

AD BOARD HN800

Specifications

Approval

Rev. 1.1

Issue Date. 2018. 04. 25

Doc No. HN800_V1.1

Note | Specification is subject to change without notice.
Consequently it is better to contact to our company before proceeding with the design of your product incorporating this board

Prepared	Checked I	Checked	Approved
			
KB. PARK			YH. HAN

Revision History

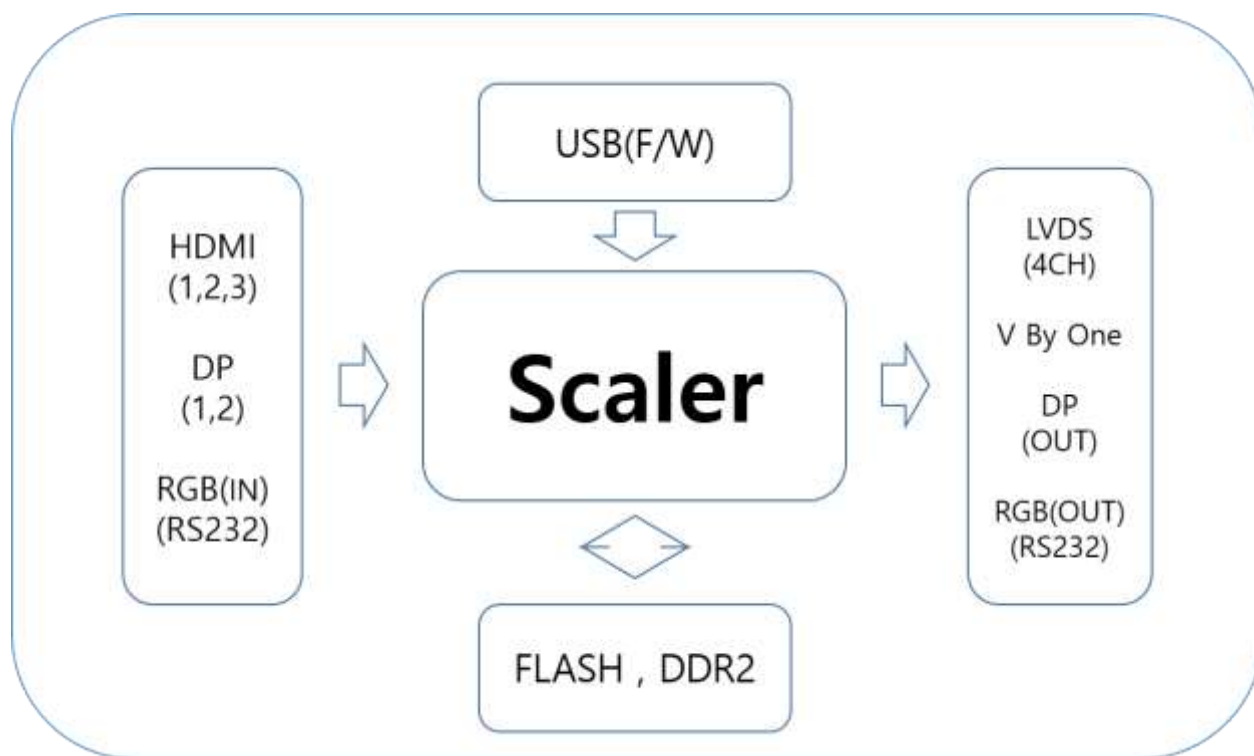
Rev.	ECN No.	Description of Changes	Date	Prepared
1.0		Initial Release	2018. 03. 09	KB. PARK
1.1		Change RS232 Interval	2018. 04. 25	KB. PARK

1. General Specification

No.	Item	Description		
1	Model Name	HN800		
2	LCD Module	LVDS Quad, V by one - 3840x2160		Output
3	Input	HDMIx3, DPx2, OUTPUT DPx1, RS232		
4	Resolution Support	H: 31 ~ 80kHz		
		V: 55 ~ 76Hz		
5	OSD Control	POWER, CH+, CH-, VOL+, VOL-, MENU, INPUT		7 keys
	Plug & Play	VESA DDC 2B Ver1.3		
6	Power Consumption	Supply Voltage	12Vdc	
		Power	-	Board Only
	Signal Connector	HDMI	HDMI 1.4a / HDMI 2.0 / HDCP V1.4	
		DP	DisplayPort V1.2	
		Audio	3W + 3W	
8	Board Size	W x H x D(mm)	200 x 155 x 15	
9	Support	PIP Window up to 1920x1080		
		Flip / Mirror Display		



