;
    100,          // ucOsdHPos;
    100,          // ucOsdVPos;
    10,           // ucOsdTimeout;
    0,            // ucAspectOriginRatio
//-----
    _ENGLISH,     // b4Language;
    _COLOREFFECT_STANDARD, // b4ColorEffect;
//-----
    _CT_OFF,      // b4ColorTempType;
    _COLOR_SPACE_RGB, // b2VGARGBYUV;
    _COLOR_SPACE_RGB, // b2DVIRGBYUV;
//-----
    2,            // b3Sharpness;
    2,            // b3Transparency;
    _OFF,         // b1OsdRotate;
    _ON,          // b1OverScan;
//-----
    _GAMMA_OFF,   // b3Gamma;
    _ASPECT_RATIO_FULL, // b3AspectRatio;
    _ON,          // b1DDCCIStatus;
    _OFF,         // b1OsdESStatus;
//-----
    _OD_GAIN_CENTER, // ucODGain;
    _DEFAULT_HUE,    // cHue;
    _DEFAULT_SATURATION, // ucSaturation;
    _HL_WIN_OFF,    // ucHLWinType;
    0x00,           // uc3DEffect;
    0x00,           // uc3DConvergence;
//-----
    _PCM_OSD_NATIVE, // b2PCMStatus : 2;
    _3D_OFF,         // b23DStatus : 2;
    _3D_MODE_FORMAT_AUTO, // b23DFormatStatus : 2;
    _3D_DISPLAY_RL, // b13DLRStatus : 1;
    _OFF,           // b13D3DTo2DStatus : 1;
//-----
    _ULTRA_VIVID_OFF, // b2UltraVividStatus : 2;
    _OFF,             // b1Osd3DOSD : 1;
    _OFF,            // b1VolumeMute : 1;
    _OFF,            // b1AudioStandAloneStatus : 1;
    0,               // b1AudioSourceStatus : 1;
    _OFF,           // b1ODStatus : 1;
//-----
    50,              // ucVolume;
//-----
    0x00,            // b33DConvergenceMode : 3;
    _AUTO_COLOR_TYPE_EXTERNAL, // b1FactoryAutoColorType : 1;
    0,              // b1SwitchDH : 1;
};
```

3.5 Peripherals

I²C-Interface

The d.scale-HDIII-IN provides an I²C-Interface for connection of useful peripheral devices. The devices can be controlled via the DDC/CI (MCCS) which is a standardized channel by VESA. As physical interface the DDC (HDMI) or the AUX-channel (DisplayPort) is used, which means, that no additional connection like USB or UART is required. The user can select and configure the devices in the firmware configuration tool.

Currently the following devices are supported:

- STMicro / LIS3DH
3-axis Gyro-sensor for Pivot-functionality
- Texas Instruments / TMP102
Temperature sensor
- Texas Instruments / OPT3001
ambient-light sensor

Analog Audio output (ONLY optional)

Via the two pins AUDIO_HOURL and AUDIO_HOURLR an analog stereo signal is provided, but it requires additional external circuitry!

