User's Manual

PALD-090T

Intel® Alder Lake N50 Processor

Compact Panel PC with 9" Resistive / **PCPA** Touch Screen

PALD-090T-N50-8G

PALD-090T-N50-16G

PALD-090T-PN50-8G

PALD-090T-PN50-16G

(Revision 1.0A)

REVISION

DATE	VERSION	DESCRIPTION
2025/06/09	Version 1.0A	New Release

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- https://www.icop.com.tw/resource_entrance

This Manual is for the PALD-090T series.

SAFETY INFORMATION

- Read these Safety instructions carefully.
- Please carry the unit with both hands, handle 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.
- Power Input voltage +12~36VDC.
- Operating temperature between 0~+60°C (+32~+158°F).
- Keep PALD-090T away from humidity.
- When a M.2 2242 PCIe Gen.3 / SATA SSD storage is the main operating system storage, please turn off power before inserting or removing. 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.

WARNING!

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

Content

Ch. 1

General Information

1.1 Product Description

ICOP Technology Inc. is proudly going to release a brand new Panel PC, which offers fanless design, low power consumption, and IP65 front panel. The PALD-090T is powered by Intel® Alder Lake N50 processor with 8GB or 16GB of DDR5 Memory that handles processing more efficiently and provides faster performance. The project capacity touch panel with LED backlight TFT LCD increases operation convenience and visibility in outdoor environments. The ultra-compact and thin exterior design is perfect for the present demanding embedded and productive applications.

The new PALD-090T inherited smooth appearance and ultra-texture aluminum exterior design to make your industrial applications look more stylish. The versatile I/O ports, IP65 front panel, 2.5 GIGA high-speed Ethernet etc. can fulfill fundamental functions. Our consistent advantages feature stable performance, extended working temperature support, low power consumption and fanless design. The expandable customize I/O ports can be accommodated connectivity requirements to industrial machine platforms and industrial automation equipment's needs.

The PALD-090T supports Win11 (64-bit), Windows 11 IoT (64-bit), Windows 10 (64-bit), Windows 10 IoT (64-bit) and Linux to meet ready-to-market demand and provide competitive advantages for customers.

1.2 Product Specifications

CPU BOARD SPECIFICATIONS

CPU	Intel® Alder Lake N50 (Dual core & **up to 3.4GHz**)
Cache	6MB
BIOS	AMI BIOS
Memory	8GB / 16GB DDR5 Memory
Display	Intel® HD Graphics
LAN	Intel® i226-V 2.5GBE x1
Audio	HD Audio-Realtek ALC897 CODEC
Internal Drives	M.2 2242 Slot (M-Key, PCIe Gen.3 / SATA Interface support NVME)
Expansion	M.2 2230 Slot (E-Key, USB2.0 / PCIe Gen.3 *1 interface support CNVi)
I/O	COM1 x1 USB3.2 Gen.1 x2 RJ45 x1 Audio-Out x1

MECHANICAL & ENVIRONMENT

Power Requirement	+12 ~ 36VDC Power Input
Power Consumption	12W (Typical for Intel® N50 without external I/O device)
Operating Temperature	0 ~ +60°C (+32~+158°F)
Storage Temperature	-30~+80°C (-22~ +176°F)
Operating Humidity	0% ~ 90% Relative Humidity, Non-Condensing
Dimensions	236.6x146x35mm (9.31"x5.75"x1.38")
Weight	780g

Protection	IP65 Front Panel
Certification	CE / FCC / VCCI / Vibration/ Shock

LCD SPECIFICATIONS

Display Type	9” WSVGA 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
Active Area (mm)	196.61 (W) x 114.15 (H)
Viewing Angle	Vertical 120^o, Horizontal 140^o
Backlight Lifetime	20,000 hrs

TOUCHSCREEN

Type1	Analog Resistive **(Standard)**
Resolution	Continuous
Transmittance	80%
Controller	USB interface
Software Driver	Linux, Win7, WES7, Win10, Win10 IoT
Durability	1 million
Type2	Projected Capacitive Touch Screen **(Optional)**
Resolution	25ppi (Min.)
Transparency	86% ± 2%
Accuracy	Within 2.5mm each target
Surface Hardness	≧ 7H (Pressure：0.5N/45°)

1.3 Inspection standard for TFT-LCD Panel

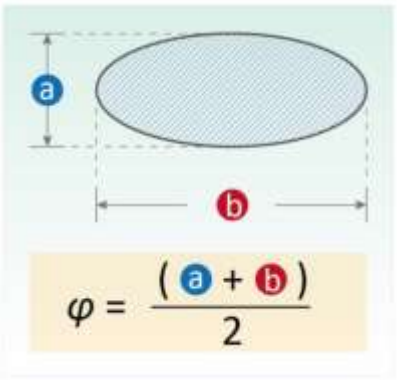
<table>
<tr><th colspan="3">DEFECT TYPE</th><th colspan="6">LIMIT</th><th>Note</th></tr>
<tr><td rowspan="10">VISUAL DEFECT</td><td rowspan="10">INTERNAL</td><td rowspan="3">SPOT</td><td colspan="3">φ＜0.15mm</td><td colspan="3">Ignore</td><td rowspan="3">Note1</td></tr>
<tr><td colspan="3">0.15mm≦φ≦0.5mm</td><td colspan="3">N≦4</td></tr>
<tr><td colspan="3">0.5mm＜φ</td><td colspan="3">N=0</td></tr>
<tr><td rowspan="2">FIBER</td><td colspan="3">0.03mm<W≦0.1mm, L≦5mm</td><td colspan="3">N≦3</td><td rowspan="2">Note1</td></tr>
<tr><td colspan="3">1.0mm＜W, 1.5mm＜L</td><td colspan="3">N=0</td></tr>
<tr><td rowspan="3">POLARIZER BUBBLE</td><td colspan="3">φ＜0.15mm</td><td colspan="3">Ignore</td><td rowspan="3">Note1</td></tr>
<tr><td colspan="3">0.15mm≦φ≦0.5mm</td><td colspan="3">N≦2</td></tr>
<tr><td colspan="3">0.5mm＜φ</td><td colspan="3">N=0</td></tr>
<tr><td>Mura</td><td colspan="6">It’ OK if mura is slight visible through 6%ND filter</td><td></td></tr>
<tr><td rowspan="8">ELECTRICAL DEFECT</td><td colspan="2" rowspan="3">BRIGHT DOT</td><td colspan="3">A Grade</td><td colspan="3">B Grade</td><td></td></tr>
<tr><td>C Area</td><td>O Area</td><td>Total</td><td>C Area</td><td>O Area</td><td>Total</td><td>Note3</td></tr>
<tr><td>N≦0</td><td>N≦2</td><td>N≦2</td><td>N≦2</td><td>N≦3</td><td>N≦5</td><td>Note2</td></tr>
<tr><td colspan="2">DARK DOT</td><td>N≦2</td><td>N≦3</td><td>N≦3</td><td>N≦3</td><td>N≦5</td><td>N≦8</td><td></td></tr>
<tr><td colspan="2">TOTAL DOT</td><td colspan="3">N≦4</td><td>N≦5</td><td>N≦6</td><td>N≦8</td><td>Note2</td></tr>
<tr><td colspan="2">TWO ADJACENT DOT</td><td>N≦0</td><td>N≦1 pair</td><td>N≦1 pair</td><td>N≦1 pair</td><td>N≦1 pair</td><td>N≦1 pair</td><td>Note4</td></tr>
<tr><td colspan="2">THREE OR MORE ADJACENT DOT</td><td colspan="6">NOT ALLOWED</td><td></td></tr>
<tr><td colspan="2">LINE DEFECT</td><td colspan="6">NOT ALLOWED</td><td></td></tr>
</table>

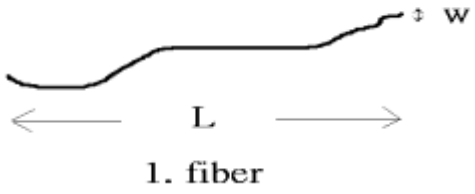
(1) One pixel consists of 3 sub-pixels, including R, G, and B dot. (Sub-pixel = Dot)

(2) Little bright Dot acceptitable under 6% ND-Filter.

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

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

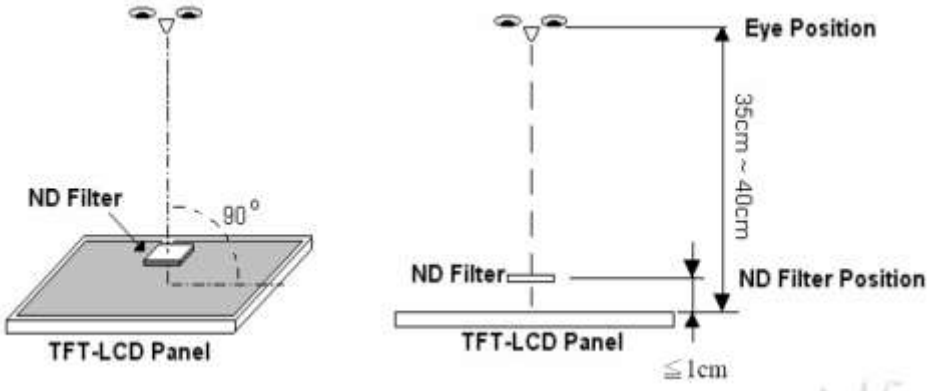




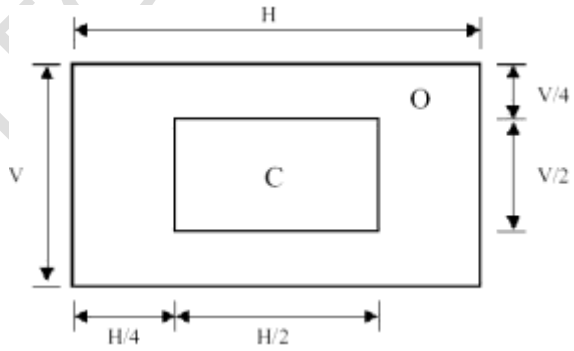
1. fiber

(a) White / Black Spot (b) Polarizer Bubble

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

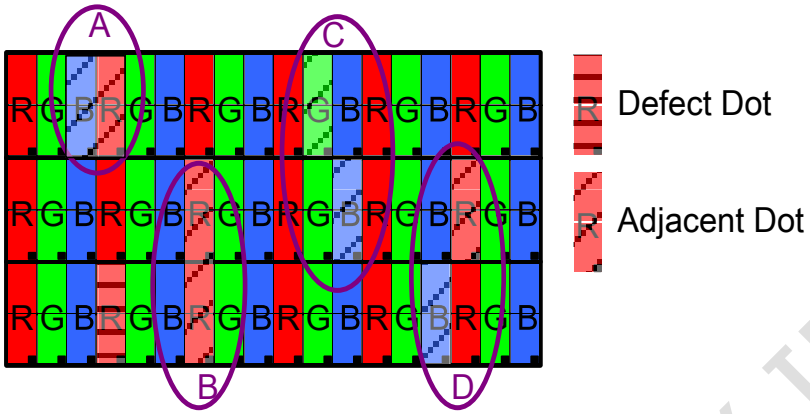


[Note 3] Display area



C Area: Center of display area **O Area**: Outer of display area

[Note 4] Judge the defect dot and the adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dark adjacent dot. And they will be counted 2 defect dots in total quantity.



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.

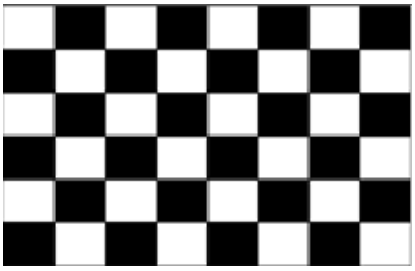
Some Image retention issue will disappear when LCD display is turned off for a period of time, but some image retention may be not reversible when LCD encounters screen burn.