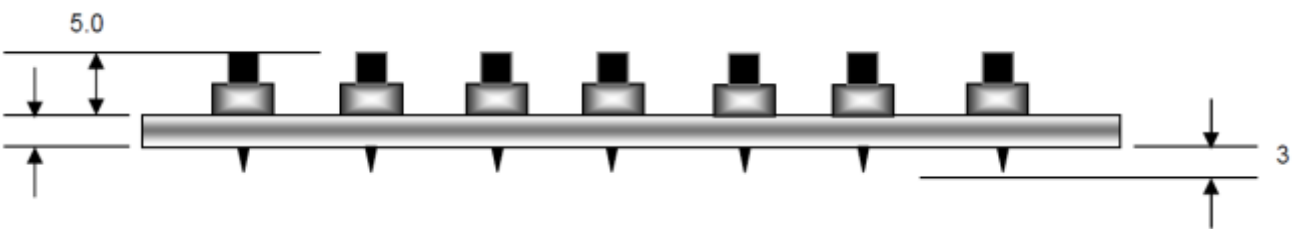
2. Functional Block Diagram



3. OSD Control Board

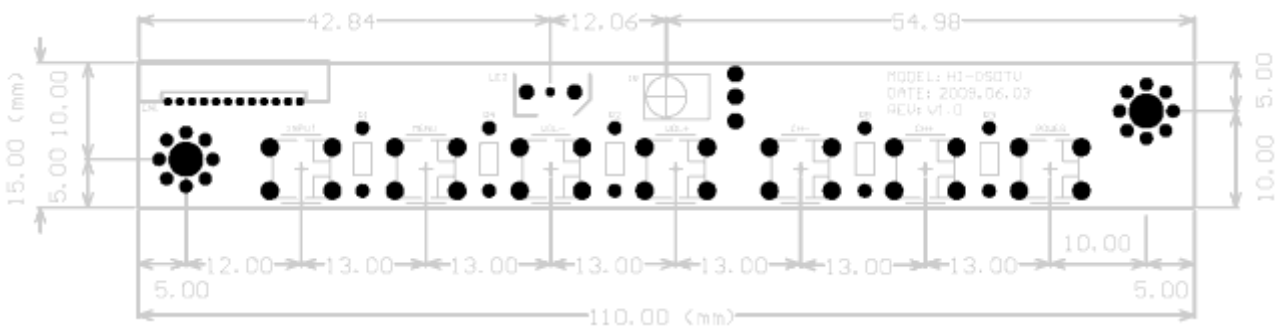
The OSD (On Screen Display) provides certain functions to have clear image and others. This board supports 7 buttons OSD operation as a standard. The control functions defined on OSD operation are as below. (Unit: mm)

Appearance



Board Size (W x H x D) : 110 x 15 x 6.6mm

Button	Function	Status	HOT Key
LED	Indicates operation status	Green/ Red/ Amber	On: Green Off: Red No Signal: Amber
POWER	Power on/off	On/Off	
MENU	Activate menu / Exit Menu		
INPUT	Input Select / Source		
LEFT	Cursor control Left		
RIGHT	Cursor control Right		
DOWN	Cursor control Down		
UP	Cursor control Up / Auto Adjust		



4-1. OSD Function



Luminance

OSD Menu			
Brightness	Brightness level Control		
	Range of Value	MIN	0
		MAX	100
Contrast	Contrast level Control		
	Range of Value	MIN	0
		MAX	100
Gamma	Gamma Select		
	Mode	ON	
		OFF	
DCR (Dynamic Contras Ration)	DCR mode select		
	Mode	OFF	
		DBC	
		DCR	
Main SR	Main SR mode select		
	Mode	OFF	
		WEAK	
		MEDIAN	
		STRONG	
3D DEI	DCR mode select		
	Mode	ON	
		OFF	

