

2I740CW

**Intel® ATOM® Amston Lake x7000 series CPU,
SODIMM DDR5,
2 x LAN / HDMI® / LVDS / USB / COM**

All-In-One

**Intel® ATOM® Amston Lake x7000 series CPU,
SODIMM DDR5 Max 16GB,
HDMI®, eDP, USB 3.2 Type C DP ALT
2 x M.2 , 1 x Nano SIM, 2 x MIPI-CSI
2 x 2.5 GbE, 6 x USB, 4 x COM,
Wide Range DC-IN 9~36V**

CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS**

NO. 2I740CW

Release date: AUG. 20. 2026

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2I740CW

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User Manual edition 0.1, AUG. 2026

Warning !

1. **Battery**

Batteries on board are consumables.

The life time of them are not guaranteed.

2. **Fanless solution with HDD**

The specification & limitation of HDD should be considered carefully when the fanless solution is implemented.

3. We will not give further notification in case of changes of product information and manual.
4. SATA interface does not support Hot SWAP function.
5. There might be a 20% inaccuracy of WDT at room temperature.
6. Please make sure the voltage specification meets the requirement of equipment before plugging in.
7. There are two types of SSD, commercial grade and industrial grade, which provide different read/write speed performance, operation temperature and life cycle. Please contact sales for further information before making orders.
8. Caution! Please notice that the heat dissipation problem could cause the MB system unstable. Please deal with heat dissipation properly when buying single MB set.
9. Please avoid approaching the heat sink area to prevent users from being scalded with fanless products.
10. If users repair, modify or destroy any component of product unauthorizedly, We will not take responsibility or provide warranty anymore.
11. DO NOT apply any other material which may reduce cooling performance onto the thermal pad.
12. It is important to install a system fan toward the CPU to decrease the possibility of overheating / system hanging up issues, or customer is suggested to have a fine cooling system to dissipate heat from CPU.

* Hardware Notice Guide

1. Before linking power supply with the motherboard, please attach DC-in adapter to the motherboard first. Then plug the adapter power to AC outlet.
Always shut down the computer normally before you move the system unit or remove the power supply from the motherboard. Please unplug the DC-in adapter first and then unplug the adapter from the AC outlet.
Please refer photo 1 as standard procedures.
2. In case of using DIRECT DC-in (without adapter), please check the allowed range for voltage & current of cables. And make sure you have the safety protection for outer issues such as short / broken circuit, overvoltage, surge, lightning strike.
3. In case of using DC-out to an external device, please make sure its voltage and current comply with the motherboard specification.
4. The total power consumption is determined by various conditions (CPU / motherboard type, device, application, etc.). Be cautious to the power cable you use for the system, one with UL standard will be highly recommended.
5. It's highly possible to burn out the CPU if you change / modify any parts of the CPU cooler.
6. Please wear wrist strap and attach it to a metal part of the system unit before handling a component. You can also touch an object which is ground connected or attached with metal surface if you don't have wrist strap.
7. Please be careful to handle & don't touch the sharp-pointed components on the bottom of PCBA.
8. Remove or change any components from the motherboard will VOID the warranty of the motherboard.
9. Before you install / remove any components or even make any jumper setting on the motherboard, please make sure to disconnect the power supply first. (follow the aforementioned instruction guide)
10. "POWERON after PWR-Fail" function must be used carefully as below:
When the DC power adaptor runs out of power, unplug it from the DC current;
Once power returns, plug it back after 5 seconds.
If there is a power outage, unplug it from the AC current, once power returns, plug it back after 30 seconds. Otherwise it will cause system locked or made a severe damage.

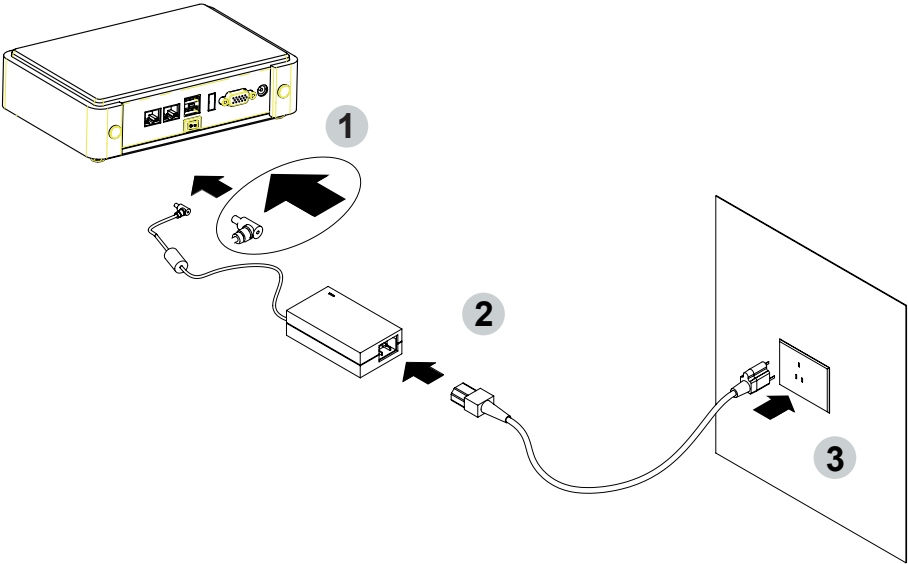
Remark 1:

Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.

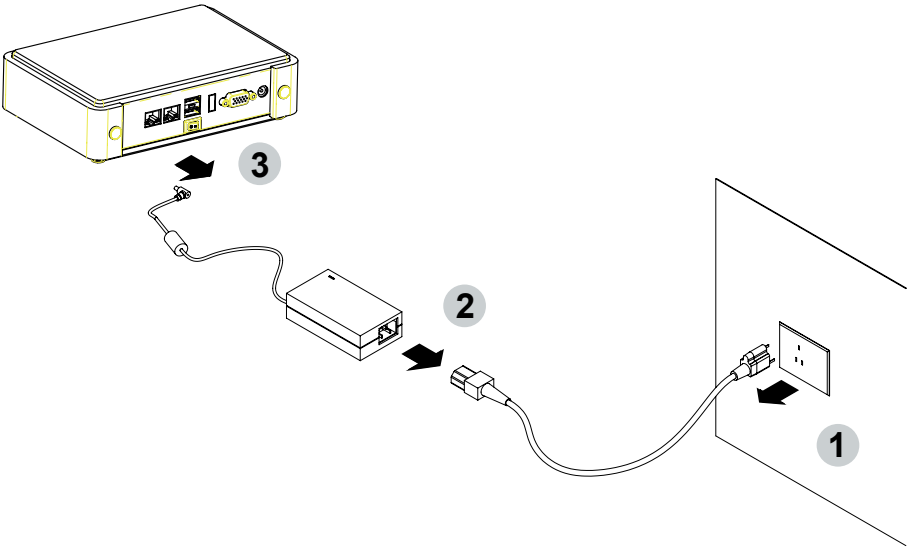
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 2I740CW is a 2.5" (108 x 102 mm) motherboard powered with Intel® Amston Lake ATOM® x7000 series CPU & offered the ideal platform for high performance applications. The ultra compact motherboard with wide range 9~36V DC power input. The 2I740CW integrates 2 x 2.5GbE LAN ports, 6 x USB ports, 4 x COM ports, HDMI®, LVDS/eDP selectable by BIOS, 1 x USB 3.2 Type-C with DP Alt Mode, 2 x MIPI-CSI camera interfaces, and 2 x M.2, 1 x Nano SIM expansion slots, making it an ideal platform for high-performance graphics with built-in IoT capabilities, real-time processing, manageability, and security. With its low power consumption, multiple 2.5GbE Ethernet ports, and wide range 9~36V DC input, the 2I740CW is an excellent choice for OpenVINO-based AI accelerator platforms and advanced Edge AI applications, including intelligent control, factory automation (Industry 4.0), IoT, and edge computing.

1-1 Major Feature

1. Intel® Amston Lake ATOM® x7000 series Processor
2. Intel® UHD Graphics for Intel® Atom x7000 series
3. SODIMM DDR5, max up to 16GB
4. Support 2 x 2.5 Gbps Intel LAN ports.
5. Support 4 x RS232 selectable to RS485 / RS422 by BIOS
6. 3 x USB 3.2 and 2 x USB 2.0, 1 Type C USB 3.2
7. Support extended 1 x M.2 B-Key for PCIe x 2 and USB 2.0 interface 1 x M.2 B-Key for SATA and USB 3.0 / 2.0 interface with Nano SIM
8. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
9. Wide Range DC IN +9V~36V

1-2 Specification

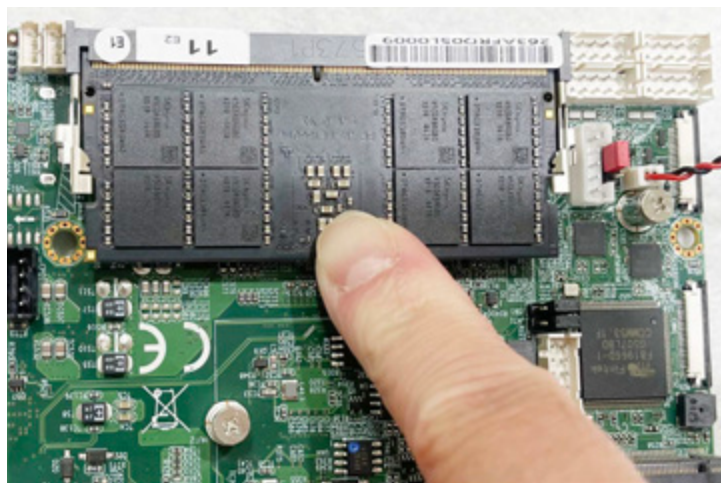
1. **SOC:** Intel® Amston Lake ATOM® x7000 series Processor
2. **Memory:** 1 SODIMM DDR5, max up to 16GB
3. **Display:** HDMI (OEM to DP), Type C DP ALT Mode, eDP
4. **SATA:** Integrated Serial ATA Host Controller 1 SATA port,
SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
5. **LAN:** 2 Intel I226-V / I226-IT LAN chipset with 10 / 100 / 1000 / 2500 Mbps
for PCIe x 1 V2.1
6. **I/O Chip:** Switch chipset for 4 port RS232 / RS422 / RS485 selected by BIOS
7. **USB:** 3 type A USB 3.2, 2 USB 2.0 internal, 1 Type C USB3.2
8. **Expansion interface:** one M.2 B-Key for PCIe x 2 and USB 2.0 interface,
one M.2 B-key for SATA and USB 3.0 / 2.0 interface with Nano SIM.
9. **WDT / DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO (Option) /
Hardware Watch Dog Timer, 0~255 sec programmable
10. **BIOS:** Insyde UEFI BIOS
11. **Dimension:** 108 x 102 mm
12. **Power:** On board DC +9~36V

1-3 Installing the Horizontal SO-DIMM

1. Align the SO-DIMM with the connector at a 45 degree angle.

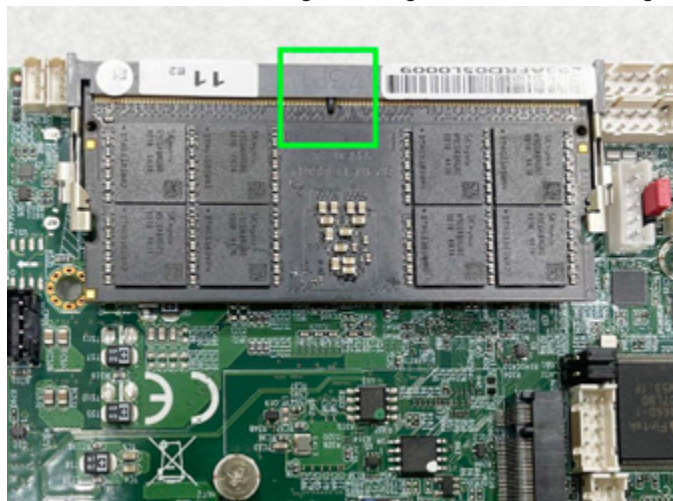


2. Press the SO-DIMM into the connector until you hear a click.

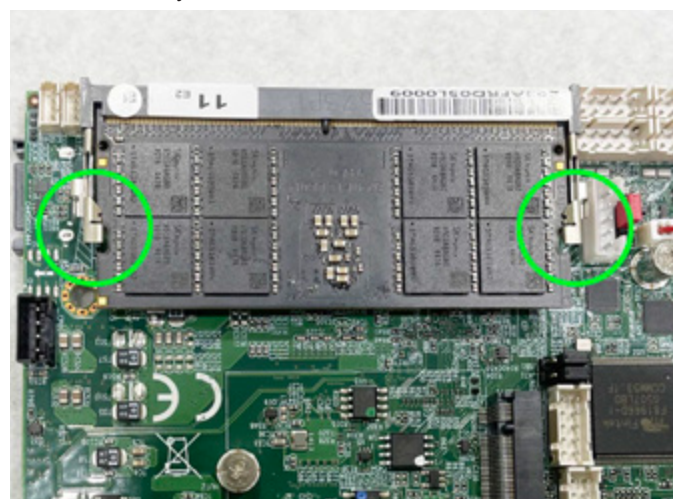


Notices:

- 1.The connectors are designed to ensure the correct insertion. If you feel resistance, check the connectors & golden finger direction, and realign the card.



2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.



