2I612CW

Intel Skylake-U / Kaby Lake-U Core i CPU, DDR4 2133 MT/s SODIMM, 2 x LAN / 2 x HDMI / USB / COM / PCIe mini card

All-In-One

Intel Skylake-U / Kaby Lake-U Core i CPU,

2 x Intel GbE LAN, 2 x PCIe mini card slots, 2 x HDMI, eDP,

4 x USB 3.0, 3 x USB 2.0, 2 x COM, Wide Range DC-IN

CAUTION

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

NO. 2I612CW
Release date: Feb. 18. 2020

Contents

2I612CW

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User Manual edition 0.1, Feb. 18. 2020

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.

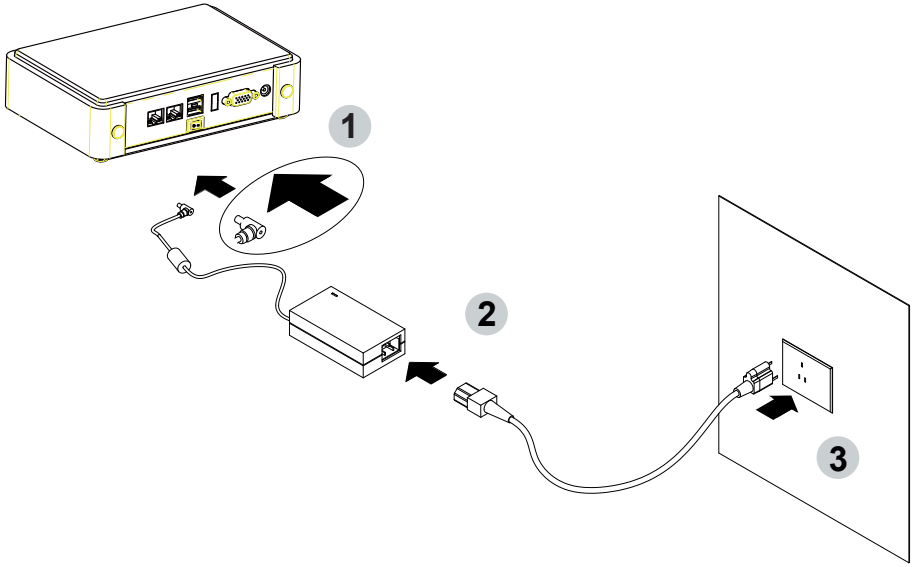
✱ Hardware Notice Guide

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 form 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.

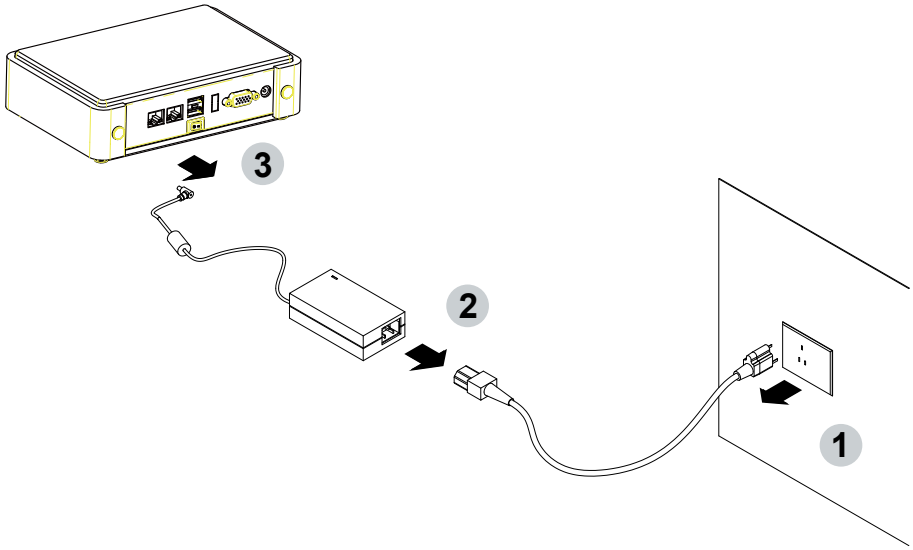
Remark 1:
Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 2I612CW is a 2.5" (110 x 92 mm) motherboard powered with Intel® Skylake-U processor & offered the ideal platform for high performance applications. The ultra compact (110 x 92 mm) motherboard with wide range 9~36V DC power input & embeds multiple Intel GbE LAN, USBs, COM Ports and VGA 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 2I612CW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III), with one-channel DDR4 2133 MHz memory up to 16 GB SODIMM slot and supports two serial ports RS232 / RS485 / RS422 jumper free auto switch by BIOS and +5V / 12V selectable by jumper. It supports 4 ports of USB 3.0, 3 ports of USB 2.0. The expandable interfaces include 1 full-size PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface, and 1 full-size PCIe Mini card for PCIe and USB interface especially for USB 3.0 device and one SATA III ports, as well as graphics interface for 2 HDMI displays.

The embedded motherboard 2I612CW is specially designed with Wide-Range Voltage DC in (9~36V) 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 two 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® Celeron 3955U Processor 2.0GHz, (Dual core), Intel® Core i5-6200U Processor 2.3GHz / 2.8GHz (Dual core), Intel® Core i7-6600U Processor 2.6GHz / 3.4GHz (Dual core)
2. Intel 9th generation (Gen 9) LP graphics and media encode / decode engine, Intel® Celeron 3955U 300MHz / 900MHz, Intel® Core i5-6200U 300MHz / 1GHz, Intel® Core i7-6600U 300MHz / 1.05GHz
3. DDR4 SODIMM slot x 1, up to 16GB
4. Support 2 x 10 / 100 / 1000 Mbps Intel LAN ports.
5. Support 2 x RS232 selectable to RS485 / RS422 by BIOS
6. 4 x USB 3.0 and 3 x USB 2.0
7. Support extended 1 x full-size Mini PCIe card for PCIe x 1 / mSATA (auto-detect) and USB interface, 1 x full-size Mini PCIe card for PCIe and USB 3.0 interface.
8. Support 1 SATA port
9. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
10. Wide Range DC IN +9V~36V

1-2 Specification

1. **SOC:** Intel® Celeron 3955U Processor 2.0GHz, (Dual core), Intel® Core i5-6200U Processor 2.3GHz / 2.8GHz (Dual core), Intel® Core i7-6600U Processor 2.6GHz / 3.4GHz (Dual core)
2. **Memory:** DDR4 SODIMM slot x 1, up to 16GB
3. **Graphics:** Intel 9th generation (Gen 9) LP graphics and media encode / decode engine, Intel® Celeron 3955U 300MHz / 900MHz, Intel® Core i5-6200U 300MHz / 1GHz, Intel® Core i7-6600U 300MHz / 1.05GHz.
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 I210-IT LAN chipset with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1
6. **I/O Chip:** Switch chipset for 2 ports RS232 / RS422 / RS485 selected by BIOS
7. **USB:** 4 type A USB 3.0, 3 USB 2.0
8. **WDT / DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO / Hardware Watch Dog Timer, 0~255 sec programmable
9. **Expansion interface:** one full-size PCIe Mini card for PCIe x 1 / mSATA (auto-detect) and USB interface, one full-size Mini PCIe card for PCIe and USB 3.0 interface
10. **BIOS:** Insyde UEFI BIOS
11. **Dimension:** 110 x 92 mm (2.5 inch)
12. **Power:** On board DC +9~36V

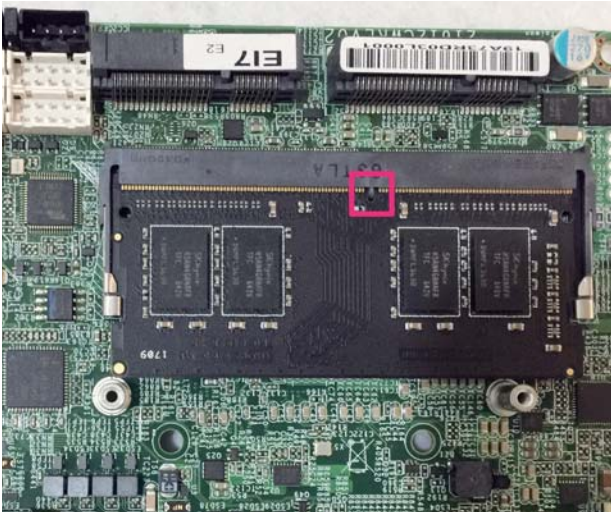
1-3 Installing the SO-DIMM

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

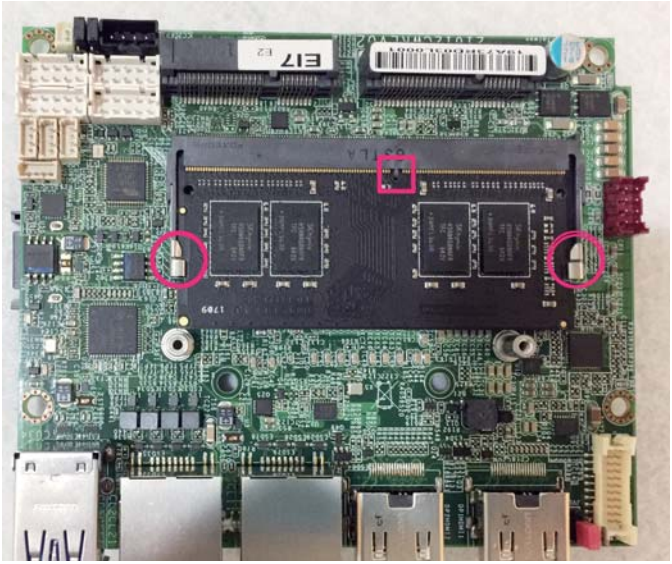
2. Press the SO-DIMM into the connector until you hear a click.

Notices:

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

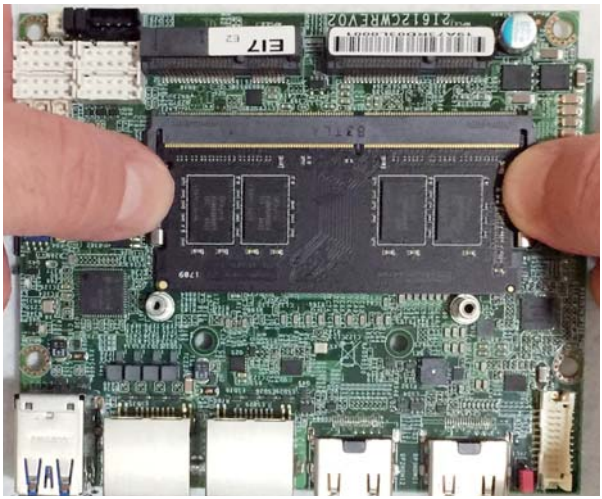


2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.

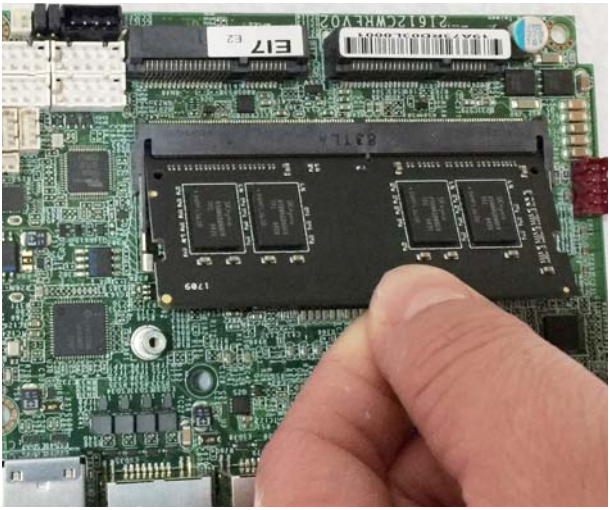


1-3-1-1 Removing the SO-DIMM

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

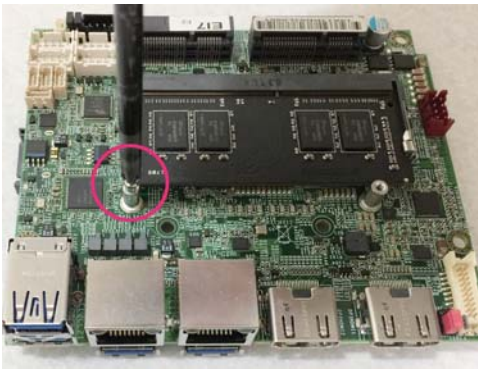


2. Lift the SO-DIMM out of its connector carefully.

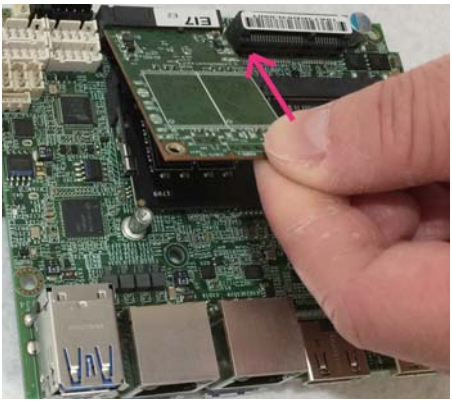


1-4 Installing the Mini PCI-e Card (Full Size)

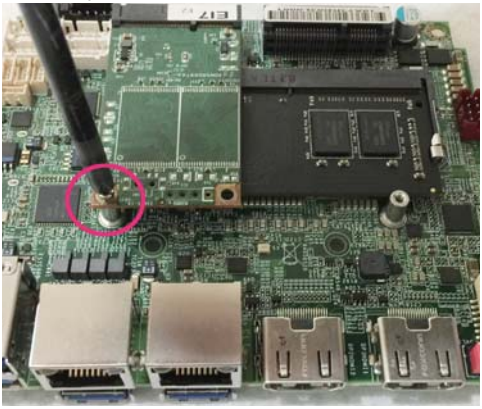
1. Unscrew the screw on the board



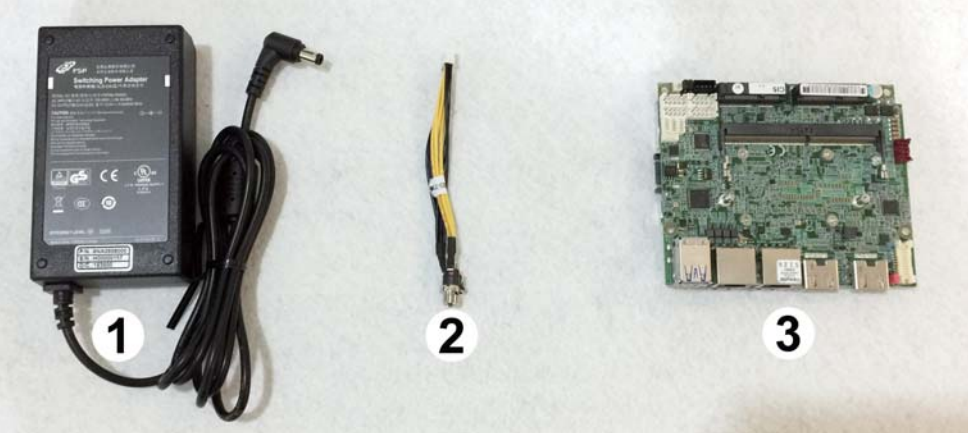
2. Plug in the Mini Card in a 45 angle



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



1-5 Packing List



	Material Code	Description	Detail Specification	Quantity
1	6G5212-0623-0100	60W Power Adapter,12V/5A	L Type,2.5Ø,FSP060-DHAN3,FSP	1
2	6G6003-7350-0100	Power Cable	LF, 2.0 2*4/DC JK,L=9cm	1
3	7G1901-2042001-0	MB-2I612CW-EC0-001	LF,2I612CW-EC0,Rev.:001	1

Optional accessories (items in addition to motherboard)
are not included in the standard packing.
Please contact your dealer to purchase the optional accessories.

Chapter-2

Hardware Installation

2-1 Unpacking Precaution

This chapter provides the information how to install the hardware of 2I612CW.
Please follow section 1-5, 2-1 and 2-2 to check the delivery package and unpack carefully. Please follow the jumper setting procedure.

NOTE!

1. Do not touch the board or any other sensitive components without all necessary anti-static protection.
2. Please pay attention to the voltage limitation of DC-IN 12V 5%.
   Overuse of DC-IN voltage limitation or change to another power adapter (not provided with this system) will VOID warranty.

You should follow these steps to protect the board from the static electric discharge whenever you handle the board:

1. Ground yourself by a grounded wrist strap at all times when you handle the 2I612CW.
   Well secure the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handling the 2I612CW for harmlessly discharge any static electricity through the strap.

2. Please use anti-static pad to put any components, parts, or tools on the pad whenever you work on them outside the computer. You may also use the anti-static bag instead of the pad. Please ask your local supplier for necessary parts on anti-static requirement.

3. Do not plug any connector or set any jumper when the power is on.

2-2 Unpacking checkup

First of all, please follow all necessary steps of section 2-1 to protect 2I612CW from electricity discharge. With reference to section 1-5 please check the delivery package again with following steps:

1. Unpack the 2I612CW board and keep all packing material, manual and driver disc etc, do not dispose !

2. Is there any components lose or drops from the board?
   DO NOT CONTINUE TO INSTALL THIS BOARD!
   CONTACT THE DEALER YOU PURCHASED THIS BOARD FROM, IMMEDIATELY.

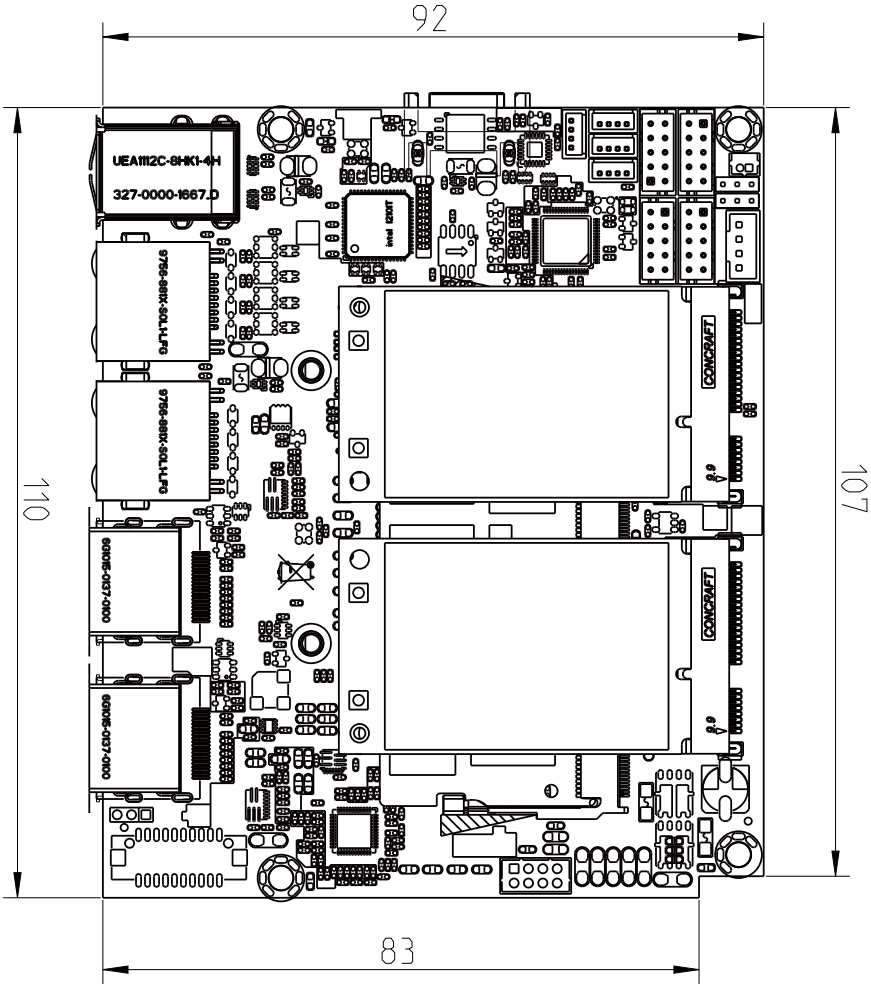
3. Is there any visible damage on the board?
   DO NOT CONTINUE TO INSTALL THIS BOARD!CONTACT THE DEALER YOU PURCHASED THIS BOARD FROM, IMMEDIATELY.