4-2. OSD Function



Color

OSD Menu			
Color Temperature	Color Mode Select		
	Mode	5000K	
		6500K	
		7500K	
		8200K	
		9300K	
RED Gain	RED Gain level Control		
	Range of Value	MIN	1
		MAX	255
RED Offset	RED Offset level Control		
	Range of Value	MIN	1
		MAX	255
GREEN Gain	GREEN Gain level Control		
	Range of Value	MIN	1
		MAX	255
GREEN Offset	GREEN Offset level Control		
	Range of Value	MIN	1
		MAX	255
BLUE Gain	BLUE Gain level Control		
	Range of Value	MIN	1
		MAX	255
BLUE Offset	BLUE Offset level Control		
	Range of Value	MIN	1
		MAX	255

4-3. OSD Function



OSD Settings

OSD Menu			
Horizontal	H level Control		
	Range of Value	MIN	0
		MAX	100
Vertical	V level Control		
	Range of Value	MIN	0
		MAX	100
Transparency	Transparency level Control		
	Range of Value	MIN	0
		MAX	4
OSD Time Out	RED level Control		
	Range of Value	MIN	0
		MAX	60

4-4. OSD Function



Set Up

OSD Menu		
Language	Language Select	
	Mode	English
Input	Input Select	
	Mode	D-SUB
		DVI
		HDMI 1
		DP
Display Size	Input Select	
	Mode	Full Screen
		Smart Fit
		4:3
		Smart 4:3
Over Scan	Over Scan Select	
	Mode	ON
		OFF
Over Driver	Over Driver Select	
	Mode	ON
		OFF
Reset	Reset Select	
	Mode	NO
		YES
DP Speed	DP Speed Select	
	Mode	2.7G
		5.4G
Flip Mode	Flip Mode Select	
	Mode	OFF
		H Flip
		V Flip
		HV Flip

4-5. OSD Function



Picture Mode

OSD Menu		
PIP / PBP	PIP/PBP Select	
	Mode	Off
		One Window
		Side by Side
		3 Division 1
		3 Division 2
		4 Division
Select Input2,3,4	Input Select	
	Mode	HDMI1
		HDMI2
		HDMI3
		DP1
		DP2
PIP Size	PIP Size Select	
	Mode	640x480
		800x600
		1024x768
		Scaling Size01
PIP Pos	PIP Pos Select	
	Mode	L.T
		R.T
		L.B
		R.B
PBP Size	PBP Size Select	
	Mode	100 Percent
		75 Percent
		50 Percent