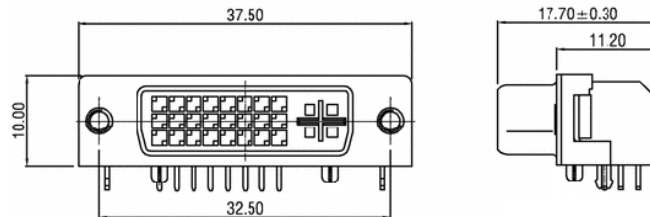
4 Connectors

4.1 Video Input

CN2 DVI

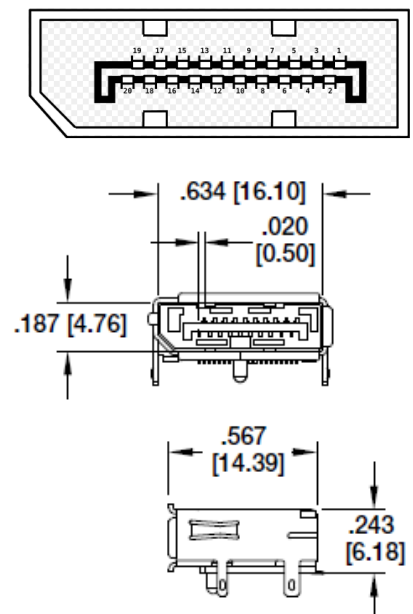
Pin	Signal	Description
1	TMDS2-	Differential TMDS Data 2-
2	TMDS2+	Differential TMDS Data 2+
3	GND	TMDS Shield
4	NC	Not Connected
5	NC	Not Connected
6	DVI_SCL	DDC EDID data clock
7	DVI_SDA	DDC EDID data
8	NC	Not Connected
9	TMDS1-	Differential TMDS Data 1-
10	TMDS1+	Differential TMDS Data 1+
11	GND	TMDS Shield
12	NC	Not Connected
13	NC	Not Connected
14	DVI_5V	5V/100mA
15	DVI_Plug	DVI Plug Detect

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
21	NC	Not connected
22	GND	TMDS Clock Shield
23	TMDSSCL-	Differential TMDS Clock -
24	TMDSSCL+	Differential TMDS Clock +
C1	NC	Not Connected
C2	NC	Not Connected
C3	NC	Not Connected
C4	NC	Not Connected
C5	NC	Not Connected
C6	NC	Not Connected



CN12 DisplayPort

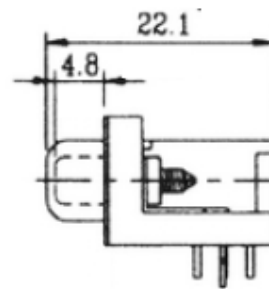
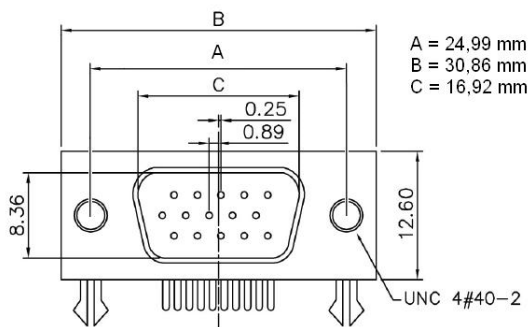
Pin CN12	Signal	Description
1	ML_Lane 0 (p)	Lane 0 (positive)
2	GND	Ground
3	ML_Lane 0 (n)	Lane 0 (negative)
4	ML_Lane 1 (p)	Lane 1 (positive)
5	GND	Ground
6	ML_Lane 1 (n)	Lane 1 (negative)
7	ML_Lane 2 (p)	Lane 2 (positive)
8	GND	Ground
9	ML_Lane 2 (n)	Lane 2 (negative)
10	ML_Lane 3 (p)	Lane 3 (positive)
11	GND	Ground
12	ML_Lane 3 (n)	Lane 3 (negative)
13	Config1	Connected to GND
14	Config2	Connected to GND
15	AUX CH (p)	Auxiliary Channel (positive)
16	GND	Ground
17	AUX CH (n)	Auxiliary Channel (negative)
18	Hot Plug	Hot Plug Detect
19	Return	Return for Power
20	DP_PWR	Power for Connector (3.3V/500mA)



CN9 RGB analog Input

Pin	Signal	Description
1	RED	Analog Red
2	GREEN	Analog Green
3	BLUE	Analog Blue
4	NC	Not Connected
5	VGA_Plug	VGA Plug Detect
