

2I640DW

**Intel Elkhart Lake ATOM® x6413E / J6412 SoC CPU,
DDR4 SODIMM,
3 x LAN / HDMI / USB / COM / M.2**

All-In-One

**Intel Elkhart Lake ATOM® x6413E / J6412 SoC CPU
2 x HDMI, eDP, 2 x M.2, 3 x LAN, 1 x Nano SIM
USB, COM, Wide Range DC-IN 9~24V**

CAUTION

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

NO. 2I640DW

Release date: JUNE. 10. 2022

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User Manual edition 0.1, JUNE. 2022

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.

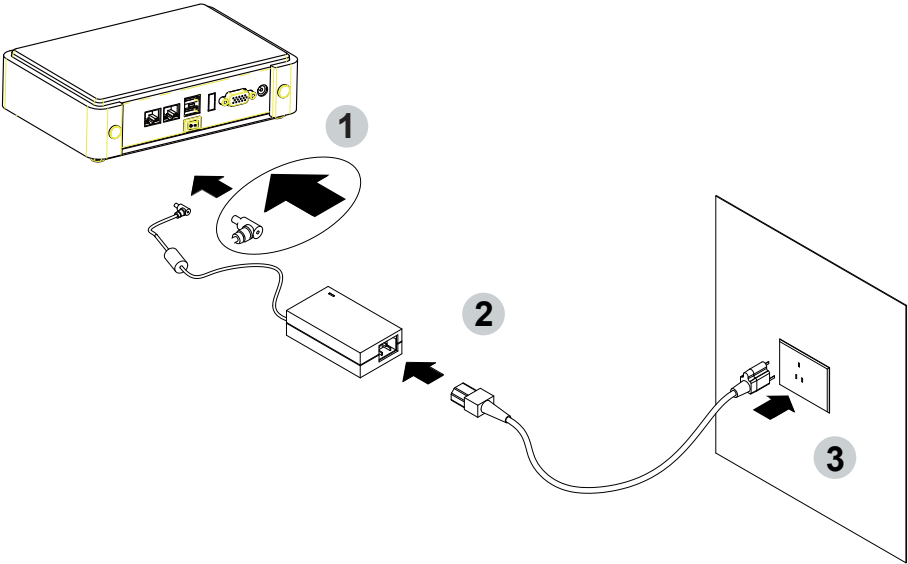
Remark 1:

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

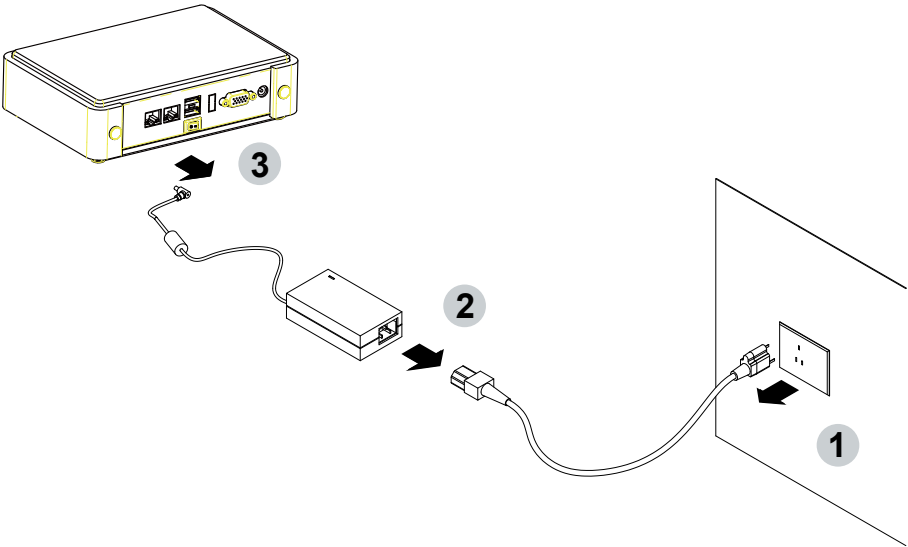
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 2I640DW is a 2.5" (110 x 98 mm) motherboard powered with Intel Atom® x6000E series and Celeron® J (formerly Elkhart Lake) processor & offered the ideal platform for high performance applications. The ultra compact (110 x 98 mm) motherboard with wide range 9~24V DC power input & embeds multiple Intel GbE LAN, USBs, COM Ports and HDMI display interface that offer the ideal platforms for high performance applications in Networking, Smart Automation, Machine Vision, In-vehicle, Industry 4.0 and any compact high-performance Internet of Things (IoT) applications.

The 2I640DW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III) for SATA-SSD interface M.2 B-Key device, with one-channel DDR4 3200 MHz memory up to 32GB SODIMM slot and supports two serial ports RS232 / RS485 / RS422 jumper free auto switch by BIOS. It supports 2 ports of USB 3.0, 3 ports of USB 2.0. The expandable interfaces include 1 M.2 B-Key for PCIe x 2 or SATA-SSD (auto-detection) and USB interface, and 1 M.2 B-Key PCIe x 2 and USB 3.0 / 2.0 interface.

The embedded motherboard 2I640DW is specially designed with Wide-Range Voltage DC in (9~24V) for widely varying input voltage requirement. All wafer IO design offers superb performance and PC specification in the industry using the specific housing. It supports with three 10 / 100 / 1000 Mbps Ethernet for seamless broadband connectivity. With Wake-On LAN function and the PXE function in BIOS, these are perfect control boards for networking devices.

1-1 Major Feature

1. Intel® Atom x6413E Processor 1.5GHz / 2.7GHz (Quad Core),
Intel® Celeron Processor J6412 2.0GHz / 2.6GHz (Quad Core)
2. Intel® UHD Graphics for 10th Gen Intel® Atom x6413E 500MHz /
750MHz, Intel® Celeron J6412 400MHz / 800MHz
3. DDR4 SODIMM slot x 1, up to 32GB
4. Support 3 x 10 / 100 / 1000 Mbps Intel LAN ports.
5. Support 2 x RS232 selectable to RS485 / RS422 by BIOS
6. 2 x USB 3.0 and 3 x USB 2.0
7. Support extended 1 x M.2 B-Key for PCIe x 2 / SATA-SSD (auto-detect) and USB
interface, 1 x M.2 B-Key for PCI2 x 2 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~24V

1-2 Specification

1. **SOC:** Intel® Atom x6413E Processor 1.5GHz / 2.7GHz (Quad Core),
Intel® Celeron Processor J6412 2.0GHz / 2.6GHz (Quad Core)
2. **Memory:** DDR4 SODIMM slot x 1, up to 32GB
3. **Graphics:** Intel® UHD Graphics for 10th Gen Intel® Atom x6413E 500MHz / 750MHz,
Intel® Celeron J6412 400MHz / 800MHz
4. **LAN:** 3 Intel I211-IT LAN chipset with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1
5. **I/O Chip:** Switch chipset for 2 ports RS232 / RS422 / RS485 selected by BIOS
6. **USB:** 2 type A USB 3.0, 3 USB 2.0
7. **WDT / DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO (Option) /
Hardware Watch Dog Timer, 0~255 sec programmable
8. **Expansion interface:** one M.2 B-Key for PCIe x 2 / SATA-SSD (auto-detect) and
USB interface, one M.2 B-key for PCIe x 2 and USB 3.0 / 2.0 interface with Nano SIM
9. **BIOS:** Insyde UEFI BIOS
10. **Dimension:** 110 x 98 mm
11. **Power:** On board DC +9~24V

1-3 Installing the SO-DIMM

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

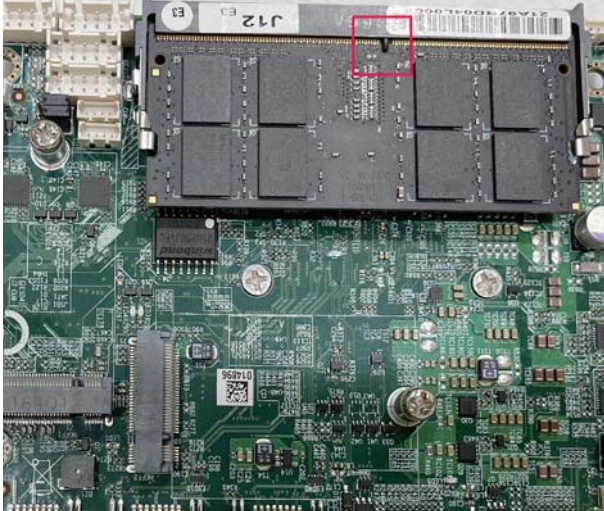


2. Press the SO-DIMM into the connector until you hear a click.

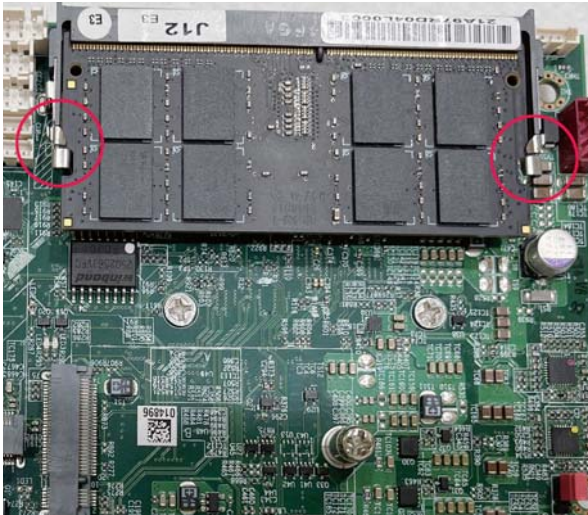


Notices:

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.



1-3-1-1 Removing the SO-DIMM

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

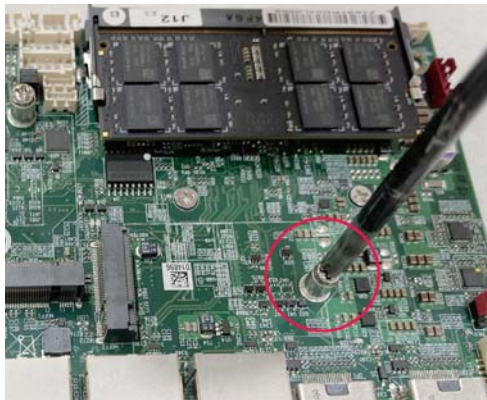


2. Lift the SO-DIMM out of its connector carefully.

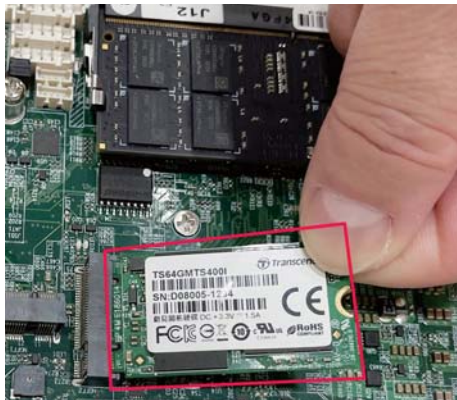


1-4 Directions for installing the M.2 B Key Mini Card

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.

