3I610DW

Intel Skylake-U / Kaby Lake-U Core i CPU, DDR4 2133 MT/s SODIMM, 5 x LAN / HDMI / USB / COM / PCIe mini card

All-In-One

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

5 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

NO. 3I610DW
Release date: JULY. 23. 2018

Contents

3I610DW

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User Manual edition 0.1, JULY. 23. 2018

Warning !

1. Battery
   Batteries on board are consumables.
   The life time of them are not guaranteed.

2. Fless 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.

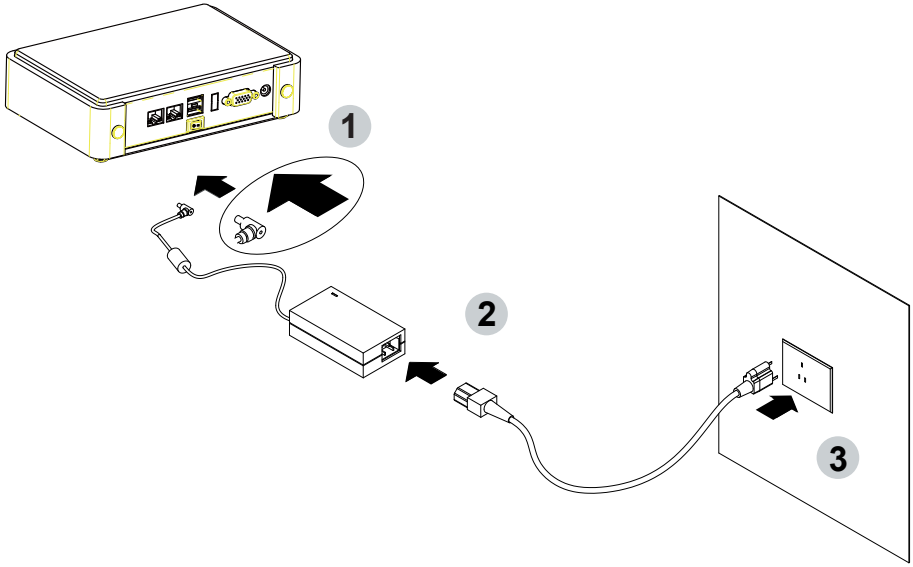
✱ Hardware Notice Guide

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-Fair" 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.

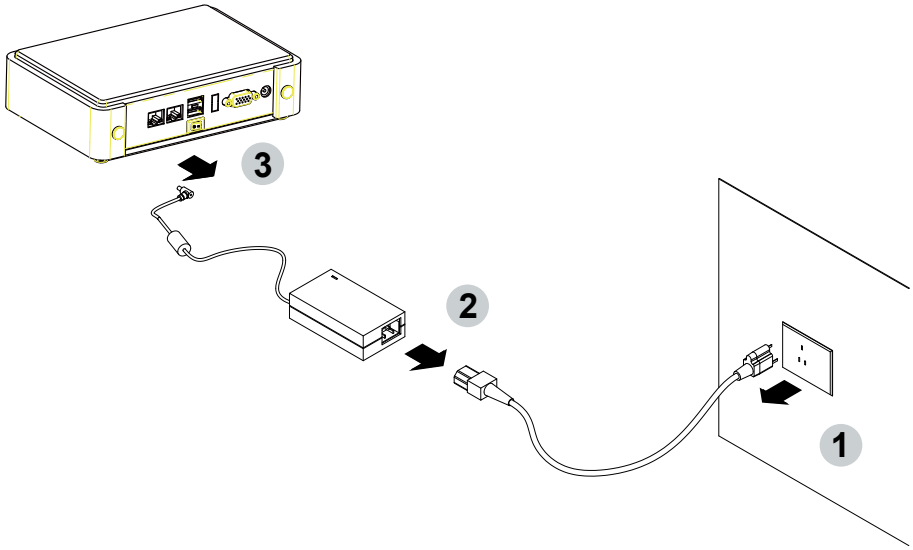
Remark 1:
Always insert/unplug the DC-in horizontally & directly to/from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 3I610DW is a 3.5" (146 x 102 mm) motherboard with wide range 9~36V DC power input & fantastic flexibility and integration with optional eIO (PCIe + USB) expansion Function: 3I610DW is based on the Intel® Skylake-U i7 / i5 / i3 / Celeron processor, integrated 5 x GbE LAN, 7 x USB, 2 x COM Port and HDMI, DP display interface that offer the ideal platforms for high performance applications in Networking, Smart Automation, Point-Of-Information (POI), Self-Services, In-vehicle, Industry 4.0 and any compact high-performance Internet of Things (IoT) applications.

The 3I610DW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III), with two-channels DDR4 2133 MHz memory up to 32 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 x 1 and USB interface and two SATA III ports, as well as graphics interface for HDMI displays. One nano SIM push-push socket onboard for the mini card (mini card 2) to get the 3G / 4G communication easier and quickly

The embedded motherboard 3I610DW is specially designed with wide-Range Voltage DC in (9~36V) for widely varying input voltage requirement. It offers superb performance and PC specification in the industry using the specific housing. It supports with five 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. It also supports 1 LVDS interface for LCD Panel with touch function and 1 panel inverter power for Panel dimming control. It suitable for ALL-IN ONE Panel PC, POS Kiosk and automation control systems.

Please kindly contact LEX (info@lex.com.tw) if you have any further query or want to get the detail information.

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. Support eDP 1.4 2 Lanes up to 1920 x 1080 resolution, 2 x HDMI 1.4b up to 3840 x 2160
4. DDR4 SODIMM slot x 2, up to 32GB
5. Support 5 x 10 / 100 / 1000 Mbps Intel LAN ports.
6. Support 2 x RS232 auto switch to RS485 / RS422 by BIOS
7. 4 x USB 3.0 and 3 x USB 2.0, 4 ports external, 3 ports internal
8. ALC886 HD Audio Specification 1.0, Two channel Class D Audio Amplifier
9. 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 x 1 and USB interface.
10. 1 Nano SIM card push-push socket pair with MPCE2
11. Support 2 SATA ports
12. Support PS2 Keyboard Mouse
13. 2 x 20 pin eIO with 1 PCIe x 1, 1 x USB2.0 and SMBus signals.
14. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
15. Support TPM 2.0 (Optional)
16. Wide Range DC IN +9V~36V
17. PCB Dimension: 146 x 102 mm

1-2 Specification

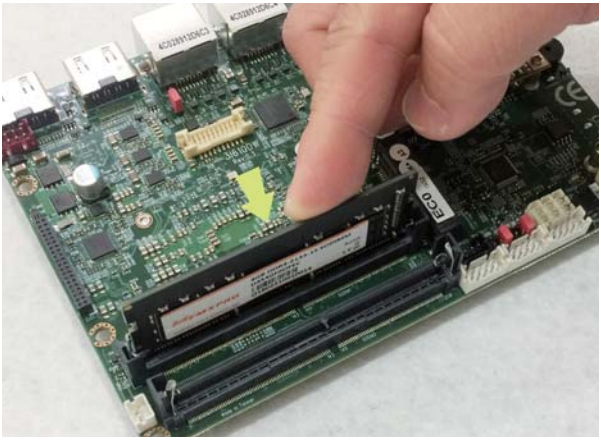
1 **SOC:** Intel® Celeron 3955U Processor 2.0GHz, (Dual core), Intel® Core i5-6200U Processor 2.3GHz / 2.8GHz (Dual core), Intel® Core i7-6600U Processor 2.6GHz / 3.4GHz (Dual core)