1-3-1 Removing the SO-DIMM

1. Release the SO-DIMM by pulling outward the two retaining clips and the SO-DIMM pops up slightly.

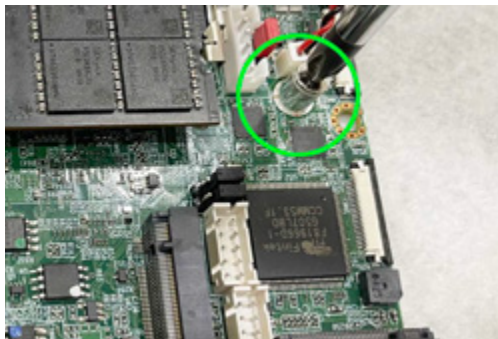


2. Lift the SO-DIMM out of its connector carefully.

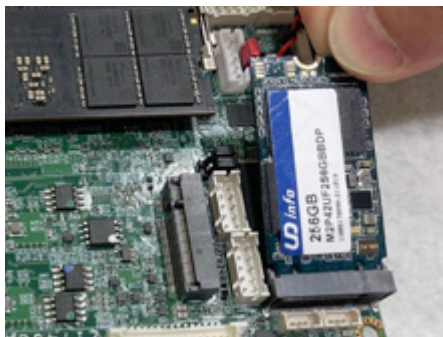


1-4 Directions for installing the M.2B Key for PCIe x2 & USB 2.0

1. Unscrew the screw on the board



2. Plug in the Mini Card in a 45 angle



3. Gently push down the Mini Card and screw the screw back.



1-5 Directions for installing the M.2B Key for USB 3.2 Gen1 & USB 2.0 & SATA

1. Unscrew the screw on the board



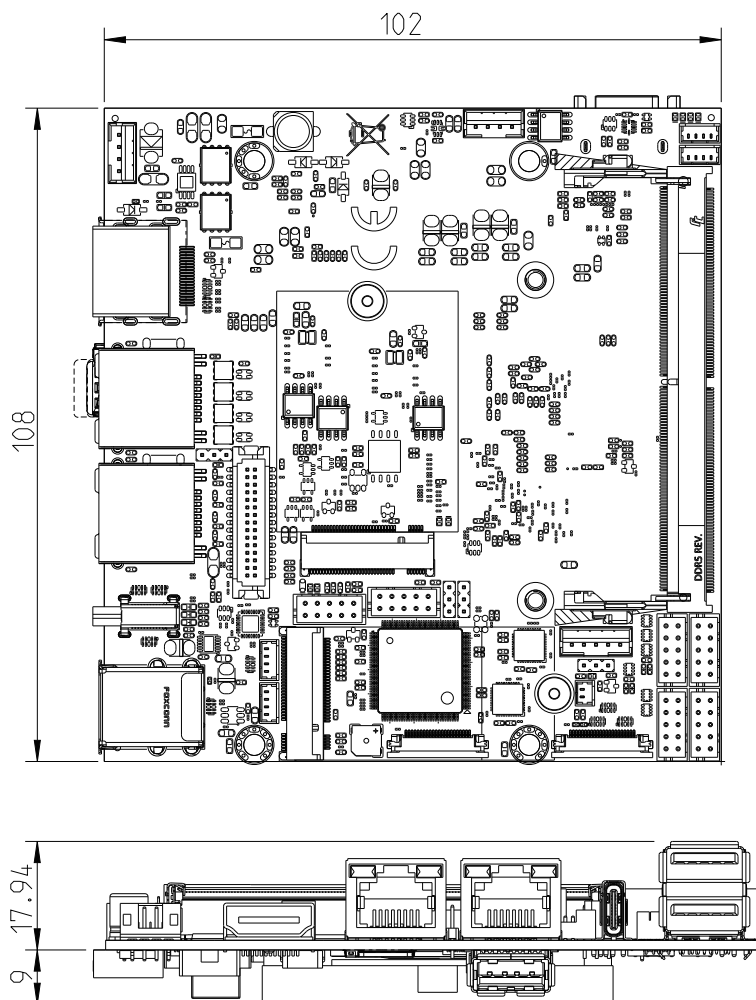
2. Plug in the Mini Card in a 45 angle



3. Gently push down the Mini Card and screw the screw back.

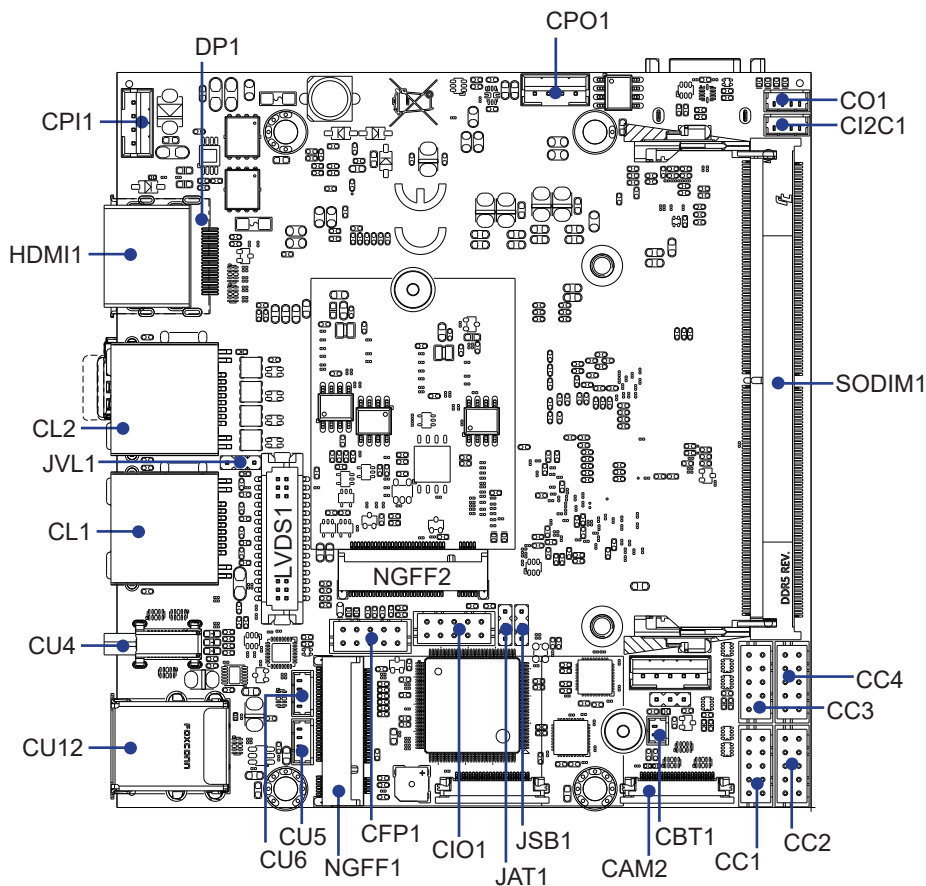


2-1 Dimension-2I740CW

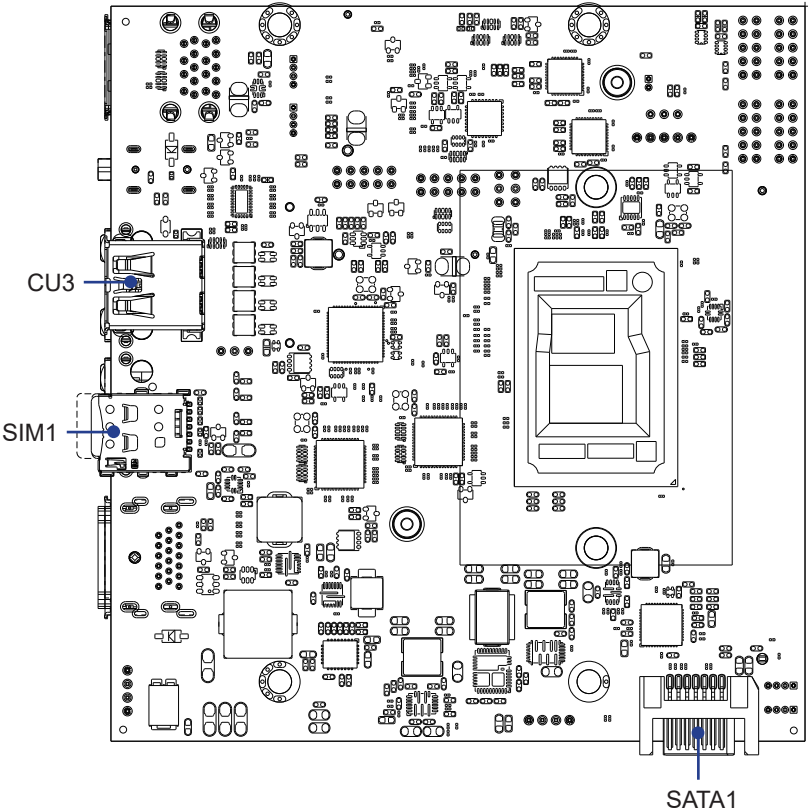


2-2 Layout-2I740CW-Connector and Jumper

TOP

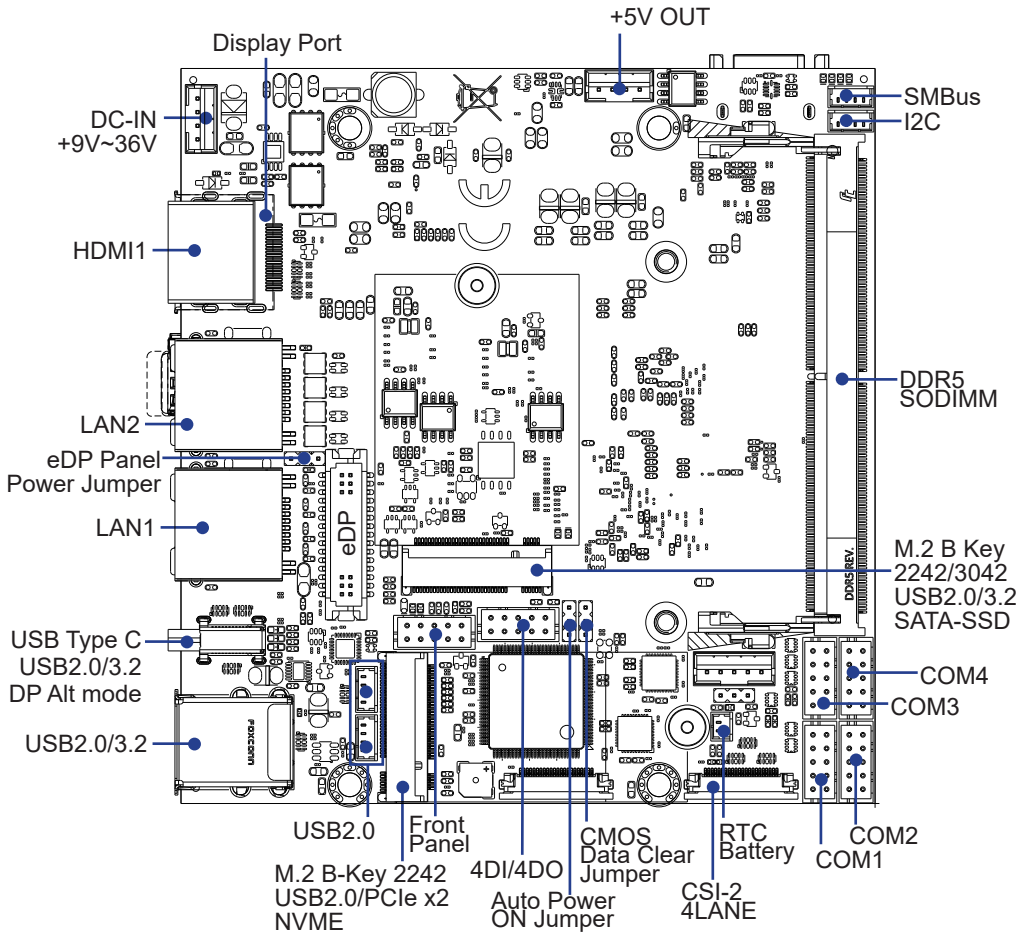


2-2-1 Layout-2I740CW-Connector and Jumper Bottom
BOT



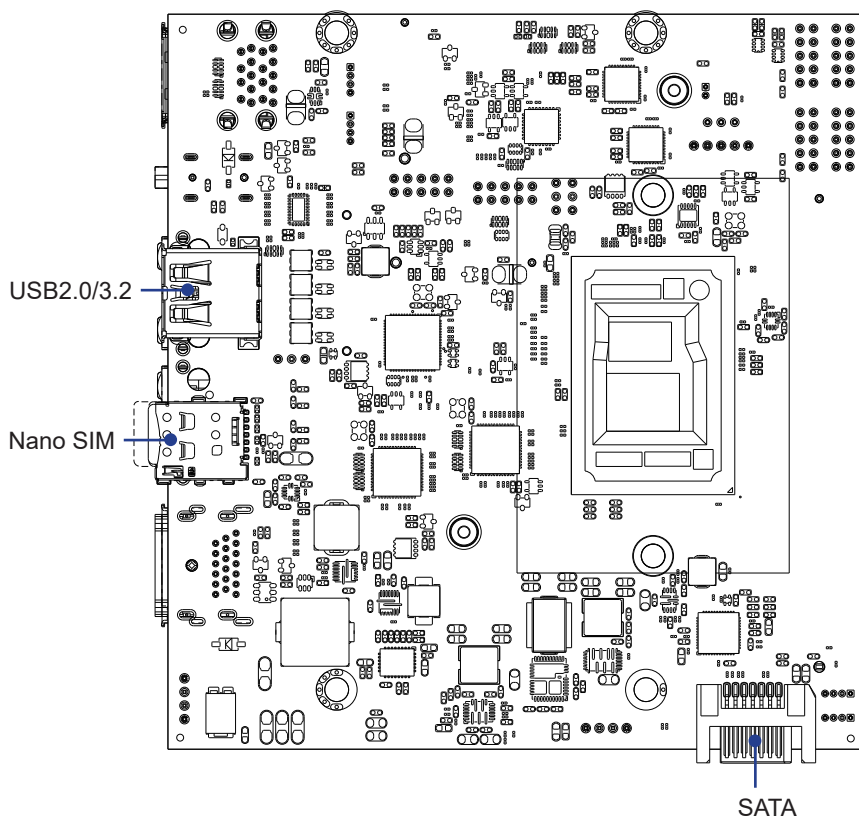
2-3 Layout-2I740CW-Function MAP

TOP



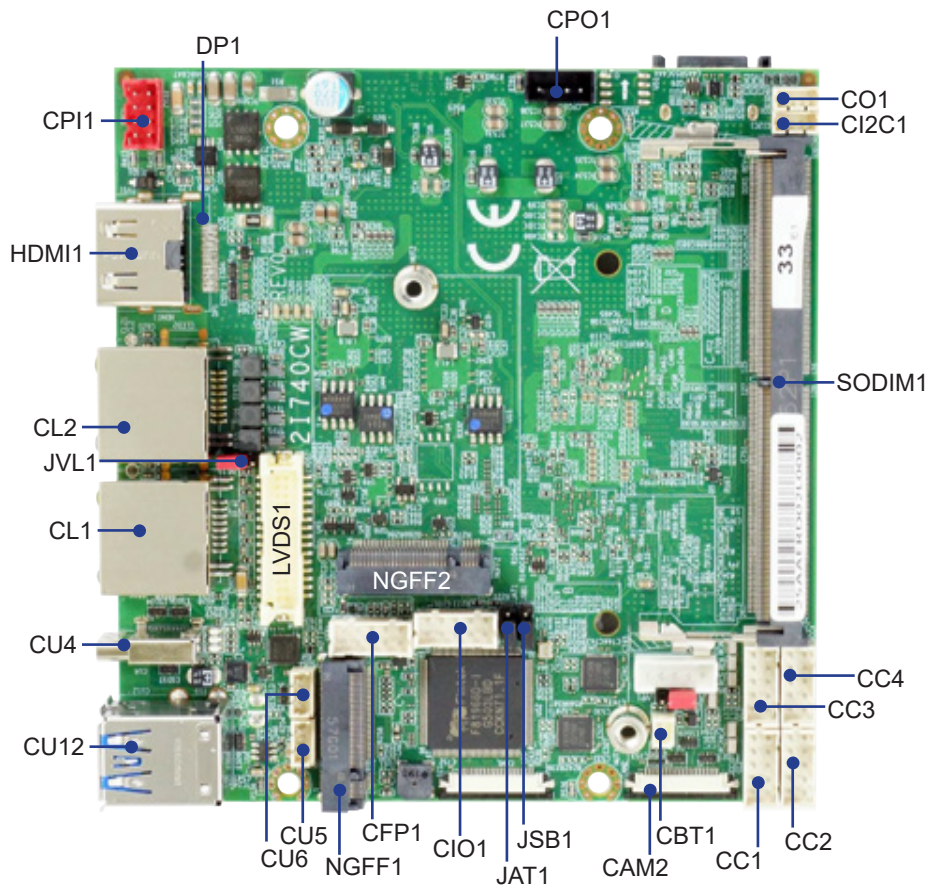
2-3-1 Layout-2I740CW-Function MAP

BOT



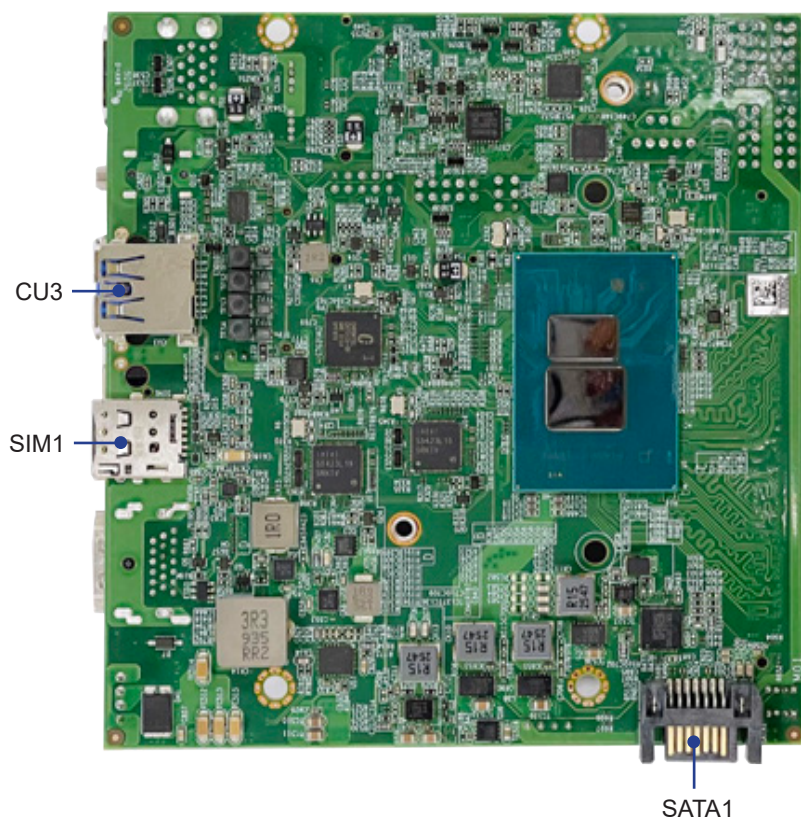
2-4 Diagram- 2I740CW

TOP



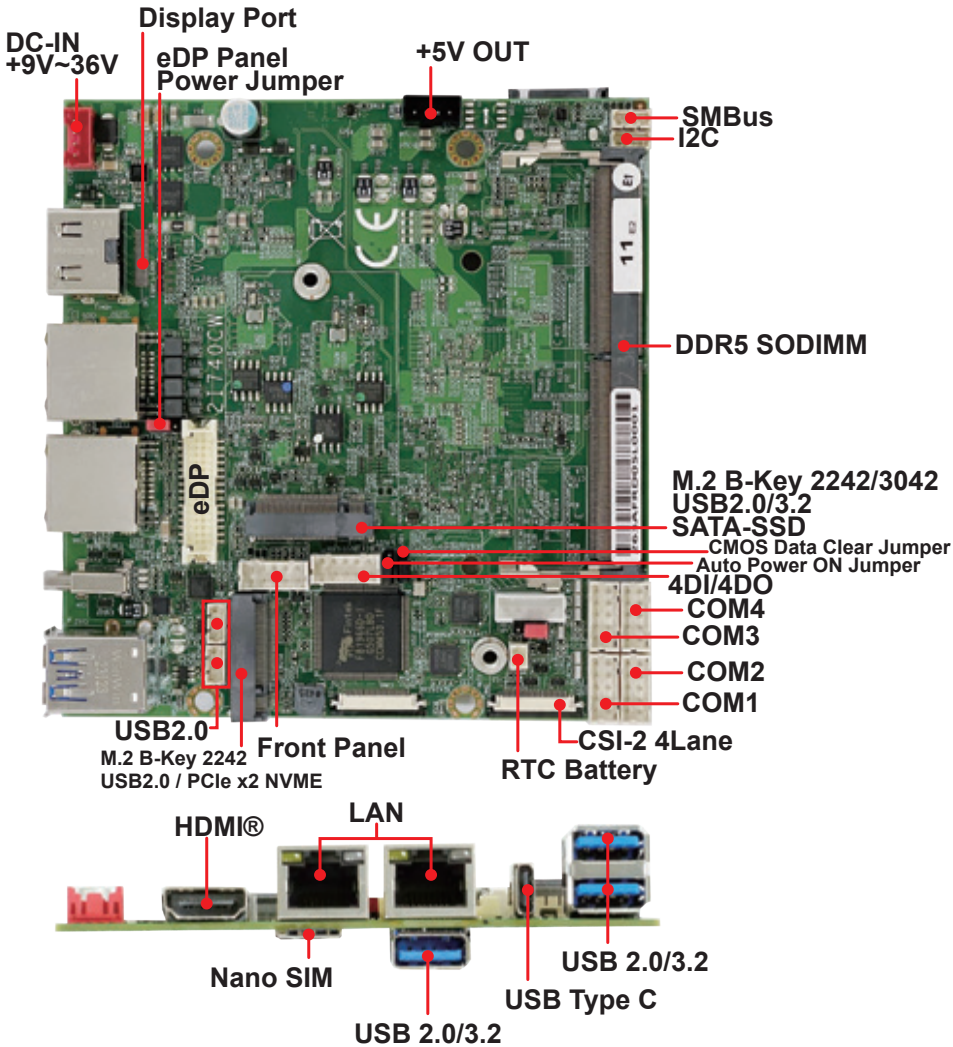
2-4-1 Diagram- 2I740CW

BOT



2-5 Function MAP- 2I740CW

TOP



2-6 List of Jumpers

- JSB1: CMOS DATA Clear
- JAT1: Auto power ON function
- JVL1: eDP panel power select

2-7 Jumper Setting Description

A jumper is ON as a closed circuit with a plastic cap covering two pins. A jumper is OFF as an open circuit without the plastic cap. Some jumpers have three pins, labeled 1, 2, and 3. You could connect either pin 1 and 2 or 2 and 3.

The below figure 2.2 shows the examples of different jumper settings in this manual.

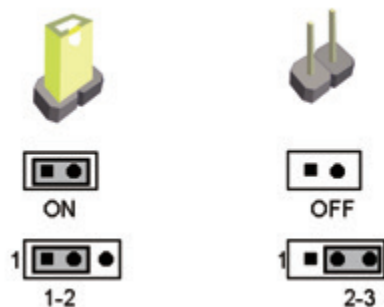


Figure 2.2

All jumpers already have its default setting with the plastic cap inserted as ON, or without the plastic cap as OFF. The default setting may be referred in this manual with a " * " symbol .

2-8 JSB1: CMOS DATA Clear

A battery must be used to retain the motherboard configuration in CMOS RAM.
Close Pin1 and pin 2 of JSB1 to store the CMOS data.

To clear the CMOS, follow the procedures below:

- 1. Turn off the system and unplug the AC power
- 2. Remove DC IN power cable from DC IN power connector
- 3. Locate JSB1 and close pin 1-2 for few seconds
- 4. Return to default setting by Close pin 1-2
- 5. Connect DC IN power cable back to DC IN Power connector

JSB1	DESCRIPTION
*1-2	Normal set
2-3	CMOS data clear

Note: Do not clear CMOS unless

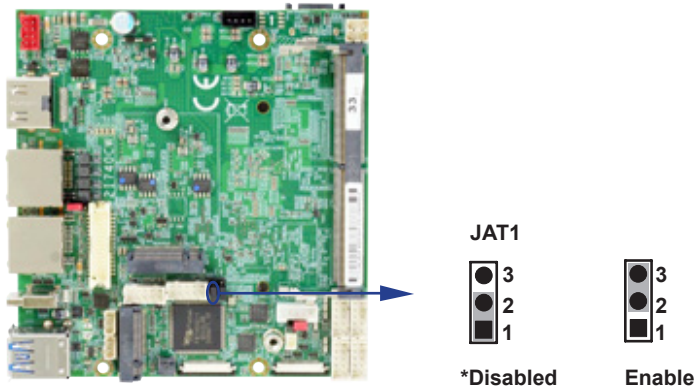
- 1. **Troubleshooting**
- 2. **Forget password**
- 3. **You fail over-clocking system**



2-9 JAT1: Auto power ON function

JAT1	DESCRIPTION
*1-2	Disabled
2-3	Enable

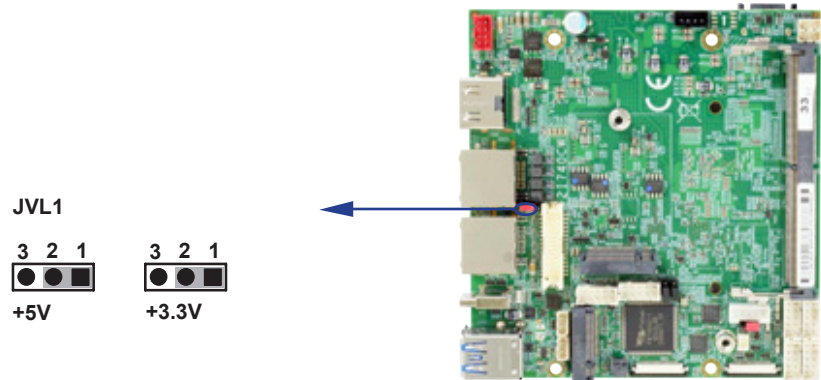
Note: Auto power ON function default is disabled.



2-10 JVL1: eDP panel power select

JVL1	DESCRIPTION
1-2	+5V
*2-3	+3.3V

Note: Attention! Check Device Power in spec.



Chapter-3

Connection

This chapter provides all necessary information of the peripheral's connections, switches and indicators. Always power off the board before you install the peripherals.

3-1 List of Connectors

SODIM1:	DDR5 SODIMM H: 9.2mm
CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer
CU12:	USB 3.2 Gen 1x1 type A dual connector
CU3:	USB 3.2 Gen 1x1 type A connector
CU4:	USB 3.2 type C connector
CU5:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU6:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1:	RJ45 LAN connector
CL2:	RJ45 LAN connector
CL11:	LAN port 2x4 pin (2.0mm) wafer (option)
CL21:	LAN port 2x4 pin (2.0mm) wafer (option)
CLED1:	LAN LED 1x4 pin (1.0mm) wafer (option)
CLED2:	LAN LED 1x4 pin (1.0mm) wafer (option)
CC1:	COM1 2x5 pin (2.0mm) wafer
CC2:	COM2 2x5 pin (2.0mm) wafer
CC3:	COM3 2x5 pin (2.0mm) wafer
CC4:	COM4 2x5 pin (2.0mm) wafer
LVDS1:	eDP 2x15 pin (1.25mm) wafer
CIO1:	4DI/4DO 2x5 pin (2.0mm) wafer
CO1:	SMBus 1x4 pin (1.25mm) wafer
CI2C1:	I2C 1x4 pin (1.25mm) wafer
CPI1:	DC-IN 1x4 pin (2.0mm) Red wafer
CPO1:	+5V output 1x4 pin (2.0mm) Black wafer
NGFF1:	M.2 B key 2242 H=8.5 socket 75pin
NGFF2:	M.2 B key 2242/3042 H=8.5 socket 75pin
HDMI1:	HDMI typeA connector
DP1:	DisplayPort connector (option)

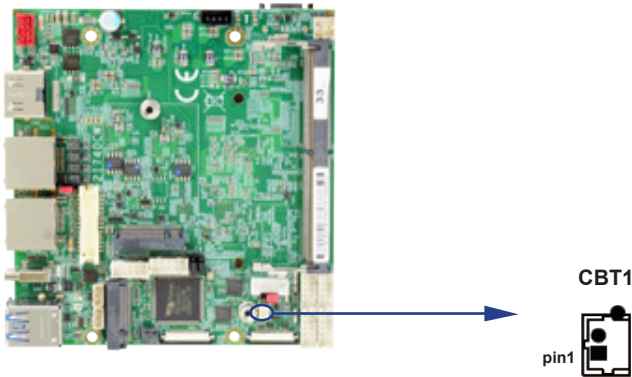
- SIM1: Nano SIM card socket
- CFP1: Front Panel connector 2x5 pin (2.0mm) wafer
- CAM1: MIPI CSI-2 camera FPC 1x22 pin (0.5mm)connector
- CAM2: MIPI CSI-2 camera FPC 1x22 pin (0.5mm)connector

3-2 CMOS battery connector

• CBT1: CMOS Battery in 1x2 pin (1.25mm) wafer

PIN NO.	DESCRIPTION
1	Battery in (GND)
2	Battery in (+3V)

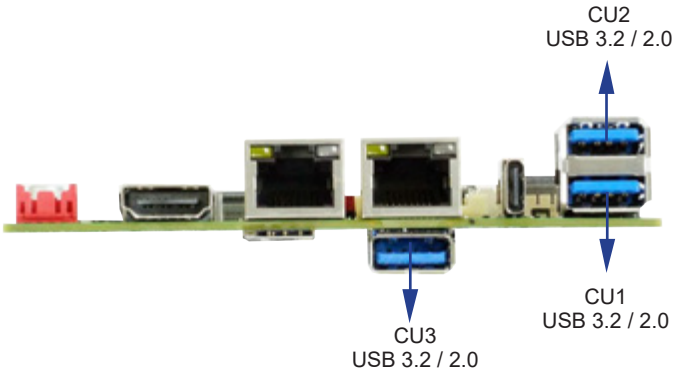
NOTE: CBT1 for external connector can extend battery capacity.



3-3 USB Interface

• CU1.CU2.CU3: USB3.2 Gen1 / 2.0 Type A connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
		1	USB3.2 TX+
1	+5V		
2	USB 2.0 D-	2	USB3.2 TX-
		3	GND
3	USB 2.0 D+	4	USB3.2 RX+
4	GND		
		5	USB3.2 RX-



• **CU4: USB Type C 24pin connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	GND	B12	GND
A2	TX1_P	B11	RX1_P
A3	TX1_N	B10	RX1_N
A4	+VBUS_5V	B9	+VBUS_5V
A5	CC1	B8	SBU2
A6	USB2_DP	B7	USB2_DN
A7	USB2_DN	B6	USB2_DP
A8	SBU1	B5	CC2
A9	+VBUS_5V	B4	+VBUS_5V
A10	RX2_N	B3	TX2_N
A11	RX2_P	B2	TX2_P
A12	GND	B1	GND

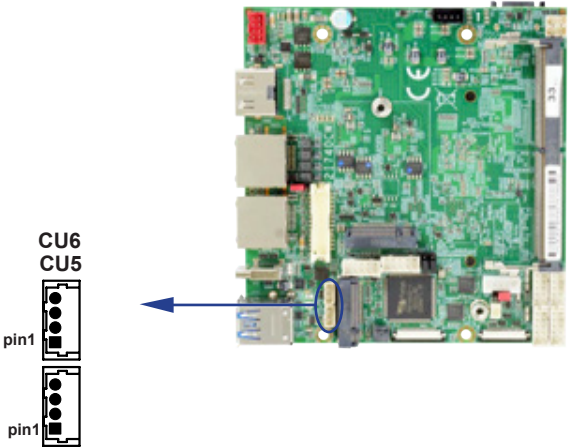
Note:

1. Support DP Alternate Mode & USB3.2 Gen 1x1/2.0.
2. Support 5V/3A.



●CU5.CU6: USB 2.0 1x4 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	DATA-
3	DATA+	4	GND



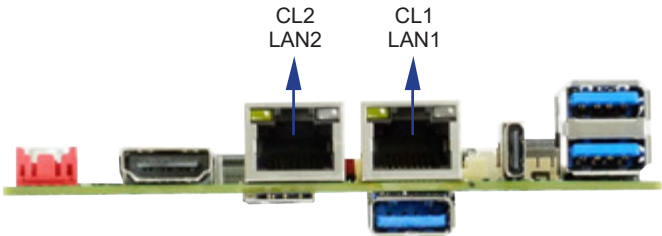
3-4 LAN Interface

• **CL1 / CL2: RJ45 LAN Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TD0+/TX+	2	TD0-/TX-
3	TD1+/RX+	4	TD2+/NC
5	TD2-/NC	6	TD1-/RX-
7	TD3+/NC	8	TD3-/NC

• **RJ45 LAN Connector-LED define 2.5Giga / 1000 / 100Mb Connector**

Speed	100 Mbps		1000 Mbps		2.5 Gbps	
Indicate	Link LED	Active LED	Link LED	Active LED	Link LED	Active LED
Light						



3-5 CL11.CL21: LAN signal out 2x4 pin (2.0mm) wafer (option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TR0-	2	TR0+
3	TR2+	4	TR1+
5	TR1-	6	TR2+
7	TR3-	8	TR3+

3-6 CLED1.CLED2:
LAN LED indicator 1x4 pin (1.0mm) wafer(option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	Speed 100M
3	Speed 1G	4	Speed 2.5G

3-7 COM interface

● **CC1.CC2.CC3.CC4: COM1.COM2.COM3.COM4 2x5 pin (2.0mm) wafer**

● **(RS232 Mode)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	+5V

Note :

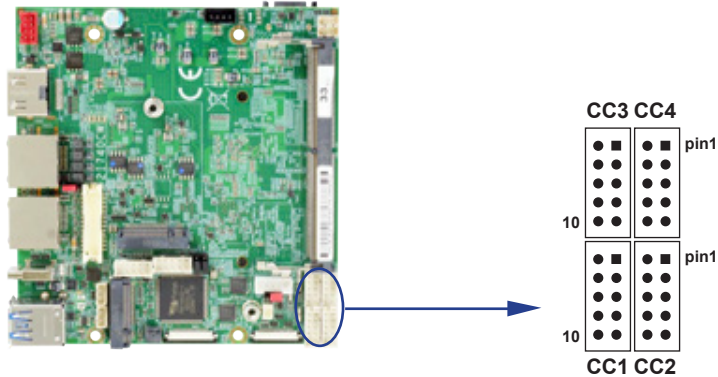
- 1. COM 1/2/3/4 Default RS232 , RS485 / RS422 by BIOS control.
- 2. The pin9 RI can be modify to Power to supply device. The power voltage can be set +5V/+12V.
The RI change Voltage function set by BOM control .Default is RI signal.
- 3. Pin 10 provides +5V for external device.

● **(RS485 Mode)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data-	2	Data+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

● **(RS422 Mode)**

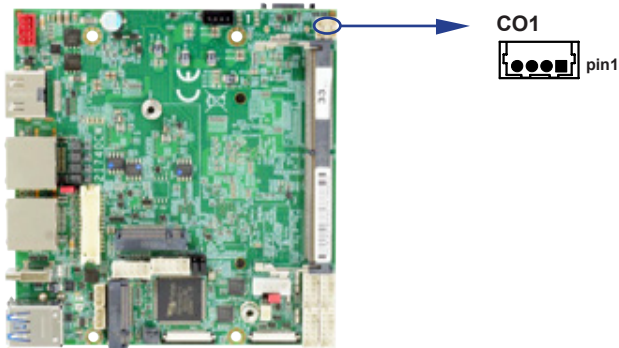
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V



3-8 SMBus Interface

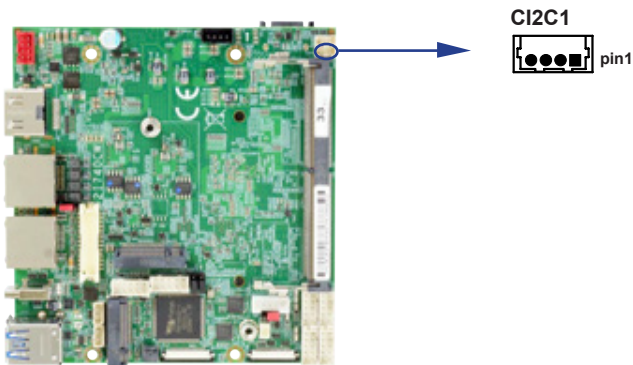
• CO1: SMBus 1x4 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SMB-Clock	4	SMB-Data



3-9 CI2C1: I²C 1x4 pin (1.25mm) wafer

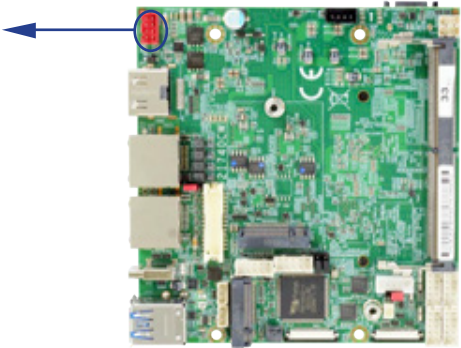
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	I2C-Clock	4	I2C-Data



3-10 CPI1: DC Power input 1x4 pin (2.0mm) wafer (RED)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	I2C-Clock	4	I2C-Data

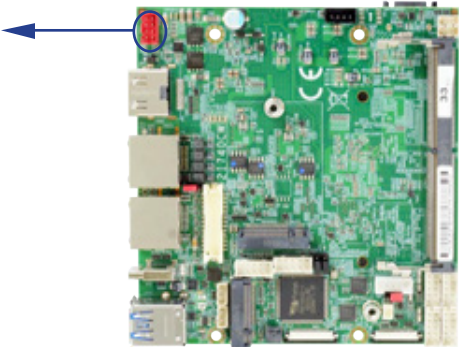
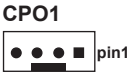
Note: Very important check DC-in Voltage.



3-11 CPO1: +5V DC voltage output 1x4 pin (2.0mm) wafer (Black)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	GND	4	

Note: Attention! Check Device Power in spec.



3-12 Display Interface

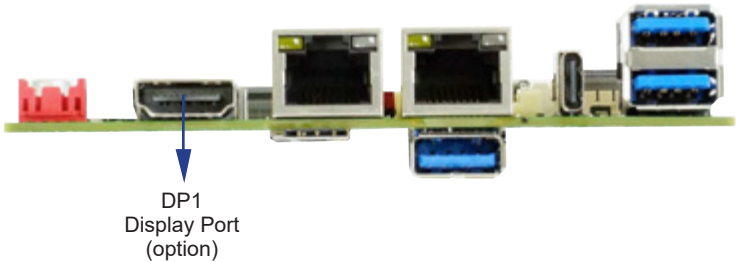
• **HDMI1: HDMI type A connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2+	2	GND
3	TMDS DATA2-	4	TMDS DATA1+
5	GND	6	TMDS DATA1-
7	TMDS DATA0+	8	GND
9	TMDS DATA0-	10	TMDS CLK+
11	GND	12	TMDS CLK-
13	NC	14	NC
15	DDC CLOCK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		



3-13 DP1: DisplayPort connector (option)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Lane0+	2	GND
3	Lane0-	4	Lane1+
5	GND	6	Lane1-
7	Lane2+	8	GND
9	Lane2-	10	Lane3+
11	GND	12	Lane3-
13	GND	14	GND
15	AUX_CH+	16	GND
17	AUX_CH-	18	H.P. Detect
19	GND	20	+3.3V

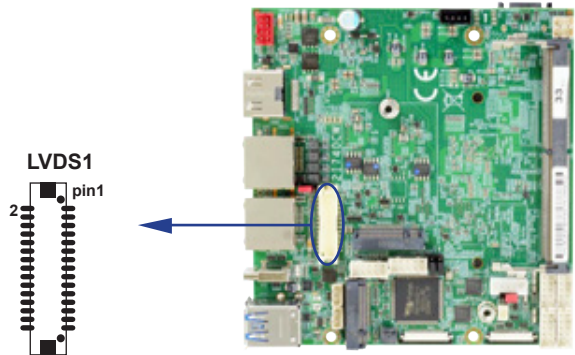


3-14 LVDS1: eDP interface 2x15 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWM dimming	2	+5V
3	eDP Panel PWR	4	eDP Panel PWR
5	NC	6	NC
7	NC	8	NC
9	eDP_TX0P	10	eDP_AUXP
11	eDP_TX0N	12	eDP_AUXN
13	GND	14	GND
15	eDP_TX1P	16	eDP_HPDP
17	eDP_TX1N	18	NC
19	PANEL_DET	20	GND
21	eDP Panel PWR	22	eDP Panel PWR
23	NC	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC

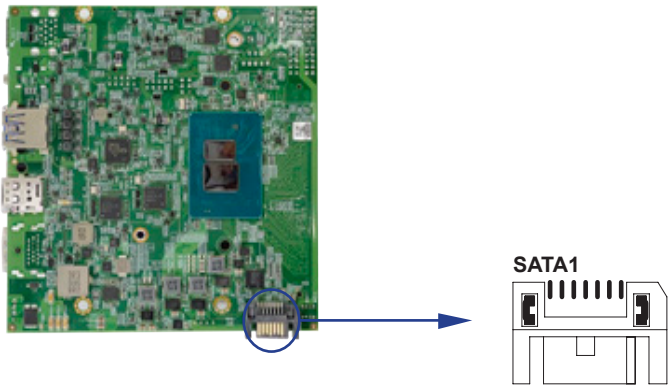
Note:

1. eDP interface support 2 lanes.
2. eDP Panel PWR By JVL1 select
3. JVL1: eDP panel +5V or +3.3V (default) voltage select.



3-15 SATA1: SATA port 1x7pin Connector

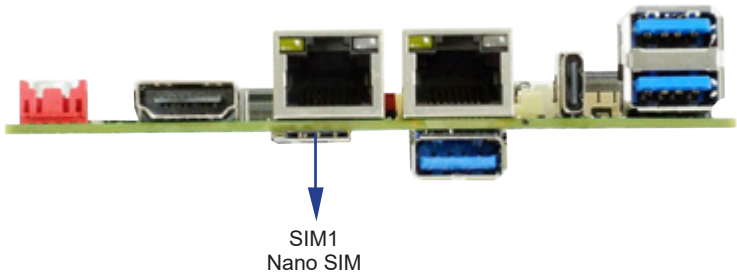
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	TX+
3	TX-	4	GND
5	RX-	6	RX+
7	GND		



3-16 SIM1: Nano SIM Card Push-Push

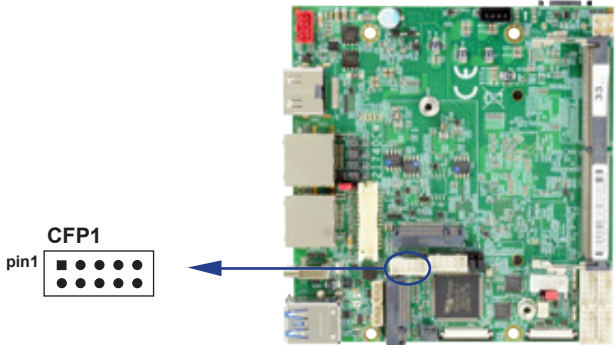
• Follow ISO 7816-2 Smart Card Standard.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	RST
3	CLK	4	NC
5	GND	6	VPP
7	DATA	8	NC



3-17 CFP1: Front Panel 2x5 pin (2.0mm) wafer

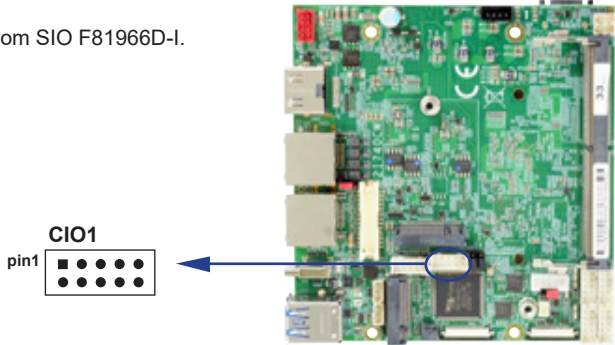
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power button pin	2	Power button GND
3	Reset pin	4	Reset GND
5	Power LED -	6	Power LED +
7	HDD LED-	8	HDD LED+
9	LAN LED-	10	LAN LED+



3-18 CIO1: DIO 0~3 2x5 pin (2.0mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

Note:
DIO and WDT function from SIO F81966D-I.