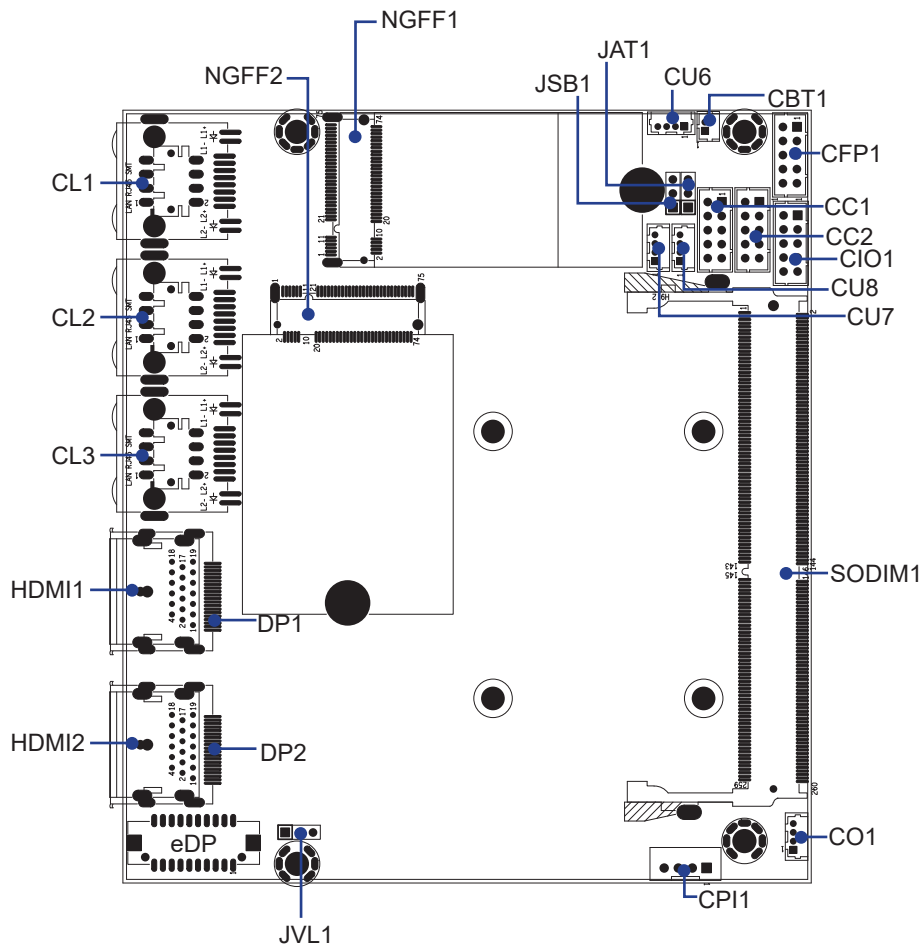


2-1 Dimension-2I640DW

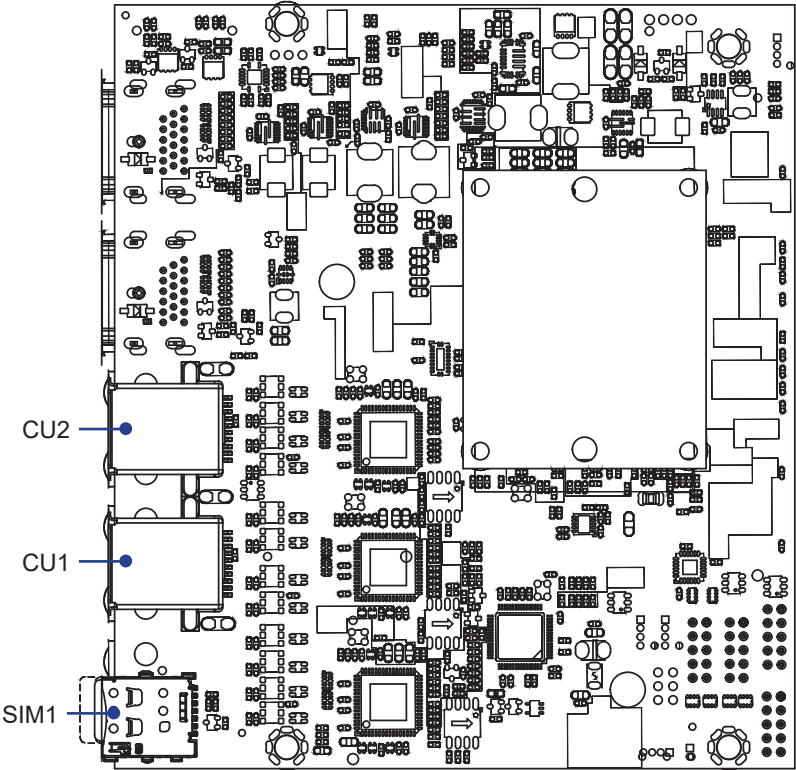


2-2 Layout-2I640DW-Connector and Jumper

TOP

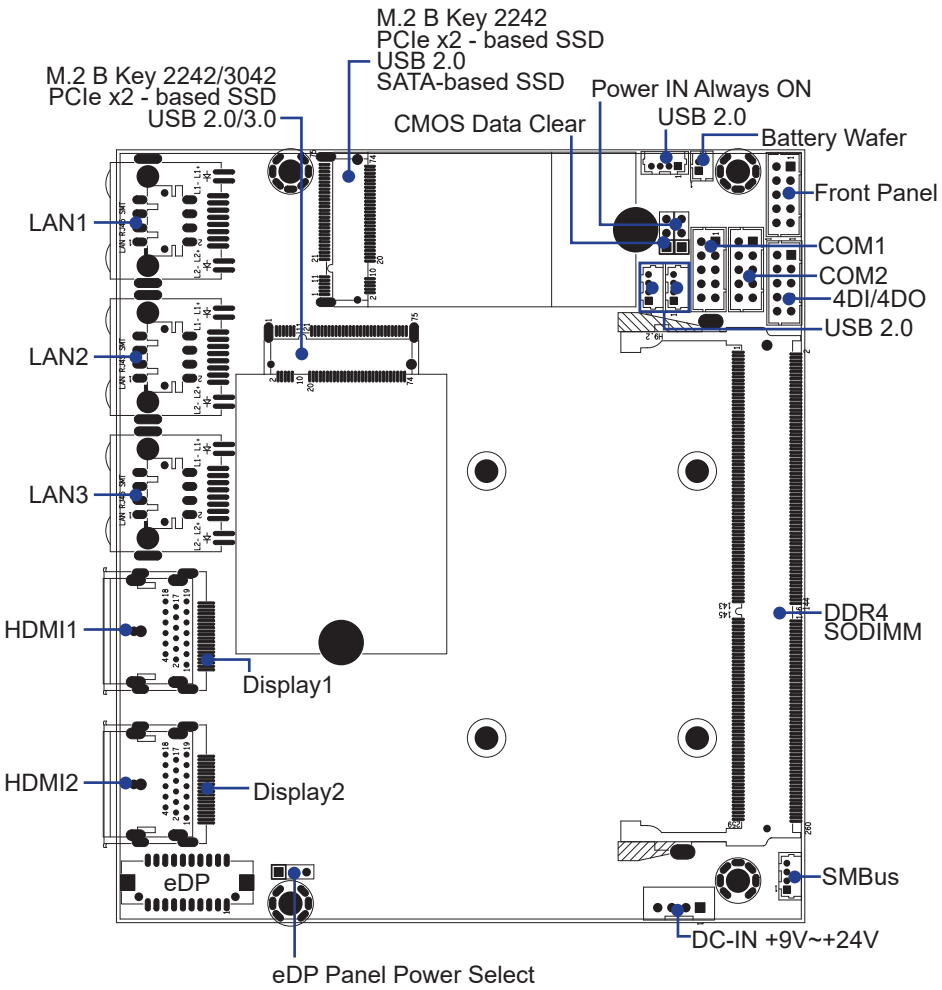


2-2-1 Layout-2I640DW-Connector and Jumper Bottom
BOT



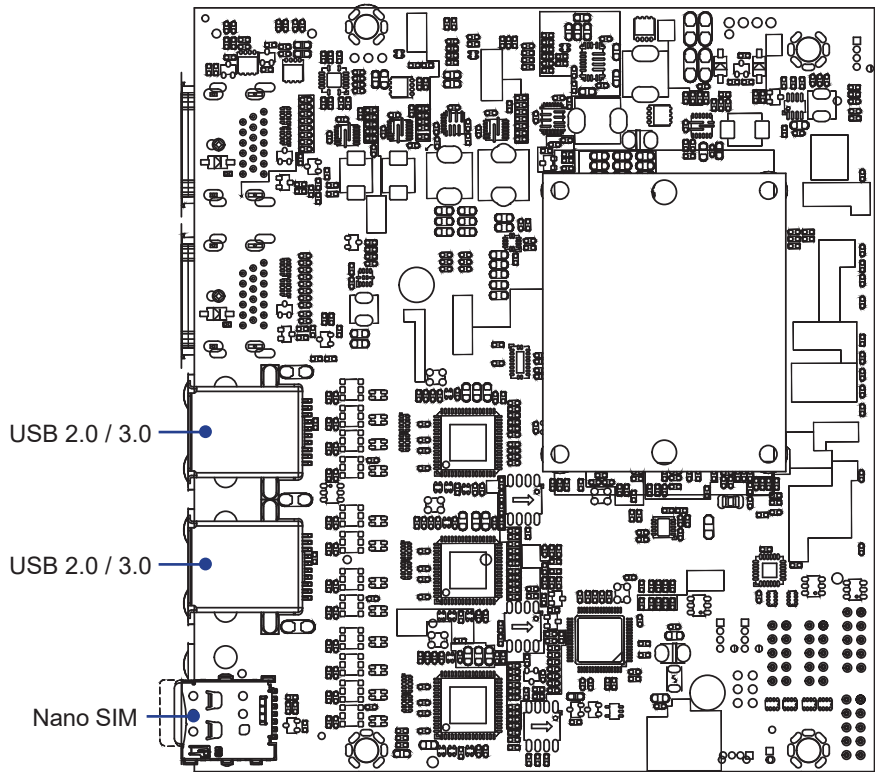
2-3 Layout-2I640DW-Function MAP

TOP



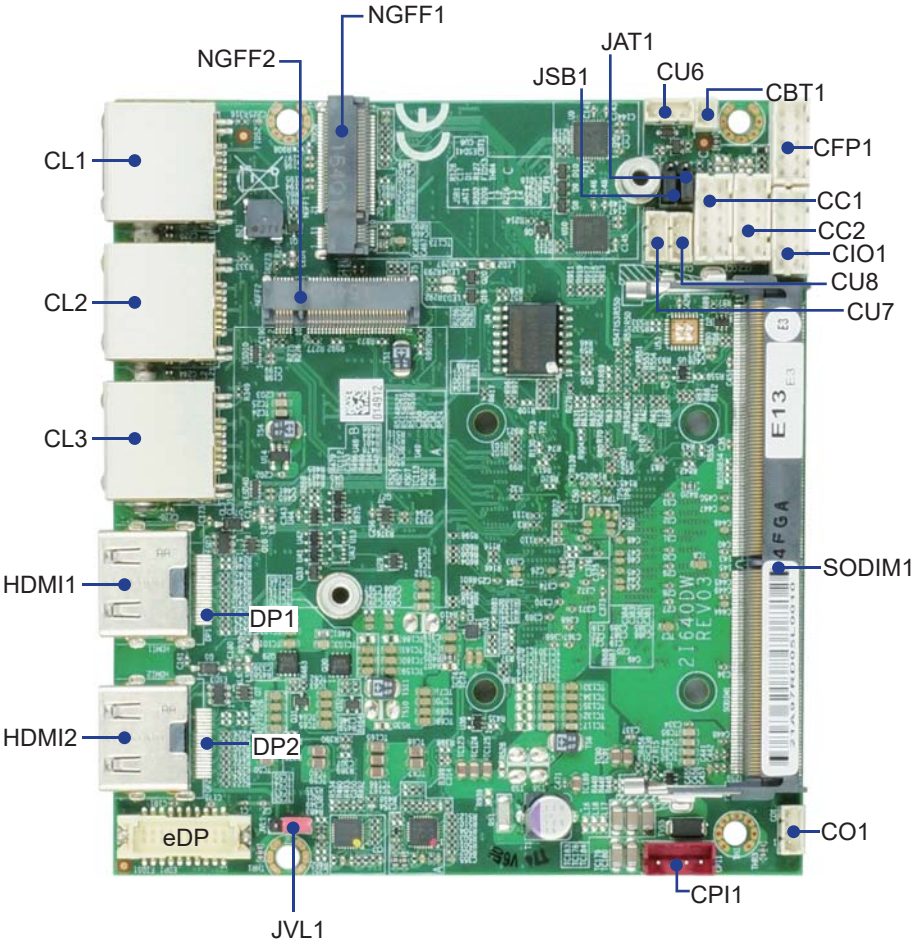
2-3-1 Layout-2I640DW-Function MAP

BOT



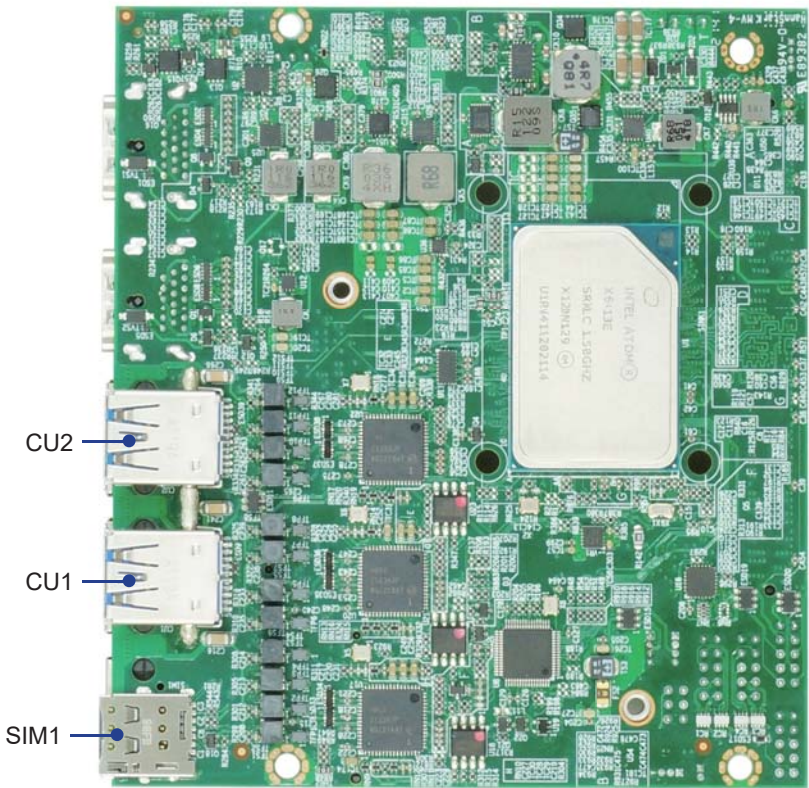
2-4 Diagram- 2I640DW

TOP



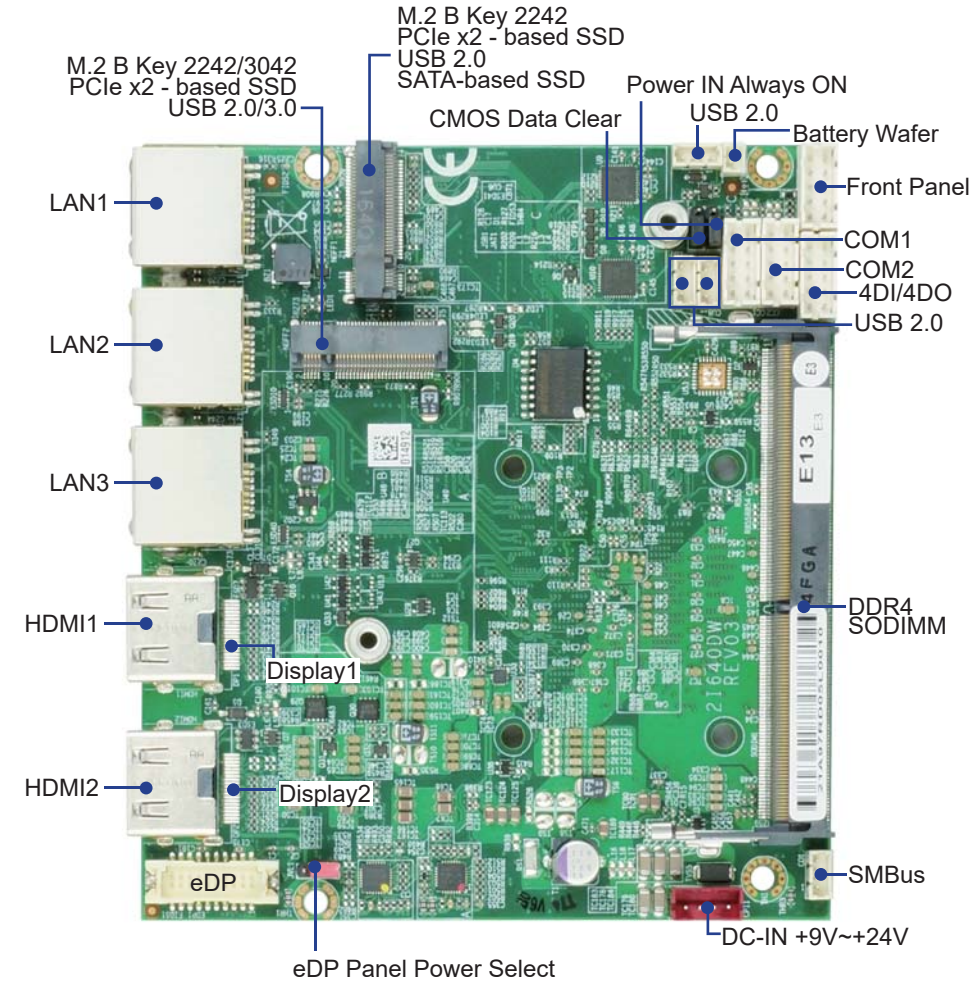
2-4-1 Diagram- 2I640DW

BOT

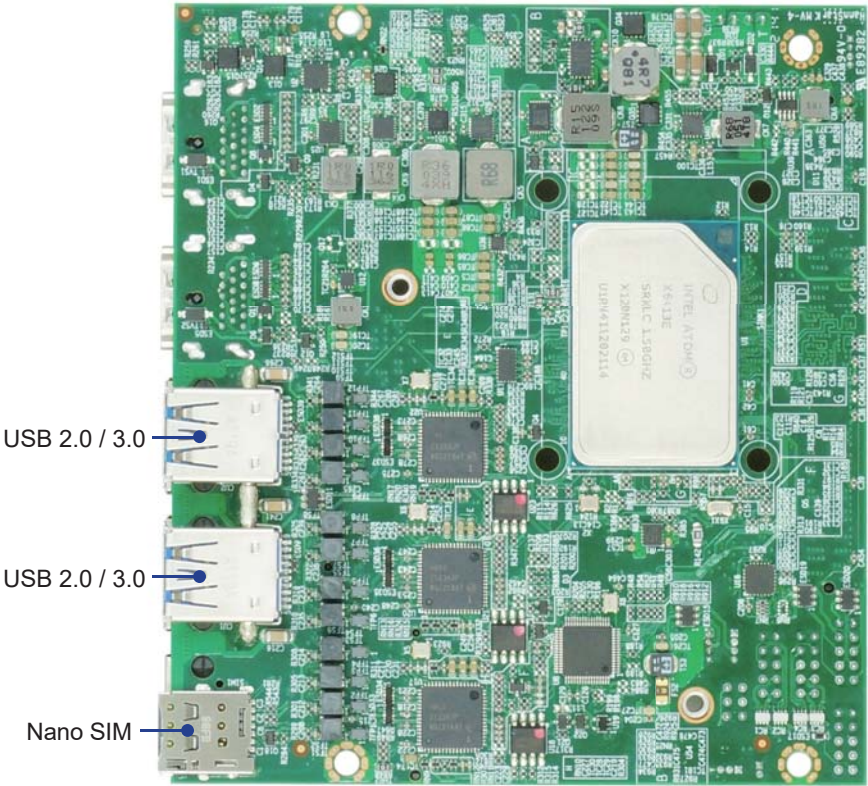


2-5 Function MAP- 2I110D

TOP



2-5-1 Function MAP- 2I110D
BOT



2-6 List of Jumpers

- JSB1: CMOS DATA Clear
- JAT1: Power in always 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.

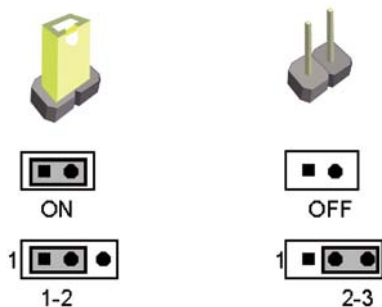


Figure 2.2

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.

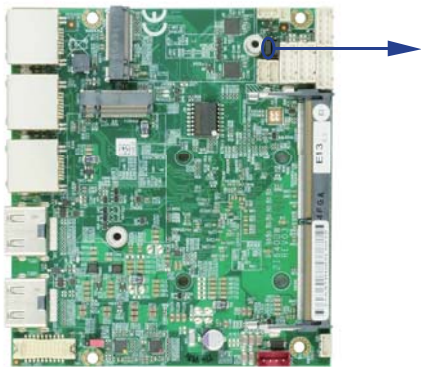
To clear the CMOS, follow the procedures below:

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**



JSB1



*Normal

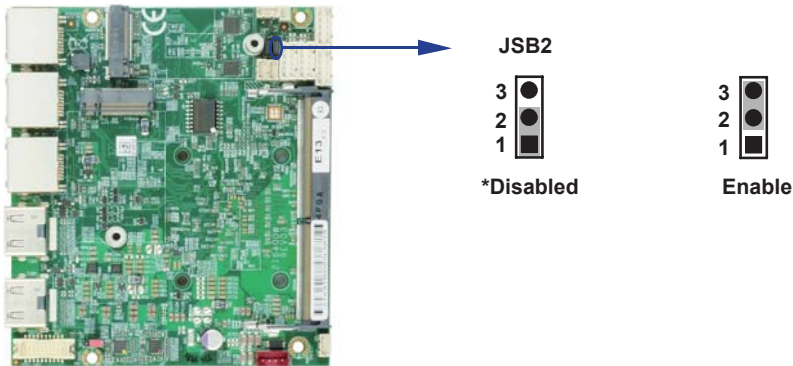


CMOS

2-9 JAT1: Power in always ON function

JSB2	DESCRIPTION
*1-2	Disabled
2-3	Enable

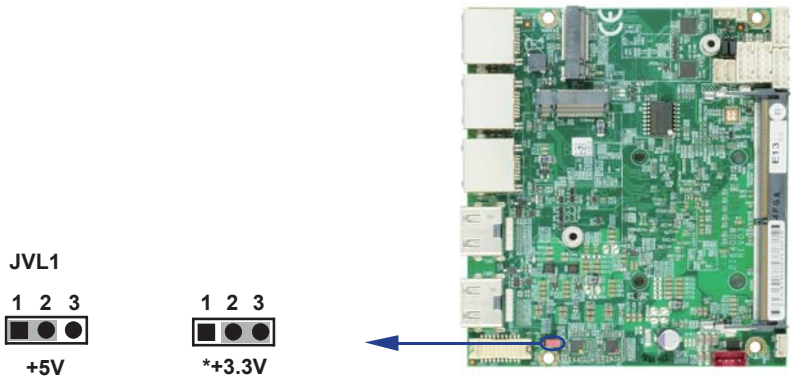
NOTE: Power always on function default is disabled.