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

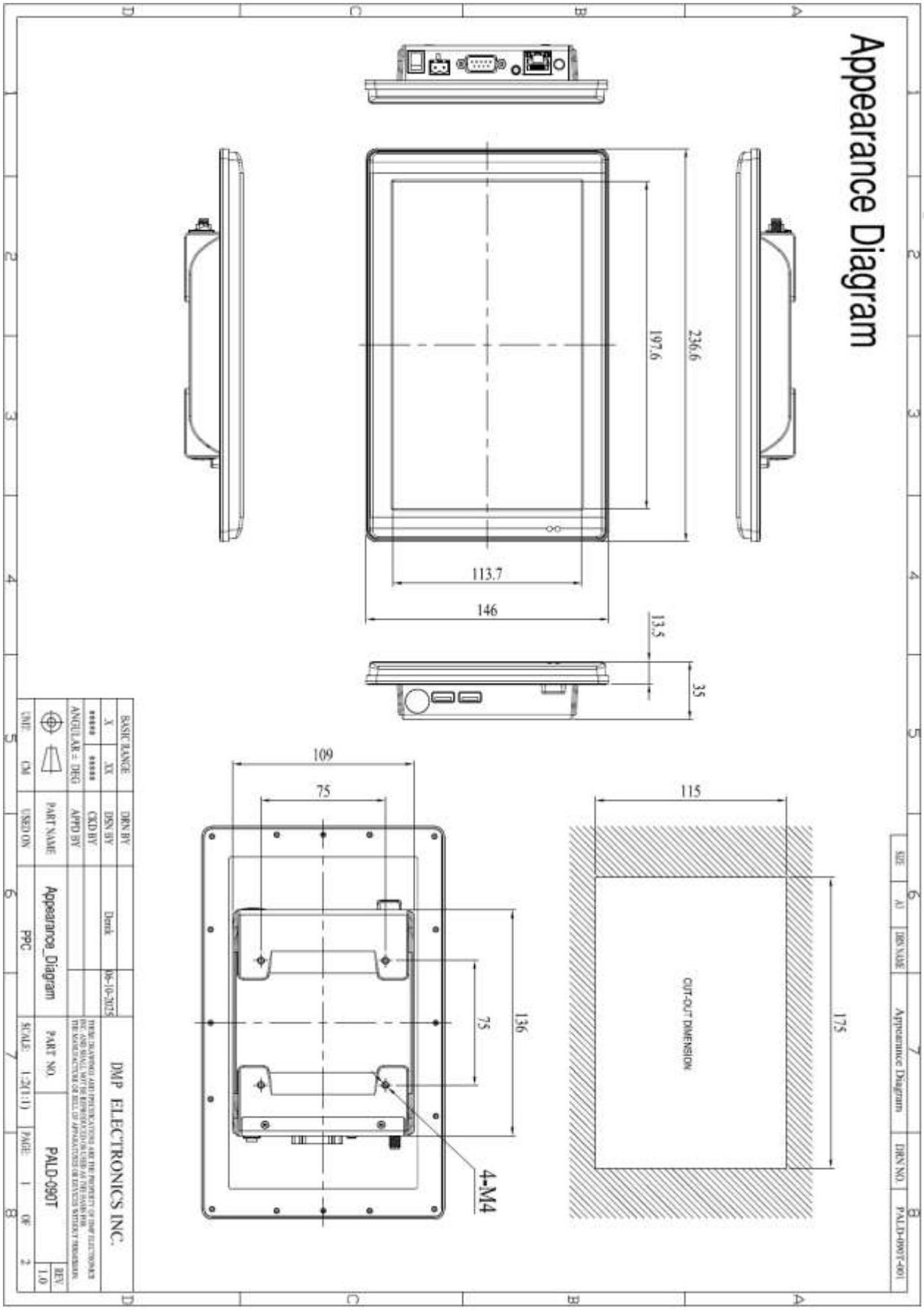
TEST ITEMS	CONDITIONS	NOTE
High Temperature Operation	70℃ ;240hrs	
High Temperature Storage	80℃ ; 240hrs	
High Temperature High Humidity Operation	60℃ ; 90%RH ;240hrs	No condensation
Low Temperature Operation	-20℃ ; 240hrs	Backlight unit always turn on
Low Temperature Storage	-30℃ ; 240hrs	
Thermal Shock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

Note 5-1

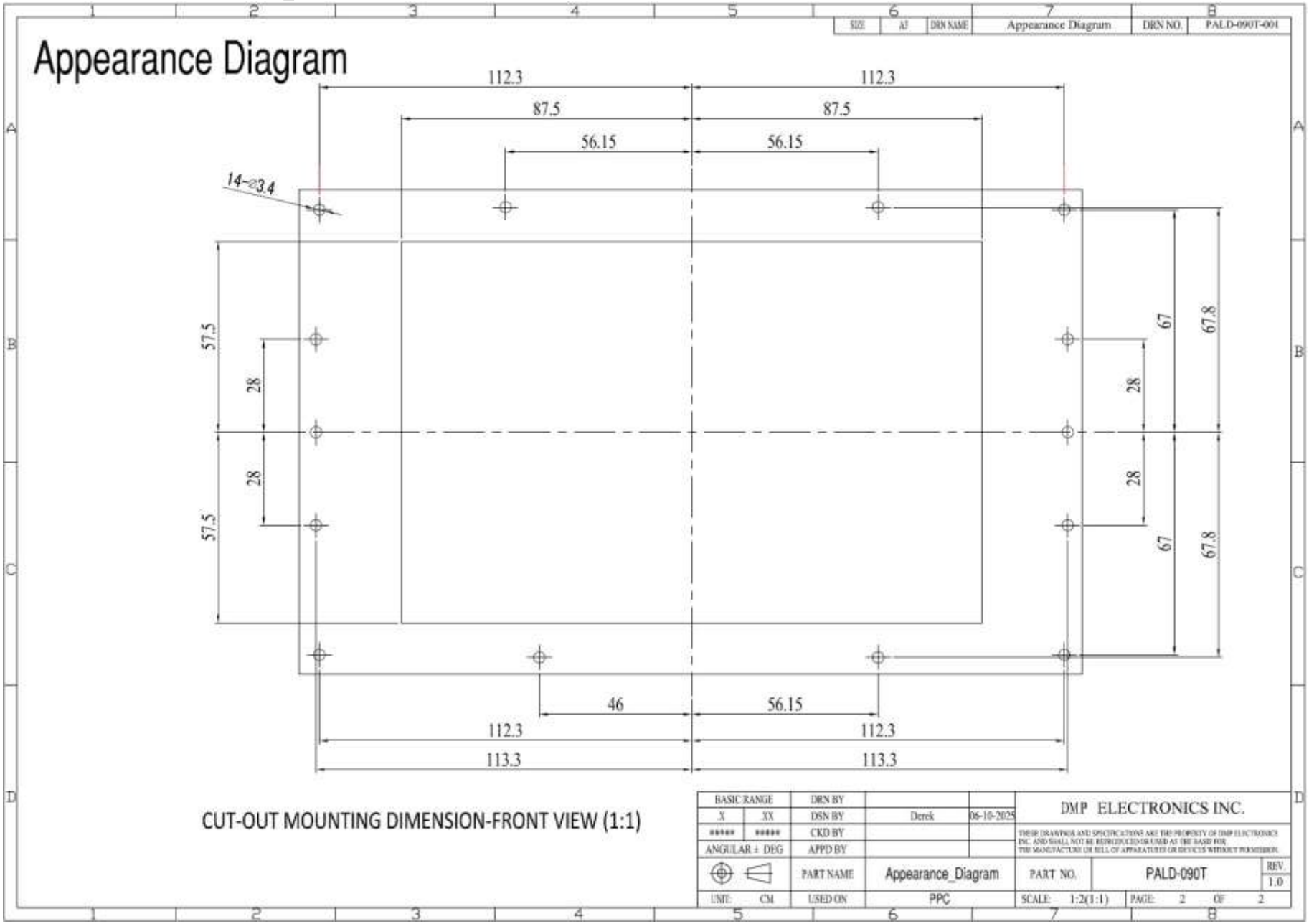
1. Condition of Image Sticking test：25 ℃± 2 ℃.
2. Operation with test pattern sustained for 4 hrs, then change to gray pattern immediately.
3. After 5 mins, the mura must be disappeared completely.



1.4 Product Dimensions



Appearance Diagram



CUT-OUT MOUNTING DIMENSION-FRONT VIEW (1:1)

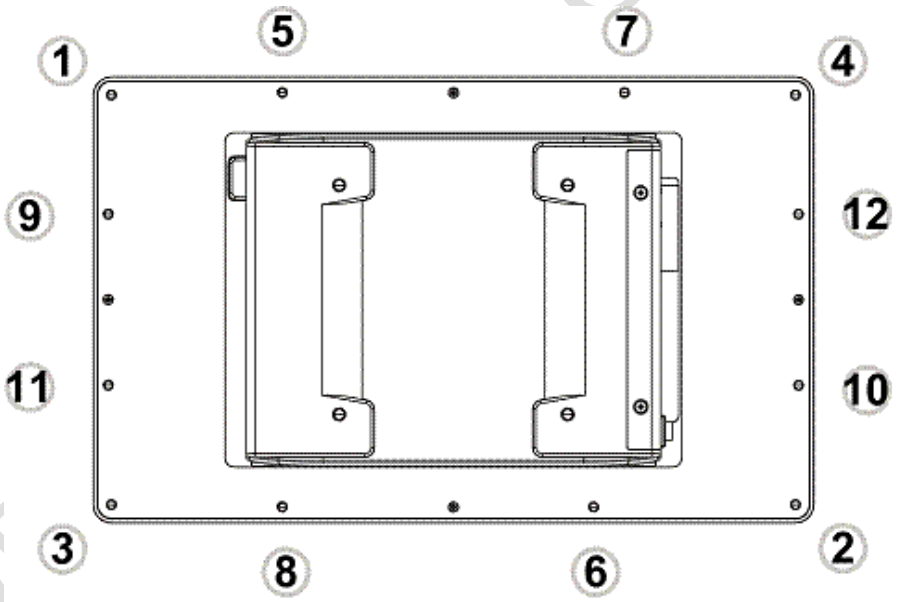
SIZE	A3	DRN NAME	Appearance Diagram	DRN NO.	PALD-090T-001

BASIC RANGE		DRN BY			DMP ELECTRONICS INC.
.X	.XX	DSN BY	Derek	06-10-2025	
*****	*****	CKD BY			THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF DMP ELECTRONICS INC. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SELL OF APPARATUSES OR DEVICES WITHOUT PERMISSION.
ANGULAR ± DEG		APPD BY			
		PART NAME	Appearance_Diagram	PART NO.	PALD-090T / REV. 1.0
UNIT:	CM	USED ON	PPC	SCALE:	1:2(1:1) / PAGE: 2 OF 2

1.5 Mounting Instruction

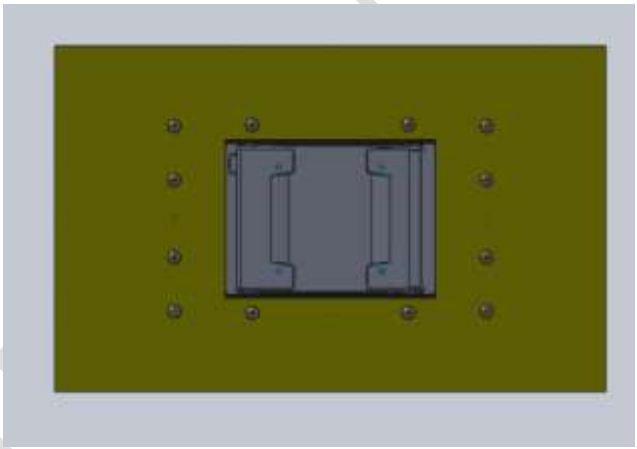
• Panel Mounting

- Cut a mounting hole in the panel. (Refer to PALD-090T Dimensions on page 10) (Note 1)
- Check and remove the twelve M3 screws in a diagonal pattern as image below if necessary.
- Place PALD-090T face-down on a clean, flat surface.
- Slide the panel cutout around the back of PALD-090T, until the panel rests directly on the gasket. Make sure the screw holes align with the screw holes on PALD-090T.
- The screw size is M3*L (L=wall thickness + 6.0mm) (Note 2)
- Insert all twelve M3 screws into the screw holes. (Note 2)
- 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 PALD-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	CPU Type & Touch Panel	RAM
PALD	090T	N50 **P**50 (With **PCAP** Touch)	8G 16G