● WDT For F81966 SMBus watch dog timer device:

DC spec:

Input low Voltage (VIL): +0.8 Max

Input High Voltage(VIH): +2V Min

Output low Current (IOL): 10mA (Min) VOL=0.4V

Output High Current (IOH): -10mA (Min) VOH=2.4V

Watch Dog Time value 0~255 sec

The system will be issued reset. When WDT is enable the hardware start down counter to zero.

The reset timer have 10~20% tolerance upon the Temperature.

Note: If want to SDK support. Please contact to sales window.

3-18-1 IO Device: F81966 LPC DIO under Windows console

The Sample code source you can download from

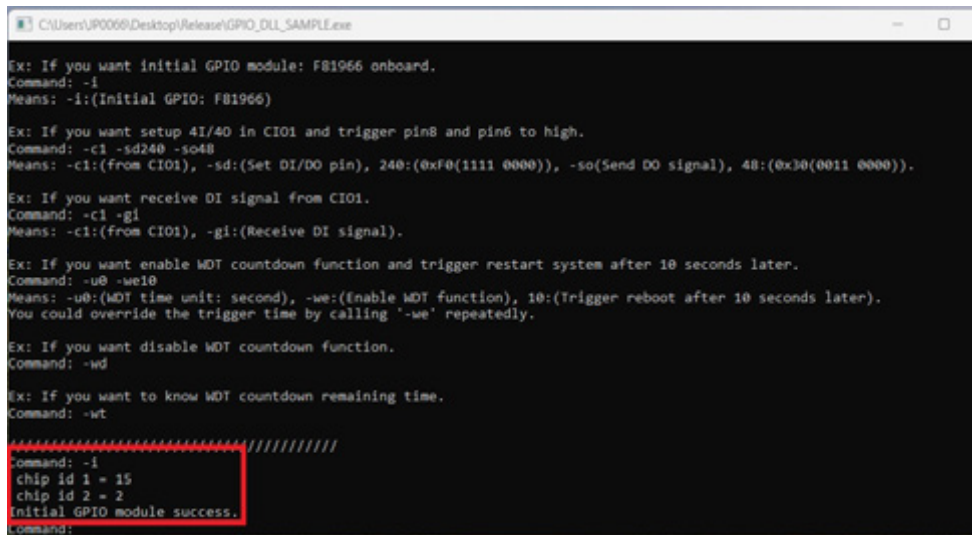
<https://www.lex.com.tw/en/download/download-hide?cid1=11&cid2=208#topDownload>

Initial F81966 module

If you want initial GPIO module: F81966 onboard.

Command: -i

Means: -i:(Initial GPIO: F81966 resource)



```
C:\Users\POO66\Desktop\Release\GPIO_DLL_SAMPLE.exe

Ex: If you want initial GPIO module: F81966 onboard.
Command: -i
Means: -i:(Initial GPIO: F81966)

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

#####
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command:
```

Free F81966 module

If you want free GPIO module resource.

Command: -f

Means: -f:(Free GPIO: F81966 resource)

```
C:\Users\JP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe
Command: -i
Means: -i:(Initial GPIO: F81966)

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -f
Free GPIO module success.
Command:
```

Check F81966 chip is exist

If you want check F81966 module is exist on the device.

Command: -check

Means: -check:(Get F81966 chip ID: 0x1502)

```
C:\Users\JP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -check
chip id 1 = 15
chip id 2 = 2
F81966 chip is exist.
Command:
```

Define GPIO pin status(DI/DO)

Setup GPIO pins status are DI or DO in CIO port.

Use 1 byte to indicate the status of the Pins.

Bit value = 1: pin status is DO; Bit value = 0: pin status is DI.

(Pin1 is bit0, Pin3 is bit1, Pin5 is bit2 and Pin7 is bit3)

(Pin8 is bit4, Pin6 is bit5, Pin4 is bit6 and Pin2 is bit7)

2-10 CIO1: DIO 0~3 2x5 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

If you want set CIO1 pins status is 4I/4O. (Bits: 0xF0)

Command: -c1 -sd240

Means: -c1:(CIO1), -sd:(set DI/DO), 240:(0xF0(1111 0000))

```
C:\Users\UP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe
Command: -i
Means: -i:(Initial GPIO: F81966)

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -c1 -sd240
set CIO1 pin DI/DO(0xF0) success.
```

Trigger DO pin signal to high or low

Set DO pin register value in CIO port to trigger high or low status.

Use 1 byte to indicate the status of the Pins.

Bit value = 1: trigger to High; Bit value = 0: trigger to low.

(Pin1 is bit0, Pin3 is bit1, Pin5 is bit2 and Pin7 is bit3)

(Pin8 is bit4, Pin6 is bit5, Pin4 is bit6 and Pin2 is bit7)

2-10 CIO1: DIO 0~3 2x5 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

If you want to trigger CIO1 pins pin8 and pin6 to high. (Bits: 0x30)

Pin which be trigger, status must be DO.

Command: -c1 -so48

Means: -c1:(CIO1), -so(Send DO signal), 48:(0x30(0011 0000))

```
C:\Users\JP006\Desktop\Release\GPIO_DLL_SAMPLE.exe

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -c1 -sd240
Set CIO1 pin DI/DO(0~3) success.
Command: -c1 -so48
Send CIO1 DO value = (0x30).
Command:
```

Receive DI pin current status

Receive DO pin register value from CIO port.

Use 1 byte to indicate the status of the Pins.
Bit value = 1: receive high; Bit value = 0: receive low.

(Pin1 is bit0, Pin3 is bit1, Pin5 is bit2 and Pin7 is bit3)

(Pin8 is bit4, Pin6 is bit5, Pin4 is bit6 and Pin2 is bit7)

2-10 CIO1: DIO 0~3 2x5 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

If you want receive CIO1 pins current status.

Pin status must be DI.
Attention: DI pin default register value is high. If pin not connect any device, return bits is always high.
Command: -c1 -gi
Means: -c1:(CIO1), -gi:(Receive DI signal)

If return value is 0x33(0011 0011), it means pin1 and pin3 in CIO1 port received high signal.
We only use pin1 and pin3 value, because CIO1 port pin status value is 0xF0(1111 0000)(4I/4O).

```
C:\Users\IP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe
Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -c1 -sd240 -so48
Set CIO1 pin DI/DO(0xF0) success.
Send 0xF0-00 value = (0x50).
Command: -c1 -gi
Receive CIO1 DI value = (0x33).
Command:
```

Enable Watch Dog Timer to reset system

If you want enable WDT countdown function and trigger restart system after 30 seconds later.

You could override the trigger time by calling '-we' repeatedly.

Command: -u0 -we30

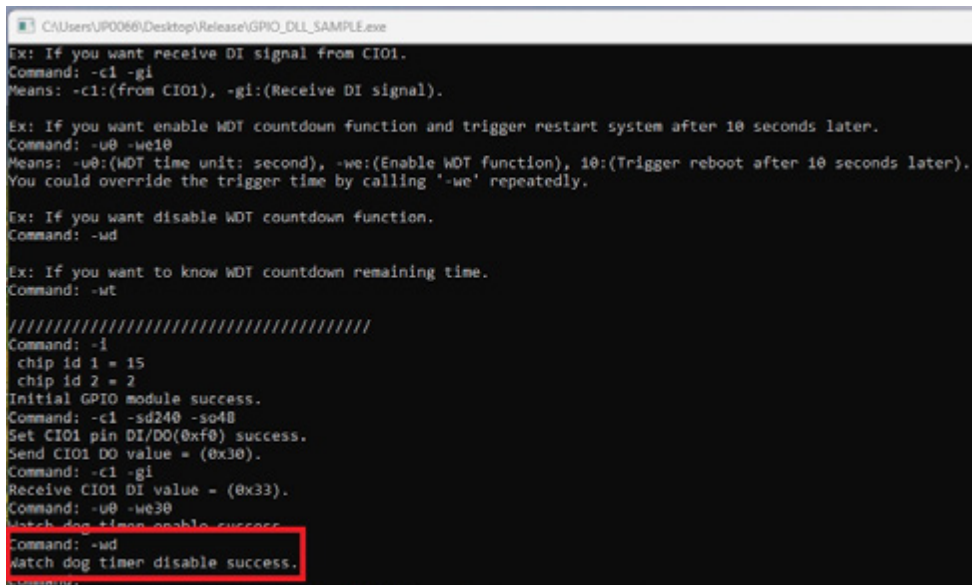
Means: -u:(WDT time unit: second), -we:(Enable WDT function), 30:(Trigger reboot after 30 seconds later)

```
CAUsers\VP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).
Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).
Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.
Ex: If you want disable WDT countdown function.
Command: -wd
Ex: If you want to know WDT countdown remaining time.
Command: -wt
////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -c1 -sd240 -so48
Set CIO1 pin DI/DO(0xf0) success.
Send CIO1 DO value = (0x30).
Command: -c1 -gi
Receive CIO1 DI value = (0x33)
Command: -u0 -we30
Watch dog timer enable success.
Command:
```

Disable Watch Dog Timer

If you want disable WDT countdown function.

Command: -wd



```
C:\Users\JP0066\Desktop\Release\GPIO_DLL_SAMPLE.exe
Ex: If you want receive DI signal from CI01.
Command: -c1 -gi
Means: -c1:(from CI01), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -c1 -sd240 -so40
Set CI01 pin DI/D0(0xf0) success.
Send CI01 DO value = (0x30).
Command: -c1 -gi
Receive CI01 DI value = (0x33).
Command: -u0 -we30
Watch dog timer enable success.
Command: -wd
Watch dog timer disable success.
```

Get Watch Dog Timer countdown time

If you want to know WDT countdown remaining time.

Command: -wt

```
C:\Users\JP0069\Desktop\Release\GPIO_DLL_SAMPLE.exe

Ex: If you want setup 4I/4O in CIO1 and trigger pin8 and pin6 to high.
Command: -c1 -sd240 -so48
Means: -c1:(from CIO1), -sd:(Set DI/DO pin), 240:(0xF0(1111 0000)), -so(Send DO signal), 48:(0x30(0011 0000)).

Ex: If you want receive DI signal from CIO1.
Command: -c1 -gi
Means: -c1:(from CIO1), -gi:(Receive DI signal).

Ex: If you want enable WDT countdown function and trigger restart system after 10 seconds later.
Command: -u0 -we10
Means: -u0:(WDT time unit: second), -we:(Enable WDT function), 10:(Trigger reboot after 10 seconds later).
You could override the trigger time by calling '-we' repeatedly.

Ex: If you want disable WDT countdown function.
Command: -wd

Ex: If you want to know WDT countdown remaining time.
Command: -wt

////////////////////
Command: -i
chip id 1 = 15
chip id 2 = 2
Initial GPIO module success.
Command: -u0 -we30
watch dog timer enable success.
Command: -wt
watch dog countdown 26 seconds.
Command:
```

F81966 DIO direct connect

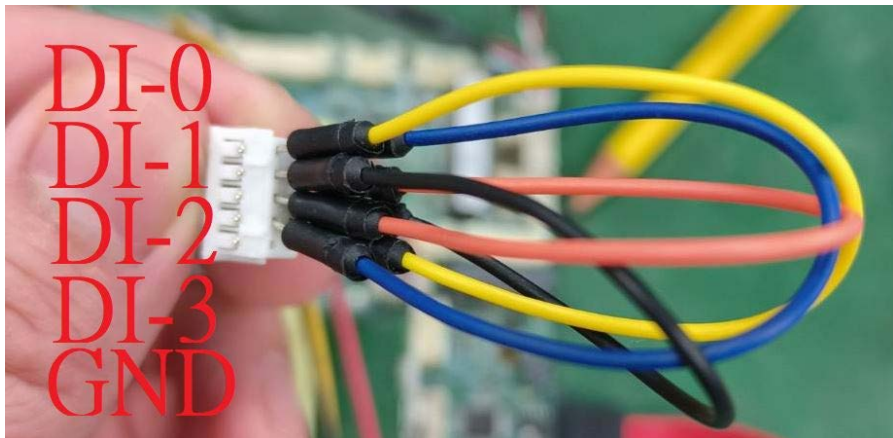
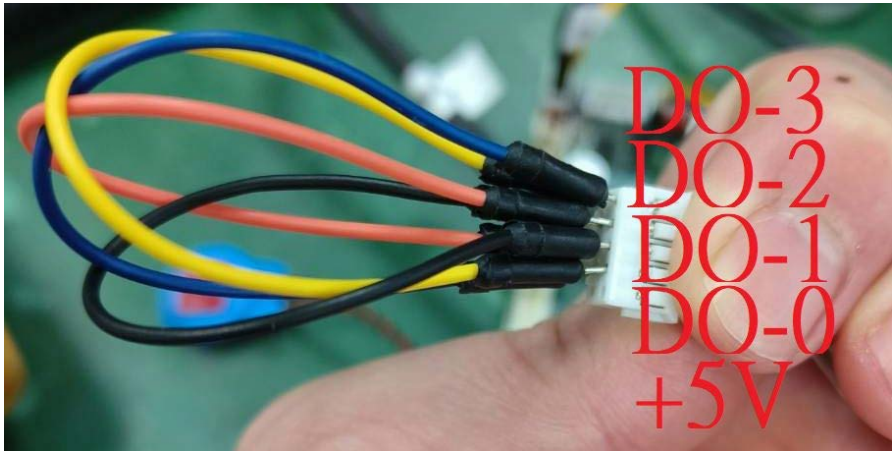
Using 2I130HW to example how to connect.
DI-0(yellow) to DO-0(yellow) 、DI-1(black) to DO-1(black) 、DI-2(orange) to DO-2(orange) 、DI-3(blue) to DO-3(blue). GND and +5V are empty.

3-7 DIO Interface

• CIO1: DIO 0~3 2x5 pin (1.25mm) wafer

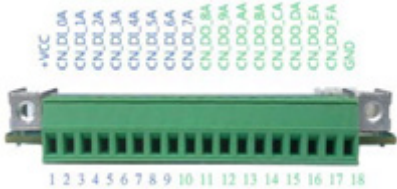
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

Note: DIO and WDT function from SIO F81966D-L.



F81966 DIO with CIO116_B

CN-DI_0A(white_red) to CN-DO_8A(white_red) 、CN-DI_1A(green) to CN-DO_9A(green) 、
CN-DI_2A(yellow) to CN-DO_AA(yellow) 、CN-DI_3A(orange) to CN-DO_BA(orange) 、
CN-DI_4A(red) to CN-DO_CA(red) 、CN-DI_5A(brown) to CN-DO_DA(brown) 、CN-DI_6A(black) to
CN-DO_EA(black) 、CN-DI_7A(white) to CN-DO_FA(white).
GND and +VCC connect to power.



PIN NO. ^①	DESCRIPTION ^②	
1 ^③	+VCC ^④	
2 ^③	CN-DI_0A ^⑤	CIO1-DI_1
3 ^③	CN-DI_1A ^⑤	CIO1-DI_2
4 ^③	CN-DI_2A ^⑤	CIO1-DI_3
5 ^③	CN-DI_3A ^⑤	CIO1-DI_4
6 ^③	CN-DI_4A ^⑤	CIO2-DI_1
7 ^③	CN-DI_5A ^⑤	CIO2-DI_2
8 ^③	CN-DI_6A ^⑤	CIO2-DI_3
9 ^③	CN-DI_7A ^⑤	CIO2-DI_4
10 ^③	CN-DO_8A ^⑥	CIO1-DO_1
11 ^③	CN-DO_9A ^⑥	CIO1-DO_2
12 ^③	CN-DO_AA ^⑥	CIO1-DO_3
13 ^③	CN-DO_BA ^⑥	CIO1-DO_4
14 ^③	CN-DO_CA ^⑥	CIO2-DO_1
15 ^③	CN-DO_DA ^⑥	CIO2-DO_2
16 ^③	CN-DO_EA ^⑥	CIO2-DO_3
17 ^③	CN-DO_FA ^⑥	CIO2-DO_4
18 ^③	GND ^⑦	

F81966_DLL Function

```
F81966_DLL_API int F81966_DLL_Init();
F81966_DLL_API int F81966_DLL_Free();
F81966_DLL_API int F81966_DLL_CheckDeviceExist();

F81966_DLL_API int F81966_DLL_SetDioPinStatus(int nCioPort, BYTE bDIOBits);
F81966_DLL_API int F81966_DLL_GetDioPinStatus(int nCioPort, BYTE& bDIOBits);

F81966_DLL_API int F81966_DLL_SendDOValue(int nCioPort, BYTE bDOVal);
F81966_DLL_API int F81966_DLL_GetDOValue(int nCioPort, BYTE& bDOVal);
F81966_DLL_API int F81966_DLL_GetDIValue(int nCioPort, BYTE& bDIVal);

F81966_DLL_API int F81966_DLL_StartWatchDogTimer(int nUnit, int nCount);
F81966_DLL_API int F81966_DLL_StopWatchDogTimer();
F81966_DLL_API int F81966_DLL_GetWatchDogCountdown(int& nUnit, int& nCount);
```

3-18-2 IO Device:F81966 LPC DIO under Linux console

The Sample code source you can download from

<https://www.lex.com.tw/en/download/download-hide?cid1=11&cid2=208#topDownload>

<FTP>

Source file: F81966_LPC_Utility_L_src

Binary file: F81966_LPC_Utility

F81966 Library : libF81966_bin_x86_64

MB Support List

Elkhart Lake	Raptor Lake
2I640CW	3I130TW

Introduction F81966 CIO

```
test@test-3I130TW:~/test/DIO$ sudo ./F81966_DIO
Usage: ./F81966_DIO <function> <CIO_number> [value]
Function options:
  read      - Read CIO port value
  write     - Write CIO port value (value required)
  getbit    - Read specific bit of CIO port (bit position required)
  setbit    - Set specific bit of CIO port (bit position and value required)
  wdt       - Test WDT function
  hmon      - Read hardware monitor values (voltages and temperatures)

Examples:
./F81966_DIO read 1
./F81966_DIO write 1 0xF
./F81966_DIO getbit 1 0
./F81966_DIO setbit 1 0 1
./F81966_DIO wdt
./F81966_DIO hmon
```

- 1.Use GET_CIO_INPUT to get the digital input data
- 2.Use SET_CIO_OUTPUT_DATA to set digital output data
- 3.Single bit setting can use SetCIOXBit0, SetCIOXBit1
- 4.Read a single bit using GetCIOXBit
- 5.Enable WDT and continuously reset WDT to ensure that the restart signal will not be triggered when the system is normal

libF81966.so Function

```
bool F81966_OPEN();
void F81966_Init();

BYTE GET_CIO_INPUT(int CIO_Number);
BYTE GET_CIO_OUTPUT_DATA(int CIO_Number);
BYTE SET_CIO_OUTPUT_DATA(int CIO_Number, BYTE byteValue);

BYTE GetCIOXBit(int CIO_Number, BYTE bitPosition);
BYTE SetCIOXBit0(int CIO_Number,BYTE byteValue, BYTE bitPosition);
BYTE SetCIOXBit1(int CIO_Number,BYTE byteValue, BYTE bitPosition);

void F81966_LPC_Set_WDT_Enable(BYTE byteValue);
void F81966_LPC_Set_WDT_Disable();

float GetVoltage(DWORD dwAddrVal);
int GetTemperature(DWORD dwAddrVal);
```

test_F81966 CIO Input/Ooutput sample code

```
Set CIO1 Digital Output all bit low
test_F81966 write 0xf;
```

```
Set CIO2 Digital Output all bit low
test_F81966 write 2 0x0;
```

```
Set CIO3 Digital Output all bit high
test_F81966 write 3 0xf;
```

```
Get CIO4 Digital Input
test_F81966 read 4;
```

```
read bit position
test_F81966 getbit 1 1
```

```
write bit position
test_F81966 setbit 1 0 1
```

Watch Dog test

sample code

test_F81966 getbit 1 1

```
Set WDT 10 sec  
test_F81966 wdt enable 10;
```

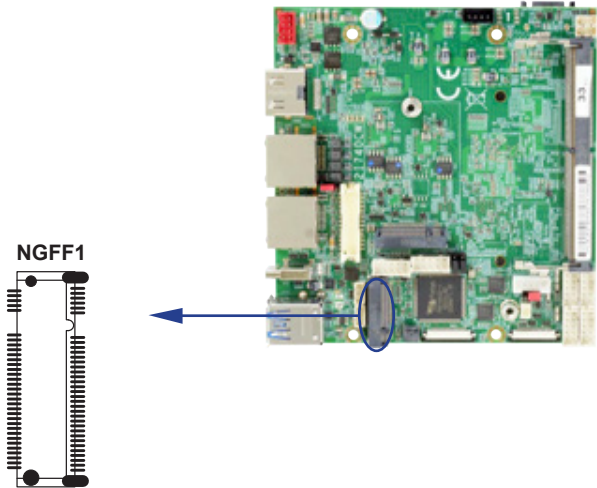
```
Disable WDT  
test_F81966 wdt disable;
```

3-19 NGFF1: PCI Express M.2 B key 2242 H=8.5 socket 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+3.3V
3	GND	4	+3.3V
5	GND	6	FULL_CARD_PWR
7	USB2.0_P	8	NC
9	USB2.0_N	10	M2_LED
11	GND		
B Key notch			
		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PCIE10_RX_DN	30	NC
31	PCIE10_RX_DP	32	NC
33	GND	34	NC
35	PCIE10_TX_DN	36	NC
37	PCIE10_TX_DP	38	NC
39	GND	40	NC
41	PCIE9_RX_DN	42	NC
43	PCIE9_RX_DP	44	NC
45	GND	46	NC
47	PCIE9_TX_DN	48	NC
49	PCIE9_TX_DP	50	M2_PRST_N
51	GND	52	SRCCCLKREQ_N
53	CLK_SRC3_DN	54	NC
55	CLK_SRC3_DP	56	NC
57	GND	58	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	NC	68	NC
69	NC	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	NC		

Note: Supports PCIe-SSD (NVME) & USB2.0 signal.



3-20 NGFF2: PCI Express M.2 B key 2242/3042 H=8.5 socket 75pin

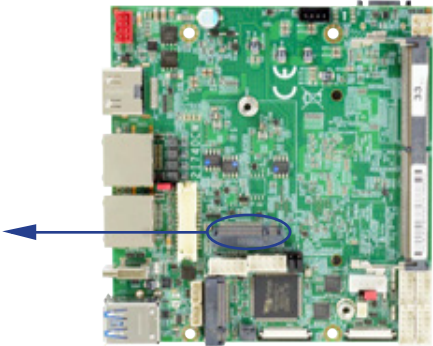
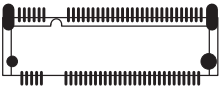
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SATA/USB3.0 PW config	2	+3.3V / +3.7V
3	GND	4	+3.3V / +3.7V
5	GND	6	FULL_CARD_PWR
7	USB2.0_P	8	W_DISABLE_1
9	USB2.0_N	10	M2_LED
11	GND		
B Key notch			
		20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	W_DISABLE_2
27	GND	28	NC
29	USB3Rn	30	SIM_RST_M2
31	USB3Rp	32	SIM_CLK_M2
33	GND	34	SIM_DATA_M2
35	USB3Tn	36	SIM_PWR_M2
37	USB3Tp	38	SIM_RST_M2
39	GND	40	NC
41	SATA-RX+	42	NC
43	SATA-RX-	44	NC
45	GND	46	NC
47	SATA-TX-	48	NC
49	SATA-TX+	50	PREST
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
59	NC	60	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM_DET
67	MD_RESET_N	68	NC
69	NC	70	+3.3V / +3.7V
71	GND	72	+3.3V / +3.7V
73	GND	74	+3.3V / +3.7V
75	NC		

Note:

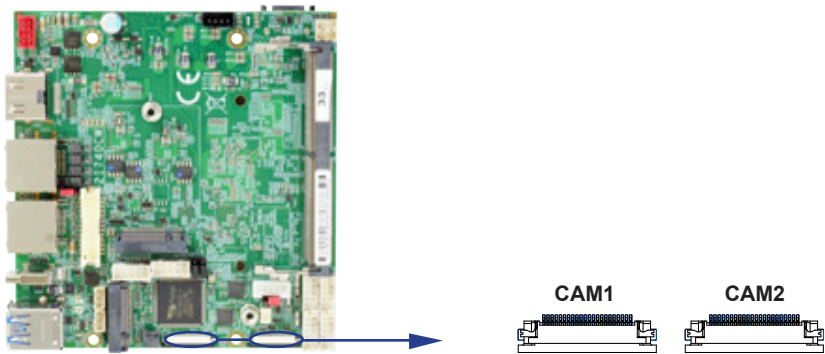
- 1. 4G LTE device VCC voltage is +3.7V.
- 2. Support USB3.1/USB2.0 & SATA signal.

NGFF2



3-21 CAM1.CAM2: CSI-2 4lane FPC 1x22pin (0.5mm) connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	I2C_SDA
3	I2C_SCL	4	GND
5	CAM_MCLK	6	CRD1_PWREN
7	GND	8	CSI_D3_P
9	CSI_D3_N	10	GND
11	CSI_D2_P	12	CSI_D2_N
13	GND	14	CSI_CLK_P
15	CSI_CLK_N	16	GND
17	CSI_D1_P	18	CSI_D1_N
19	GND	20	CSI_D2_P
21	CSI_D0_N	22	GND



3-22 Connector wafer of Compatible Brand and part number list

Location	CKTS	Pitch	Brand name	Mating connector	Cable housing
CBT1	1x2 2Pin	1.25mm	MOLEX	53047-0210	51021-0200
CU4.CU5.CO1. CI2C1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CL11.CL21	2x4 8Pin	2.0mm	JST	B8B-PHDSS	PHDR-08VS
CLED1.CLED2	1x4 4Pin	1.0mm	JST	BM04B-SRSS-TB	04SR-3S
LVDS1	2x15 30Pin	1.25mm	HIROSE	DF13-30DS-1.25C	DF13-30DP-1.25V
CPI1	1x4 4Pin	2.0mm	JST	B4B-PH-KL	PHR-4
CAM1.CAM2	1x22 22Pin	0.5mm	MOLEX	54548-2272	
CC1.CC2.CC3. CC4.CIO1.CFP1	2x5 10Pin	1.25mm	HIROSE	DF13-10DS-1.25C	DF13-10DP-1.25V

Chapter-4

Introduction of BIOS

The BIOS is a program located in the Flash Memory on the motherboard.

This program is a bridge between motherboard and operating system.

When you start the computer, the BIOS program gains control.

The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the necessary hardware, it detects the entire hardware devices and configures the parameters of the hardware synchronization. After these tasks are completed, BIOS will give control of the computer back to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate with, it is the key factor of system stability and of ensuring your system performance at best.

In the BIOS Setup main menu, you can see several options. We will explain these options in the following pages. First, let us see the function keys you may use here:

Press <Esc> to quit the BIOS Setup.

Press ↑↓←→ (up, down, left, right) to choose the option you want to confirm or modify.

Press <F10> to save these parameters and to exit the BIOS Setup menu after you complete the setup of BIOS parameters.

