



PRTD Panel PC Series with 9" TFT LCD

■ Model:

PRTD-090T-5A-N4F / PRTD-090T-8A-N4F

PRTD-090T-5A-B4F / PRTD-090T-8A-B4F

PRTD-090T-5A-N5F / PRTD-090T-8A-N5F

PRTD-090T-5A-B5F / PRTD-090T-8A-B5F

User's Manual

(Revision 1.1A)



CE



FCC



VCCI



VIBRATION



IP 65



TOUCH



Wi-Fi



FANLESS

Revision

<i>Date</i>	<i>Version</i>	<i>Description</i>
2018/07/01	Version 1.0	Initial Release
2019/07/30	Version 1.1	Add section 1.3 [Note 5] instruction

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Safety Information

- Read these Safety instructions carefully.
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Do not expose your Panel PC to rain or moisture, in order to prevent shock and fire hazard.
- Keep PRTD-090T away from humidity.
- Do not open the cabinet to avoid electrical shock. Refer to your nearest dealer for qualified personnel servicing.
- Never touch un-insulated terminals or wire unless your power adaptor is disconnected.
- Locate your Panel PC as close as possible to the socket outline for easy access and to avoid force caused by entangling of your arms with surrounding cables from the Panel PC.
- USB connectors are not supplied with Limited Power Sources.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

DO NOT ATTEMPT TO OPEN OR TO DISASSEMBLE THE CHASSIS (ENCASING) OF THIS PRODUCT. PLEASE CONTACT YOUR DEALER FOR SERVICING FROM QUALIFIED TECHNICIAN.

Table of Contents

Table of Contents.....		iii
1	.General Information	1
	1.1 Product Description.....	1
	1.2 Product Specification	2
	1.3 Inspection standard for TFT-LCD Panel	4
	1.4 Product Dimension.....	9
	1.5 Panel Mounting Instruction.....	11
	1.6 Ordering Information	13
	1.7 Packing List	15
2	.System Installation	16
	2.1 CPU Board Outline.....	16
	2.2 Connector Summary	17
	2.3 Connector Pin Assignments.....	18
	2.4 External I/O Overview	20
	2.5 External I/O Pin Assignment.....	21
3	.Android Settings	24
	3.1 Enable LED backlight-off function	24
	3.2 Touch calibration	26
Warranty		29



1. General Information

1.1 Product Description

PRTD-090T is an ultra-compact platform for the present demanding embedded and productive applications. It has RTD1195 Cortex-A7 ARM Dual Core which consumes only minimum power requirement when running at 1.2GHz, and DDR3 memory provides faster data transfer rate. By using 9" TFT LCD, PRTD-090T becomes the perfect choice for a limited budget. In additional, the integrated Gigabit Ethernet port supplies the communication capability which makes PRTD-090T can be more widely used when running Android 4.4.4 environments to become the perfect solution for system integration.

1.2 Product Specification

Table 1-1 Product Specification

CPU Board Specifications	
CPU	RTD1195-1.2GHz Cortex-A7 ARM Dual-Core
Cache	L2: 512KB Cache
Memory	1GB/2GB DDR3 onboard
Watchdog Timer	Watchdog timer counter at a fixed 27MHz rate
LAN	Integrated Gigabit Ethernet
Audio	High Definition Audio
Internal Drives	8GB of Flash onboard with Android 4.4.4 Pre-installed Micro SD slot (Like a card reader only)
I/O	RS-232 x 1 USB port (Ver3.0) x 1 USB port (Ver2.0) x 1 RJ-45 Port x 1
Mechanical & Environment	
Power Requirement	Single Voltage +5VDC (5A) Multi Voltage +8~+35VDC (8A)
Power Consumption	10W (Max.)
Operating Temperature	0 ~ +60°C (32 ~ +140°F) / -20~+70°C (-4 ~ +158°F) Optional (-I)
Storage Temp.	-30 ~ +70°C (14 ~ +158°F)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
Dimensions	236.6 x 146 x 35mm (9.31 x 5.75 x 1.38 inches)

Weight	755g
Front Panel Protection	IP 65
Certification	CE / FCC / VCCI / Vibration / Shock
LCD Specifications	
Display Type	9" TFT LCD
Backlight Unit	LED
Display Resolution	1024(W) x 600(H)
Brightness (cd/m ²)	300 nits
Contrast Ratio	500 : 1
Display Color	262, 144
Pixel Pitch (mm)	190.5 (H) x 189 (V)
Viewing Angle	Vertical 120°, Horizontal 140°
Backlight Lifetime	18,000 hrs
Touchscreen	
Type	Analog Resistive
Resolution	Continuous
Transmittance	80%
Controller	USB interface
Software Driver	Android
Durability	1 million