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

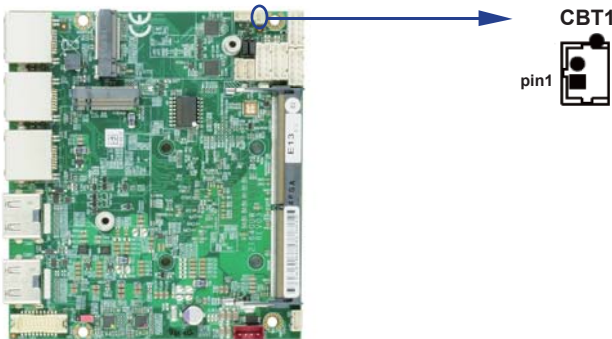
CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer
CU1:	USB 3.0 type A connector
CU2:	USB 3.0 type A connector
CU6:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU7:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU8:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1:	RJ45 LAN connector
CL2:	RJ45 LAN connector
CL3:	RJ45 LAN connector
CL11:	LAN port 2x4 pin (2.0mm) wafer (option)
CL21:	LAN port 2x4 pin (2.0mm) wafer (option)
CL31:	LAN port 2x4 pin (2.0mm) wafer (option)
CC1:	COM1 2x5 pin (2.0mm) wafer
CC2:	COM2 2x5 pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5 pin (2.0mm) wafer
CIO1:	4DI / 4DO 2x5 pin (2.0mm) wafer
CO1:	SMBus 1x4 pin (1.25mm) wafer
CPI1:	DC-IN 1x4 pin (2.0mm) Red wafer
EDP1:	eDP 2x10 pin (1.25mm) wafer
SIM1:	Nano SIM card socket
SODIM1:	DDR4 SODIMM H: 9.2mm
NGFF1:	M.2 B key 2242 H=8.5 sockets 75 pin
NGFF2:	M.2 B key 2242 / 3042 H=8.5 sockets 75 pin
HDMI1:	HDMI typeA connector
HDMI2:	HDMI typeA connector
DP1:	DisplayPort connector (option)
DP2:	DisplayPort connector (option)

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)

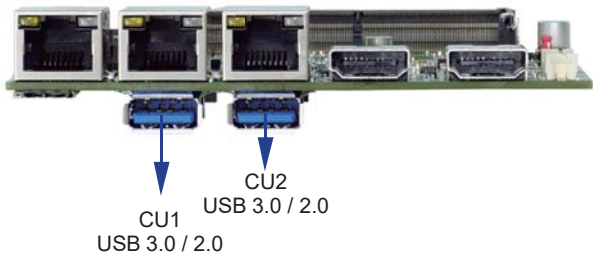
Note:
NOTE: CBT1 for external connector can extend battery capacity.



3-3 USB Interface

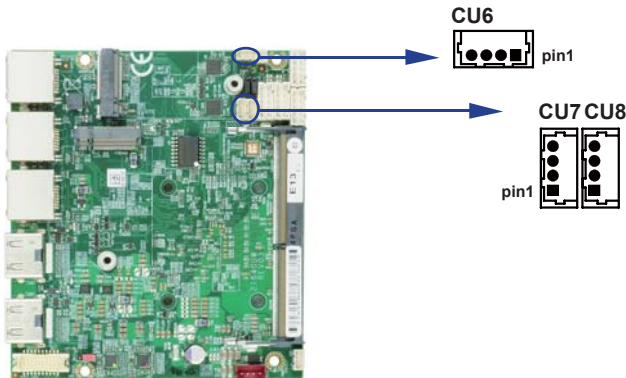
• CU1 / CU2: USB 3.0 / 2.0 Type A connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
		1	USB 3.0 TX+
1	+5V		
2	USB 2.0 D-	2	USB 3.0 TX-
		3	GND
3	USB 2.0 D+	4	USB 3.0 RX+
4	GND		
		5	USB 3.0 RX-



• CU6 / CU7 / CU8: 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 / CL3: RJ45 LAN Connector**

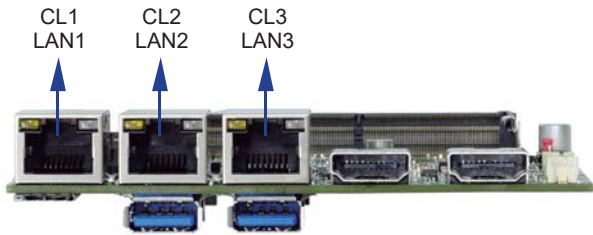
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TD0-/TX+	2	TD0-/TX-
3	TD1-/RX+	4	TD2-/NC
5	TD2-/NC	6	TD1-/RX-
7	TD3-/NC	8	TD3-/NC

• **CL1 / CL2 / CL3: RJ45 LAN Connector**

Speed	10 Mbps		100 Mbps		1000 Mbps	
Indicate	Link LED	Active LED	Link LED	Active LED	Link LED	Active LED
Light						

• **CL11 / CL21 / CL31: 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+



3-5 COM interface

CC1 / CC2: COM1 / COM2 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

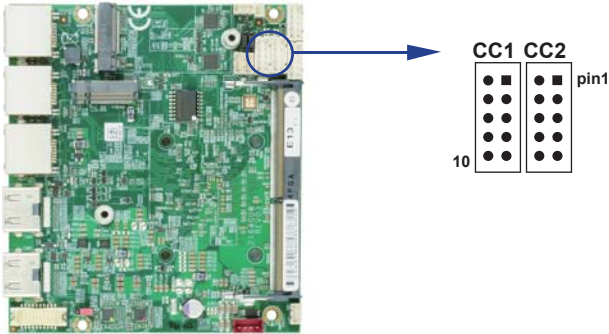
- Note: 1. COM 1 / 2 Default RS232 RS485 / RS422 by BIOS control.
2. The pin9 RI can be modify to Power to supply device. The power voltage can be set +12V or +5V. The RI change Voltage function set by BOM control. Default is RI signal.
3. Pin 10 provides +5V for external device.

• (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)

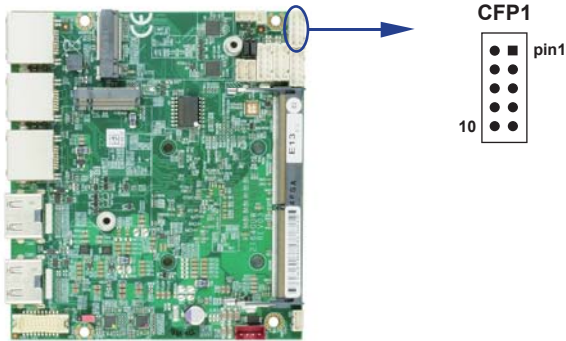
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V



3-6 Front Panel Pin Header

● 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+



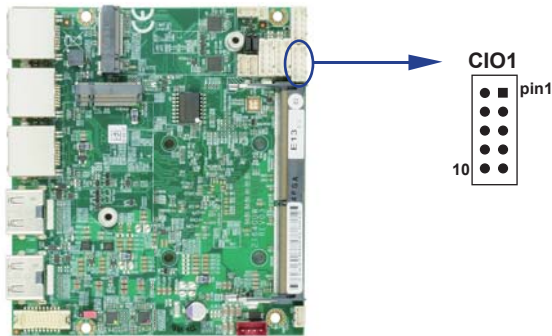
3-7 DIO Interface

● 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:

- 1. DI pin default pull up 10KΩ to +5V.
- 2. If use need isolate circuit to control external device.
- 3. F75111N-1 I2C bus address 0x9c.



● WDT For F75111N-1 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.

3-7-1 IO Device: F75111 CIO Utility

The Sample code source you can download from

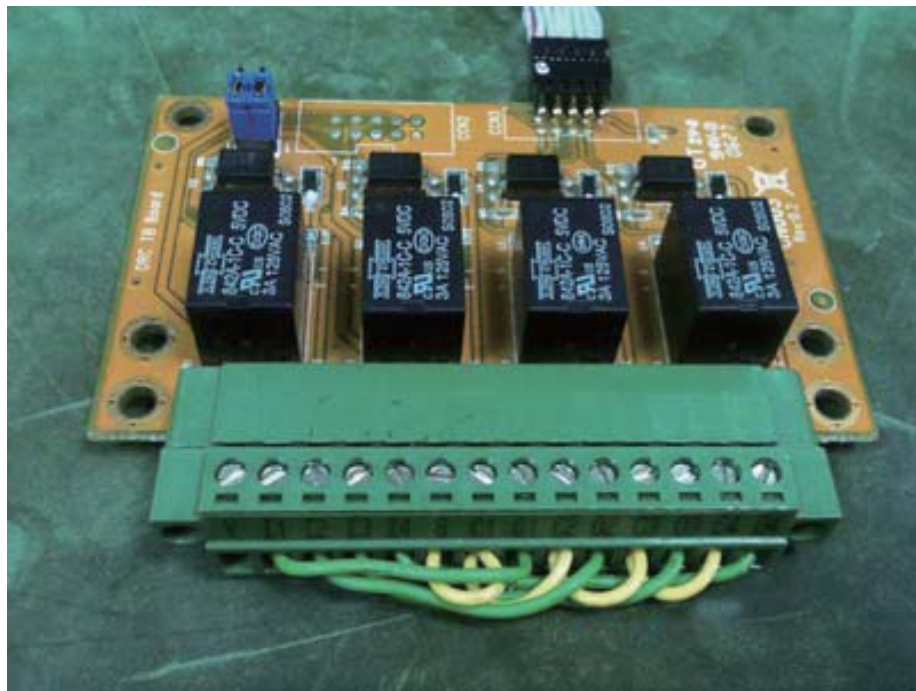
Source file: CIO_Utility_Src_v3.0.5_w.zip

http://tprd.info/lexwiki/index.php/IO_Device:F75111_CIO_Utility

Binary file: CIO_Utility_Bin_v3.0.5_x32_w.zip CIO_Utility_Bin_v3.0.5_x64_w.zip

F75113 DLL: F75113.dll

We do the demo test with a test tool which Dlx connect to DOx with Relay.



How to use this Demo Application

CIO_Utility v3.0.4

CIO Test

2120/CIO1

F75111(9C) successful
F75111(6E) fail
F75113(6E) fail

7 6 5 4 3 2 1 0

DO1

DI1 status

DO2

DI2 status

SINGLE TEST

LOOP TEST

COUNT 1

WDT Test

F75111(9C)

F75111(6E)

F75113(6E)

Enable

10

Disable

☐ Enable loop

WDT status

CIO_Utility v3.0.4

CIO Test

4140/CIO1

F75111(9C) successful
F75111(6E) fail
F75113(6E) fail

7 6 5 4 3 2 1 0

DO1

DI1 status

DO2

DI2 status

SINGLE TEST

LOOP TEST

COUNT 1

WDT Test

F75111(9C)

F75111(6E)

F75113(6E)

Enable

10

Disable

☐ Enable loop

WDT status

CIO_Utility v3.0.4

CIO Test

4140*2(CIO1+CIO2)

F75111(9C) successful
F75111(6E) fail
F75113(6E) fail

7 6 5 4 3 2 1 0

DO1

DI1 status

DO2

DI2 status

SINGLE TEST

LOOP TEST

COUNT 1

WDT Test

F75111(9C)

F75111(6E)

F75113(6E)

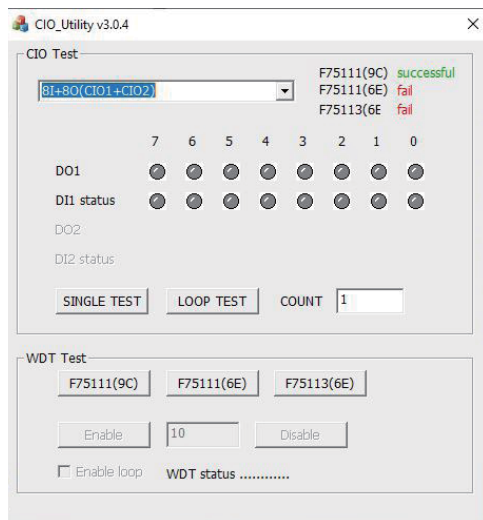
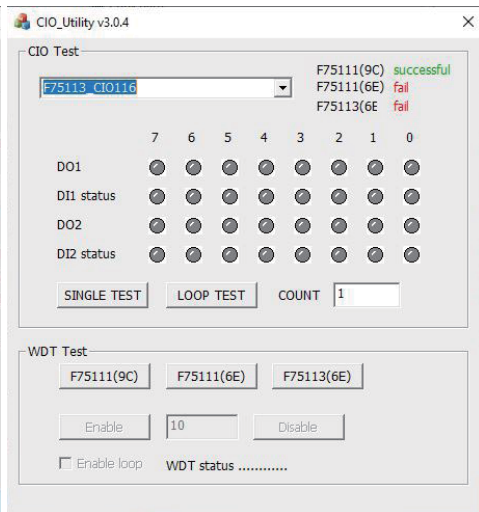
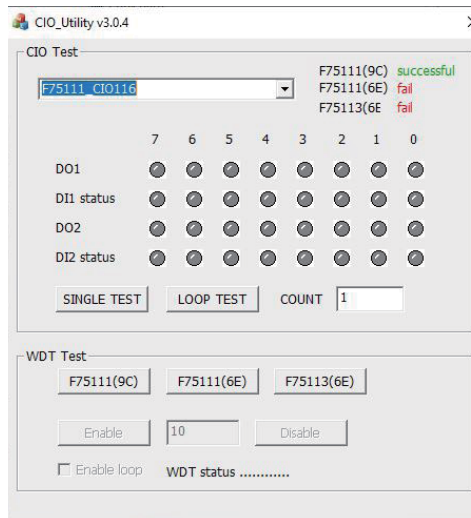
Enable

10

Disable

☐ Enable loop

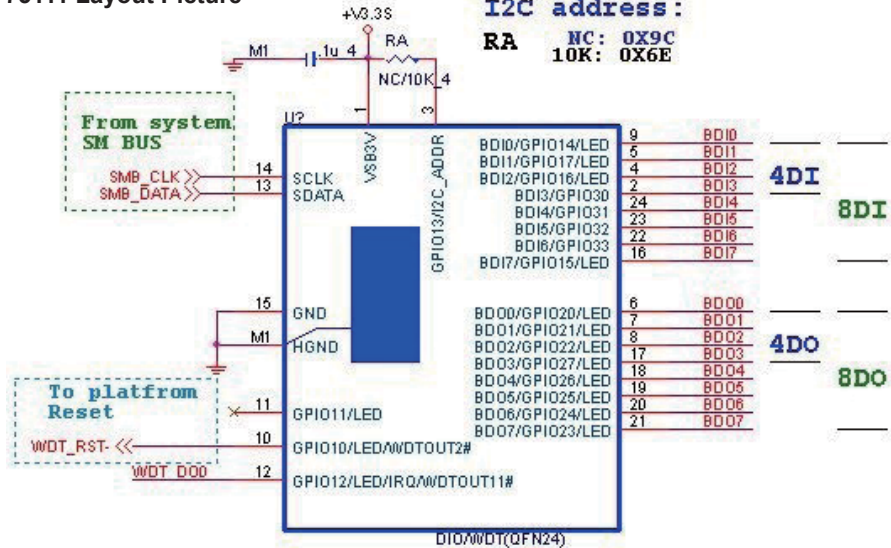
WDT status



Attention Please: You must be install vcredist_x86.exe when first time you run the F75111_DIO.exe DEMO AP, The vcredist_x86.exe include all required DLL file.

1. Press the select your test "2i2o", "4i4o", "4i4o*2", "F75111CIO116", "F75113CIO116", "8i+8o"
2. start test, select single mode or looptest

F75111 Layout Picture



Introduction F75111

Initial Internal F75111 port address (0x9c)

- define GPIO1X, GPIO2X, GPIO3X to input or output
- and Enable WDT function pin

Set F75111 DI/DO (sample code as below Get Input value/Set output value)

- DO: InterDigitalOutput(BYTE byteValue)
- DI: InterDigitalInput()

PULSE mode

Sample to setting GP33, 32, 31, 30 output 1mS low pulse signal.

```
{
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_CONTROL    0x00); //This is setting low,Level output
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_WIDTH_CONTROL, 0x01); //This selects the pulse width to 1mS
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_CONTROL_MODE,    0x0F); //This is setting the GP33, 32, 31, 30 to
output function.
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_Output_Data ,    0x0F); //This is setting the GP33, 32, 31, 30
output data.
}
```

Initial internal F75111

```
void F75111::InitInternalF75111()
{
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO1X_CONTROL_MODE ,0x00); //set GPIO1X to Input function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO3X_CONTROL_MODE ,0x00); //set GPIO3X to Input function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_CONTROL_MODE ,0xFF); //set GPIO2X to Output function

    this->Write_Byte(F75111_INTERNAL_ADDR,F75111_CONFIGURATION, 0x03); //Enable WDT OUT function
}
```

Set output value

```
void F75111::InterDigitalOutput(BYTE byteValue)
{
    BYTE byteData = 0;
    byteData = (byteData & 0x01 )? byteValue + 0x01 : byteValue;
    byteData = (byteData & 0x02 )? byteValue + 0x02 : byteValue;
    byteData = (byteData & 0x04 )? byteValue + 0x04 : byteValue;
    byteData = (byteData & 0x80 )? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x40 )? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20 )? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x10 )? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x08 )? byteValue + 0x80 : byteValue; // get value bit by bit

    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_OUTPUT_DATA,byteData); // write byteData value via
    GPIO2X output pin
}
```