4. Check your optional parts (i.e. DDR, CF etc.), all necessary jumpers setting to jumper pin-set, and CMOS setup correctly.
   Please also refer to all information of jumper settings in this manual.

5. Check your external devices (i.e. Add-On-Card, Driver Type etc.) for complete add-in or connection and CMOS setup correctly.
   Please also refer to all information of connector connection in this manual.

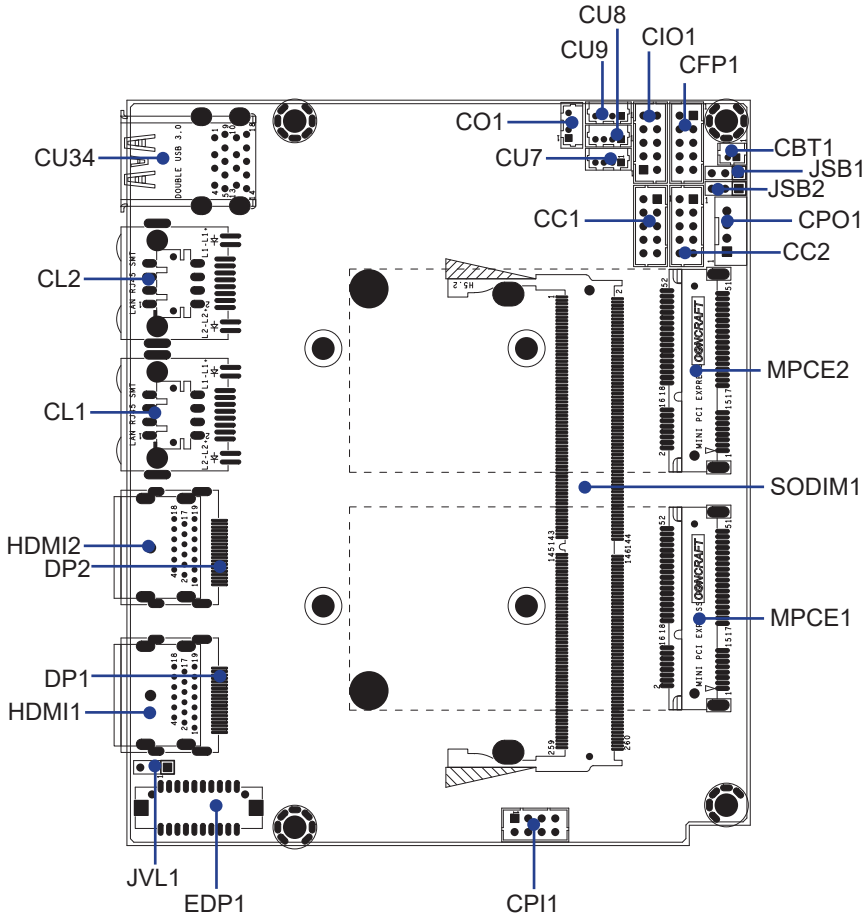
6. Please keep all necessary manual and driver disc in a good condition for future re-installation if you change your Operating System.

2-3 Dimension-2I612CW



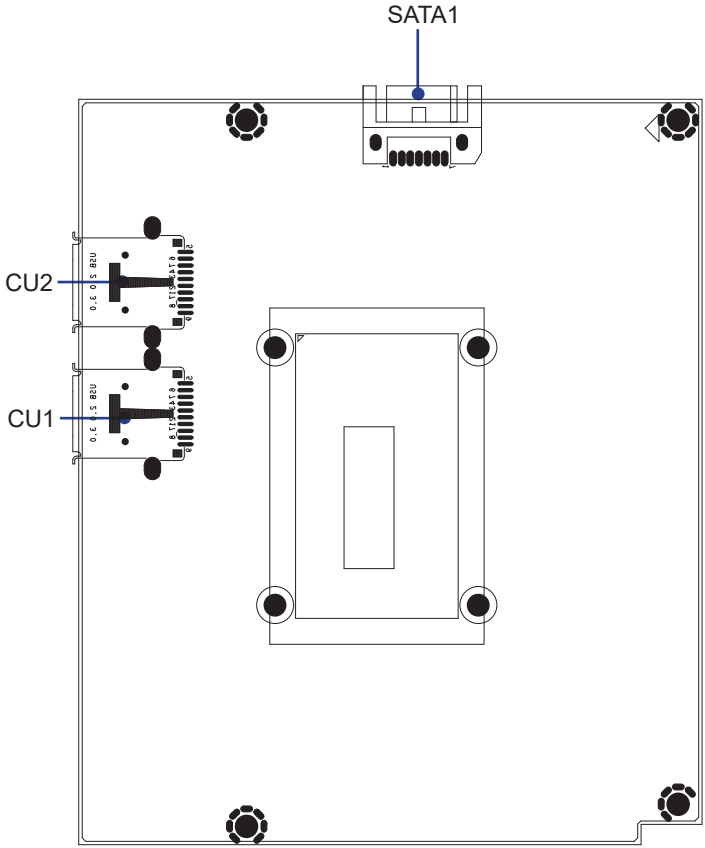
2-4 Layout-2I612CW-Connector and Jumper

TOP



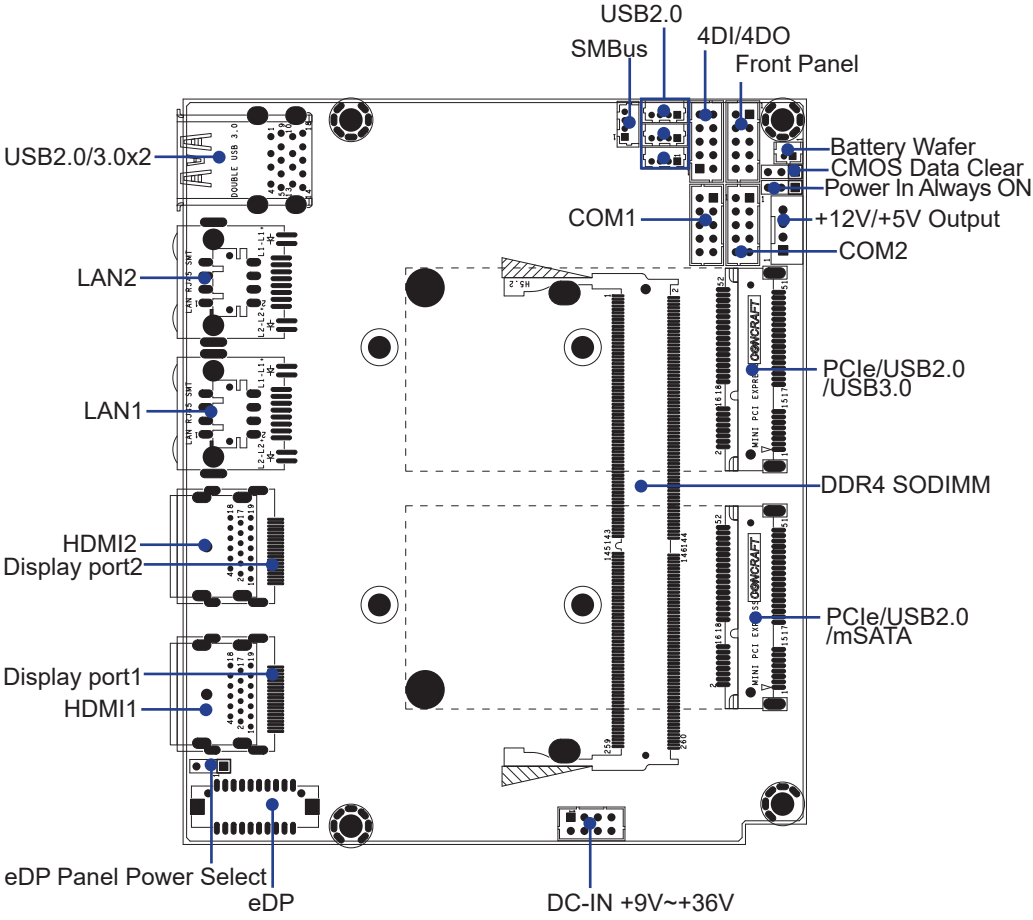
2-4-1 Layout-2I612CW-Connector and Jumper Bottom

BOT



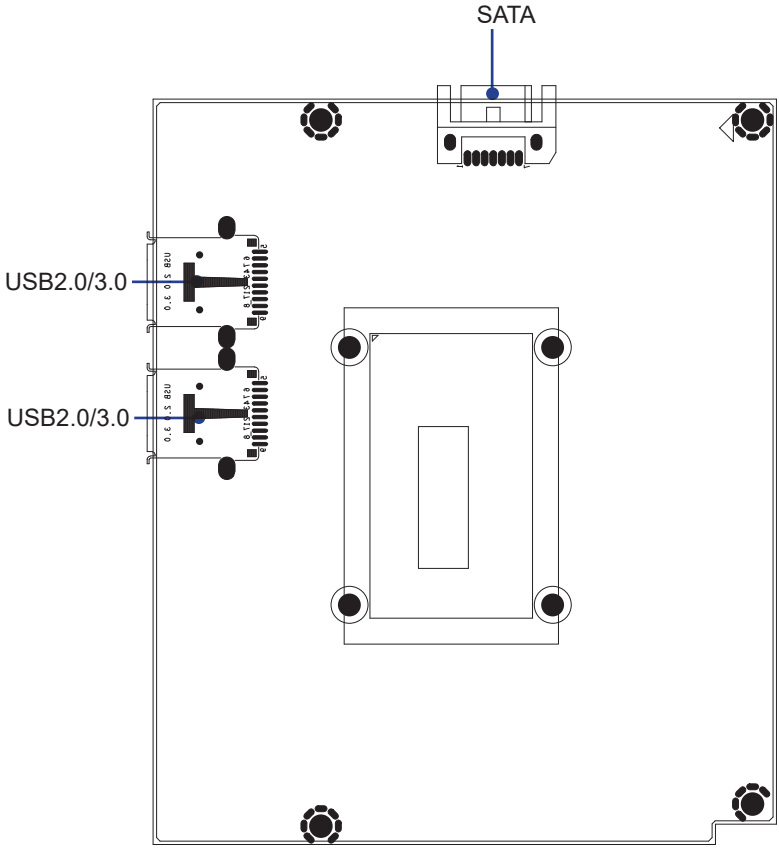
2-5 Layout-2I612CW-Function MAP

TOP



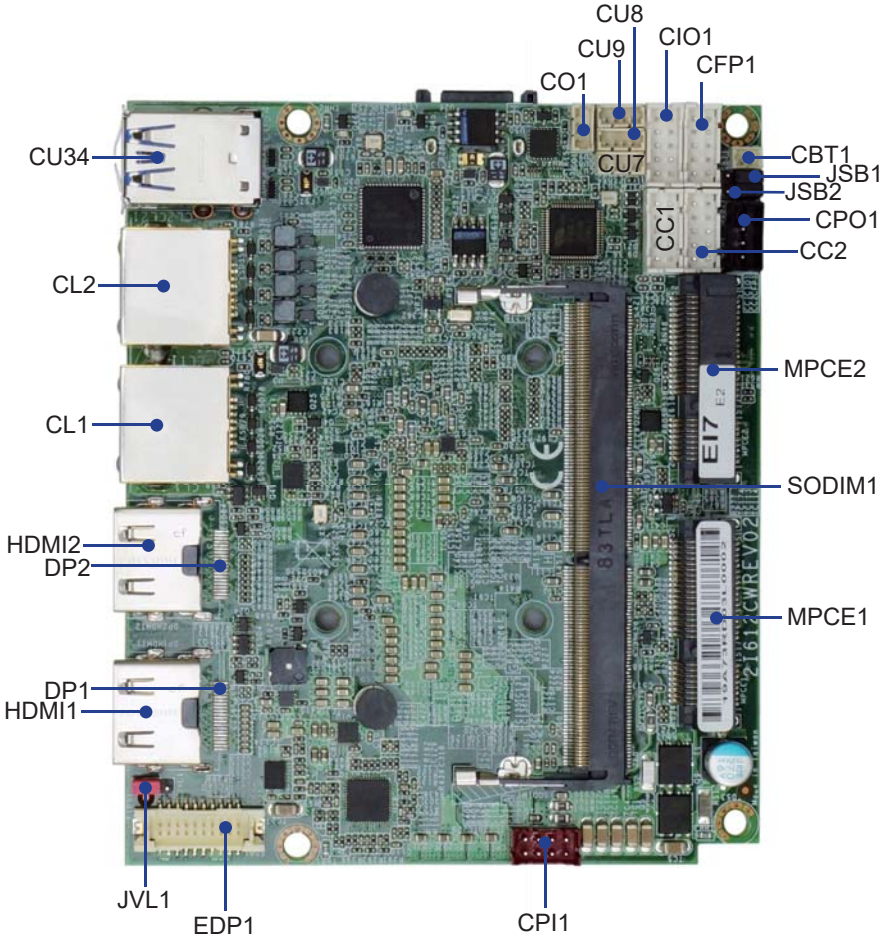
2-5-1 Layout-2I612CW-Function MAP

BOT



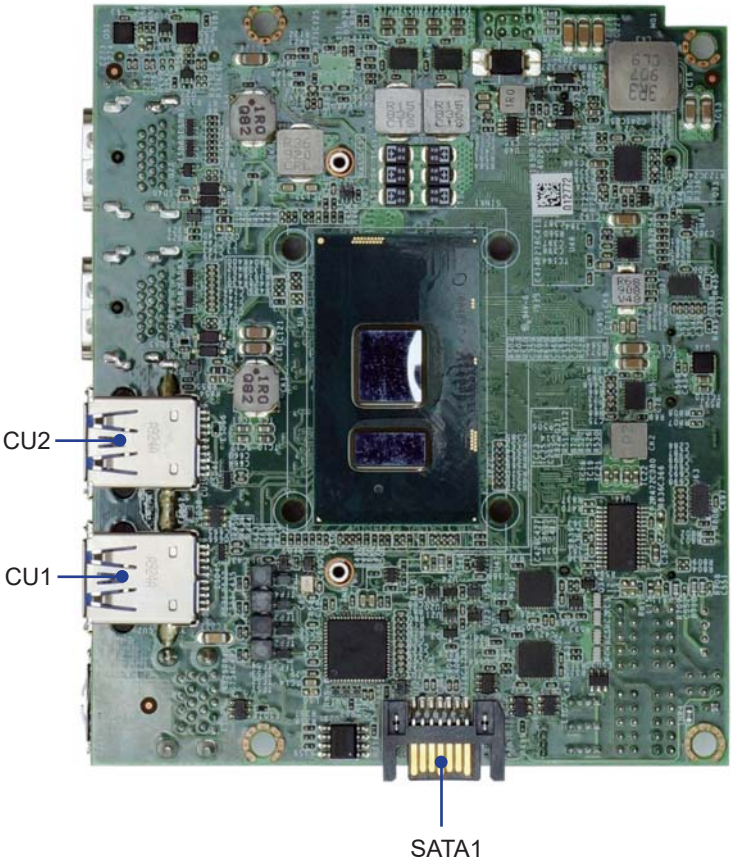
2-6 Diagram- 2I612CW

TOP

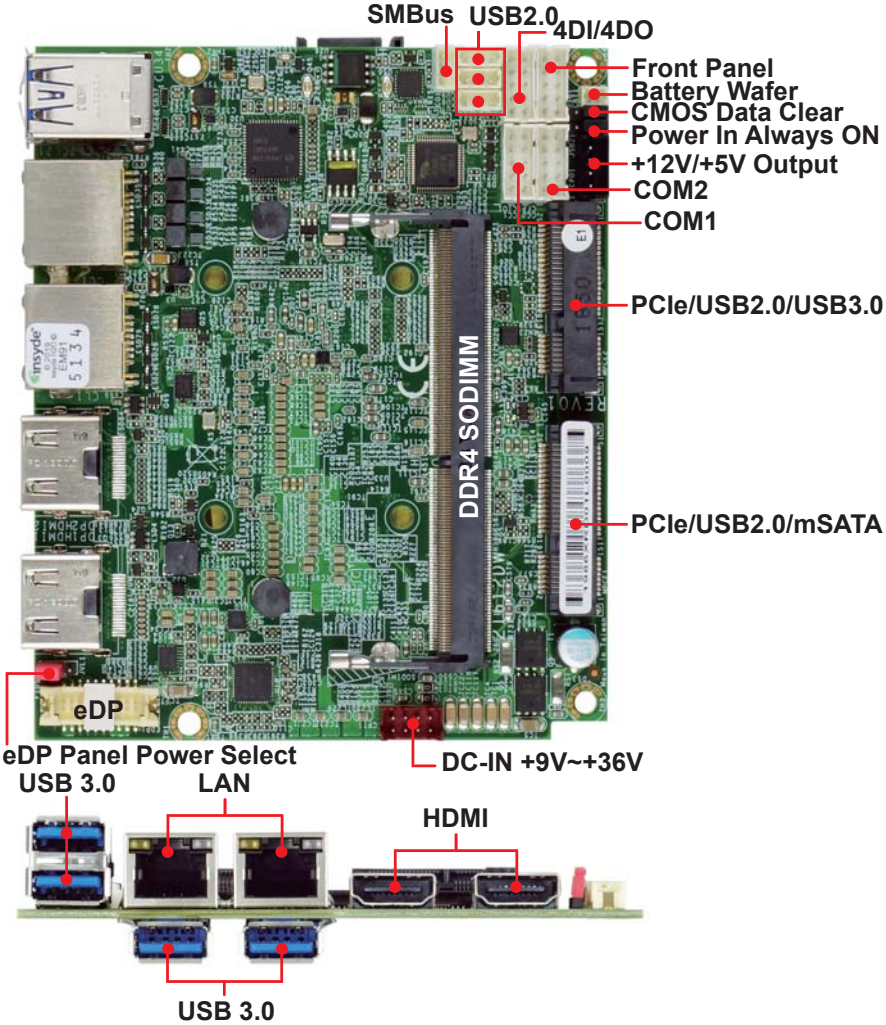


2-6-1 Diagram- 2I612CW

BOT



2-6-2 Function MAP- 2I612CW



2-7 List of Jumpers

JSB1: CMOS DATA Clear

JSB2: Power in always ON function

JVL1: eDP panel power select

2-8 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.