1. Product Code：

PALD：PALD Series。

2. LCD Size：

090T：9” LCD Panel。

3. CPU Type：

N50：Intel® Alder Lake N50 Processor with Resistive Touch Panel。

PN50：Intel® Alder Lake N50 Processor with **PCAP Touch Panel**。

4. RAM：

8G：8GB DDR5 Memory。

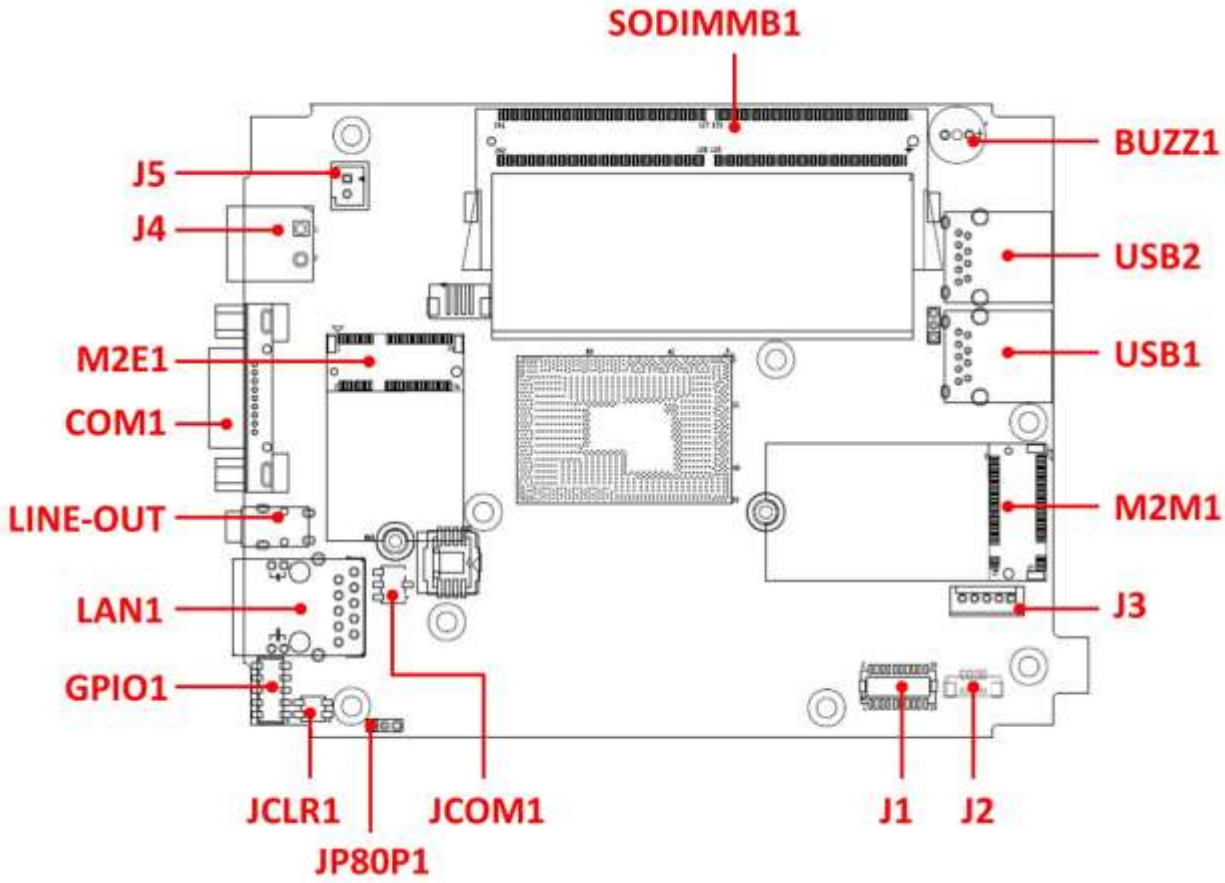
16G：16GB DDR5 Memory。

PART NUMBER	DESCRIPTION
PALD-090T-N50-8G	9" Panel PC w/Intel® Alder Lake N50/8GB DRAM /2U/2.5GbE/1S/**RTP**/DC12~36V Power Input
PALD-090T-N50-16G	9" Panel PC w/Intel® Alder Lake N50/16GB DRAM /2U/2.5GbE/1S/**RTP**/DC12~36V Power Input
PALD-090T-PN50-8G	9" Panel PC w/Intel® Alder Lake N50/8GB DRAM /2U/2.5GbE/1S/ **PCAP** /DC12~36V Power Input
PALD-090T-PN50-16G	9" Panel PC w/Intel® Alder Lake N50/16GB DRAM /2U/2.5GbE/1S/ **PCAP** /DC12~36V Power Input
WLAN KIT (Optional)	JWW6051 x1 (M.2 E-Key 802.11ac/a/b/g/n Module) WIRELESS-ANTENNA-DB x1 WIRELESS-CABLE-MHF4 x1

Ch. 2

System Installation

2.1 CPU Board Outline



PALD CPU Board

2.2 Connector Summary

No.	Description	Type of Connections	Pin #
J1	HDMI **(Reserved)**	1.0mm 20-pin wafer	20-pin
J2	Power LED Header	1.25mm 4-pin wafer	4-pin
J3	USB2.0 **(Reserved for touch controller)**	2.0mm 5-pin wafer	5-pin
J4	Power Connector	External Power Plug	2-pin
J5	Power Switch Header	2.54mm 2-pin wafer	2-pin
JCLR1	RTC Reset or Clear CMOS	2.0mm 4-pin pin header	4-pin
JCOM1	COM1 Pin-9 Function Select	2.0mm 4-pin pin header	4-pin
JP80P1	Set GPIO or 80 Port **(Reserved)**	2.0mm 3-pin pin header	3-pin
BUZZ1	Buzzer	PC Buzzer 2-pin	2-pin
COM1	COM1	External D-Sub 9-pin	9-pin
GPIO1	GPIO **(Reserved)**	2.0mm 10-pin pin header	10-pin
LAN1	2.5GbE LAN	External RJ45 Connector	8-pin
LINE-OUT	Audio Line-out Jack	External Audio Line-out Jack	4-pin
M2E1	M.2 E-Key (2230)	M.2 E-Key 2230 Slot	75-pin
M2M1	M.2 M-Key (2242)	M.2 M-Key 2242 Slot	75-pin
USB1	USB3.2	External USB3.2 Connector	9-pin
USB2	USB3.2	External USB3.2 Connector	9-pin
SODIMMB1	DDR5 SO-DIMM Slot	DDR5 SO-DIMM Slot	262-pin

2.3 Connector Pin Assignments

J1: HDMI (Reserved)

Pin #	Signal Name	Pin #	Signal Name
1	HDMI_D2+	2	N/C
3	HDMI_D2-	4	GND
5	GND	6	HDMI_CLK+
7	HDMI_D1+	8	HDMI_CLK-
9	HDMI_D1-	10	GND
11	GND	12	HDMI_SCL
13	HDMI_D0+	14	HDMI_SDA
15	HDMI_D0-	16	GND
17	VCC	18	HDMI_HPD
19	GND	20	GND
1	HDMI_D2+	2	N/C

J2: Power LED Header

Pin #	Signal Name	Pin #	Signal Name
1	VCC_PWR	2	GND
3	VCC_SATA	4	SATA_LED_N

J3: USB2.0 (Reserved)

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	USBD2-
3	USBD2+	4	GND
5	GND		

J4: Power Connector

Pin #	Signal Name	Pin #	Signal Name
1	DCIN	2	GND

J4: J5: Power Switch Header

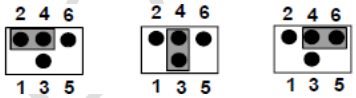
Pin #	Signal Name	Pin #	Signal Name
1	DCIN	2	VIN+

JCLR1: RTC Reset or Clear CMOS

(Just make the pins shorted around 3 seconds for active)

Pin #	Signal Name
1 & 2 Shorted	RTC Reset
3 & 4 Shorted	Clear CMOS

JCOM1: COM1 Pin-9 Function Select



Pin #	Signal Name
2 & 4 Closed	RI = RI
3 & 4 Closed	RI = +5V
4 & 6 Closed	RI = +12V

JP80P1: Set GPIO or 80 Port (Reserved)

Pin #	Signal Name
1 & 2 Closed	80 Port
3 & 4 Closed	GPIO

BUZZ1: Buzzer

Pin #	Signal Name	Pin #	Signal Name
1	BUZZ+	2	BUZZ-

COM1: COM1

Pin #	Signal Name	Pin #	Signal Name
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

GPIO1: GPIO (Reserved)

Pin #	Signal Name	Pin #	Signal Name
1	GPIO80	2	GPIO81
3	GPIO82	4	GPIO83
5	GPIO84	6	GPIO85
7	GPIO86	8	GPIO87
9	GND	10	VCC

LAN1: 2.5GbE LAN

Pin #	Signal Name	Pin #	Signal Name
1	TP0+	2	TP0-
3	TP1+	4	TP2+
5	TP2-	6	TP1-
7	TP3+	8	TP3-

LINE-OUT: Audio Line-out Jack

Pin #	Signal Name	Pin #	Signal Name
1	GND_AUD	2	LOUT-R
3	Open Touch	4	LOUT-L

USB1 & USB2: USB3.2

Pin #	Signal Name	Pin #	Signal Name
1	VCC	2	USB3_D-
3	USB3_D+	4	GND
5	USB3_RX-	6	USB3_RX+
7	GND	8	USB3_TX-
9	USB3_TX+		

M2E1: M.2 E-Key (2230)

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	3.3V
3	USB_D+	4	3.3V
5	USB_D-	6	LED1
7	GND	8	PCM_CLK / I2C SCK
9	SDIO CLK / SYSCLK	10	PCM SYNC / I2S WS
11	SDIO CMD	12	PCM_IN / I2S_IN
13	SDIO DATA0	14	PCM_OUT / I2S SD_OUT
15	SDIO DATA1	16	LED2#
17	SDIO DATA2	18	GND
19	SDIO DATA3	20	UART WAKE#
21	SDIO WAKE#	22	UART RxD
23	SDIO RESET# / TX_BLANK -ING	-	-
24-31		Key E	
-	-	32	UART TxD
33	GND	34	UART CTS
35	PETp0	36	UART RTS
37	PETn0	38	Vendor defined
39	GND	40	Vendor defined
41	PERp0	42	Vendor defined
43	PERn0	44	COEX3
45	GND	46	COEX_RxD

47	PEFCLKP0	48	COEX_TxD
49	PEFCLKN0	50	SUSCLK
51	GND	52	PERST0#
53	CLKREQ0#	54	W_DISABLE_2#
55	PEWake0#	56	W_DISABLE1#
57	GND	58	I2C_DATA
59	Reserved / PETp1	60	I2C_CLK
61	Reserved / PETn1	62	ALERT#
63	GND	64	Reserved
65	Reserved / PERp1	66	UIM_SWP / PERST1#
67	Reserved / PERn1	68	Uim_Power_Snk / CLKREQ1#
69	GND	70	Reserved / REFCLKp1#
71	Reserved / REFCLKp1	72	3.3V
73	Reserved / REFCLKn1	74	3.3V
75	GND		

M2M1: M.2 M-Key (2242)

Pin #	Signal Name	Pin #	Signal Name
1	CONFIG_3	2	3.3V
3	GND	4	3.3V
5	PERn3	6	N/A
7	PERp3	8	N/A
9	GND	10	DAS/DSS
11	PETn3	12	3.3V
13	PETp3	14	3.3V
15	GND	16	3.3V
17	PERn2	18	3.3V
19	PERp2	20	N/A
21	CONFIG_0	22	N/A
23	PETn2	24	N/A
25	PETp2	26	N/A
27	GND	28	N/A
29	PERn1	30	N/A
31	PERp1	32	N/A
33	GND	34	N/A
35	PETn1	36	N/A
37	PETp1	38	DEVSLP
39	GND	40	N/A
41	SATA-B+/PERn0	42	N/A
43	SATA-B-/PERp0	44	N/A
45	GND	46	N/A
47	SATA-A-/PETn0	48	N/A
49	SATA-A+/PETp0	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKN	54	PEWAKE#
55	PEFCLKP	56	MFG1
57	GND	58	MFG2
59-66	Removed		
67	N/A	68	SUSCLK
69	CONFIG_1	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	CONFIG_2		

2.4 External I/O Overview

{ PALD-090T }

{Note}

1. The RS232/485/422 function of COM1 is selected by BIOS setup. (Please refer section 4.3 to setup the COM1 function.)

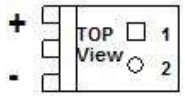
2. Wireless Antenna is reserved for M.2 E-Key (2230) WLAN module.