Get Input value

```
BYTE F75111::InterDigitalInput()
{
    BYTE byteGPIO1X = 0;
    BYTE byteGPIO3X = 0;
    BYTE byteData    = 0;

    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO1X_INPUT_DATA,&byteGPIO1X); // Get value from GPIO1X
    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO3X_INPUT_DATA,&byteGPIO3X); // Get value from GPIO3X

    byteGPIO1X = byteGPIO1X & 0xF0; // Mask unuseful value
    byteGPIO3X = byteGPIO3X & 0x0F; // Mask unuseful value

    byteData = ( byteGPIO1X & 0x10 )? byteData + 0x01 : byteData;
    byteData = ( byteGPIO1X & 0x80 )? byteData + 0x02 : byteData;
    byteData = ( byteGPIO1X & 0x40 )? byteData + 0x04 : byteData;
    byteData = ( byteGPIO3X & 0x01 )? byteData + 0x08 : byteData;

    byteData = ( byteGPIO3X & 0x02 )? byteData + 0x10 : byteData;
    byteData = ( byteGPIO3X & 0x04 )? byteData + 0x20 : byteData;
    byteData = ( byteGPIO3X & 0x08 )? byteData + 0x40 : byteData;
    byteData = ( byteGPIO1X & 0x20 )? byteData + 0x80 : byteData; // Get correct DI value from GPIO1X & GPIO3X

    return byteData;
}
```

define F75111 pin in F75111.h

```

//-----
#define F75111_INTERNAL_ADDR      0x9C // OnBoard F75111 Chipset
#define F75111_EXTERNAL_ADDR     0x6E // External F75111 Chipset
//-----
#define F75111_CONFIGURATION     0x03 // Configure GPIO13 to WDT2 Function
//-----
#define GPIO1X_CONTROL_MODE      0x10 // Select Output Mode or Input Mode
#define GPIO2X_CONTROL_MODE      0x20 // Select GPIO2X Output Mode or Input Mode
#define GPIO3X_CONTROL_MODE      0x40 // Select GPIO3X Output Mode or Input Mode
//-----
#define GPIO1X_INPUT_DATA        0x12 // GPIO1X Input
#define GPIO3X_INPUT_DATA        0x42 // GPIO3X Input
//-----
#define GPIO2X_OUTPUT_DATA       0x21 // GPIO2X Output
//-----
#define GPIO1X_PULSE_CONTROL      0x13 // GPIO1x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO1X_PULSE_WIDTH_CONTROL 0x14 // GPIO1x Pulse Width Control Register
#define GP1_PSWIDTH_500US        0x00 // When select Pulse mode:    500    us.
#define GP1_PSWIDTH_1MS         0x01 // When select Pulse mode:     1      ms.
#define GP1_PSWIDTH_20MS        0x02 // When select Pulse mode:    20     ms.
#define GP1_PSWIDTH_100MS       0x03 // When select Pulse mode:   100     ms.
//-----
#define GPIO2X_PULSE_CONTROL      0x23 // GPIO2x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO2X_PULSE_WIDTH_CONTROL 0x24 // GPIO2x Pulse Width Control Register
#define GP2_PSWIDTH_500US        0x00 // When select Pulse mode:    500    us.
#define GP2_PSWIDTH_1MS         0x01 // When select Pulse mode:     1      ms.
#define GP2_PSWIDTH_20MS        0x02 // When select Pulse mode:    20     ms.
#define GP2_PSWIDTH_100MS       0x03 // When select Pulse mode:   100     ms.
//-----
#define GPIO3X_PULSE_CONTROL      0x43 // GPIO3x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO3X_Output_Data       0x41 // GPIO3x Output Data Register
#define GPIO3X_PULSE_WIDTH_CONTROL 0x44 // GPIO3x Pulse Width Control Register
#define GP3_PSWIDTH_500US        0x00 // When select Pulse mode:    500    us.
#define GP3_PSWIDTH_1MS         0x01 // When select Pulse mode:     1      ms.
#define GP3_PSWIDTH_20MS        0x02 // When select Pulse mode:    20     ms.
#define GP3_PSWIDTH_100MS       0x03 // When select Pulse mode:   100     ms.
//-----

```


3-7-2 IO Device:F75111 CIO Utility CIO116

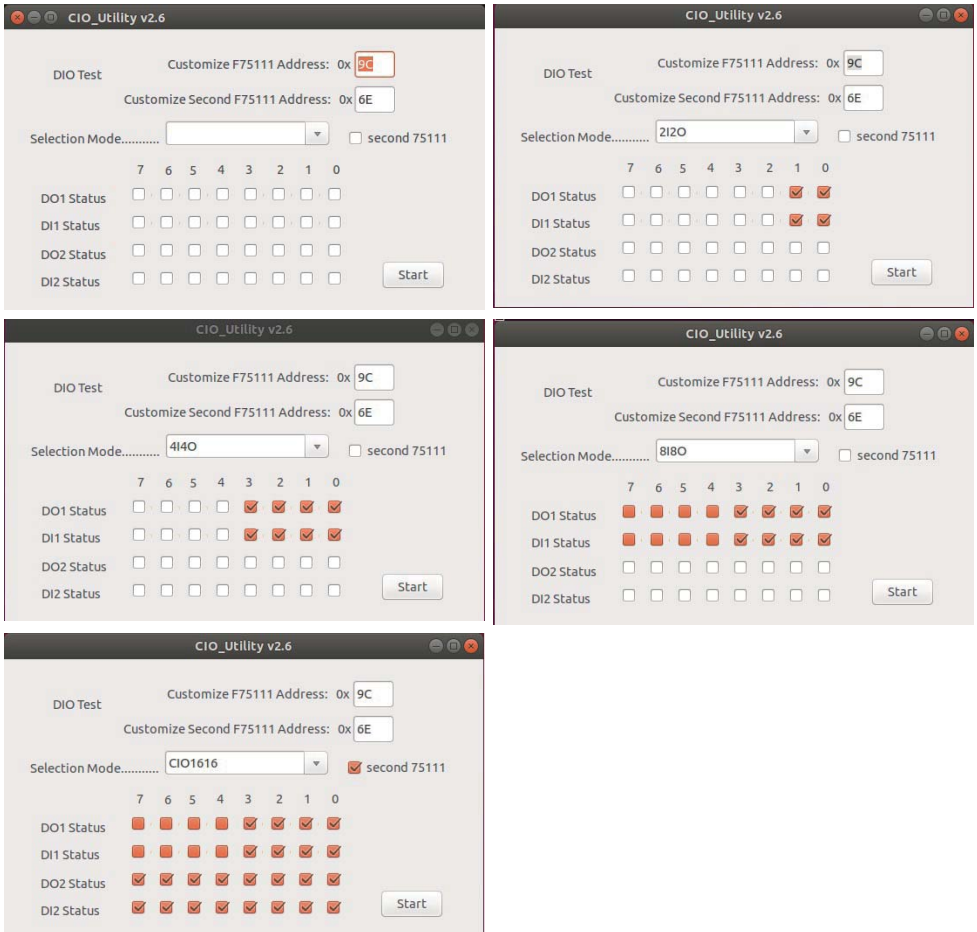
The Sample code source you can download from

Source file: CIO_Utility_Src_v3.0.3.tar.gz

Binary file: CIO_Utility_Bin_v3.0.3_x32.tar.gz CIO_Utility_Bin_v3.0.3_x64.tar.gz

http://tprd.info/lexwiki/index.php/IO_Device:F75111_CIO_Utility_CIO116

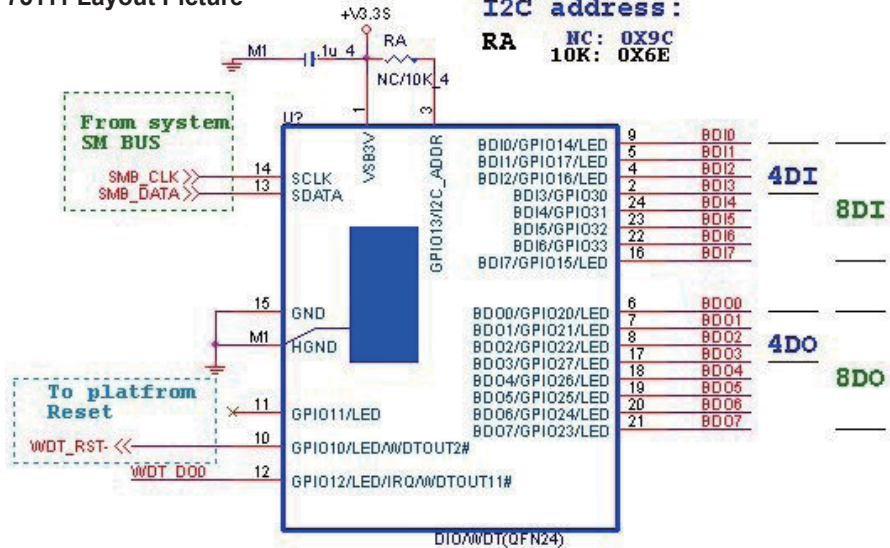
How to use this Demo Application



**Before executing the program began, Please switch to the highest authority, continued second F75111, chmod 777 and root: **

1. Press the select your test "2i2o", "4i4o", "8i8o", "CIO1616"
2. If you test CIO1616 checkbutton second 75111
3. start button, select single mode or looptest

F75111 Layout Picture



Introduction

Initial Internal F75111 port address (0x9c)

define GPIO1X, GPIO2X, GPIO3X to input or output
 and Enable WDT function pin

Set F75111 DI/DO (sample code as below Get Input value/Set output value)

DO: InterDigitalOutput(BYTE byteValue))
 DI: InterDigitalInput()

PULSE mode

Sample to setting GP33, 32, 31, 30 output 1mS low pulse signal.

```
{
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_CONTROL, 0x00); //This is setting low pulse output
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_WIDTH_CONTROL, 0x01); //This selects the pulse width to 1mS
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_CONTROL_MODE, 0x0F); //This is setting the GP33, 32, 31, 30
to output function.
this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_Output_Data , 0x0F); //This is setting the GP33, 32, 31, 30
output data.
}
```

Initial internal F75111

```
void F75111::InitInternalF75111()
{
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO1X_CONTROL_MODE ,0x00); //set GPIO1X to Input function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO3X_CONTROL_MODE ,0x00); //set GPIO3X to Input function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_CONTROL_MODE ,0xFF); //set GPIO2X to Output function
    this->Write_Byte(F75111_INTERNAL_ADDR,F75111_CONFIGURATION ,0x03); //Enable WDT OUT function
}
```

Set output value

```
void F75111::InterDigitalOutput(BYTE byteValue)
{
    BYTE byteData = 0;
    byteData = (byteData & 0x01 )? byteValue + 0x01 : byteValue;
    byteData = (byteData & 0x02 )? byteValue + 0x02 : byteValue;
    byteData = (byteData & 0x04 )? byteValue + 0x04 : byteValue;
    byteData = (byteData & 0x80 )? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x40 )? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20 )? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x10 )? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x08 )? byteValue + 0x80 : byteValue; // get value bit by bit

    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_OUTPUT_DATA,byteData); // write byteData value via
    GPIO2X output pin
}
```

Get Input value

```
BYTE F75111::InterDigitalInput()
{
    BYTE byteGPIO1X = 0;
    BYTE byteGPIO3X = 0;
    BYTE byteData = 0;

    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO1X_INPUT_DATA,&byteGPIO1X); // Get value from GPIO1X
    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO3X_INPUT_DATA,&byteGPIO3X); // Get value from GPIO3X

    byteGPIO1X = byteGPIO1X & 0xF0; // Mask unuseful value
    byteGPIO3X = byteGPIO3X & 0x0F; // Mask unuseful value

    byteData = ( byteGPIO1X & 0x10 )? byteData + 0x01 : byteData;
    byteData = ( byteGPIO1X & 0x80 )? byteData + 0x02 : byteData;
    byteData = ( byteGPIO1X & 0x40 )? byteData + 0x04 : byteData;
    byteData = ( byteGPIO3X & 0x01 )? byteData + 0x08 : byteData;

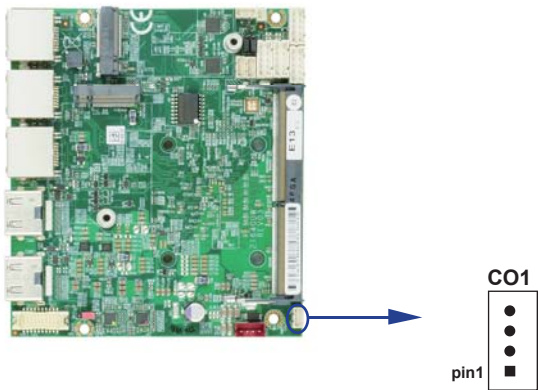
    byteData = ( byteGPIO3X & 0x02 )? byteData + 0x10 : byteData;
    byteData = ( byteGPIO3X & 0x04 )? byteData + 0x20 : byteData;
    byteData = ( byteGPIO3X & 0x08 )? byteData + 0x40 : byteData;
    byteData = ( byteGPIO1X & 0x20 )? byteData + 0x80 : byteData; // Get correct DI value from GPIO1X & GPIO3X
    return byteData;
}
```

define F75111 pin in F75111.h

```
//-----
#define F75111_INTERNAL_ADDR      0x9C // OnBoard F75111 Chipset
#define F75111_EXTERNAL_ADDR     0x6E // External F75111 Chipset
//-----
#define F75111_CONFIGURATION     0x03 // Configure GPIO13 to WDT2 Function
//-----
#define GPIO1X_CONTROL_MODE      0x10 // Select Output Mode or Input Mode
#define GPIO2X_CONTROL_MODE      0x20 // Select GPIO2X Output Mode or Input Mode
#define GPIO3X_CONTROL_MODE      0x40 // Select GPIO3X Output Mode or Input Mode
//-----
#define GPIO1X_INPUT_DATA        0x12 // GPIO1X Input
#define GPIO3X_INPUT_DATA        0x42 // GPIO3X Input
//-----
#define GPIO2X_OUTPUT_DATA       0x21 // GPIO2X Output
//-----
#define GPIO1X_PULSE_CONTROL      0x13 // GPIO1x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO1X_PULSE_WIDTH_CONTROL 0x14 // GPIO1x Pulse Width Control Register
#define GP1_PSWIDTH_500US        0x00 // When select Pulse mode: 500 us.
#define GP1_PSWIDTH_1MS         0x01 // When select Pulse mode: 1 ms.
#define GP1_PSWIDTH_20MS        0x02 // When select Pulse mode: 20 ms.
#define GP1_PSWIDTH_100MS       0x03 // When select Pulse mode: 100 ms.
//-----
#define GPIO2X_PULSE_CONTROL      0x23 // GPIO2x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO2X_PULSE_WIDTH_CONTROL 0x24 // GPIO2x Pulse Width Control Register
#define GP2_PSWIDTH_500US        0x00 // When select Pulse mode: 500 us.
#define GP2_PSWIDTH_1MS         0x01 // When select Pulse mode: 1 ms.
#define GP2_PSWIDTH_20MS        0x02 // When select Pulse mode: 20 ms.
#define GP2_PSWIDTH_100MS       0x03 // When select Pulse mode: 100 ms.
//-----
#define GPIO3X_PULSE_CONTROL      0x43 // GPIO3x Level/Pulse Control Register
// 0:Level Mode
// 1:Pulse Mode
#define GPIO3X_Output_Data       0x41 // GPIO3x Output Data Register
#define GPIO3X_PULSE_WIDTH_CONTROL 0x44 // GPIO3x Pulse Width Control Register
#define GP3_PSWIDTH_500US        0x00 // When select Pulse mode: 500 us.
#define GP3_PSWIDTH_1MS         0x01 // When select Pulse mode: 1 ms.
#define GP3_PSWIDTH_20MS        0x02 // When select Pulse mode: 20 ms.
#define GP3_PSWIDTH_100MS       0x03 // When select Pulse mode: 100 ms.
//-----
```

3-8 CO1: SMBus 1x4 pin (1.25mm) wafer

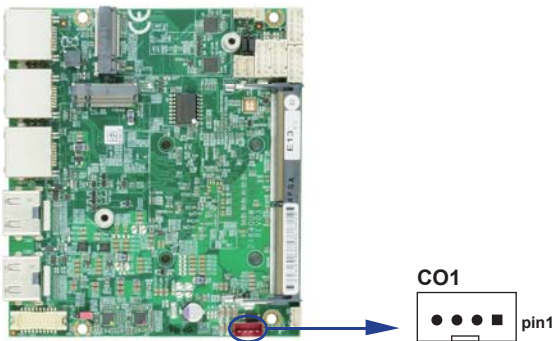
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	GND
3	SMB-Clock	4	SMB-Data



3-9 CPI1: DC Power input 1x4 pin (2.0mm) wafer (RED)

PIN NO.	DESCRIPTION
1,4	GND
2,3	DC-IN

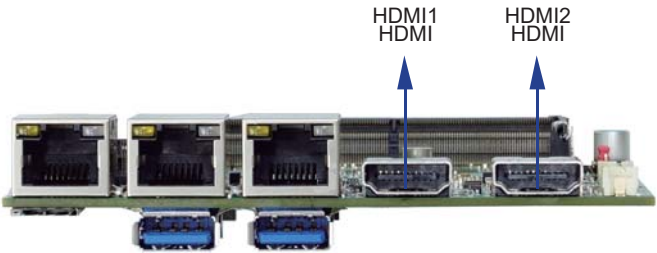
Note: Very important check DC-in Voltage.



3-10 Display Interface

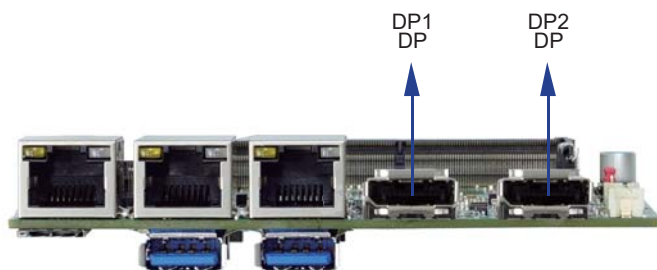
● HDMI1 / HDMI2: HDMI type A connector

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		



● DP1 / DP2: Display Port 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

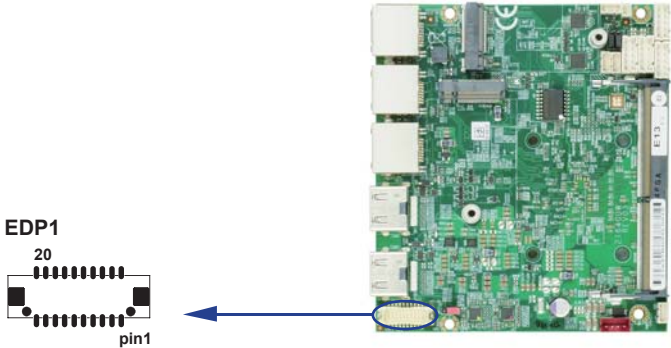


● EDP1: eDP interface 2x10 pin (1.25mm) wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Lane-0-DATA-	2	+12V
3	Lane-0-DATA+	4	+12V
5	Lane-1-DATA-	6	GND
7	Lane-1-DATA+	8	GND
9	Backlight Enable	10	GND
11	PWM dimming	12	GND
13	I2C Clock	14	+LCD (5V or 3.3V)
15	I2C Data	16	+LCD (5V or 3.3V)
17	eDP Aux+	18	+LCD (5V or 3.3V)
19	eDP Aux-	20	EDP_HPD

Note:

- 1. eDP interface support 2 lanes.
- 2. JVL1: eDP panel +5V / +3.3V (default) Voltage select.
- 3. eDP1 PIN 9 for panel backlight enable. +3.3V Level
- 4. eDP1 PIN 11 for panel backlight dimming control



3-11 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

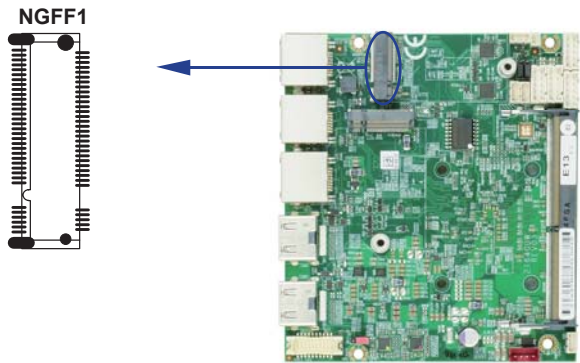


3-12 NGFF1: PCI Express M.2 B key 2242 H=8.5 sockets 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NC	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	M2_PERn1	30	NC
31	M2_PERp1	32	NC
33	GND	34	NC
35	M2_PETn1	36	NC
37	M2_PETp1	38	NC
39	GND	40	NC
41	M2_PERn0 / SATA-RX+	42	NC
43	M2_PERp0 / SATA-RX-	44	NC
45	GND	46	NC
47	M2_PETn0 / SATA-TX-	48	NC
49	M2_PETp0 / SATA-TX+	50	PREST
51	GND	52	SRCCCLKREQ_N
53	PCIE_CLK_N0	54	NC
55	PCIE_CLK_P0	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	NC
67	NC	68	NC
69	CFG1_SATA_PCIE	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	NC		

- Note:
- 1. NGFF1 support PCIe x2 / SATA-SSD Auto detect.
 - 2. NGFF1 VCC voltage support +3.3V.