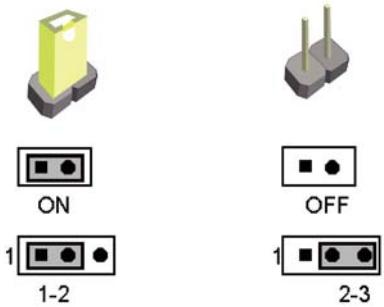


Figure 2.2

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 .

2-9 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

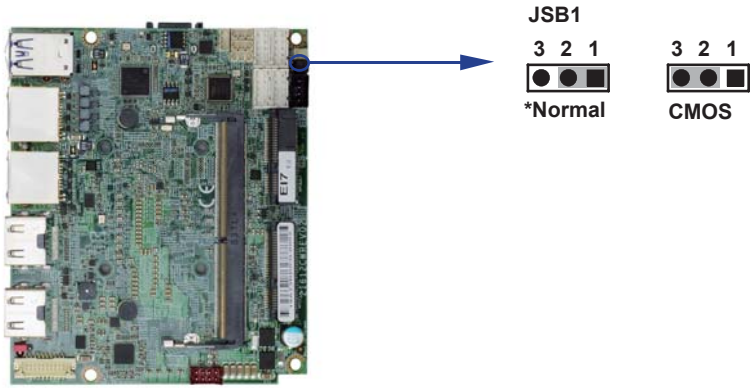
JSB1	DESCRIPTION
*1-2	Normal set
2-3	CMOS data clear

Note: Do not clear CMOS unless

1. Troubleshooting

2. Forget password

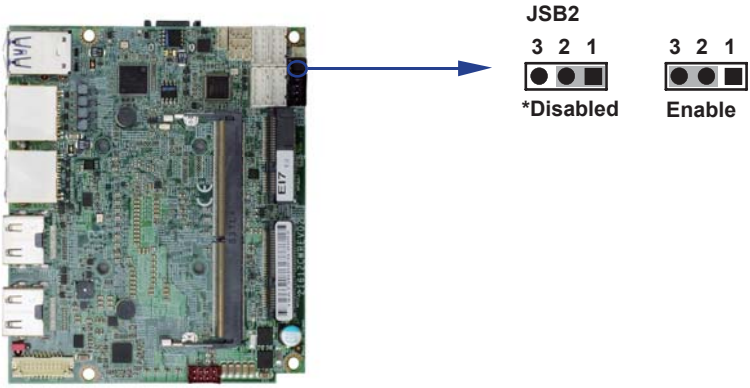
3. You fail over-clocking system



2-10 JSB2: Power in always ON function

JSB2	DESCRIPTION
*1-2	Disabled
2-3	Enable

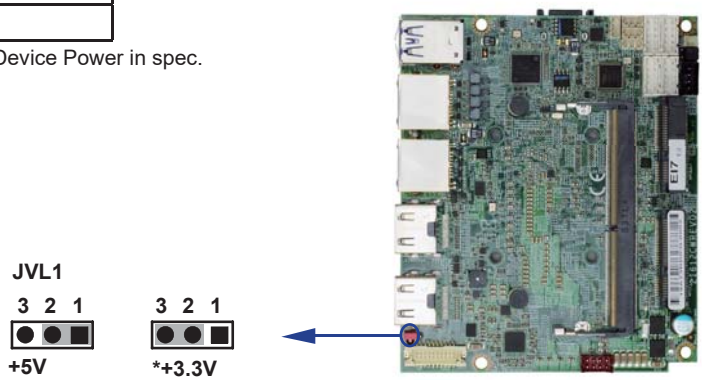
NOTE: Power always on function default is disabled.



2-11 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

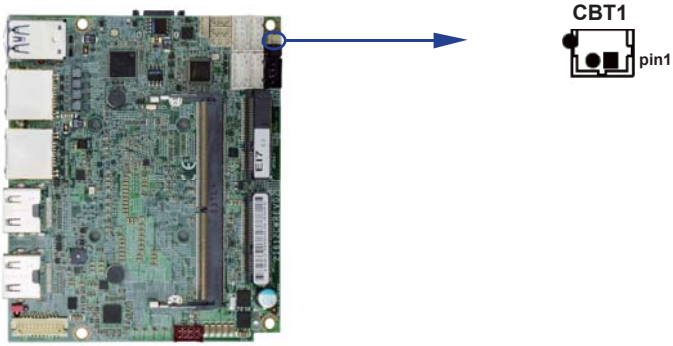
CBT1:	CMOS Battery in 1x2 pin (1.25mm) wafer
CU1:	USB 3.0 type A connector
CU2:	USB 3.0 type A connector
CU34:	USB 3.0 type A connector
CU7:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU8:	USB 2.0 port 1x4 pin (1.25mm) wafer
CU9:	USB 2.0 port 1x4 pin (1.25mm) wafer
CL1 :	RJ45 LAN connector
CL2 :	RJ45 LAN connector
CL11:	LAN port 2x4 pin (2.0mm) wafer (option)
CL21:	LAN port 2x4 pin (2.0mm) wafer (option)
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:	I2C Bus 1x4 pin (1.25mm) wafer
CPI1:	DC-IN 2x4 pin (2.0mm) Red wafer
CPO1:	+12V / +5V power output 1x4 pin (2.0mm) Black wafer
EDP1 :	eDP 2x10 pin (1.25mm) wafer
SATA1:	SATA connector 7pin.
SODIM1 :	DDR4 Channel 0 SODIMM H: 5.2mm
MPCE1 :	Full size mini card port 1 socket 52pin
MPCE2 :	Full size mini card port 2 socket 52pin
HDMI1 :	HDMI typeA connector
HDMI2 :	HDMI typeA connector
DP1 :	Display Port connector (option)
DP2 :	Display Port connector (option)

3-2 CMOS battery connector

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

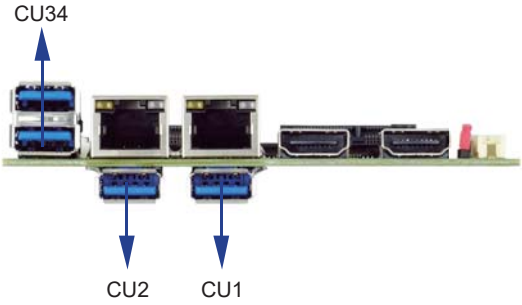
PIN NO.	DESCRIPTION
1	Battery in (GND)
2	Battery in (+3V)

NOTE: CBT1 for external connector can extend battery capacity.



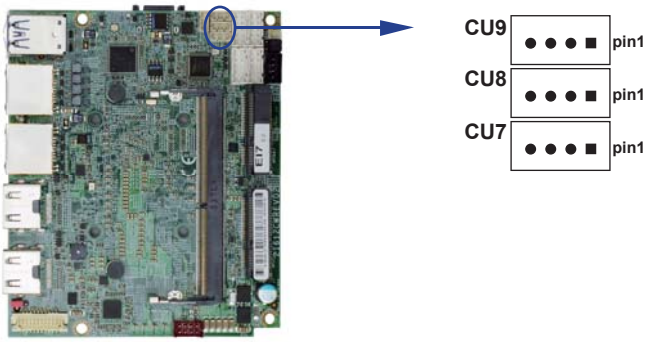
3-3 CU1.CU2.CU34: USB 3.0 / 2.0 Type A connector

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-



3-4 CU7.CU8.CU9: USB2.0 1x4 pin (1.25mm) wafer

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

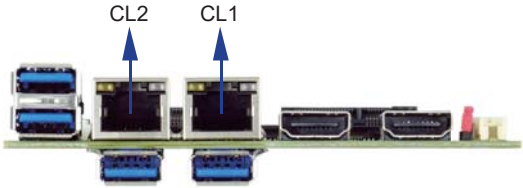


3-5 CL1.CL2: RJ45 LAN Connector

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 Giga / 100 / 10MB Connector

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



3-6 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+

3-7 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	NC

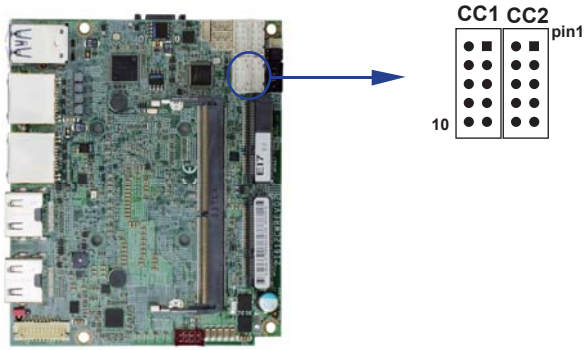
Note: 1. COM 1 / 2 Default RS232, RS485 / RS422 by BIOS control.
2. The pin9 RI can be modify to Power to supply device.
The power voltage can be set +12V or +5V.
The RI change Voltage function set by BOM control .Default is RI signal.

● 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	NC

● RS422 Mode

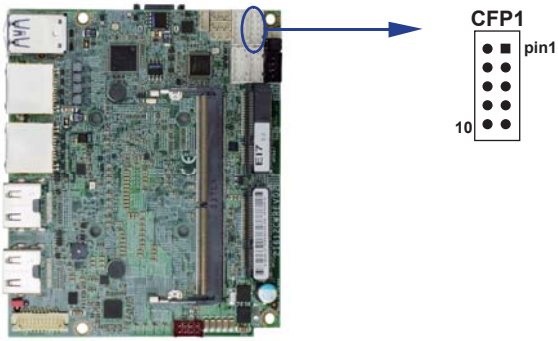
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	2	TX+
3	RX+	4	RX-
5	GND	6	NC
7	NC	8	NC
9	NC	10	NC



3-8 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+

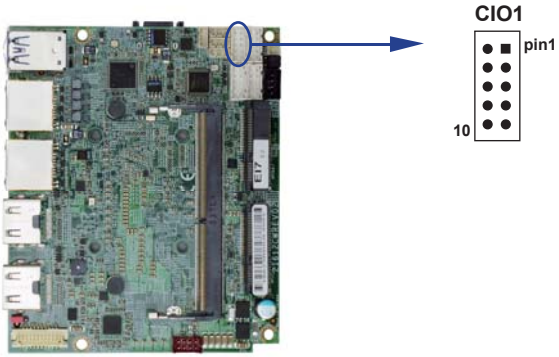


3-9 Digital Input / Output / Watch Dog Time

● 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 I²C 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.

3-9-1 IO Device: F75111 under DOS

The Sample code source you can download from

Source file: F75111_Dos_Src.rar http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_DOS

Binary file: F75111_Dos_Bin.rar

USERNAME & PASSWORD: sf

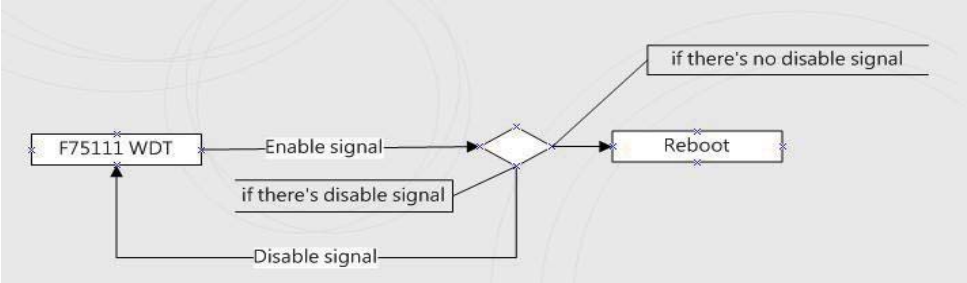
How to use this Demo Application

1.Boot Ms-Dos Operating System

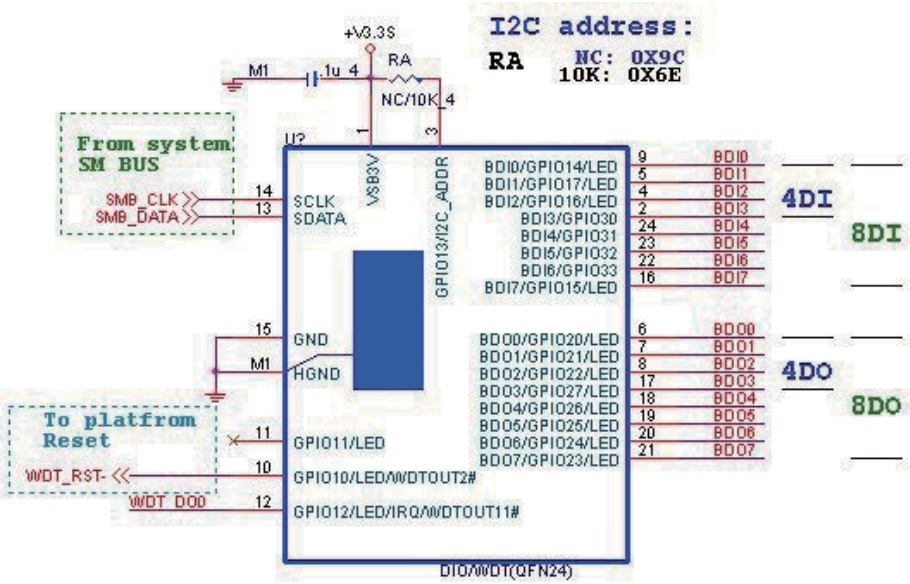
2.execute "75WDT.EXE" binary file

3.Input 1 to Enable WDT timer or input 0 to Disable it.

4.input numbers of second for chip countdown and Reset Computer



F75111 Layout Picture



Introduction

Enable Watch Dog Timer

```
WriteI2CByte(I2CADDR, CONFIG, 0x03);//Set Watch Dog Timer function
  WriteI2CByte(I2CADDR, WDT_TIMER, timer);//Set Watch Dog Timer range from 0-255.
  WriteI2CByte(I2CADDR, WDT_TIMER_CTL, 0x73);//Enable Watch Dog Timer in second and pulse mode
```

Disable Watch Dog Timer

```
WriteI2CByte(I2CADDR, WDT_TIMER_CTL, 0x00);
```

Time Pause for mini seconds

```
void pause(int time)
 {
    asm mov ah,0h;          //Ah = 00 Read System Time Counter

    asm int 1ah;            //read time from Time Counter and store it in DX register
    asm add dx,time;
    asm mov bx,dx;
    label:
    asm int 1ah;
    asm cmp bx,dx;
    asm jne label;
 }
```

3-9-2 IO Device: F75111 CIO Utility

The Sample code source you can download from

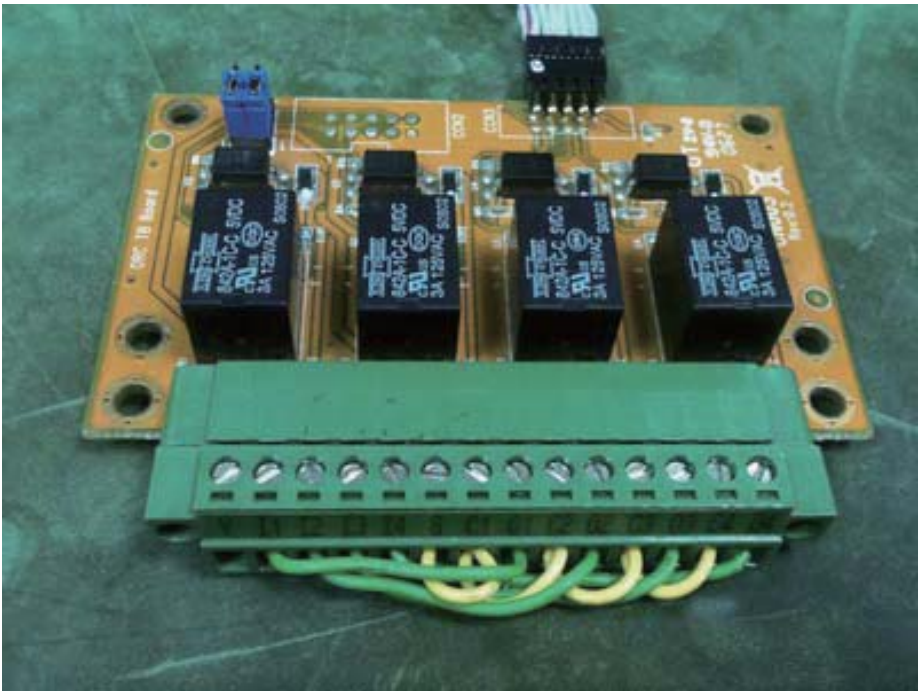
Source file: CIO_Utility_Src_v3.0.5_w.zip http://tprd.info/lexwiki/index.php/IO_Device:F75111_CIO_Utility

Binary file: CIO_Utility_Bin_v3.0.5_x32_w.zip

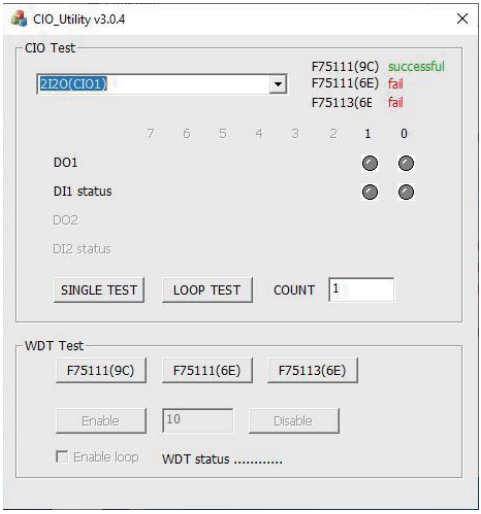
CIO_Utility_Bin_v3.0.5_x64_w.zip

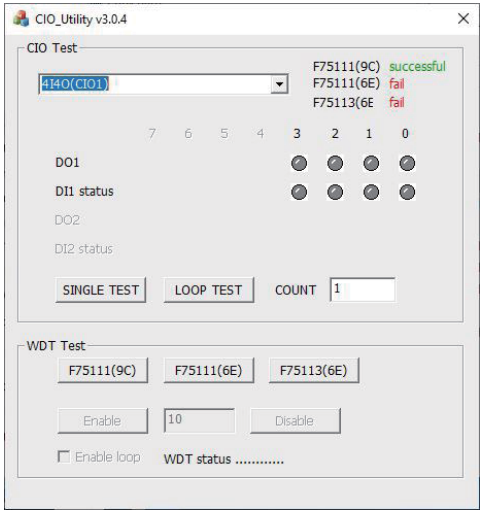
F75113 DLL : F75113.dll

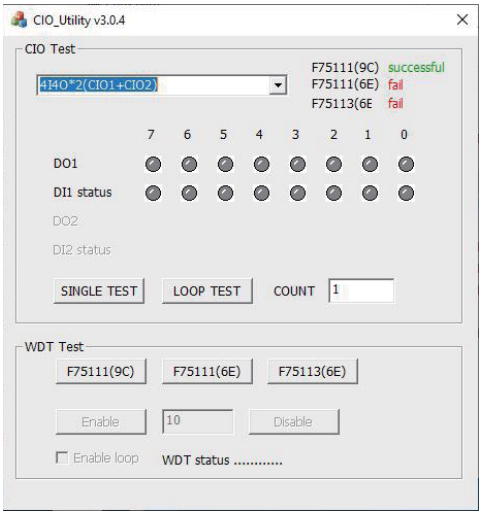
We do the demo test with a test tool which DIx connect to DOx with Relay.