1.3 Inspection standard for TFT-LCD Panel

Table 1-2 Inspection Standard

DEFECT TYPE		LIMIT		Note				
VISUAL DEFECT	SPOT	$\phi < 0.15\text{mm}$	Ignore	Note1				
		$0.15\text{mm} \leq \phi \leq 0.5\text{mm}$	$N \leq 4$					
		$0.5\text{mm} < \phi$	$N=0$					
	INTERNAL	FIBER	$0.03\text{mm} < W \leq 0.1\text{mm}, L \leq 5\text{mm}$	$N \leq 3$	Note1			
			$1.0\text{mm} < W, 1.5\text{mm} < L$	$N=0$				
	POLARIZER BUBBLE	$\phi < 0.15\text{mm}$	Ignore	Note1				
		$0.15\text{mm} \leq \phi \leq 0.5\text{mm}$	$N \leq 2$					
$0.5\text{mm} < \phi$		$N=0$						
Mura	It' OK if mura is slight visible through 6%ND filter							
ELECTRICAL DEFECT	BRIGHT DOT	A Grade			B Grade			Note3
		C Area	O Area	Total	C Area	O Area	Total	
		$N \leq 0$	$N \leq 2$	$N \leq 2$	$N \leq 2$	$N \leq 3$	$N \leq 5$	
	DARK DOT	$N \leq 2$	$N \leq 3$	$N \leq 3$	$N \leq 3$	$N \leq 5$	$N \leq 8$	
	TOTAL DOT	$N \leq 4$			$N \leq 5$	$N \leq 6$	$N \leq 8$	Note2
	TWO ADJACENT DOT	$N \leq 0$	$N \leq 1$ pair	$N \leq 1$ pair	$N \leq 1$ pair	$N \leq 1$ pair	$N \leq 1$ pair	Note4
	THREE OR MORE ADJACENT DOT	NOT ALLOWED						
LINE DEFECT	NOT ALLOWED							

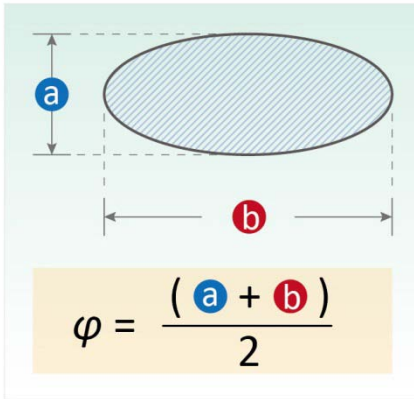
(1) One pixel consists of 3 sub-pixels, including R, G, and B dot.

(Sub-pixel = Dot)

(2) LITTLE BRIGHT DOT ACCEPTABLE UNDER 6 % ND-Filter

(3) If require G0 grand (Total dot $N \leq 0$), please contact region sales.

[Note 1] W : Width[mm], L : Length[mm], N : Number, ϕ : Average Diameter.



1. White / Black Spot
2. Polarizer Bubble

Fig 1-1

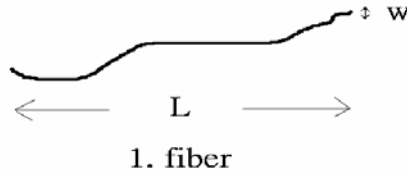


Fig 1-2

[Note 2] Bright dot is defined through 6% transmission ND Filter as following.

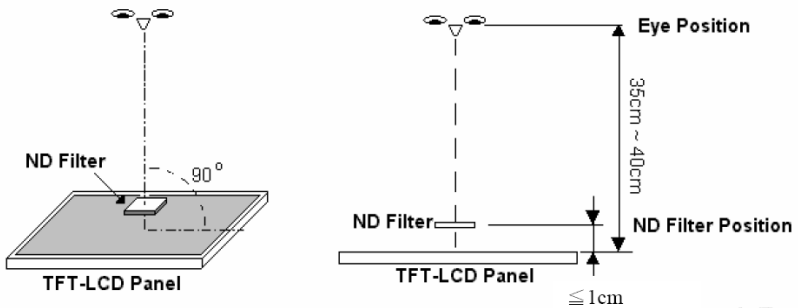
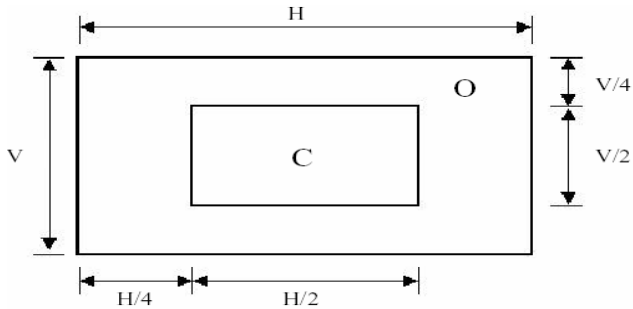


Fig 1-3

[Note 3]

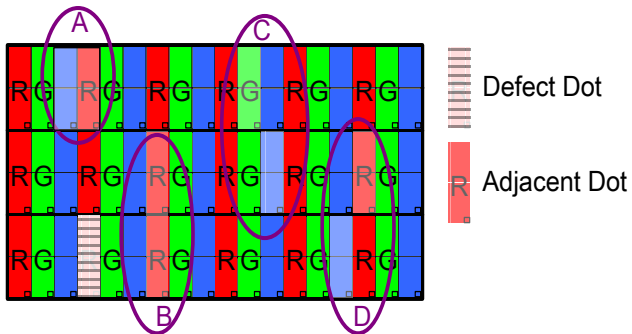


C Area: Center of display area

O Area: Outer of display area

[Note 4]

Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dart adjacent dot. And they will be counted 2 defect dots in total quantity.



- (1) The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.

Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

[Note 5]

According to the technical information from LCD manufacturer, the image retention may happen on LCD display if the static image is kept for a period of time without any change. ICOP will suggest customers not to have static image on LCD for over 4 hours without any image movement and also enable screensaver to avoid image sticking issue if LCD displays need to be kept on for a long time.

Some Image retention issue will disappear when LCD display is turned off for a period of time, but some image retention may be not reversible when LCD encounters screen burn.

