



§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No: **LP070A065P-FNR**

Description: **7" Digital TFT-LCD Module**

SPEC No.: **SAS-1603004**

Version: **0.3**

Issue Date: **December 5, 2016**

※ This approval sheet contains 19 pages including the cover and appendix.

Customer:	Approved By:
Date: / / 16	

Approved By:

Checked By:

Designed By:



1. General Description

1.1 Features

- 7" (1024x600) Digital TFT LCD
- Aspect Ratio: 16:9
- Input Signal HDMI 1.3a
- Maximum Support Resolution 1920x1080
- Headphone Driver, 46mW@32Ω
- Projected Capacitive Touch
- 5 Key Buttons Control
- UART / RS232 Serial Remote Control (Option)
- 8 Language OSD Menu
- LED Backlight
- Single Operation Voltage +5V

1.2 Applications

- Industrial
- Medical Environment
- Instrument Display
- Kiosk
- Security
- Signage
- Office Electronics
- Home Application
- Educate Application

2. Contents

Contents	Page
1. General Description.....	1
1.1 Features	1
1.2 Applications	1
2. Contents.....	2
3. Specifications.....	3
4. Block Diagram.....	3
5. Order Information.....	4
6.1 Unit	4
6. Accessories (Option).....	5
7. Operation manual / Connection.....	6
12.1 Driver Board Manual	6
8. Pin Description.....	7-8
8.1 J101 : Pin Assignment of Power Input (DC-Jack Inside Diameter:2.5 ϕ Outside Diameter:5.5 ϕ Side Entry Type)	7
8.2 J702: Pin Assignment of UART (Pitch 1.25mm 4Pin, Top Entry Type)	7
8.3 J401 : Pin Assignment of HDMI-A Type Input (HDMI 1.3a -19Pin Female)	7
8.4 J601D : Pin Assignment of Key Board (Pitch 1.25mm 12Pin , Side Entry Type) (Option)	8
8.5 J701 : Pin Assignment of Touch USB (USB A Type - Female 2.0mm, Side Entry Type)	8
8.6 J301 : Pin Assignment of Phone Jack (Outside Diameter:3.5 ϕ Side Entry Type)	8
9. Absolute Maximum Ratings.....	9
9.1 Absolute Maximum Ratings	9
10. Recommended Operating Conditions.....	9
10.1 Electrical Characteristics	9
10.2 Support Display Mode Characteristics	9
11. Projected Capacitive Touch Panel Characteristics.....	10
11.1 Electrical Performance	10
11.2 Optical Performance	10
11.3 Mechanical Performance	10
11.4 Touch Panel Operation System Support	10
12. Key Function by OSD.....	11-14
14.1 Menu Operation	11-14
13. Dimension Information.....	15
7.1 Unit (LP070A065P-FNR)	15
14. Installation Recommendations.....	16-17
14. Appendix.....	18
14.1 TFT-LCD Mechanical Specifications	18
14.2 TFT-LCD Optical Characteristics	18