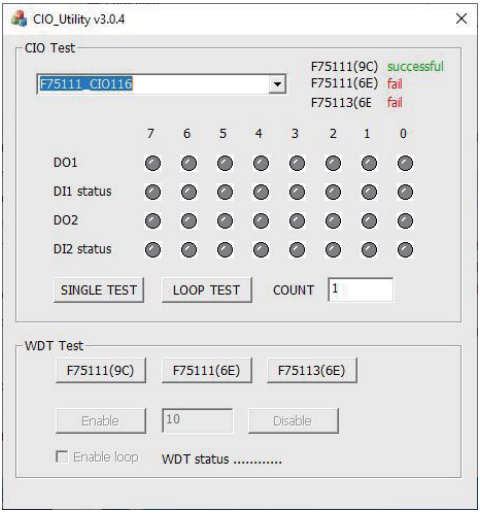


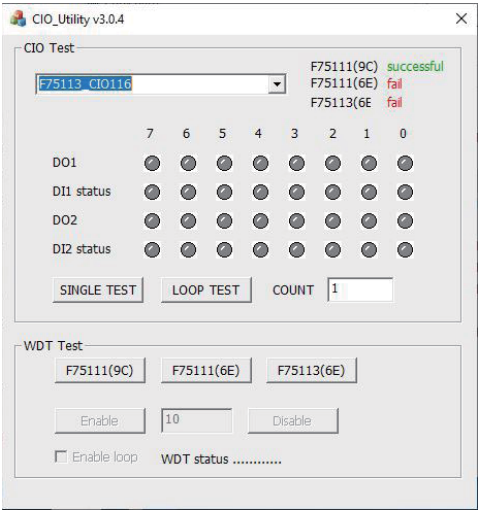
How to use this Demo Application

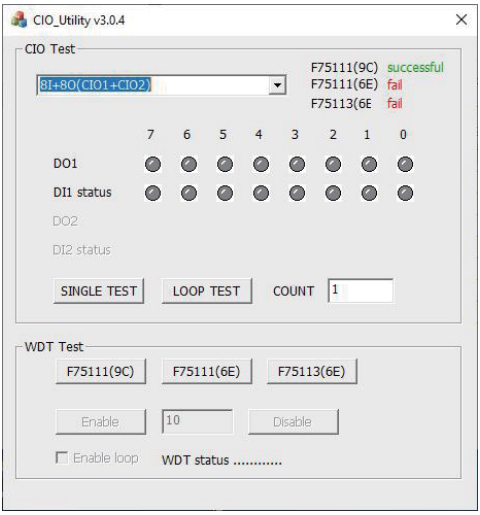








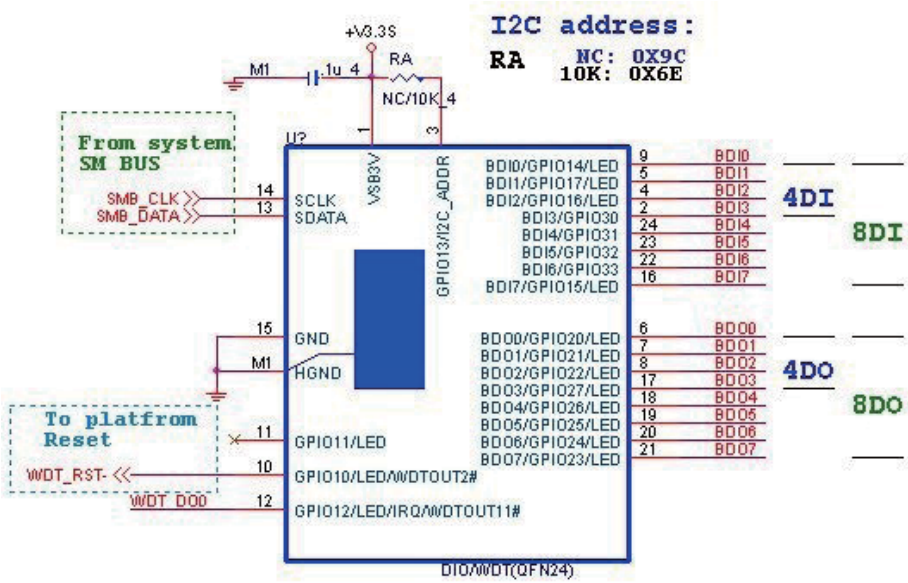




Attention Please:You must be install vcredist_x86.exe when first time you run the F75111_DIO.exe DEMO AP,The vcredist_x86.exe include all required DLL file.

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
}
```

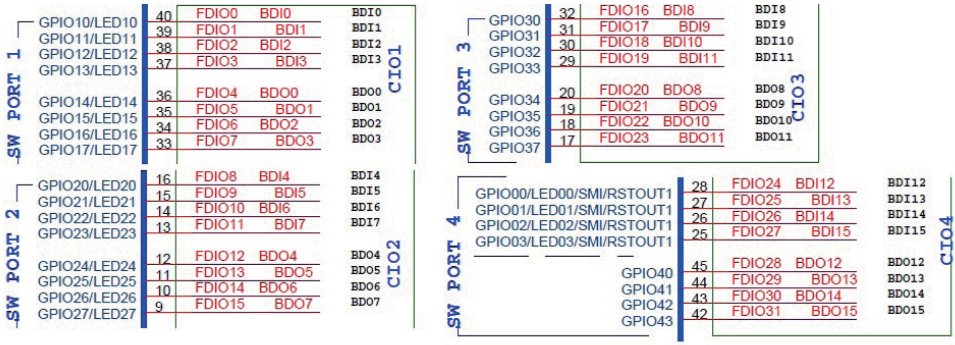
Get Input value

```
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.
//-----------------------------------------------------------------------------------------------------------
```

Introduction F75113



Base on 75113.Dll API function as below list

```
F75113_API bool _stdcall F75113_Init();
F75113_API BYTE        F75113_GetDigital_Low_Input();          //BDI0-BDI7
F75113_API BYTE        F75113_GetDigital_High_Input();         //BDI8-BDI15
F75113_API void        F75113_SetDigital_Low_Output(BYTE byteValue);   //BDO0-BDO7
F75113_API void        F75113_SetDigital_High_Output(BYTE byteValue);  //BDO8-BDO15

F75113_API void        F75113_SetWDT_Enable(BYTE byteTimer);     //For the F75113 on board
F75113_API void        F75113_SetWDT_Disable();                  //For the F75113 on board
```

3-9-3 IO Device:F75111 CIO Utility CIO116

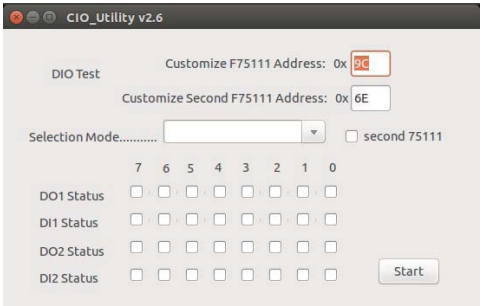
The Sample code source you can download from

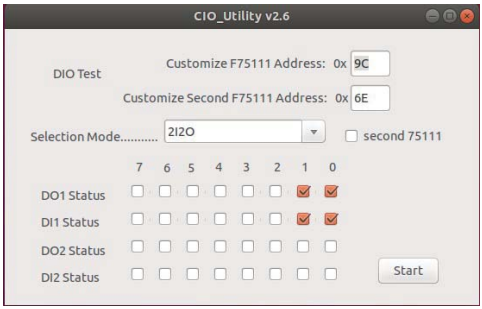
Source file: CIO_Utility_Src_v3.0.3.tar.gz

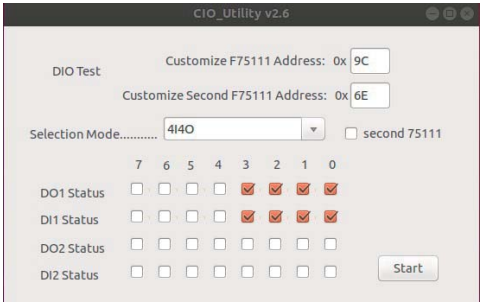
Binary file: CIO_Utility_Bin_v3.0.3_x32.tar.gz CIO_Utility_Bin_v3.0.3_x64.tar.gz

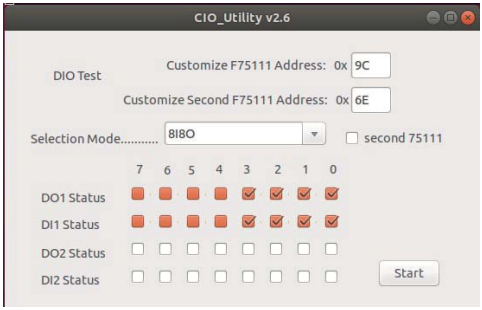
http://tprd.info/lexwiki/index.php/IO_Device:F75111_CIO_Utility_CIO116

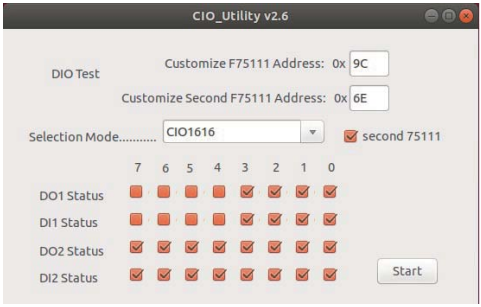
How to use this Demo Application







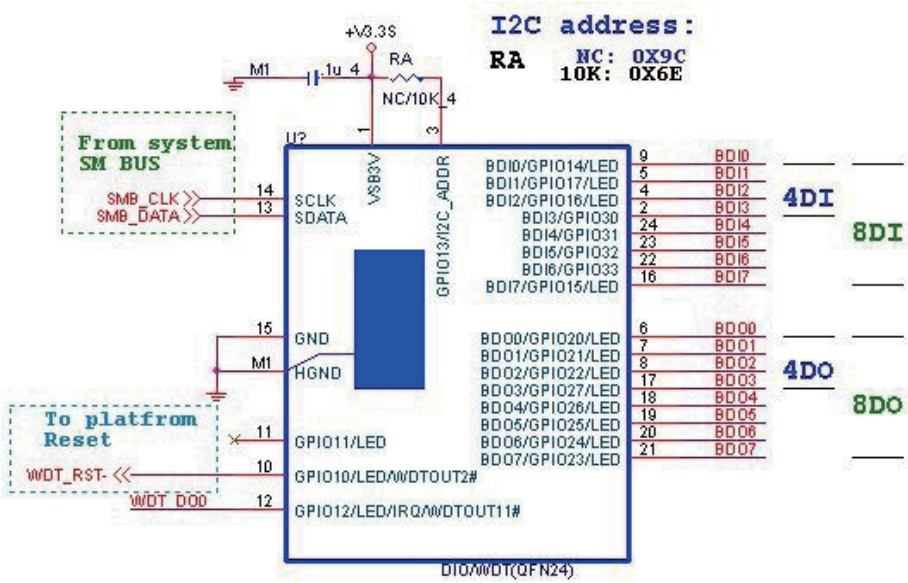




Before executing the program began, Please switch to the highest authority , continued second F75111 ,chmod 777 and root: \

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.
//-----------------------------------------------------------------------------------------------------------
```

3-9-4 IO Device:F75111 CIO Utility Console under linux

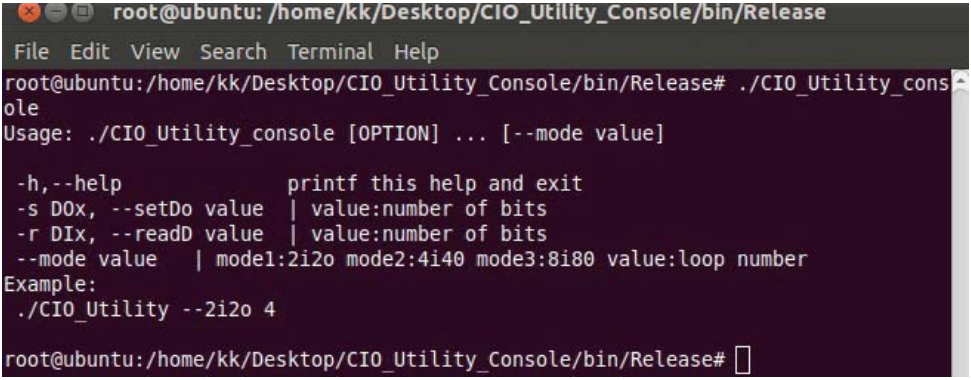
The Sample code source you can download from

Source file: CIO_Utility_Console_L_src_v1.3.tar.gz

Binary file: CIO_Utility_Console_L_bin_v1.3.tar.gz

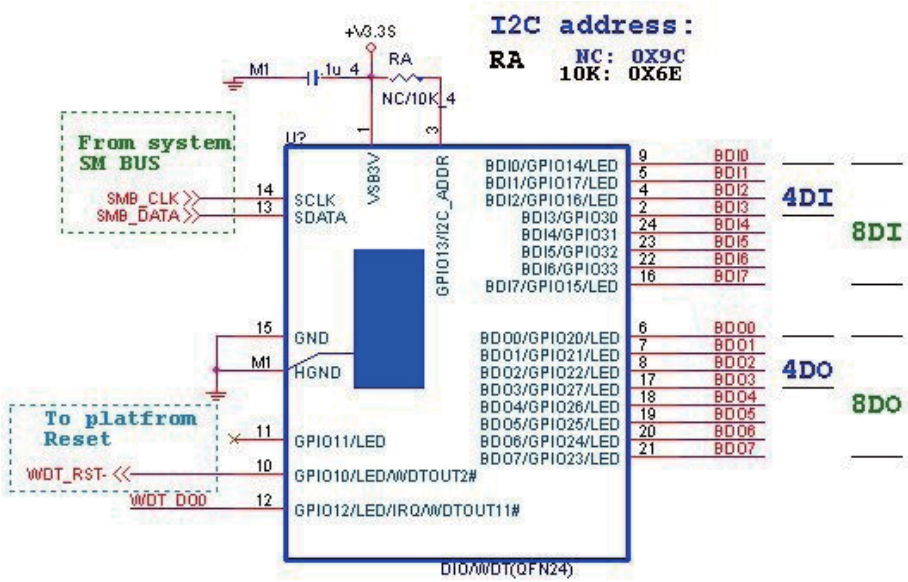
http://tprd.info/lexwiki/index.php/IO_Device:F75111_CIO_Utility_Console_under_linux

How to use this Demo Application



1. The program must control I/O device, when you use this you must change user to root, you can use this command "sudo su"
2.enter "./CIO_Utility_console -h"show help function
Example:
CIO_Utility_console --4i4o 1

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;
}
```

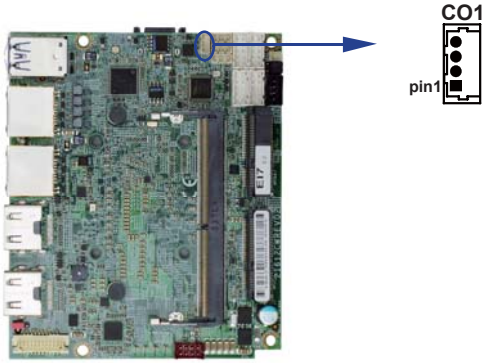
define F75111 pin in F75111.h

