



APLEX



PhanTAM-1XXA Series

15.6", 18.5", 21.5" Fanless Stainless Steel Display

User Manual

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V1.0

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Revision History

Reversion	Date	Description
1.0	2022/11/04	Official Version

Warning!

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

Disclaimer

This information in this document is subject to change without notice. In no event shall Apex Technology Inc. be liable for damages of any kind, whether incidental or consequential, arising from either the use or misuse of information in this document or in any related materials.

Dear Valued Partners

Thank you for supporting APLEX Technology. Kindly note for PhanTAM series, the pressure testing screw is loosen for half turn before shipment. The purpose is to avoid potential quality concerns caused by radical air pressure change during transportation. This especially applies to air shipment with unpressurized cabin.

Upon receiving the system, please tighten the pressure testing screw before deployment to ensure 100% functionality.

Here is our suggestion:

1. Prepare a 3mm hex screwdriver
2. Tighten the screw (indicated in circle) clockwise until it is well in place
3. Recommend torque is 8~10 kgf-cm

Apologies for any inconveniences caused and thank you for your cooperation.

Yours Sincerely



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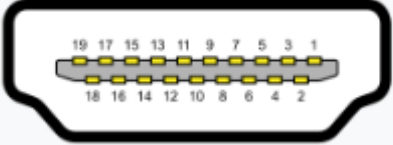

Chapter 1 Getting Started

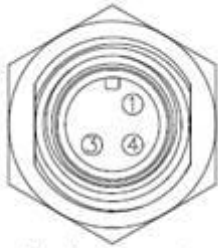
1.1 Features

- 15.6"/21.5" Fanless stainless steel display
- Gap-free sealing and Slim Front Frame architecture
- IP66/IP69K full-sealed with Anti-Corrosion Enclosure
- Special Hygienic Screws on I/O cover
- Optional Robust Waterproof Air Pressure Balance Screw
- M12 Connectors with waterproof cover and chain
- 24V DC power input

1.2 Specifications

		PhanTAM-1XXA Series	
I/O port – Standard m12 I/O Connector on the Rear Side with waterproof			
LVDS	1 x 18/24 bit dual Channel on board		
VGA	1 x M12 for VGA by 12 pin with waterproof cover and chain		 <p>Pin Assignments Front View</p>
		Pin Define	
	1	R	
	2	G	
	3	B	
	4	DDATA	
	5	HSYNC	
	6	GND	
	7	VSYNC	
	8	DCLK	
	9	VCC	
	10	GND	
	11	GND	
	12	GND	

<p>HDMI</p>	<p>1 x M12 17Pin W.F. HDMI with waterproof cap</p> <table border="1"> <thead> <tr> <th colspan="2">Type A (Receptacle) HDMI</th> </tr> </thead> <tbody> <tr><td>1</td><td>TMDS Data2+</td></tr> <tr><td>2</td><td>TMDS Data2 Shield</td></tr> <tr><td>3</td><td>TMDS Data2-</td></tr> <tr><td>4</td><td>TMDS Data1+</td></tr> <tr><td>5</td><td>TMDS Data1 Shield</td></tr> <tr><td>6</td><td>TMDS Data1-</td></tr> <tr><td>7</td><td>TMDS Data0+</td></tr> <tr><td>8</td><td>TMDS Data0 Shield</td></tr> <tr><td>9</td><td>TMDS Data0-</td></tr> <tr><td>10</td><td>TMDS Clock+</td></tr> <tr><td>11</td><td>TMDS Clock Shield</td></tr> <tr><td>12</td><td>TMDS Clock-</td></tr> <tr><td>13</td><td>CEC</td></tr> <tr><td>14</td><td>Reserved (N.C. on device)</td></tr> <tr><td>15</td><td>SCL(I²C serial clock for DDC)</td></tr> <tr><td>16</td><td>SDA(I²C serial data for DDC)</td></tr> <tr><td>17</td><td>DDC/CEC Ground</td></tr> <tr><td>18</td><td>+5 V Power</td></tr> <tr><td>19</td><td>Hot Plug Detect</td></tr> </tbody> </table>	Type A (Receptacle) HDMI		1	TMDS Data2+	2	TMDS Data2 Shield	3	TMDS Data2-	4	TMDS Data1+	5	TMDS Data1 Shield	6	TMDS Data1-	7	TMDS Data0+	8	TMDS Data0 Shield	9	TMDS Data0-	10	TMDS Clock+	11	TMDS Clock Shield	12	TMDS Clock-	13	CEC	14	Reserved (N.C. on device)	15	SCL(I ² C serial clock for DDC)	16	SDA(I ² C serial data for DDC)	17	DDC/CEC Ground	18	+5 V Power	19	Hot Plug Detect	
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		2	NC								
Power	1 x DC power input (9~36V) by M12 3-pin connector			 <p>Pin Assignments Front View</p>							
		<table border="1"> <thead> <tr> <th></th> <th>Pin Define</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>NC</td> </tr> <tr> <td>3</td> <td>VCC</td> </tr> <tr> <td>4</td> <td>GND</td> </tr> </tbody> </table>				Pin Define	1	NC	3	VCC	4
	Pin Define										
1	NC										
3	VCC										
4	GND										
Others	Auto-Dimming Function via TB-45 (option) 1 x Touch on/off button on front bezel Touch on(Default, no pressing); Touch off(option, press downward)										
OSD Control Membrane	OSD on the rear side										
Touch Screen											
Type	Projected capacitive touch screen (for P model)										
Interface	USB										
Light Transmission	Resistive touch window: over 80% Projected capacitive touch screen: over 90%										
Power											
Power Input	DC 24V										
Mechanical											
Construction	304 Stainless steel enclosure (default) 316 Stainless steel enclosure (optional)										
Mounting	VESA 100x100mm, Swing Arm Stand(option)										
Construction	Stainless steel enclosure										
IP Rating	IP66/IP69K										
Environmental											
Operating temperature	0~50°C / -20~60°C for option(no -20~60°C for 21.5" model)										
Storage temperature	-30~70°C										
Humidity	10 to 90% @ 40°C, non- condensing										
Certification	CE / FCC Class A										