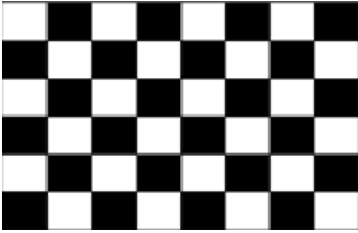
The following is LCD manufacturer's test result for customers' reference.

TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	70°C ;240hrs	
High Temperature Storage	80°C ; 240hrs	
High Temperature High Humidity Operation	60°C ; 90%RH ;240hrs	No condensation
Low Temperature Operation	-20°C ; 240hrs	Backlight unit always turn on
Low Temperature Storage	-30°C ; 240hrs	
Thermal Shock	-30°C (0.5hr) ~ 80°C (0.5hr) ; 200 Cycles	
Image Sticking	25°C ; 4hrs	Note 5-1
MTBF	20,000Hrs	

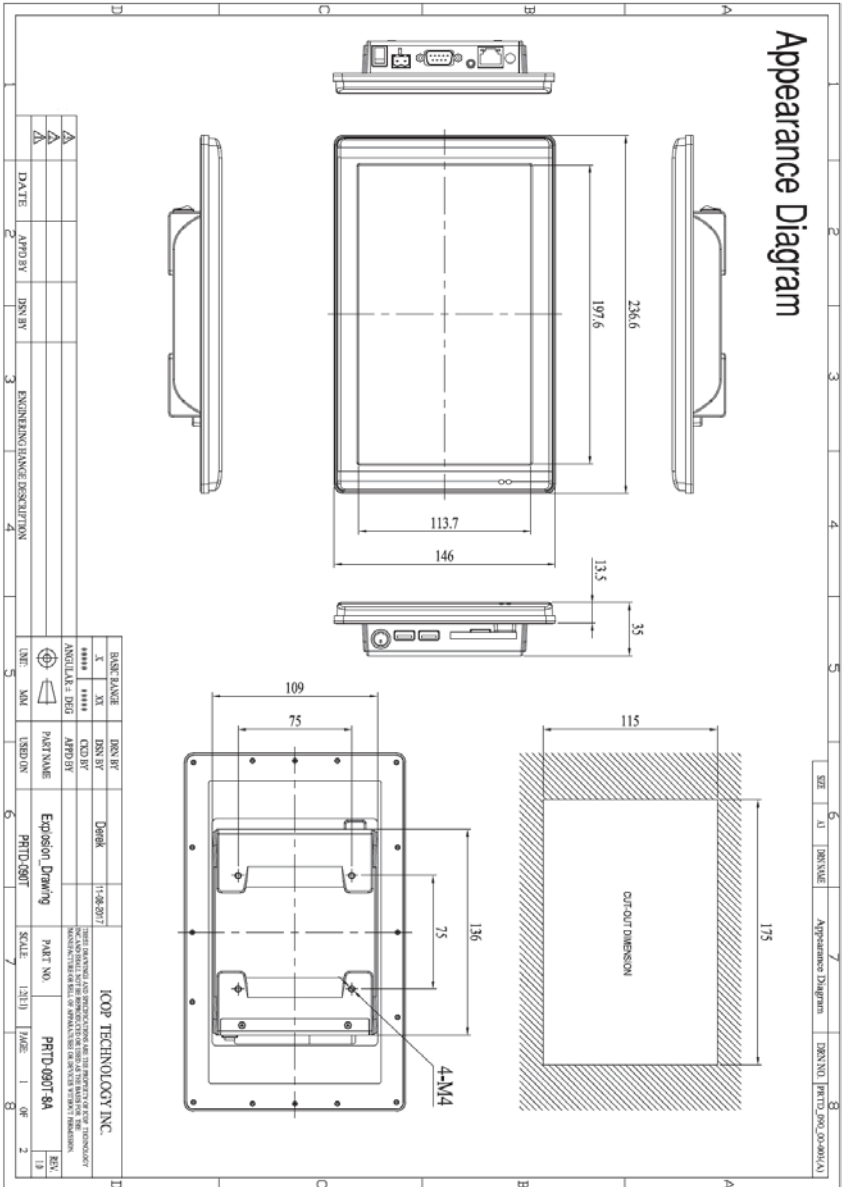
Note 5-1

1. Condition of Image Sticking test : 25 °C ± 2 °C.
2. Operation with test pattern sustained for 4 hrs, then change to gray pattern immediately.