2. **Memory:** DDR4 SODIMM slot x 2, up to 32GB
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. Support eDP 1.4 2 Lanes up to 1920 x 1080 resolution, 2 HDMI 1.4b up to 3840 x 2160
4. **SATA:** Integrated Serial ATA Host Controller 2 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
5. **LAN:** 4 Intel I210-IT LAN chipset & 1 Intel I219LM Giga Phy with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1
6. **I/O Chip:** F81804U I/O chipset for 2 ports RS232 / RS422 / RS485 auto switch by BIOS
7. **USB:** 4 type A USB 3.0, 3 USB 2.0
8. **Sound:** Support line in, line out and MIC in, Two channel Class D Audio Amplifier
9. **WDT/DIO:** Hardware digital Input & Output, 4 x DI / 4 x DO (Option) / Hardware Watch Dog Timer, 0~255 sec programmable
10. **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 x 1and USB interface
11. **SIM:** 1 Nano push-push socket pair with MPCE2
12. **TPM:** SLB 9665 TT 2.0 Trusted Platform Module (Optional)
13. **BIOS:** Insyde UEFI BIOS
14. **Dimension:** 146 x 102 mm (3.5 inch)
15. **Power:** On board DC +9~36V

1-3 Installing the SO-DIMM

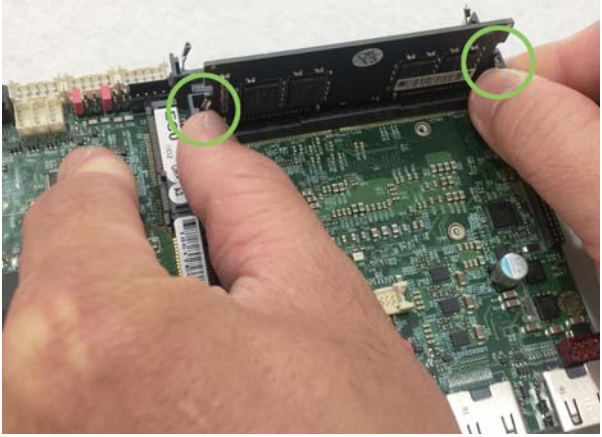
1. Insert the memory into the SODIMM slot diagonally.

2. Press the memory into the SODIMM slot.



1-3-1 Removing the SO-DIMM

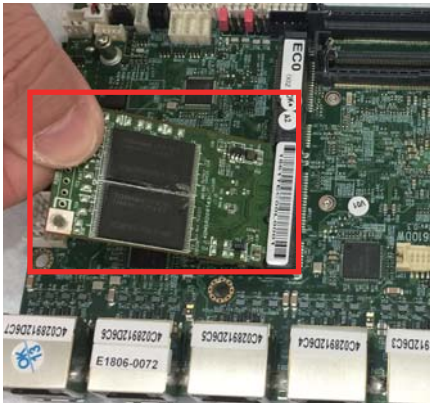
1. Pull down two sides of fixed flat- springs out of the memory



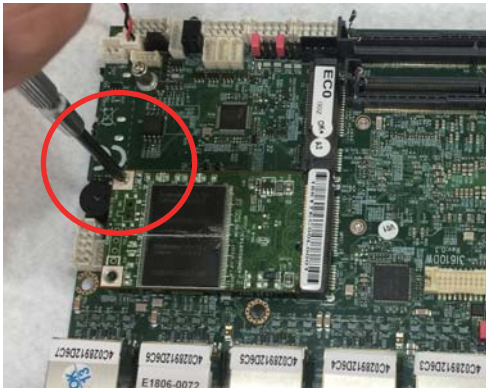
1-4 Installing the Mini PCI-e Card (Full Size)

1. Unscrew the screw on the board

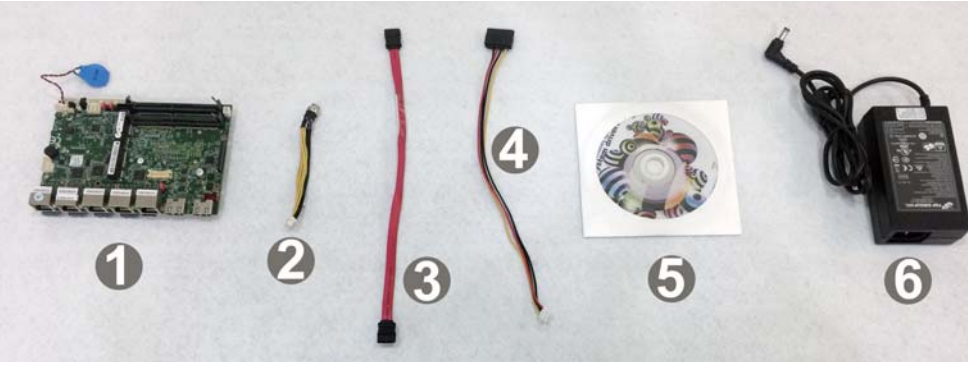
2. Plug in the Mini Card in a 45 angle



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



1-5 Packing List



	Material Code	Description	Detail Specification	Quantit
1	7G1901-1705001-0	MB-3I610DW-EC0-001	LF	1
2	6G6003-7350-0100	Power Cable	LF, 2.0 2*4/DC JK,L=9cm	1
3	6G6001-2203-0100	SATA DATA Cable (Red)	LF,L=25cm	1
4	6G6003-1009-0100	SATA Power Cable	LF,L=25cm,1*4/2.0 to 180° SATA 15p	1
5	6G8006-2350-0100	DVD	LF, Support Apollo Lake/Skylake	1
6	6G5212-0620-0100	■60W Power Adapter,12V/5A,2.5Ø	LF,L Type,FSP060-DIBAN2,FSP	1

*The packing list above is for the users who purchase single motherboard. The users who purchase the board with chassis may refer to the packing list in the Assembly Guide.

Please contact with your dealer if any of these items is missing or damaged on delivery. And please keep all parts of the delivery package with packing materials in case if you need to deliver or store the product in the future.

Chapter-2

Hardware Installation

2-1 Unpacking Precaution

This chapter provides the information how to install the hardware of 3I610DW.
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 3I610DW.
   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 3I610DW 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 3I610DW from electricity discharge. With reference to section 1-5 please check the delivery package again with following steps:

1. Unpack the 3I610DW 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.

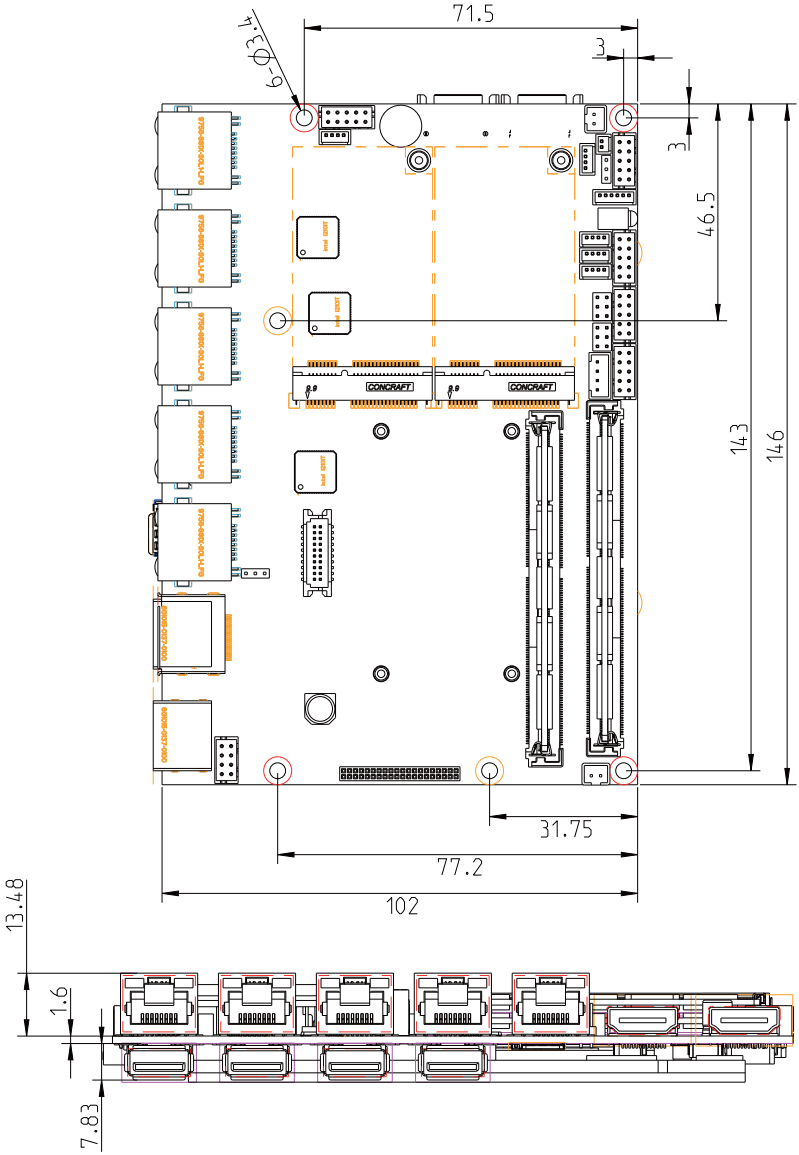
4. Check your optional parts (i.e. DDR, CF etc.), all necessary jumpers setting to jumper pin-set, and CMOS setup correctly.
   Please also refer to all information of jumper settings in this manual.

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.