2.5 External I/O Pin Assignment

Power Switch

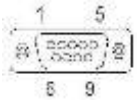
Pin #	Status
|	ON
O	OFF

Power Connector (8A)



Pin #	Signal Name
1	+12 ~ 36V
2	GND

COM1

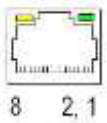


Pin #	Signal Name	Pin #	Signal Name
1	DCD	**2**	RXD
3	TXD	**4**	DTR
5	GND	**6**	DSR
7	RTS	**8**	CTS
9	RI		

Audio Line-Out

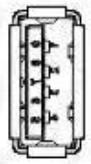
Pin #	Signal Name
1	GND_AUD
2	LOUT-R
3	Open Touch
4	LOUT-L

2.5GbE LAN



Pin #	Signal Name	Pin #	Signal Name
1	TP0+	2	TP0-
3	TP1+	4	TP2+
5	TP2-	6	TP1-
7	TP3+	8	TP3-

USB 3.2 Gen.1 Ports



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

Ch. 3

Hardware Installation

PALD-090T supports various kinds of storages for industrial application, divided into M.2 M-Key (2242) PCIe Gen.3 / SATA interface support NVME.

3.1 Installing the M.2 2242 PCIe Gen.3 / SATA Storage

[SPEC]

Standard M.2 2242 form factor
22 x 42 x 3.2 mm

[M.2 2242 SATA LIST]

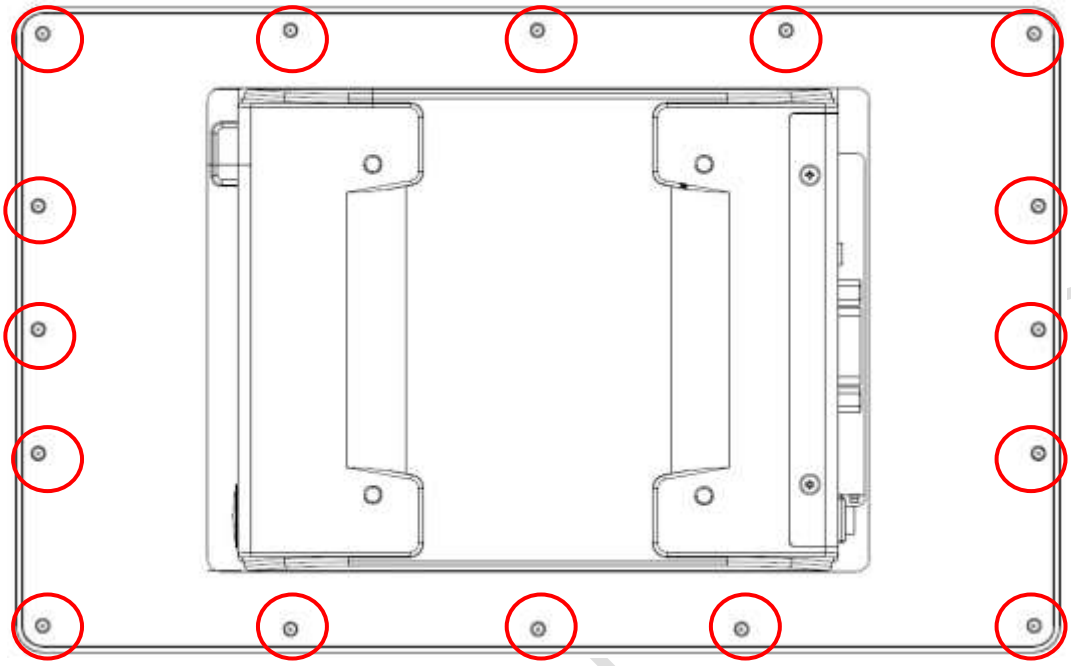
P/N	Flash Type	Capacity	Operating Temperature
IM242S-128G-T	TLC	128GB	0℃ ~ +70℃
IM242S-256G-T	TLC	256GB	0℃ ~ +70℃
IM242S-512G-T	TLC	512GB	0℃ ~ +70℃
IM242S-1TB-T	TLC	1TB	0℃ ~ +70℃

[M.2 2242 PCIE GEN.3X2 LIST]

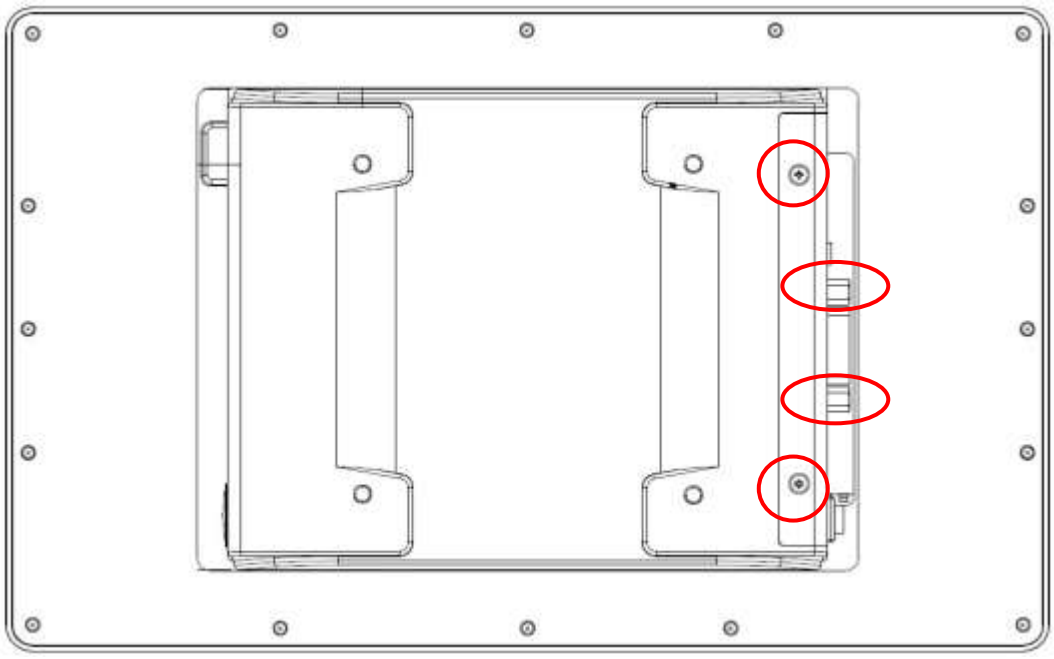
P/N	Flash Type	Capacity	Operating Temperature
IM242P2-128G-T	TLC	128GB	0℃ ~ +70℃
IM242P2-256G-T	TLC	256GB	0℃ ~ +70℃
IM242P2-512G-T	TLC	512GB	0℃ ~ +70℃
IM242P2-1TB-T	TLC	1TB	0℃ ~ +70℃

[STEP]

1. Remove the 16 screws as the image below.



2. Remove the 2 screws and 2 Hex Head Bolts as the image below.

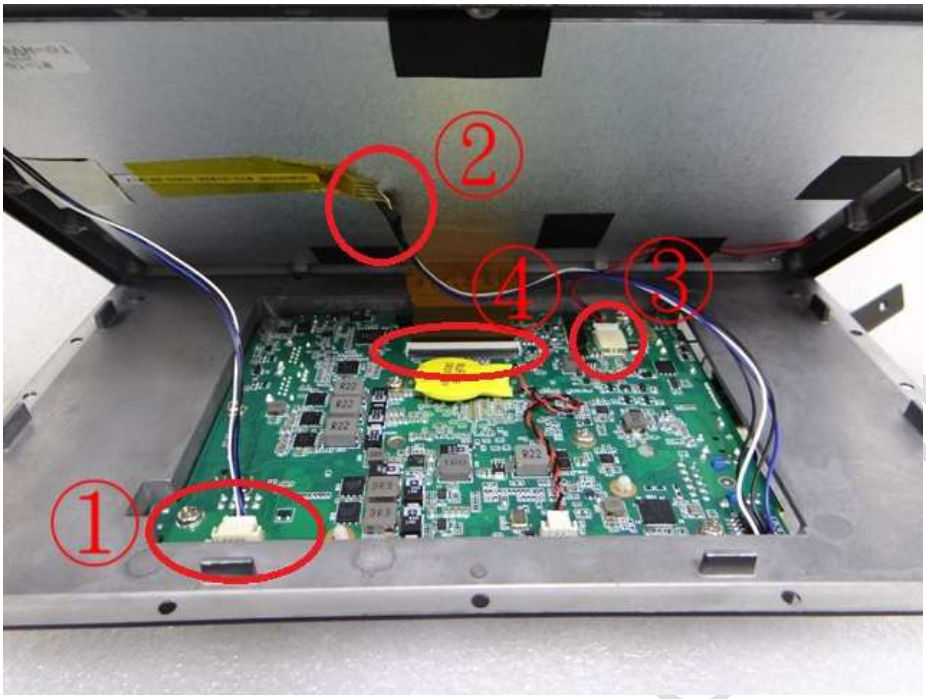


3. Pull out the I/O bracket carefully.

4. Be careful to upside down the panel PC, which LEDs are on the bottom of left side.

5. Pull up the front panel carefully.

6. Remove the wires 1, 2, 3, and 4 in sequence.

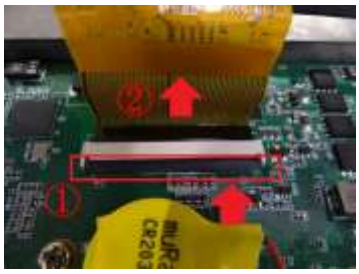


(1) Pull up and remove the LED cable carefully.

(2) Remove the touch cable carefully.

(3) Pull up and remove the LED backlight cable carefully.

(4) Open up the LVDS housing, and then pull up and remove the FPC cable.