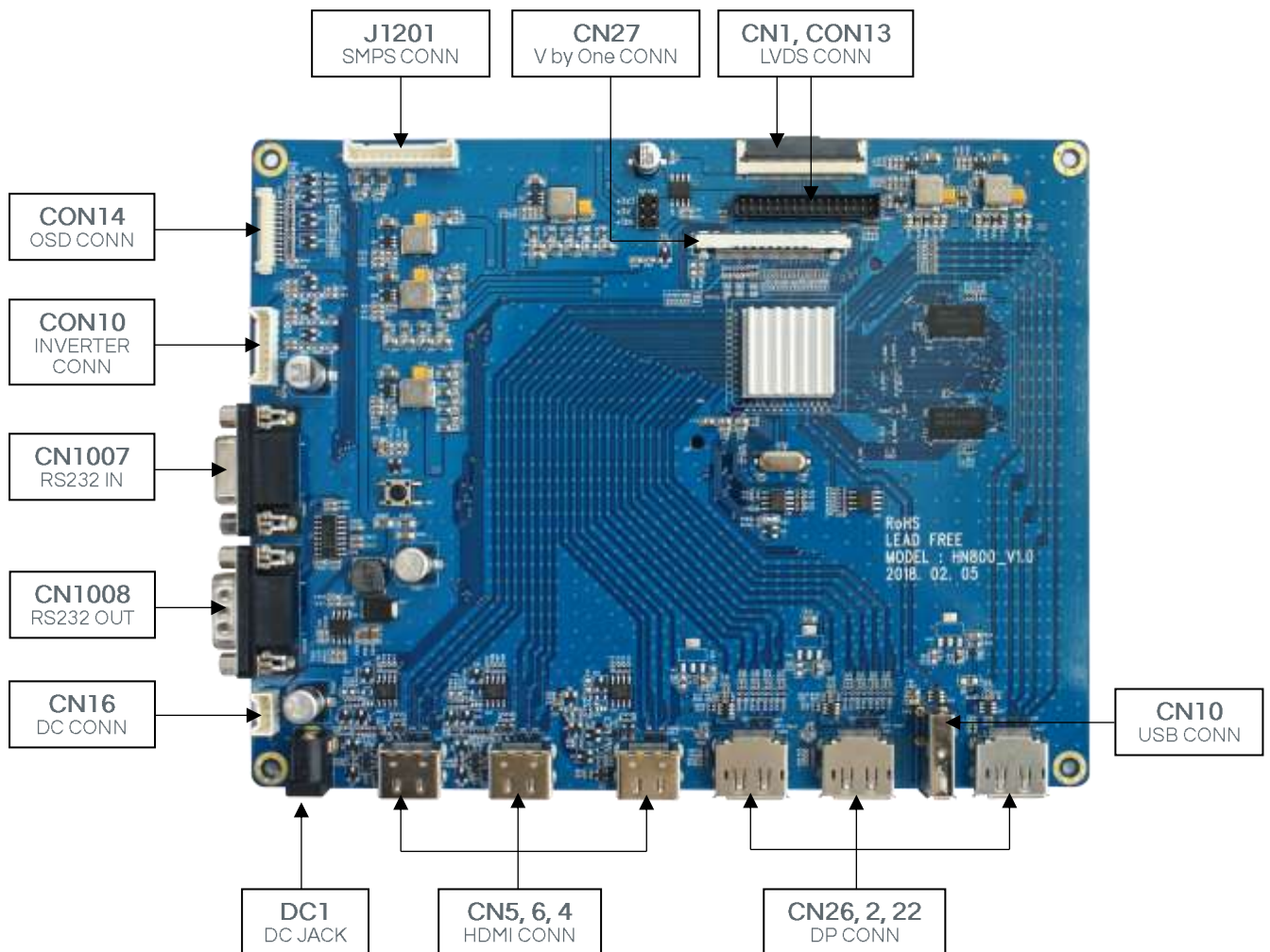
4-6. OSD Function



Video Wall Mode

OSD Menu			
Video Wall Enable	Video Wall Select		
	Mode	Off	
		On	
ID	ID Select		
	Range of Value	MIN	1
		MAX	100
H Ratio	H Ratio Select		
	Range of Value	MIN	1
		MAX	15
V Ratio	V Ratio Select		
	Range of Value	MIN	1
		MAX	15

6. Connector, Pinout & Jumpers



Summary:

Reference	Item	Description	Type	Manufacture
CN1	CONN	LVDS CONNECTOR	05002HR-H51G5	
CN13	CONN	LVDS CONNECTOR	YDW200-32P	
CN27	CONN	V by One CONNECTOR	FI-RE51S-HF	
J1201	CONN	SMPS CONNECTOR	SMW200-12P	
CON14	CONN	OSD CONNECTOR	12505WR-12	
CON10	CONN	INVERTER CONNECTOR	SMW200-08P	
CN1007~8	CONN	RS232 CONNECTOR	D-SUB DS1037-09F,M	
CN16	CONN	DC CONNECTOR	SMW200-04P	
DC1	JACK	DC JACK	3P, R / A 2.5PIE	
CN4~6	CONN	HDMI CONNETOR	19P(R-S151L-3 락)	
CN2,22,26	CONN	DP CONNECTOR	G3167JB253-001-H	
CN10	CONN	USB CONNECTOR	YS-UA-002-10	