- **Power Consumption and Mechanical Specifications**

	PhanTAM-116AP(H)	PhanTAM-121AP(H)
Power Consumption		
Power Consumption	MAX: 12.1W (116AP)	MAX:14.66W (121AP)
Mechanical		
Mounting	VESA mount 100 x 100, Swing ARM Stand	
Dimensions(mm)	404.6 x 255.7 x 64.7	540.5 x 332.9 x 61.5
Net Weight	4.85 Kg	7.6 Kg

- **Standard LCD**

	PhanTAM-116AP	PhanTAM-121AP
Display		
Display Type	15.6" TFT LCD	21.5" TFT LCD
Max. Resolution	1366 x 768 1920 x 1080	1920 x 1080
Max. Colors	16.7M 16.2M	16.7M
Contrast Ratio	500:1 800: 1	1000: 1
Luminance(cd/m ²)	400 nits 450 nits	250 nits
Viewing Angle	170(H) / 160(V) 170(H) / 170(V)	178(H)/178(V)
Backlight Lifetime	50,000 hrs	50,000 hrs
Option	Optical bonding	

- **High Brightness LCD (Option)**

	PhanTAM-116APH	PhanTAM-121APH
Dipslay		
Display Type	15.6" TFT LCD	21.5" TFT LCD
Max. Resolution	1366 x 768 1920 x 1080	1920 x 1080
Max. Colors	16.7M 16.2M	16.7M
Contrast Ratio	500:1 800: 1	1000: 1
Luminance(cd/m ²)	1000 nits	1000 nits
Viewing Angle	160(H) / 160(V) 170(H) / 170(V)	178(H)/178(V)
Backlight Lifetime	50,000 hrs	50,000 hrs
Option	Optical bonding	

1.3 Dimensions

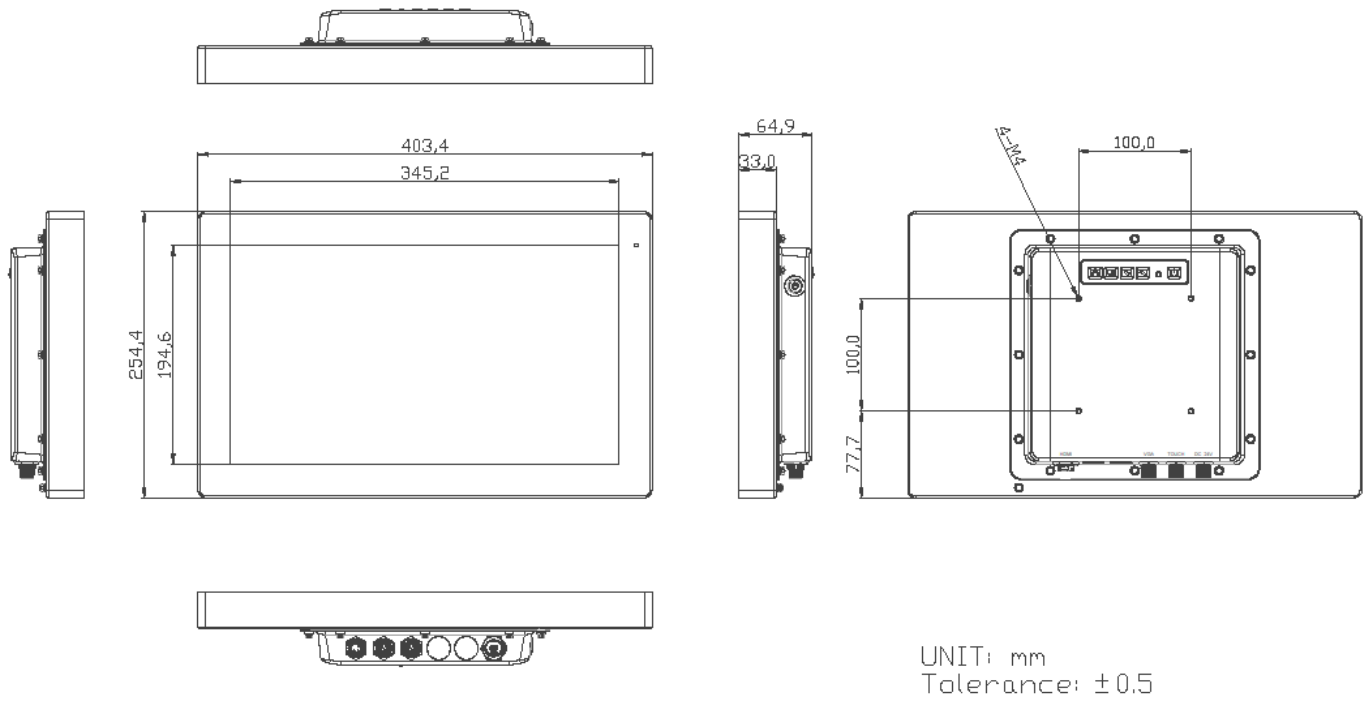


Figure 1.1: Dimensions of PhanTAM-116AP(H)