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



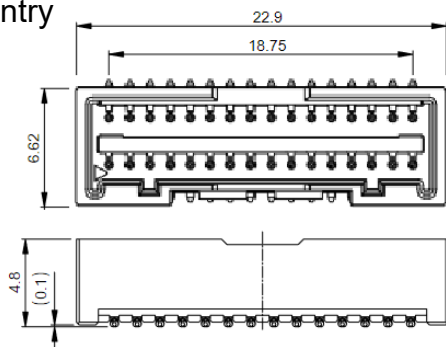
4.2 Video Output

CN3/CN3A LVDS Output

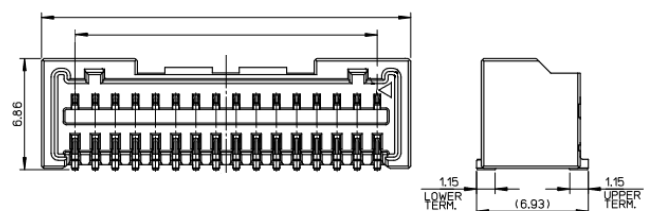
Pin	Signal	Description
1	SVCC	Switched panel power supply +3,3V/+5V (fused)
2		
3		
4	GND	Ground
5		
6		
7		
8		
9	GND	Ground
10		
11	TXVB0-	LVDS data 2nd pixel
12	TXVB0+	LVDS data 2nd pixel
13	TXB1-	LVDS data 2nd pixel
14	TXB1+	LVDS data 2nd pixel
15	TXB2-	LVDS data 2nd pixel
16	TXB2+	LVDS data 2nd pixel

Pin	Signal	Description
17	TXBCL-	LVDS clock 2nd pixel
18	TXBCL+	LVDS clock 2nd pixel
19	TXB3-	LVDS data 2nd pixel
20	TXB3+	LVDS data 2nd pixel
21	TXA0-	LVDS data 1st pixel
22	TXA0+	LVDS data 1st pixel
23	TXA1-	LVDS data 1st pixel
24	TXA1+	LVDS data 1st pixel
25	TXA2-	LVDS data 1st pixel
26	TXA2+	LVDS data 1st pixel
27	TXACL-	LVDS clock 1st pixel
28	TXACL+	LVDS clock 1st pixel
29	TXA3-	LVDS data 1st pixel
30	TXA3+	LVDS data 1st pixel
31	GND	Ground
32		

Top Entry CN3



Side Entry CN3A

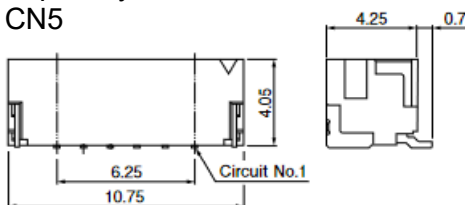


4.3 Backlight

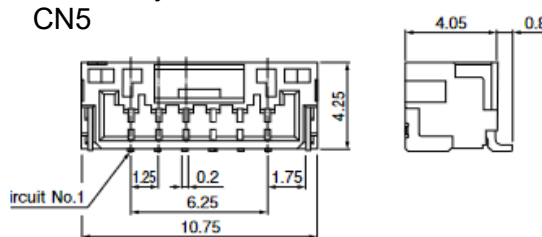
CN5 Backlight Power Supply & Control

Pin	Signal	Description
1	BPS	Backlight power supply
2	BPS	Backlight power supply
3	EBKL	Enabel backlight signal
4	BRCTRL	Brightness Control
5	GND	Ground
6	GND	Ground

Top Entry
CN5



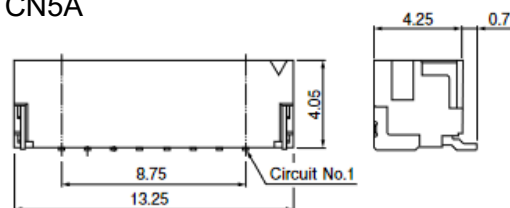
Side Entry
CN5



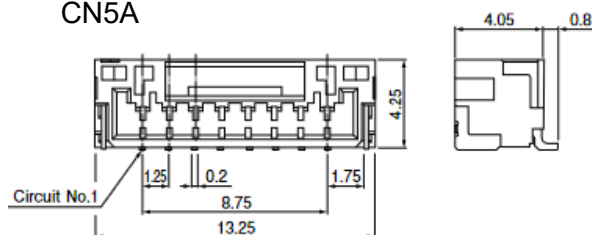
CN5A Backlight Power Supply & Control (Optional)

Pin	Signal	Description
1	BPS	Backlight power supply
2	BPS	Backlight power supply
3	BPS	Backlight power supply
4	EBKL	Enabel backlight signal
5	BRCTRL	Brightness Control
6	GND	Ground
7	GND	Ground
8	GND	Ground

Top Entry