3. After 5 mins, the mura must be disappeared completely.



1.4 Product Dimension



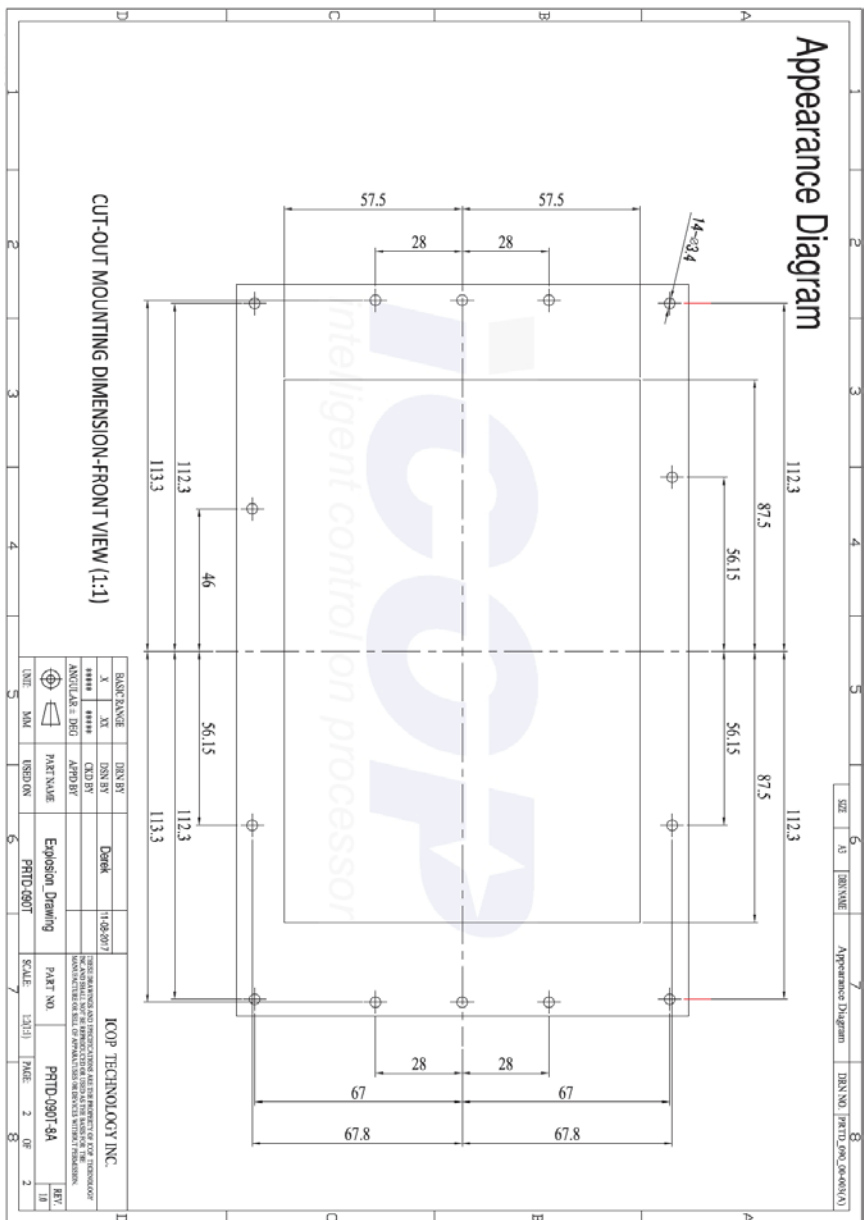
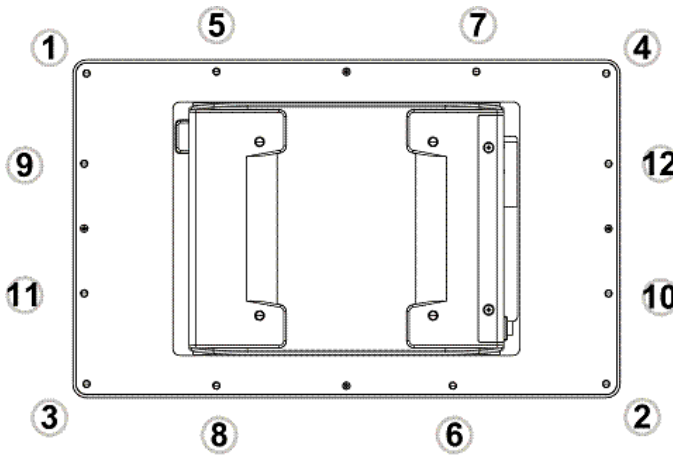
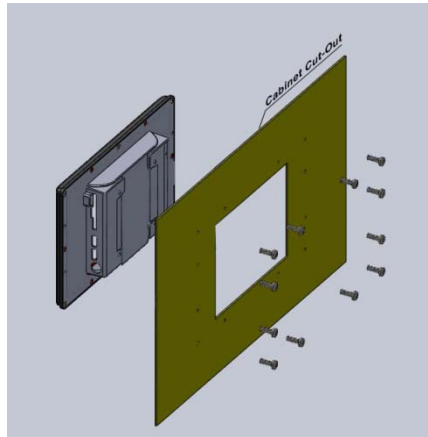


Fig 1-4 Product Dimension

1.5 Panel Mounting Instruction

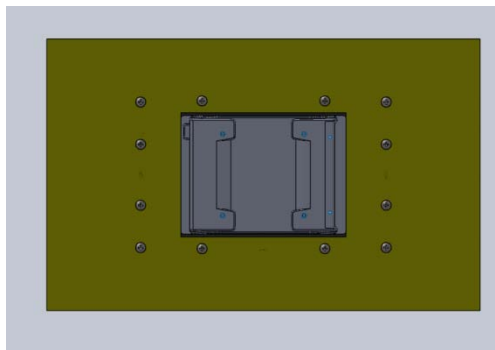
1. Cut a mounting hole in the panel. (Refer to PRTD-090T Dimensions on page 7) (Note 1)
2. Check and remove the twelve M3 screws in a diagonal pattern as image below if necessary.
3. Place PRTD-090T face-down on a clean, flat surface.
4. Slide the panel cutout around the back of PRTD-090T, until the panel rests directly on the gasket. Make sure the screw holes align with the screw holes on PRTD-090T.
5. The screw size is M3*L (L=wall thickness + 6.0mm) (Note 2)
6. Insert all twelve M3 screws into the screw holes. (Note 2)
7. Finger-tighten the M3 screws. Finish tightening the M3 screws in a diagonal pattern using an M3 screw driver (see the image as below); maximum torque 1.18Nm (12 kgf-cm).