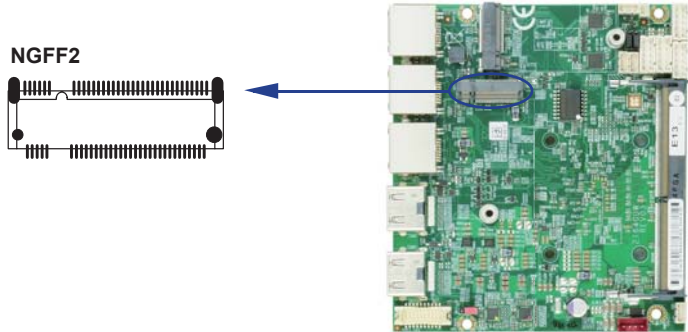


3-13 NGFF2: PCI Express M.2 B key 2242 / 3042 H=8.5 sockets 75pin

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	CFG3_USB3_PCIE	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	M2_PERn1_U3Rn	30	SIM_RST_M2
31	M2_PERp1_U3Rp	32	SIM_CLK_M2
33	GND	34	SIM_DATA_M2
35	M2_PETn1_U3Tn	36	SIM_PWR_M2
37	M2_PETp1_U3Tp	38	NC
39	GND	40	NC
41	M2_PERn0_MSRp	42	NC
43	M2_PERp0_MSRe	44	NC
45	GND	46	NC
47	M2_PETn0_MSTn	48	NC
49	M2_PETp0_MSTp	50	PREST
51	GND	52	SRCCCLKREQ_N
53	PCIE_CLK_N0	54	NC
55	PCIE_CLK_P0	56	NC
57	GND	58	NC
59	NC	60	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
61	ANTCTL1	62	NC
63	ANTCTL2	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	CONFIG_2		

- Note:
1. NGFF2 support USB 3.0 / PCIe x2 Auto detect.
 2. VCC voltage default support +3.3V.
 3. BOM control, if need 4G LTE device VCC voltage is +3.7V.



3-14 CRFP1: Antenna control 1x4 pin (1.25mm) wafer (OEM)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ANTCTL1	2	ANTCTL2
3	+V5	4	GND

- Note:
1. Antenna control by OEM
 2. Antenna control with NGFF2

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.

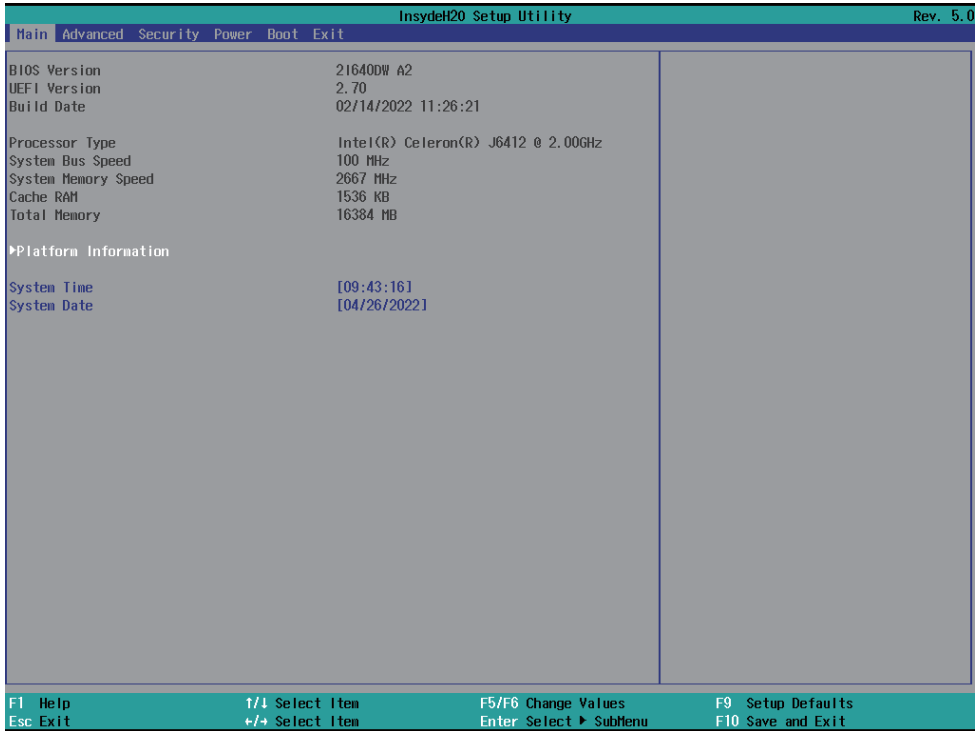
Press Page Up / Page Down or +/- keys to modify the BIOS parameters for the active option.

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

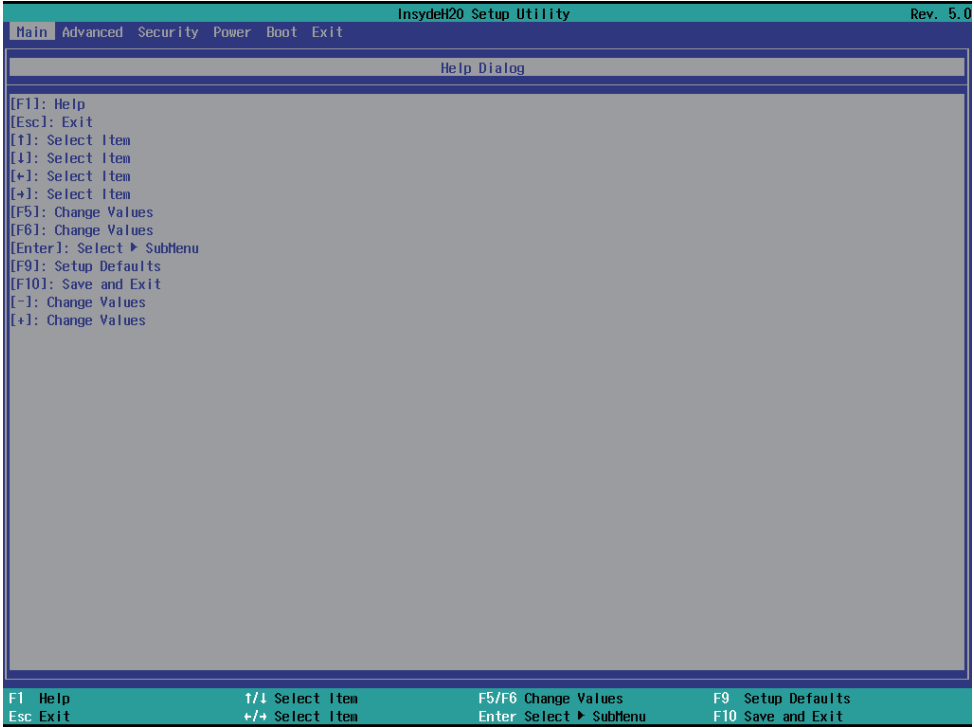


In the above BIOS Setup main menu of, you can see several options.

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

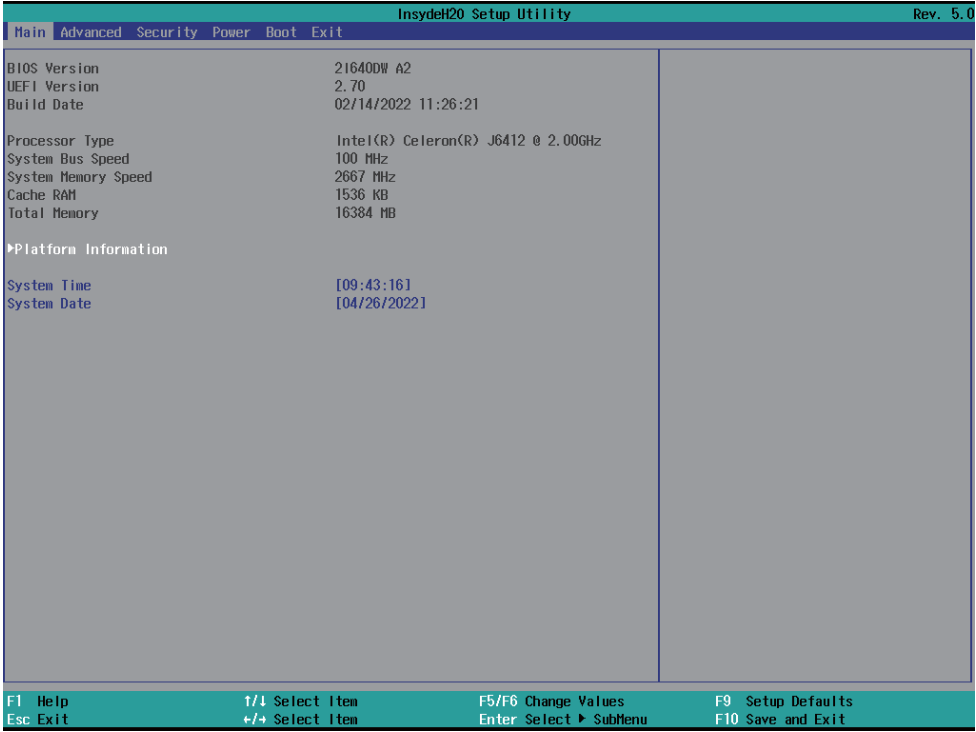
Boot Quiet boot or boot from USB selected.

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.