CN5A



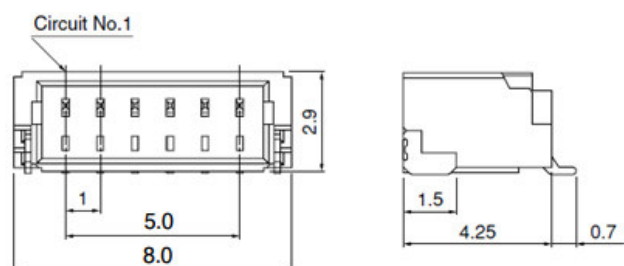
Side Entry
CN5A



4.4 Board Control

CN11 Keypad Control

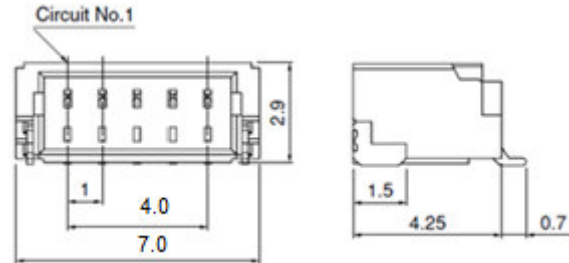
Pin	Signal	Description
1	KP_DRV	Reference Voltage for Voltage Devider - ONLY
2	LED_1	Red Status LED
3	LED_2	Green Status LED
4	Key	Voltage Divider Feedback
5	+3.3V	3.3V Low Power Supply
6	GND	Ground



4.5 Peripherals

CN1 I2C-Interface

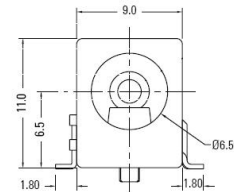
Pin	Signal	Description
1	+3.3V	3.3V Low power supply
2	Peri_SDA	I ² C data
3	PERI_SCL	I ² C clock
4	I2C_S_IN	Reserved for future use
5	GND	Ground



4.6 Power Supply

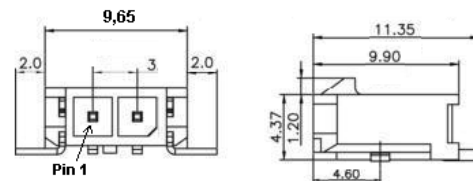
CN13 Power Supply Connector (external)

Pin	Signal	Description
Center	+12V/+24V	12V/24V Power supply (max 3A)
Outer Shield	GND	Ground



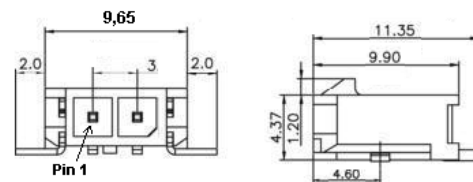
CN10 Power Supply Connector (optional/external)

Pin	Signal	Description
1	+12V/+24V	12V/24V Power supply
2	GND	Ground



CN16 Power Supply Connector (optional/internal)

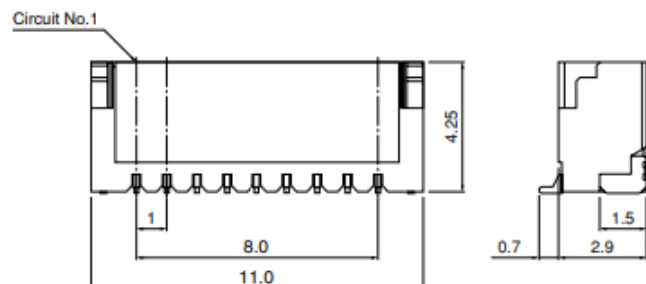
Pin	Signal	Description
1	+12V/+24V	12V/24V Power supply
2	GND	Ground



4.7 ISP – In System Programming (For Future Use)

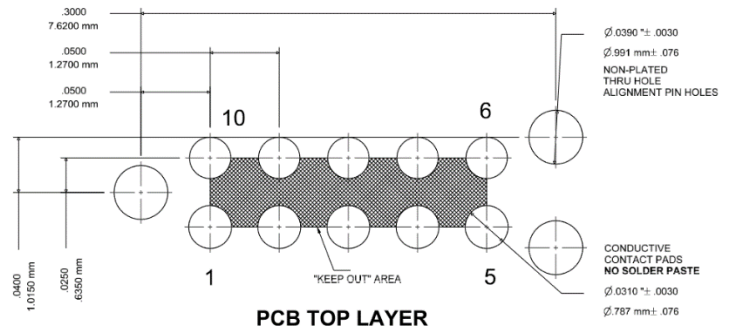
CN8 ISP-Interface (For Future Use)

Pin	Signal	Description
1	3.3V_PRG	3.3V programming supply
2	SCLK_PRG	Serial clock
3	MOSI_PRG	Master-out/slave-in data
4	MISO_PRG	Master-in/slave-out data
5	SCE_PRG	Chip-select
6	FLASH_WP	Write protect
7	SPI_SW_RT	Enable programming, active high
8	GND	Ground



CON_PRG1 ISP-Interface (For Future Use)

Pin	Signal	Description
1	3.3V_PRG	3.3V programming supply
2	SCLK_PRG	Serial clock
3	MISO_PRG	Master-in/slave-out data
4	NC	Not conneted