```
//-----------------------------------------------------------------------------------------------------------
#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.
//-----------------------------------------------------------------------------------------------------------
```

3-10 I²C Bus Interface

● CO1: I²C Bus 1x4 pin (1.25mm) wafer

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

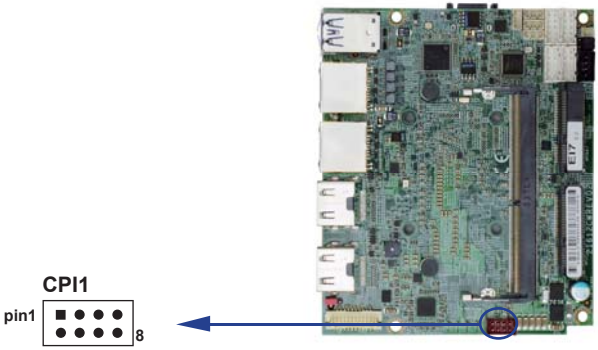


3-11 DC Power Input

● CPI1: DC Power input 2x4 pin (2.0mm) wafer (RED)

PIN NO.	DESCRIPTION
1,2,7,8	GND
3,4,5,6	DC-IN

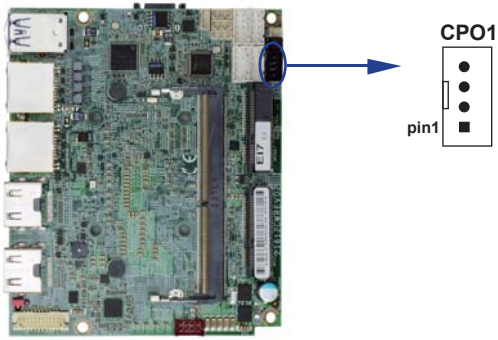
Note: Very important check DC-in Voltage.



3-12 CPO1: +12V / +5V DC voltage output 1x4 pin (2.0mm) wafer (BLACK)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	2	GND
3	GND	4	+12V

Note: Very important check DC-in Voltage.

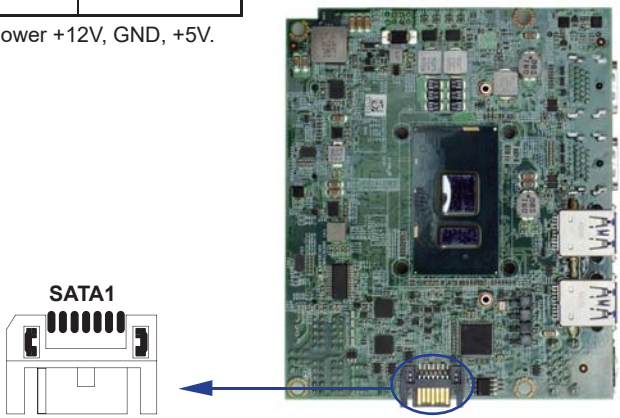


3-13 SATA Interface

- **SATA1: SATA port 1x7 pin connector**

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

Note: CPO1 provide SATA HDD power +12V, GND, +5V.



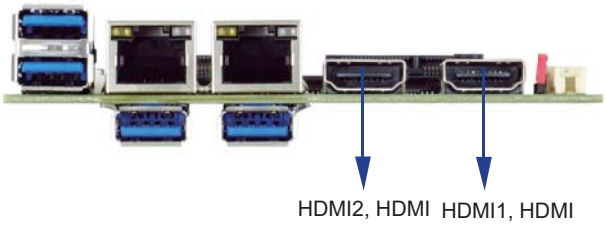
3-14 Display interface

● 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 CLK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		

● DP1 / DP2: Display port connector (option)

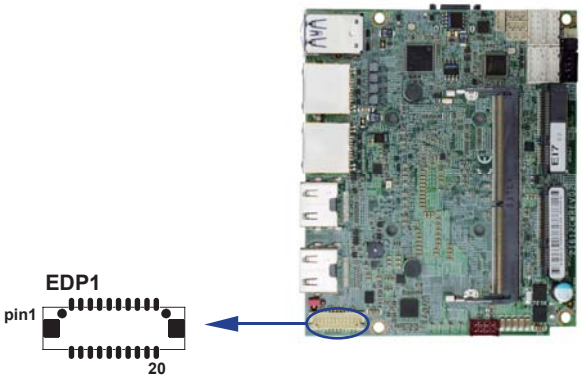
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Lane0+	2	GND
3	Lane0-	4	Lane1+
5	GND	6	Lane1-
7	Lane2+	8	GND
9	Lane2-	10	Lane3+
11	GND	12	Lane3-
13	GND	14	GND
15	AUX_CH+	16	GND
17	AUX_CH-	18	H.P. Detect
19	GND	20	+5V



3-15 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

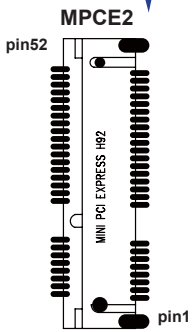
Note:
1. eDP interface support 2 lanes.
2. JVL1: eDP panel +5V / +3.3V (default) Voltage select.
3. eDP1 PIN 9 for panel backlight enable. +3.3V Level
4. eDP1 PIN 11 for panel backlight dimming control

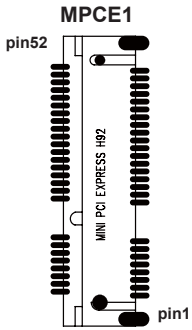


3-16 MPCE1 PCI Express mini card

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
51	mSATA / PCIe detect	52	+3.3V
49	NC	50	GND
47	NC	48	+1.5V
45	NC	46	NC
43	GND	44	NC
41	+3.3V	42	NC
39	+3.3V	40	GND
37	GND	38	USB-DATA+
35	GND	36	USB-DATA-
33	PCIe-TX+ / mSATA-TX+	34	GND
31	PCIe-TX- / mSATA-TX-	32	NC
29	GND	30	NC
27	GND	28	+1.5V
25	PCIe-RX+ / mSATA-RX-	26	GND
23	PCIe-RX- / mSATA-RX+	24	+3.3V
21	GND	22	PERST#
19	NC	20	NC
17	NC	18	GND
Mechanical Key			
15	GND	16	NC
13	REFCLK+	14	NC
11	REFCLK-	12	NC
9	GND	10	NC
7	NC	8	NC
5	NC	6	+1.5V
3	NC	4	GND
1	NC	2	+3.3V

Note: MPCE1 Pin51 mSATA / PCIe auto detect function.





3-17 MPCE2 PCI Express mini card

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
51	NC	52	+3.3V
49	NC	50	GND
47	NC	48	+1.5V
45	NC	46	NC
43	GND	44	NC
41	+3.3V	42	NC
39	+3.3V	40	GND
37	GND	38	USB-DATA+
35	GND	36	USB-DATA-
33	PCIe-TX+ / USB3.0TX+	34	GND
31	PCIe-TX- / USB3.0TX-	32	NC
29	GND	30	NC
27	GND	28	+1.5V
25	PCIe-RX+ / USB3.0RX+	26	GND
23	PCIe-RX- / USB3.0RX-	24	+3.3V
21	GND	22	PERST#
19	NC	20	NC
17	NC	18	GND
Mechanical Key			
15	GND	16	NC
13	REFCLK+	14	NC
11	REFCLK-	12	NC
9	GND	10	NC
7	NC	8	NC
5	NC	6	+1.5V
3	NC	4	GND
1	NC	2	+3.3V

Note: MPCE2 support USB 2.0, PCIe or USB 3.0 by BIOS control.

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 <Del> 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

```
                                InsydeH20 Setup Utility                                  Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 BIOS Version                          2I612CWA1                  This is the help for the hour, minute,
 Build Date                            12/19/2019                 second field. Valid range is from 0 to
 Build Time                            15:24:44                   23, 0 to 59, 0 to 59. INCREASE/REDUCE :
 Processor Type                        Intel(R) Core(TM) i7-6600U CPU @ 2.60GHz  +/-.
 System Bus Speed                      100 MHz
 System Memory Speed                   2133 MHz
 Total Memory                          8192 MB
 Channel A
   SODIMM 0                            8192 MB
 Channel B
   SODIMM 0                            [Not Installed]

 Platform Configuration
 CPUID:                                0x406E3 (SKYLAKE ULT ULX)
 CPU Speed:                            2800 MHz
 CPU Stepping:                         03 (D0/K0 Stepping)
 L1 Data Cache:                        32 KB
 L1 Instruction Cache:                 32 KB
 L2 Cache:                             256 KB
 L3 Cache:                             4096 KB
 PCH Rev / SKU                         21 (C1 Stepping) / SKL PCH-LP (U) Premium
                                        SKU

 System Time                           [16:18:32]
 System Date                           [12/19/2019]