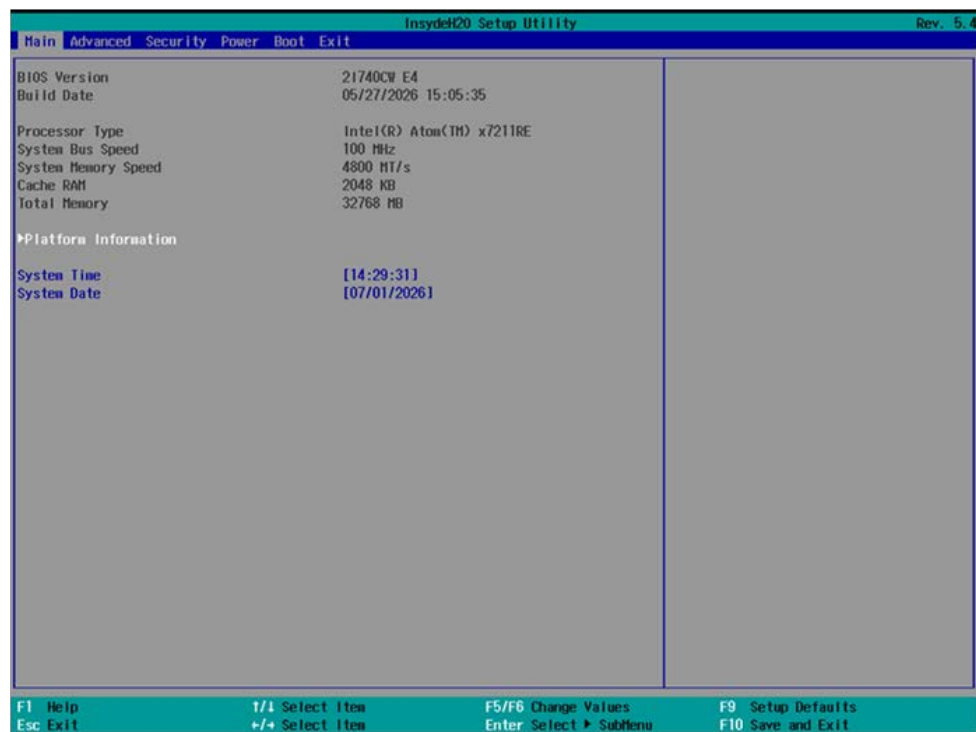
Press Page Up/Page Down or +/- keys to modify the BIOS parameters for the active option.

4-1 Enter Setup

Power on the computer and press key immediately to enter Setup.

If the message disappears before your respond but you still wish to enter Setup, restart the system by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart the system by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.

4-2 BIOS Menu Screen & Function Keys



In the above BIOS Setup main menu of, you can see several options.

We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press >< (right, left) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<-> or <F5>/<F6> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Reset.
- Press <Esc> to quit the BIOS Setup.

4-3 Getting Help



Status Page Setup Menu / Option Page Setup Menu

Press F1 to pop up a help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

4-4 Menu Bars

There are six menu bars on top of BIOS screen:

Main To change system basic configuration

Advanced To change system advanced configuration

Chipset To change PCH IO configuration

Security Password settings

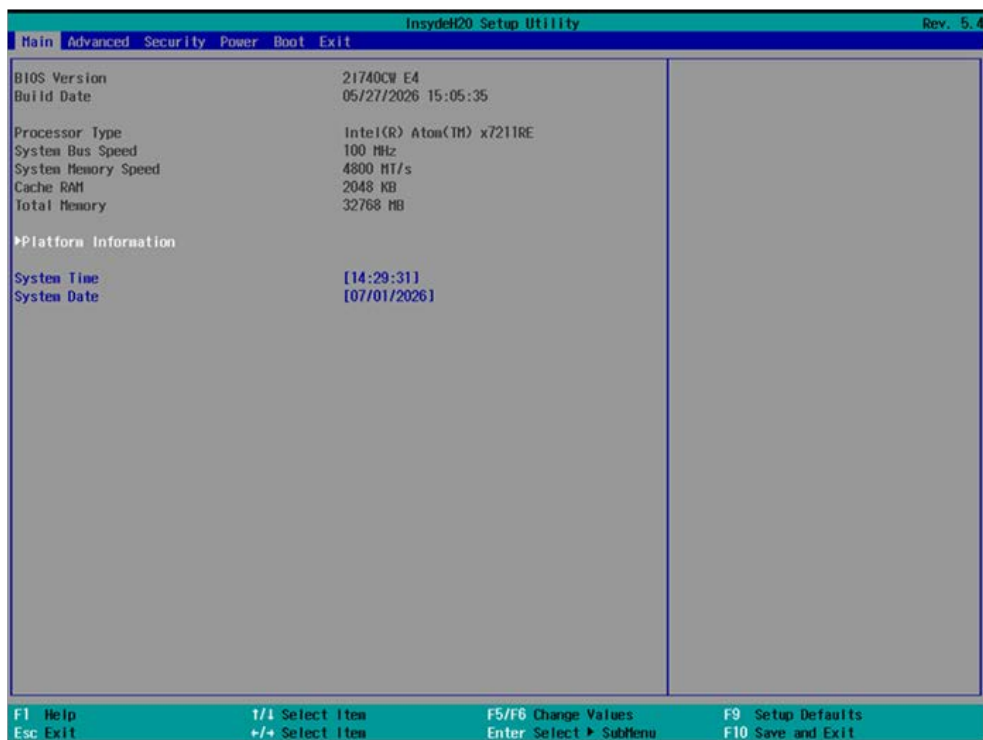
Boot Quiet boot or boot from USB selected.

Save & Exit Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar.

The selected one is highlighted.

4-5 Main



Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

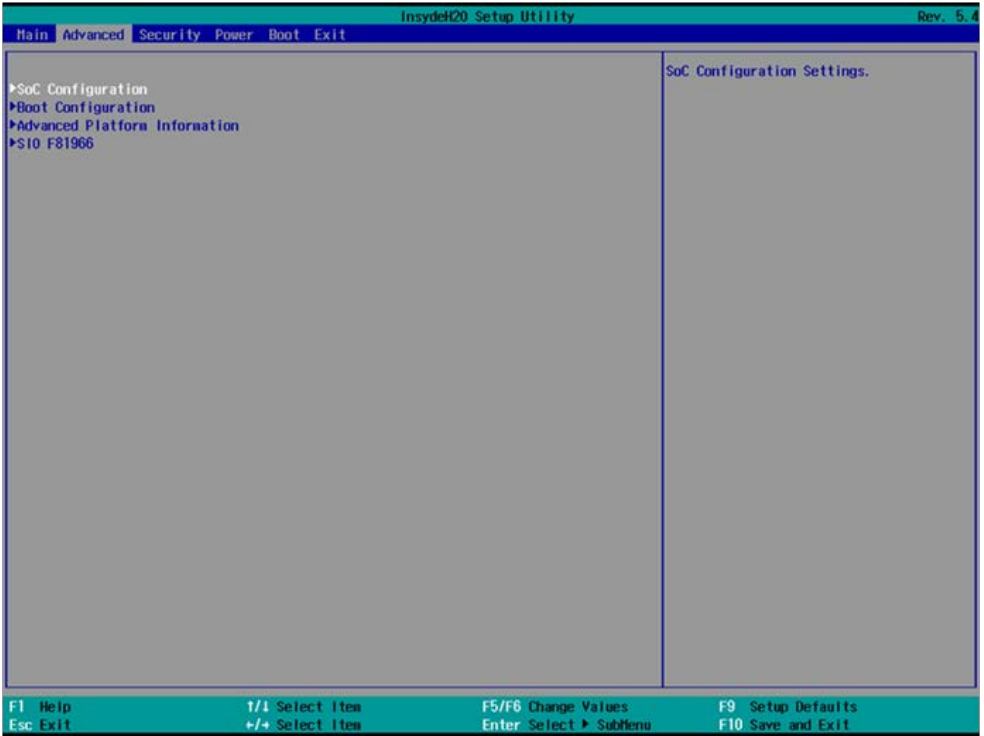
System Date

Set the Date. Please use [Tab] to switch between data elements.

System Time

Set the Time. Please use [Tab] to switch between data elements.

4-6 Advanced



SOC Config Configuration

Please refer section 4-6-1

Boot Configuration

Please refer section 4-6-2

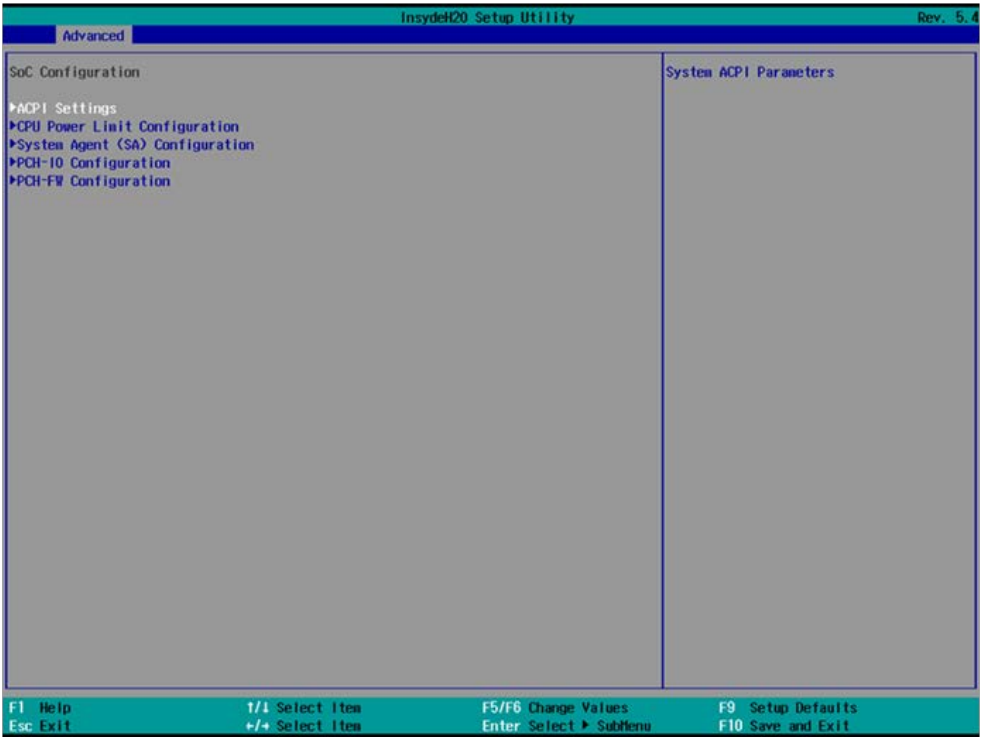
Advanced Platform Information

Please refer section 4-6-3

SIO F81966

Please refer section 4-6-4

4-6-1 SoC Config Configuration



ACPI Settings

Please refer section 4-6-1-1

CPU Power Limit Configuration

Please refer section 4-6-1-2

System Agent (SA) Configuration

Please refer section 4-6-1-3

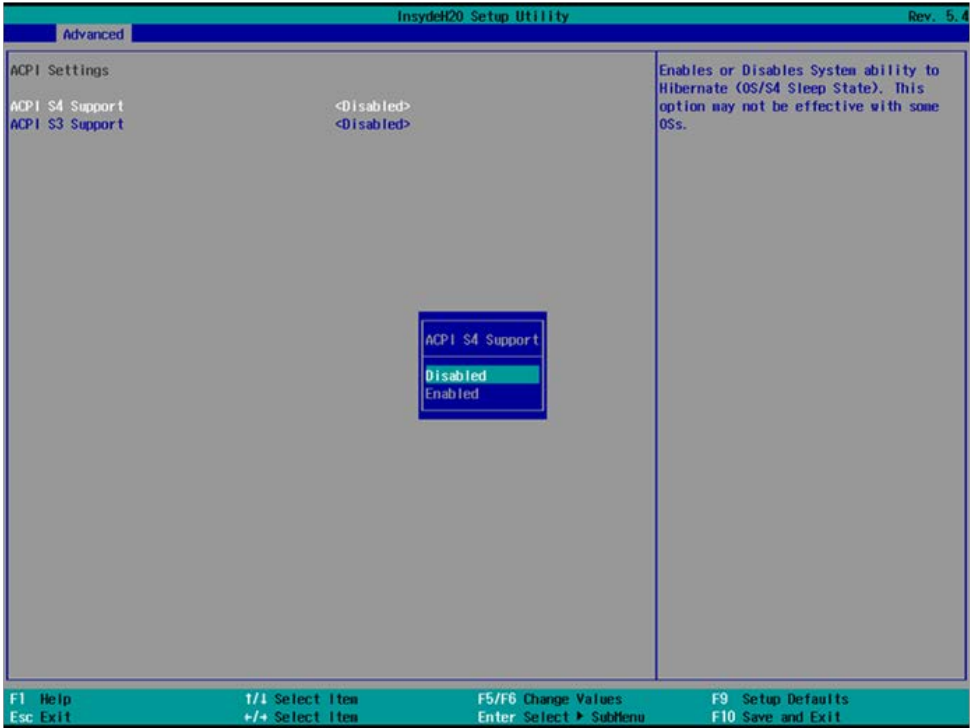
PCH-IO Configuration

Please refer section 4-6-1-4

PCH-FW Configuration

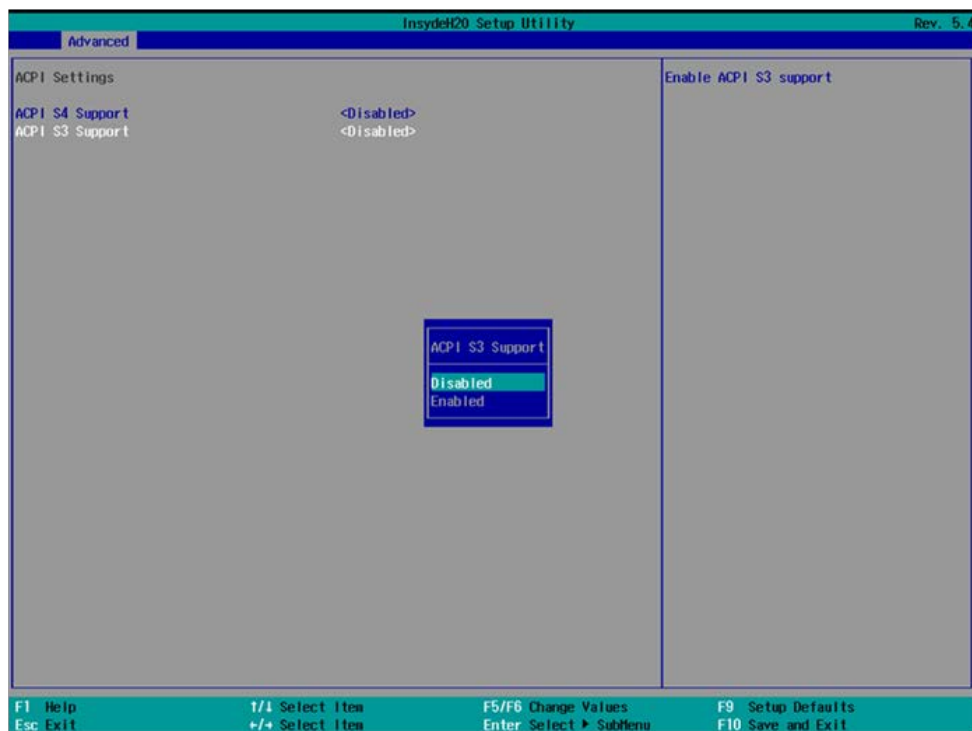
Please refer section 4-6-1-5

4-6-1-1 ► ACPI Settings



ACPI S4 Support

To select ACPI S4 (suspend to disk) support. The optional settings: Enabled or Disabled (default)



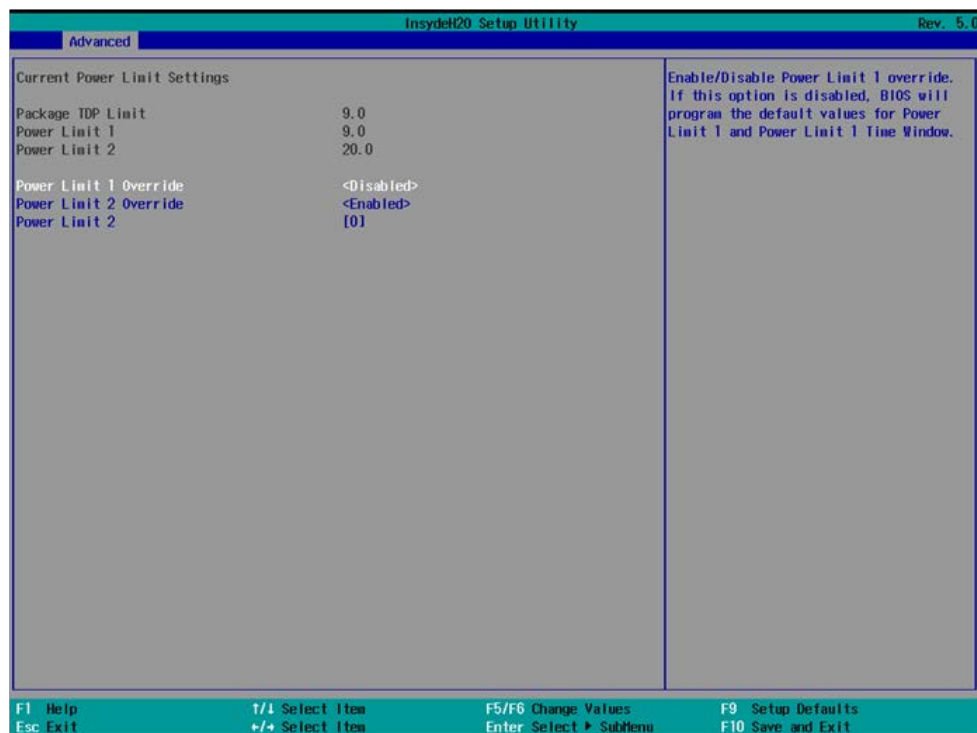
ACPI S3 Support

To select ACPI S3 (sleep state) support. The optional settings: Enabled or Disabled (default)

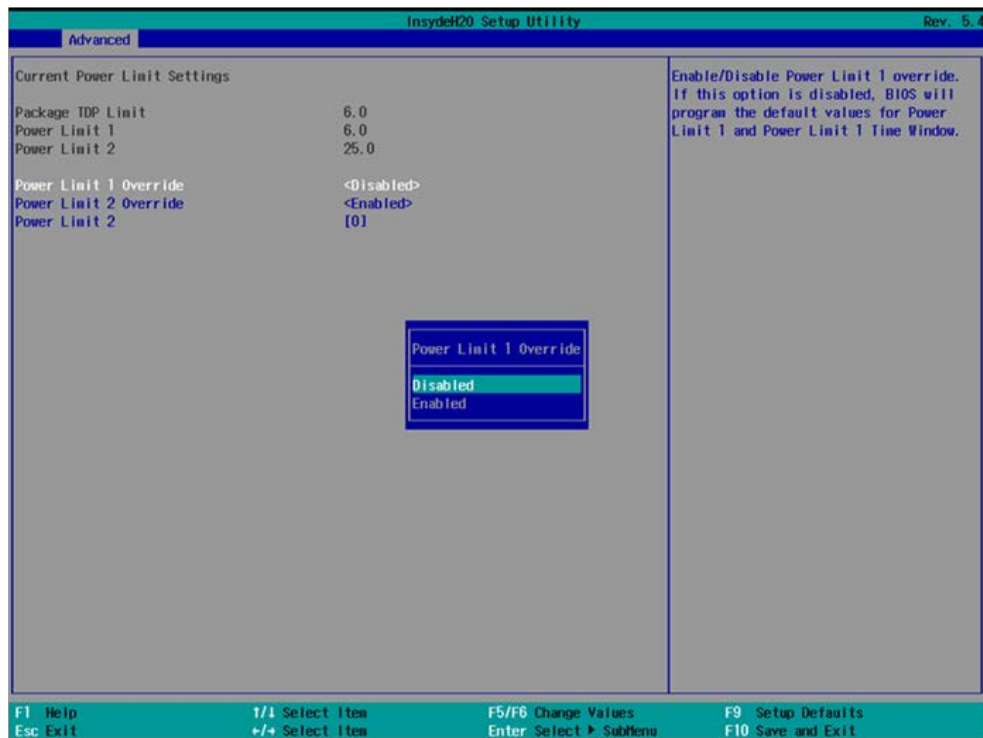
4-6-1-2 ► CPU Power Limit Configuration

InsydeH2O Setup Utility		Rev. 5.4
Advanced		
Current Power Limit Settings		Enable/Disable Power Limit 1 override. If this option is disabled, BIOS will program the default values for Power Limit 1 and Power Limit 1 Time Window.
Package TDP Limit	6.0	
Power Limit 1	6.0	
Power Limit 2	25.0	
Power Limit 1 Override	<Disabled>	
Power Limit 2 Override	<Enabled>	
Power Limit 2	[0]	
F1 Help T/1 Select Item F5/F6 Change Values F9 Setup Defaults Esc Exit +/- Select Item Enter Select ► SubItem F10 Save and Exit		

The setting follows INTEL Atom® x7211RE Processor power limit default configuration.



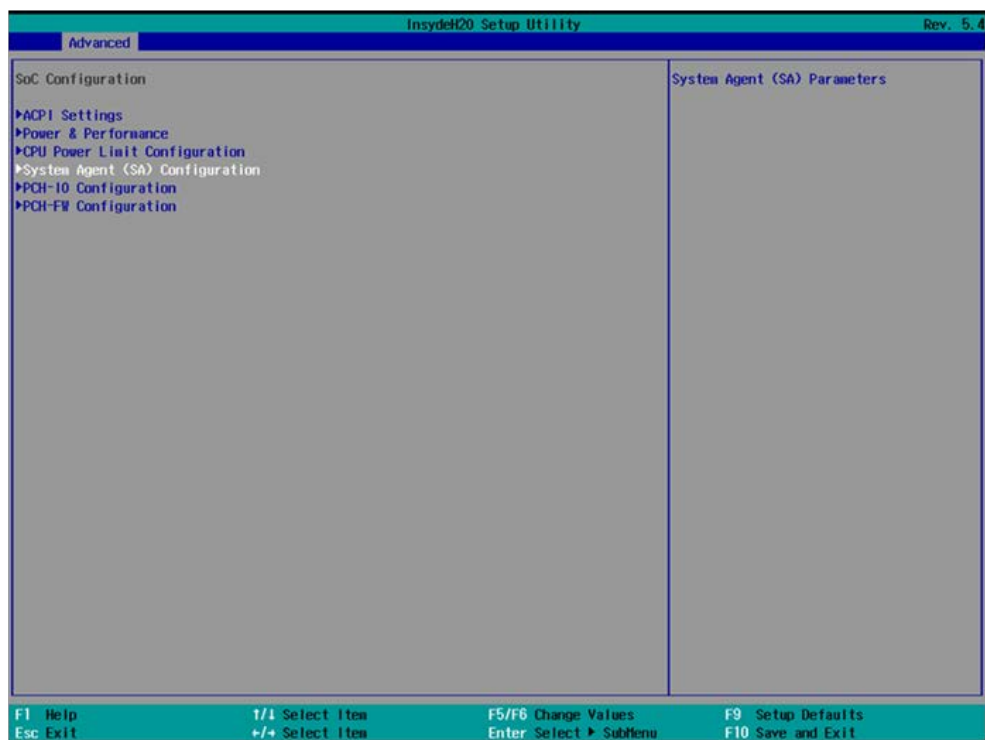
The setting follows INTEL Atom® x7433RE Processor power limit default configuration.

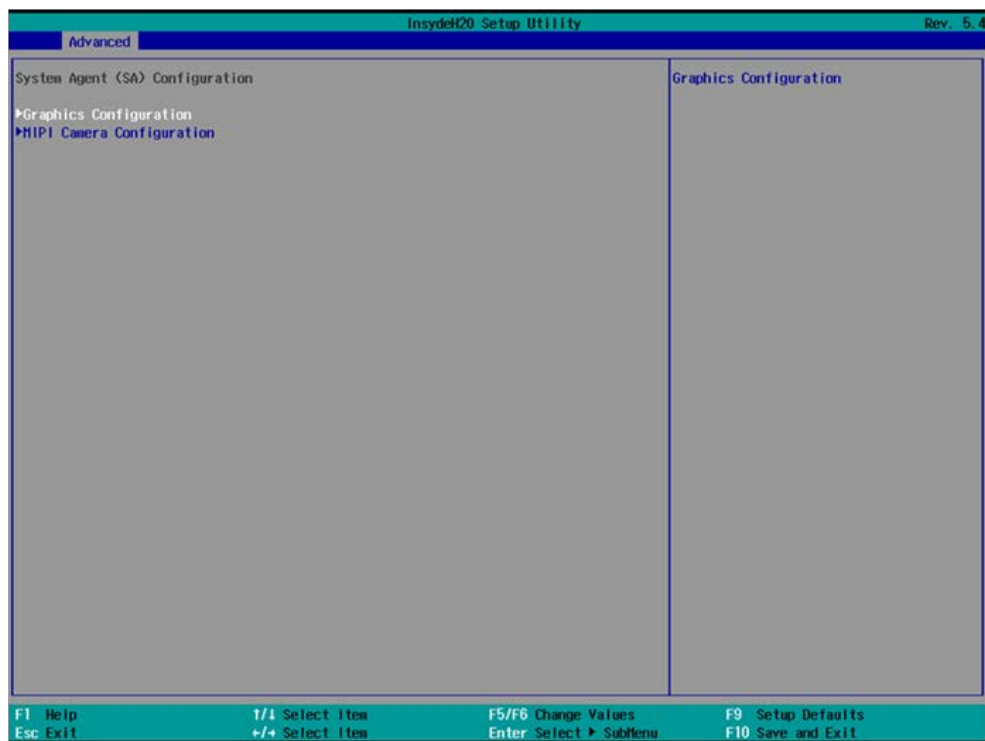


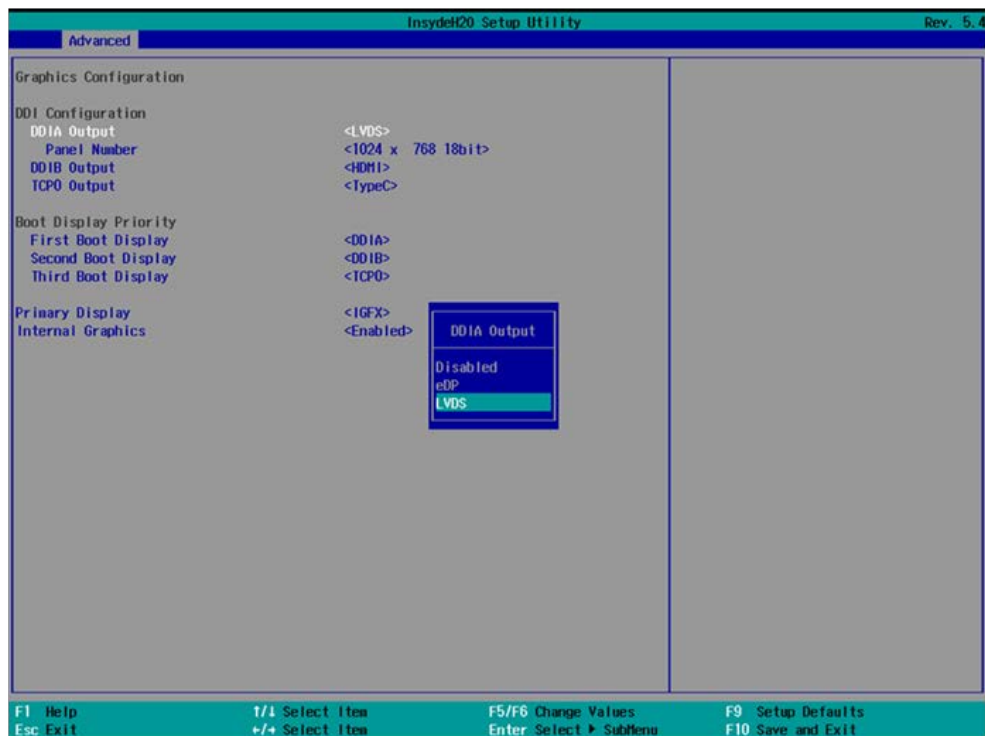
Power Limit Override

Enable / disable PL1 / PL2 and enter the power numerical value from 0 to 20000 to get higher or lower CPU TDP