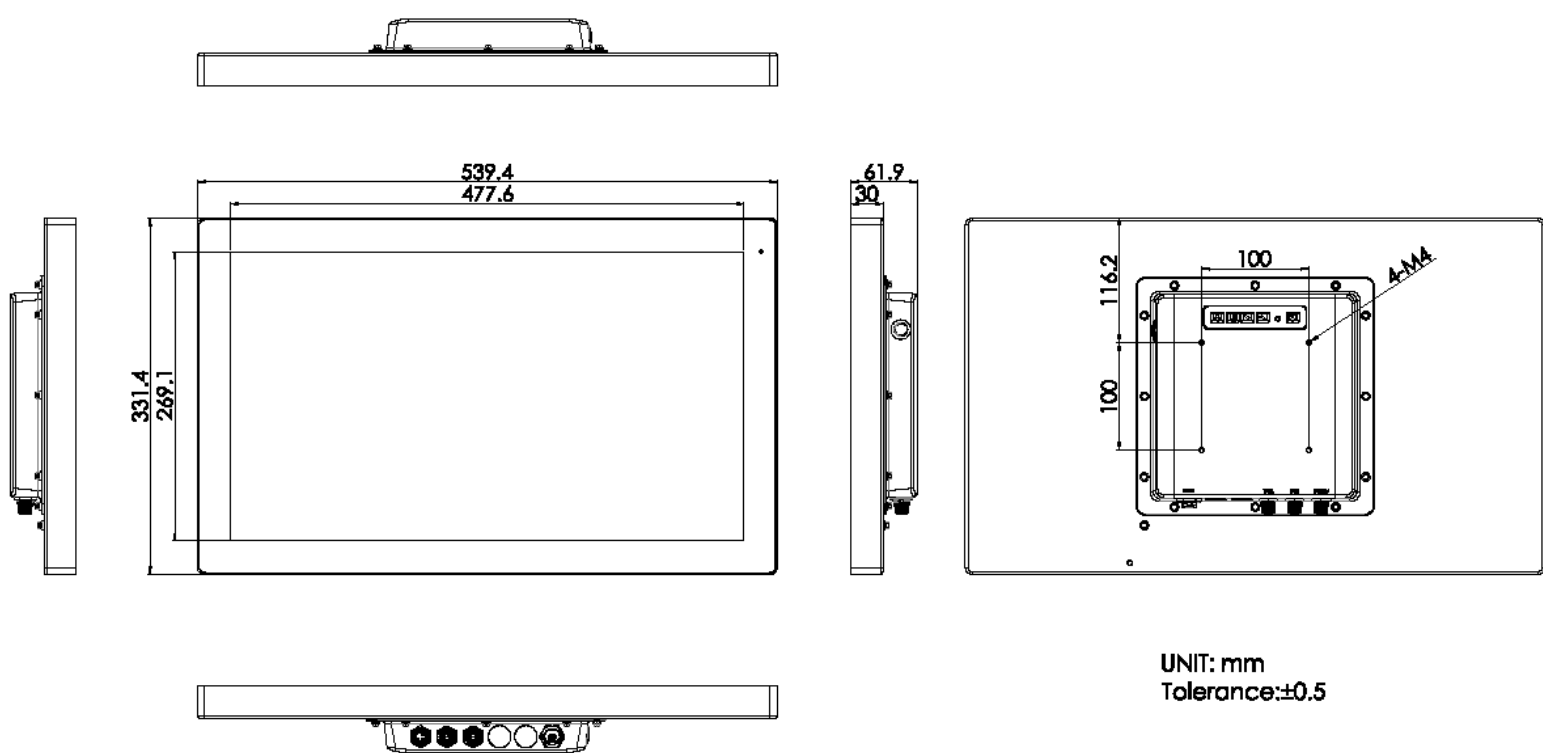


Figure 1.2: Dimensions of PhanTAM-121AP(H)

1.4 Brief Description of PhanTAM-1XXA Series

PhanTAM-1XXA series with TB-6030 AD board is an IP66/IP69K rated with M12 connectors new generation stainless steel display, which comes with 15.6" and 21.5" color TFT LCD. PhanTAM-1XX series are DC 24V power input and true flat front bezel designed with grade 304 stainless steel enclosure (grade 316 is for option). Furthermore, the models support projected capacitive touch, and can be high brightness LCD and optical bonding designed for option. It supports touch on/off button on the side edge for hygienic cleaning and ergonomic versatile mounting: space-saving VESA mounting and Swing Arm Stand.



Figure 1.3: Front View PhantAM-116AP(H)



Figure 1.4: Rear View of PhantAM-116AP(H)