Note 1:

It is strongly recommended that a professional machine shop cut the mounting hole in the panel.



Note 2:

The length for all twelve M3 screws will be according to the thickness of mounting panel. For example: The length of standard M3 screws for PRTD-090T is 6mm. If the thickness of your mounting panel is 3mm and washer thickness is 1mm, you have to use 10mm M3 screw.

1.6 Ordering Information

Product Code	LCD Size	DC-Input Type	BT&WLAN	DRAM	Flash onboard	Wide Temp.
PRTD	057T	5A (DC5V)	N (No BT&WLAN)	4 (1GB)	F (8GB-MLC)	I (Wide Temp.)
	090T	8A (DC8~35V)	B (With BT&WLAN)	5 (2GB)		

1. Product Code : Code 1~3.

PRTD : PRTD Series.

2. LCD Size : Code 4~7.

057T : 5.7" LCD with touchscreen.

090T : 9" LCD with touchscreen.

3. DC-Input Type : Code 8~9.

5A : Audio Line-out and Singal DC5V Power Input.

8A : Audio Line-out and Support DC8~35 Power Input.

4. BT&WLAN : Code 10.

N : No BT&WLAN.

B : With BT&WLAN.

5. DRAM Onboard : Code 11.

4 : 1GB.

5 : 2GB.

6. Flash Onboard : Code 12.

F : 8GB.

7. Wide Temp. : Code 13.

I : Support Wide Temp. -20~+70°C. **(Optional)**
(Standard version doesn't need to show this item.)

Table 1-3 Ordering Information

PART NUMBER	DESCRIPTION
PRTD-090T-5A-N4F	9" Panel PC w/1GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / Power Adapter
PRTD-090T-8A-N4F	9" Panel PC w/1GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / 8-35 DC Support
PRTD-090T-5A-N5F	9" Panel PC w/2GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / Power Adapter
PRTD-090T-8A-N5F	9" Panel PC w/2GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / 8-35 DC Support
PRTD-090T-5A-B4F	9" Panel PC w/1GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / Bluetooth & WLAN / Power Adapter
PRTD-090T-8A-B4F	9" Panel PC w/1GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / Bluetooth & WLAN / 8-35 DC Support
PRTD-090T-5A-B5F	9" Panel PC w/2GB DDR3 / 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD / Bluetooth & WLAN / Power Adapter

PRTD-090T-8A-B5F

9" Panel PC w/2GB DDR3

/ 8GB eMMC / USB2.0 / USB3.0 / Line-Out / LAN / COM / MicroSD /

Bluetooth & WLAN / 8-35 DC Support

1.7 Packing List

Table 1-4 Packing List

PART NUMBER	PACKAGE	
PRTD-090T-5A-N4F	PRTD-090T-5A-N4F	Power-20W-3PIN-X & PowerHead-US/EU
PRTD-090T-8A-N4F	PRTD-090T-8A-N4F	
PRTD-090T-5A-N5F	PRTD-090T-5A-N5F	Power-20W-3PIN-X & PowerHead-US/EU
PRTD-090T-8A-N5F	PRTD-090T-8A-N5F	
PRTD-090T-5A-B4F	PRTD-090T-5A-B4F	Power-20W-3PIN-X & PowerHead-US/EU WIRELESS-ANTENNA-157
PRTD-090T-8A-B4F	PRTD-090T-8A-B4F	WIRELESS-ANTENNA-157
PRTD-090T-5A-B5F	PRTD-090T-5A-B5F	Power-20W-3PIN-X & PowerHead-US/EU WIRELESS-ANTENNA-157
PRTD-090T-8A-B5F	PRTD-090T-8A-B5F	WIRELESS-ANTENNA-157