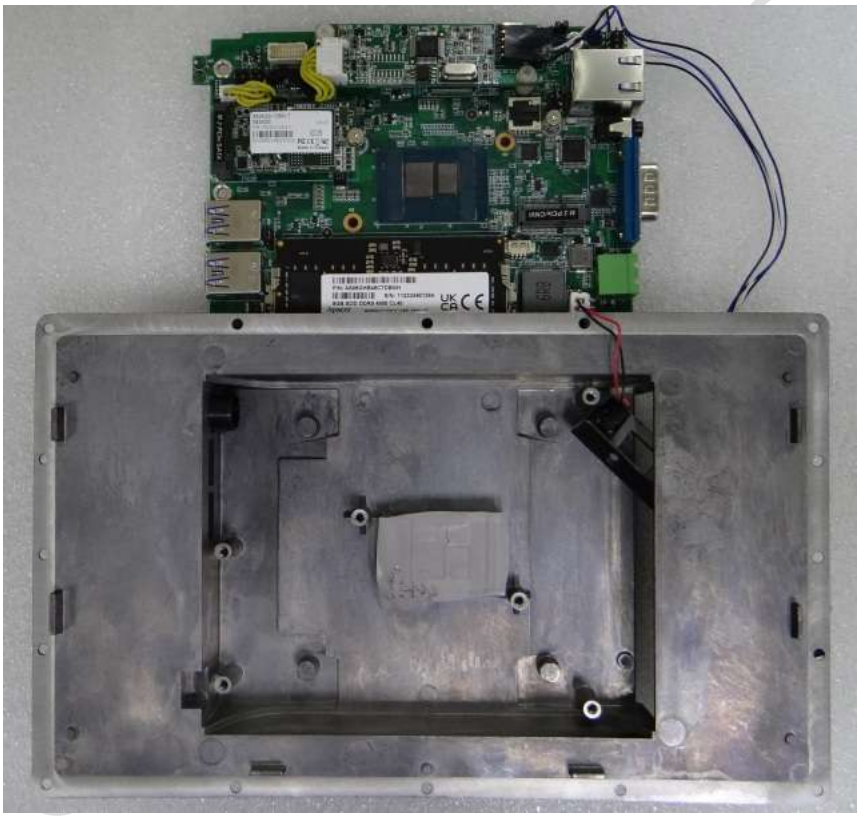


7. Remove the front panel, and then remove 4 screws.

8. Remove 2 screws.

9. Upside down the cover carefully, and then press the COM1 connector and separate the motherboard from the case.

10. Remove the motherboard.

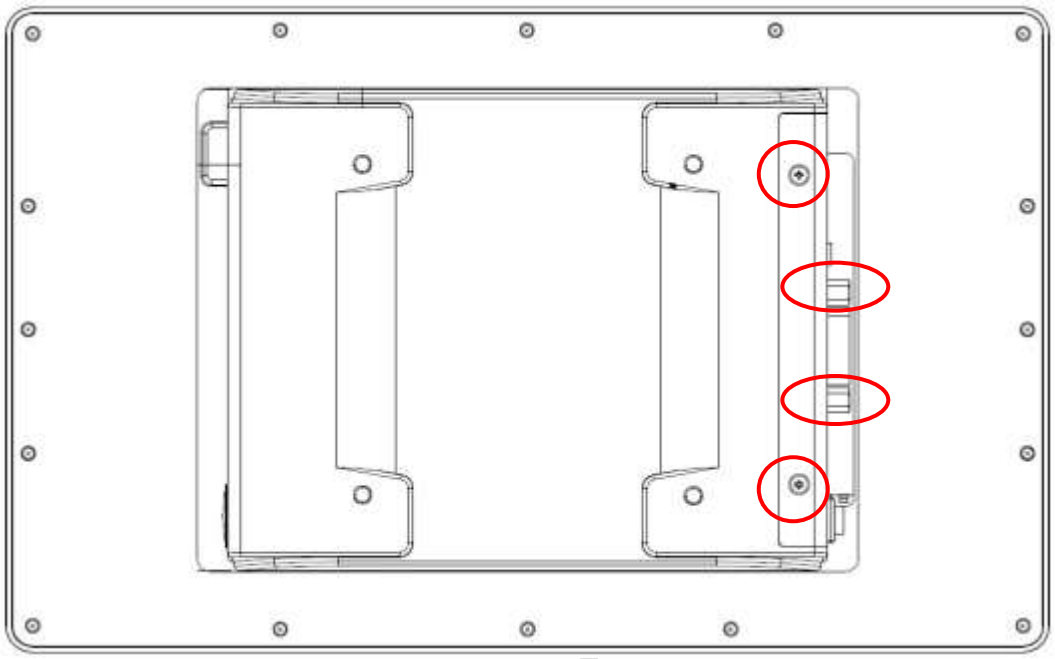


11. Remove the M.2 screw and plug M.2 storage in the socket, and then lock the screw back.

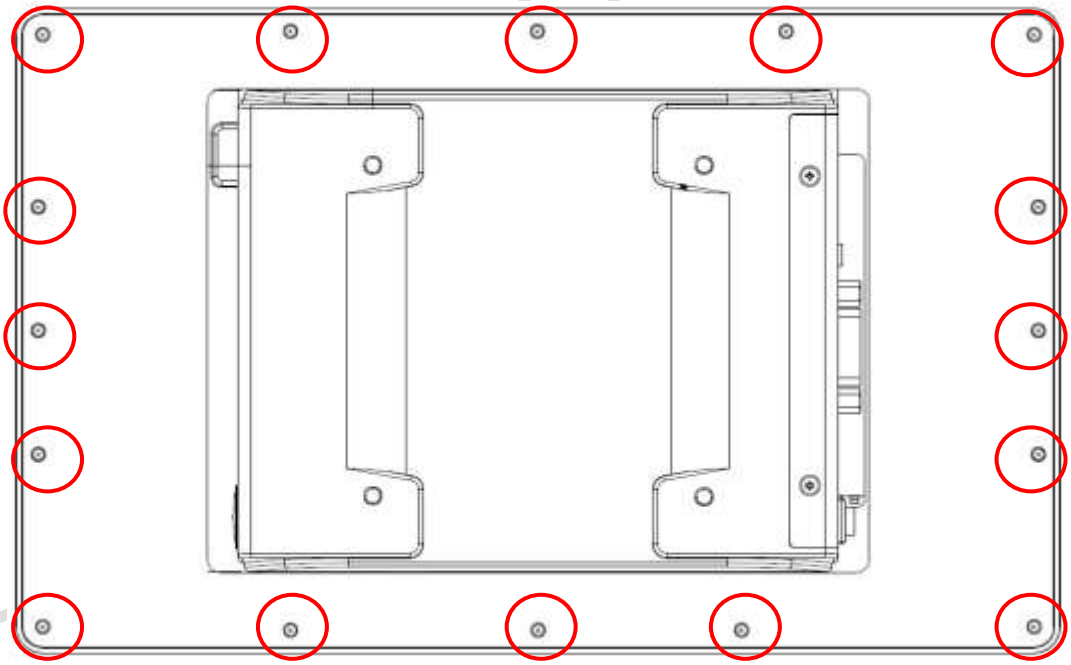
12. Put the motherboard back to case and lock 2 screws back in the middle.

13. Tighten the 4 screws diagonally.

14. Refer the step 6, 5, 4, 3 to assemble the cables and front panel back.
15. Lock 2 screws and 2 Hex Head Bolts back.



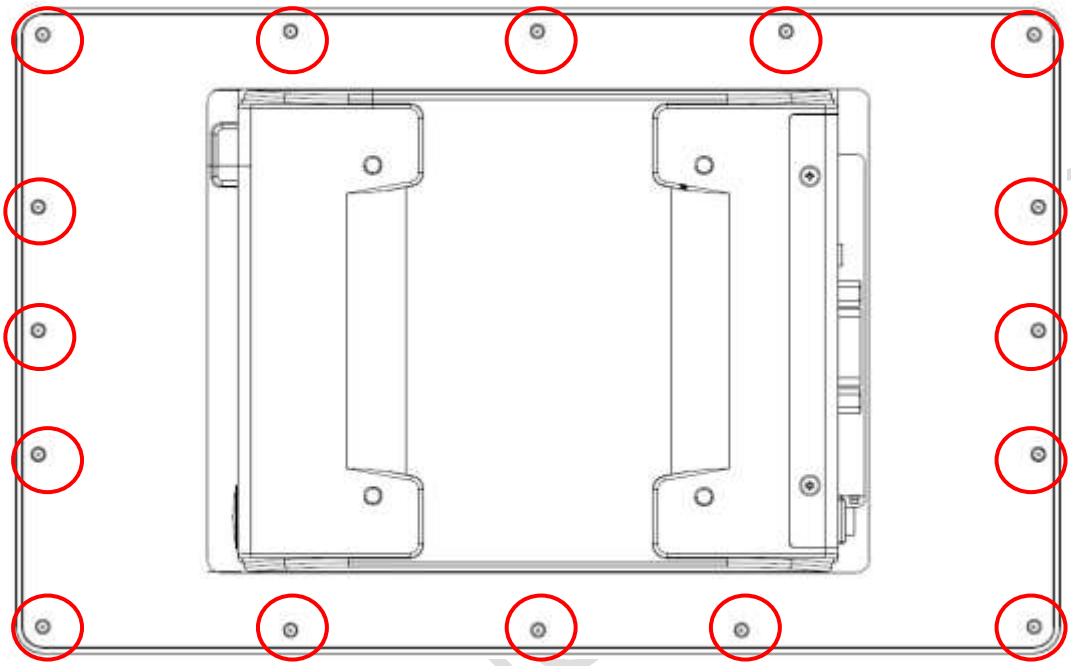
16. Lock the 16 screws back.



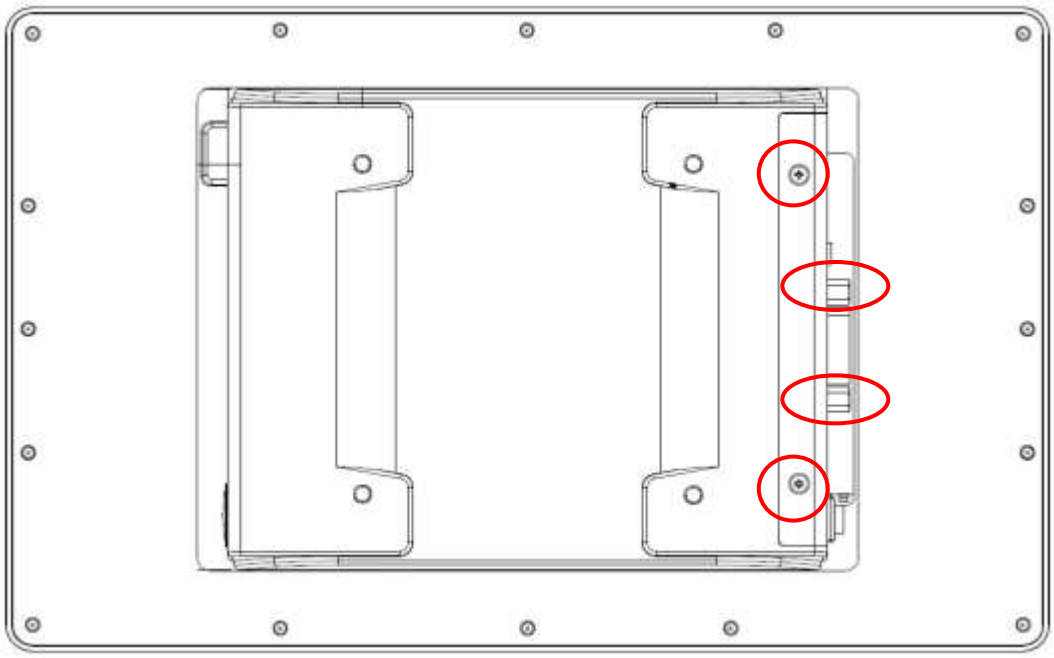
3.2 Installing the M.2 2230 E-Key Module

[STEP]