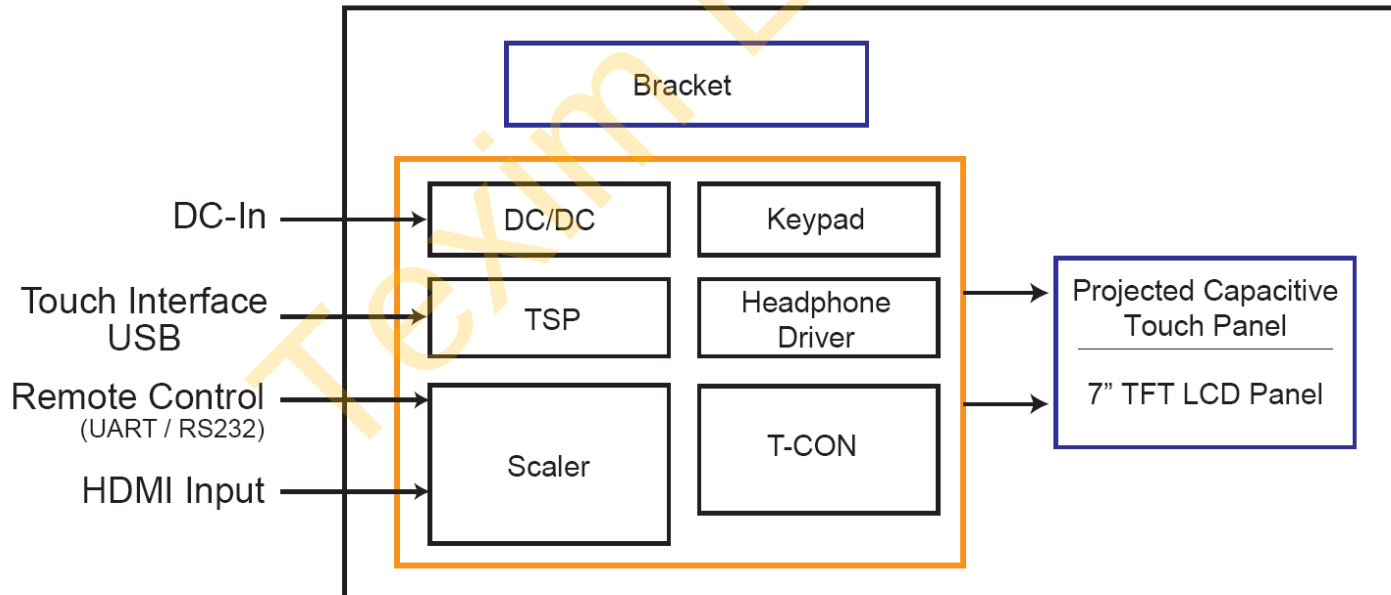
3. Specifications

LCD	
Panel Size	7"
Resolution (Pixels)	1024x600
Color	262K
Luminance	213 cd/m ²
Contrast Ratio	700
Viewing Angle	75 / 75 / 70 / 75
LED Life Time	15K (Min)
Power Requirement	
Power Input (DC Jack 2.5 ϕ)	+5V _{DC}
Power Consumption	3.6 Watts
Touch Screen	
PCAP Type	USB Interface
Projected Capacitive Touch Support OS	Windows / Linux

Input Signal	
HDMI	1.3a
Audio	
Headphone Driver	46mW@32 Ω Phone Jack ϕ 3.5
Controls	
Key	5 Buttons
Serial Remote Control	UART / RS232 (Option)
Environment	
Operating Temp.	-10~+40 $^{\circ}$ C
Storage Temp.	-20~+60 $^{\circ}$ C
High Temperature & High Humidity (Non-condensing)	+40 $^{\circ}$ C / 90%

4. Block Diagram

LP070A065P-FNR



5. Order Information

5.1 *Unit*

Parameter	LP070A065P-FNR	Unit	Remark
HDMI	◎		
Touch Panel Type	Projected Capacitive Touch		
Touch Screen Interface	USB		
Headphone Driver	◎		
5 Keys	◎		
UART Remote Control	◎		
Dimension	179.8x137.8x25.1	mm	
Weight	409	g	±10%
Condition	Standard		

Note: 1.The assembling of panel and bracket is aimed for delivery, packaging and experiment. If the demand of shockproof and long-term fix, pls have it into consideration of mechanism design.

Optional Functions	
Parameter	- RS232 Remote Control - External Key - Accessories (Refer to Page 5)

6. Accessories (Option)

Before you begin installing the KIT, please make sure that the following materials have been shipped:



A. LASTD05030-FDR



B. LAAC818000-FDR



C. LACABLE068-FDR



D. LAUSB18000-FDR



E. LACABLE070-FDR

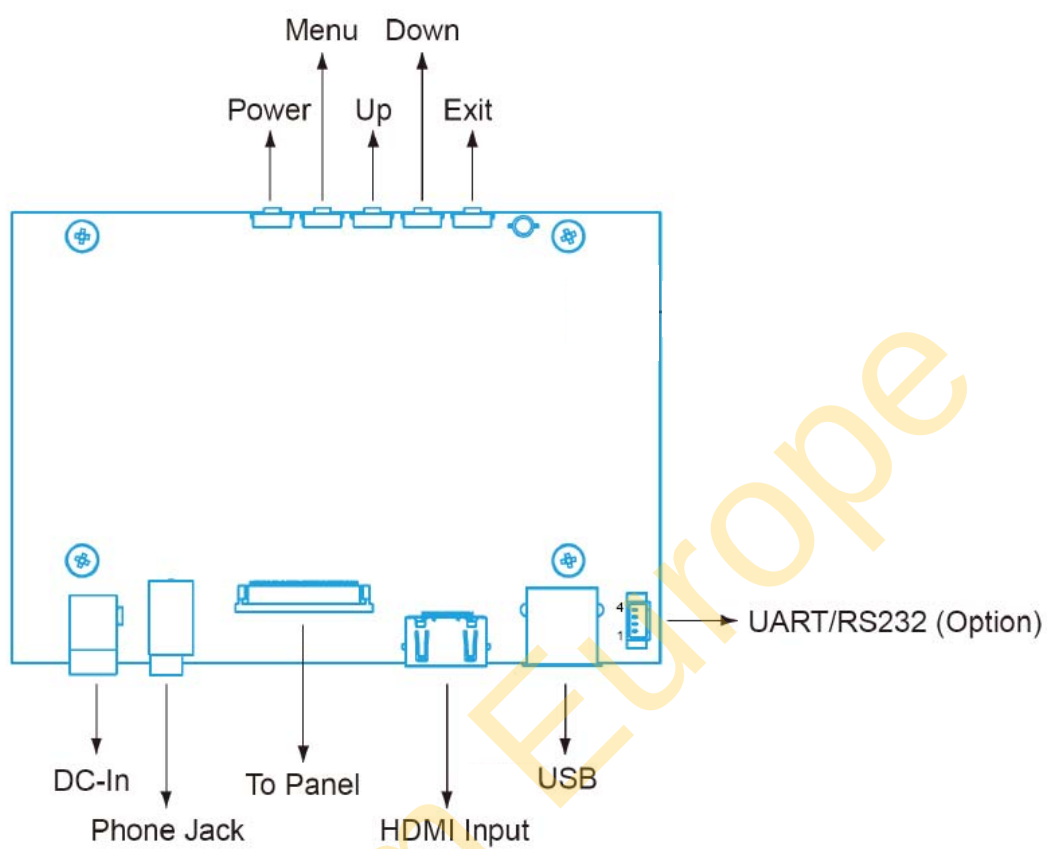


F. LAVCD00002-FDR

- A. AC to DC Adapter (L:1500mm,100-240V_{AC} 50-60Hz to +5V_{DC} @ 3A, ϕ 2.5)
- B. Power Cord (L:1800mm, Plug Type B for USA)
- C. HDMI Cable (L:1800mm)
- D. USB Cable (L:1800mm)
- E. AUDIO Cable (L:1800mm)
- F. Touch Screen Driver CD Disk / User Manual

7 Operation manual / Connection

7.1 Driver Board Manual



8. Pin Description

8.1 J101 : Pin Assignment of Power Input (DC Jack Inside Diameter:2.5 ϕ Outside Diameter:5.5 ϕ Side Entry Type)

Pin No.	Symbol	I/O	Description	Remark
1	DC-In	I	+5 Vdc Input Voltage	
2	GND	-	Power Ground	

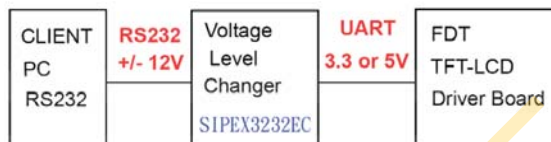
8.2 J702 : Pin Assignment of UART (Pitch 1.25mm 4Pin, Top Entry Type)

※ FDT Connector Part No.: MS24014 (STM) [Same as 53398-0471 (MOLEX)] ;

※ FDT Matching Connector Part No.: P24014 (STM) [Same as 51021-0400 (MOLEX)].

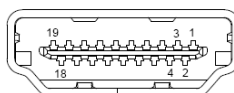
Pin No.	Symbol	I/O	Description	Remark
1	TX / RS232 TX (Option)	O	UART / RS232 (Option) Transmission Data	
2	RX / RS232 RX (Option)	I	UART / RS232 (Option) Receive Data	
3	GND	-	Ground	
4	+3.3Vdc	O	+3.3Vdc Output Voltage	

Note: All Functions can be controlled by UART , About UART command list please contact FDT sales.



8.3 J401 : Pin Assignment of HDMI-A Type Input (HDMI 1.3a -19Pin Female)

Pin No.	Symbol	I/O	Description	Remark
1	DATA2+	I	Positive HDMI Input for B Link Data Channel 2	
2	DET_HDMI	-	HDMI Detect	
3	DATA2-	I	Negative HDMI Input for B Link Data Channel 2	
4	DATA1+	I	Positive HDMI Input for B Link Data Channel 1	
5	GND	-	Ground	
6	DATA1-	I	Negative HDMI Input for B Link Data Channel 1	
7	DATA0+	I	Positive HDMI Input for B Link Data Channel 0	
8	GND	-	Ground	
9	DATA0-	I	Negative HDMI Input for B Link Data Channel 0	
10	DCLK+	I	Positive HDMI Input for B Link Clock Channel	
11	GND	-	Ground	
12	DCLK-	I	Negative HDMI Input for B Link Clock Channel	
13	NC	-	No Connection	
14	NC	-	No Connection	
15	HDMI_SCL	I	DDC2 Clock	
16	HDMI_SDA	I	DDC2 Data	
17	GND	I	DDC/CEC Ground	
18	HDMI5V	I	HDMI +5Vdc Input	
19	HDMI_HPD	I	Hot Plug Detect	



8.4 J601D : Pin Assignment of Key Board (Pitch 1.25mm 12Pin , Side Entry Type)(Option)

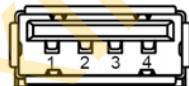
※ FDT Connector Part No.: MS240112R (STM) [Same as 53261-1219 (MOLEX)] ;

※ FDT Matching Connector Part No.: P240112 (STM) [Same as 51021-1200 (MOLEX)].

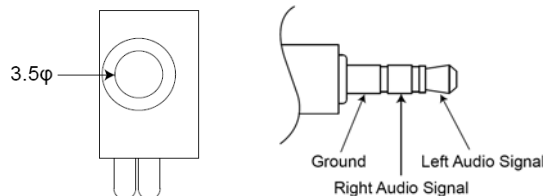
Pin No.	Symbol	I/O	Description	Remark
1	-	-	Don't Connect	
2	SW5	I	EXIT	
3	SW4	I	DOWN	
4	SW3	I	UP	
5	SW2	I	MENU / S	
6	SW1	I	POWER / SOURCE	
7	GND	-	Ground	
8	VDDP	-	VDDP +3.3Vdc Output Voltage	
9	-	-	Don't Connect	
10	RED	O	Indicator red LED for power off control	
11	GREEN	O	Indicator green LED for power on control	
12	GND	-	Ground	