6-1. Connector, Pinout & Jumpers

CN1: LVDS Connector

Pin No.	Symbol	Description
1	VCC	PANEL VCC
2	VCC	PANEL VCC
3	VCC	PANEL VCC
4	VCC	PANEL VCC
5	VCC	PANEL VCC
6	VCC	PANEL VCC
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	TXA0N	A LINE 0 (NEGATIVE)
11	TXA0P	A LINE 0 (POSITIVE)
12	TXA1N	A LINE 1 (NEGATIVE)
13	TXA1P	A LINE 1 (POSITIVE)
14	TXA2N	A LINE 2 (NEGATIVE)
15	TXA2P	A LINE 2 (POSITIVE)
16	GND	Ground
17	TXACKN	A LINE CLOCK (NEGATIVE)
18	TXACKP	A LINE CLOCK (POSITIVE)
19	GND	Ground
20	TXA3N	A LINE 3 (NEGATIVE)
21	TXA3P	A LINE 3 (POSITIVE)
22	TXA4N	A LINE 4 (NEGATIVE)
23	TXA4P	A LINE 4 (POSITIVE)
24	GND	Ground
25	TXB0N	B LINE 0 (NEGATIVE)
26	TXB0P	B LINE 0 (POSITIVE)
27	TXB1N	B LINE 1 (NEGATIVE)
28	TXB1P	B LINE 1 (POSITIVE)
29	TXB2N	B LINE 2 (NEGATIVE)
30	TXB2P	B LINE 2 (POSITIVE)
31	GND	Ground
32	TXBCKN	B LINE CLOCK (NEGATIVE)
33	TXBCKP	B LINE CLOCK (POSITIVE)
34	GND	Ground
35	TXB3N	B LINE 3 (NEGATIVE)
36	TXB3P	B LINE 3 (POSITIVE)
37	TXB4N	B LINE 4 (NEGATIVE)
38	TXB4P	B LINE 4 (POSITIVE)
39	GND	Ground
40~51	NC	NOT CONNECTOR

6-2. Connector, Pinout & Jumpers

CON13: LVDS Connector

Pin No.	Symbol	Description
1	VDD	PANEL VDD
2	VDD	PANEL VDD
3	VDD	PANEL VDD
4	NC	-
5	GND	Ground
6	TXB4+	Positive(+) LVDS 4data(B Port)
7	TXB4-	Negative(-) LVDS 4data(B Port)
8	TXB3+	Positive(+) LVDS 3data(B Port)
9	TXB3-	Negative(-) LVDS 3data(B Port)
10	TXBC+	Positive(+) LVDS Clock data(B Port)
11	TXBC-	Negative(-) LVDS Clock data(B Port)
12	GND	Ground
13	TXB2+	Positive(+) LVDS 2data(B Port)
14	TXB2-	Negative(-) LVDS 2data(B Port)
15	TXB1+	Positive(+) LVDS 1data(B Port)
16	TXB1-	Negative(-) LVDS 1data(B Port)
17	TXB0+	Positive(+) LVDS 0data(B Port)
18	TXB0-	Negative(-) LVDS 0data(B Port)
19	GND	Ground
20	TXA4+	Positive(+) LVDS 4data(A Port)
21	TXA4-	Negative(-) LVDS 4data(A Port)
22	TXA3+	Positive(+) LVDS 3data(A Port)
23	TXA3-	Negative(-) LVDS 3data(A Port)
24	TXAC+	Positive(+) LVDS Clock data(A Port)
25	TXAC-	Negative(-) LVDS Clock data(A Port)
26	GND	Ground
27	TXA2+	Positive(+) LVDS 2data(A Port)
28	TXA2-	Negative(-) LVDS 2data(A Port)
29	TXA1+	Positive(+) LVDS 1data(A Port)
30	TXA1-	Negative(-) LVDS 1data(A Port)
31	TXA0+	Positive(+) LVDS 0data(A Port)
32	TXA0-	Negative(-) LVDS 0data(A Port)