1. Remove the 16 screws as the image below.



2. Remove the 2 screws and 2 Hex Head Bolts as the image below.

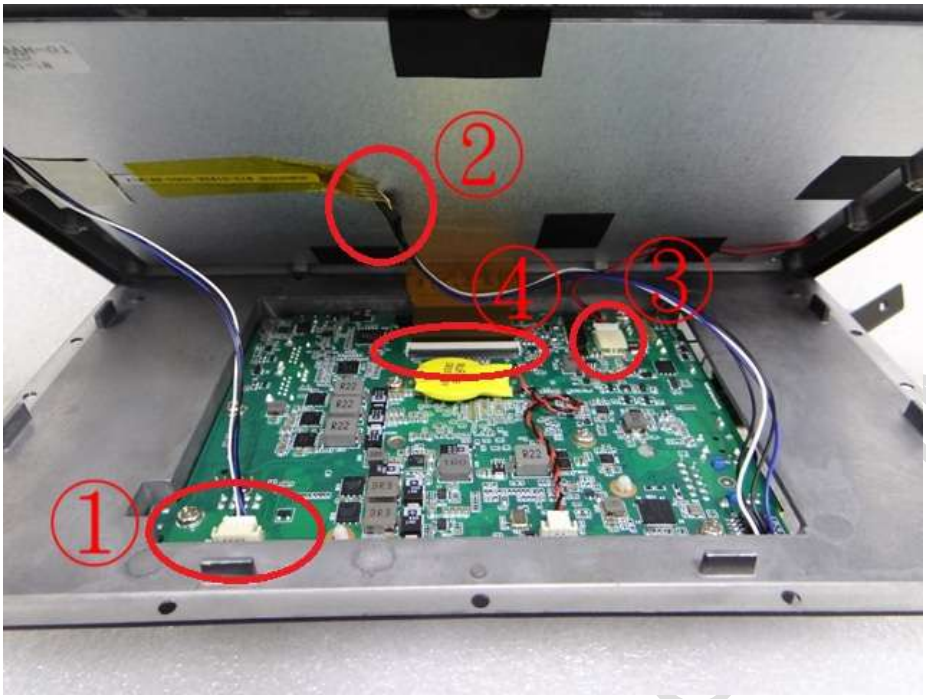


3. Pull out the I/O bracket carefully.

4. Be careful to upside down the panel PC, which LEDs are on the bottom of left side.

5. Pull up the front panel carefully.

6. Remove the wires 1, 2, 3, and 4 in sequence.

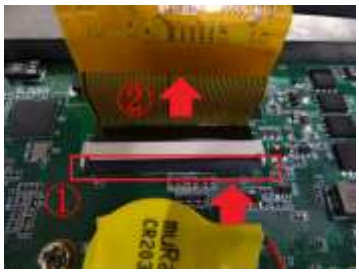


(1) Pull up and remove the LED cable carefully.

(2) Remove the touch cable carefully.

(3) Pull up and remove the LED backlight cable carefully.

(4) Open up the LVDS housing, and then pull up and remove the FPC cable.

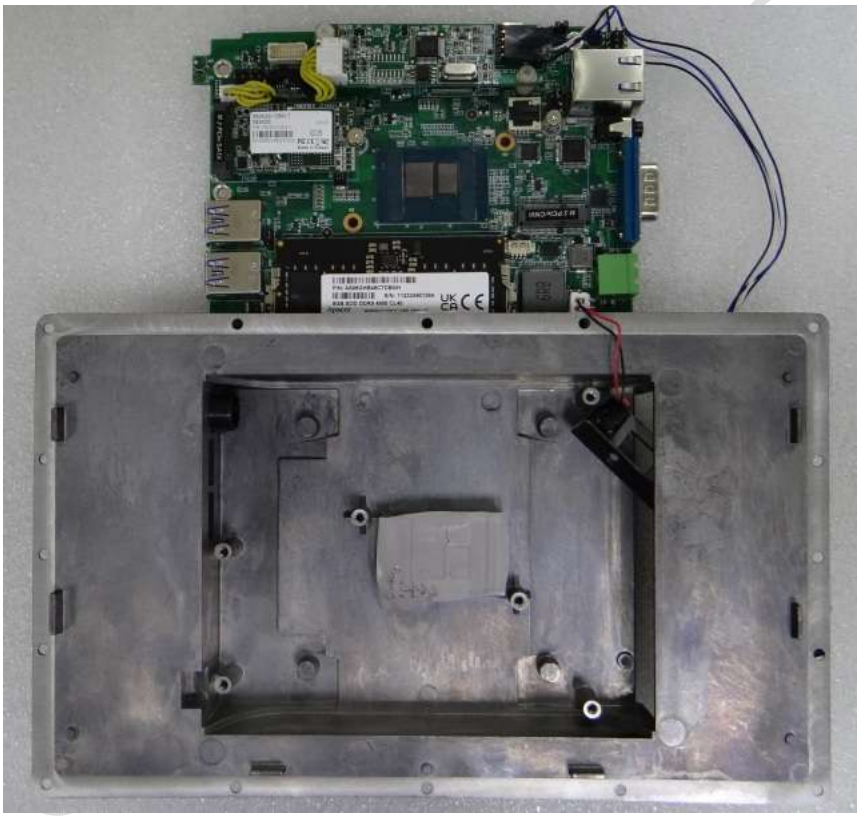


7. Remove the front panel, and then remove 4 screws.

8. Remove 2 screws.

9. Upside down the cover carefully, and then press the COM1 connector and separate the motherboard from the case.

10. Remove the motherboard.

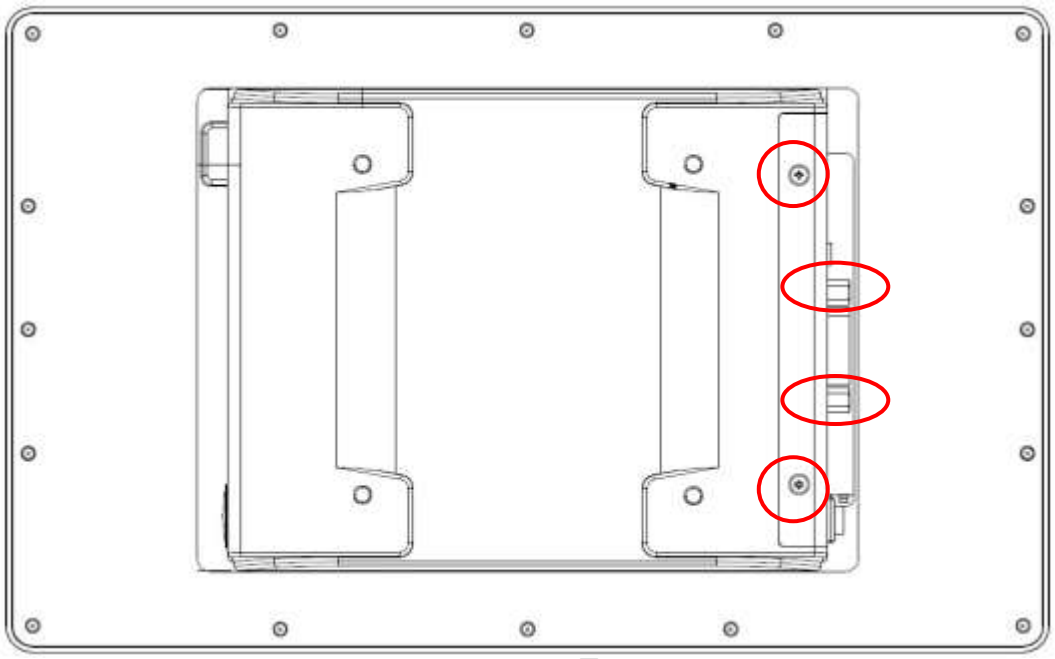


11. Remove the M.2 screw and plug M.2 E-Key 2230 device in the socket, and then lock the screw back.

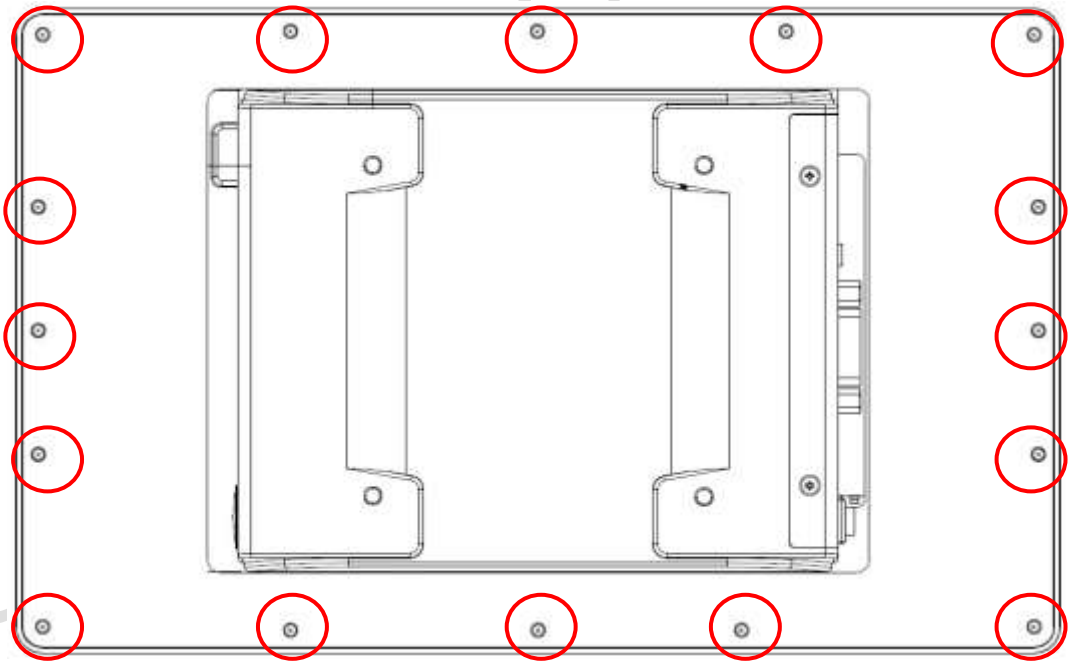

12. Put the motherboard back to case and lock 2 screws back in the middle.

13. Tighten the 4 screws diagonally.

14. Refer the step 6, 5, 4, 3 to assemble the cables and front panel back.
15. Lock 2 screws and 2 Hex Head Bolts back.



16. Lock the 16 screws back.



Ch. 4

Drivers and BIOS Instruction

4.1 Operating System Support and Drivers

The PALD-090T support Legacy and UEFI operating system. For Windows, the driver support Win10, Win10 IoT Enterprise, Win11 and Win11 IoT Enterprise.

Please get the drivers from ICOP technical support URL:

https://www.icop.com.tw/resource_entrance

For Linux, most Linux distributions support Intel® Alder Lake Processor and user can install Linux upon PALD-090T directly. Please contact your region sales for technical support if you have any question.

4.2 BIOS Hot Key

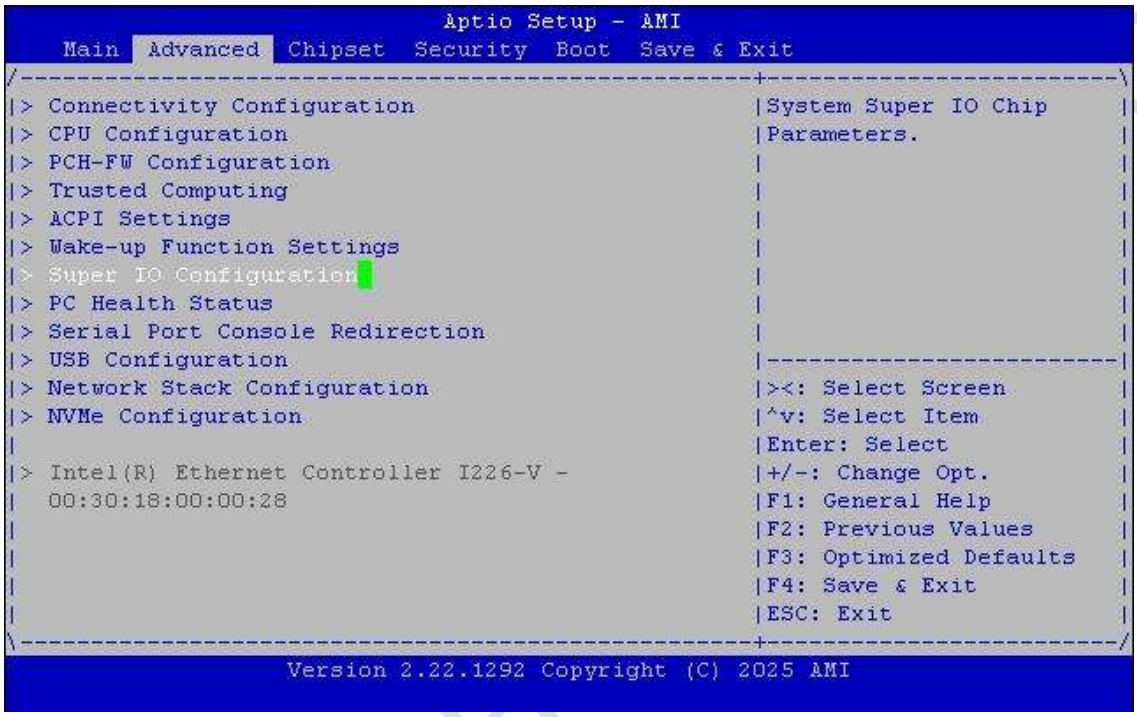
After power on, it supports BIOS hot key as below.