8.5 J701 : Pin Assignment of Touch USB (USB A Type - Female 2.0mm, Side Entry Type)

Pin No.	Symbol	I/O	Description	Remark
1	VBUS	-	USB VCC	
2	D-	-	DATA (-)	
3	D+	-	DATA (+)	
4	DGND	-	Digital Ground	



8.6 J301 : Pin Assignment of Phone Jack (Outside Diameter:3.5 φ Side Entry Type)



9. Absolute Maximum Ratings

9.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	V _{in}	+4.5	+6	V	
Digital Input Signal	TTL	0.3	3.6	V	
HDMI Input Signal		-	165	MHz	
Operating Temp.		-10	+40	°C	
Storage Temp.		-20	+60	°C	
High Temperature & High Humidity (Non-condensing)		-	+40 / 90	°C / %	

10. Recommended Operating Conditions

10.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	DC-in	I	+4.8	+5	+5.8	V	
Total Current	I _{in}	I	-	720	-	mA	+5V
Power Consumption		I	-	3.6	-	W	±15%
Output Voltage	VDD	O	3.2	3.3	3.4	V	
HDMI Input Signal			-	-	165	MHz	

10.2 Support Display Mode Characteristics

Dots per inch	H	Unit	Polarity	V	Unit	Polarity	Note
800 × 600	37.88	KHz	Positive	60.3	Hz	Positive	
1024 × 600	37.54	KHz	Positive	60	Hz	Positive	
1024 × 768	48.36	KHz	Positive	60	Hz	Positive	
1280 × 1024	63.98	KHz	Positive	60	Hz	Positive	
1600 × 1200	75	KHz	Positive	60	Hz	Positive	
1920 × 1080	67.5	KHz	Positive	60	Hz	Positive	

11. Projected Capacitive Touch Panel Characteristics

11.1 Electrical Performance

Parameter		Symbol	Remark
Operating Voltage		DC 5.0 V	
Operating Current		30 mA	
Circuit Resistance	X-axis	< 100 K	Connector
	Y-axis	< 100 K	Connector
Insulation Resistance		$\geq 100 \text{ M}\Omega$	DC15V
Chatting		$\geq 50 \text{ ms}$	DC3.3V
Interface		USB	
Report Rate		> 100 Frames/sec	

11.2 Optical Performance

Parameter	Specifications
Transmittance	Min 85%

11.3 Mechanical Performance

Parameter	Specifications	Remark
Finger knocking durability	$\geq 1 \text{ Million times}$	End shape: R = 8mm, Hardness 50~60 degree Load force: 250 gf Frequency: 5 Hz
Input method	Finger	
Surface hardness	7H	750 gw

11.4 Touch Panel Operation System Support

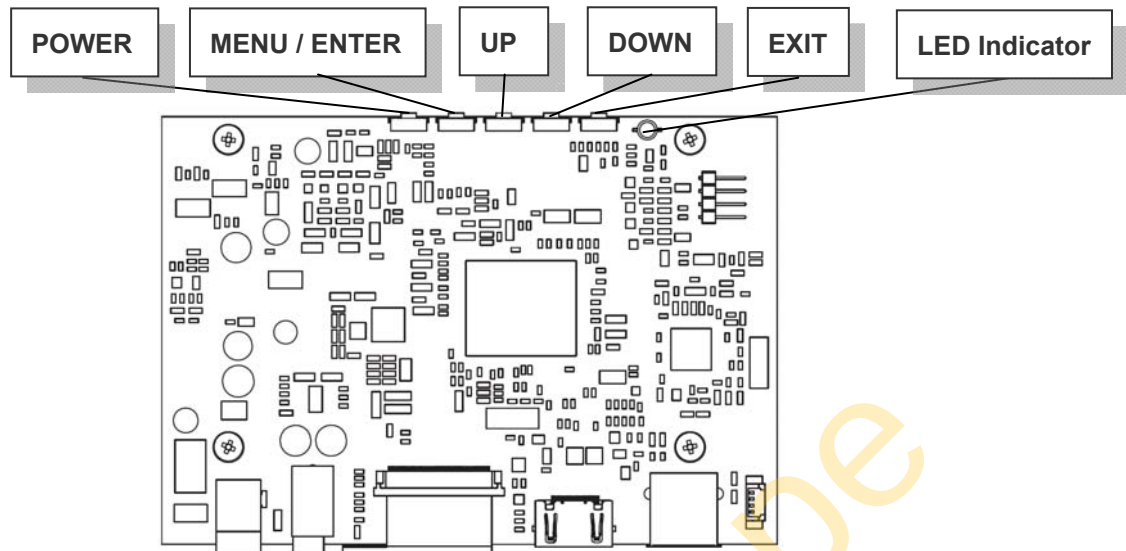
Driver Vender : ITE (ITE Tech. Inc.)

OS	Version	Interface
Windows	Windows 7	USB
	Windows 8 / 8.1	
Linux	Kernel 3.0.8 and above	USB

Note: How to use Touch Driver, please refer to Readme of Touch Screen Driver CD Disk (LAVCD00002-FDR).