2. System Installation

2.1 CPU Board Outline

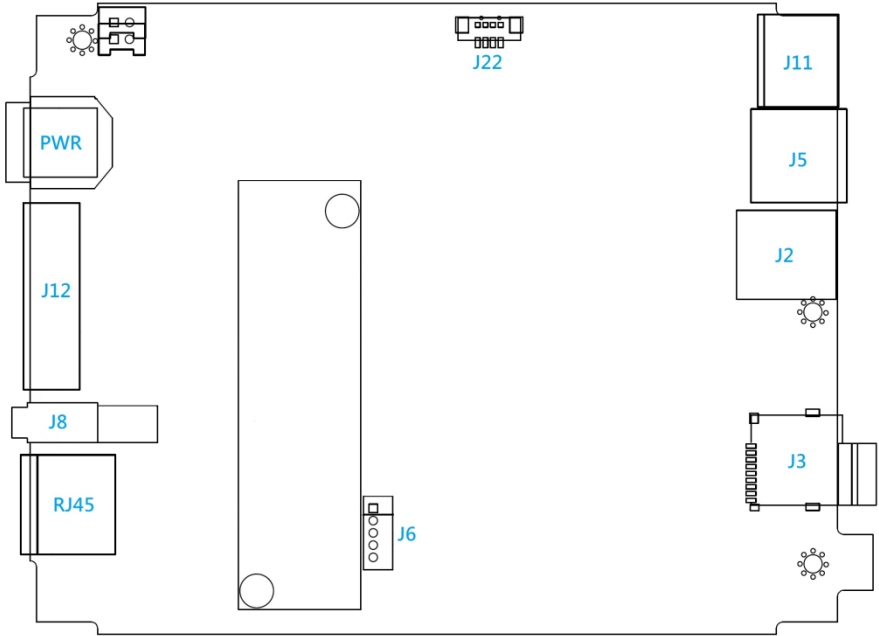


Fig 2-1 PRTD CPU Board

2.2 Connector Summary

Table 2-1 Summary Table

Nbr	Description	Type of Connections	Pin nbrs.
J2	USB 3.0	External USB 3.0 Connector	9-pin
J3	Micro SD Card Socket	Micro SD socket	9-pin
J5	USB 2.0	External USB 2.0 Connector	6-pin
J6	USB 2.0 (For Touch Controller)	2.0mm 5-pin wafer	5-pin
J8	Audio Line-Out	1.25mm Phone Jack	5-pin
J11	Software Programming Port (Reserved)	External Mini DIN Socket	6-pin
J12	COM1 (RS232)	External D-Sub Male Connector	9-pin
J22	I2C (For External Garmmar Firmware Programming)	1.25mm 4-pin wafer	4-pin
RJ45	Ethernet	External RJ45 Connector	8-pin
PWR	Power Connector (5A)	External Mini DIN Socket	3-pin
PWR	Power Connector (8A)	External Power Plug	2-pin

2.3 Connector Pin Assignments

J2: USB 3.0

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	D-
3	D+	4	GND
5	SSRX-	6	SSRX+
7	GND	8	SSTX-
9	SSTX+		

J6: USB 2.0 (For Touch Controller)

Pin #	Signal Name
1	VCC
2	USB3-
3	USB3+
4	GND
5	GND

J3: Micro SD Card Socket

Pin #	Signal Name	Pin #	Signal Name
1	DAT2	2	DAT3
3	CMD	4	VDD
5	CLK	6	VSS
7	DAT0	8	DAT1

J8: Audio Line-Out

Pin #	Signal Name	Pin #	Signal Name
1	AMUTE	2	AOR
3	AOL	4	AOL

J5: USB 2.0

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	USB1-
3	USB1+	4	GND
5	GND	6	GND

J11: Software Programming Port **(Reserved)**

Pin #	Signal Name	Pin #	Signal Name
1	TXD0	2	RXD0
3	GND	4	N/C
5	N/C	6	N/C

J12: COM1 (RS232)

Pin #	Signal Name	Pin #	Signal Name
1	N/C	2	RXD1
3	TXD1	4	N/C
5	GND	6	N/C
7	RTS1	8	CTS1
9	N/C		

PWR: Power Connector (5A)

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

J22: I2C (For External Gamma Firmware Programming)

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	GND
3	I2C_SCL	4	I2C_SDA

PWR: Power Connector (8A)

Pin #	Signal Name
1	+ 8 ~ 35V
2	GND

RJ45

Pin #	Signal Name	Pin #	Signal Name
1	BI_DA+	2	BI_DA-
3	BI_DB+	4	BI_DC+
5	BI_DC-	6	BI_DB-
7	BI_DD+	8	BI_DD-

2.4 External I/O Overview

{ PRTD-090T-8A }



Fig 2-2 PRTD-090T-8A I/O overview

{ PRTD-090T-5A }




Fig 2-3 PRTD-090T-5A I/O overview

{Note}

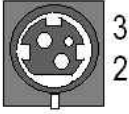
1. WLAN is optional
2. COM1 is RS232 signals only
3. MicroSD Socket likes a reader for data wrting/reading only

2.5 External I/O Pin Assignment

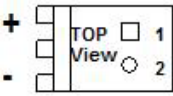
Power Switch

	Pin #	Status
		ON
	O	OFF


Power Connector (5A)

	Pin #	Signal Name
	1	+5V
	2	GND
	3	NC

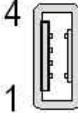
Power Connector (8A)

	Pin #	Signal Name
	1	+8 ~ 35V
	2	GND


Audio Line-Out

	Pin #	Signal Name
	1	GND
	2	LOUTL
	3	Open Touch
	4	Open Touch
	5	VREFOUT

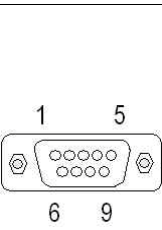
USB 2.0 Port

	Pin #	Signal Name
	1	VCC
	2	USB0-
	3	USB0+
	4	GND
	5	GGND
6	GGND	

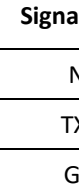
USB 3.0 Port

	Pin #	Signal Name
	1	VCC
	2	D-
	3	D+
	4	GND
	5	SSRX-
	6	SSRX+
	7	GND
	8	SSTX-
9	SSTX+	

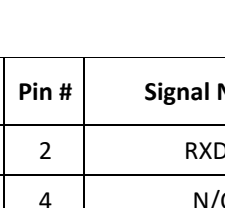
COM1 RS232

	Pin #	Signal Name	Pin #	Signal Name
	1	N/C	2	RXD1
	3	TXD1	4	N/C
	5	GND	6	N/C
	7	RTS1	8	CTS1
	9	N/C		