4-6-1-3 ► System Agent (SA) Configuration





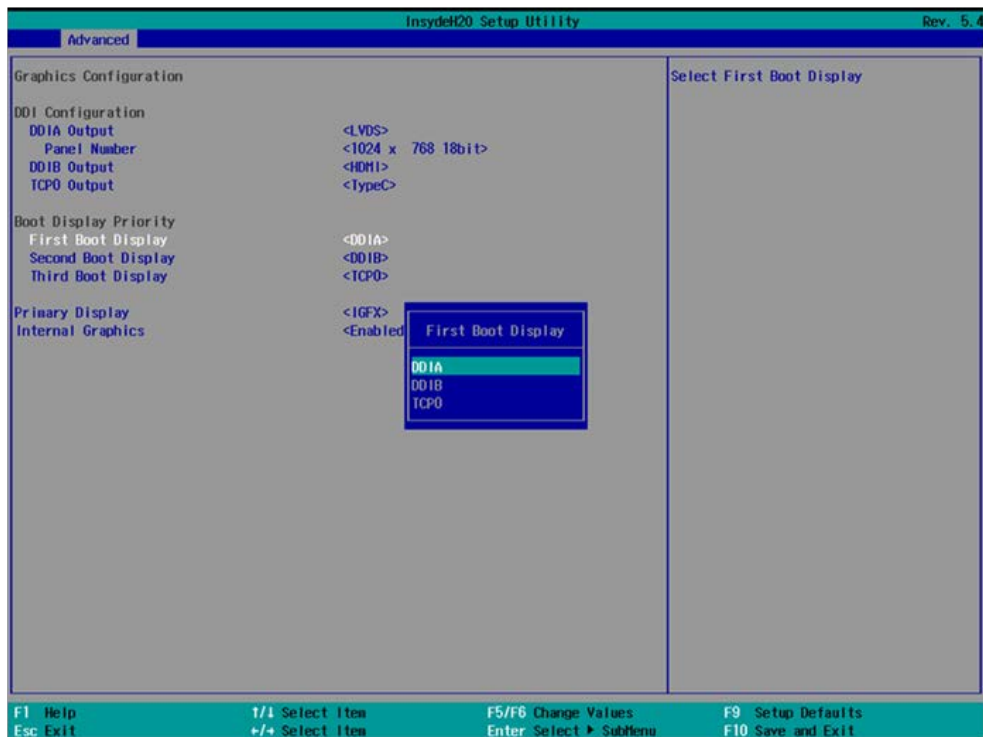


Graphic Configuration DDI Configuration

To select Display priority, there are DDIA (LVDS or DP, default is LVDS), DDIB HDMI, TCP0 Type C



To select LVDS Panel Resolution, default is 1024 x 768 18bit

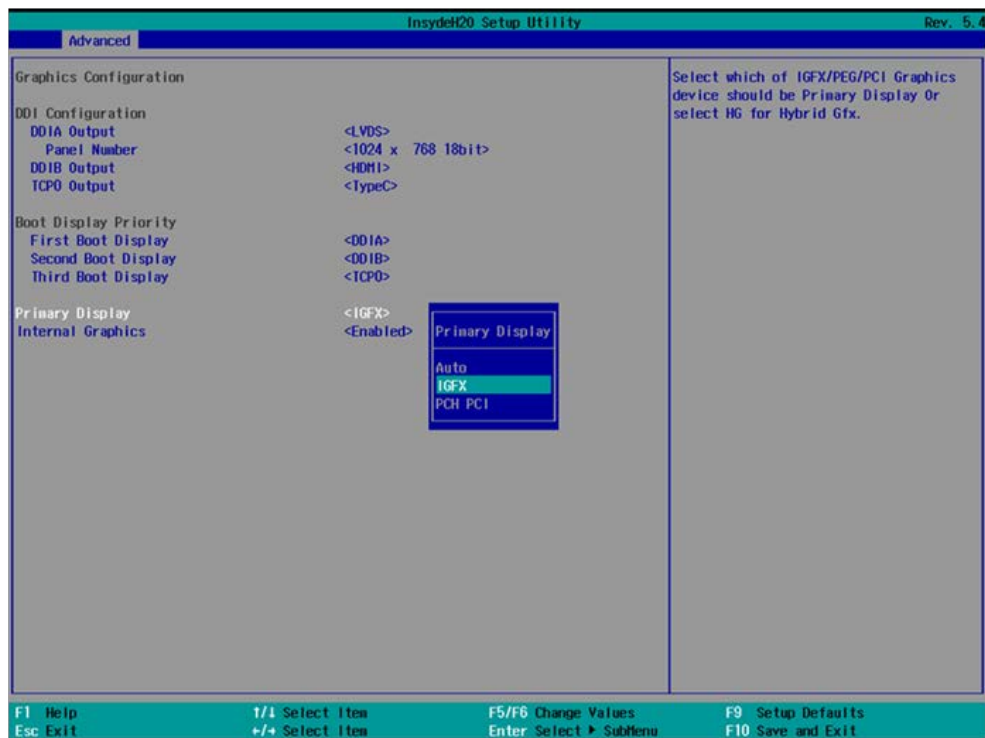


Boot Display Priority

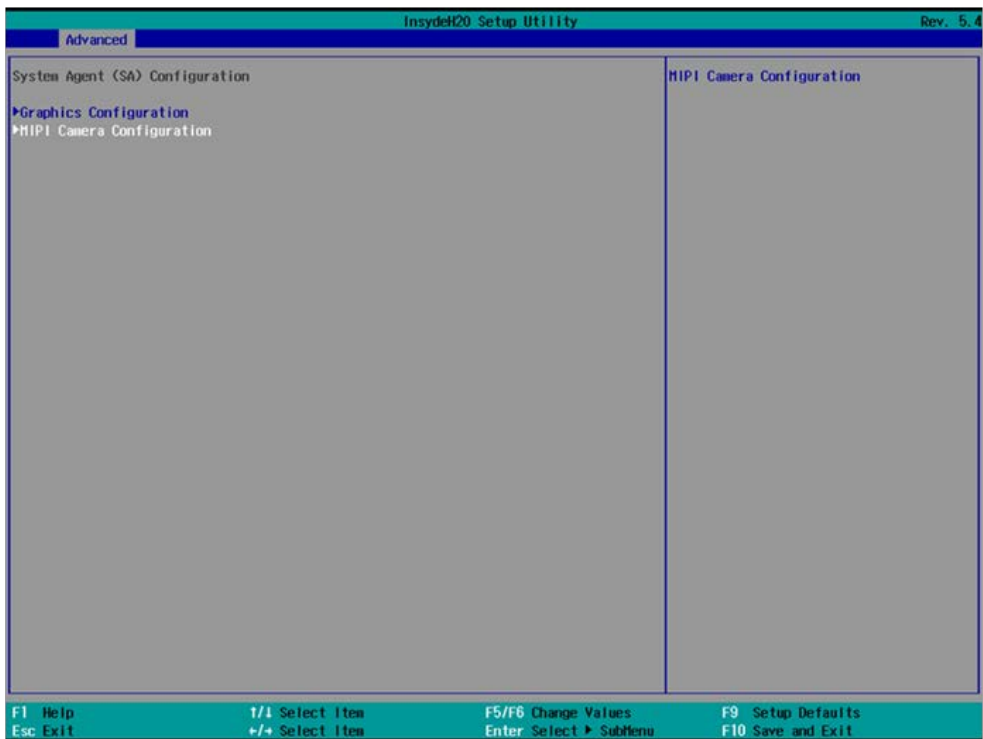
To select First Boot Display priority. DDIA LVDS or eDP, DDIB HDMI or TCP0 Type C

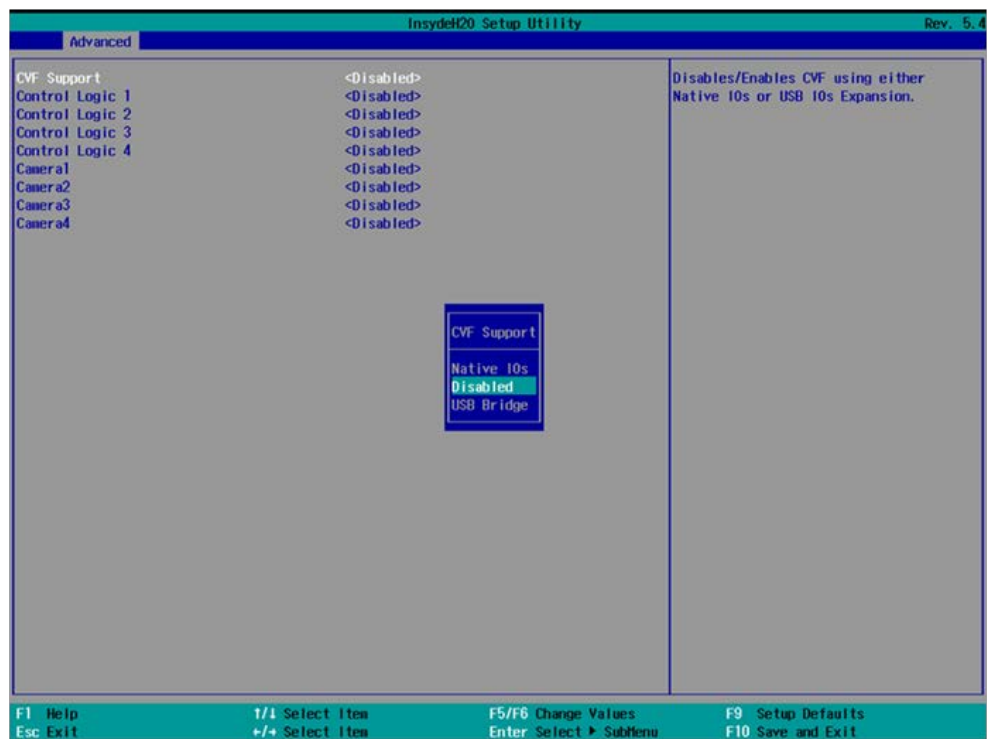
To select Second Boot Display priority, there are DDIB HDMI, TCP0 Type C, default is HDMI

To select Third Boot Display priority, there is TCP0 Type C



Primary Display. The optional settings are: Auto, IGFX, PCH PCI

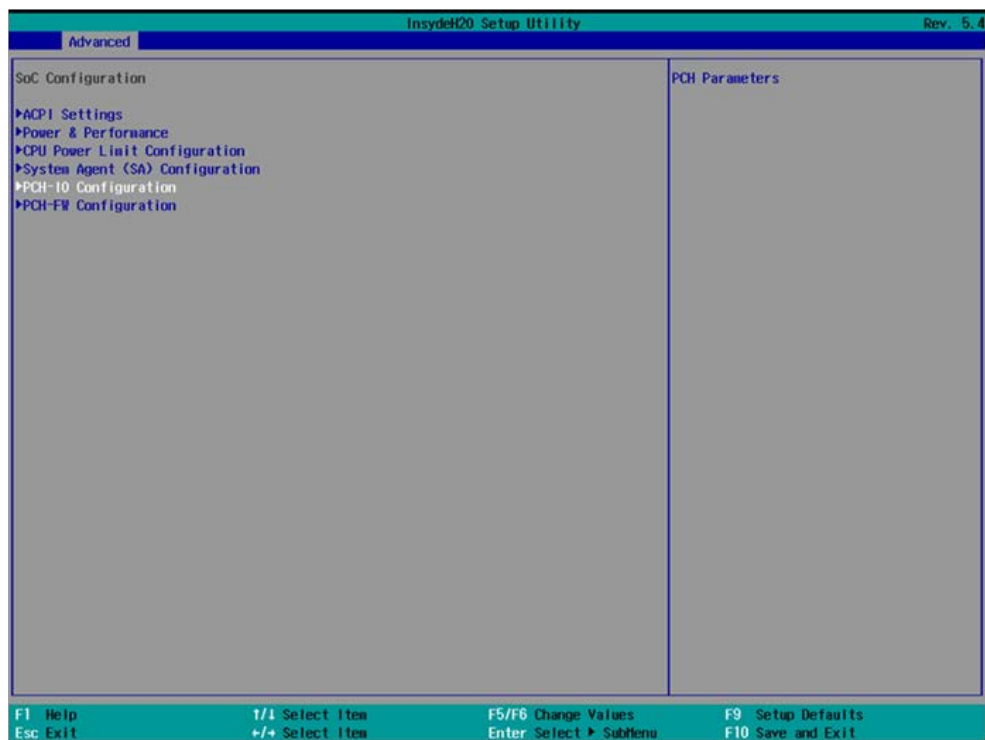


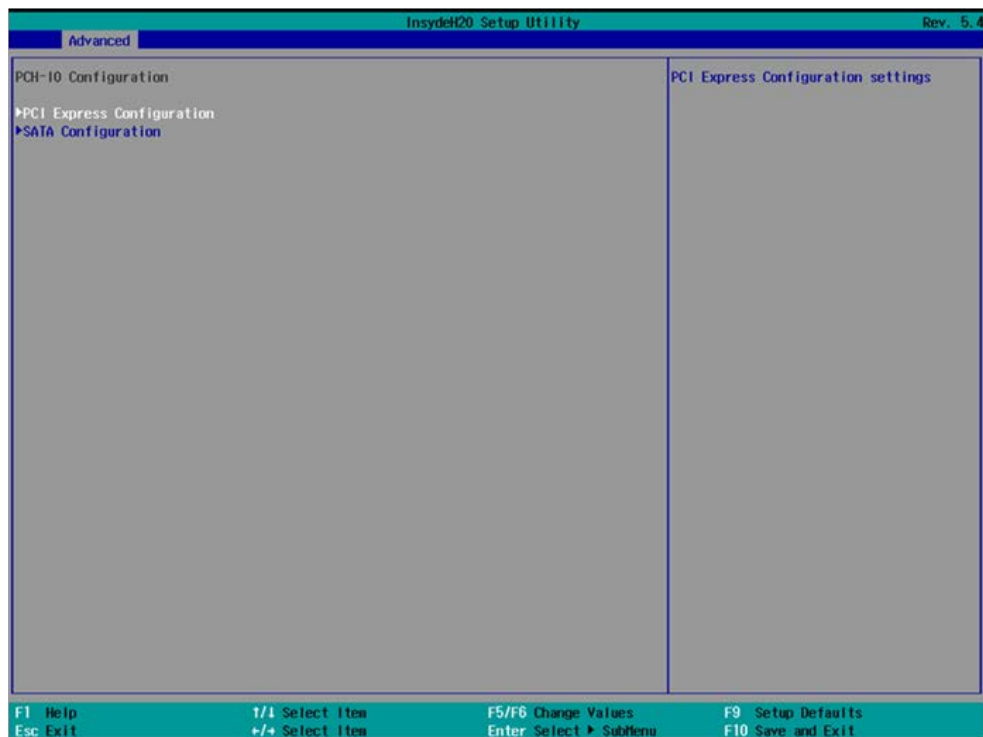


MIPI Camera Configuration

To enable Computer Vision Sensing mode. Default is Disabled

4-6-1-4► PCH-IO Configuration





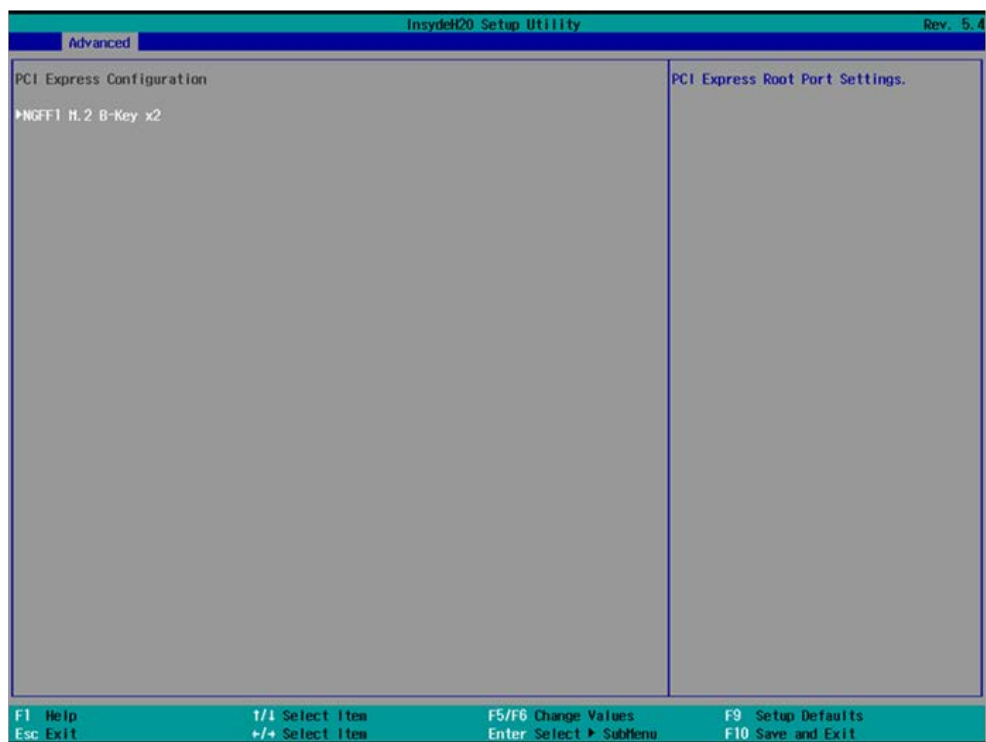
PCI Express Configuration

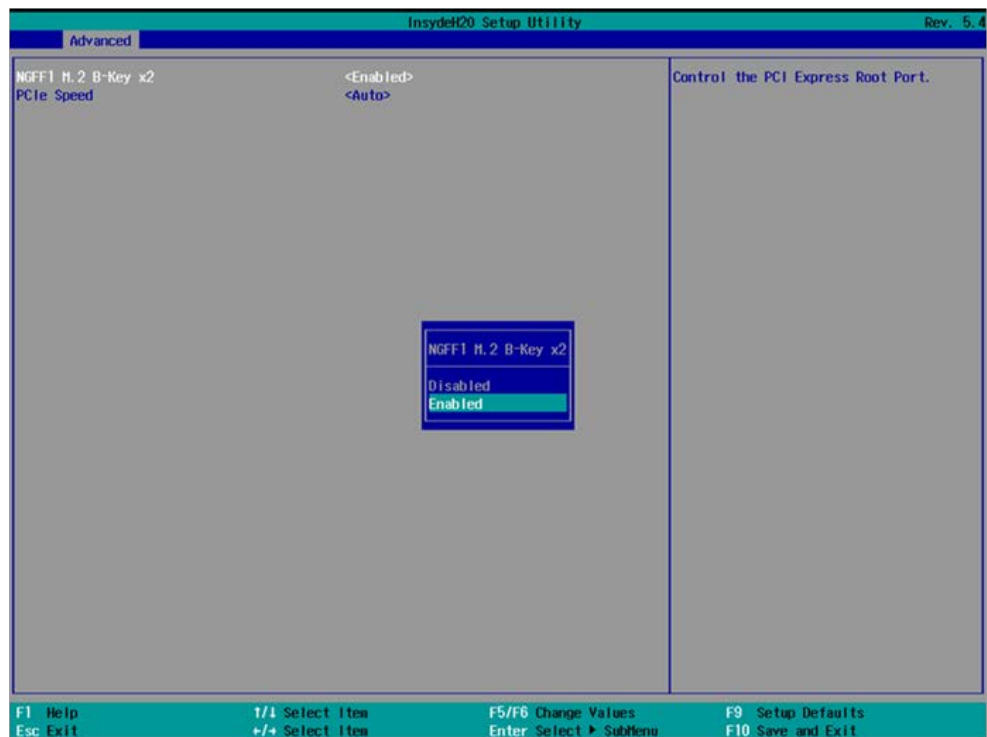
Please refer section 4-6-1-4-1

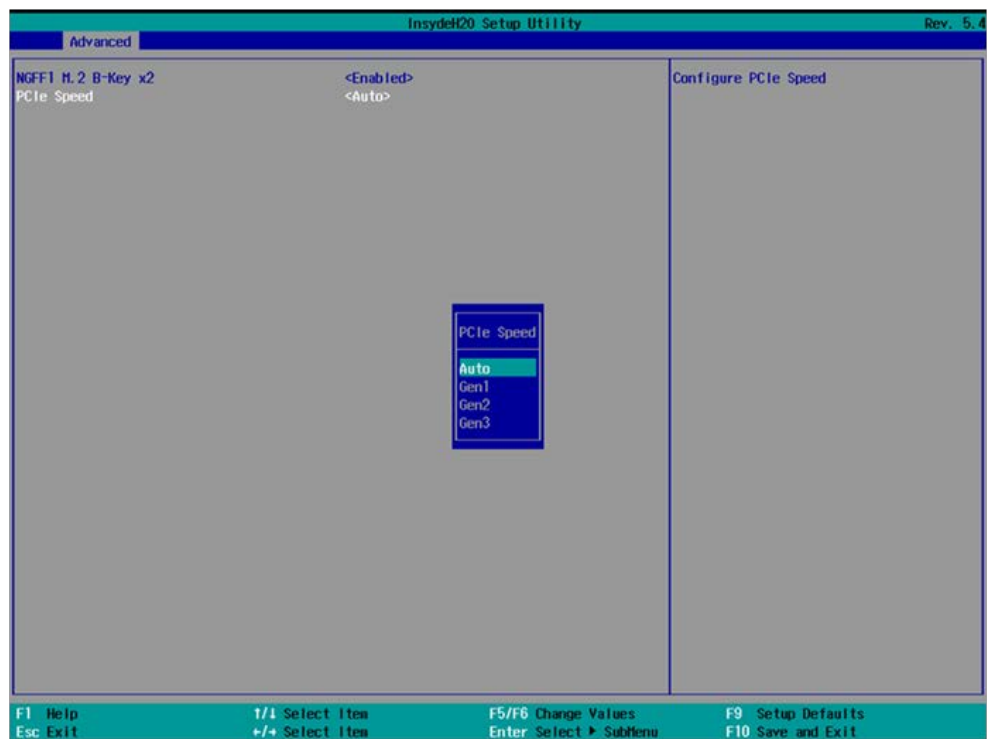
SATA Configuration

Please refer section 4-6-1-4-2

4-6-1-4-1 ► PCI Express Configuration

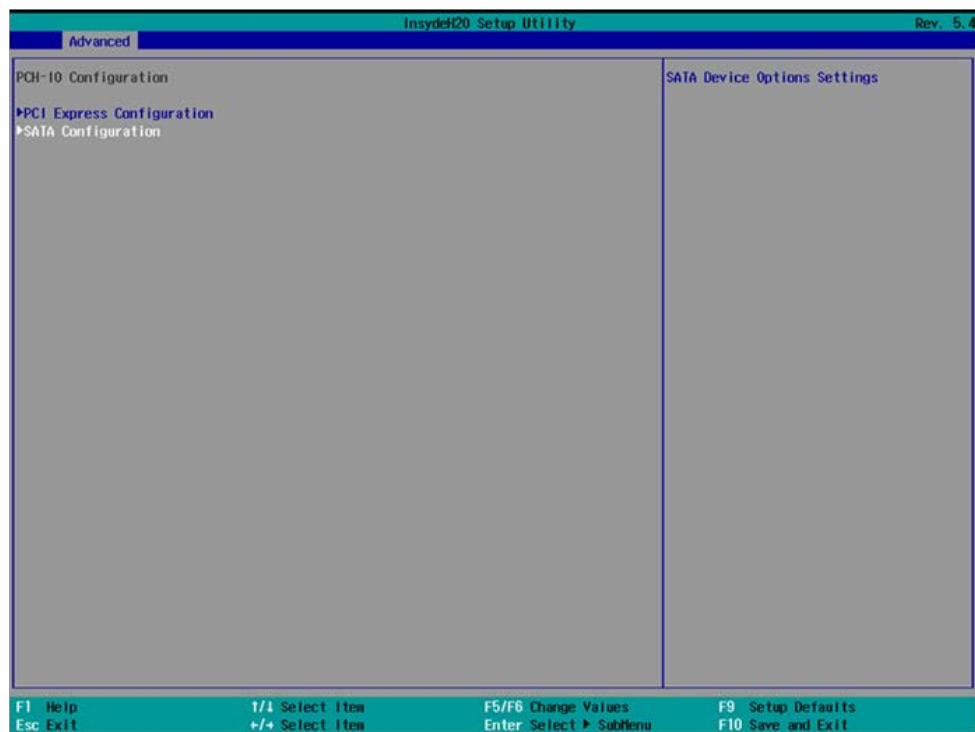


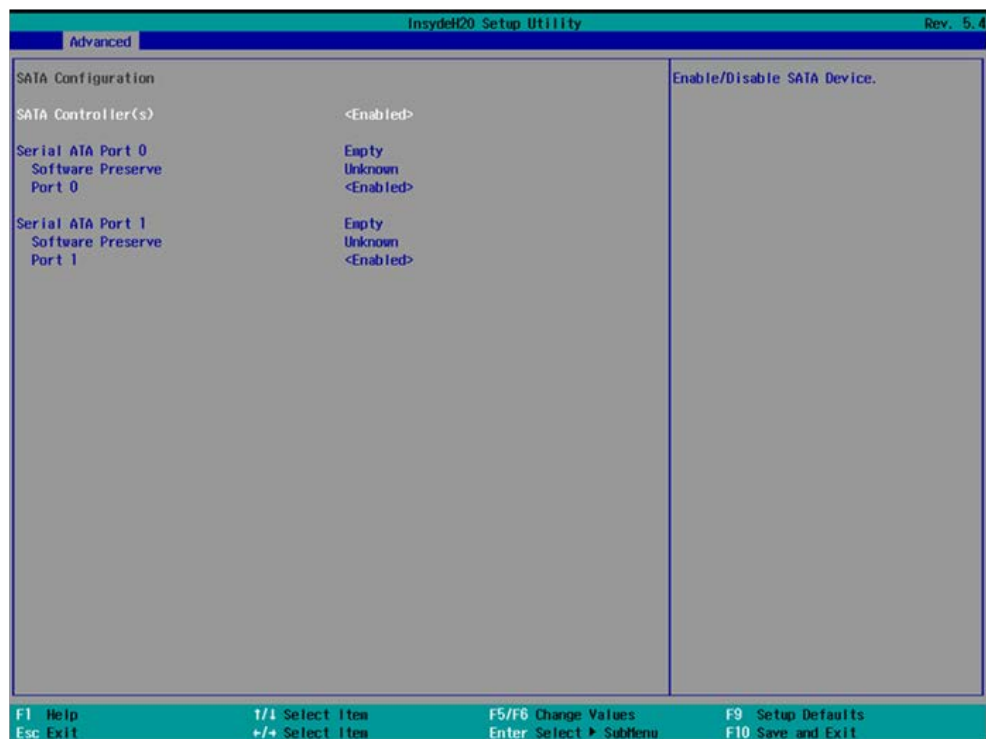




To select NGFF1 device enabled or not and to change the PCIe Speed, there are Auto, Gen1, Gen2, Gen3, default is Auto

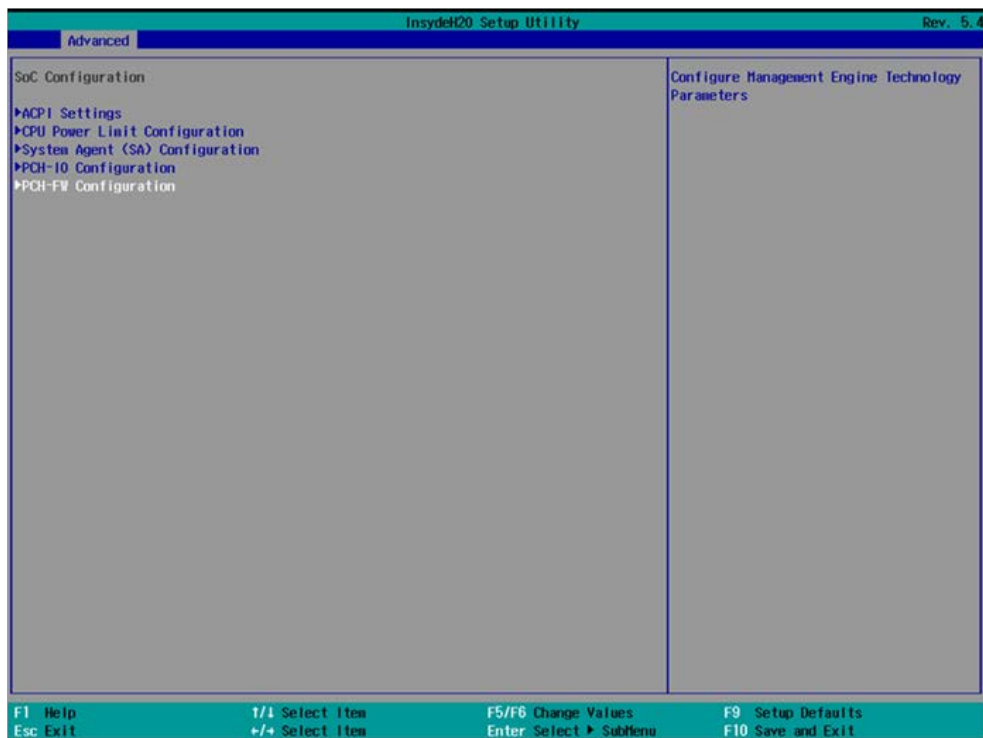
4-6-1-4-2 ► SATA Configuration





To select SATA device enabled or not.