5	SPI_SW_RT	Enable programming, active high
6	SCE_PRG	Chip-select
7	GND	Ground
8	FLASH_WP	Write protect
9	MOSI_PRG	Master-out/slave-in data
10	NC	Not conneted



Matching connector/prog-cable: Tag-connect / TC2050-IDC-NLFP

4.8 Connector Overview

CN	Description	Type	Manufacturer
CN1	I2C-Interface	SM05B-SRSS-TB	JST
CN2	DVI	DVI-I female	e.g. Molex
CN3	LCD-TFT Interface - VT	504187-3270	Molex
CN3A	LCD-TFT Interface - HZ	504189-3270	Molex
CN5	Backlight - VT	BM06B-GHS-GB-TBT	JST
CN5	Backlight – HZ	BM06B-GHS-GB-TB	JST
CN5A	Backlight - VT	BM08B-GHS-GB-TBT	JST
CN5A	Backlight – HZ	BM08B-GHS-GB-TB	JST
CN8	ISP-Interface	BM08B-SRSS-TB	JST
CN9	RGB Analog Input	15-pin H-DSUB female	---
CN10	Power Supply	2-1445057-2	Tyco
CN11	Keypad Control	SM06B-SRSS-TB	JST
CN12	DP Input	e.g. DPC-F-S-RA-SMT	Adam-Tech
CN13	Power supply	KLDX-SMT2-0202-A	Kycon
CN16	Power Supply	2-1445057-2	Tyco

5 Specifications

5.1 Electrical Characteristics

Operating Values

Item	Condition	MIN.	TYP.	MAX.	Unit	Note
Supply Voltage ¹⁾		8	12	15	VDC	*1
Current Input	Stand-by		TBD		mA	
	1920x1200		TBD		mA	Board only
Panel Supply Voltage / Current	+3.3V			2.0	A	Output
	+5V			3.0	A	Output
Supply Voltage ¹⁾		19	24	29	VDC	
Current Input	Stand-by		TBD		mA	
	1920x1200		TBD		mA	Board only
Total 24V to 12V conversion: max 42W						
Panel Supply Voltage / Current	+3.3V			2.0	A	Output
	+5V			3.0	A	Output
Backlight Supply	+12V			TBD	A	Output
Operating Temperature		0	-	70	°C	

*1: Output voltage for display backlight is same as supply voltage

5.2 Temperature & Humidity

Item	MIN.	TYP.	MAX.	Unit	Note
Operating Temperature	0/TBD	-	+70	°C	
Storage Temperature	10/TBD	-	+85	°C	
Humidity	5	-	90	%RHmax	

6 Outline Dimensions