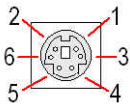
RJ45

	Pin #	Signal Name	Pin #	Signal Name
	1	BI_DA+	2	BI_DA-
	3	BI_DB+	4	BI_DC+
	5	BI_DC-	6	BI_DB-
	7	BI_DD+	8	BI_DD-


Micro SD Card Socket (Like Card Reader Only)

	Pin #	Signal Name
	1	DAT2
	2	DAT3
	3	CMD
	4	VDD
	5	CLK
	6	VSS
	7	DAT0
8	DAT1	


Software Programming Port **(Reserved)**

	Pin #	Signal Name
	1	TXD0
	2	RXD0
	3	GND
	4	N/C
	5	N/C
	6	N/C

Power LED

	LED Color	State
	Blue	Power On

SD Card Detect LED

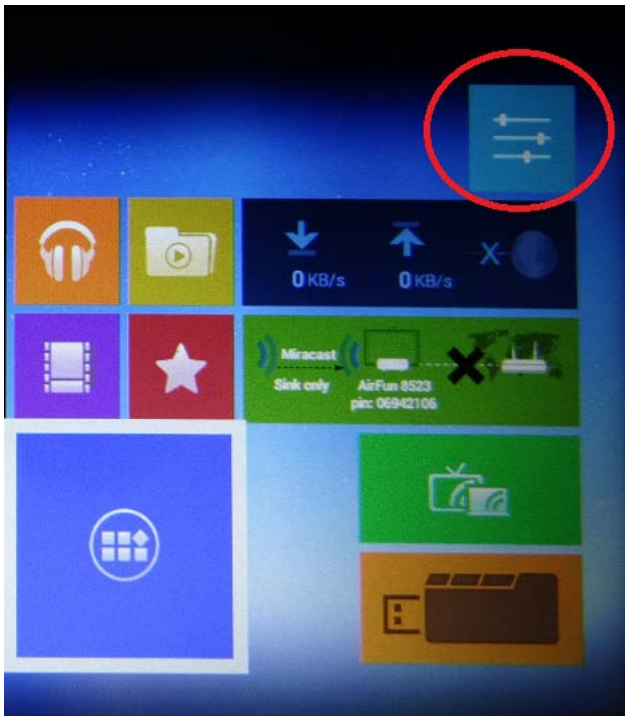
	LED Color	State
	Green Flash	Flash LED once when SD Card is plugged-in and detected

3.Android Settings

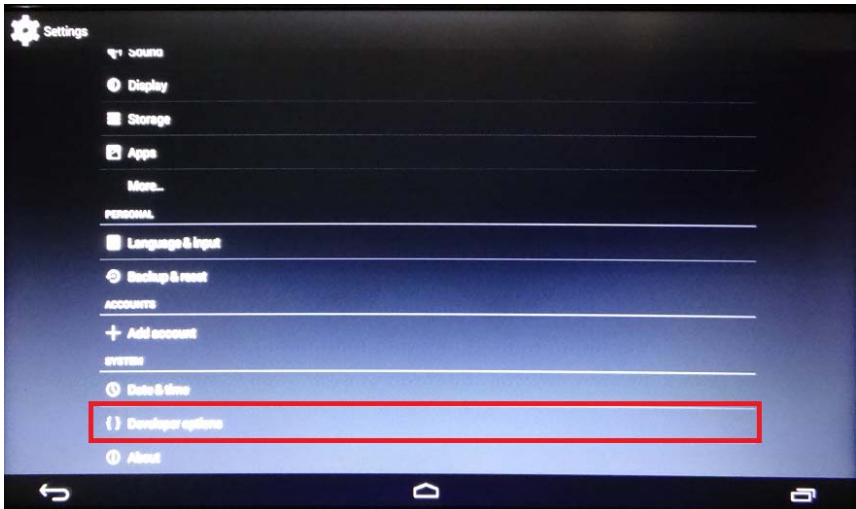
3.1 Enable LED backlight-off function

(Best recommend for saving LCD life time solution.)

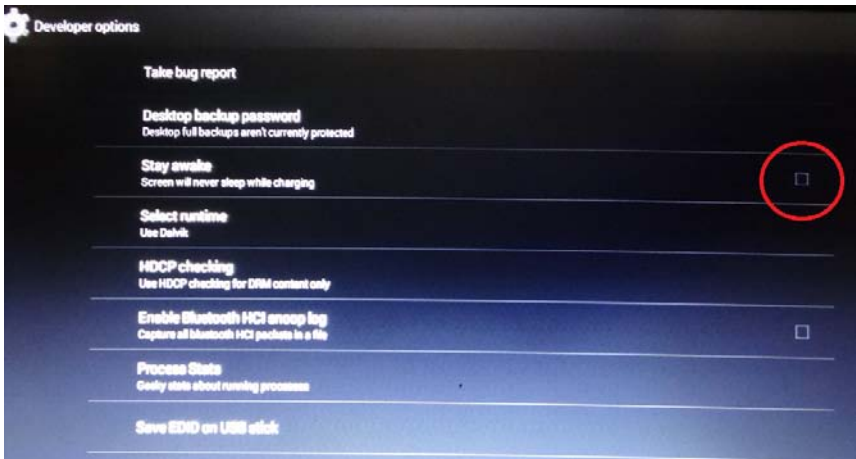
Step1: Choose settings icon.



Step2: Choose “Developer options”.