6-3. Connector, Pinout & Jumpers

CN27: V by One Connector

Pin No.	Symbol	Description
1	GND	Ground
2	VBY7P	V BY ONE 7+
3	VBY7N	V BY ONE 7-
4	GND	Ground
5	VBY6P	V BY ONE 6+
6	VBY6N	V BY ONE 6-
7	GND	Ground
8	VBY5P	V BY ONE 5+
9	VBY5N	V BY ONE 5-
10	GND	Ground
11	VBY4P	V BY ONE 4+
12	VBY4N	V BY ONE 4-
13	GND	Ground
14	VBY3P	V BY ONE 3+
15	VBY3N	V BY ONE 3-
16	GND	Ground
17	VBY2P	V BY ONE 2+
18	VBY2N	V BY ONE 2-
19	GND	Ground
20	VBY1P	V BY ONE 1+
21	VBY1N	V BY ONE 1-
22	GND	Ground
23	VBY0P	V BY ONE 0+
24	VBY0N	V BY ONE 0-
25	GND	Ground
26	VBYLOCKN	Lock Detect
27	VBYHTPDN	Hot Plug Detect
28 ~ 32	NC	No Connection
33	EE_SCL	SCL For I2C
34	EE_SDA	SDA For I2C
35 ~ 38	NC	No Connection
39 ~ 42	GND	Ground
43 ~ 44	NC	No Connection
45 ~ 51	VLCD	PANEL VCC

6-4. Connector, Pinout & Jumpers

J1201: SMPS Connector

Pin No.	Symbol	Description
1	PD	-
2	SYS_5V	5V
3	5V	5V
4	5V	5V
5	GND	Ground
6	GND	Ground
7	12V	VCC
8	12V	VCC
9	ONBACK	On/Off
10	ADJBACK	DIM
11	PWMBACK	DIM
12	GND	Ground

CON14: OSD Connector

Pin No.	Symbol	Description
1	LED-Red	Red Color
2	LED-Green	Green Color
3	GND	Ground
4	NC	NC
5	MENU	For Menu Switch
6	AUTO	For Auto Switch
7	DOWN	For Down Switch
8	UP	For Up Switch
9	POWER	For Power Switch
10	GND	Ground
11	IR_OUT	IR DATA
12	+3V3	IR Power 3.3V

CON10: Invertor Connector

Pin No.	Symbol	Description
1	+12V_NORMAL	12V
2	+12V_NORMAL	12V
3	+5V_NORMAL	5V
4	ADJ_PWM	Adjust PWM
5	GND	Ground
6	GND	Ground
7	BL-ON/OFF	Backlight on signal
8	BL-ADJUST	Backlight dimming signal

6-5. Connector, Pinout & Jumpers

CN1007: RS232 Connector

Pin No.	Symbol	Description
1	NC	Not Connect
2	TX	RS DATA
3	RX	RS DATA
4	NC	Not Connect
5	GND	Ground
6	NC	Not Connect
7	NC	Not Connect
8	NC	Not Connect
9	NC	Not Connect

CN1008: RS232 Connector

Pin No.	Symbol	Description
1	NC	Not Connect
2	TX	RS DATA
3	RX	RS DATA
4	NC	Not Connect
5	GND	Ground
6	NC	Not Connect
7	NC	Not Connect
8	DDCAA_SDA	DATA
9	DDCAA_SCL	CLOCK

6-6. Connector, Pinout & Jumpers

CN16: DC Connector

Pin No.	Symbol	Description
1	+12V_NORMAL	12V
2	+12V_NORMAL	12V
3	GND	Ground
4	GND	Ground

DC1: DC JACK

Pin No.	Symbol	Description
1	+12V_NORMAL	12V
2	GND	Ground
3	GND	Ground

CN4: HDMI Connector

Pin No.	Symbol	Description
1	HDMI_1_D2+	HDMI 2line 2data+
2	CD-SENSE-1	MHL Cable Detect Sense
3	HDMI_1_D2-	HDMI 2line 2data-
4	HDMI_1_D1+	HDMI 2line 1data+
5	GND	Ground
6	HDMI_1_D1-	HDMI 2line 1data-
7	HDMI_1_D0+	HDMI 2line 0data+
8	GND	Ground
9	HDMI_1_D0-	HDMI 2line 0data-
10	HDMI_1_CLK+	HDMI 2line CLK+
11	GND	Ground
12	HDMI_1_CLK	HDMI 2line CLK-
13	CEC	HDMI CEC
14	NC	Not Connect
15	HDMI_1_DDCCK	HDMI DDC SCL
16	HDMI_1_DDCDA	HDMI DDC SDA
17	GND	Ground
18	HDMI_TX_5V-1	HDMI power signal
19	CBUS-HPD-1	HPD pin