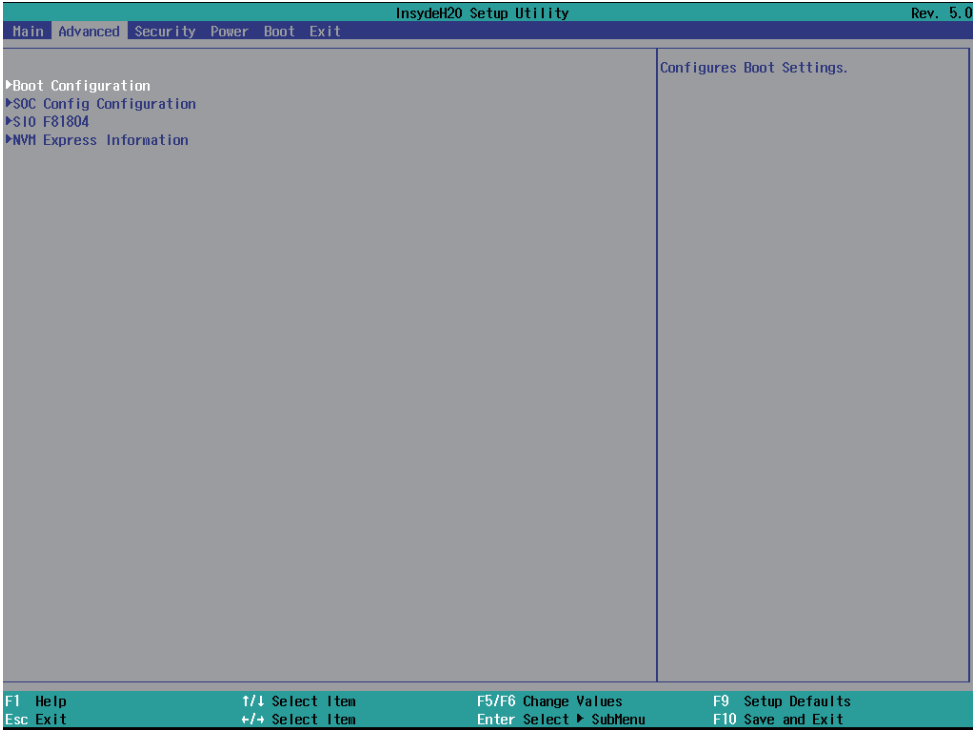
System Date

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



Boot Configuration

Please refer section 4-6-1

SOC Config Configuration

Please refer section 4-6-2

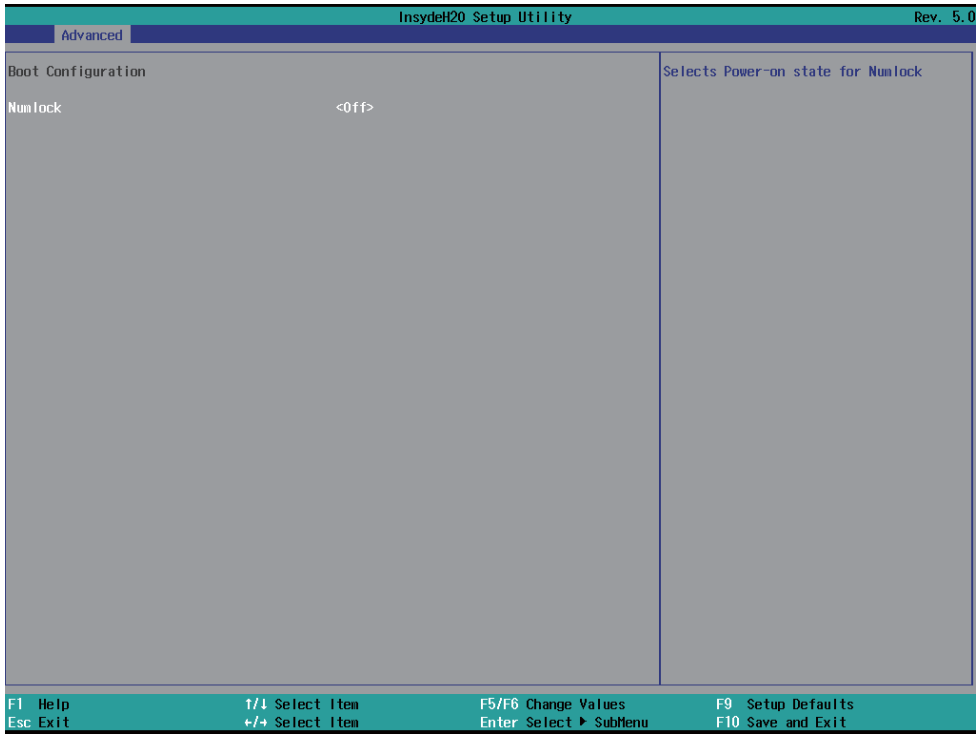
SIO F81804

Please refer section 4-6-3

NVM Express information

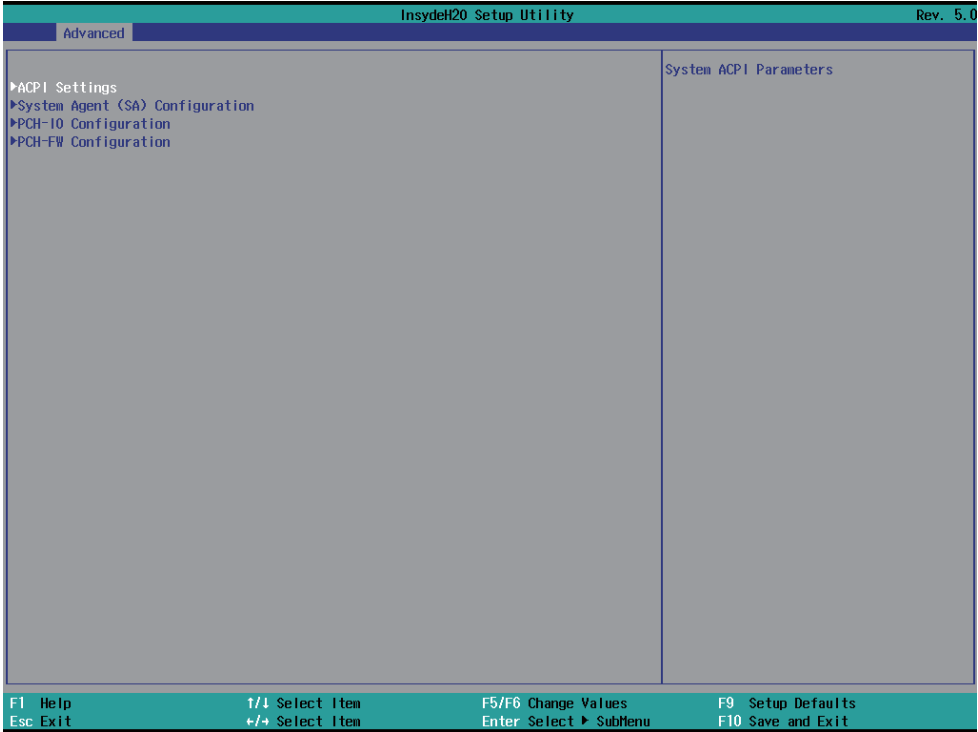
Please refer section 4-6-4

4-6-1 Boot Configuration



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

4-6-2 SOC Config Configuration



ACPI Settings

Please refer section 4-6-2-1

System Agent (SA) Configuration

Please refer section 4-6-2-2

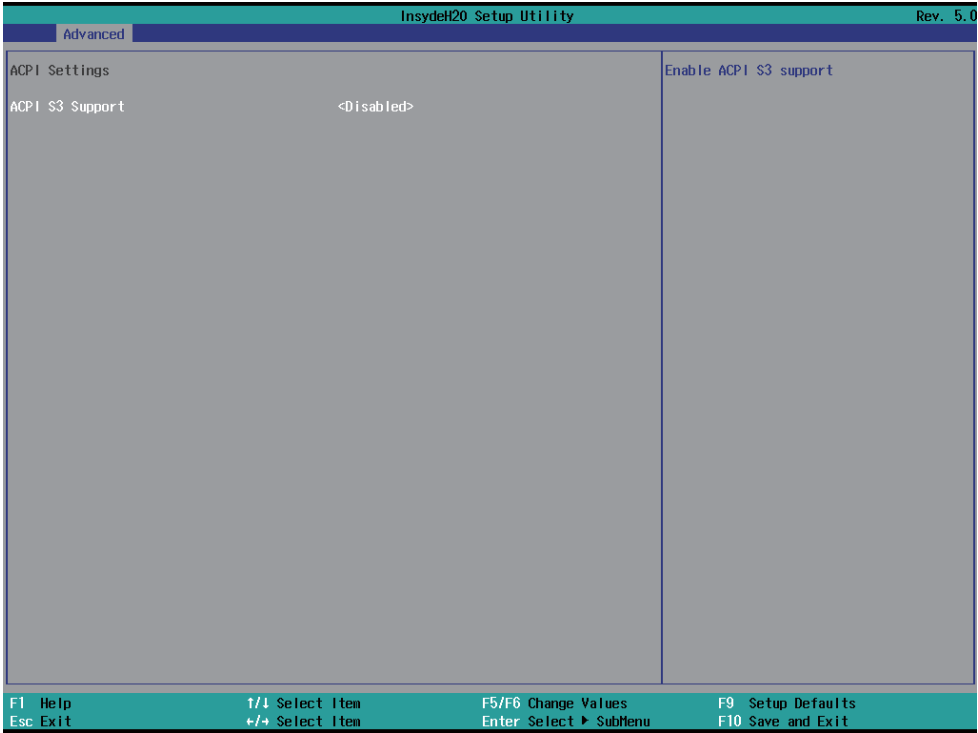
PCH-IO Configuration

Please refer section 4-6-2-3

PCH-FW Configuration

Please refer section 4-6-2-4

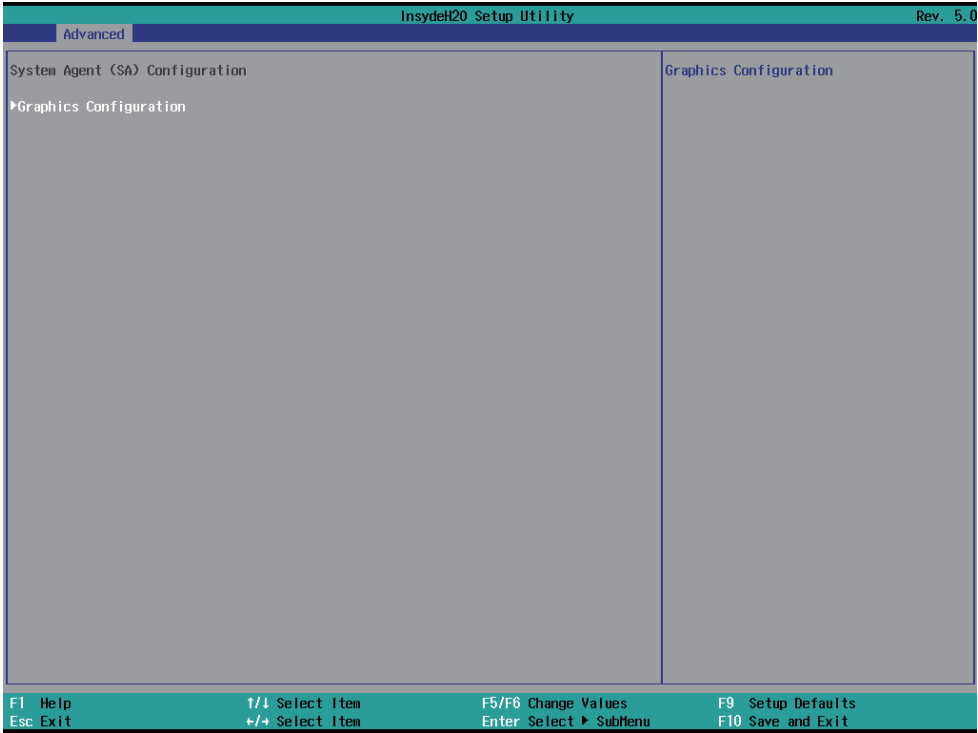
4-6-2-1 ► ACPI Settings

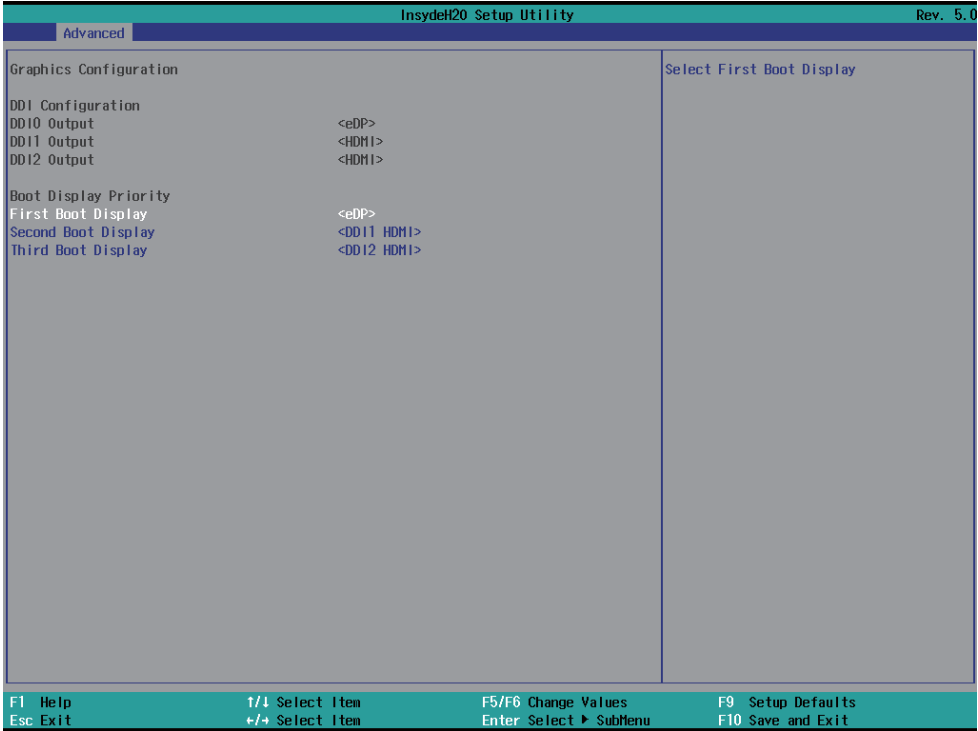


ACPI S3 Support

To enable BIOS support security device or not, default is Enabled.

4-6-2-2 ► System Agent (SA) Configuration





Graphic Configuration

First Boot Display

To select First Boot Display priority, there are eDP, DDI1 HDMI, DDI2 HDMI, default is eDP.

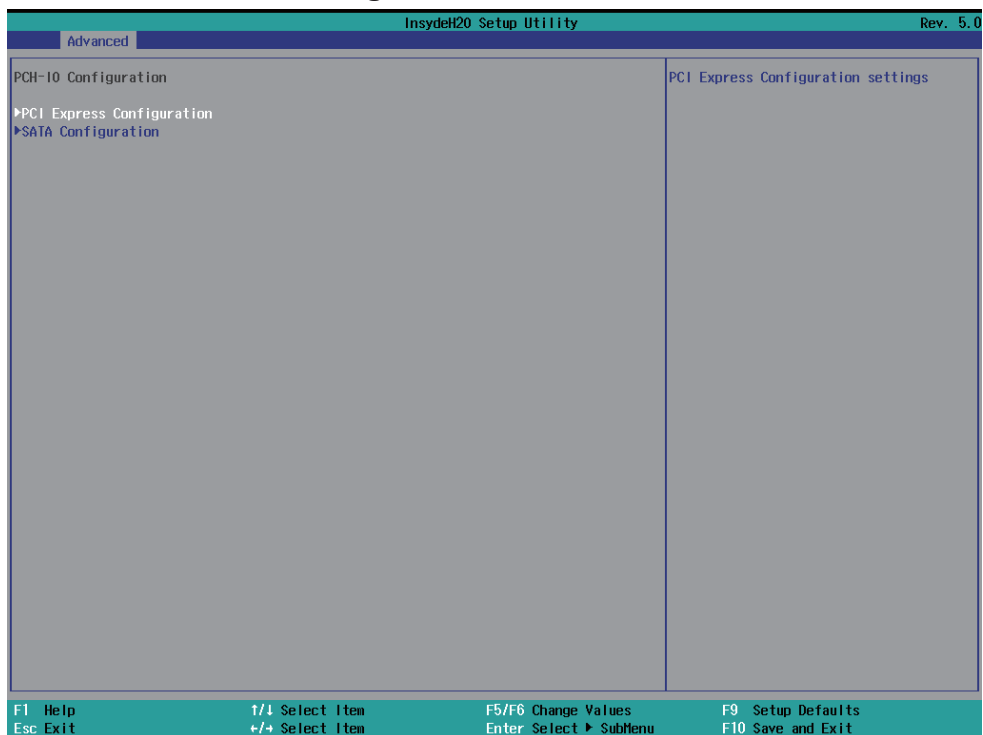
Second Boot Display

To select Second Boot Display priority, there are DDI1 HDMI, DDI2 HDMI, default is DDI1 HDMI.

Third Boot Display

To select First Boot Display priority, there is DDI2 HDMI.

4-6-2-3 ► PCH-IO Configuration



PCI Express Configuration

Please refer section 4-6-2-3-1

SATA Configuration

Please refer section 4-6-2-3-2

4-6-2-3-1 ► PCI Express Configuration

Advanced

InsydeH20 Setup Utility

Rev. 5.0

PCI Express Configuration

►NGFF1 M.2 B-Key
►NGFF2 M.2 B-Key

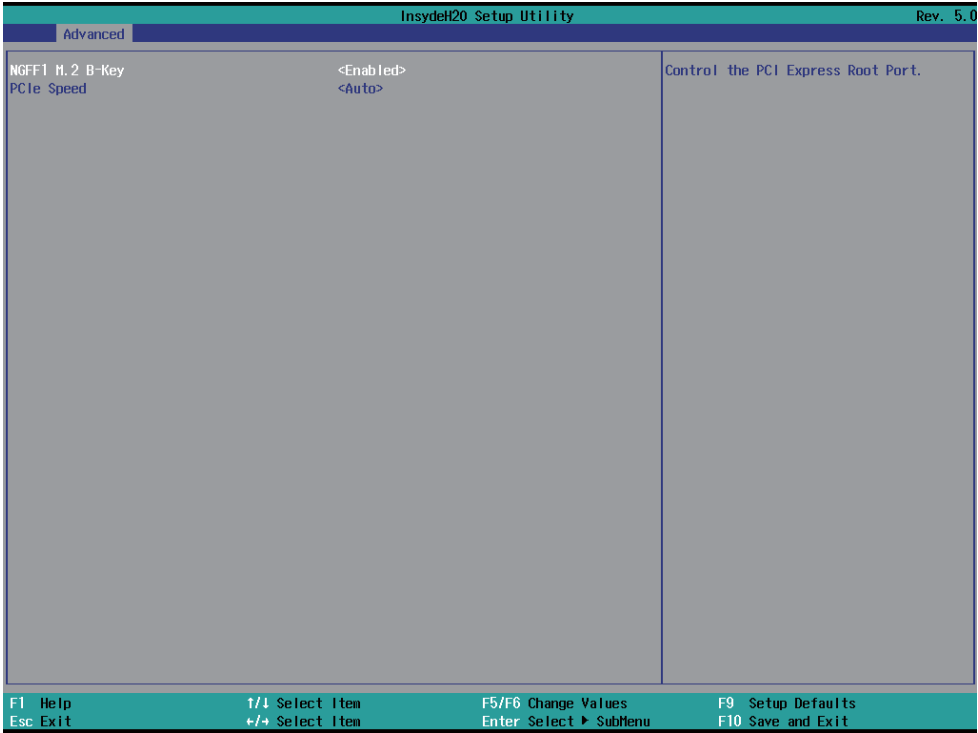
PCI Express Root Port Settings.

F1 Help
Esc Exit

T/↓ Select Item
←/→ Select Item

F5/F6 Change Values
Enter Select ► SubMenu

F9 Setup Defaults
F10 Save and Exit



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

4-6-2-4 ► PCH-FW Configuration

Advanced

InsydeH20 Setup Utility

Rev. 5.0

ME Firmware Version	15.40.10.2252	ME Firmware Version
ME Firmware Mode	Normal Mode	
ME Firmware SKU	Consumer SKU	
ME Firmware Status 1	0x90000255	
ME Firmware Status 2	0x32850106	