12. Key Function by OSD

12.1 Menu Operation

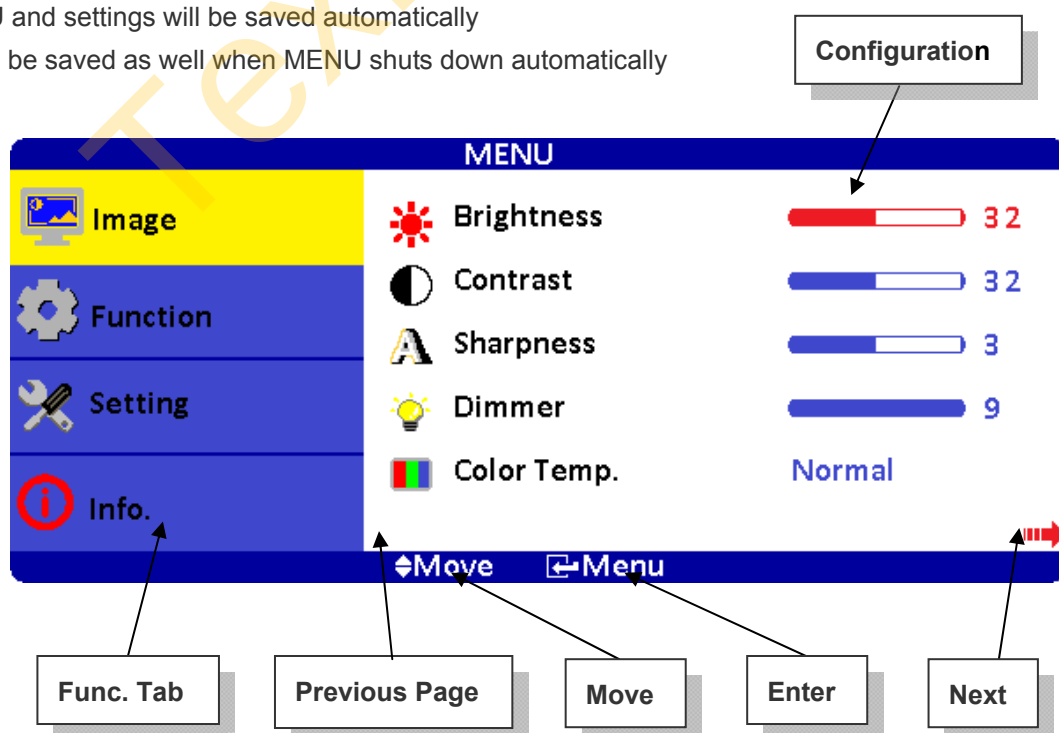


OSD ICON Instructions :

1. POWER : Power On/Off
2. MENU / ENTER : (After turning on MENU, only ENTER is available)
3. UP : Move Upward / Increase Value / Option Switch
4. DOWN : Move Downward / Decrease Value / Option Switch
5. EXIT : Return to Previous Page
6. LED Indicator
 - Waiting : Flickering Green
 - Power ON : Green
 - Power OFF : Red

Save OSD Setting:

1. EXIT MENU and settings will be saved automatically
2. Settings will be saved as well when MENU shuts down automatically



Overview of the Menu :



Image

Indicator	Meaning	Default	Adjustable range	Remark
	Brightness	32	0~63	Adjust-Bar
	Contrast	32	0~63	Adjust-Bar
	Sharpness	3	1~5	Adjust-Bar
	Dimmer	15	0~15	Adjust-Bar
	Color Temp.	Normal	Normal / Warm / Cool	
	Exit			



Function

ICON	Meaning	Default	Adjustable range	Function	Remark
	Show Status	On	On / Off	Information of input source	ON: Show ; OFF: Hidden
	Blue Screen	On	On / Off	No signal input shows blue or black screen.	ON: Blue ; OFF: Black
	Auto Power On	On	On / Off	Modules turns on automatically Without power key input.	ON: Auto ; OFF: Manual
	Auto Power Saving	Off	6s / 15s / 30s / Off	Modules go ready when no input source is detected.	ON: Auto ; OFF: Normal
	Auto Sleep	Off	15M / 30M / 60M / Off	Modules go sleep when set timing is out.	ON: Auto ; OFF: Normal
	Exit				

Note : After configuration is set, RESET won't restore to default setting.



Setting

Indicator	Meaning	Default	Adjustable range	Remark
	Volume	32	0~63	
	Mute	Off	On / Off	On : Mute , Off : Sound
	Mirror	Off	On / Off	Left-right reversal
	Flip	Off	On / Off	Upside down
	Language	English	English / 中文 / 日本語 / 한국의 / Française / Deutsch / Italiano / Española / Português	Reset won't restore to default setting
	Reset			Restore to default
	Exit			



Info.