4-6-1-5 ► PCH-FW Configuration



Advanced

ME Firmware Version	16.50.20.1647
ME Firmware Mode	Normal Mode
ME Firmware SKU	Consumer SKU
ME Firmware Status 1	0x90000255
ME Firmware Status 2	0x39850106
ME Firmware Status 3	0x00000020
ME Firmware Status 4	0x00004000
ME Firmware Status 5	0x00000000
ME Firmware Status 6	0x00400002

ME Firmware Version

F1 Help

↑/↓ Select Item

F5/F6 Change Values

F9 Setup Defaults

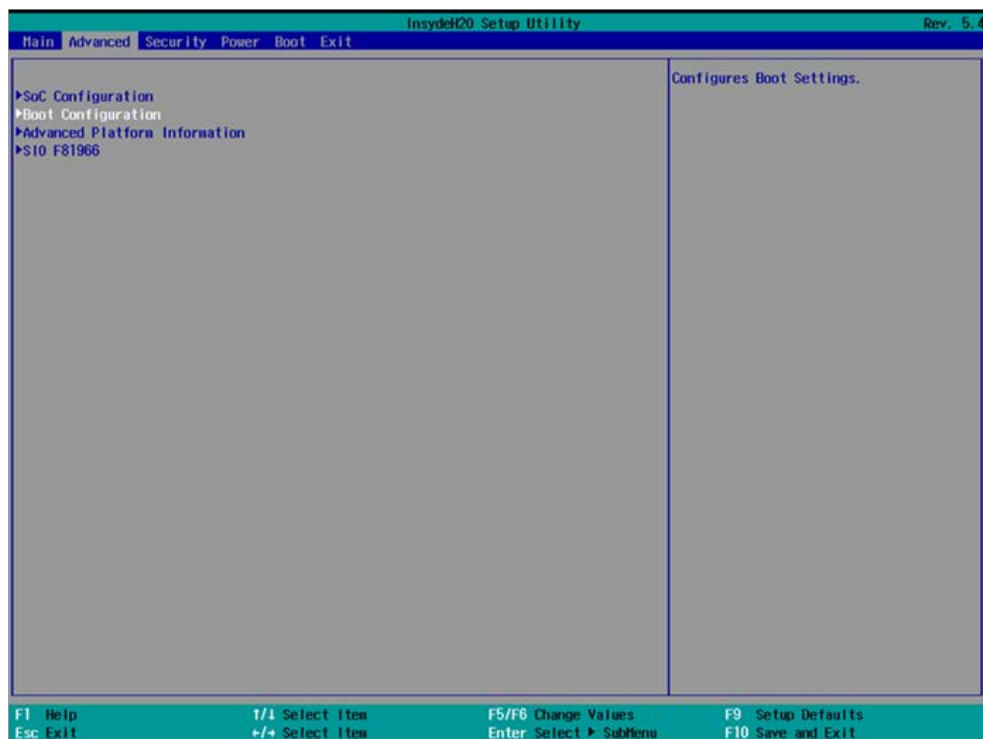
Esc Exit

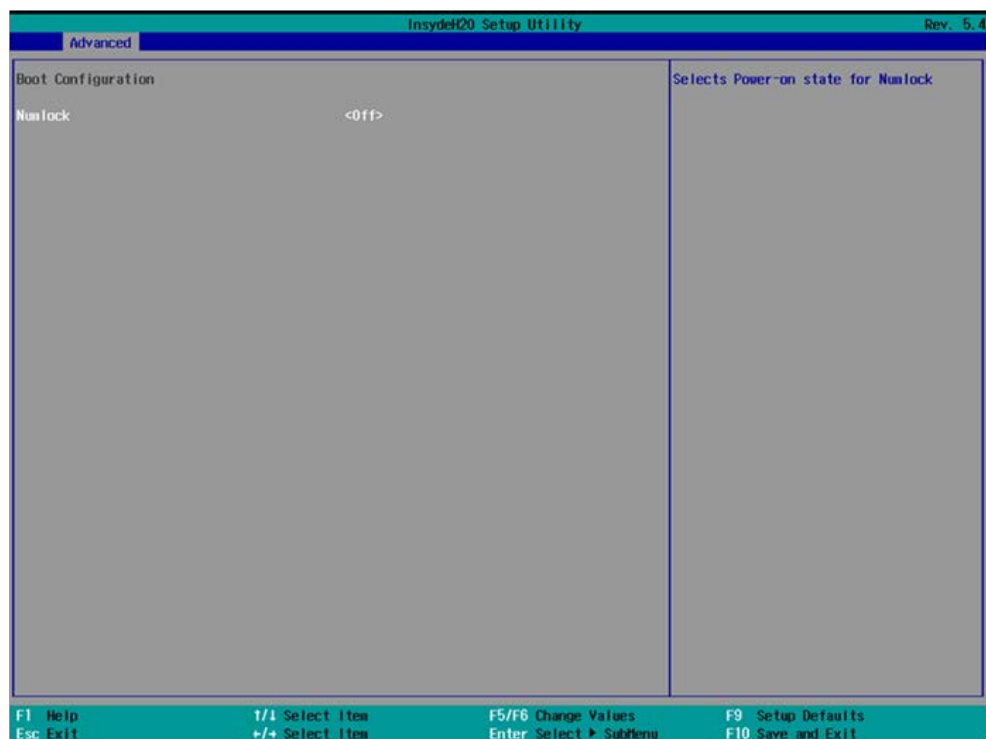
←/→ Select Item

Enter Select ► SubItems

F10 Save and Exit

4-6-2 Boot Configuration

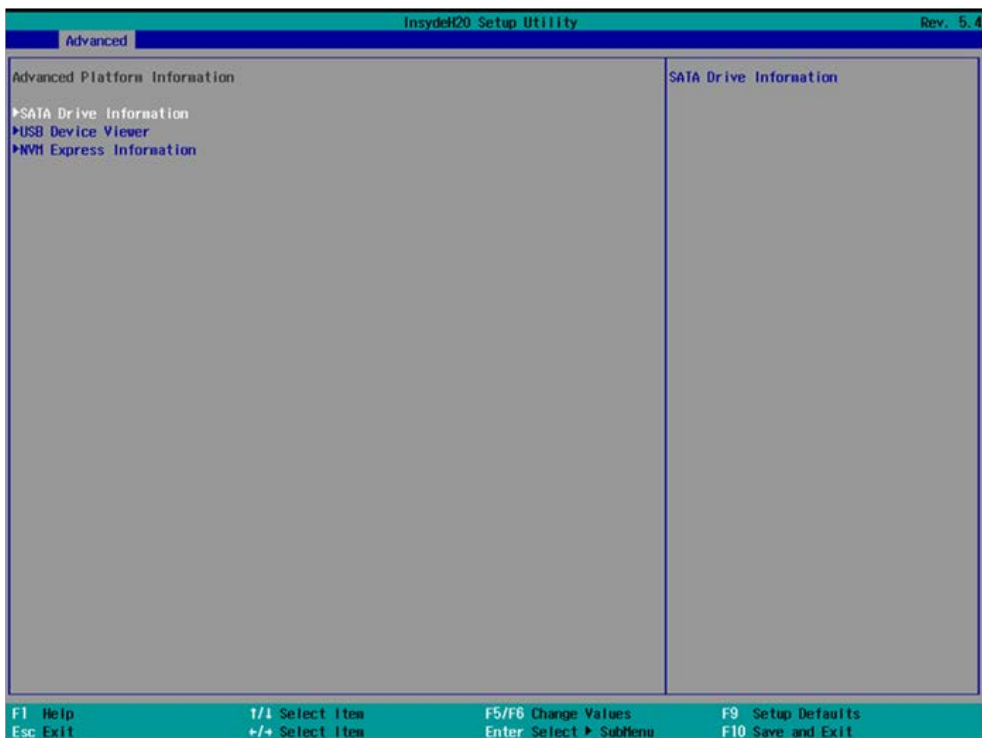


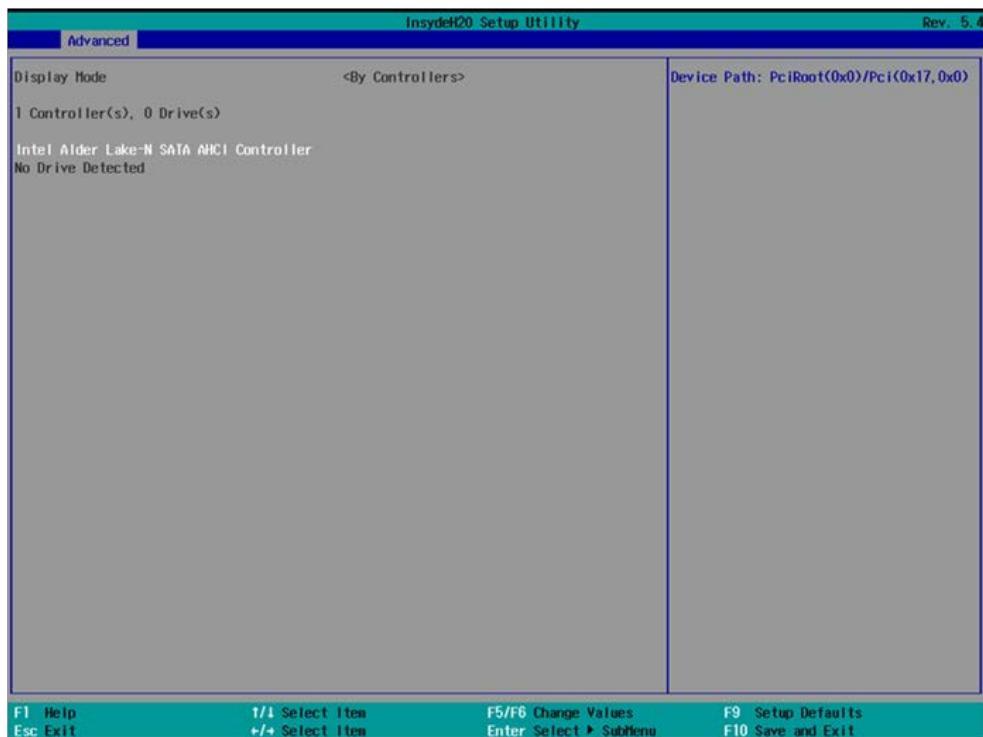


To select Power-on state for NumLock, default is <off>

4-6-3 Advanced Platform Configuration

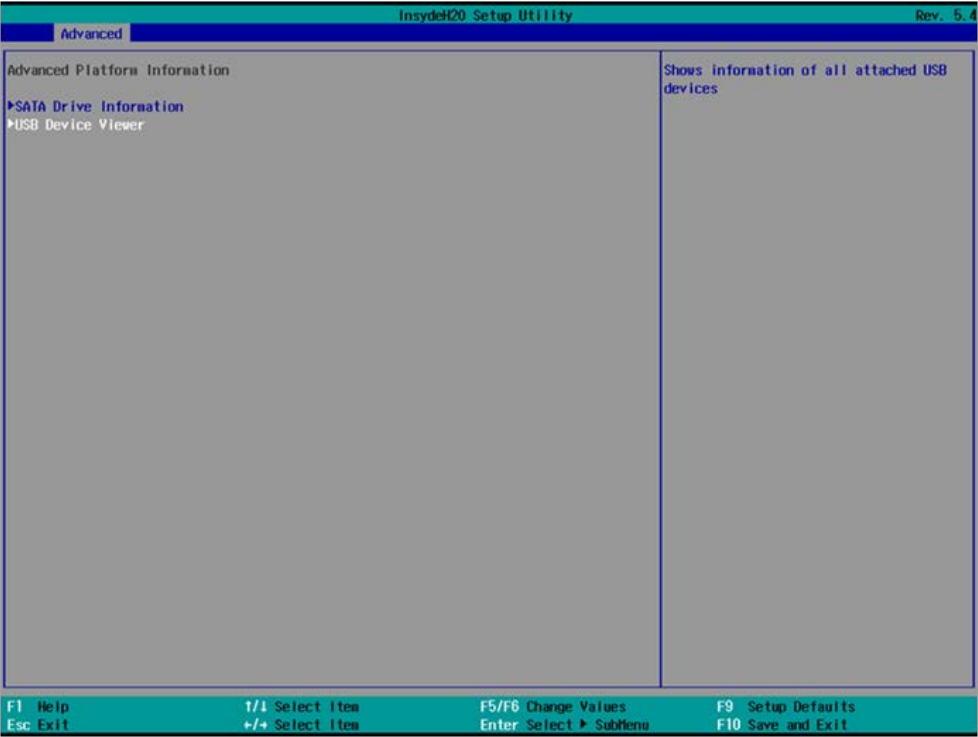
SATA Drive Information

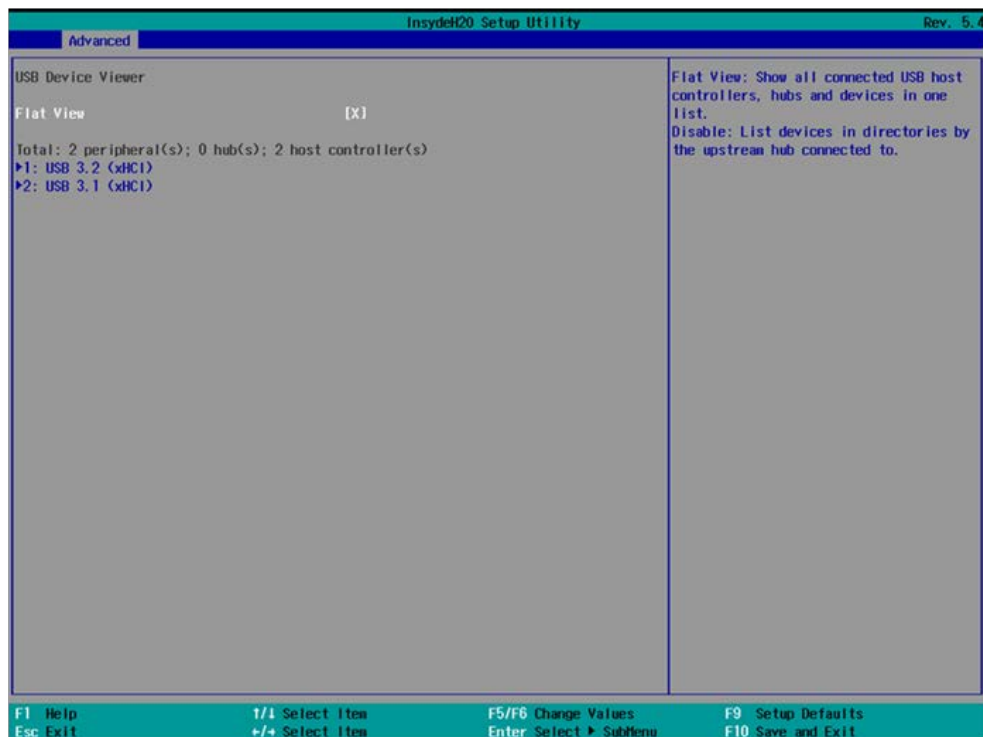




Shows SATA Drive information

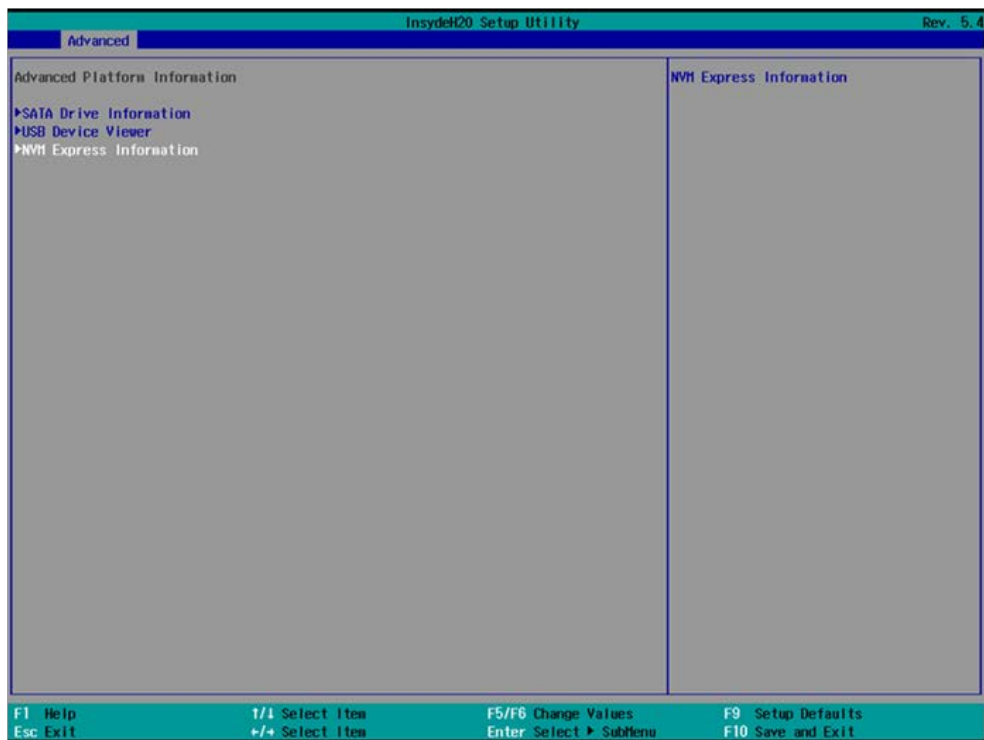
USB Device Viewer





Shows USB Drive information

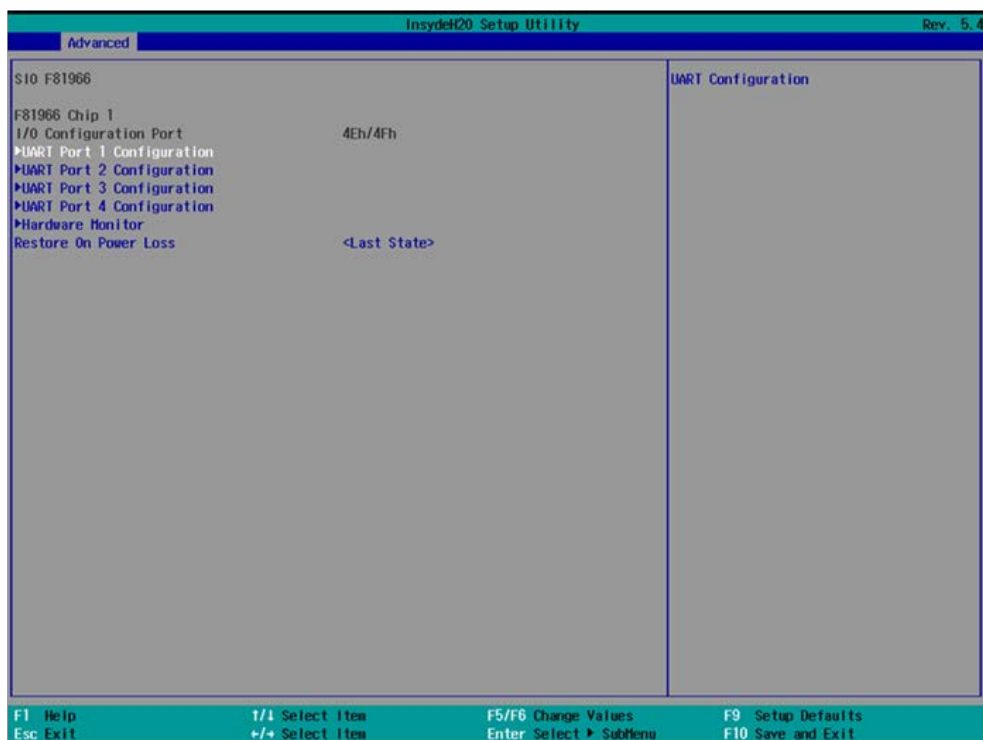
NVM Express Information





Shows NVMe Device information

4-6-4 SIO F81966



UART Port 1 Configuration

Please refer section 4-6-4-1

UART Port 2 Configuration

Please refer section 4-6-4-2

UART Port 3 Configuration

Please refer section 4-6-4-3

UART Port 4 Configuration

Please refer section 4-6-4-4

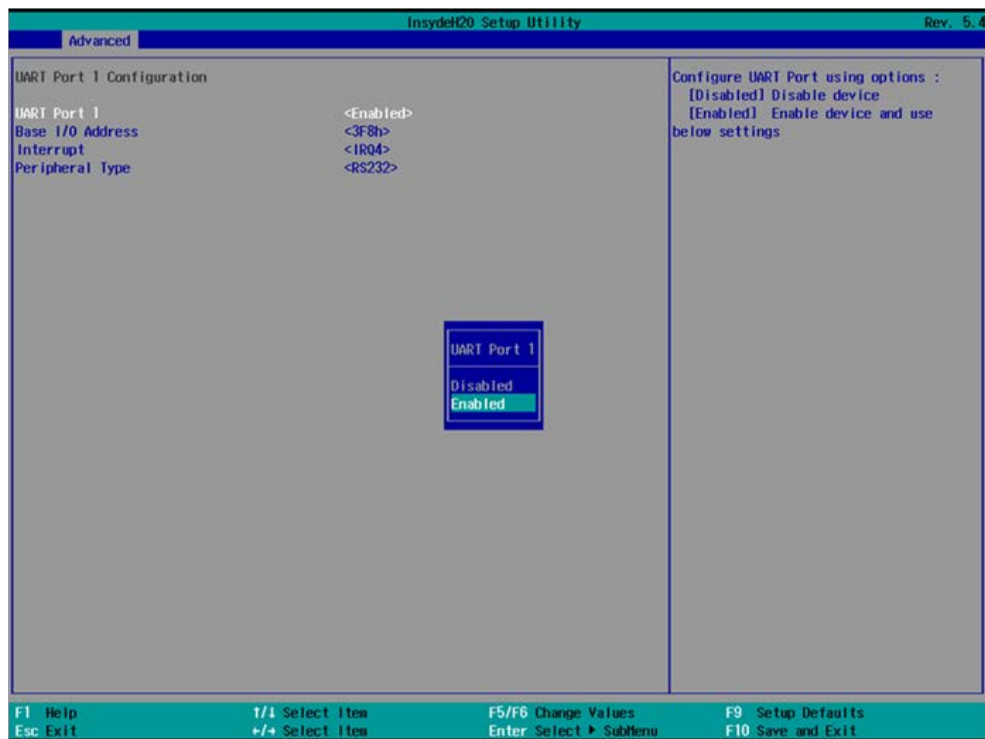
Hardware Monitor

Please refer section 4-6-4-5

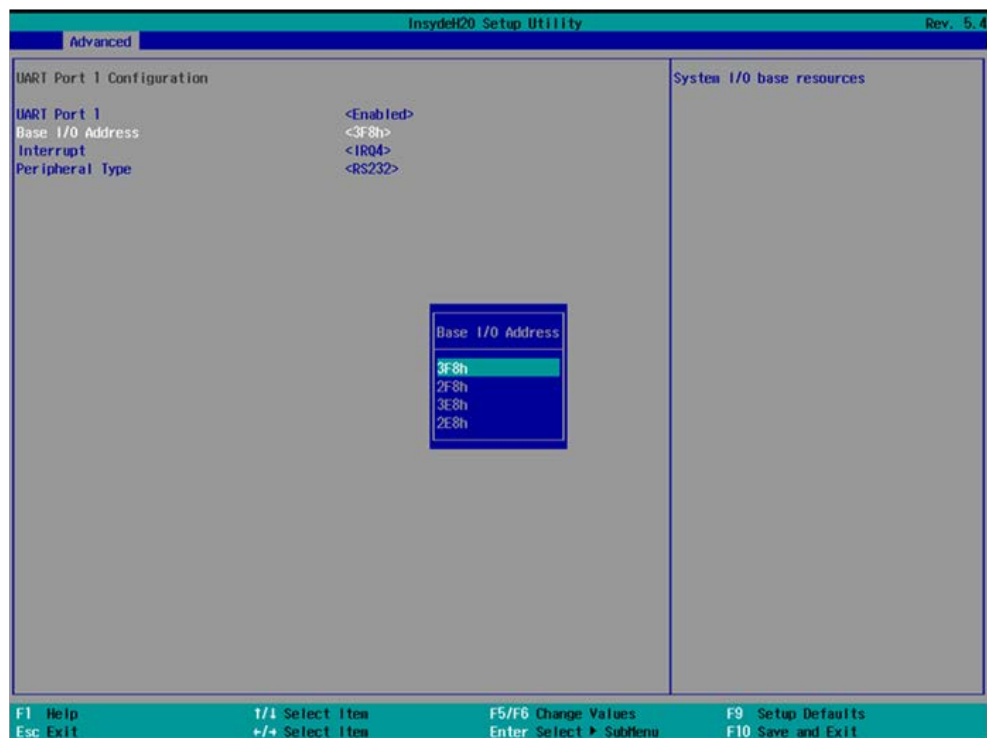
Restore on Power Loss

Please refer section 4-6-4-6

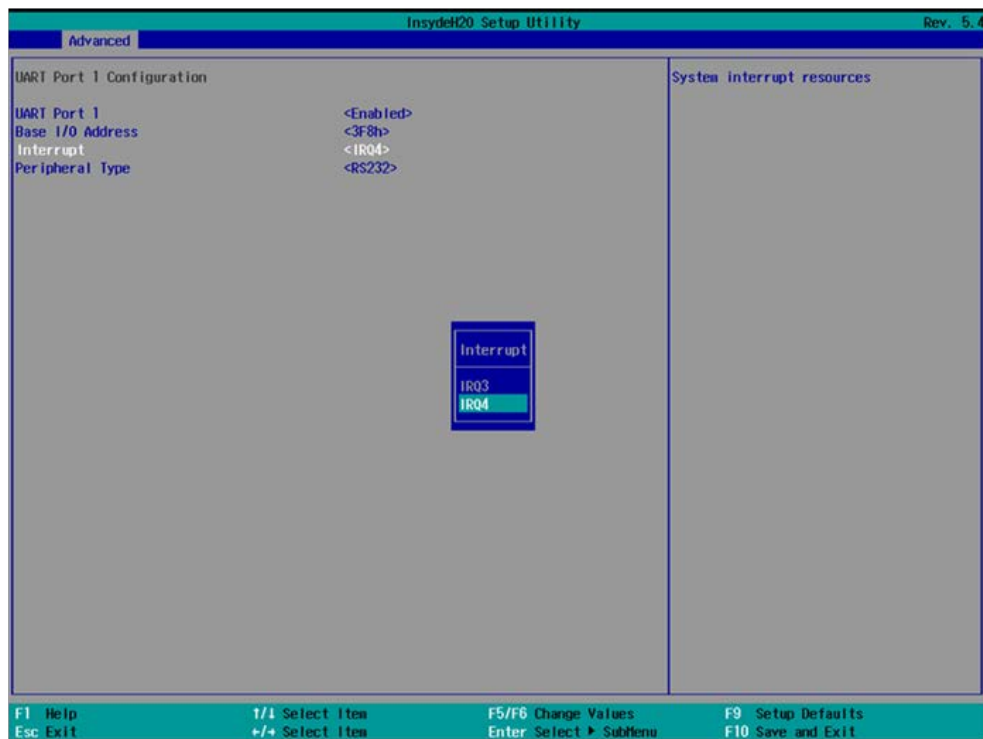
4-6-4-1 ► UART Port 1 Configuration



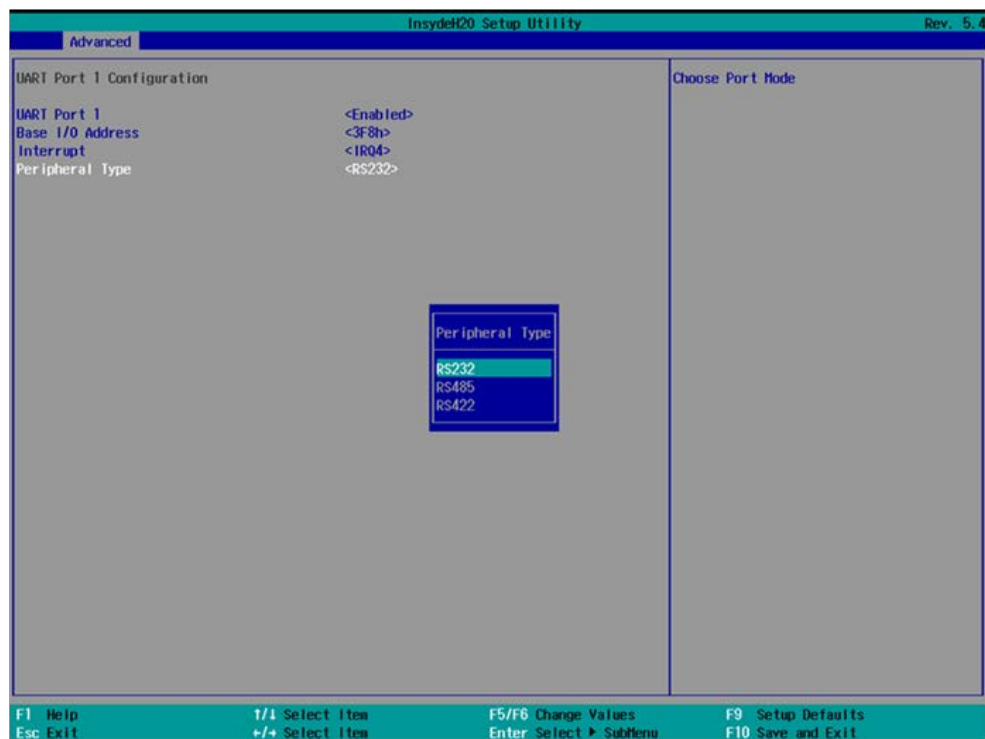
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 3F8h.