 F1  Help          ↑/↓ Select Item     F5/F6 Change Values       F9  Setup Defaults
 Esc Exit          ←/→ Select Item     Enter Select ▶ SubMenu    F10 Save and Exit
```

There are six menu bars on top of BIOS screen:

Main To change system basic configuration

Advanced To change system advanced configuration

Security Password settings

Power ACPI and wake device settings

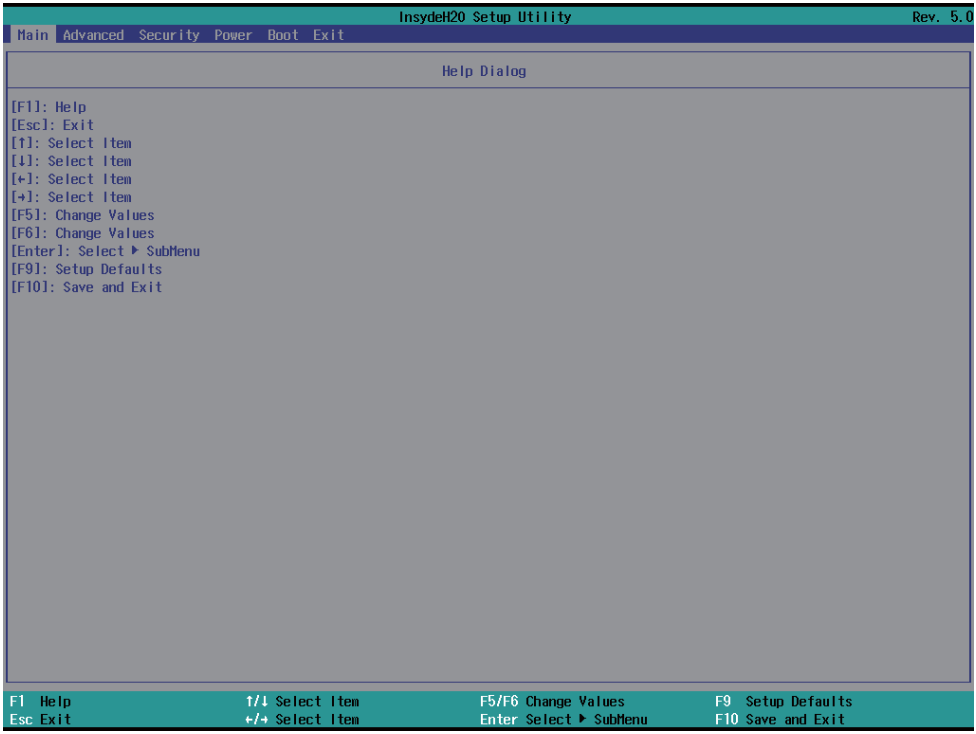
Boot To change system boot configuration

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.

4-3 Getting Help



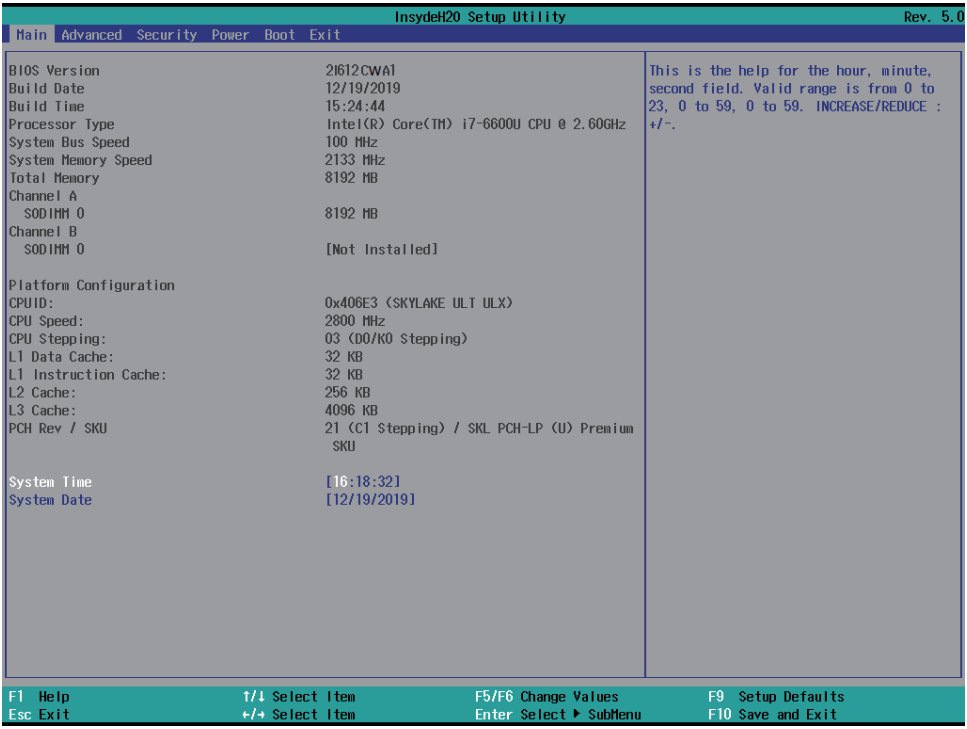
Status Page Setup Menu / Option Page Setup Menu

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>.

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 ←→ (left, right) 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.
- [F9]: Optimized defaults.
- [F10]: Save & Exit.
- Press <Esc> to quit the BIOS Setup.

4-4 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.

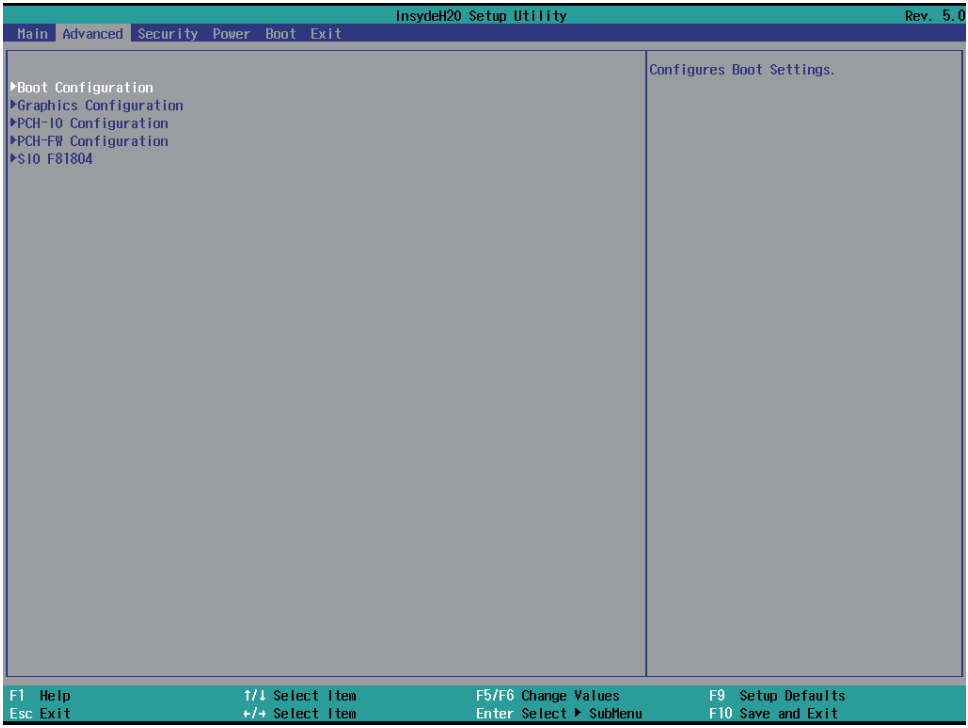
System Date

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

System Time

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

4-5 Advanced



Boot Configuration

Please refer section 4-5-1

Graphics Configuration

Please refer section 4-5-2

PCH-IO Configuration

Please refer section 4-5-3

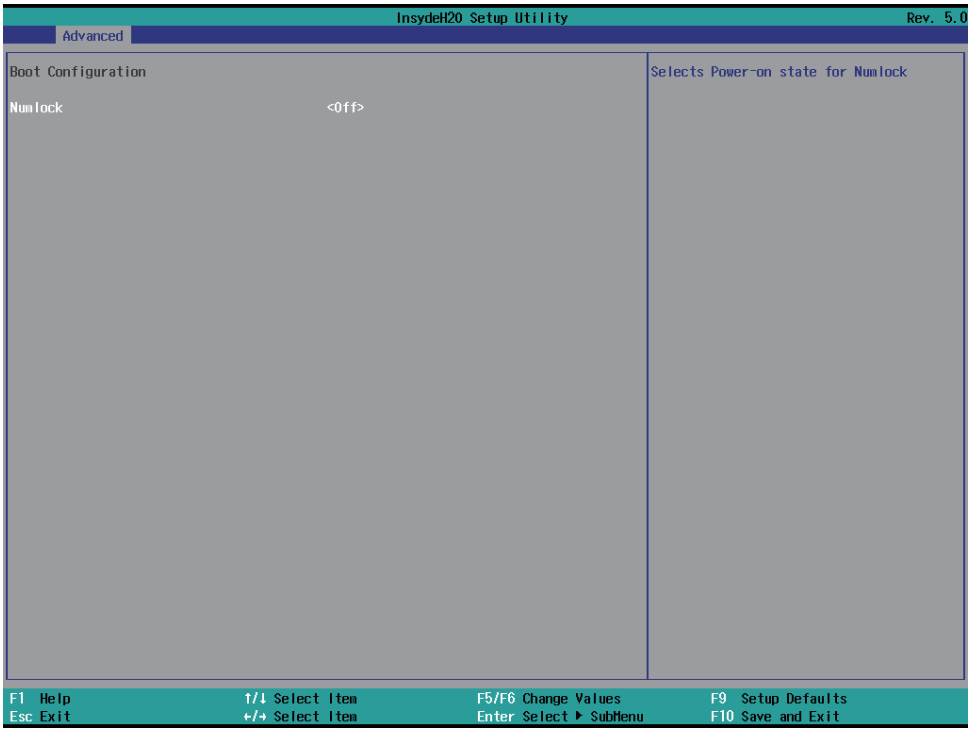
PCH-FW Configuration

Please refer section 4-5-4

SIO FINTEK81804

Please refer section 4-5-5

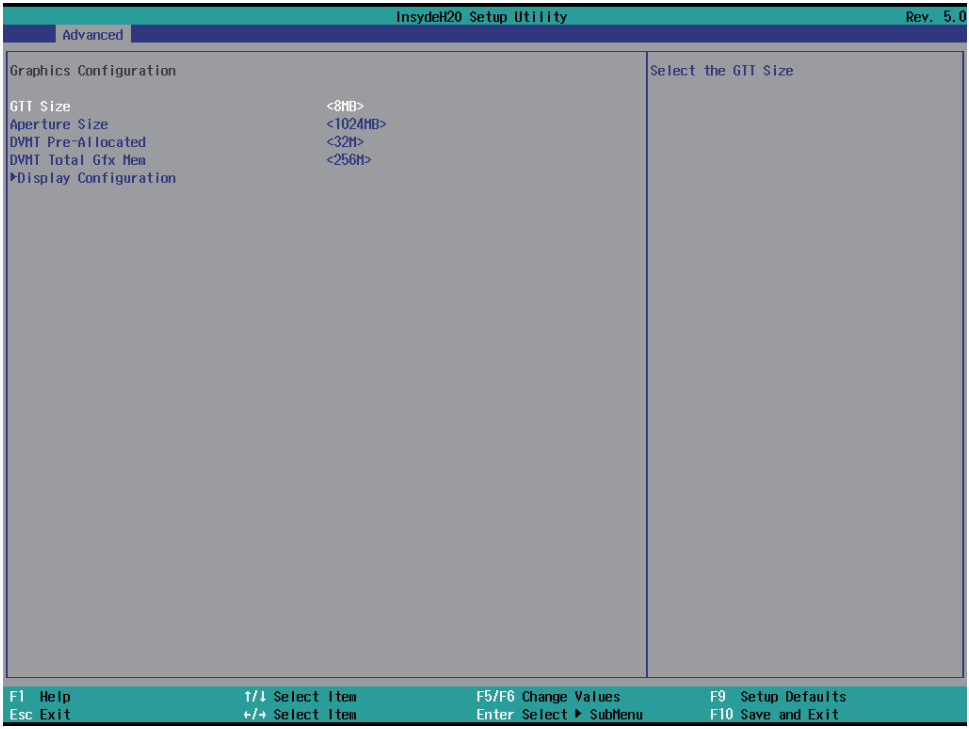
4-5-1 Boot Configuration



Numlock

Select Power-on state for Numlock, default is <Off>

4-5-2 Graphics Configuration



GTT Size

Graphics Translation Table Size. The optional settings are: 2MB, 4MB, 8MB (default)

Aperture Size

The optional settings are: 128MB, 256MB, 512MB, 1024MB(default)

DVMT Pre-Allocated

Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

The optional settings are: 16MB, 32MB (default), 64MB

DVMT Total Gfx Mem

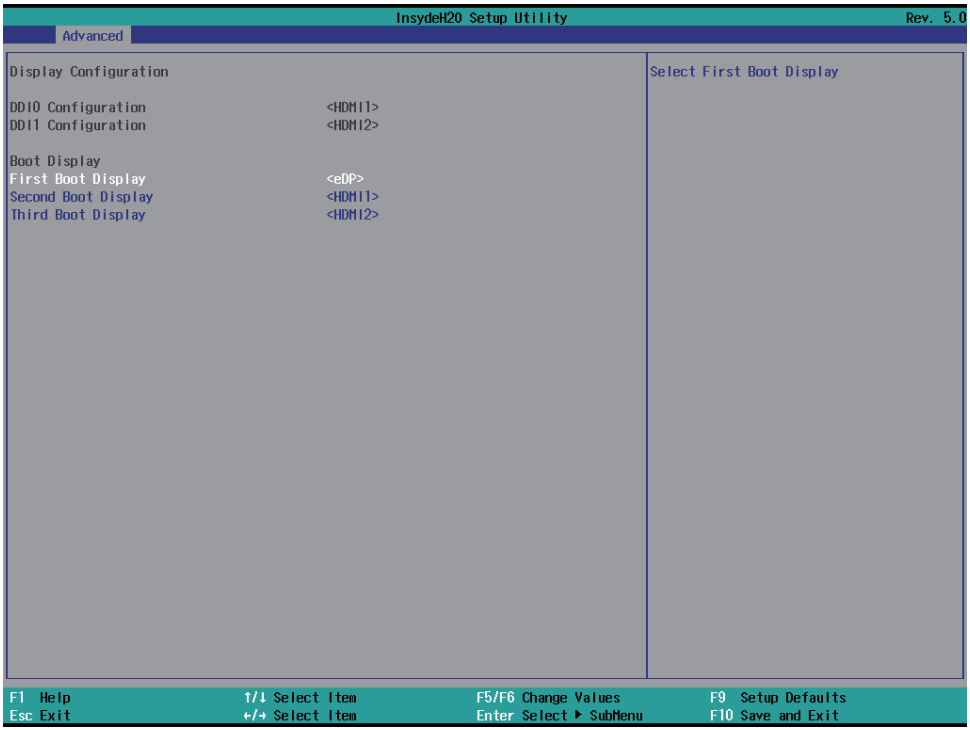
Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device

The optional settings are: 256MB (default), 128MB, MAX.

Display Configuration

Please refer section 4-5-2-1

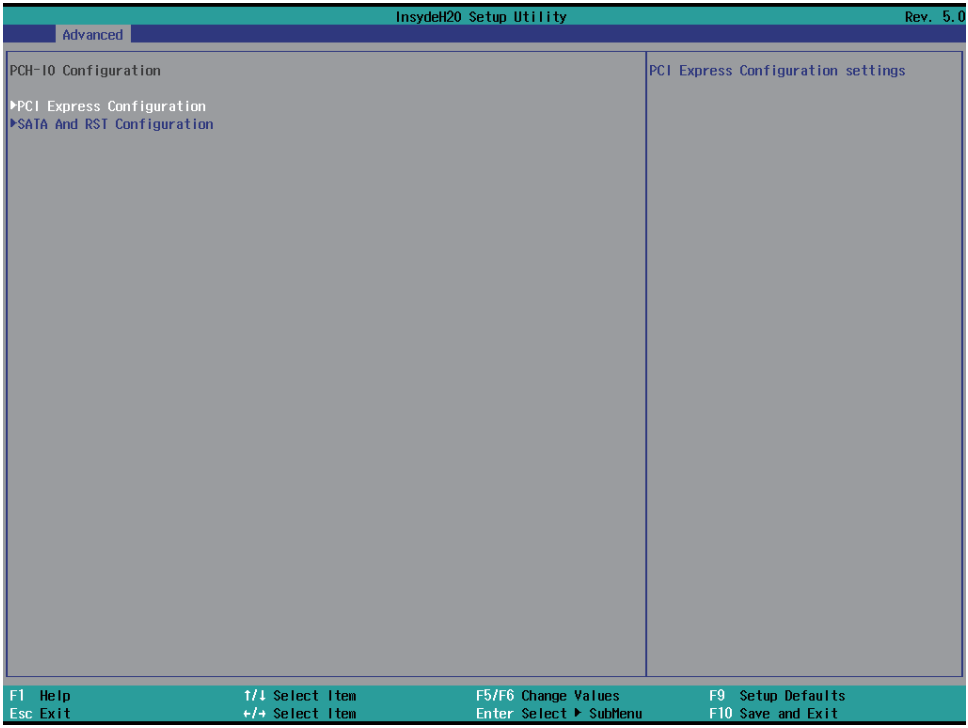
4-5-2-1 ► Display Configuration



Boot Display

To select the displays priority to eDP, HDMI1 or HDMI2

4-5-3 PCH-IO Configuration



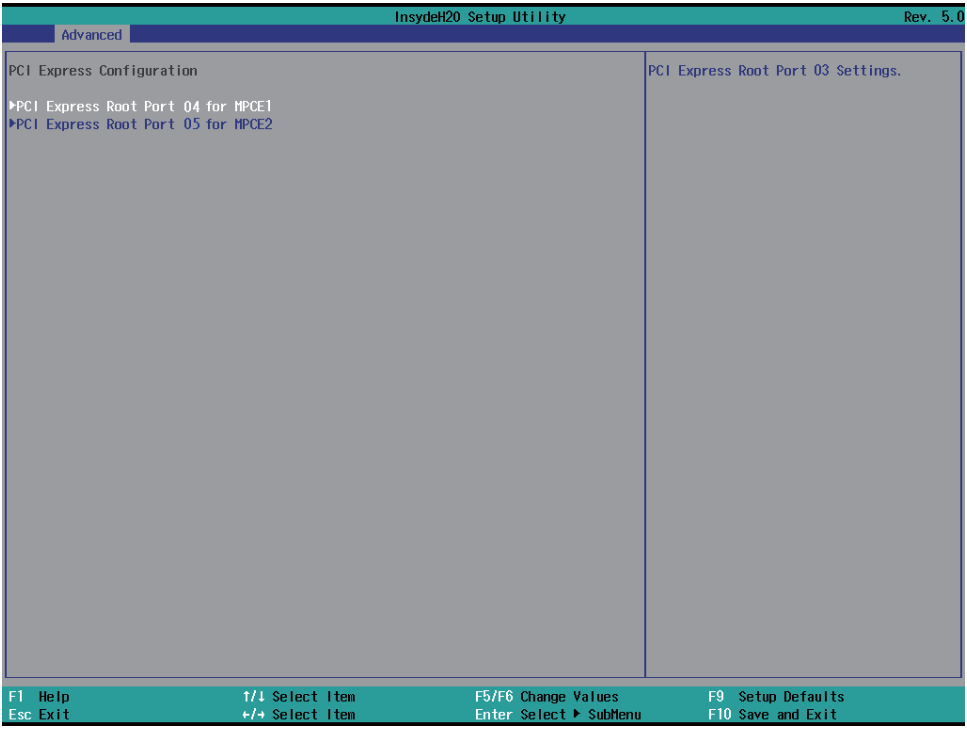
PCI Express Configuration

Please refer section 4-5-3-1

SATA And RST Configuration

Please refer section 4-5-3-2

4-5-3-1 ► PCI Express Configuration



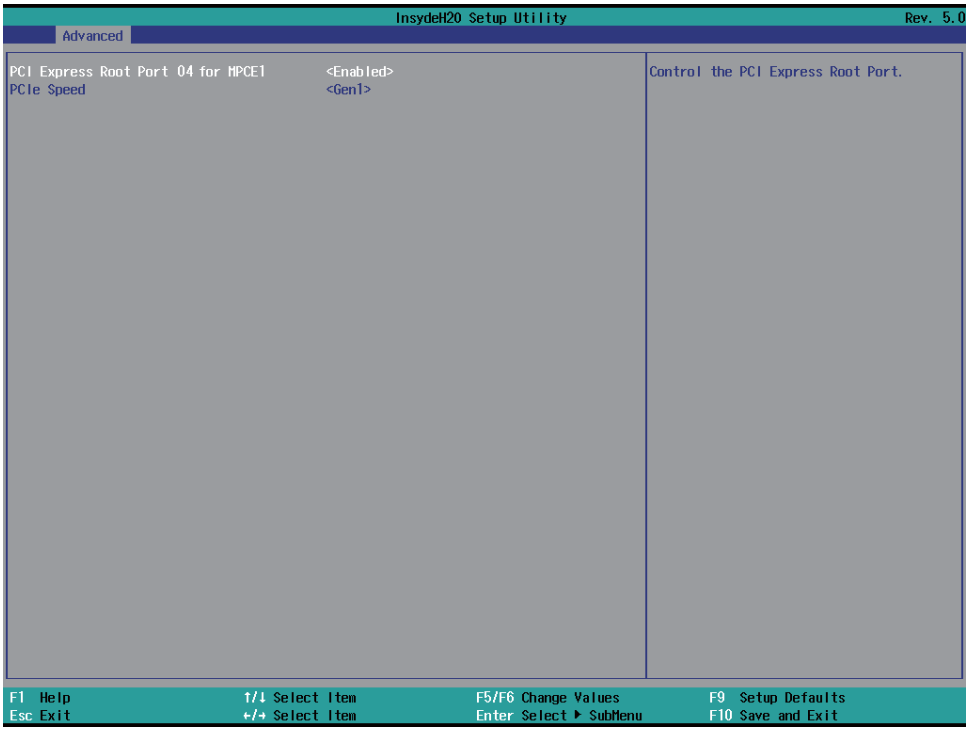
PCI Express Root Port 04 for MPCE1

Please refer section 4-5-3-1-1

PCI Express Root Port 05 for MPCE2

Please refer section 4-5-3-1-2

4-5-3-1-1 ► PCI Express Root Port 04 for MPCE1



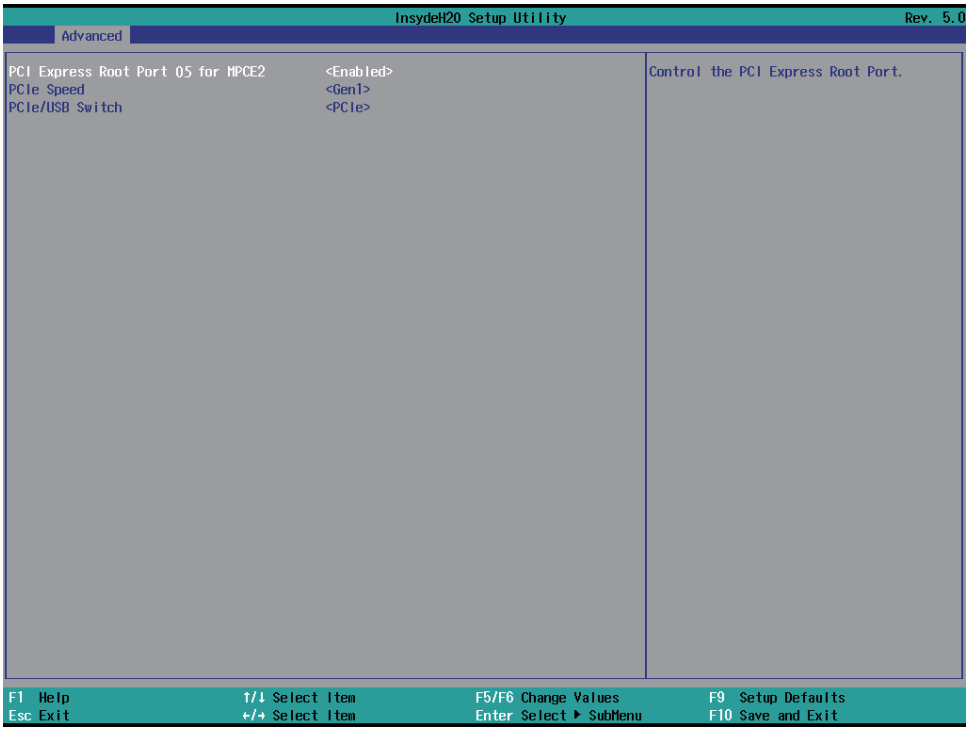
PCI Express Root Port 04 for MPCE1

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

Select PCI Express port speed.

The optional settings are: Auto, Gen1 (default), Gen2, Gen3

4-5-3-1-2 ► PCI Express Root Port 05 for MPCE2



PCI Express Root Port 05 for MPCE2

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

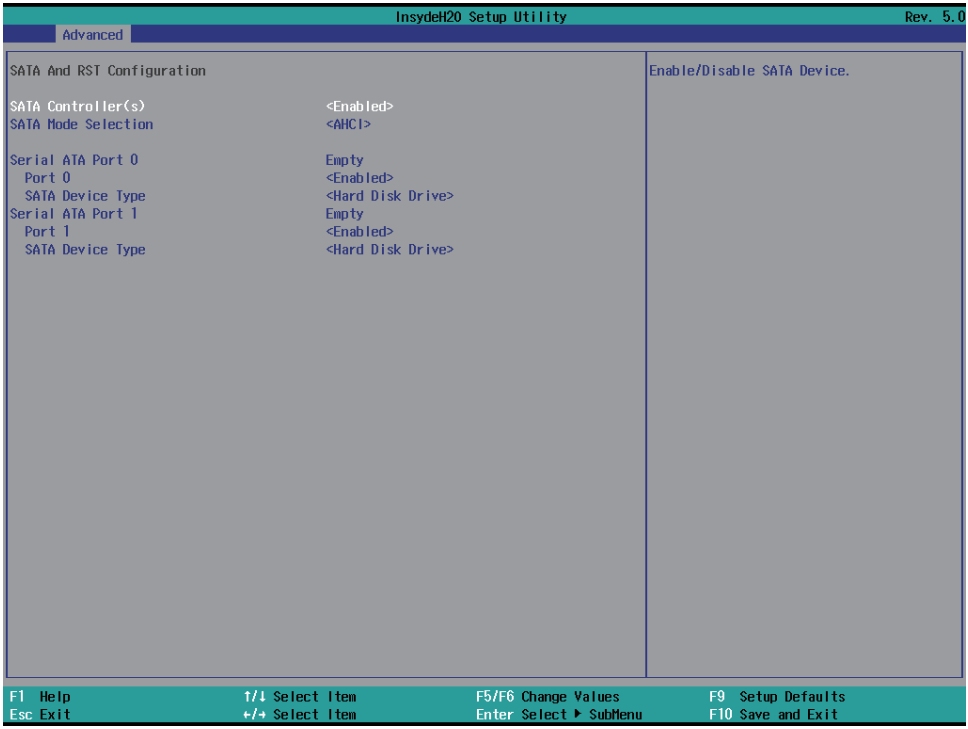
Select PCI Express port speed

The optional settings are: Auto, Gen1 (default), Gen2, Gen3

PCIe / USB Switch

The optional settings are: USB3 / PCIe (default)

4-5-3-2 ► SATA And RST Configuration



SATA Controller

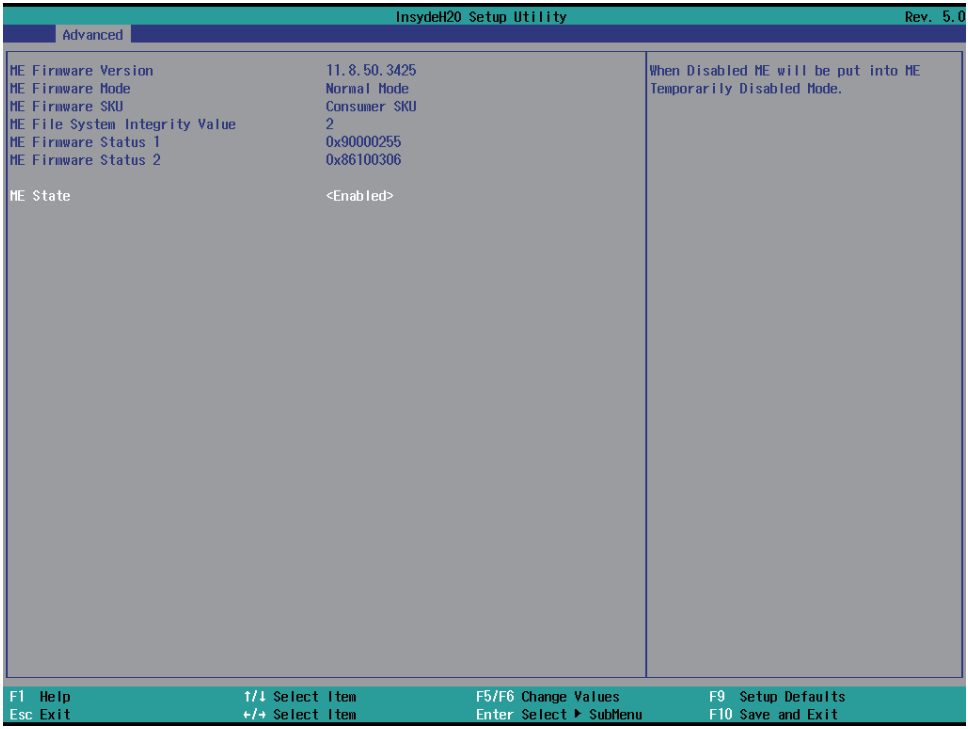
Use this item to Enable or Disable SATA Device.

The optional settings are: Enabled (default) or Disabled

SATA Mode Selection

Support AHCI Mode only.

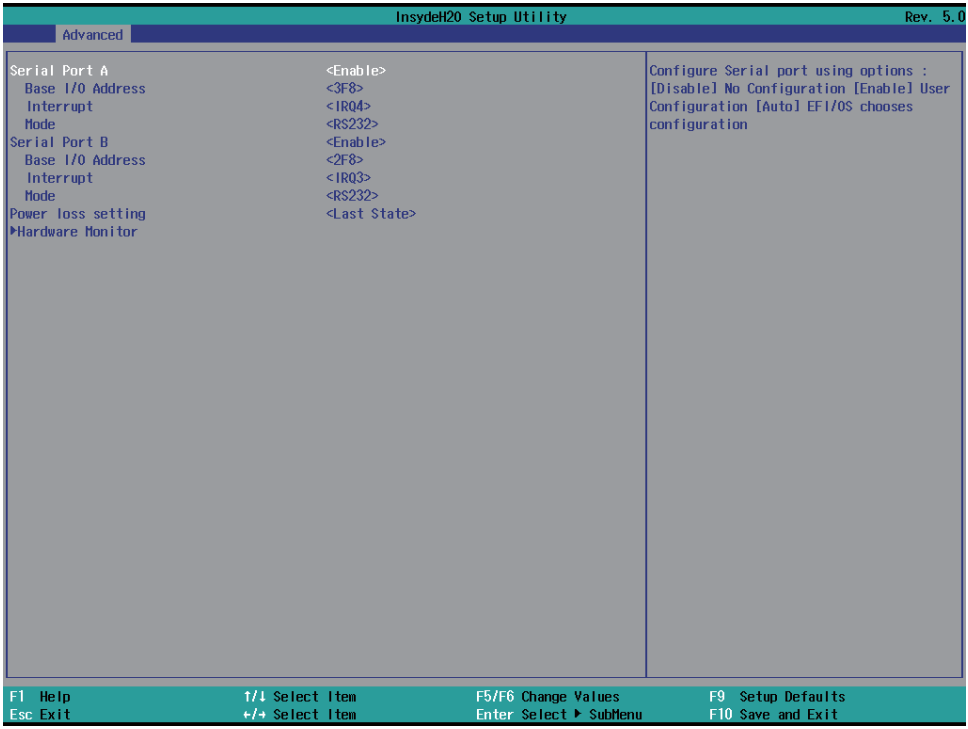
4-5-4 PCH-FW Configuration



ME State
The optional settings are: Enabled (default) or Disabled

Manageability Features State
The optional settings are: Enabled or Disabled (default)

4-5-5 SIO FINTEK81804



Serial Port 1/2

Use this item to enable or disable serial port.

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

Serial Port A Base IO Address / Interrupt / Serial Mode

Use this item to select an optimal setting for super IO device.

The optional settings are:

IO=3F8h; IRQ=4 (default)

IO=3E8h; IRQ=3,4

IO=2E8h; IRQ=3,4

IO=2F8h; IRQ=3,4

Serial Port B Base IO Address / Interrupt / Serial Mode

Use this item to select an optimal setting for super IO device.

The optional settings are:

IO=2F8h; IRQ=3 (default)

IO=2E8h; IRQ=3,4
IO=3E8h; IRQ=3,4
IO=3F8h; IRQ=3,4

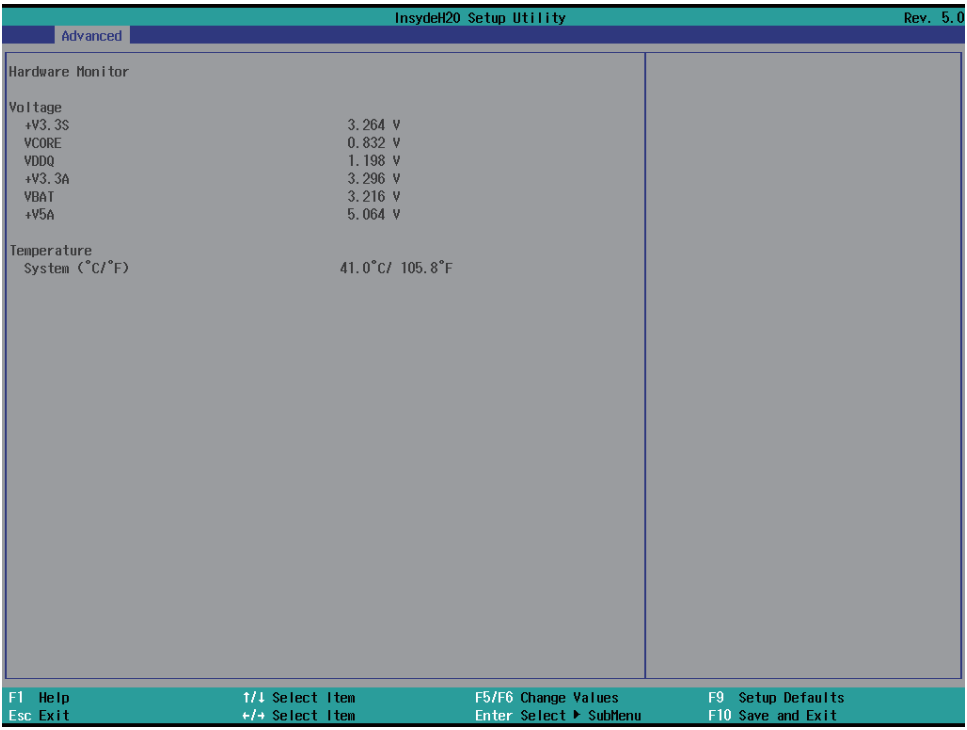
Mode
RS232 (default) / RS485 / RS422

Power Loss setting
This item specifies whether your system will reboot after a power failure or interrupt occurs.

[Last state]	Restores the system to the status before power failure or interrupt occurred.
[Always on]	Leaves the computer in the power on state.
[Always off]	Leaves the computer in the power off state.

Hardware Monitor
Please refer section 4-5-5-1

4-5-5-1 ▶ Hardware Monitor

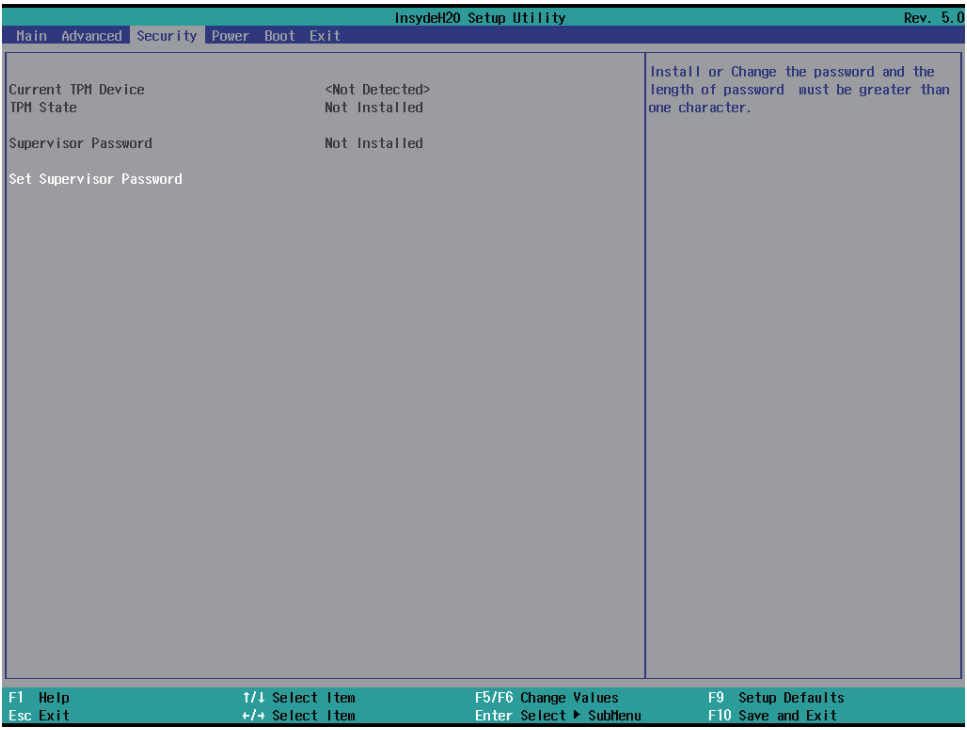


Press [Enter] to view PC health status.

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 Security

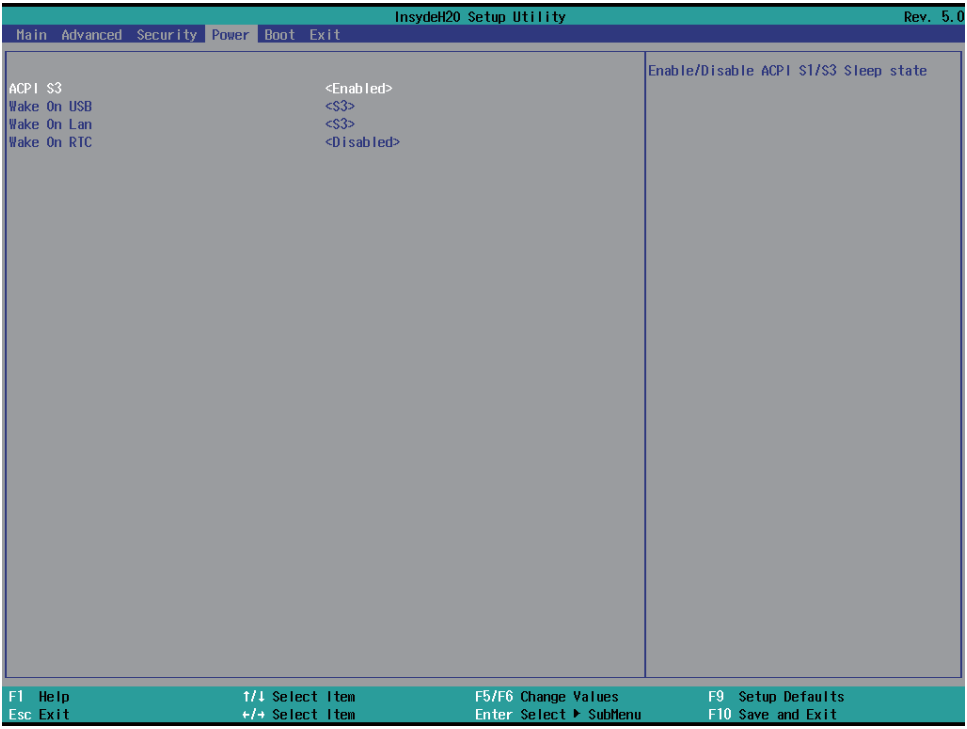


Supervisor Password

To set up an Supervisor password

1. Select Supervisor Password.
   The screen then pops up an Create New Password dialog.
2. Enter your desired password that is no less than 3 characters and no more than 10 characters.
3. Hit [Enter] key to submit.

4-7 Power



ACPI S3

Select ACPI sleep state (S3) supported

The optional settings: Enabled, Disabled (default)

Wake On USB

Wake on USB from Mouse or Keyboard interrupt signal when system in S3 state

The optional settings: S3 (default), Disabled

Wake On LAN

Wake on LAN from LAN1 when system in S3 S5, or both of them state

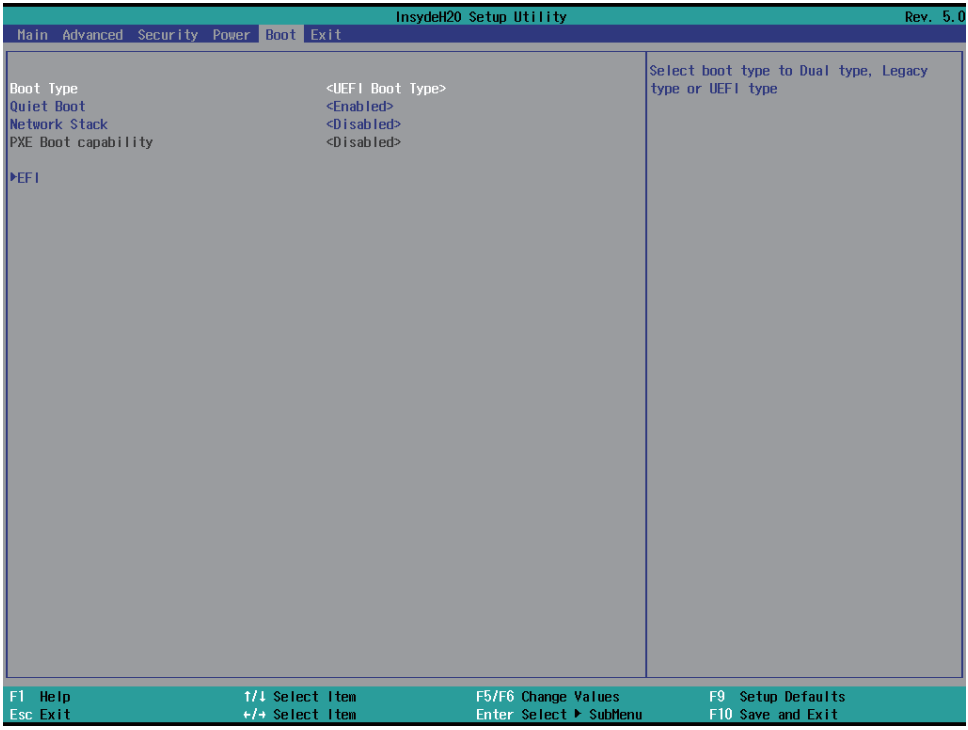
The optional settings: S3 (default), S5, S3 / S5, Disabled

Wake On RTC

To select an alarm event to wake on a specific day / hour / min. / sec.

The optional settings: Disabled (default), By Every Day, By Day of Month

4-8 Boot



Boot type

Select boot type for Dual type, Legacy boot type or UEFI boot type, default is UEFI boot type