MENU



Image

Source : HDMI



Function

Resolution : 1024x600



Setting

H-Position : 37.5KHz

V-Position : 59.8Hz



Information

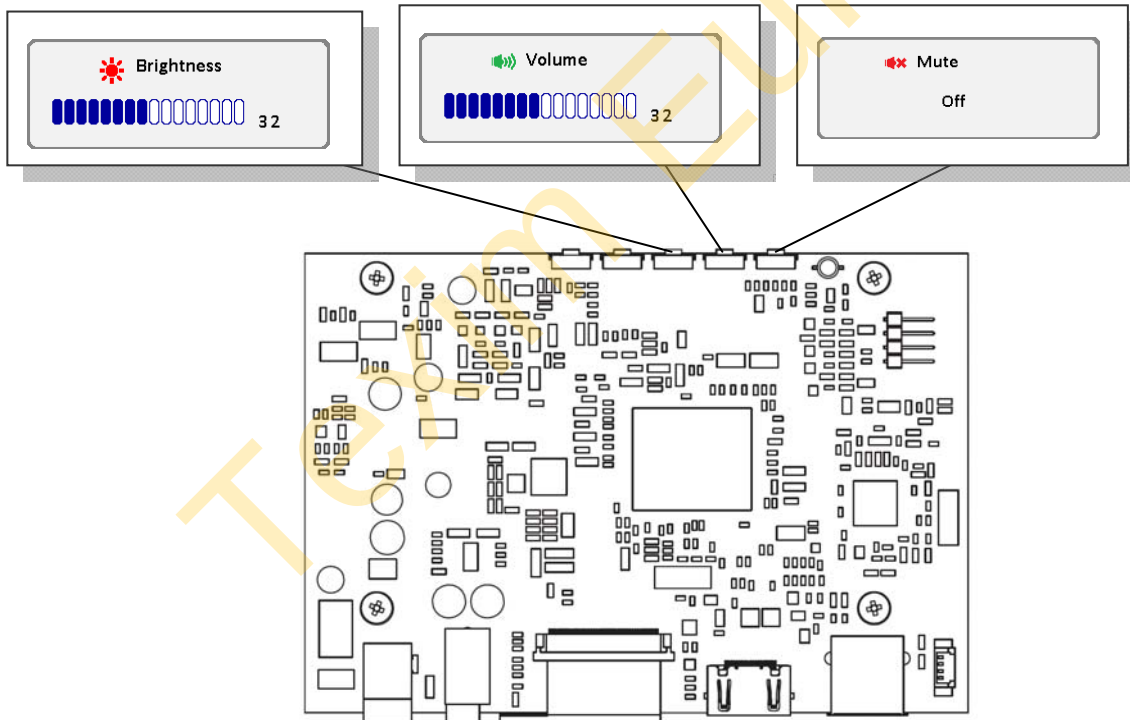
Program Ver : 1.00

Command Ver : 1.00

Move

Exit / Menu

Hot Key When OSD Menu is Off :



Information of Input Source and Functionality :