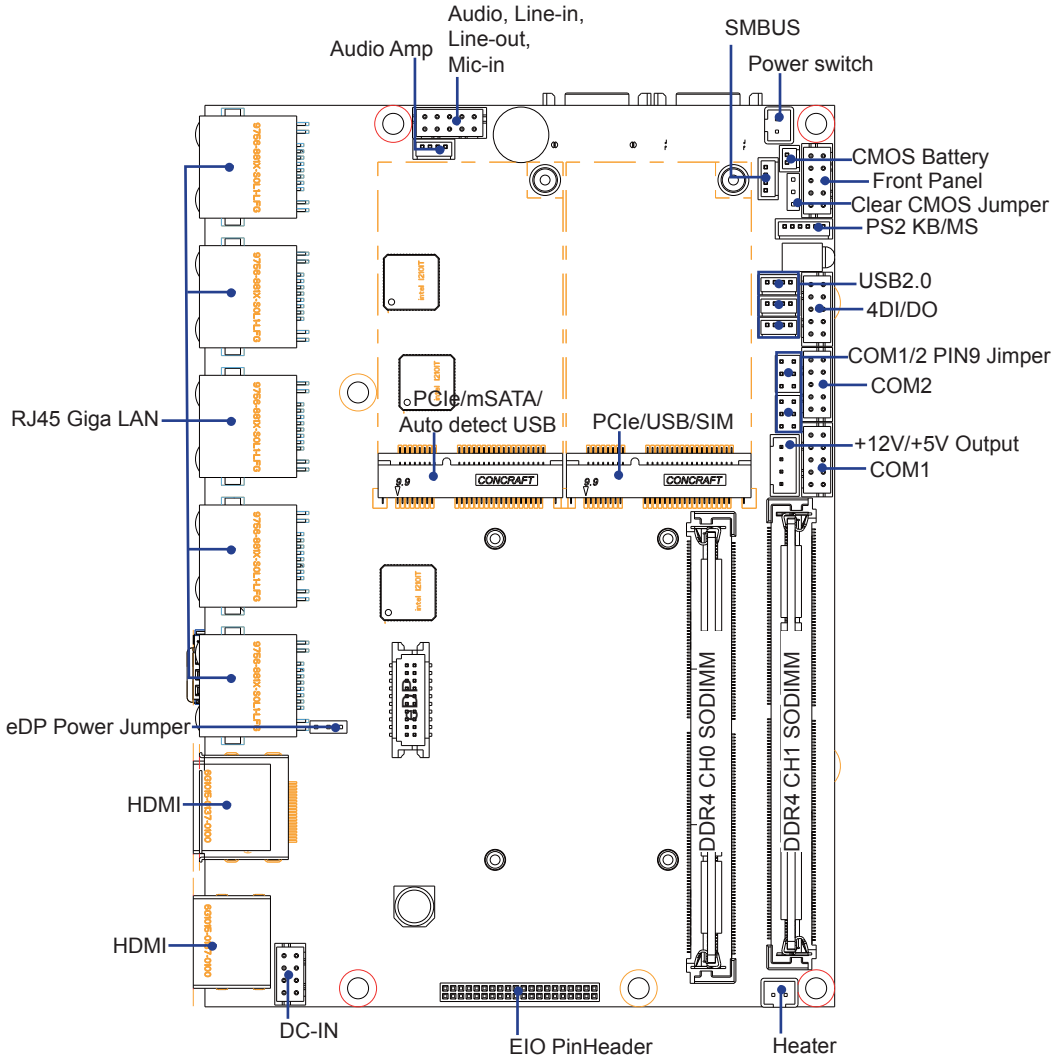
2-3 Dimension-3I610DW

TOP



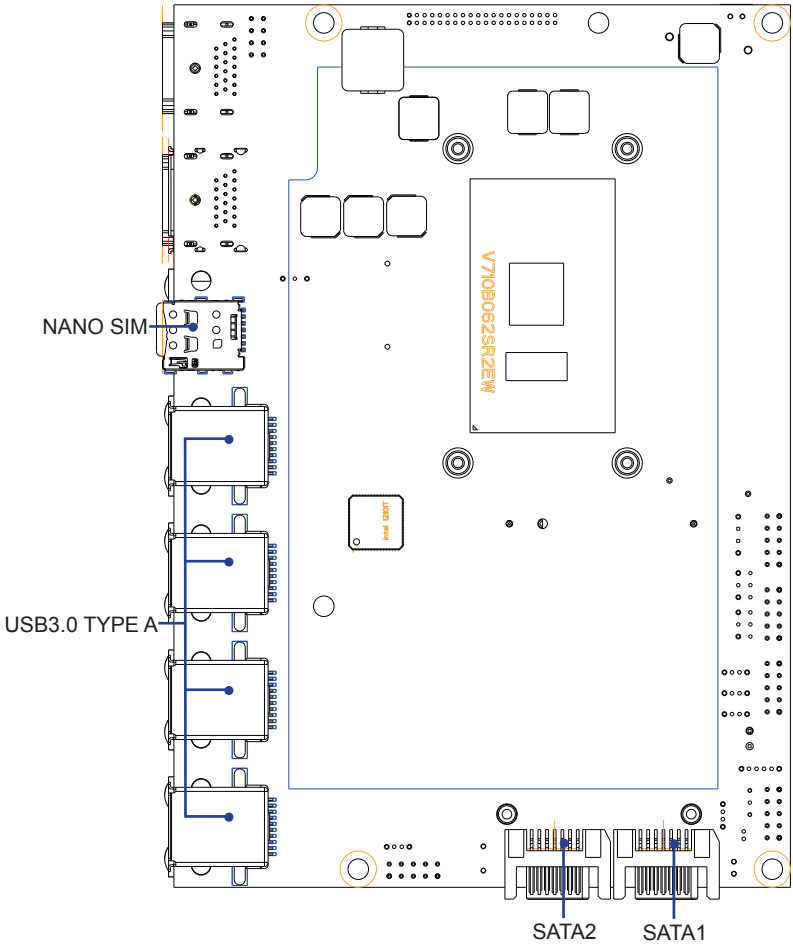
2-4 Layout-3I610DW-Function Map

TOP

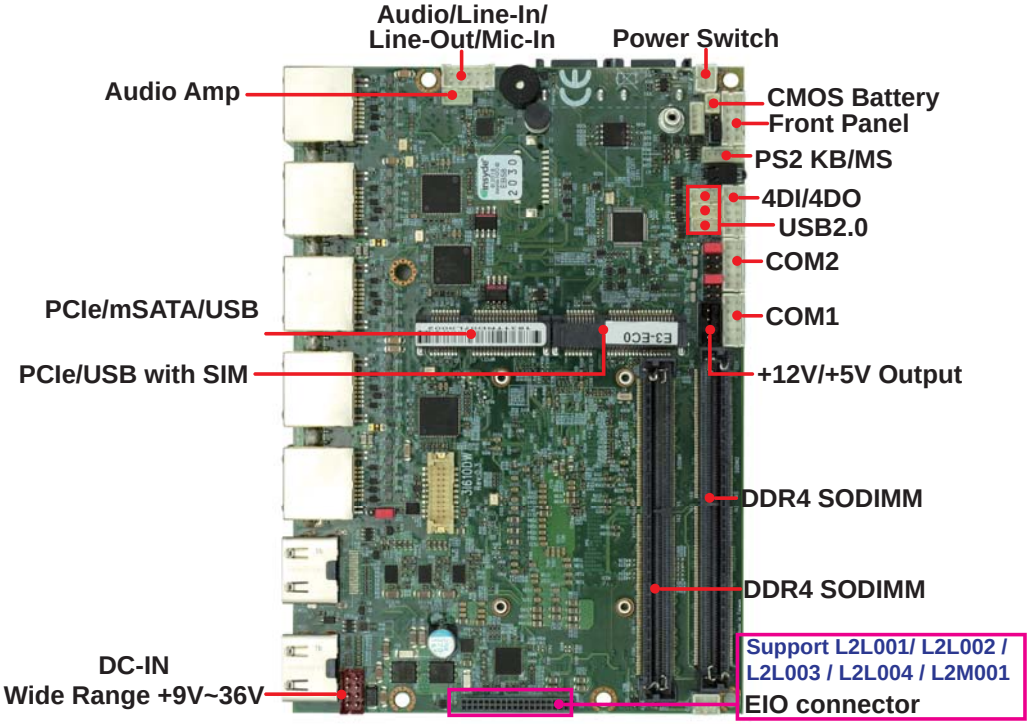


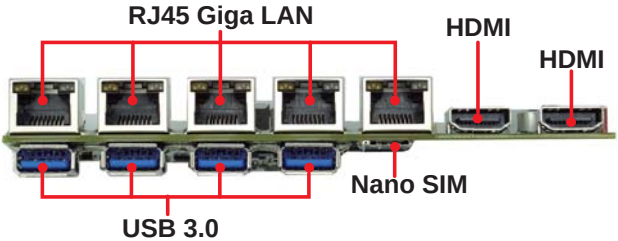
2-4-1 Layout-3I610DW-Function Map

BOT



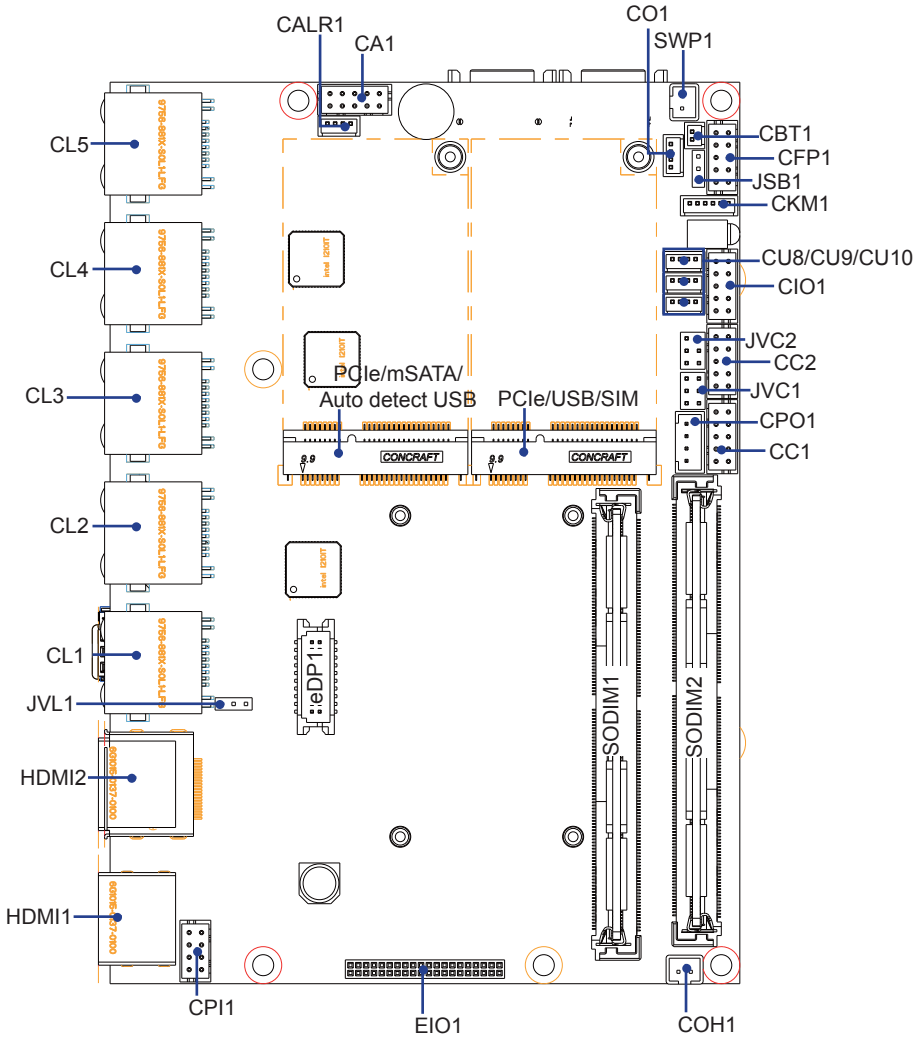
2-5 Function Map-3I610DW





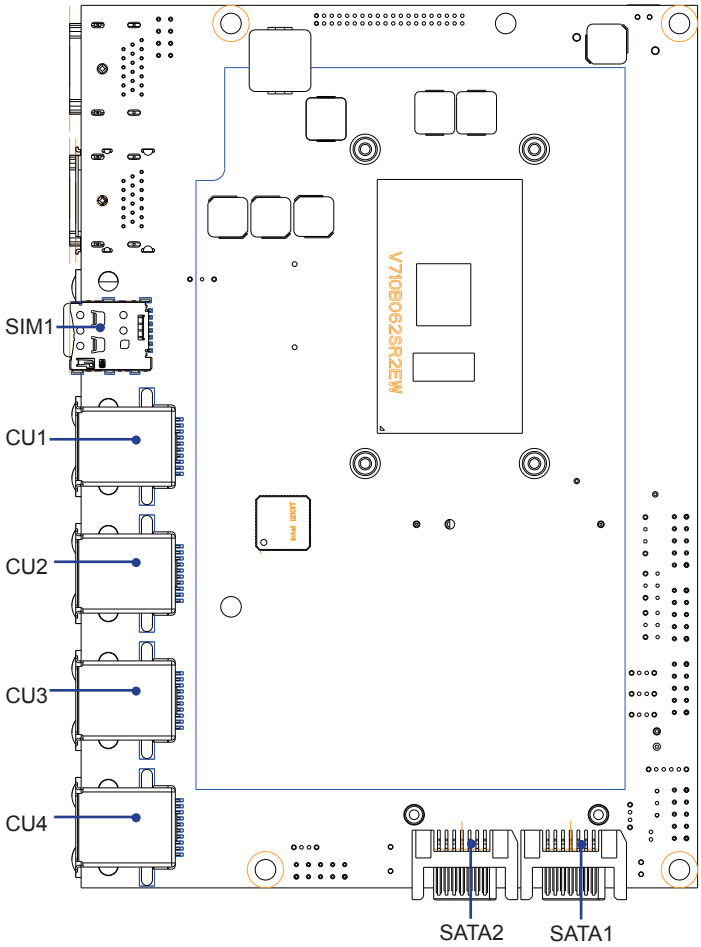