Quiet Boot

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

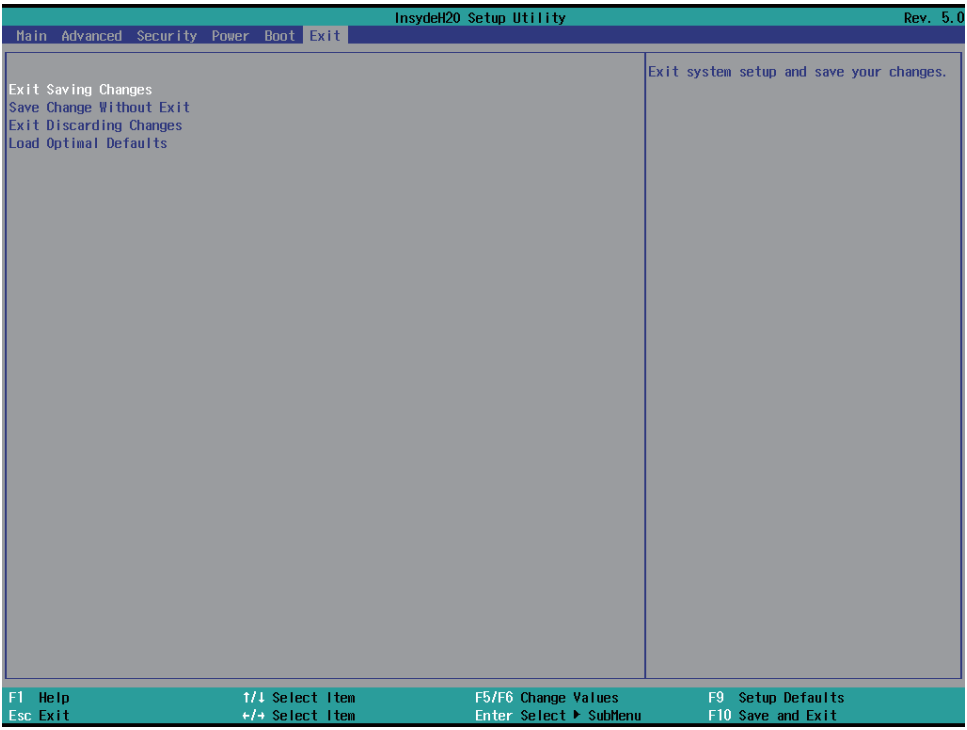
Network Stack

Enabled for PXE function, default is disabled.

EFI

Determine which EFI storage device for booting, this item will not show on this page if there is no any storage device found.

4-9 EXIT



Exit Saving Changes
This item allows user to reset the system after saving the changes.

Save Change Without Exit
This item allows user to saving the changes but doesn't restart.

Exit Discard Changes
This item allows user restart the system but no saving the changes

Load Optimal Default
Use this item to restore the optimal default for all the setup options.

Chapter-5

DRIVER INSTALLATION

There is a system installation DVD in the package. This DVD does not only include all the drivers you need but also some other free application programs and utility programs.
In addition, this DVD also includes an auto detect software telling you which hardware is installed and which driver is needed so that your system can function properly. We call this auto detect software SYSTEM INSTALL.

SYSTEM INSTALL Supports Windows 10(32bit/64bit) / Windows 8/8.1(32bit/64bit) / Windows 7(32bit/64bit)

Insert the DVD into your DVD-ROM drive and the SYSTEM INSTALL menu should appear as below. If the menu does not appear, double-click MY COMPUTER and double-click DVD-ROM drive or click START, click RUN, and type X:\SETUP.EXE
(assuming your DVD-ROM drive is X).

Make your selection from SYSTEM INSTALL menu:

1. Auto Detect Main board and OS to AUTOMATIC DRIVER INSTALLATION menu
2. Browse DVD to view the contents of the DVD
3. Exit to exit SYSTEM INSTALL menu

AUTOMATIC DRIVER INSTALLATION menu

1. INF	Install Intel Skylake or Kaby Lake chipset driver
2. VGA	Install onboard VGA driver
3. HD Audio	Install HD Audio Codec driver
4. ME Tool	Install Intel Management Engine driver
5. LAN	To the LAN driver Readme file

6. Items for Windows 7

6-1. KMDF	Install windows update package (FOR Win 7 only)
6-2. ME Tool	Install Intel Management Engine driver
6-3. USB 3.0	Install Intel USB 3.0 driver (FOR Win 7 only)
6-4. TPM 2.0	Install Intel TPM 2.0 driver (FOR Win 7 only) note 1

note 1: For Windows 7 Ultimate and i7 CPU only

Each selection is illustrated below:

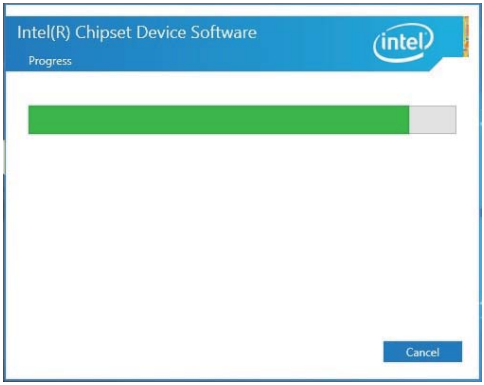
5-1 INF Install Intel Skylake Kaby Lake Chipset Driver (example for WIN10 64bit)

1. At the "AUTOMATIC DRIVER INSTALLATION menu"screen, click "INF".

2. At the "Intel® Chipset Device Software"screen, click "Next".

3. At the "License Agreement" screen, click "Accept".

4. At the "Readme File Information" screen, click "Install".



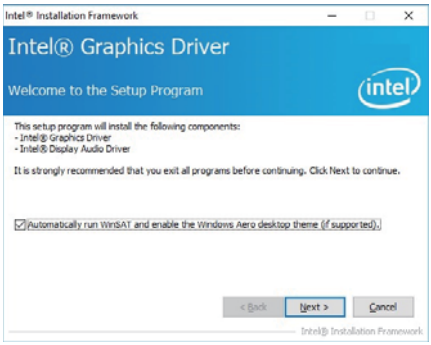
5. Progressing

NOTE: SYSTEM INSTALL will auto detect file path X:\driver\sky_lake\INF\SetupChipset.exe

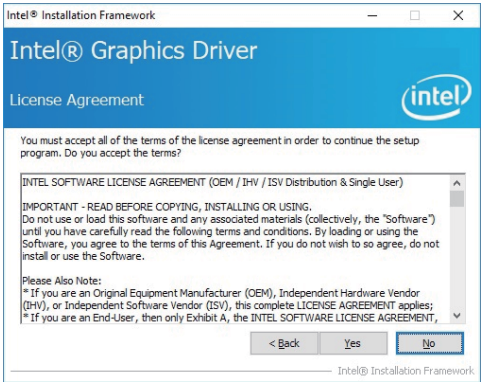
6. Click "Restart Now" then to restart the computer.

5-2 VGA Install Intel Skylake & Kaby Lake VGA Driver (example for WIN10 64bit)

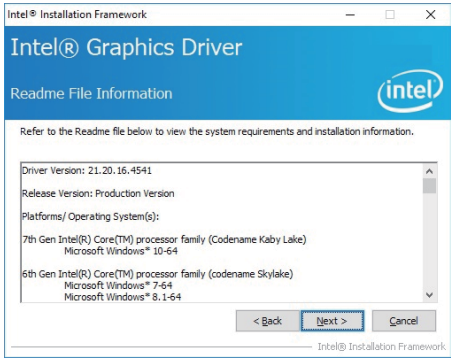
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "VGA".



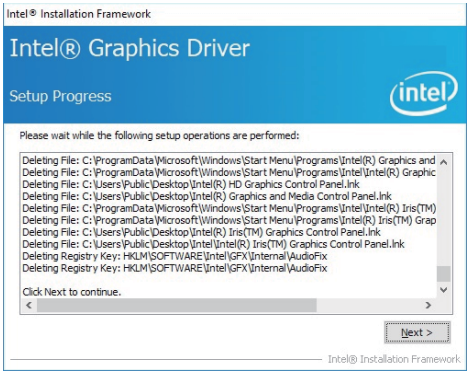
2. At the "Welcome to the Setup Program screen, Click "Next".



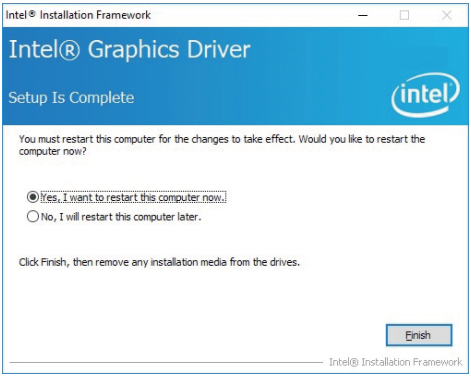
3. At the "License Agreement" screen, Click "Yes"



4. At the "Readme File Information" screen, Click "Next"



5. At the "Setup Progress" screen, Click "Next".

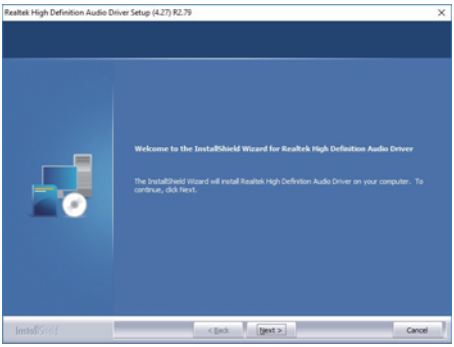


6. Click "Finish" to restart the computer

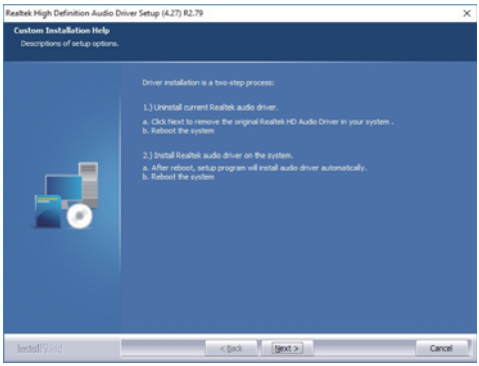
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 64-bit
X: \driver\sky_lake\VGA\X64\Setup.exe
For Windows 32-bit
X:\driver\sky_lake\VGA\X86\Setup.exe

5-3 HD Audio Install High Definition Audio Driver (example for WIN10 64bit)

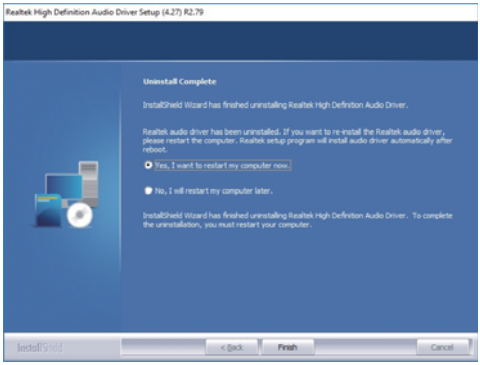
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "HD Audio".



2. Click "Next"



3. Click "Next"



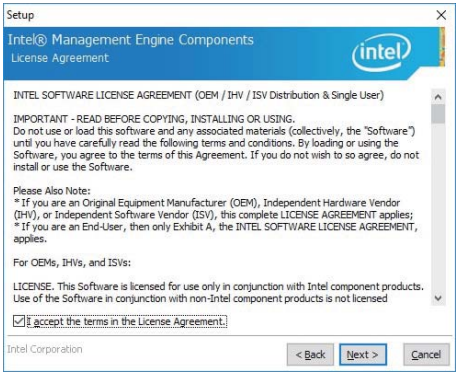
4. Click "Finish" then to restart the computer.

NOTE: SYSTEM INSTALL will auto detect file path
For Windows 64-bit,
X:\driver\sky_lake\Audio\0006-64bit_Win7_Win8_Win81_Win10_R279
For Windows 32-bit
X: \driver\sky_lake\Audio\Win7_Win8_Win81_R273

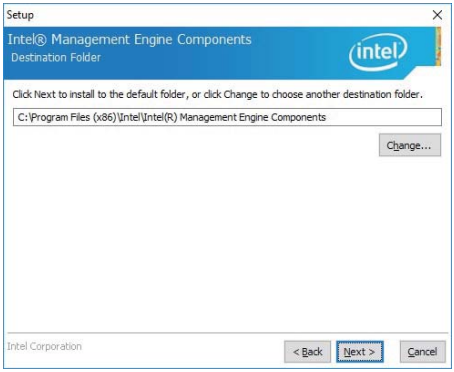
5-4 ME Tool Install Intel USB 3.0 ME Driver (example for WIN10 64bit)

1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "ME Too".

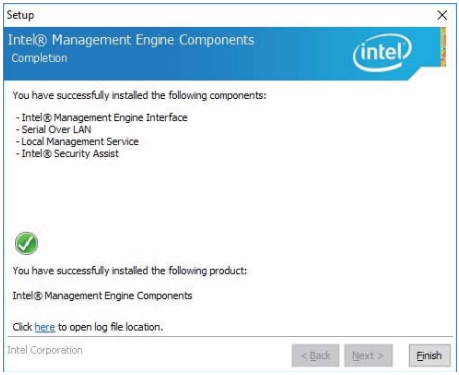
2. At the "Welcome to the Setup Program screen, Click "Next.



3. At the "License Agreement" screen, Click "☑" "Next".



4. At the "Destination Folder" screen, Click "Next".

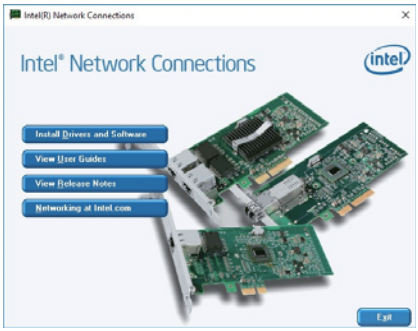


5. Click "Finish" to finish the setup.

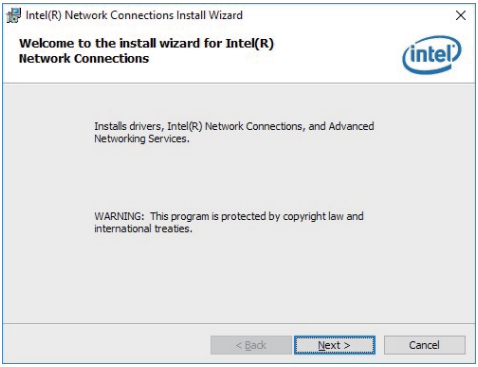
NOTE: SYSTEM INSTALL will auto detect file path
X: \driver\sky_lake\ME\SetupME

5-5 LAN Install LAN Driver (example for WIN10 64bit)

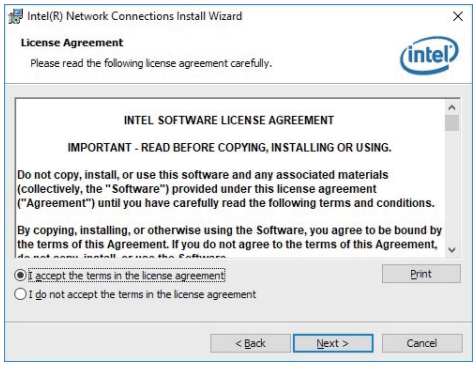
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "LAN".



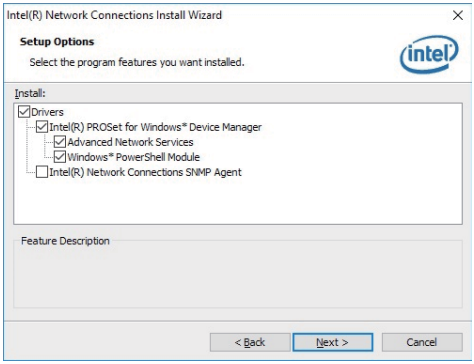
2. At the "Intel Network Connections" screen, Click "Install Drivers and Software".



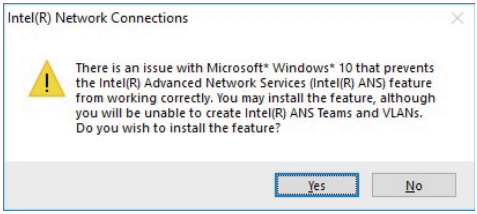
3. Click "Next".



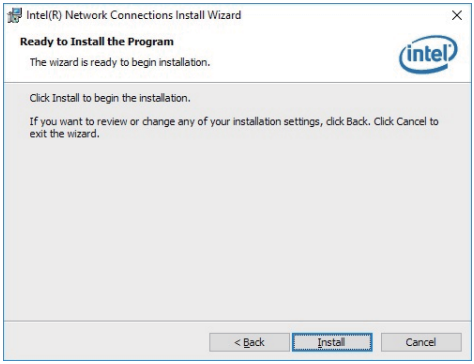
4. At the "License Agreement" screen, Click "☑" "Next"



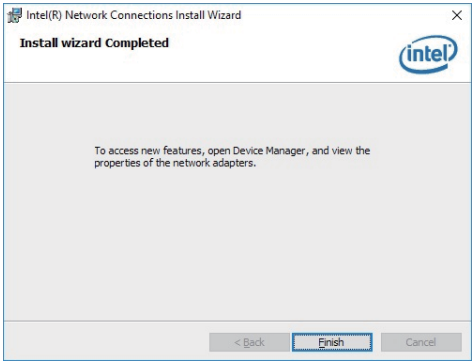
5. Click "Next".



6. Click "Yes".



7. Click "Install".



6. Click "Finish" to finish the setup.

3. Click "Finish" to restart computer
NOTE: SYSTEM INSTALL will auto detect file path
X:\driver\sky_lake\LAN\Autorun.exe

5-6 Items for Windows 7 installation

Note : Before Windows 7 installation, USB 3.0 Driver MUST rebuild in a new DVD or in a pen-drive. Please following the steps as below

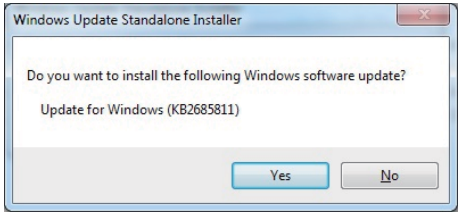
step1 Create a folder X:/win7/boot & X:/win7/install X:/win7/image
step2 unzip usb3.0 driver to X:/win7/usb3.0
step3 Copy the files on the disc D:\sources\install.wim D:\sources\boot.wim to X:/win7/image
step4 Open cmd as your system administrator
step5 Perform the following steps