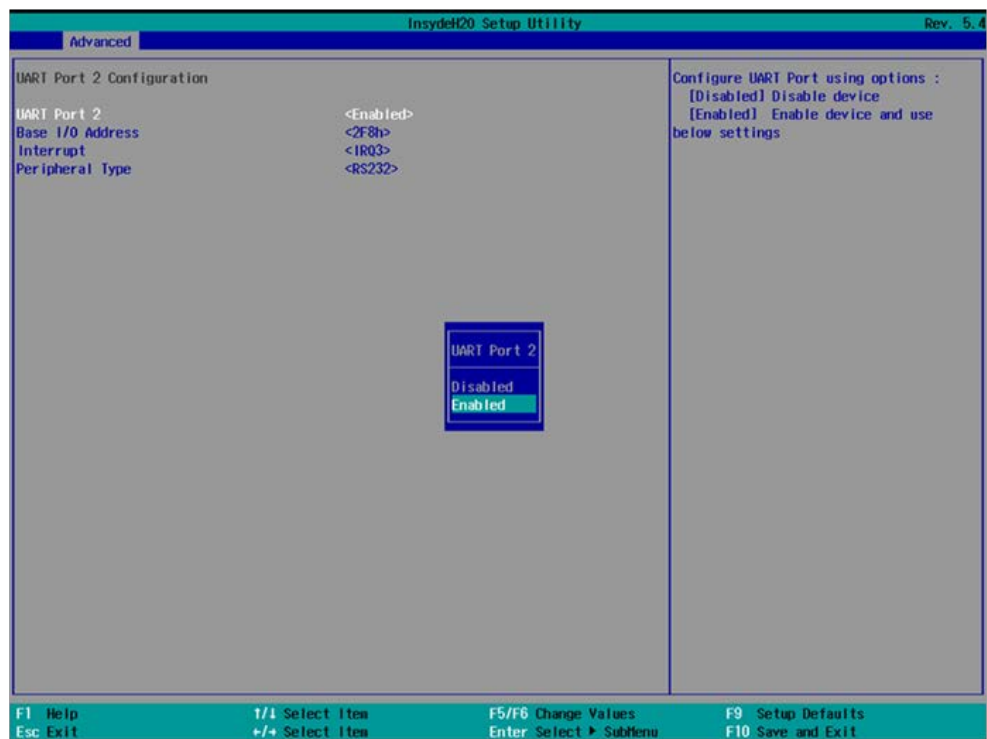


Interrupt, default is IRQ4.

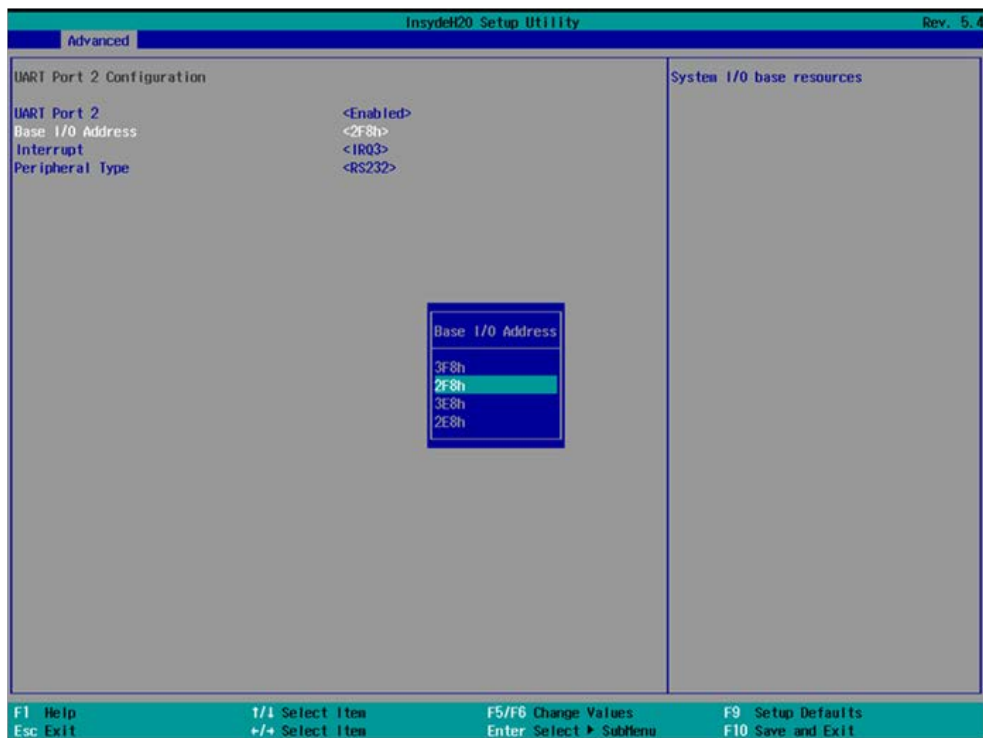


Peripheral, to select the Serial port to RS232/RS422/RS485, default is RS232.

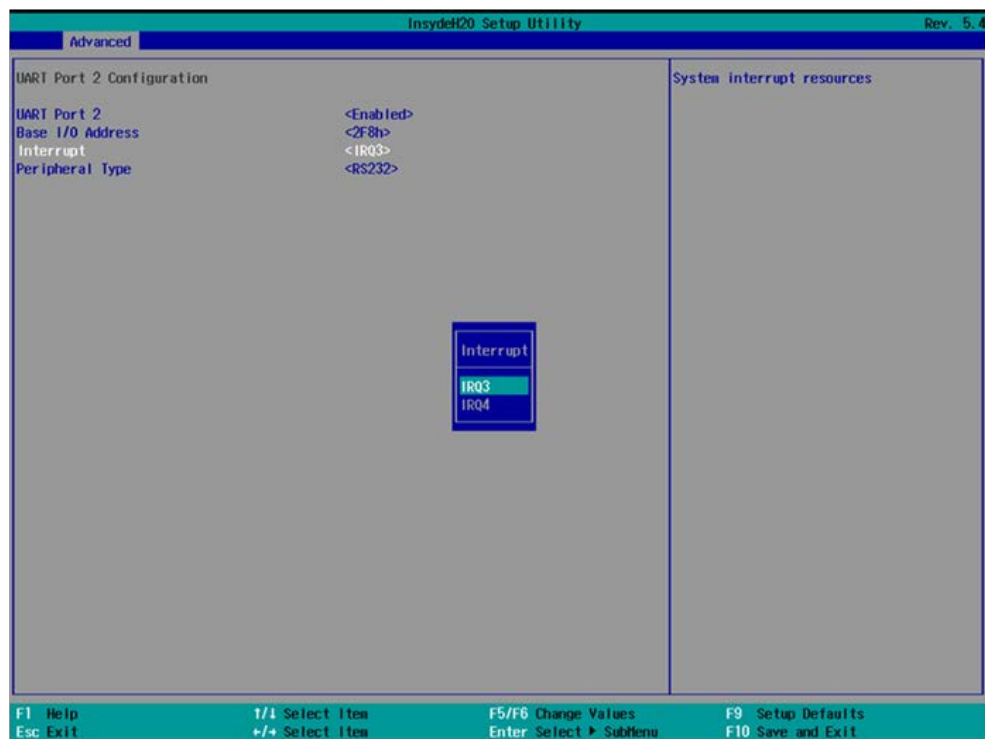
4-6-4-2 ► UART Port 2 Configuration



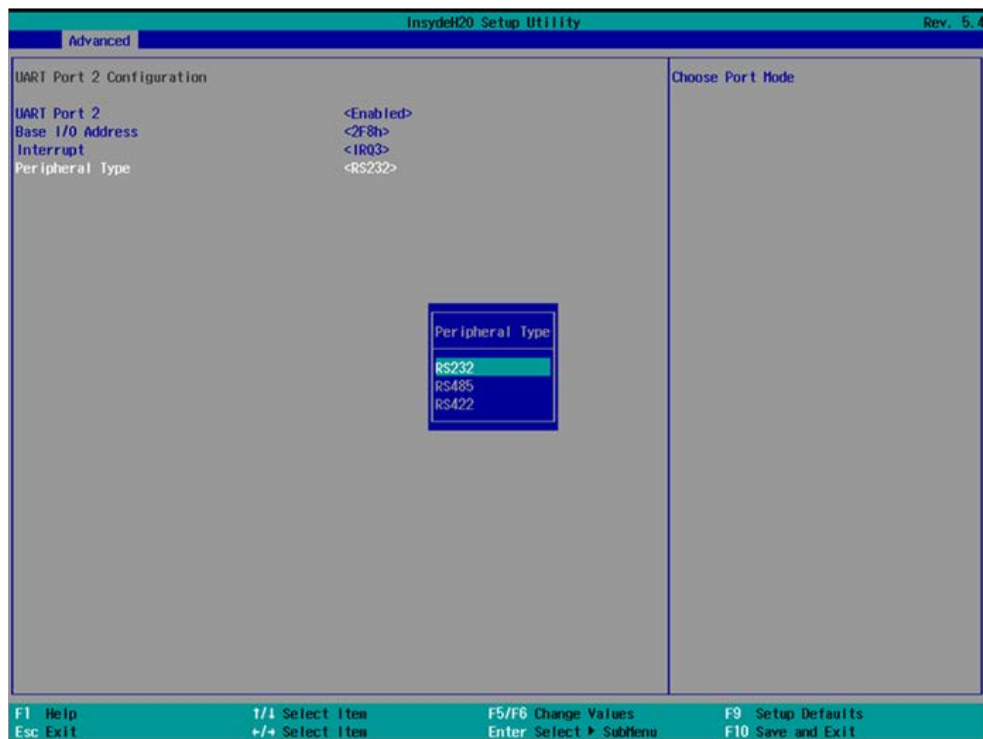
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 2F8h.

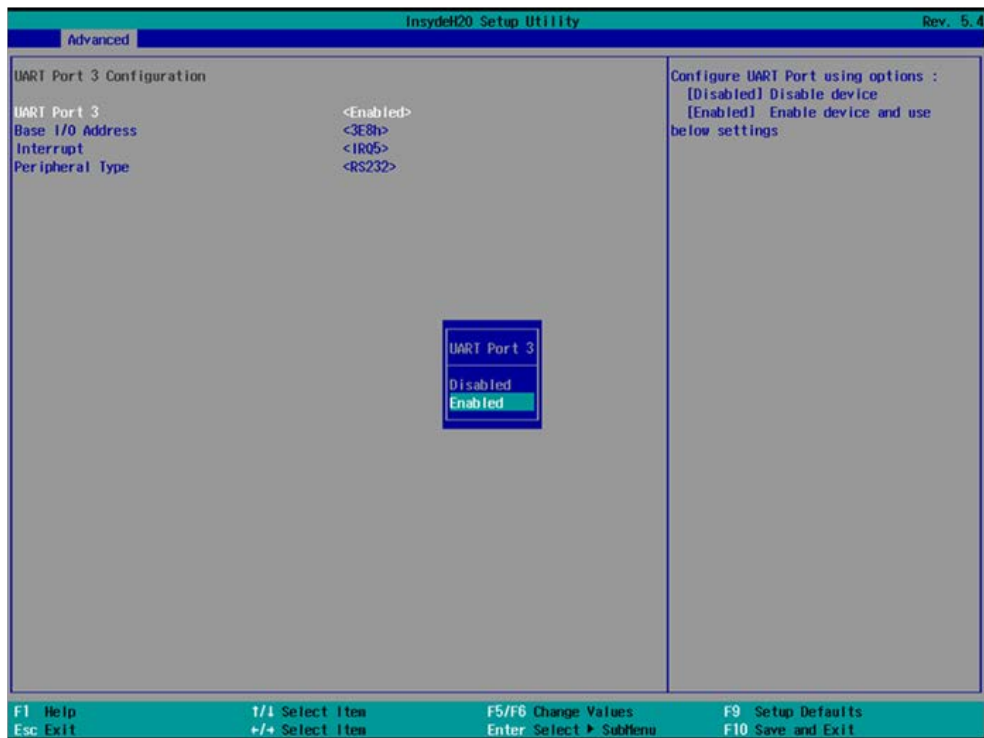


Interrupt, default is IRQ3.

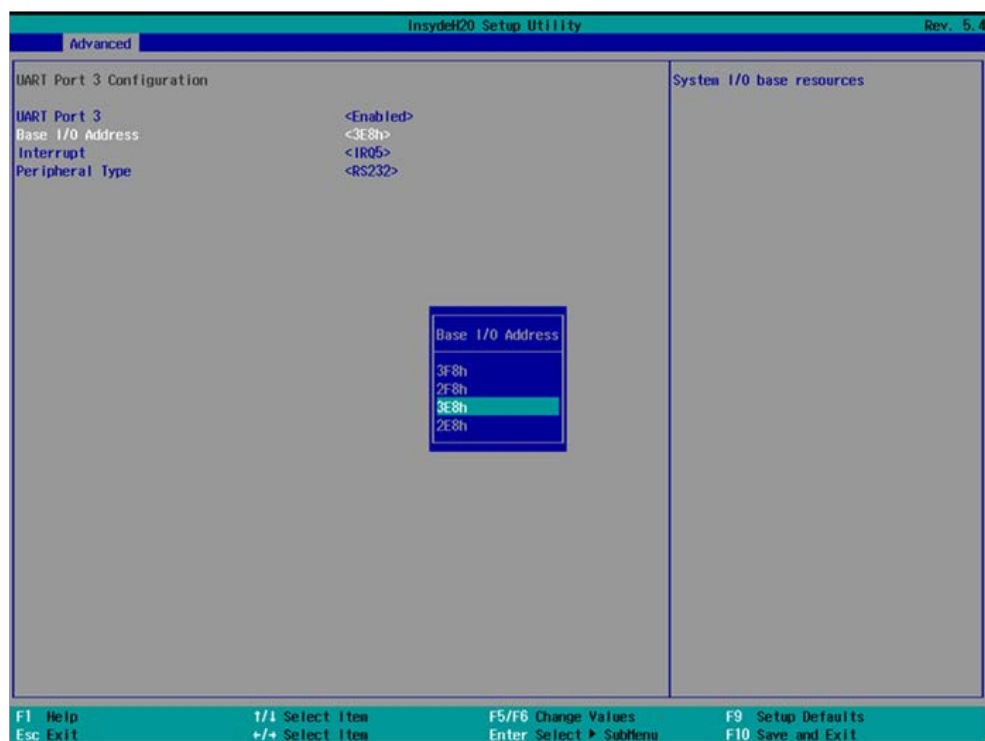


Peripheral, to select the Serial port to RS232/RS422/RS485, default is RS232.

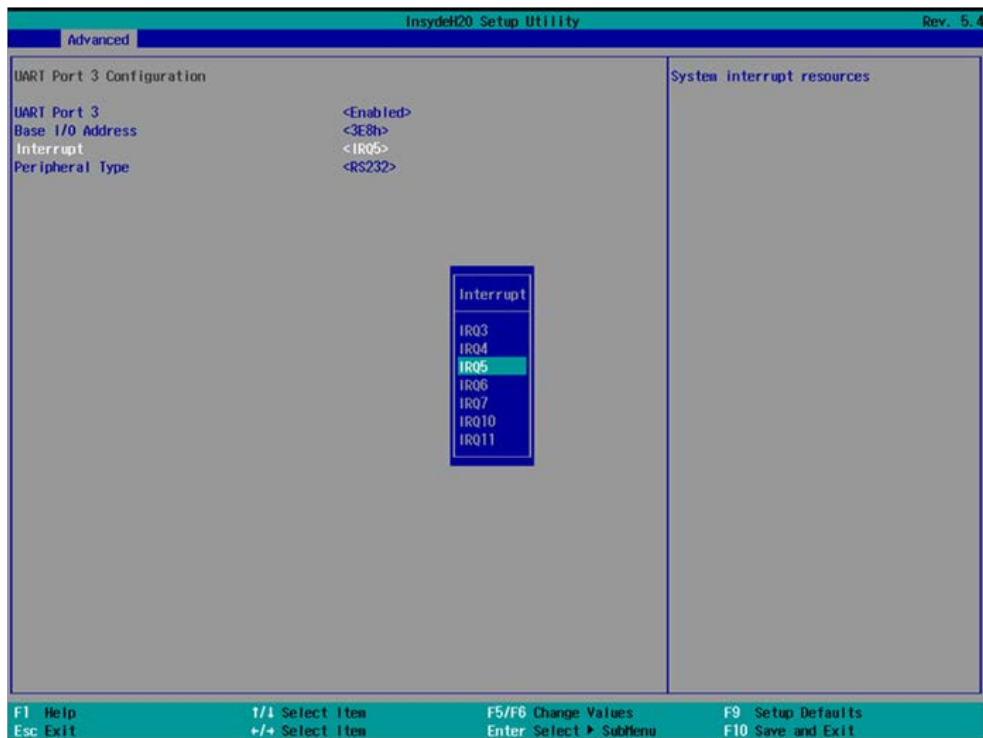
4-6-4-3 ► UART Port 3 Configuration



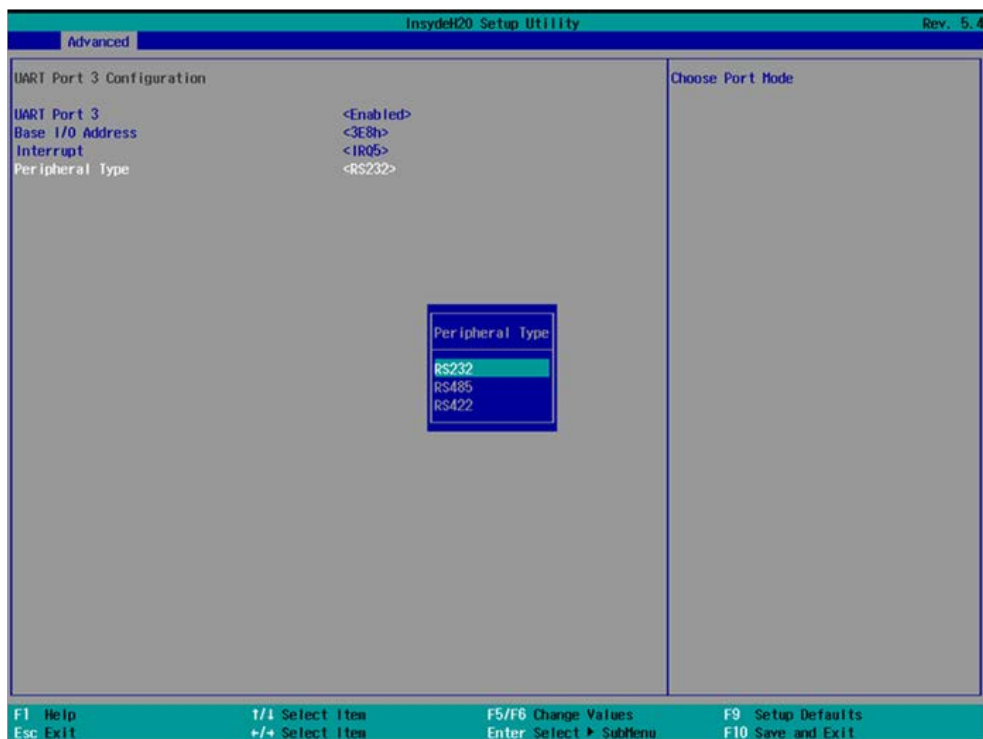
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 3E8h.

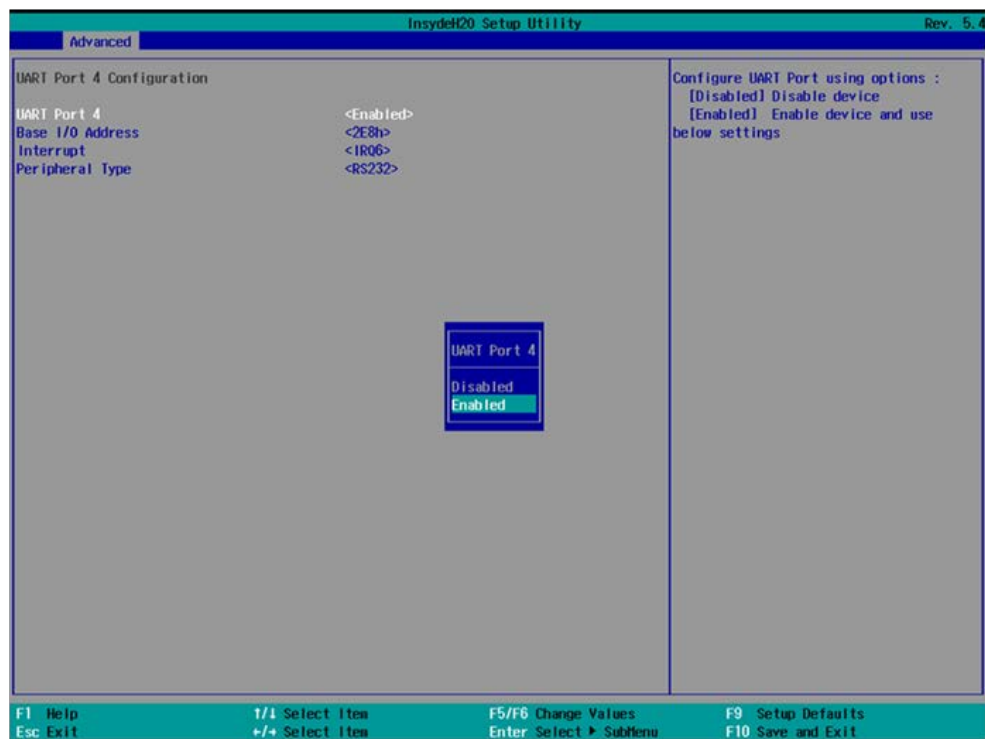


Interrupt, default is IRQ5.

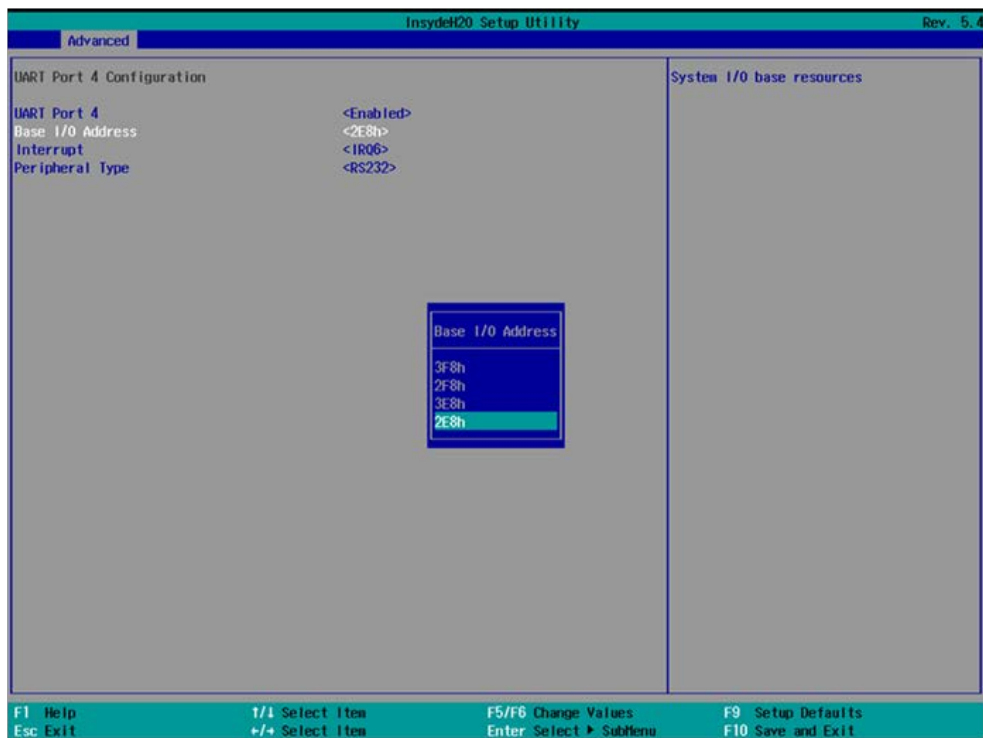


Peripheral, to select the Serial port to RS232/RS422/RS485, default is RS232.

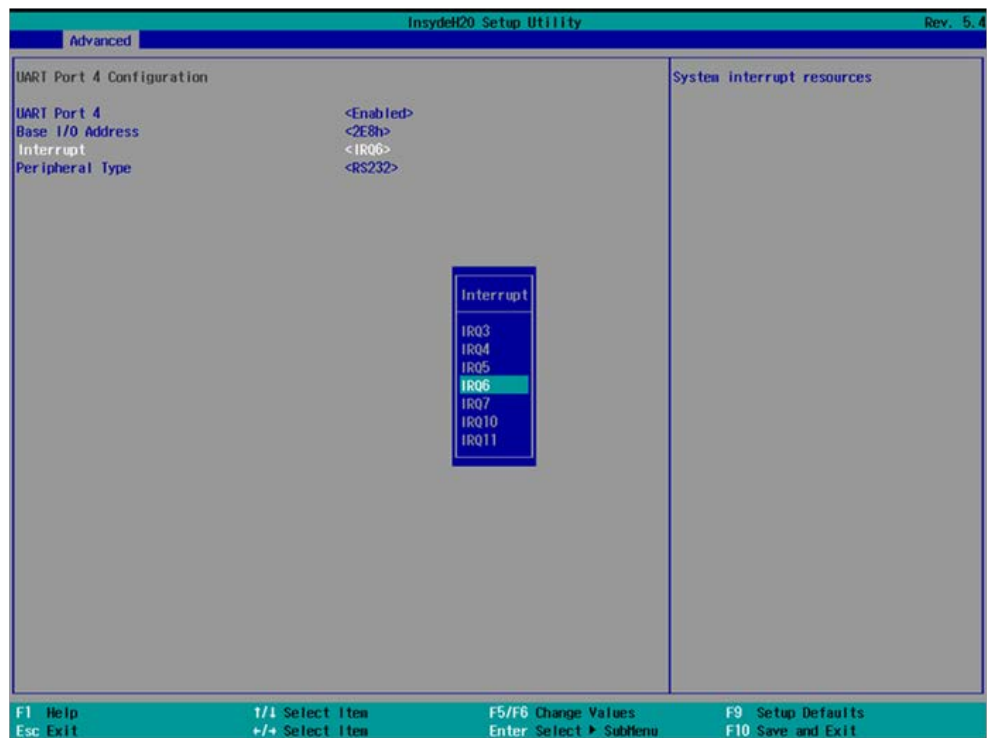
4-6-4-4 ► UART Port 4 Configuration



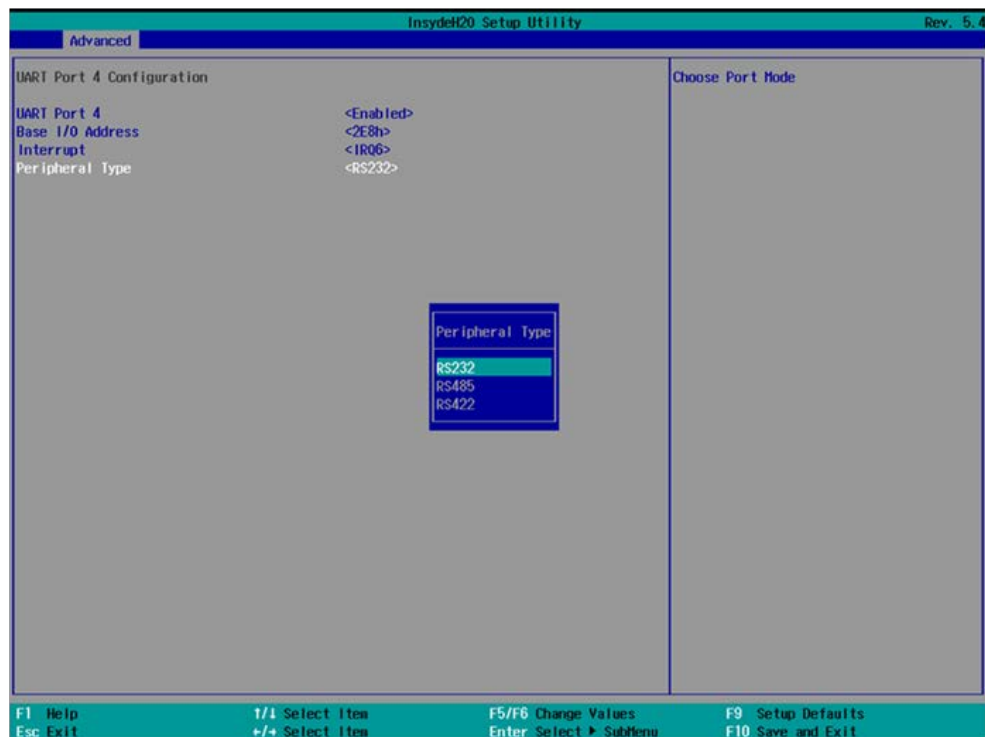
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 2E8h.