	Press < **Del** > to enter the AMI BIOS setup
	Press < **F7** > to enter boot device selection Menu

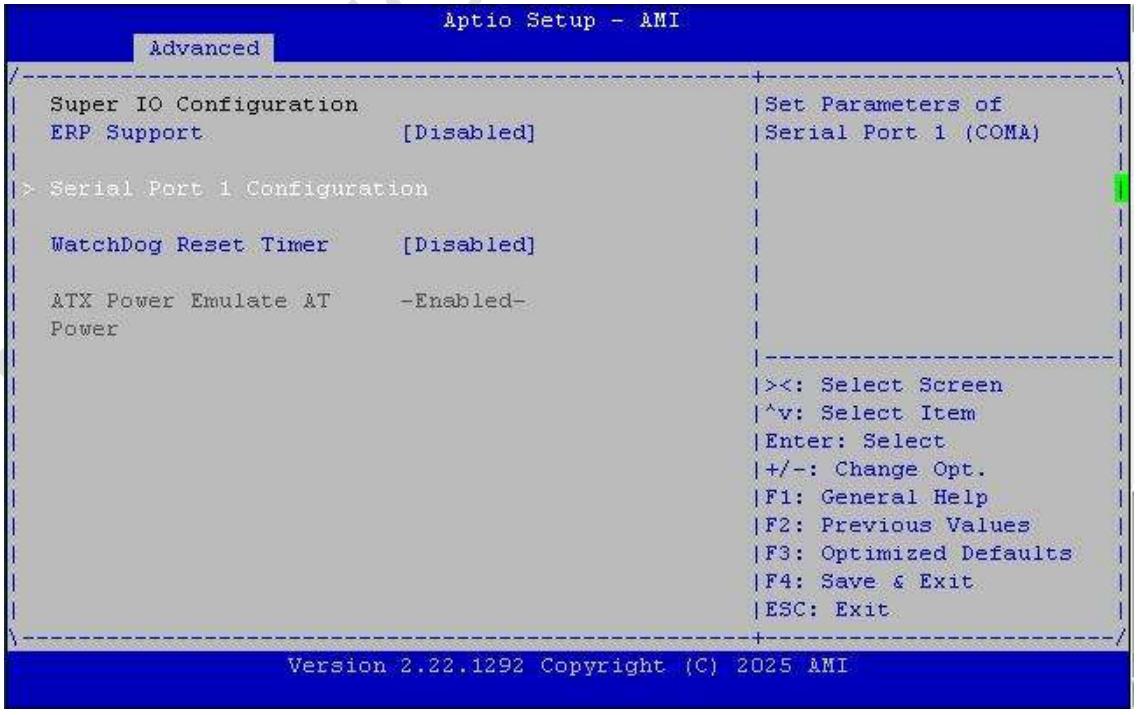
4.3 BIOS COM1 Setting (RS232/422/485)

COM1 can be set to be RS232/422/485 function. Please refer the instruction as below.

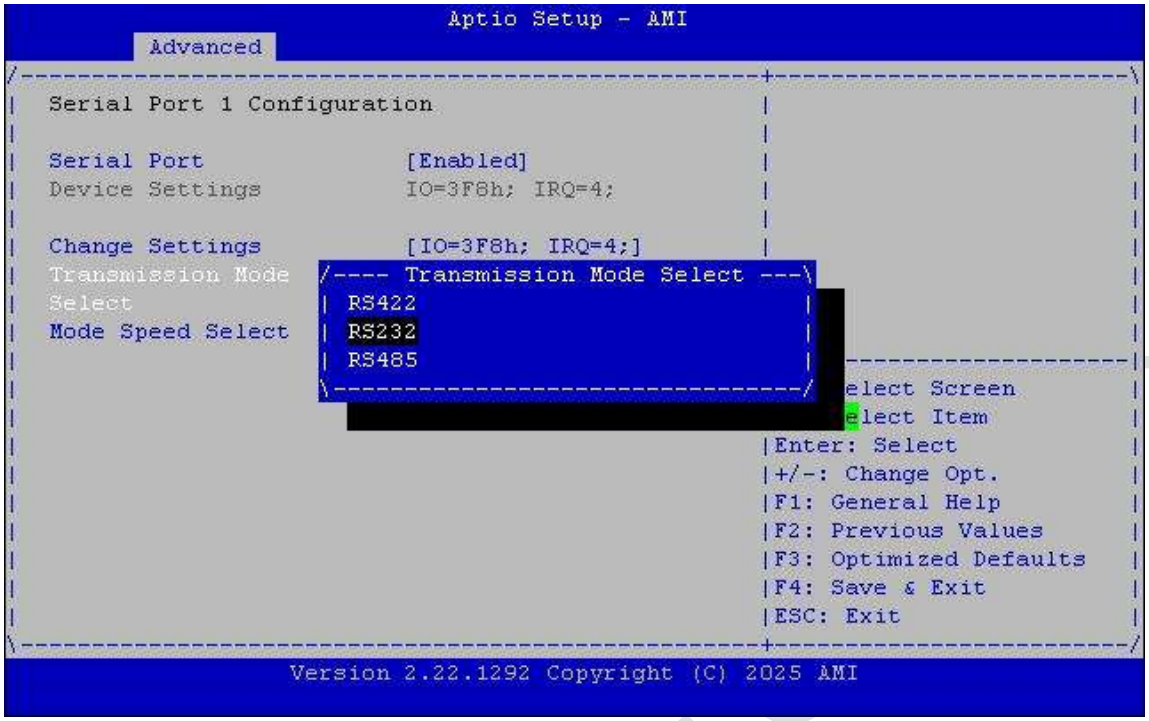
(1) In the BIOS Setup, please go to “Advanced” and “Super IO Configuration”.



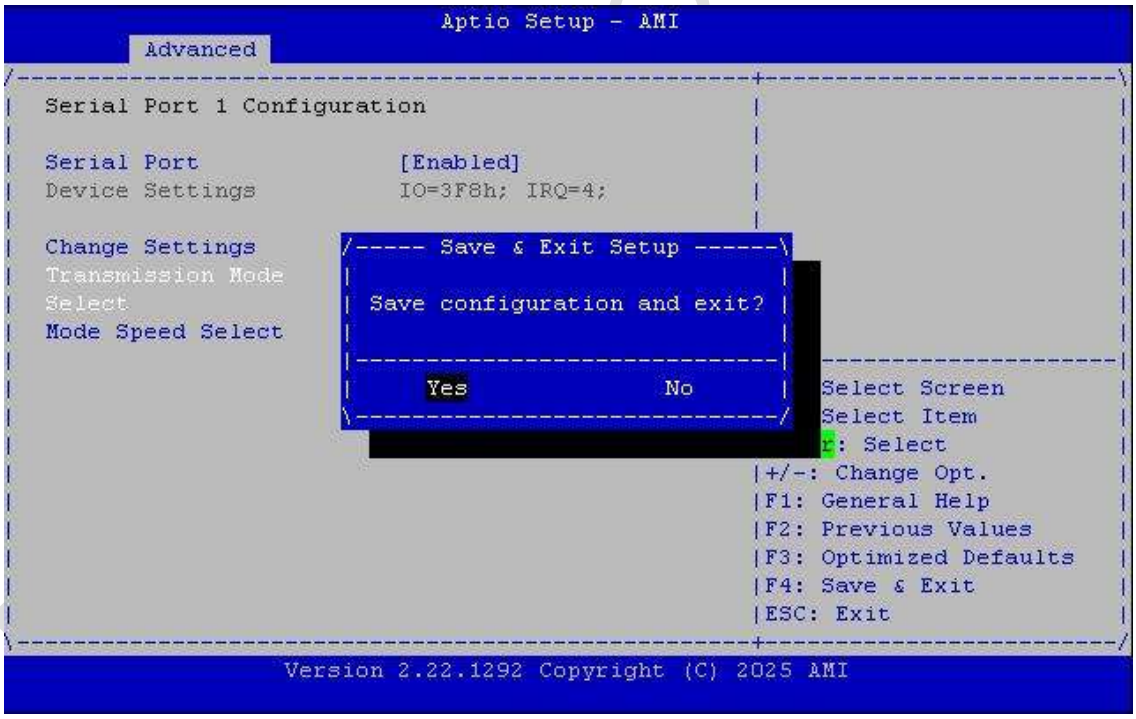
(2) Go to “Serial Port 1 Configuration”.



(3) Go to “Transmission Mode Select” and set RS232/422/485 function.



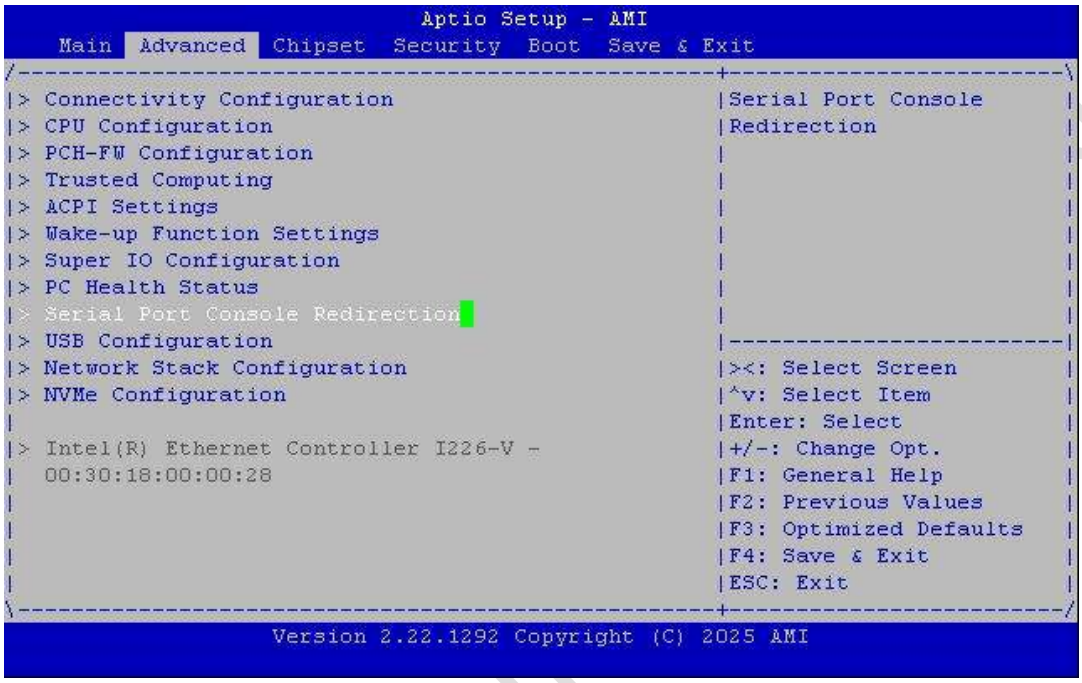
(4) After setting, please press “F4” key to save & exit.