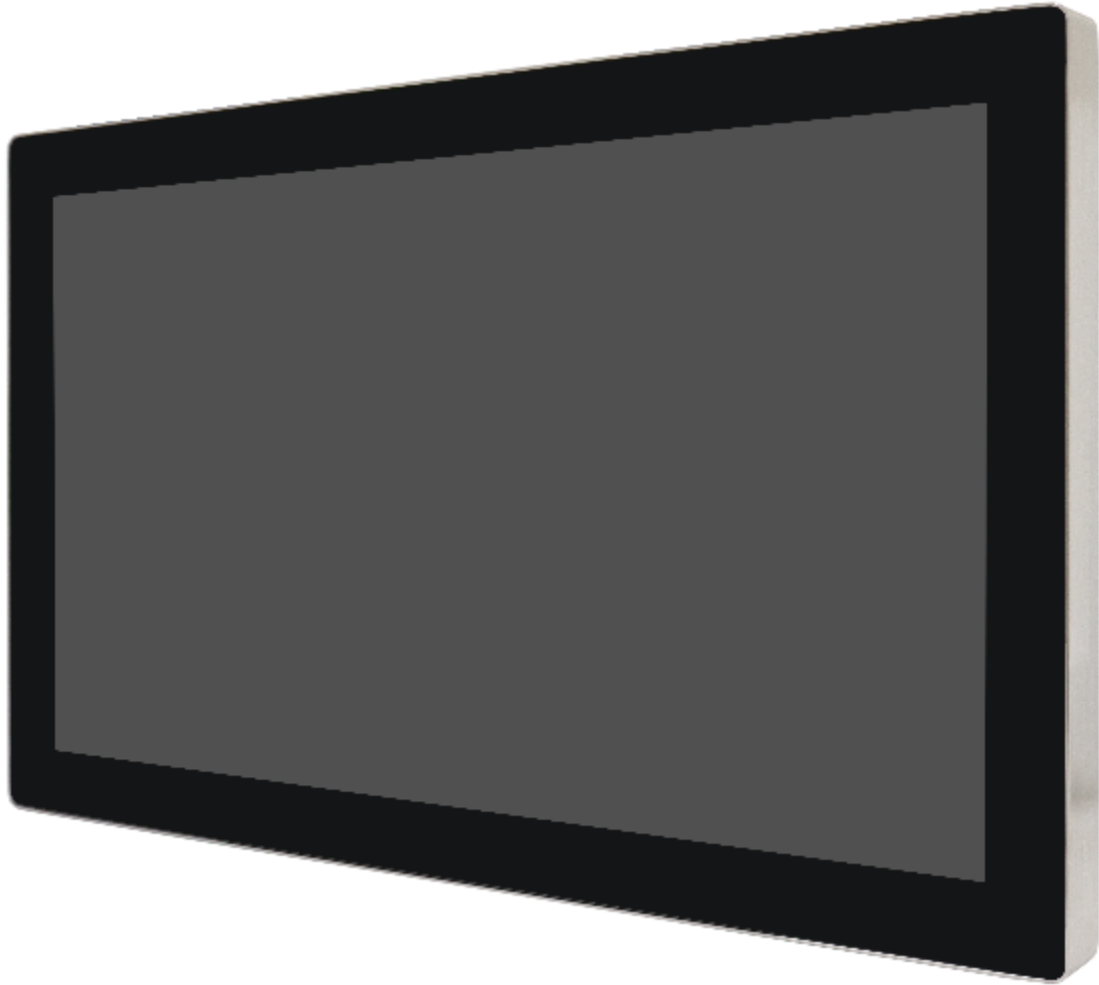


Figure 1.5: Front View of PhantAM-121AP(H)



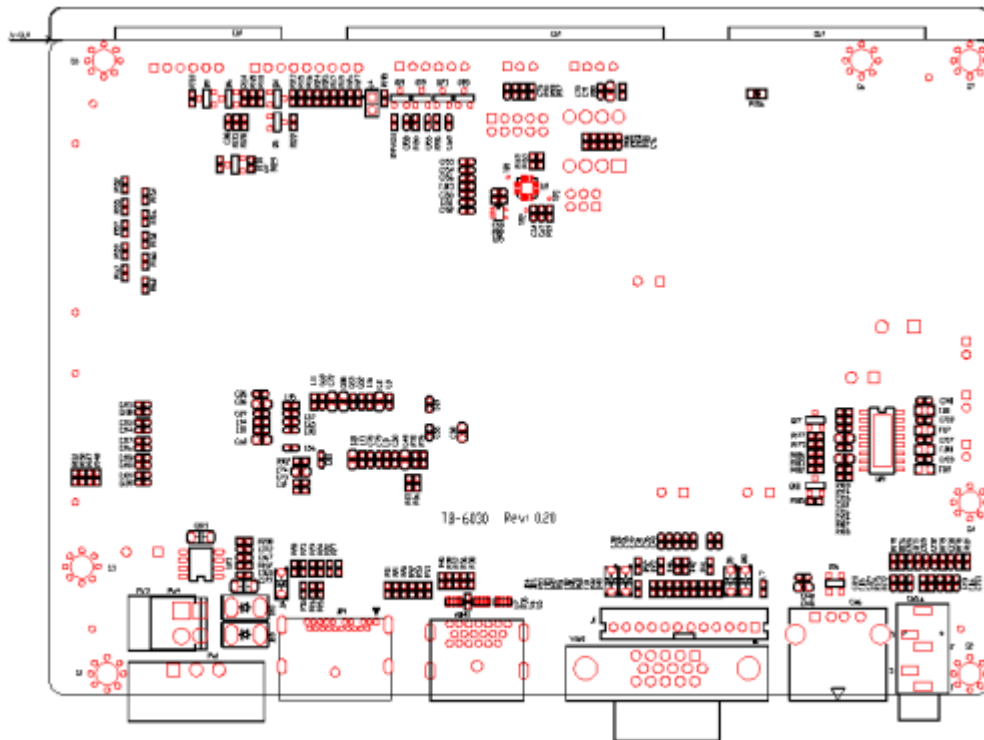
Figure 1.6: Rear View of PhantAM-121AP(H)