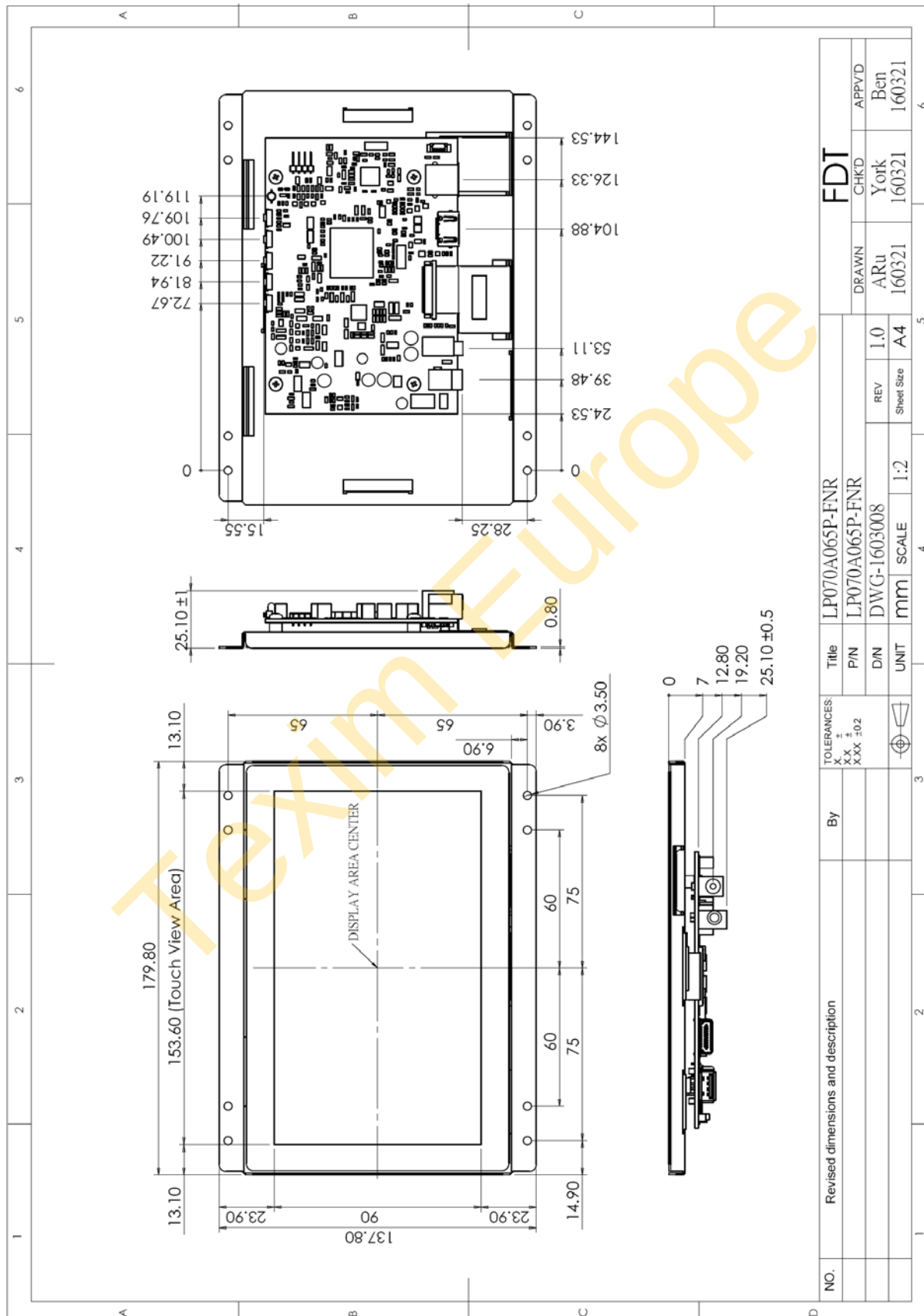
[Source] : Input Signal Switch

Overview of Input Signals :