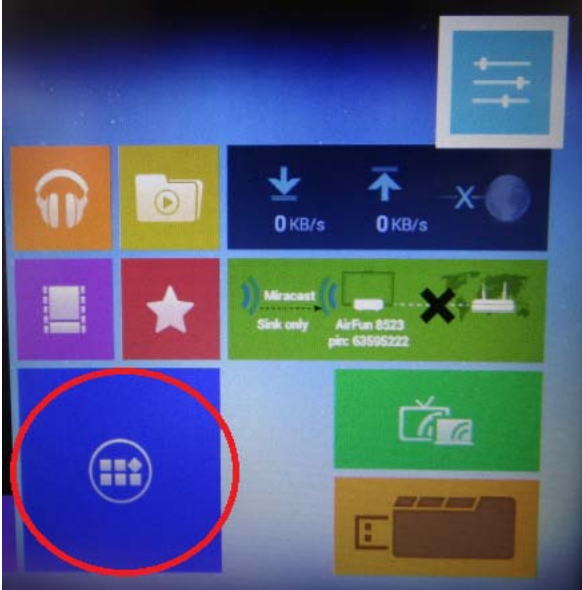
Step3: Disable “Stay awake” function.



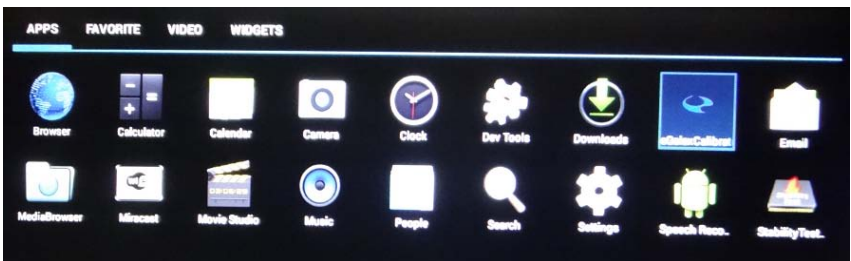
Step4: System will disable LED backlight if no any active over 1 min.

3.2 Touch calibration

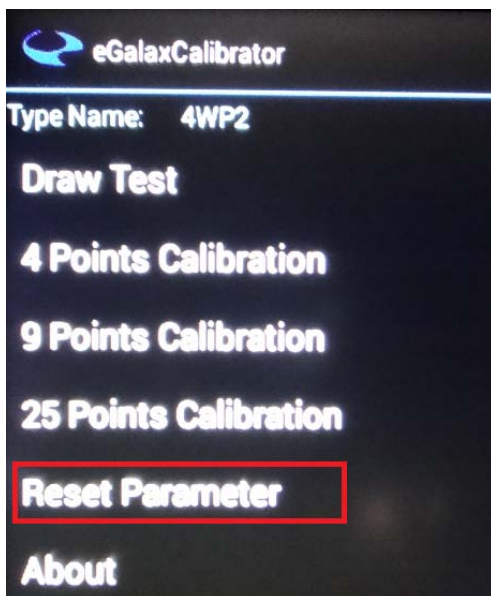
Step1: Choose all apps icon.



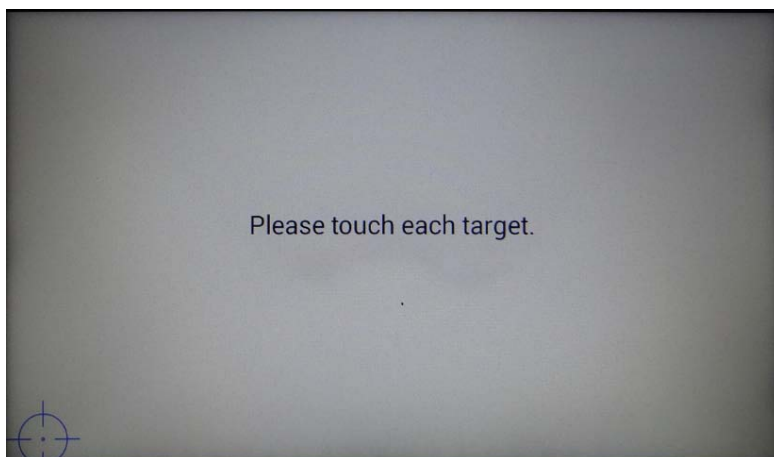
Step2: Choose “eGalaxCalibrator”.



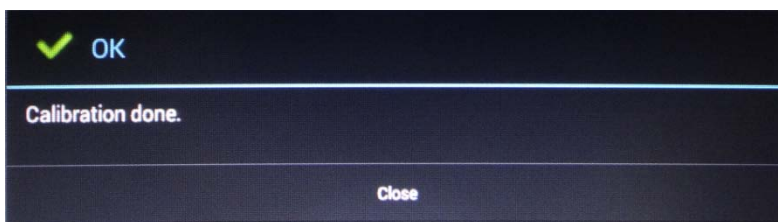
Step3: Choose "Reset Parameter".



Step4: Start to reset parameter and do the 4 points calibration.



Step5: After finish, please close this program.



Note:

User also can download calibration program as below link and copy this file to a USB storage (FAT32), and then plug USB storage on PRTD and install this APK file directly.

ftp://ppc:ppc@ftp.icop.com.tw/PRTD/090T/APP/Touch/eGalaxCalibrator_v0.11-release-HideBar-usb.apk



Warranty

This product is warranted to be in good working order for a period of one year from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster. Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, originality to use this product. Vendor will not be liable for any claim made by any other related party. Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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