Chapter 2 Hardware

2.1 AD Board Specifications

Main Controller IC	Realtek RTD2556QR-CG
Video Input	1 x DP via DP Connector 1 x HDMI via HDMI Connector 1 x VGA via female 15pin 3 row D-sub
Video Output	1 x 18/24-bit dual channel LVDS w/USB2.0 for PCAP touch via DF13-40DP
High Brightness LCD Backlight Power	Backlight control, Backlight enable and DC 12V output via pitch2.0mm 6pin wafer (INVT)
Backlight Control	Support PWM control only
Auto Dimming	Support auto dimming 1 x Ambient light sensor via pitch2.0mm 3pin wafer (Minimum Brightness: 5%, Maximum Brightness: 100% @Ambient Illuminance is 700lux)
RTW Interface (Reserve)	Onboard USB interface touch controller IC Support RTW via pitch2.0mm 9pin wafer
USB Input	1 x USB2.0 input via USB type-A
Audio	Lin-in via 1 x 3.5mm audio jack Support 2x2W speaker via 2 x pitch2.0mm 2pin wafer (SPKL,SPKR)
OSD Function	Support OSD control via 1 x pitch2.0mm 9pin wafer
Power Input	DC 24V input only
Connector	Dinkle_ECH350RM-3P Dinkle_ESK381R-02P/Changjiang Connectors_A3963WR-2P (Co-lay)

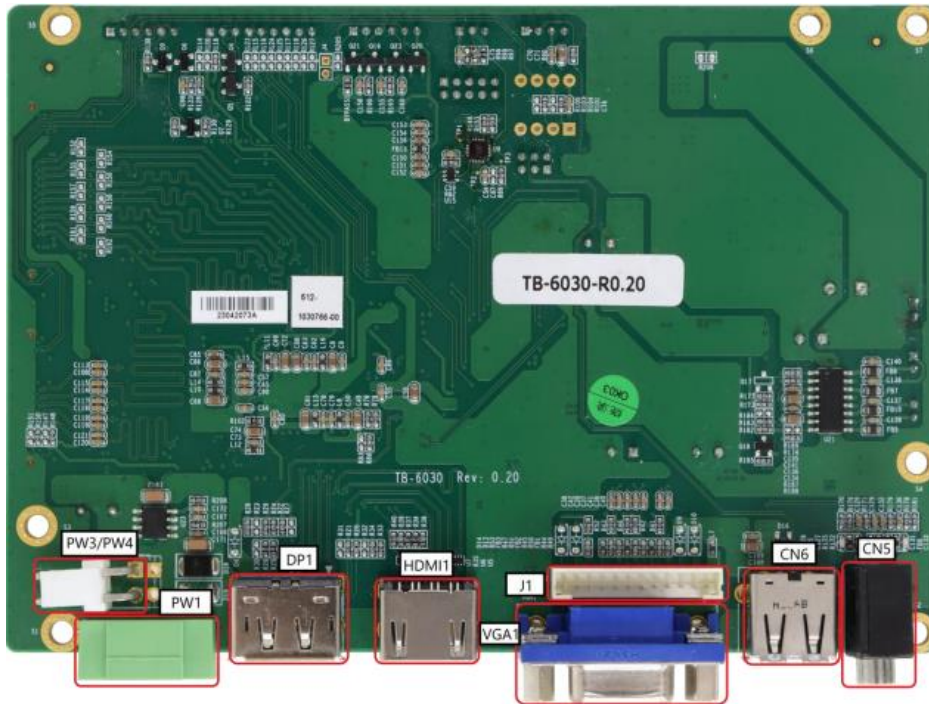
2.2 AD Board Dimensions



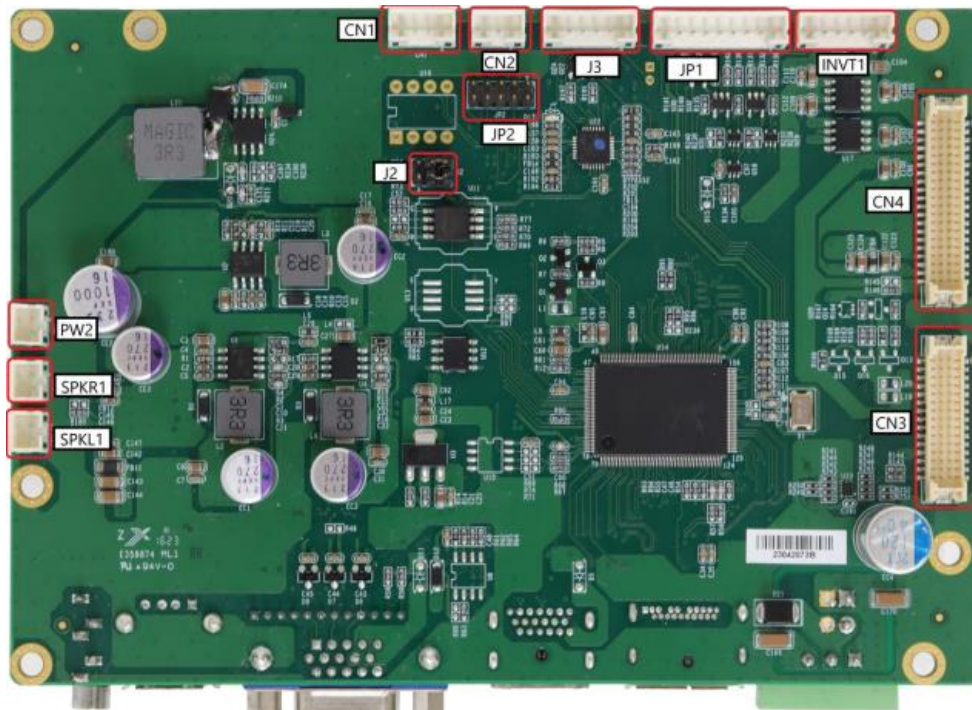
146 x 102 (units :mm)

2.3 Jumpers and Connectors Location

Top Side



Bottom Side



External IO



2.4 Jumpers and Connectors

1. DP1 (Display Port Input):



(DisplayPort Connector), DisplayPort Interface connector, provide high-quality video and audio input.