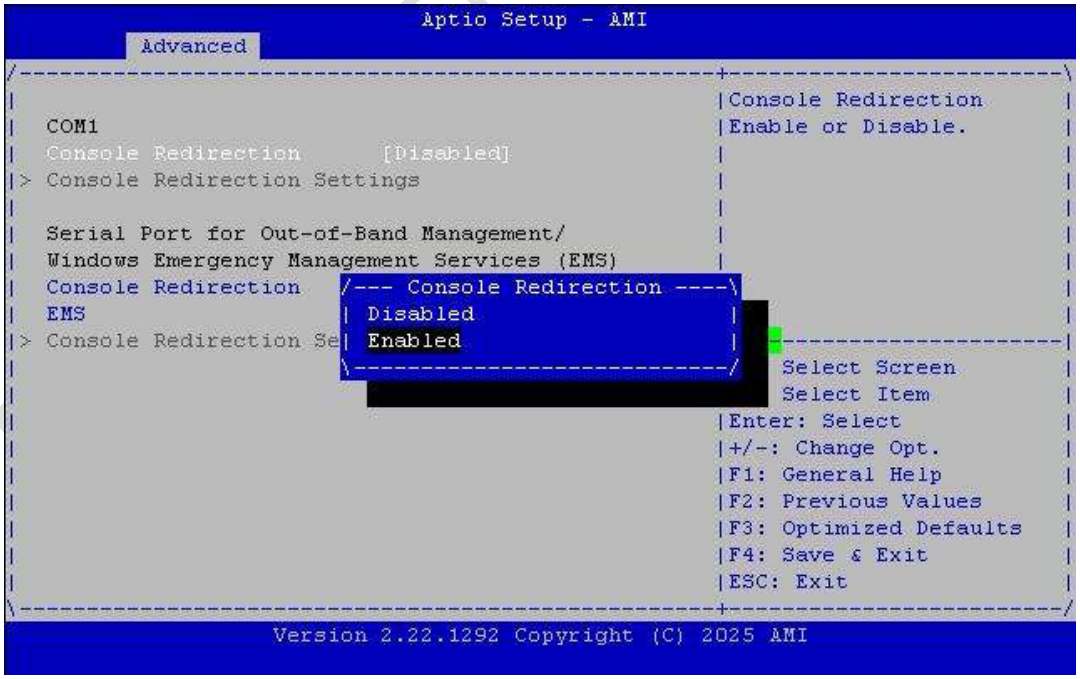
4.4 BIOS Serial Port Console Redirection

PPC-150P-TGL supports Serial Port Console Redirection as below.

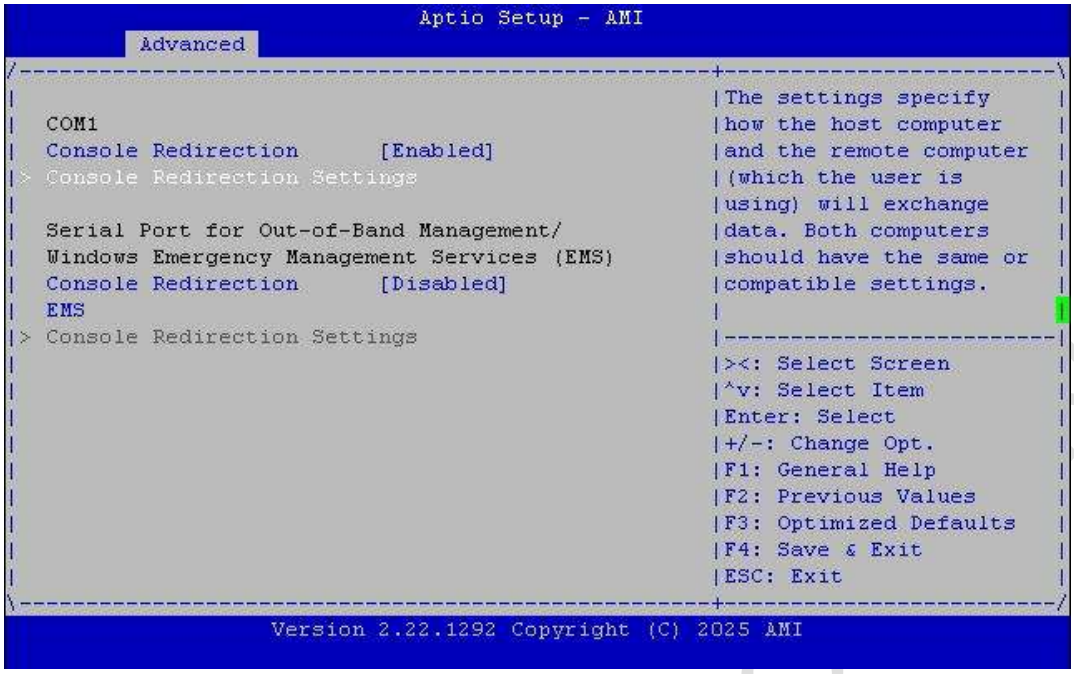
(1) Go to “Advanced” and “Serial Port Console Redirection”.



(2) Set “Console Redirection” to be “Enabled”.



(3) Go to “Console Redirection Settings”.



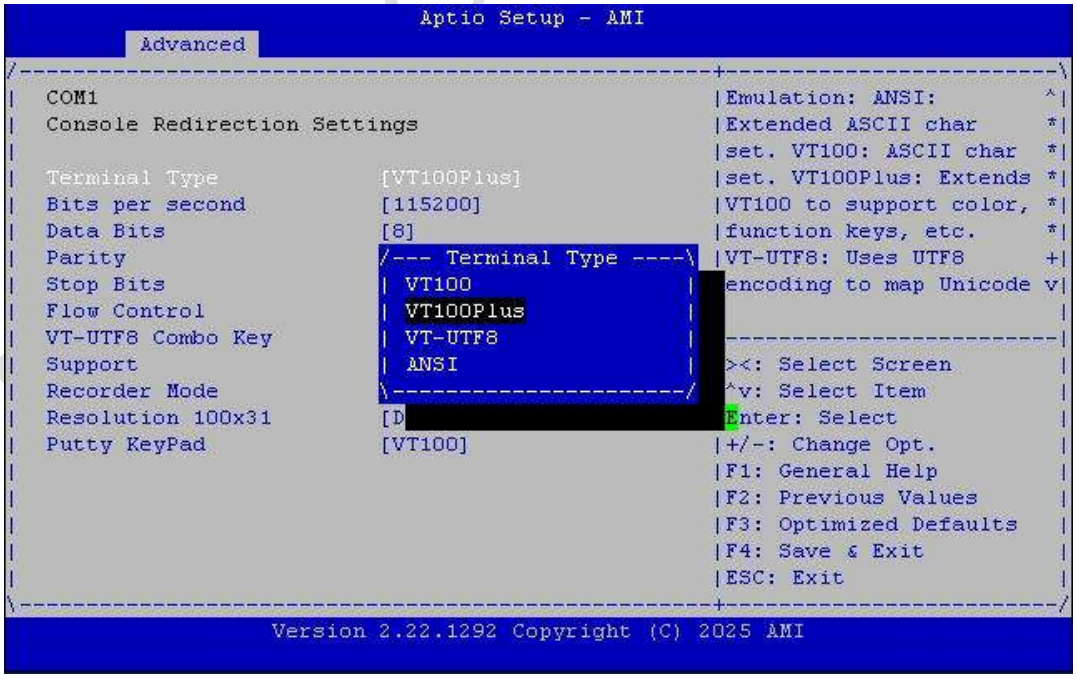
(4) Set “Terminal Type” to “VT100Plus”.

Emulation: [VT100]: ASCII char set.

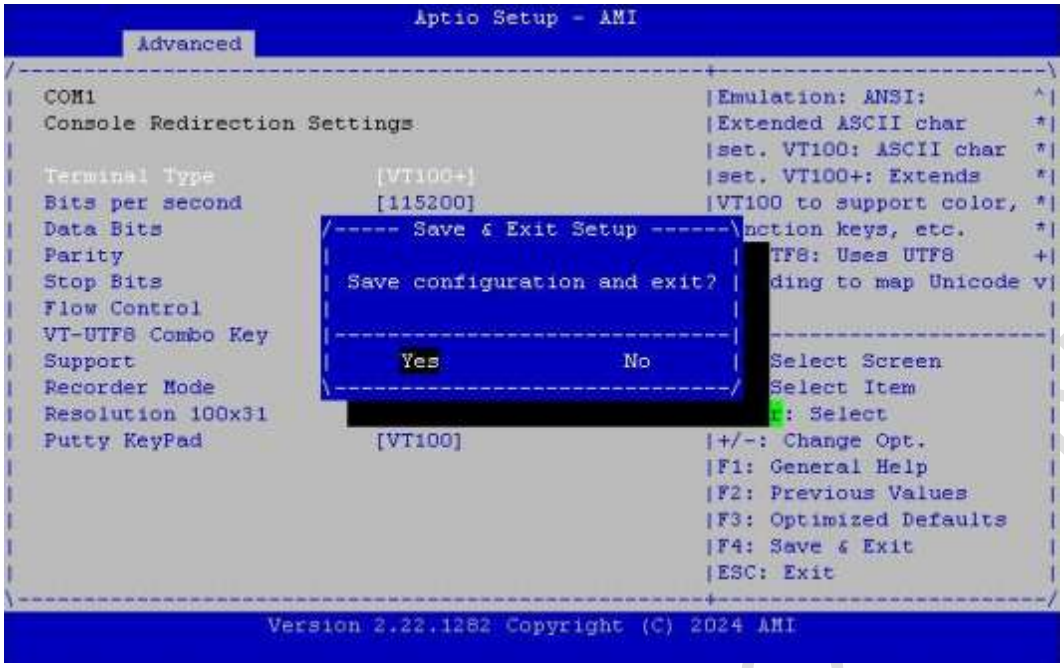
[VT100Plu]: Extended VT100 to support color, function keys, etc.

[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more Bytes.

[ANSI]: Extended ASCII char set.

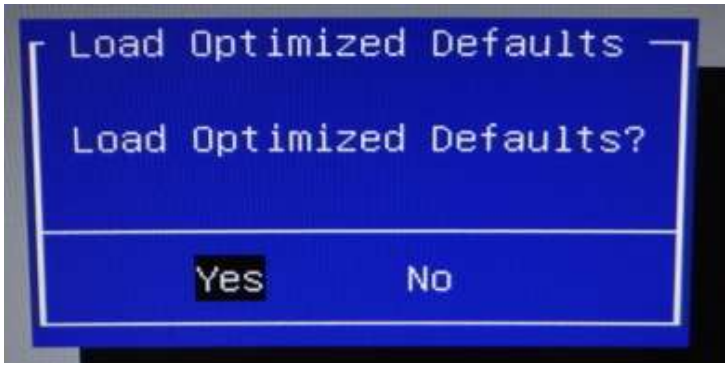


(4) After setting, please press “F4” key to save & exit.

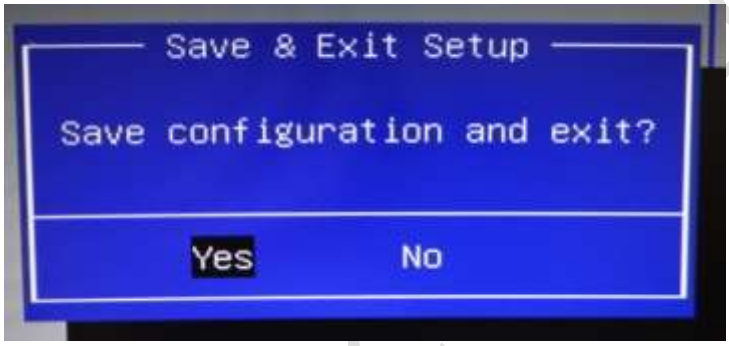


4.5 BIOS Load Default Setting

(1) Power on and press “Del” key in the BIOS setup, and then press “F9” key to load optimized defaults.



(2) After setting, please press “F10” key to save configuration and exit.



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.