2-6 Connector MAP-3I610DW

TOP



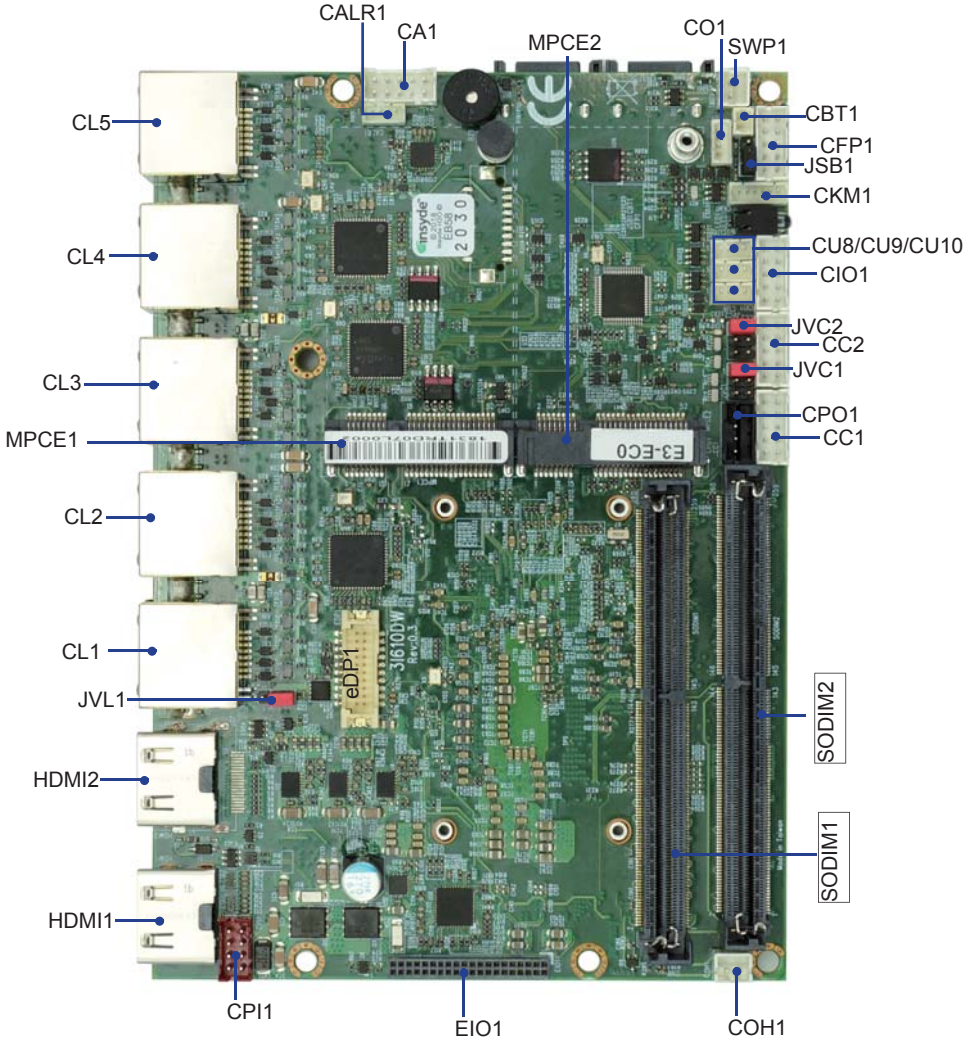
2-6-1 Connector MAP-3I610DW

BOT



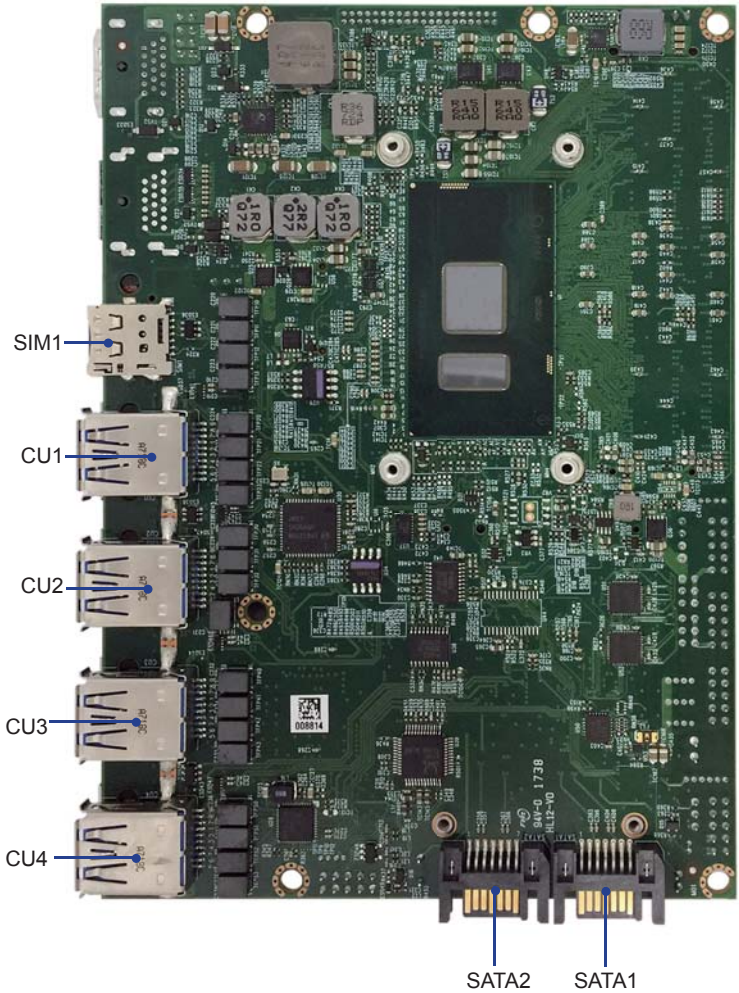
2-7 Diagram- 3I610DW

TOP



2-7-1 Diagram- 3I610DW

BOT



2-8 List of Jumpers

JSB1: CMOS DATA Clear

JVL1: eDP panel power select

JVC1/2: COM1/2 PIN9 RI / +12V / +5V Select

2-9 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.