Signal Name	Pin#	Pin#	Signal Name
LANE3-	1	2	GND
LANE3+	3	4	LANE2-
GND	5	6	LANE2+
LANE1-	7	8	GND
LANE1+	9	10	LANE0-
GND	11	12	LANE0+
GND	13	14	GND
AUX_CHP	15	16	DP CAB DET
AUX_CHN	17	18	DP HPD
RETURN	19	20	DP 3.3V

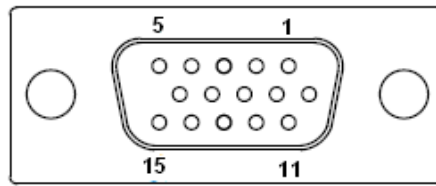
2. HDMI1 (HDMI Input):



(HDMI Connector), High Definition Multimedia Interface connector, provide high-quality video and audio input.

Signal Name	Pin#	Pin#	Signal Name
DATA2+	1	2	GND
DATA2-	3	4	DATA1+
GND	5	6	DATA1-
DATA0+	7	8	GND
DATA0-	9	10	CLK+
HDMI CAB DET	11	12	CLK-
NC	13	14	NC
HDMI SCL	15	16	HDMI SDA
GND	17	18	HDMI 5V
HDMI HPD	19		

3. VGA1 (VGA Input):



(CRT DB15 Connector), Video Graphic Array Port, provide high-quality video input.

Pin#	Signal Name
1	CRT_RED
2	CRT_GREEN
3	CRT_BLUE
4	GND
5	GND
6	R
7	G
8	B
9	VGA_5V
10	DET_VGA
11	GND
12	DDCA-SDA
13	HSYNC
14	VSYNC
15	DDCA-SCL

4. J1 (VGA input):

(2.0mm Pitch 1 x 12 Pin Wafer), Video Graphic Array Port, provide 12Pin cable to VGA output.

Pin#	Signal Name
1	GND
2	VSYNC
3	HSYNC
4	GND
5	CRT_RED
6	GND
7	CRT_GREEN
8	GND
9	CRT_BLUE

10	GND
11	DDCA-SDA
12	DDCA-SCL

5. CN1 (IR Connect): Reserved

(2.0mm 1x4 Pin wafer connector), Reserved for IR receiver.

Pin#	Signal Name
1	GND
2	IR
3	3.3V
4	NC

6. CN2:

(2.0mm 1x3 Pin wafer connector), for external light sensor.

Pin#	Signal Name
1	5V
2	Sensor
3	GND

7. JP1 (OSD):

(2.0mm 1x9 Pin wafer connector), On Screen Display menu Control connector.

Pin#	Signal Name
1	Power Key
2	R_LED
3	G_LED
4	GND
5	MENU Key
6	Down Key
7	UP Key
8	Select Key
9	NC

8. CN3: Reserved

9. CN4 (LVDS Output):

(1.25mm Pitch 2x20 Connector), for 24-bit output connector, the interface features dual channel 18/24-bit output.

Signal Name	Pin#	Pin#	Signal Name
LVDS_12V	1	2	LCDS_12V
BKLT_CTRL	3	4	BKLT_EN
GND	5	6	GND
LVDS_VCC5	7	8	LVDS_VCC5
LVDS_VCC3	9	10	LVDS_VCC3
GND	11	12	GND
TXA0N	13	14	TXA0P
TXA1N	15	16	TXA1P
TXA2N	17	18	TXA2P
TXA3N	19	20	TXA3P
TXACN	21	22	TXACP
TXB0N	23	24	TXB0P
TXB1N	25	26	TXB1P
TXB2N	27	28	TXB2P
TXBCN	29	30	TXB3P
TXB3N	31	32	TXBCP
LVDS_DDC_DET	33	34	GND
CPT-USB_N	35	36	CPT-USB_P
DDCSDA_AUTO	37	38	LVDS_USB_5V
DDCSCL_AUTO	39	40	LVDS_VCC3

10. INVT1:

(2.0mm Pitch 1x6 wafer Pin Header), Backlight control connector for LVDS.

Pin#	Signal Name
1	LVDS_DC12V
2	LVDS_DC12V
3	Ground
4	Ground
5	BKLT_EN
6	BKLT_CTRL

11. SPKL1 (Audio output):

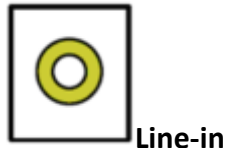
(2.0mm 1x2Pin wafer connector), Amplifier left channel output.

Pin#	Signal Name
1	L+ (output)
2	L- (output)

12. SPKR1 (Audio output):

(2.0mm 1x2 Pin wafer connector), Amplifier right channel output.

Pin#	Signal Name
1	R+ (output)
2	R- (output)

13. CN5 (Line In):

(Diameter 3.5mm Jack) Use for the connection of external audio source via a Line-in cable.

14. CN6(USB2.0):

(USB Type-A), for external USB2.0 signal input.

Pin#	Signal Name
1	USB 5V
2	USB-
3	USB+
4	GND

15. J2:

(2.0mm Pitch 2x3 Pin Header), RS232 or USB input for PM6000 Touch Controller Signal jumper setting.

J2	PM6000 input Signal	CN4/USB output
Close (3-5,4-6)	NC	
Close (1-3,2-4)	USB (CN6)	NC
Close (1-3,2-4)	RS232 (CN7)	NC
Close (1-3,2-4)	RS232 (CN7)	NC

16. J3:

(2.0mm Pitch 1x6 Pin Wafer), touch screen connecting lines.

Pin#	4-Wire	5-Wire
1	N/A	Sense(S)
2	Right	LR
3	Left	LL
4	Bottom	UR

5	Top	UL
6	GND	GND

17. PW1:

(3.50mm Pitch 3-Pin Terminal Block), DC24V power input connector.