6-7. Connector, Pinout & Jumpers

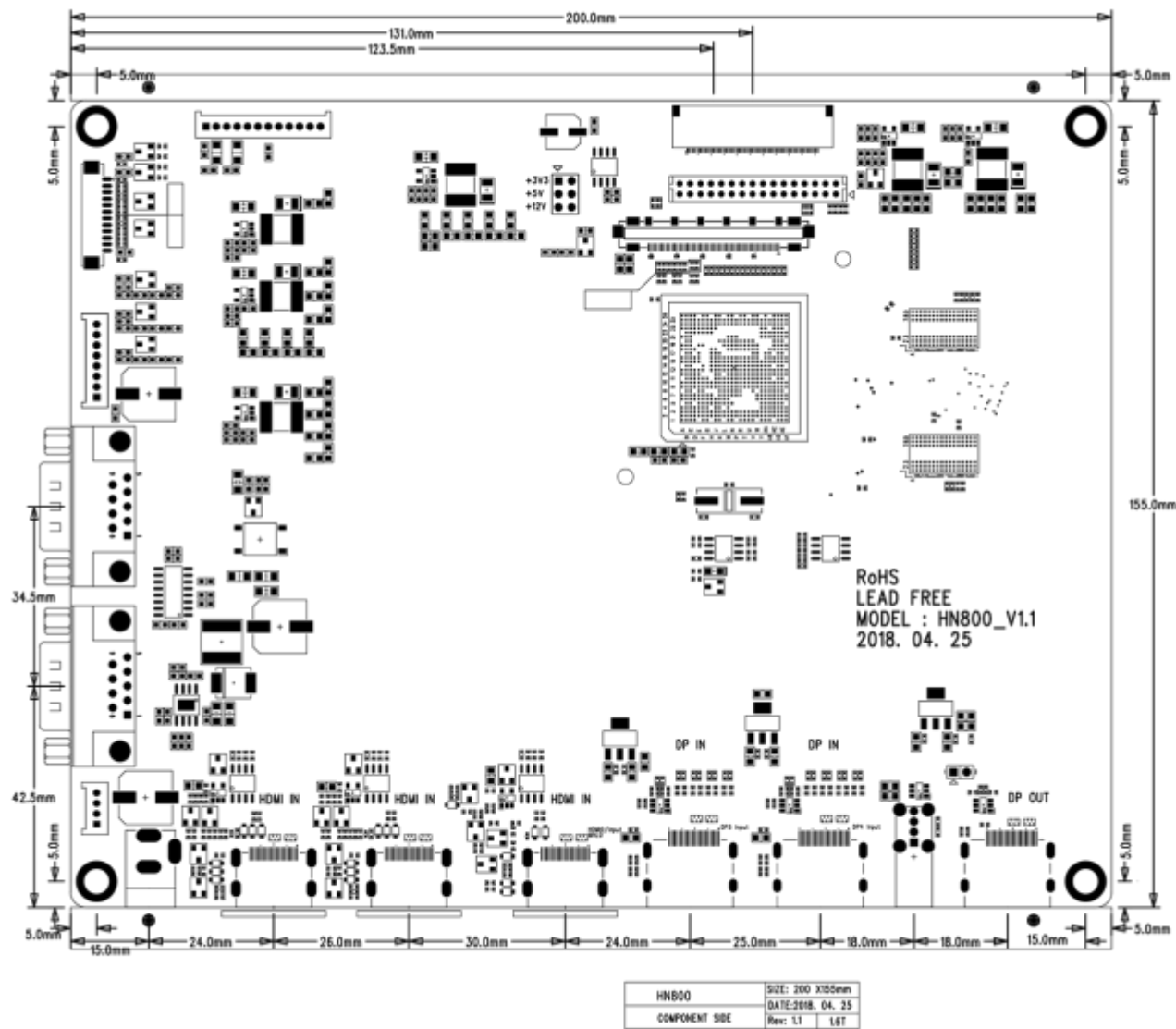
CN2: DP Connector

Pin No.	Symbol	Description
1	DP_2_RX_3N	DP Channel1 input data pair 3-
2	GND	Ground
3	DP_2_RX_3P	DP Channel1 input data pair 3+
4	DP_2_RX_2N	DP Channel1 input data pair 2-
5	GND	Ground
6	DP_2_RX_2P	DP Channel1 input data pair 2+
7	DP_2_RX_1N	DP Channel1 input data pair 1-
8	GND	Ground
9	DP_2_RX_1P	DP Channel1 input data pair 1+
10	DP_2_RX_0N	P Channel1 input data pair 0-
11	GND	Ground
12	DP_2_RX_0P	DP Channel1 input data pair 0+
13	GND	Ground
14	GND	Ground
15	AUX_C_DAP	DP Channel1 AUX+
16	GND-	Ground
17	AUX_C_DAN	DP Channel1 AUX-
18	DP_2_RX_HPD	DP Channel1 hot-plug detect
19	GND	Ground
20	NC	Not Connect

CN10: USB Connector

Pin No.	Symbol	Description
1	VBUS	VBUS
2	DM0	DATA
3	DP0	DATA
4	GND	Ground

7. CONTROLLER DIMENSIONS



[DIMENSION DOWNLOAD](#)

8. APPLICATION NOTES

A. USING THE CONTROLLER WITHOUT BOTTONS ATTACHED:

This is very straightforward:

- ▷ Firstly setup the controller/display system with the buttons. With the attached controllers and display system active make any settings for color, contrast and image position as required then switch everything off.
- ▷ Remove the control switches, the 7-way cable.
- ▷ 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

B. INVERTER CONNECTION:

There are 3 potential issues to consider with inverter connection:

- ▷ Power
- ▷ ON/OFF
- ▷ Brightness (DIM-ADJ)

Inverter power : This should be matched with the inverter specification.

Inverter ON/OFF : This is a pin provided on some inverter for ON/OFF function and is used by this panel controller for VESA DPMS compliance. If the inverter does not have on/off pin or the on/off pin is not used DPMS will not operate. Pin5 should be matched to the inverter specification for the ON/OFF pin.