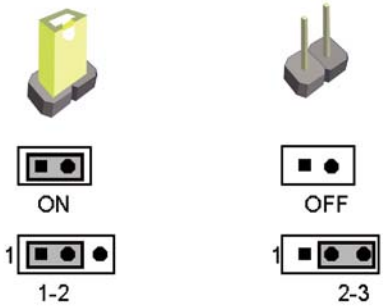


Figure 2.2

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 .

2-10 JSB1: CMOS DATA Clear

A battery must be used to retain the motherboard configuration in CMOS RAM.

Close Pin1 and pin 2 of JSB2 to store the CMOS data.

To clear the CMOS,follow the procedures below:

1. Turn off the system and unplug teh AC power
2. Remove DC IN power cable from DC IN power connector
3. Locate JSB2 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

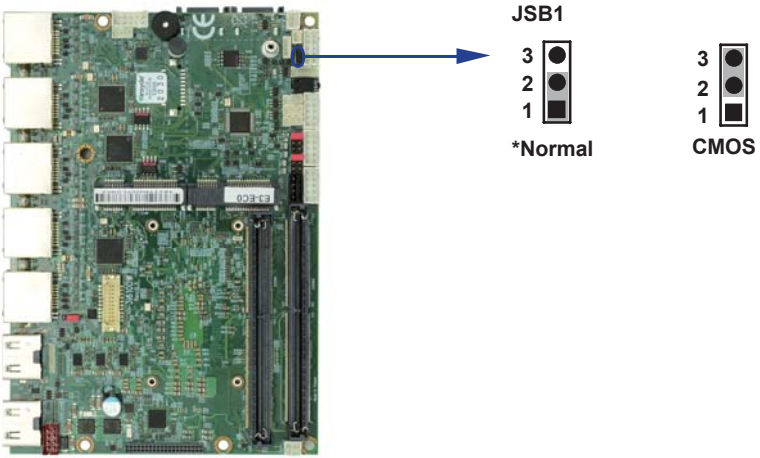
JSB1	DESCRIPTION
*1-2	Normal Set
2-3	CMOS / ME data clear

Note: Do not clear CMOS unless

1. Troubleshooting

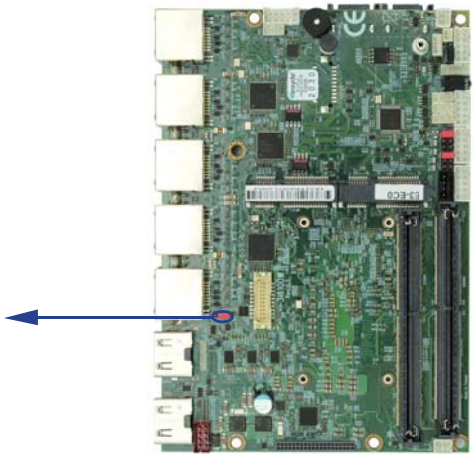
2. Forget password

3. You fail over-clocking system



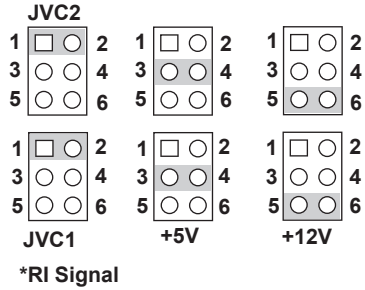
2-11 JVL1: eDP panel power select

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



2-12 JVC1/2: COM1/2 PIN9 RI / +12V / +5V Select

JVC1/2	DESCRIPTION
*1-2	COM port pin9 use RI signal
3-4	COM port pin9 use +5V voltage
5-6	COM port pin9 use +12V voltage



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:	COMS battery 1x2 pin (1.25mm)wafer
CA1:	Line-out/Line-in/Mic-in/SPDIF-out 2x5 pin (2.0mm) Wafer
CALR1:	Amplifier Line-out Right/Left channel 4pin (1.25mm) wafer
CC1 :	COM1 2x5pin (2.0mm) wafer
CC2 :	COM2 2x5pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5pin (2.0mm) wafer
CIO1:	4DI/4DO 2x5 pin (2.0mm) Wafer
CKM1:	PS2 KB/MS 1x6 pin (1.25mm) wafer
CU1:	USB 3.0 Type A connector
CU2:	USB 3.0 Type A connector
CU3:	USB 3.0 Type A connector
CU4:	USB 3.0 Type A connector
CU8:	USB 2.0 port 4pin (1.25mm) Wafer
CU9:	USB 2.0 port 4pin (1.25mm) Wafer
CU10:	USB 2.0 port 4pin (1.25mm) Wafer
CL1 :	LAN port 1 RJ45 Connector
CL2 :	LAN port 2 RJ45 Connector
CL3 :	LAN port 3 RJ45 Connector
CL4 :	LAN port 4 RJ45 Connector
CL5 :	LAN port 5 RJ45 Connector
CO1:	I2C Bus 4pin (1.25mm) Wafer
COH1:	+12V Heater 1x2 pin (2.00mm) Wafer
CPI1:	DC 12V-IN 2x4 pin (2.0mm) Red wafer
CPO1:	+12V/+5V power output 4 pin (2.0mm) Black wafer
EDP1:	eDP 2x10 pin (1.25mm) connector
EIO1:	eIO 2x20 PIN Header.
HDMI1:	HDMI Type A connector
HDMI2:	HDMI Type A connector
SATA1:	SATA connector 7pin
SATA2:	SATA connector 7pin
SODIMM1:	DDR4 Channel 0 SODIMM H: 5.2mm
SODIMM2:	DDR4 Channel 1 SODIMM H: 9.2mm

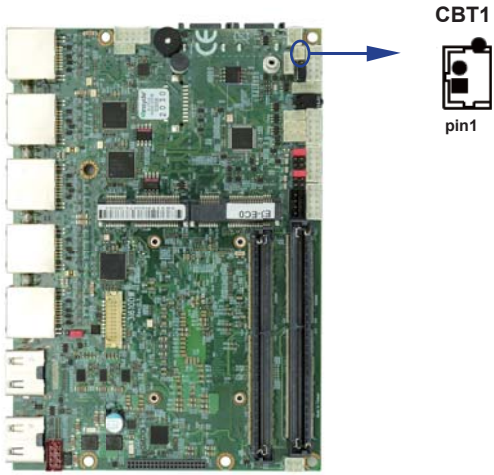
SWP1: Power On-Off 1x2 pin Wafer
MPCE1: Full size mini card port 1 sockets 52pin
MPCE2: Full size mini card port 2 sockets 52pin

3-2 CMOS battery connector

● CBT1: CMOS Battery 1x2pin (1.25mm) Wafer

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

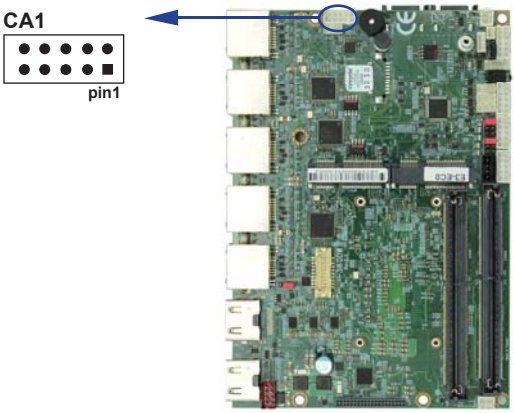
Note:
1. When the board without Adaptor plug in, this board power RTC consumption about 2.7uA
2. If adaptor always plug in RTC power consumption about 0.1uA