```
=====================================================================
dism /Mount-Wim /Wimfile:C:\win7\image\boot.wim /index:2 /Mountdir:C:\win7\boot
dism /image:C:\win7\boot /add-driver /driver:C:\win7\usb3.0 /Recurse /ForceUnsigned
dism /unmount-wim /mountdir:C:\win7\boot /commit
dism /Mount-Wim /Wimfile:C:\win7\image\boot.wim /index:1 /Mountdir:C:\win7\boot
dism /image:C:\win7\boot /add-driver /driver:C:\win7\usb3.0 /Recurse /ForceUnsigned
dism /unmount-wim /mountdir:C:\win7\boot /commit
dism /Mount-Wim /Wimfile:C:\win7\image\install.wim /index:1 /Mountdir:C:\win7\install
dism /image:C:\win7\boot /add-driver /driver:C:\win7\usb3.0 /Recurse /ForceUnsigned
dism /unmount-wim /mountdir:C:\win7\install /commit
=====================================================================
```

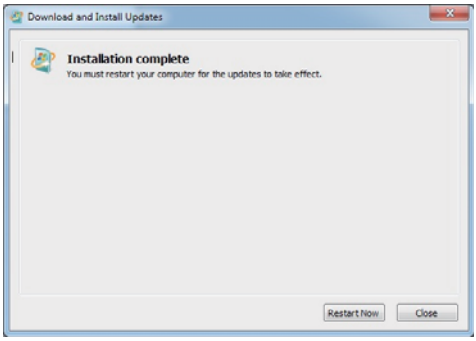
step6 copy X:/win7/image/install.wim X:/win7/image/boot.wim D:\sources\
step7 Reburn the disc

5-6-1 KMDF Install Windows Update package (FOR Win 7 only)

1. At the "AUTOMATIC DRIVER INSTALLATION menu", click "KMDF".



2. Click "Yes".

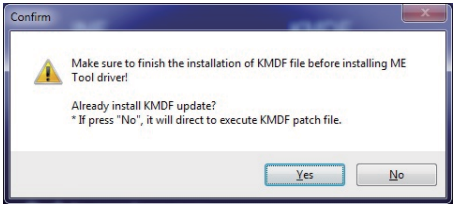


3. Click "Restart Now" to restart the computer.

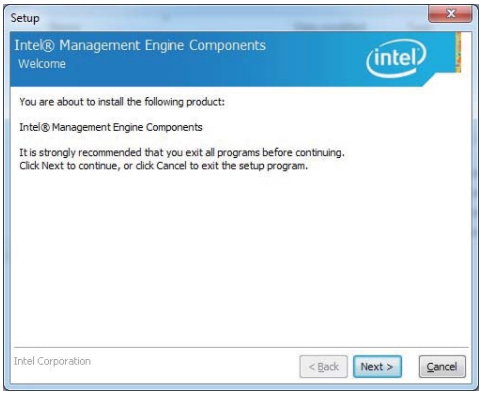
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64-bit,
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x64
For Windows 7 32-bit,
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x86

5-6-2 ME Tool Install Intel ME Tool driver for WIN7
Please install KMDF file first.

1. At the "AUTOMATIC DRIVER INSTALLATION menu", click "ME Tool".

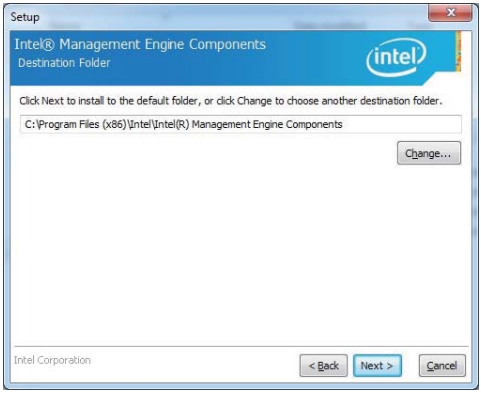


2. Click "Yes". KMDF file must being installed before ME Tool installation.

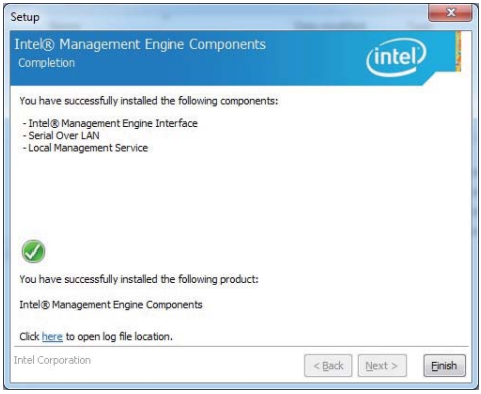


3. Click "Next".

4. Accept the terms and Click "Next".



5. Click "Next".



6. Click "Finish" to finish the setup.

NOTE: SYSTEM INSTALL will auto detect file path
X: \driver\sky_lake\ME\SetupME

5-6-3 USB 3.0 Install for WIN7

1. At the "AUTOMATIC DRIVER INSTALLATION menu", click "USB 3.0".

Intel® USB 3.0/3.1 eXtensible Host Controller Driver
Welcome to the Setup Program

This setup program will install the following components:
- Intel® USB 3.0/3.1 eXtensible Host Controller Driver
- Intel® USB 3.0/3.1 Hub Driver
- Intel® USB 3.0 Monitor

Click Next to continue.

2. Click "Next".

Intel® USB 3.0/3.1 eXtensible Host Controller Driver
License Agreement

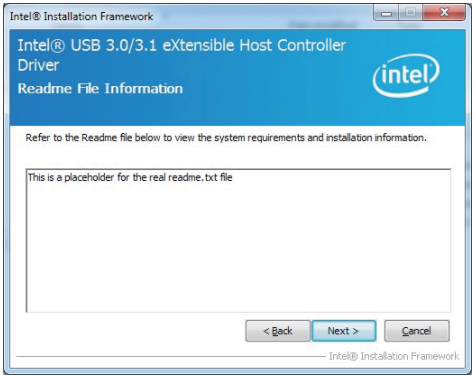
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?

INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.

Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,

3. Click "Yes".

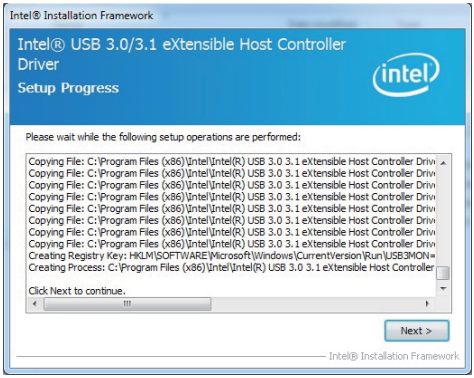


Intel® USB 3.0/3.1 eXtensible Host Controller Driver
Readme File Information

Refer to the Readme file below to view the system requirements and installation information.

This is a placeholder for the real readme.txt file

4.Click "Next".



Intel® USB 3.0/3.1 eXtensible Host Controller Driver
Setup Progress

Please wait while the following setup operations are performed:

```
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Copying File: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller Driv
Creating Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run\USB3MON=
Creating Process: C:\Program Files (x86)\Intel\Intel(R) USB 3.0 3.1 eXtensible Host Controller

Click Next to continue.
```

5.Click "Next".

Intel® USB 3.0/3.1 eXtensible Host Controller Driver
Setup Is Complete

The setup program successfully installed the following components:
- Intel® USB 3.0/3.1 eXtensible Host Controller Driver
- Intel® USB 3.0/3.1 Hub Driver
- Intel® USB 3.0 Monitor

Click Finish to complete the setup process.

6. Click "Finish" to finish the setup.

NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 32 / 64-bit,
X:\driver\sky_lake\USB 3.0\Setup.exe

5-6-4 TPM 2.0

For Windows 7 Ultimate and i7 CPU only

5-7 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 2I612CW 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 2I612CA1.BIN–BIOS -ALL

2I612CA1.BIN.ROM is the file name of the latest BIOS.

It may be 2I612CA1.BIN, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I612CA1.BIN –BIOS -ALL

-BIOS : Flash BIOS region

-ALL : Flash all

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