PW1 (Dinkle ECH350RM-03P)

Pin#	Power Input
1	DC+24V
2	Ground
3	FG

18. PW3/PW4: Co-lay, Default PW3

(3.50mm Pitch 2-Pin Terminal Block), DC24V power input connector.

PW3/PW4 (PW3: Dinkle ESK381R-2P PW4: CJT A3963WR-2P)

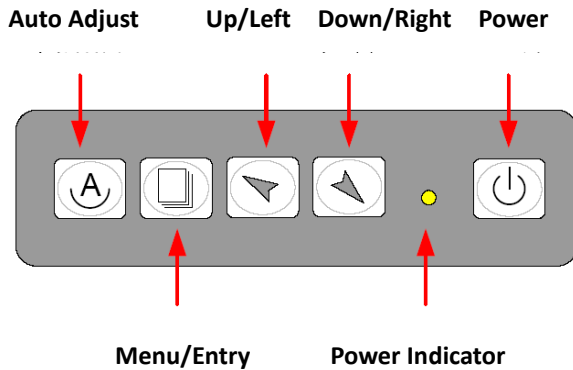
Pin#	Power Input
1	DC+24V
2	Ground


19. PW2 (DC12V output):

(2.0mm Pitch 1x2 Pin Wafer), provide DC12V output.


Pin#	Power Input
1	DC+12V
2	Ground

3.1 AD Board OSD Functions




 Power switch: To turn ON or OFF the power



 Shift the icon to the right side or shift it up

 Shift the icon to the left side or shift it down



 Menu: To enter OSD menu for related icon and item.

 Auto Button: One-touch auto adjustment





1.) Getting into Burn-in Mode

Before setting into a burn-in mode, first disconnect the AC power cord. Then press (don't let them go) the   buttons until the AC power cord is connected and the "RGB" appears on the top left corner of your screen. Now it can be put into the burn-in mode for changing colors.

2.) Getting Out of Burn-in Mode










Before getting out of the burn-in mode, please first disconnect the AC power cord. Then press the  button (if not workable, press the  button and don't let them go) until the AC power cord is connected. Please don't let your fingers go until the AC power cord is connected again and the wording of "RGB" appears on the top left corner of your screen, and wait for 3 second. Under the non-signal entry situation, if **Cable Not Connected** is seen, exit is thus successfully made.

When the Burn-in Mode is Unable to Eradicate...

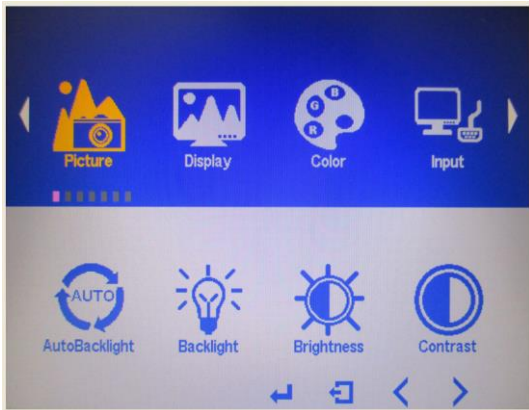
- 1.) If the “RGB” is still on the top left corner of the screen, press  to enter “Miscellaneous” and choose “Reset”, and then **Yes**, and press . When the screen goes black, disconnect power and repeat the above steps.
- 2.) If the “RGB” is not found, disconnect the AC power cord first. Then press the   buttons (don't let them go) until the AC power cord is connected, and wait for 2 to 3 seconds. When “RGB” appears, repeat the above steps.

3.2 OSD Controls

To make any adjustment, select the following:

20. Press  (Menu) to show the OSD menu or disable the OSD menu.
21. Select the icon that you wish to adjust with the ( /  or +/-) key in the menu.
22. Press  (Menu) and then choose the item with the ( /  or +/-) key.
23. Press  (Menu) and then adjust the quality with the ( /  or +/-) key.

3.3 Main Menu



In the **PICTURE**, there are the following items:

- AutoBacklight
- Backlight
- Brightness
- Contrast
- Sharpness
- Exit



AutoBacklight



Backlight



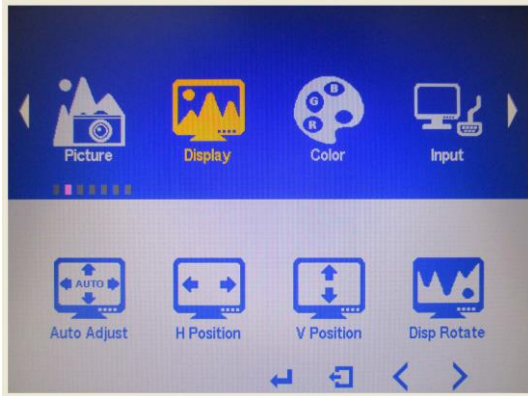
Brightness



Contrast



Sharpness

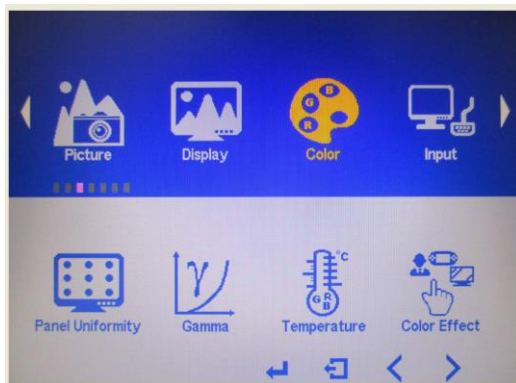


In the **DISPLAY**, there are the following items:

- AutoAdjust
- H Position
- V Position
- Disp Rotate
- Exit

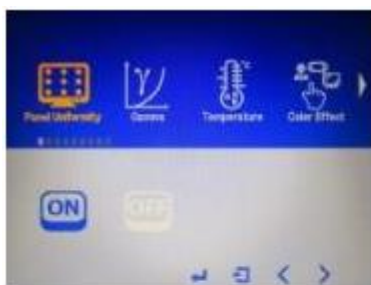


Disp Rotate



In the **COLOR**, there are the following items:

- Panel Uniformity
- Gamma
- Color Temp
- Color Effect
- Exit



Panel Uniformity



Gamma

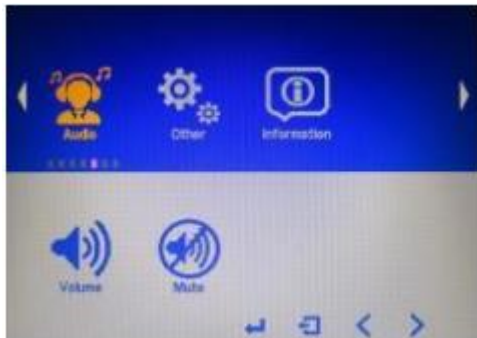


Temperature



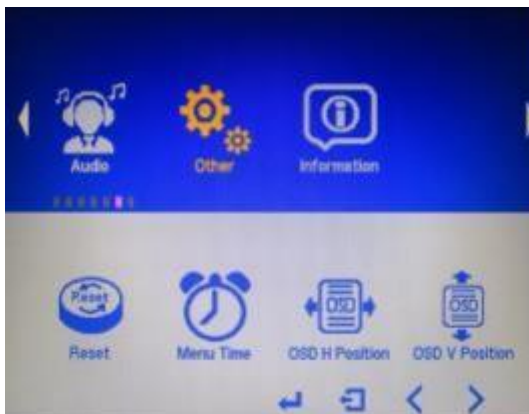
In the **INPUT**, there are the following items:

- Auto Select
- DP
- HDMI
- Exit



In the **AUDIO**, there are the following items:

- Volume
- Mute
- Exit



In the **OTHER**, there are the following items:

- Reset
- Menu Time
- OSD H Position
- OSD V Position
- Exit

Appendix A: Swing Arm Stand Installation

The PhanTAM-1XX Series model can use Swing Arm, install as shown in Picture below.

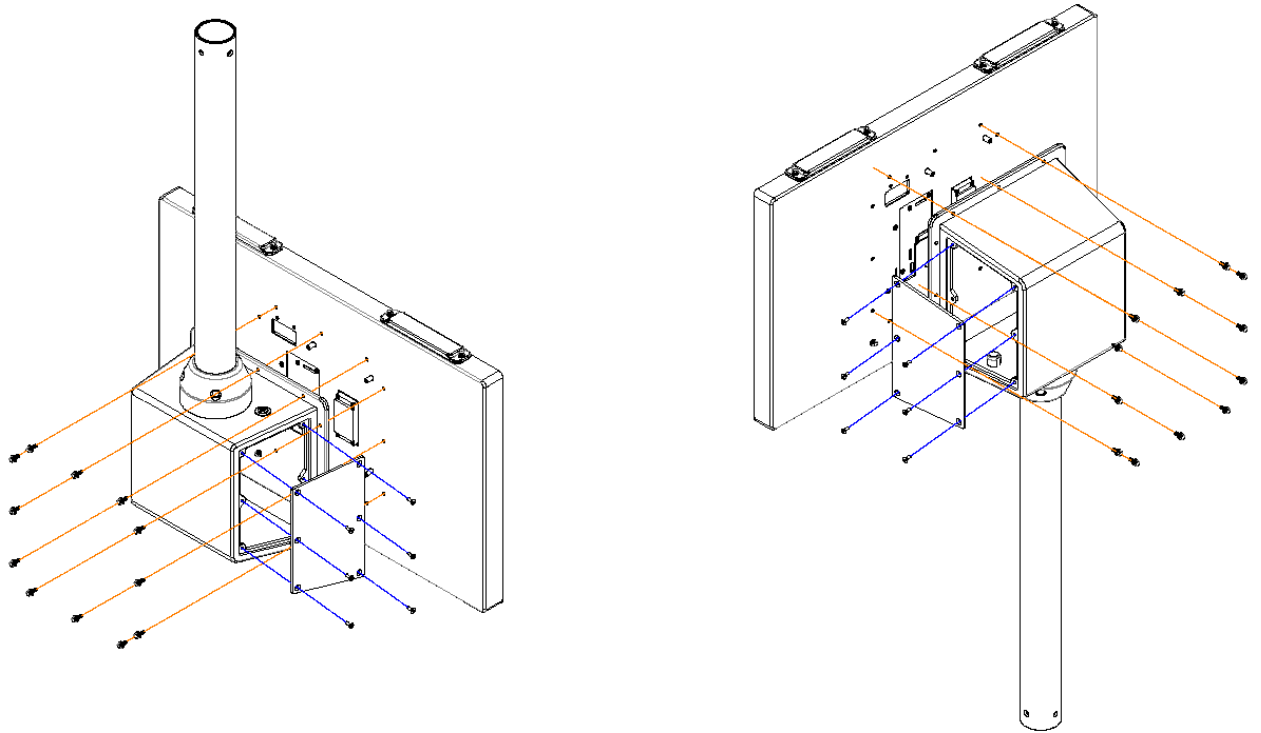


Figure A: Swing Arm of PhanTAM-1XXA Series