3-3 Audio interface

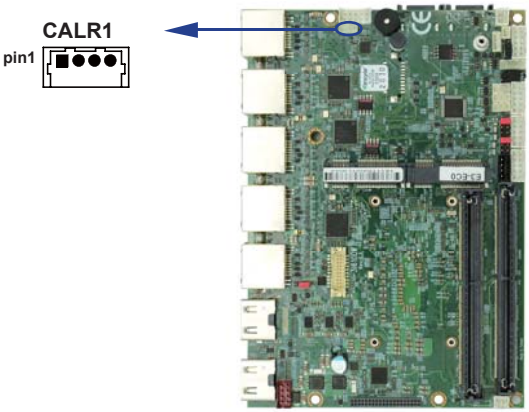
● CA1: Line-out / Line-in / Mic-in 2x5 pin (2.0mm) Wafer

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line-out-R	2	MIC-IN
3	Line-in-R	4	GND
5	GND	6	GND
7	Line-in-L	8	+5V
9	Line-out-L	10	MIC-IN



● CALR1: Amplifier Line-out Right / Left channel 4pin (1.25mm) wafer

PIN NO.	DESCRIPTION
1	Left+
2	Left-
3	Right-
4	Right+



3-4 CC1/2 COM1/2 2x5pin (2.0mm) wafer

● (RS232 Mode)

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

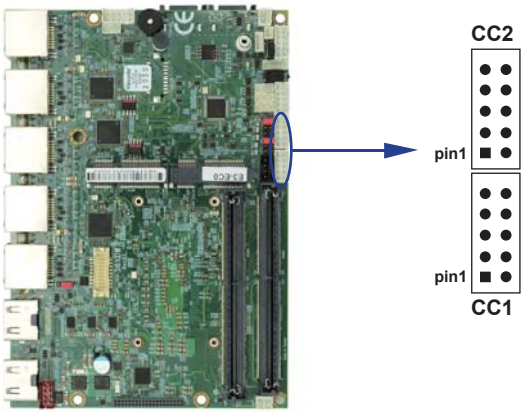
● (RS485 Mode)

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

● (RS422 Mode)

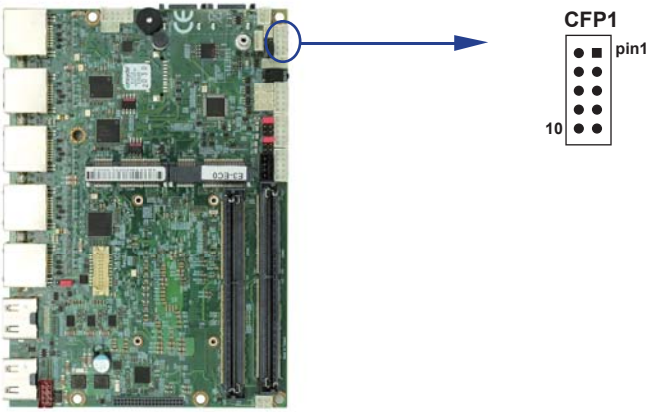
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX -	6	NC
2	TX +	7	NC
3	RX +	8	NC
4	RX -	9	NC
5	GND	10	+5V

Note:
1. Pin 9 RI and Voltage setting only for COM 1/2 ports, JVC1 for COM1, JVC2 for COM2
2. Default support RS232 / RS422 / RS485 by BIOS selected



3-5 CFP1 Front Panel connector 2x5pin (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+



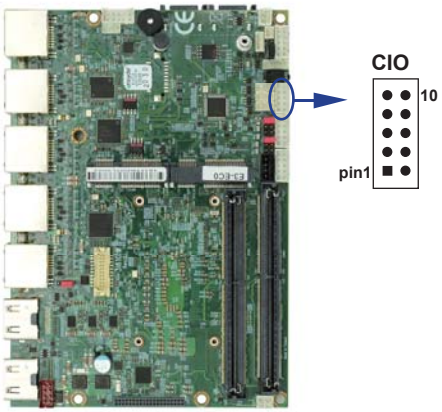
3-6 CIO1 DIO 0--3 (2x5pin 2.0mm wafer)

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 I^2C bus address 0x9c

- **For F75111N I^2C 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.



3-6-1 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

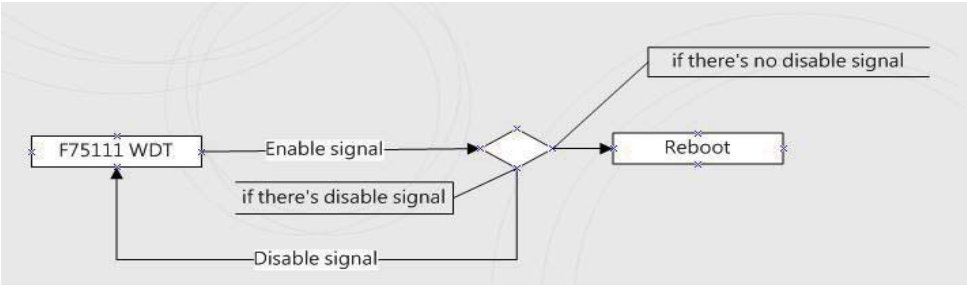
How to use this Demo Application

1.Boot Ms-Dos Operating System

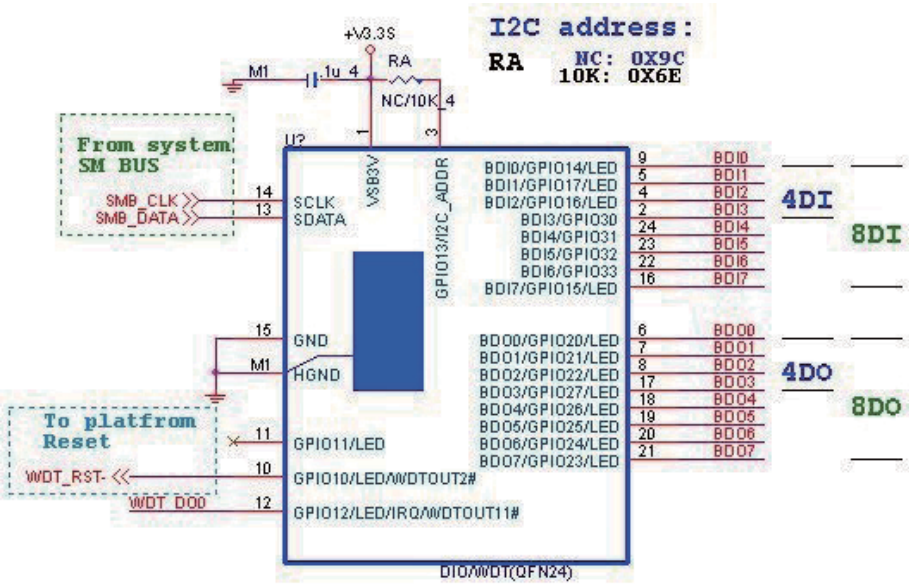
2.execute "75WDT.EXE" binary file

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

How to use this Demo Application

```
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
```

How to use this Demo Application

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

How to use this Demo Application

```
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;
  }
```