Brightness Dimming control : This controller boards are supported analog dimming and PWM dimming control method too. And it is important to consider the specifications for the inverter to be used.

9. APPLICABLE GRAPHIC MODE

The microprocessor measures the, H – sync V – sync and polarity for RGB Inputs, and uses this timing information to control all of the display operation to get the proper image on a screen. This board can detect all VESA standard Graphic modes shown on the table below and Provide more clear and stable image on a screen.

HDMI input format

Mode \ Spec	Horizontal Timing		Vertical Timing	
	Freq.	Active	Freq.	Active
	KHz	Pixel	Hz	Lind
720X480(P)	31.469	720	59.94	480
1280X720(P)	45	1280	60	720
1920X1080(P)	33.75	1920	60	540
720X480(I)	15.734	720	59.94	240
720X576(P)	31.25	720	50	576
1280X720(P)	37.50	720	50	720
1920X1080(I)	28.125	1920	50	540
720X576(I)	15.625	720	50	288
1920X1080(P)	67.432	1920	59.940	1080
1920X1080(P)	56.250	1920	50	1080
1920X1080(I)	26.973	1920	23.976	1080
1920X1080(I)	33.750	1920	30	1080
3840X2160 30Hz		3840	30	2160
3840X2160 60Hz		3840	60	2160

DP input format

Mode \ Spec	Horizontal Timing		Vertical Timing	
	Freq.	Active	Freq.	Active
	KHz	Pixel	Hz	Lind
720X480(P)	31.469	720	59.94	480
1280X720(P)	45	1280	60	720
1920X1080(P)	33.75	1920	60	540
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720X576(P)	31.25	720	50	576
1280X720(P)	37.50	720	50	720
1920X1080(I)	28.125	1920	50	540
720X576(I)	15.625	720	50	288
1920X1080(P)	67.432	1920	59.940	1080
1920X1080(P)	56.250	1920	50	1080
1920X1080(I)	26.973	1920	23.976	1080
1920X1080(I)	33.750	1920	30	1080
3840X2160 30Hz		3840	30	2160
3840X2160 60Hz		3840	60	2160