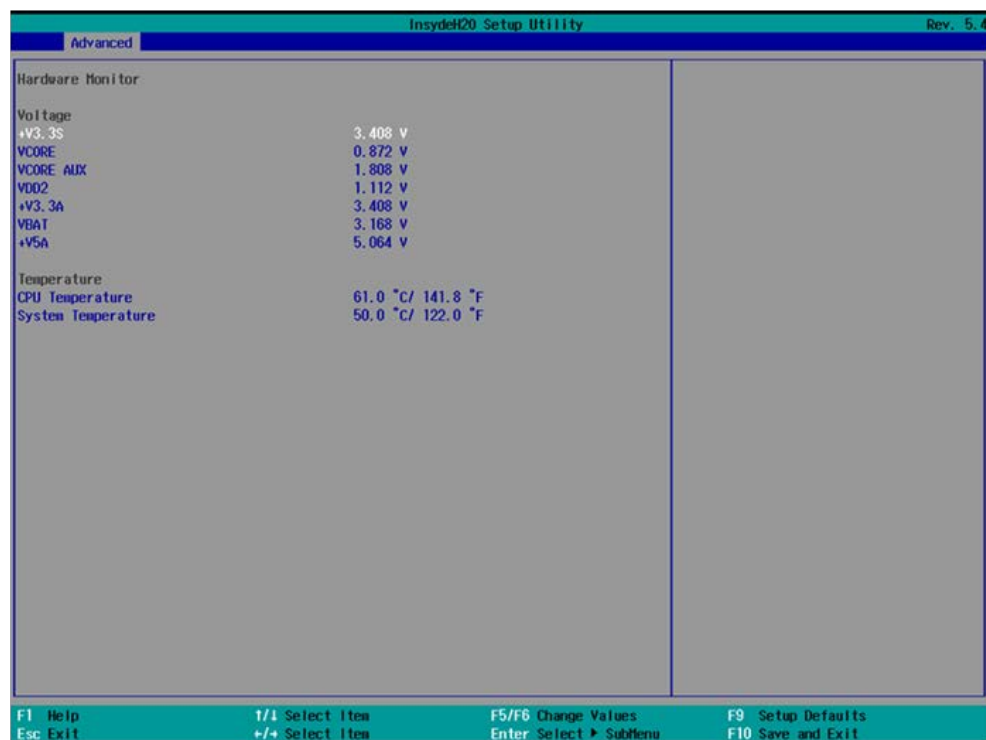


Interrupt, default is IRQ6.



Peripheral, to select the Serial port to RS232/RS422/RS485, default is RS232.

4-6-4-5 ► Hardware Monitor

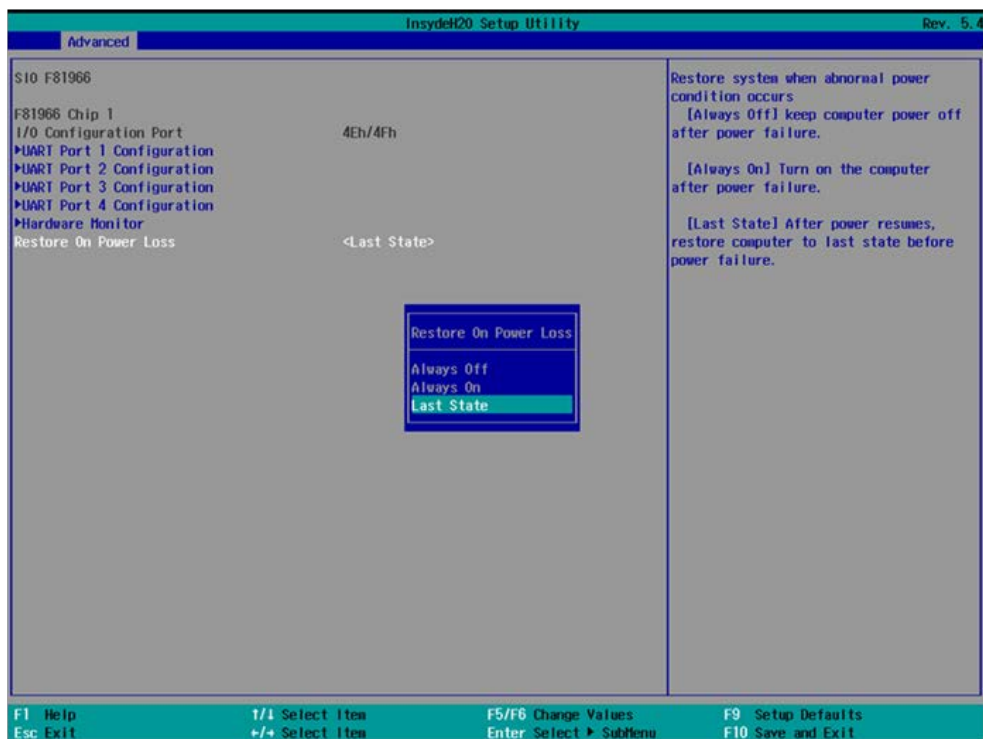


Press [Enter] to view PC health status.

This section shows the status of your CPU, Fan, and overall system.

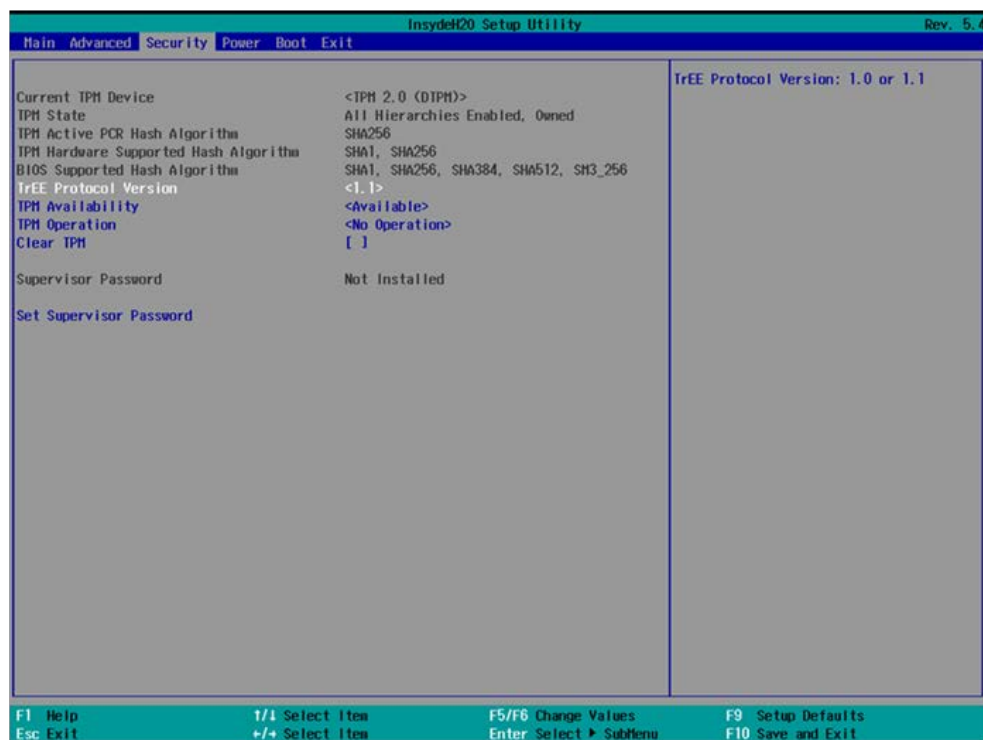
This is only available when there is Hardware Monitor function onboard.

4-6-4-6 Restore On Power Loss

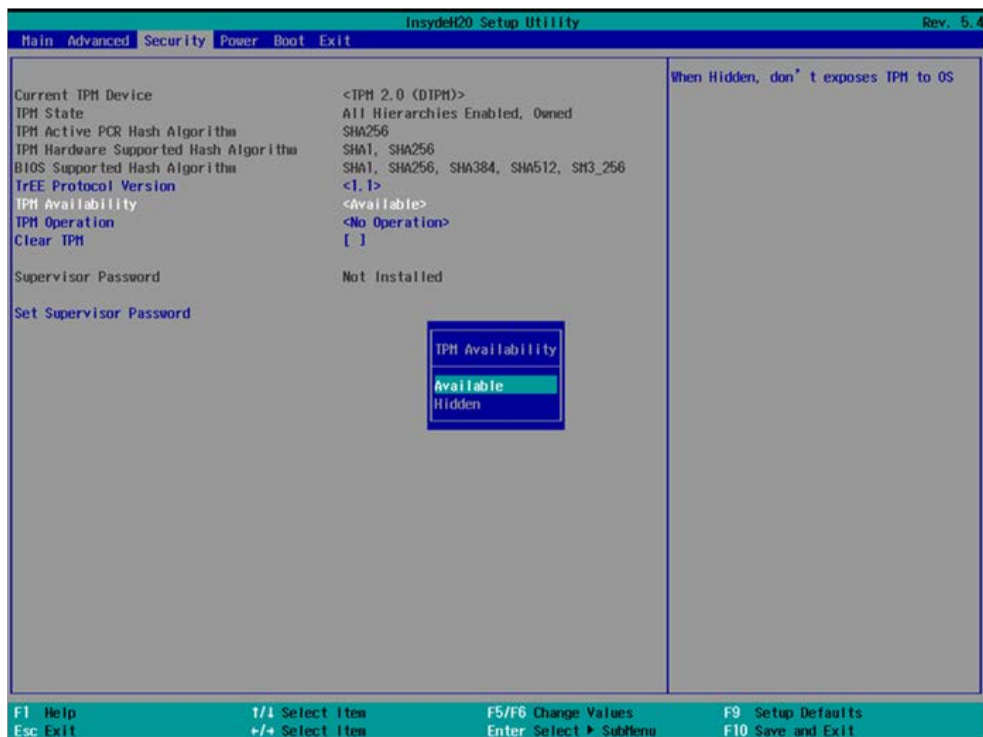


To select the power behavior after power fail, default is Last State.

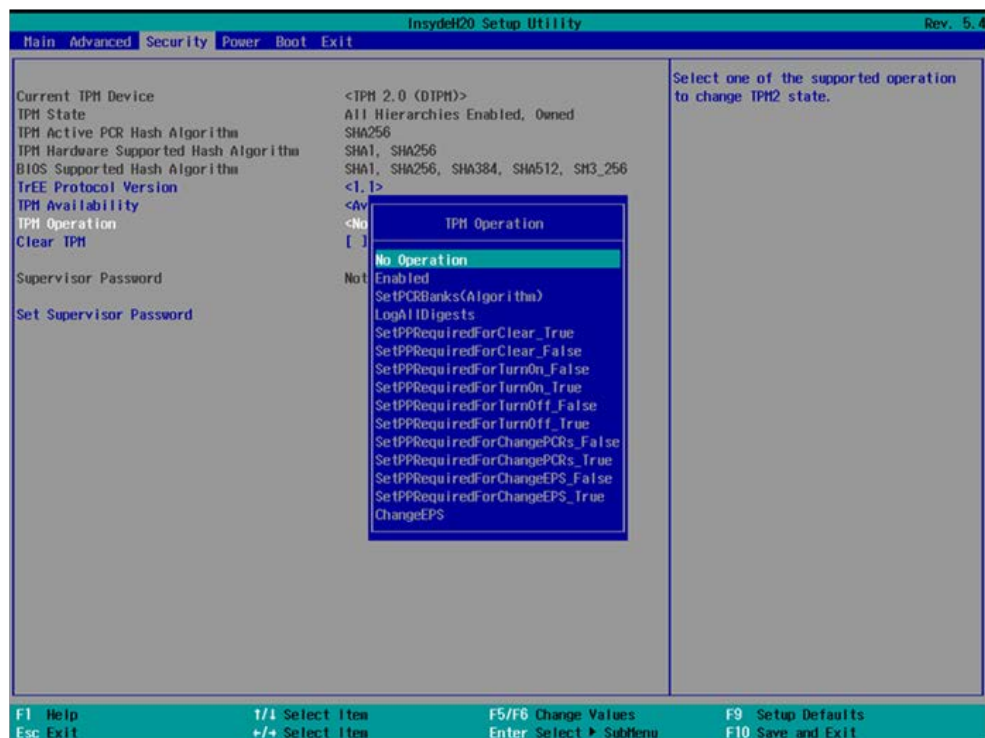
4-7 Security



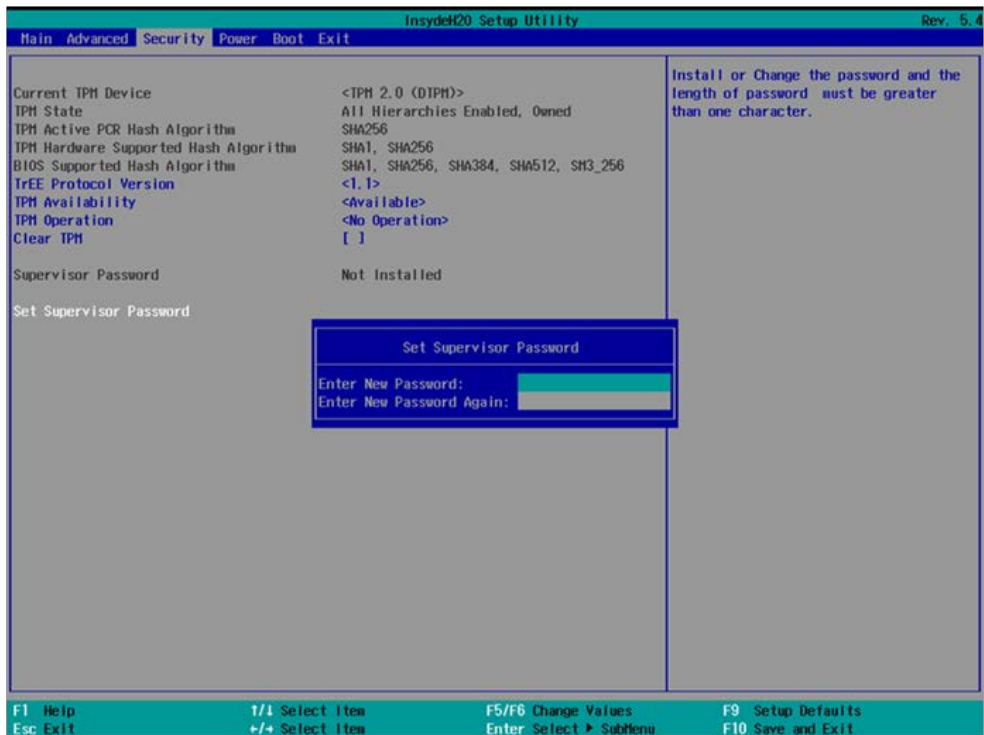
TrEE Protocol Version There are 1.0 and 1.1 versions.



TPM Availability To select TPM available or hidden

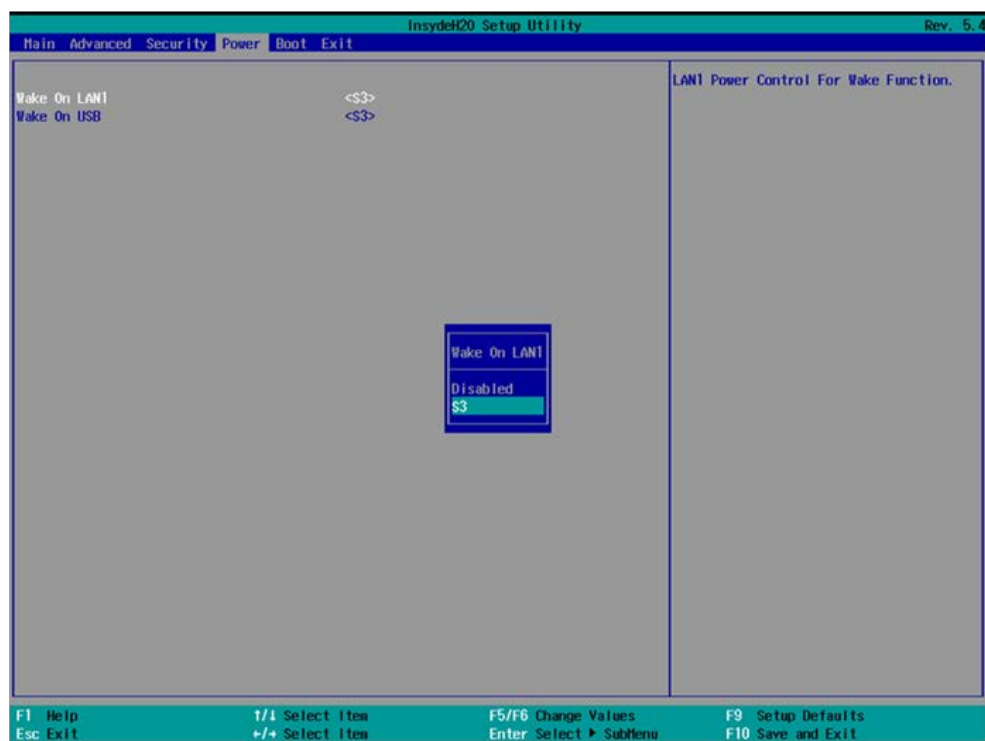


TPM Operation To select TPM operations
Set Supervisor Password

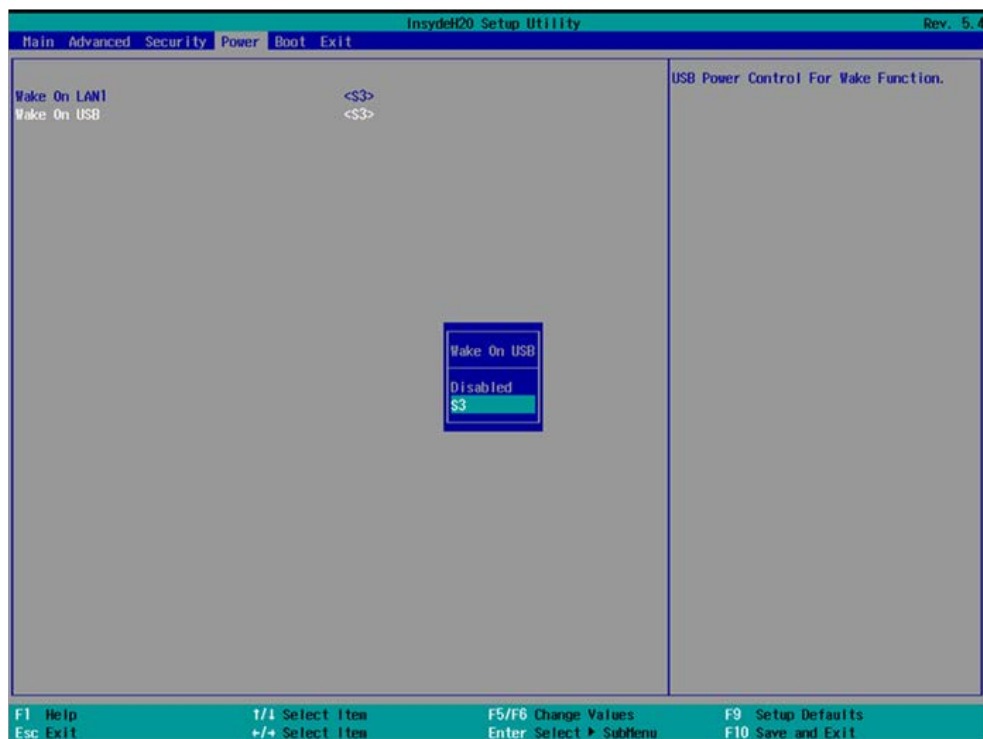


To set up the Supervisor password

4-8 Power

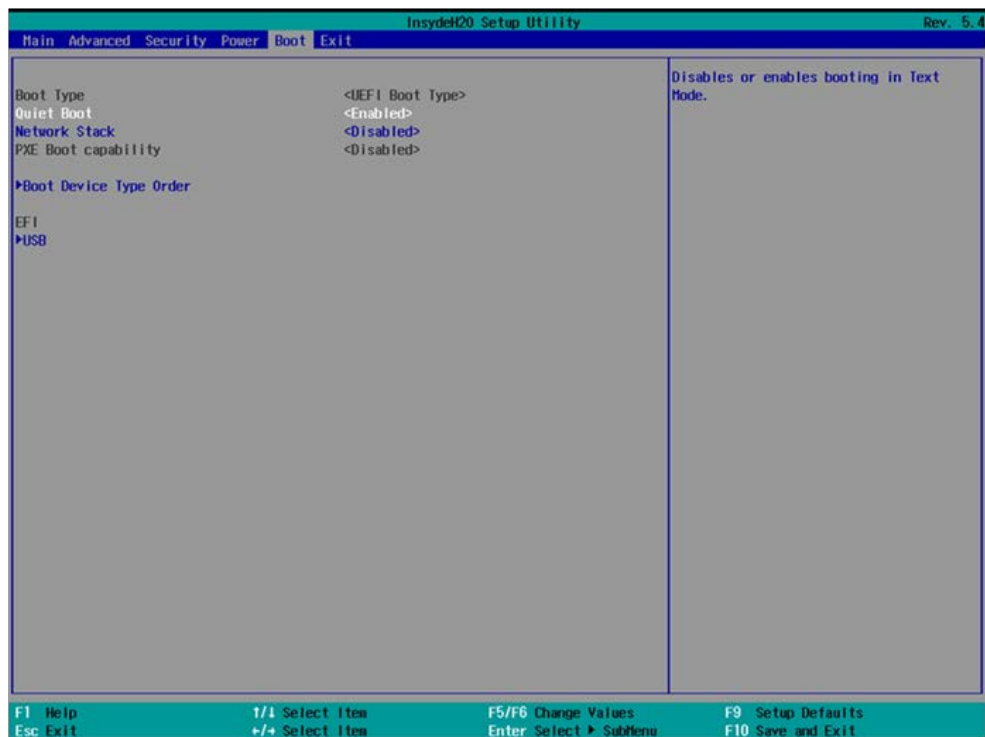


Wake On LAN1 To select S3 wake on LAN1, default is S3.



Wake On USB To select S3 wake on USB, default is S3.

4-9 Boot



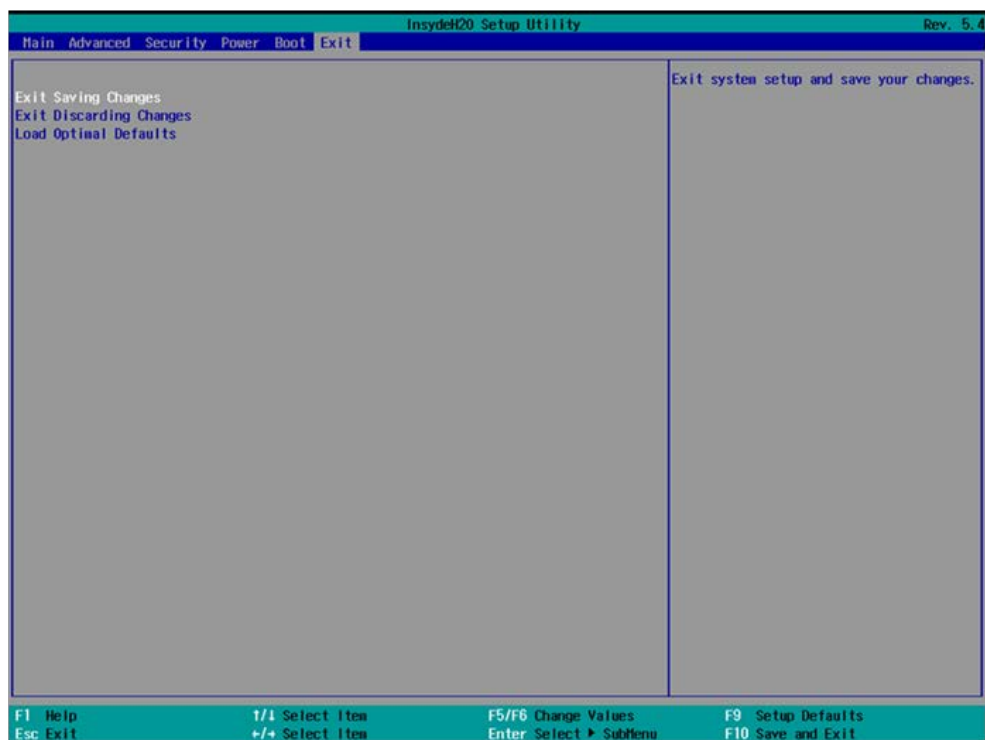
Quiet Boot

The optional settings are: Enabled(default), Disabled.

Network Stack

The optional settings are: Enabled, Disabled(default).

4-10 Save & Exit



Exit Saving Changes

Save configuration and reset

Exit Discarding Changes

Reset without saving the changes

Load Optimal Defaults

To restore the optimal default for all the setup options

4-11 How to update Insyde BIOS

Under DOS Mode

STEP 1. Prepare a bootable disc.

(Storage device could be USB FDD or USB pen drive.)

STEP 2. Copy utility program to your bootable disc. You may download it from our website.

STEP 3. Copy the latest BIOS for your LEX motherboard from our website to your bootable disc.

STEP 4. (Here take 2I740CW as an example, please enter your motherboard's name)

Insert your bootable disc into X: (X could be C:, A: or others.

It depends on which type of storage device you use.)

Start the computer and type

X:\: H2OFFT-D.EXE 2I740CWA2.ROM -BIOS -ALL

2I740CWA2.ROM is the file name of the latest BIOS.

It may be 2I740CWA1.ROM or 2I740CWA2.ROM, etc.

Please leave one space between .ROM & -BIOS -ALL

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I740CWA2.ROM -BIOS -ALL

-BIOS : Flash BIOS region

-ALL : Flash all

STEP 5. Press ENTER and the BIOS will be updated,
Computer will restart automatically.

Appendix B: Resolution list

640 x 480 x (256 / 16bit / 32bit)
800 x 600 x (256 / 16bit / 32bit)
1024 x 768 x (256 / 16bit / 32bit)
1152 x 864 x (256 / 16bit / 32bit)
1280 x 600 x (256 / 16bit / 32bit)
1280 x 720 x (256 / 16bit / 32bit)
1280 x 768 x (256 / 16bit / 32bit)
1280 x 800 x (256 / 16bit / 32bit)
1280 x 960 x (256 / 16bit / 32bit)
1280 x 1024 x (256 / 16bit / 32bit)
1400 x 1050 x (256 / 16bit / 32bit)
1440 x 900 x (256 / 16bit / 32bit)
1600 x 900 x (256 / 16bit / 32bit)
1600 x 1200 x (256 / 16bit / 32bit)
1680 x 1050 x (256 / 16bit / 32bit)
1920 x 1080 x (256 / 16bit / 32bit)
1920 x 1200 x (256 / 16bit / 32bit)