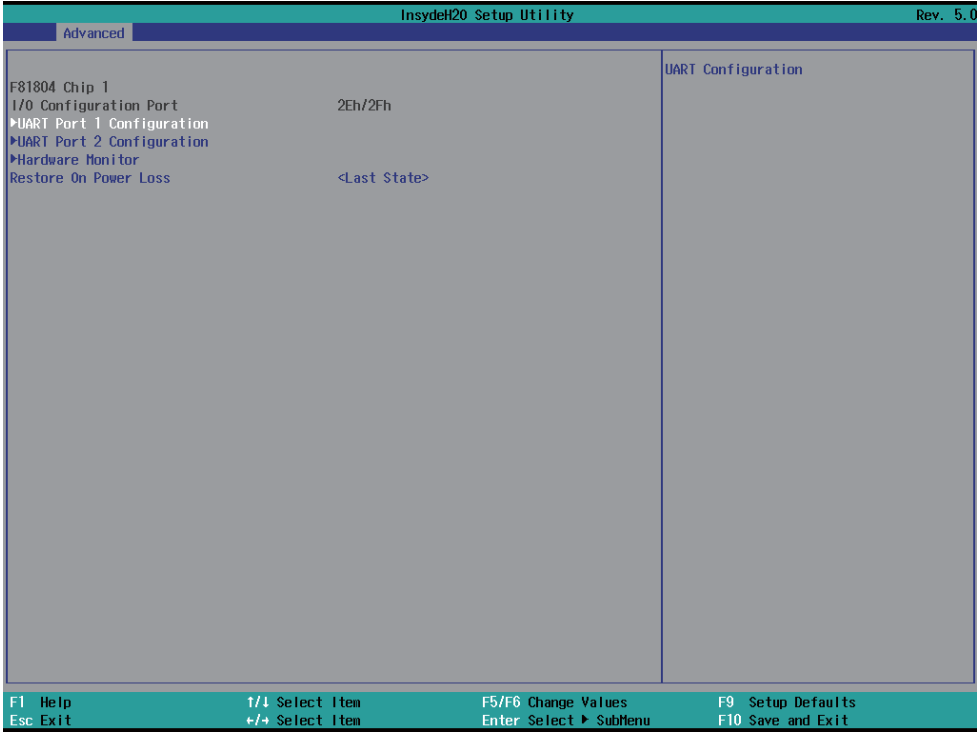
F1 Help
Esc Exit

T/↓ Select Item
↑/→ Select Item

F5/F6 Change Values
Enter Select ► SubMenu

F9 Setup Defaults
F10 Save and Exit

4-6-3 SIO F81804



UART Port 1 Configuration

Please refer section 4-6-3-1

UART Port 2 Configuration

Please refer section 4-6-3-2

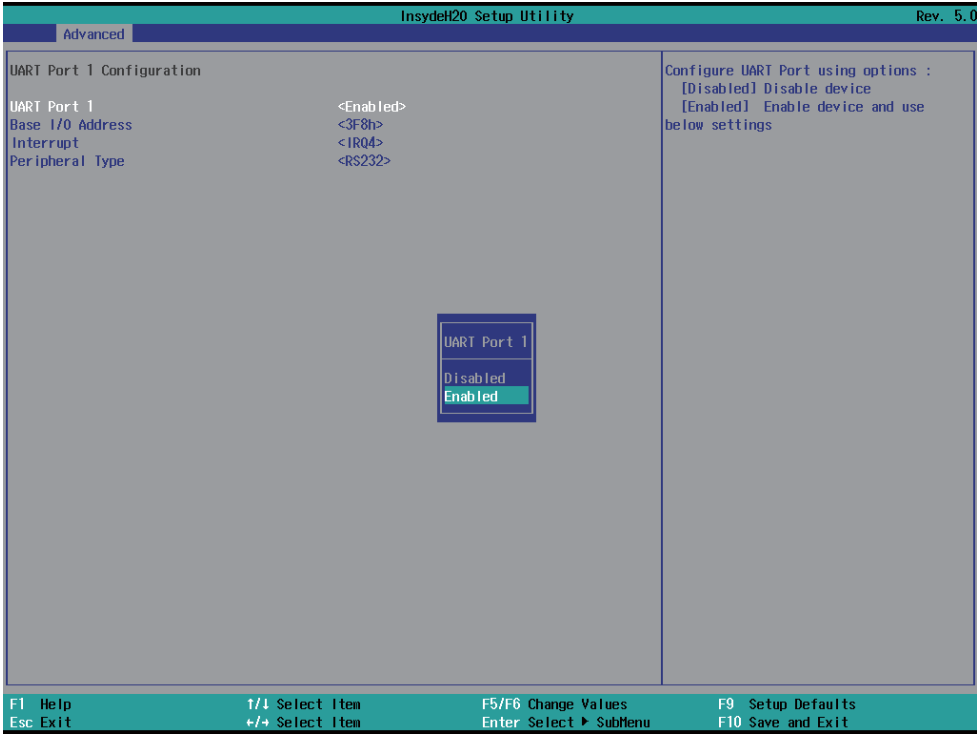
Hardware Monitor

Please refer section 4-6-3-3

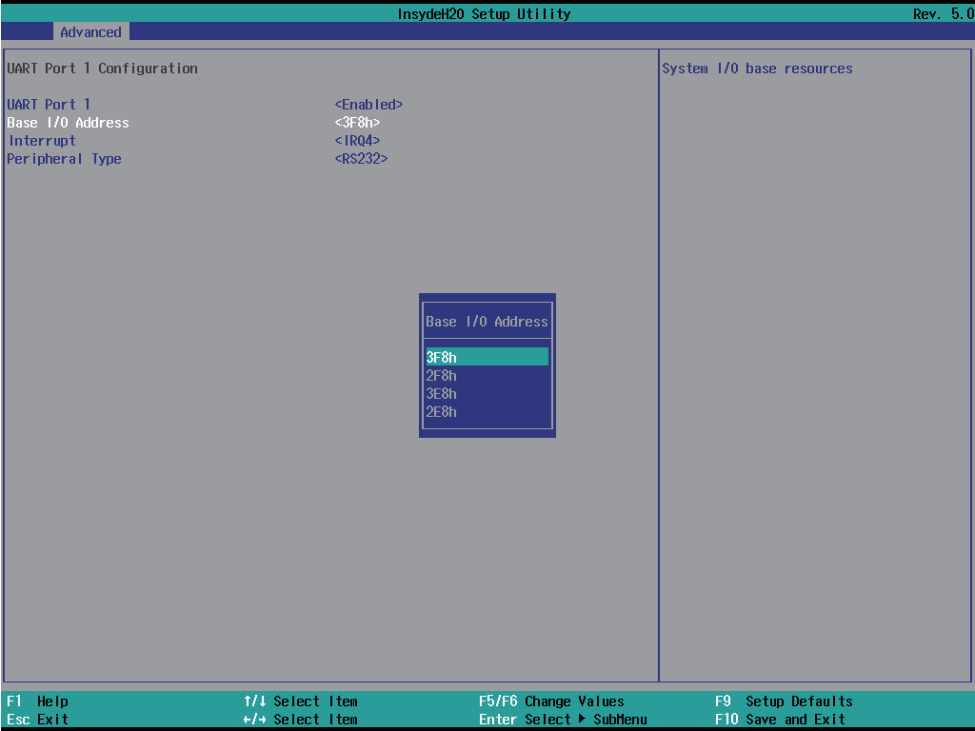
Restore on Power Loss

Please refer section 4-6-3-4

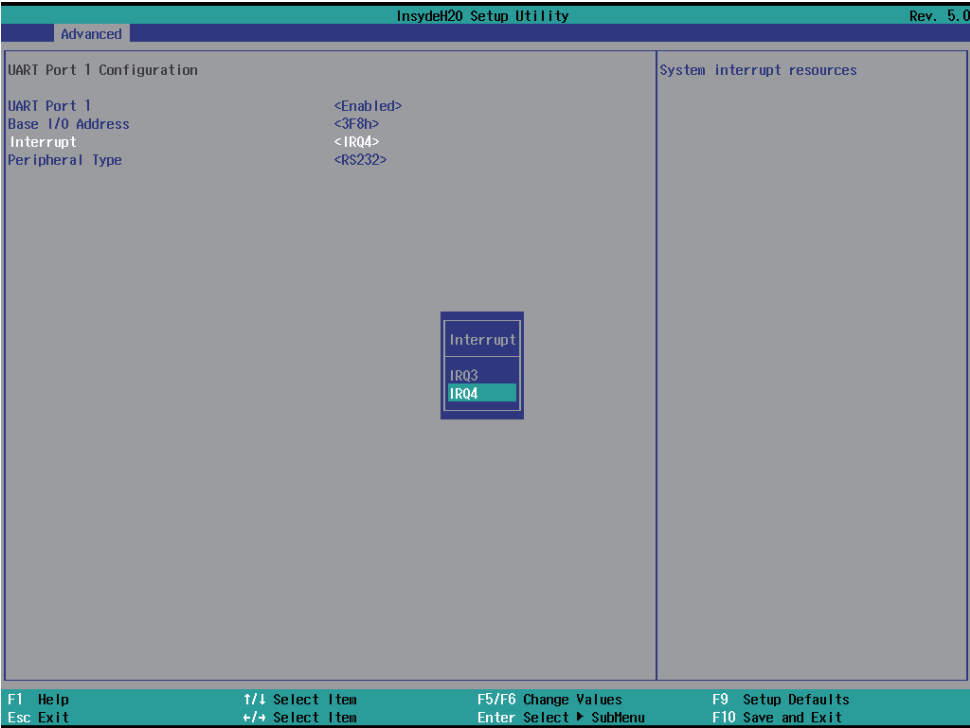
4-6-3-1 ► UART Port 1 Configuration



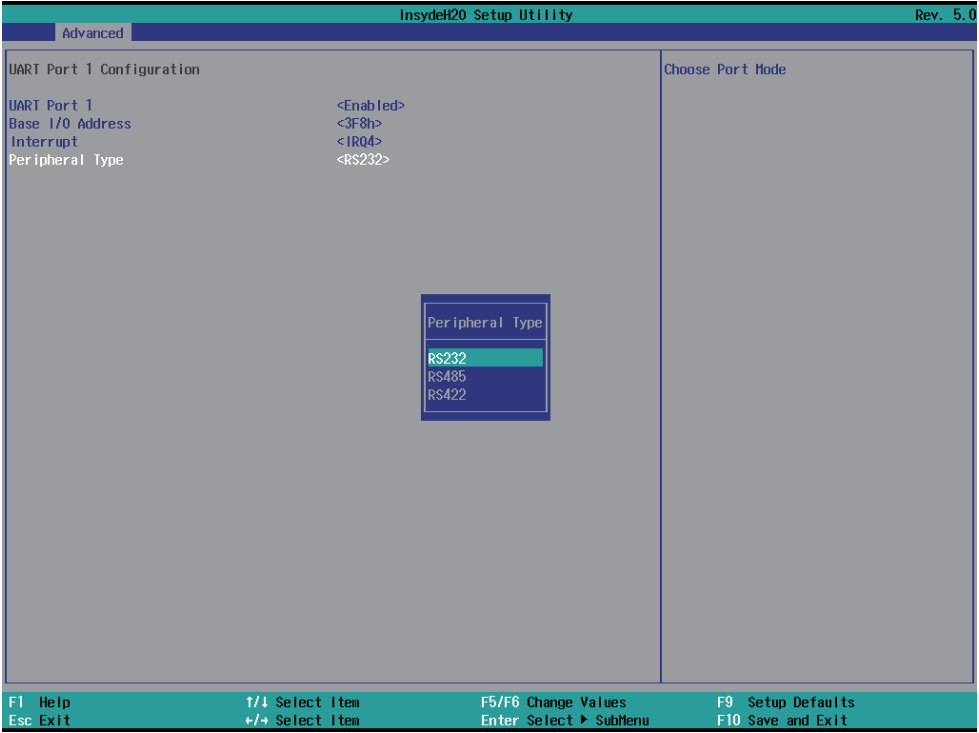
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 3F8h.

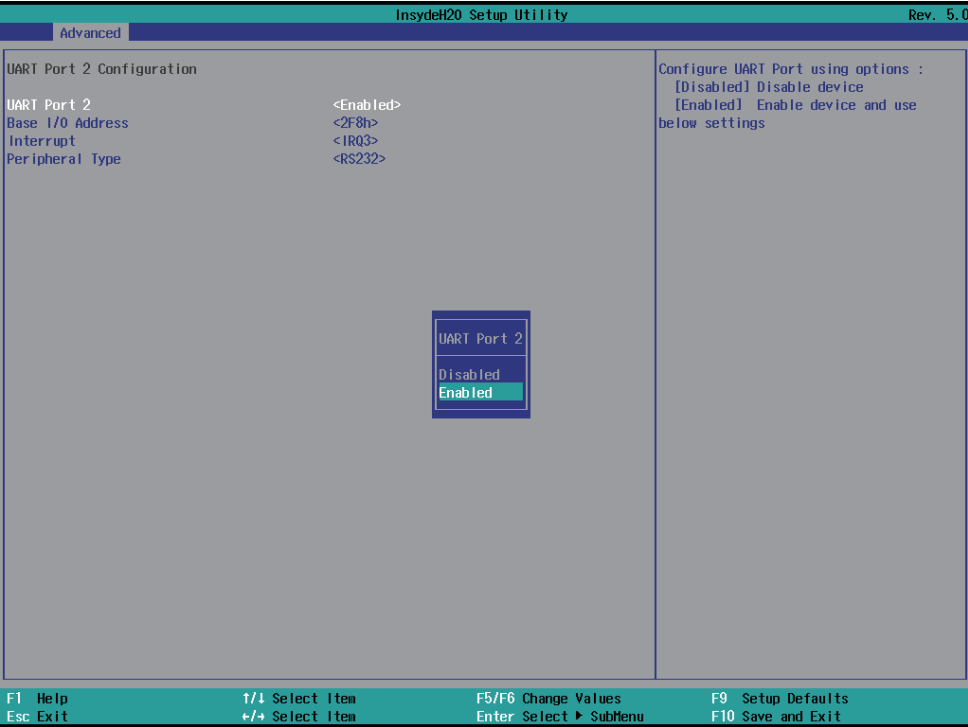


Interrupt, default is IRQ4.

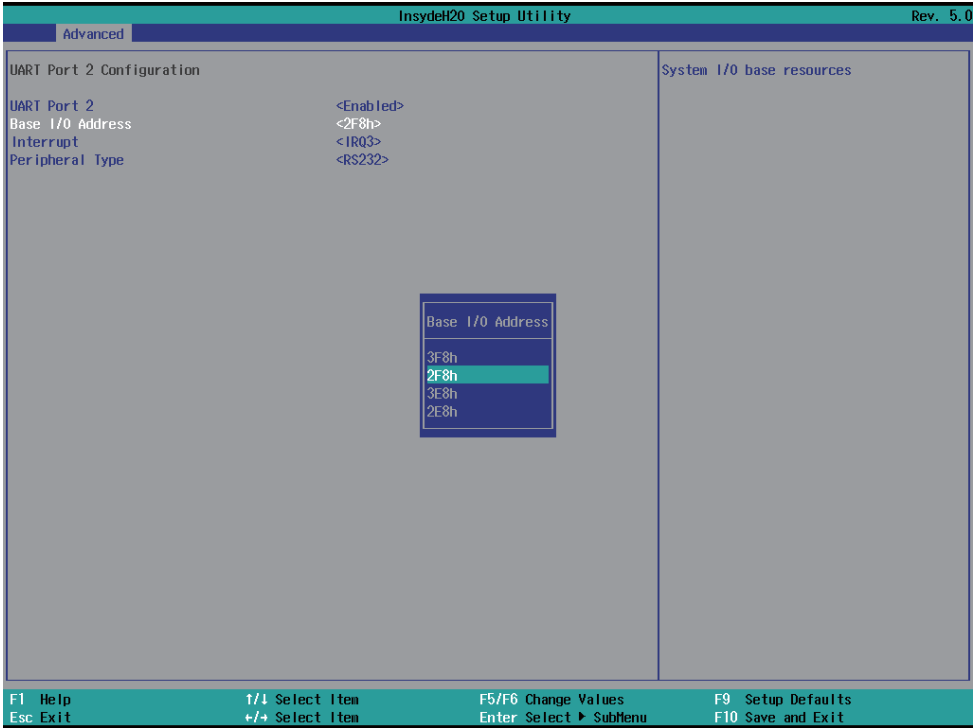


Peripheral, to select the Serial port to RS232 / RS422 / RS485, default is RS232.

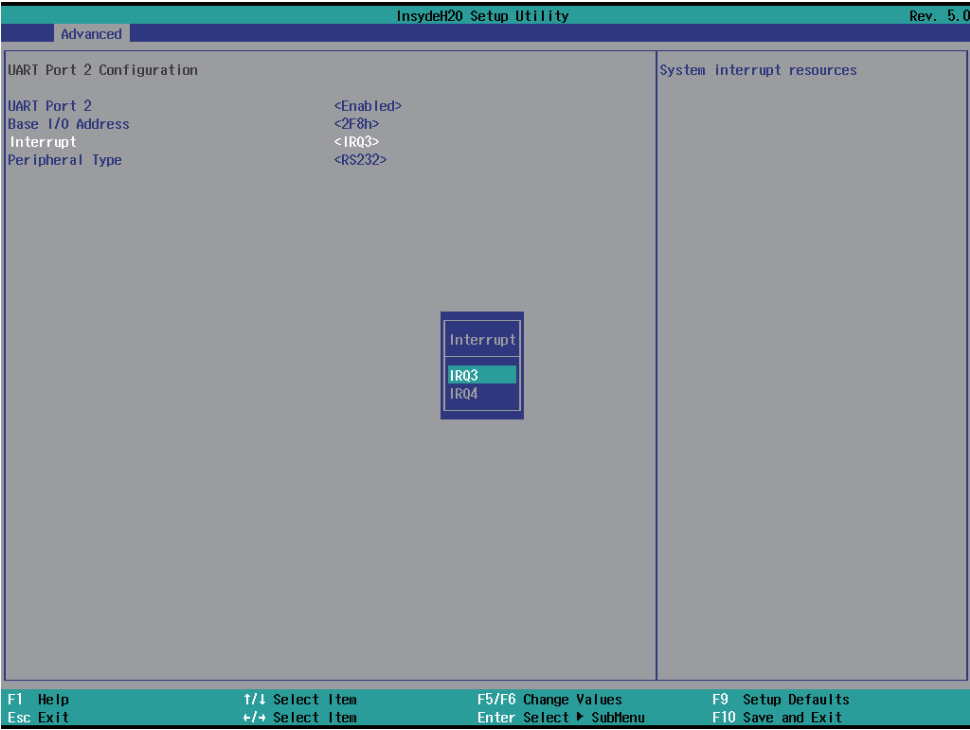
4-6-3-2 ► UART Port 2 Configuration



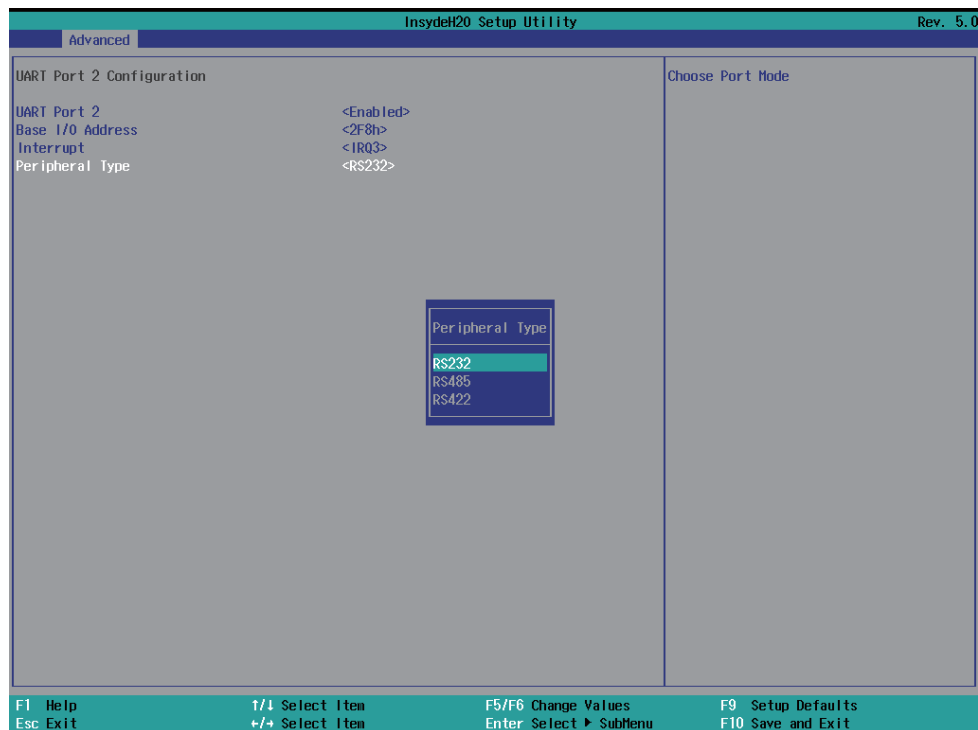
To Enable Serial port or not, default is Enabled.



Base I/O Address, default is 2F8h.