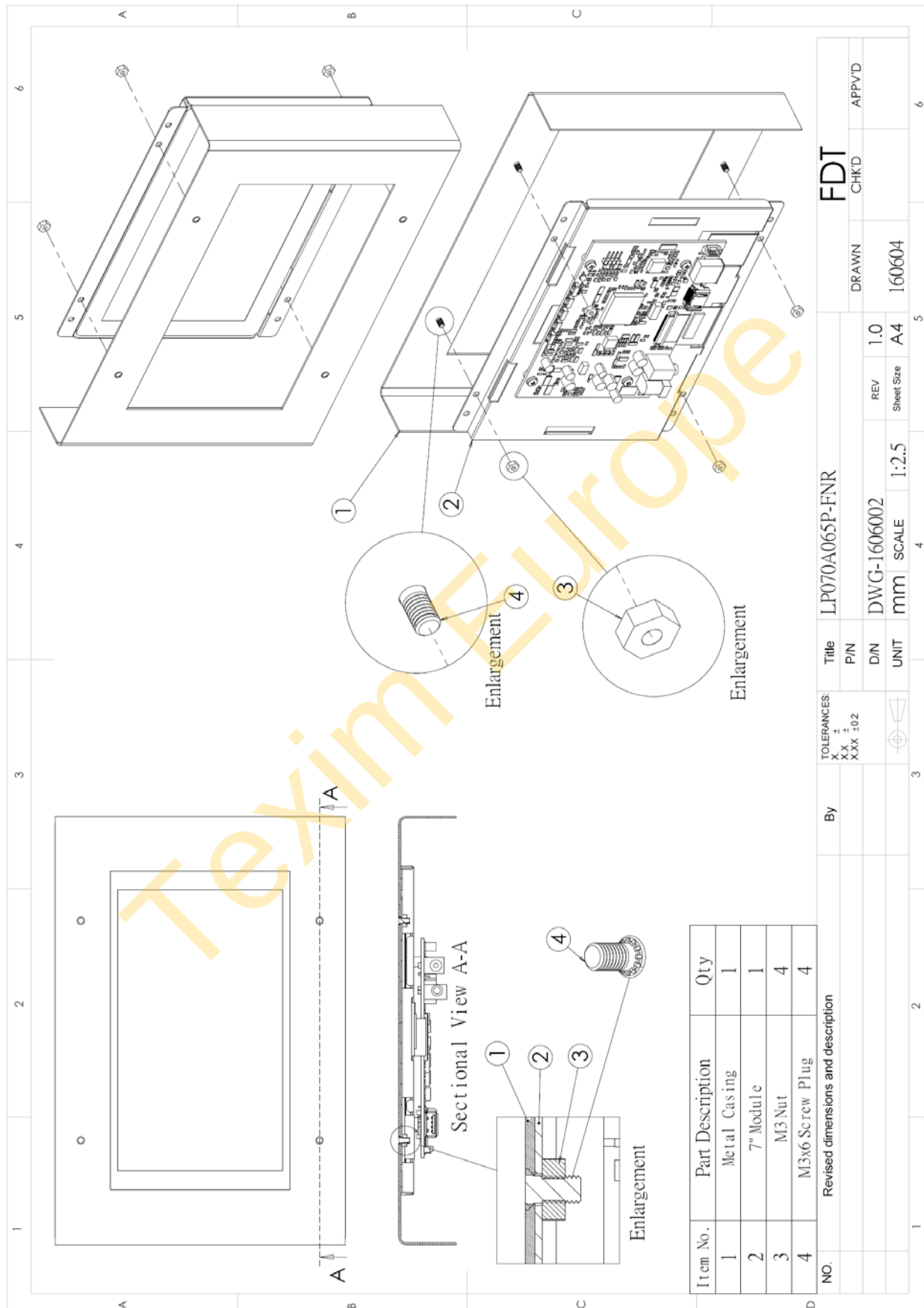
Indicator	Interface
	HDMI

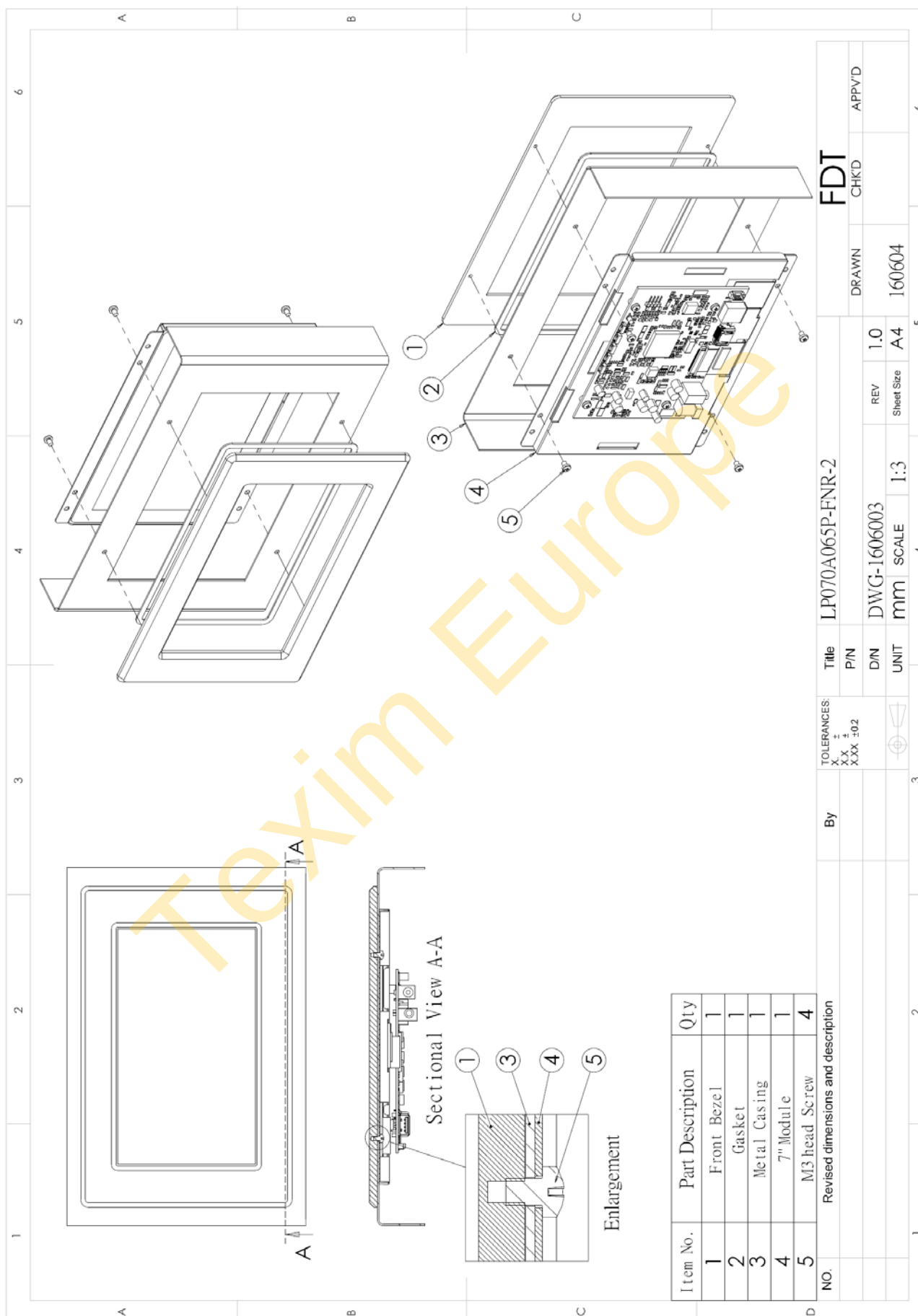
13. Dimension Information

13.1 Unit (LP070A065P-FNR)



14. Installation Recommendations





15. Appendix

15.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	7 (diagonal)	Inch
Display Format	1024 x (R.G.B) x 600	Dot
Active Area	153.6(W) × 90.0(H)	mm
Pixel Pitch	0.15(H) x 0.15(V)	mm
Pixel Arrangement	RGB-stripe	
Surface Treatment	Clear	

15.2 TFT-LCD Optical Characteristics

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	CR ≥ 10	65	75	---	deg	
		Right		65	75	---	deg	
	Vertical	Top		60	70	---	deg	
		Bottom		65	75	---	deg	
Contrast Ratio		CR	At optimized Viewing angle	500	700	---	---	
Luminance		L		200	250	---	cd/m ²	
LED Life Time			25°C	15000	---	---	Hrs	Note

Note: The "LED Life Time" is defined as the module brightness decrease to 50% original.