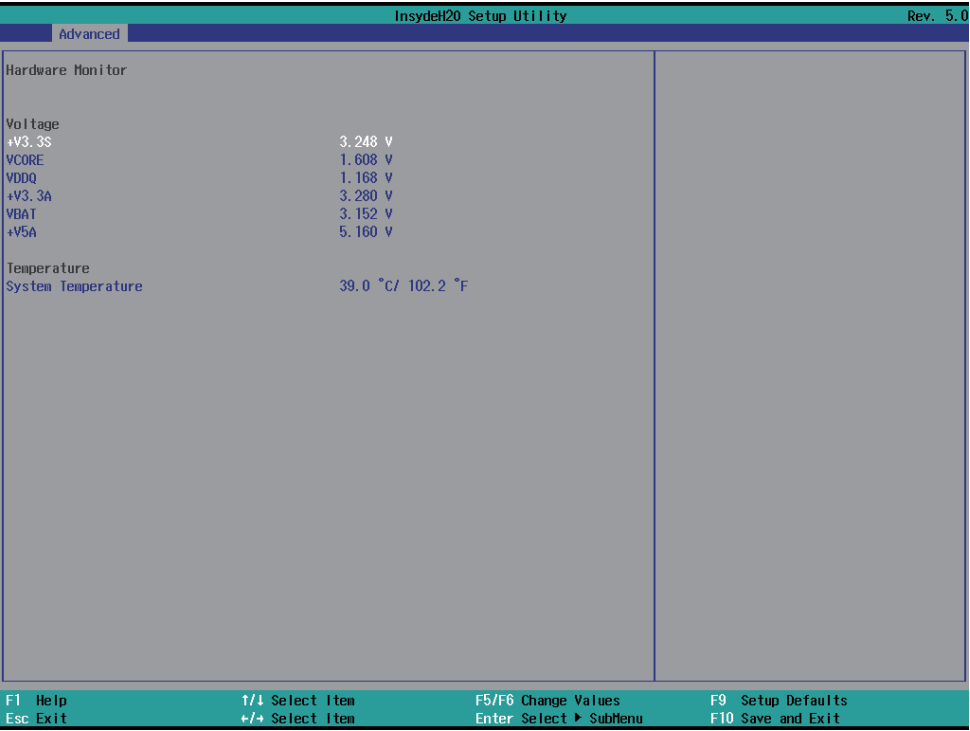


Interrupt, default is IRQ3.



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

4-6-3-3 ► 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.

4-6-3-4 Restore On Power Loss

Advanced

InsydeH20 Setup Utility

Rev. 5.0

F81804 Chip 1

I/O Configuration Port

►UART Port 1 Configuration

►UART Port 2 Configuration

►Hardware Monitor

Restore On Power Loss

2Eh/2Fh

<Last State>

Restore system when abnormal power condition occurs

[Always Off] keep computer power off after power failure.

[Always On] Turn on the computer after power failure.

[Last State] After power resumes, restore computer to last state before power failure.

Restore On Power Loss

Always Off

Always On

Last State

F1 Help

Esc Exit

F5/F6 Change Values

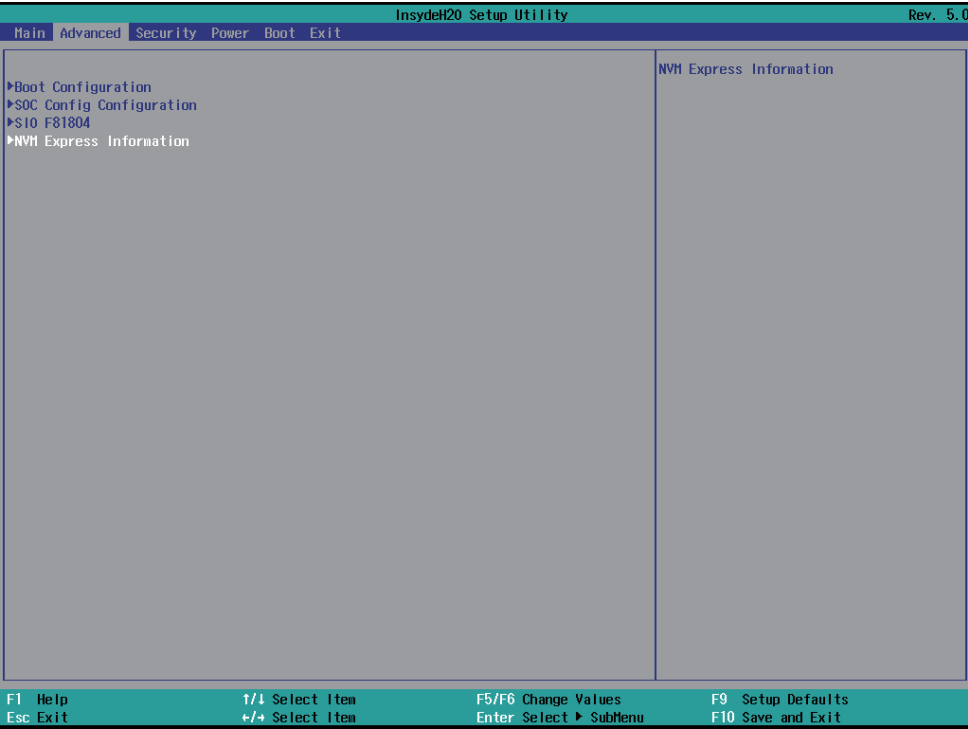
Enter Select ► SubMenu

F9 Setup Defaults

F10 Save and Exit

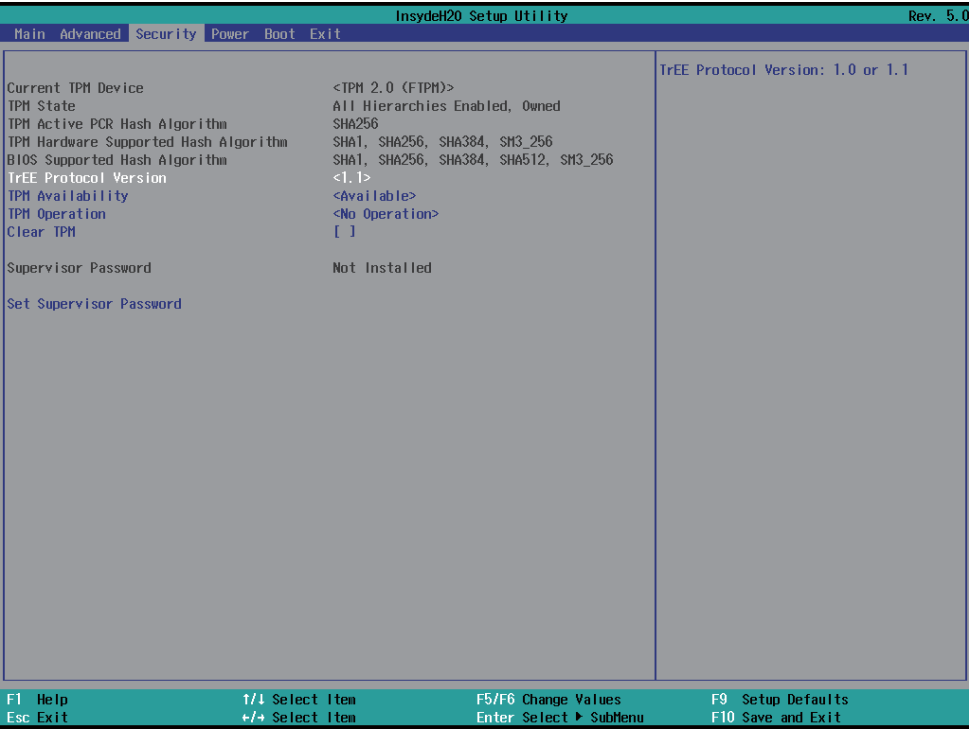
To select the power behavior after power fail, default is last state.

4-6-4 NVM Express Information



Press [Enter] to view the NVMe storage devices information.

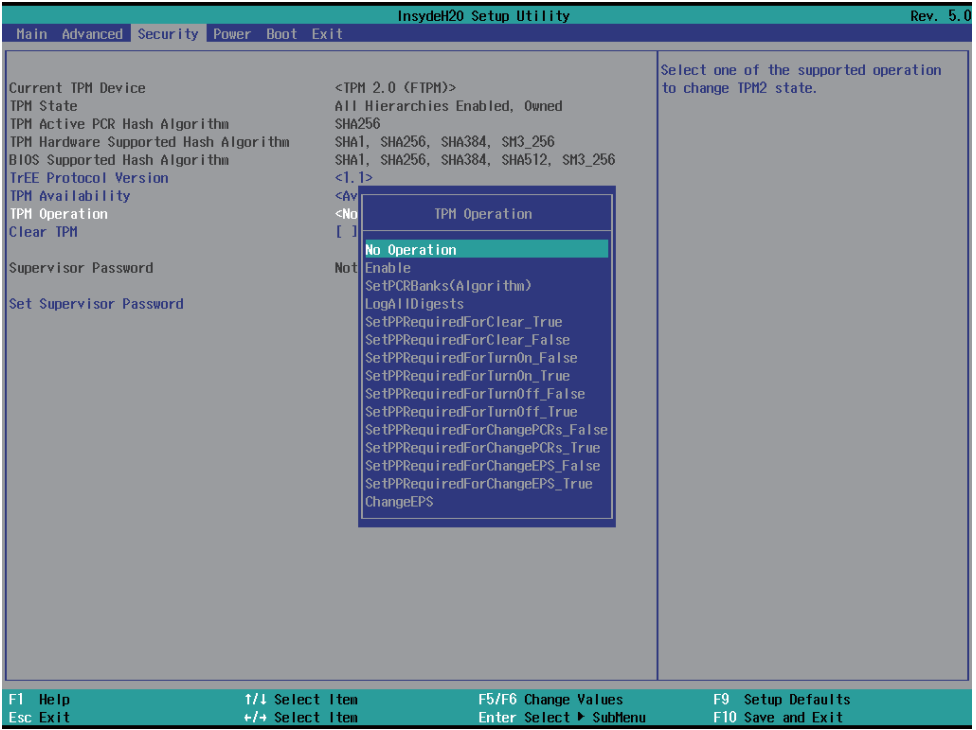
4-7 Security



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

InsydeH20 Setup Utility

Rev. 5.0

MainAdvancedSecurityPowerBootExit

Current TPM Device <TPM 2.0 (fTPM)>
TPM State All Hierarchies Enabled, Owned
TPM Active PCR Hash Algorithm SHA256
TPM Hardware Supported Hash Algorithm SHA1, SHA256, SHA384, SM3_256
BIOS Supported Hash Algorithm SHA1, SHA256, SHA384, SHA512, SM3_256
TrEE Protocol Version <1.1>
TPM Availability <Available>
TPM Operation <No Operation>
Clear TPM []

Supervisor Password Not Installed

Set Supervisor Password

Set Supervisor Password

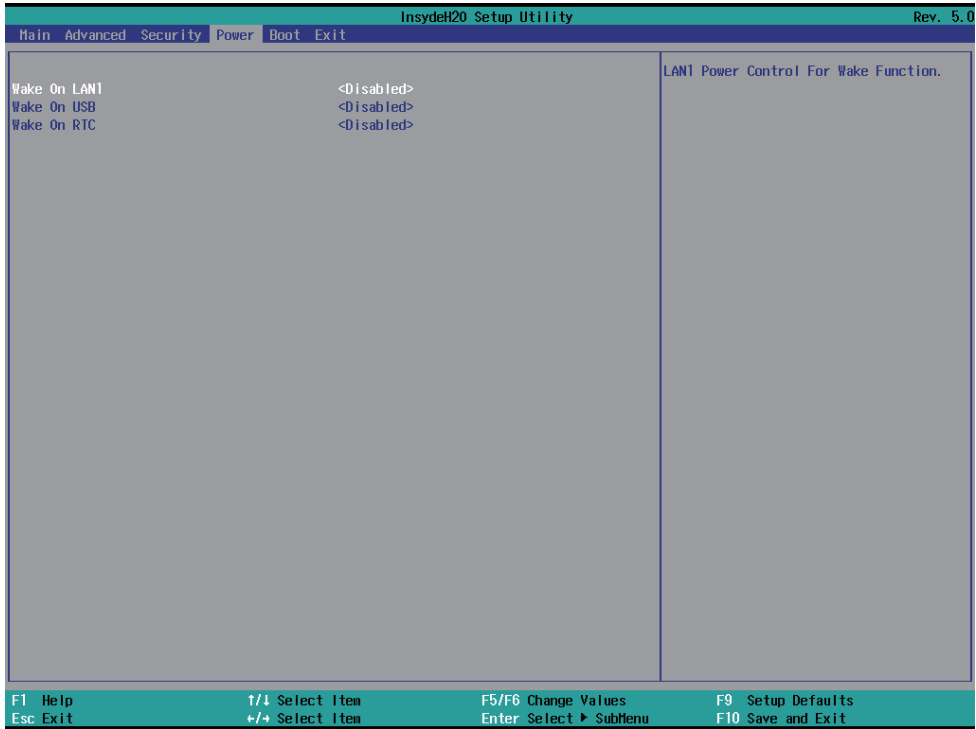
Enter New Password:
Enter New Password Again:

Install or Change the password and the length of password must be greater than one character.

F1 Helpt/l Select ItemF5/F6 Change ValuesF9 Setup Defaults
Esc Exit+/- Select ItemEnter Select ► SubMenuF10 Save and Exit

To set up an Supervisor password

4-8 Power



Wake On LAN1

To select S3, S5 or S3 / S5 wake on LAN1, default is Disabled.

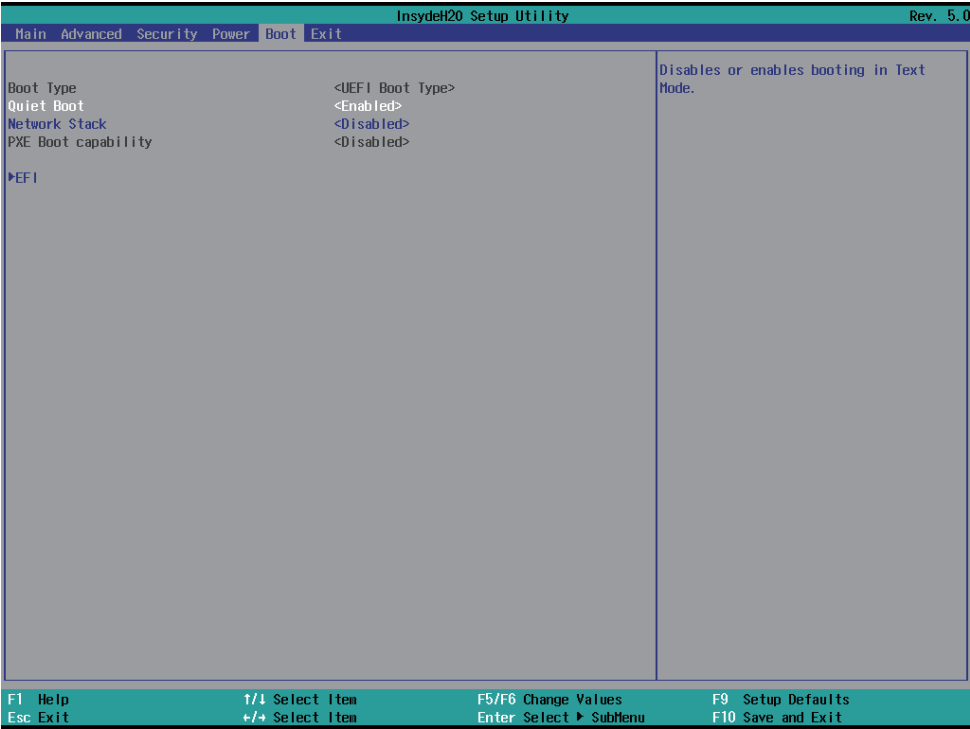
Wake On USB

To select S3 wake on USB, default is Disabled.

Wake On RTC

The optional settings are: Disabled (default), By every day, By day of month.

4-9 Boot



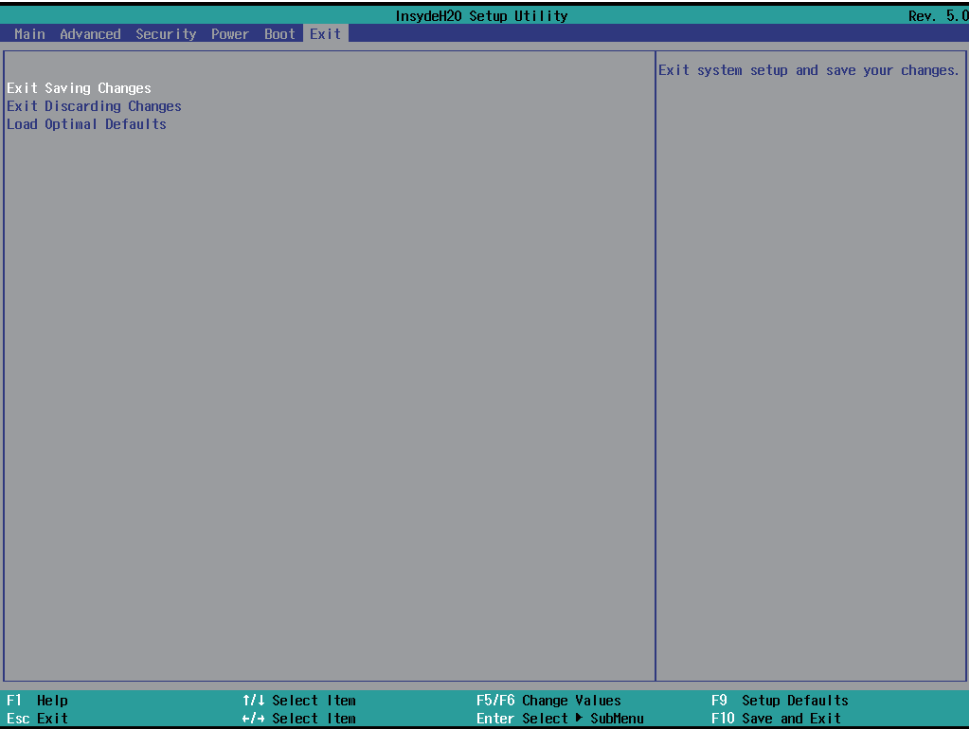
Quiet Boot

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 2I640DW 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 2I640DWA2.ROM -BIOS -ALL

2I640DWA2.ROM is the file name of the latest BIOS.

It may be 2I640DWA1.ROM or 2I640DWA2.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I640DWA2.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)