3-6-2 IO Device: F75111 under Windows

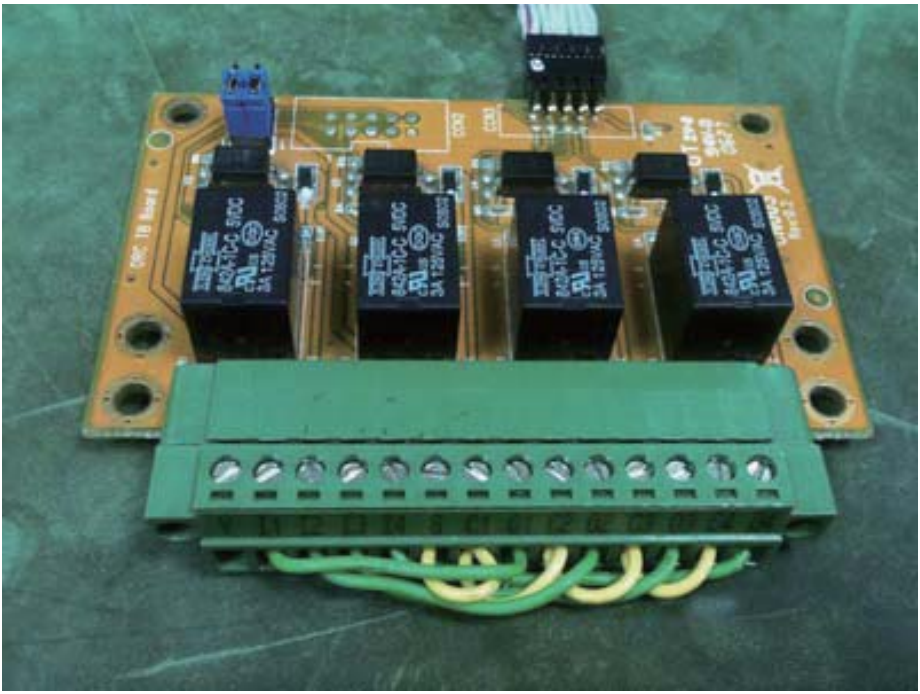
The Sample code source you can download from

Source file: F75111_DIO_Src_v2.8W(32bit).zip http://tprd.info/lexwiki/index.php/IO_Device:F75111

Binary file: F75111_DIO_Bin_v2.8W(32bit).zip

USERNAME & PASSWORD: sf

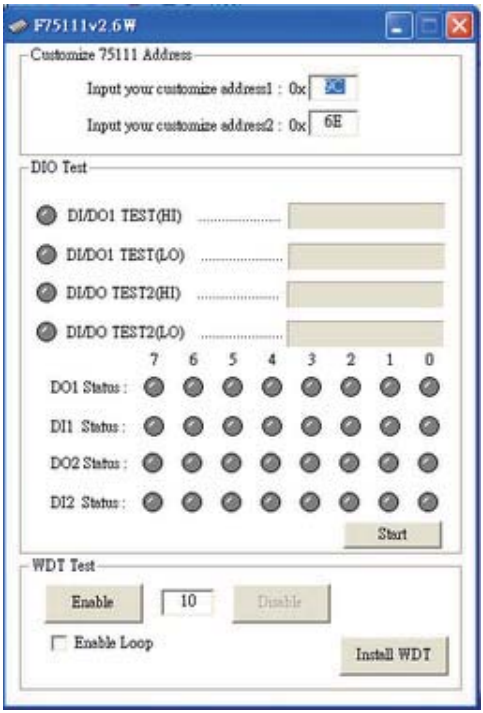
We do the demo test with a test tool which DIx connect to DOx with Relay.



How to use this Demo Application

one F75111

two F75111



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.

WARNING: win7 system architecture, use the system administrator to open DIO utility

1. Press the "Start" button to test DIO function

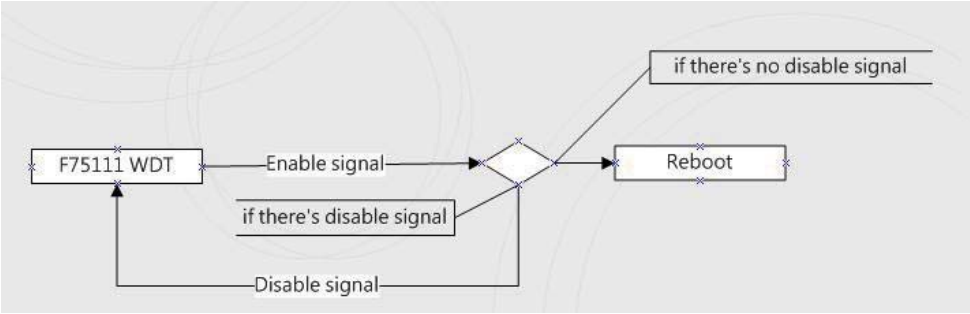
2. Press the "Enable" button to test WDT function

3. Press the "Disable" button to disable WDT

4. Check the "Enable Loop" box and press "Enable" to do WDT loop test

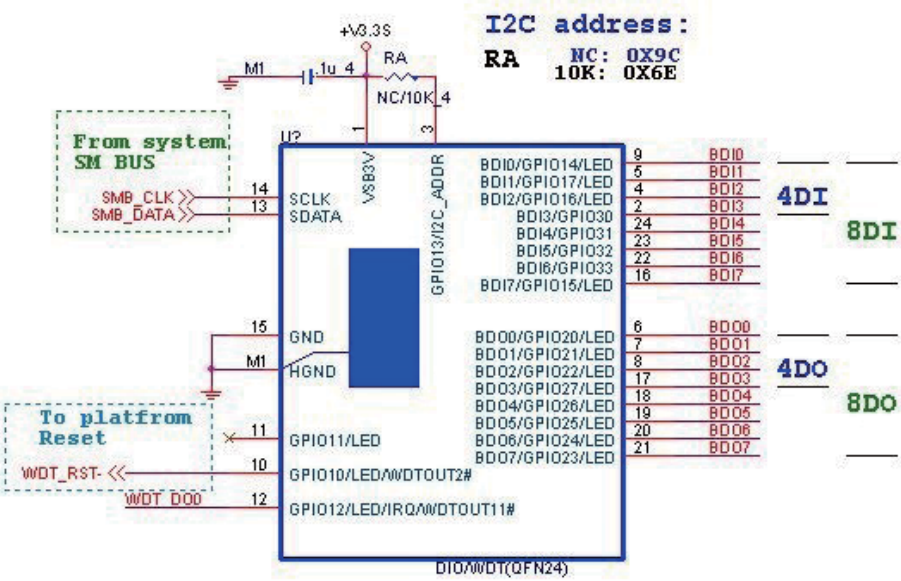
5. Press "Install WDT" to set the system to autorun this application when booting, press again to remove this application when booting.

**6. If WDT enable, system icon will be  . if disable, system icon will be  **



p.s.
f75111 send "F75111_SetWDTEnable(BYTE byteTimer)" including a parameter "timer",
if there's no disable signal (F75111_SetWDTDisable()) to stop it before timer countdown to 0, System will reboot.
if there's disable signal received, resent Enable WDT signal, for a loop to prevent from reboot

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()

Enable/Disable WDT

Enable : F75111_SetWDTEnable (BYTE byteTimer)
Disable: F75111_SetWDTDisable ()

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;
}
```

Enable WatchDog

```
void F75111_SetWDTEnable (BYTE byteTimer)
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_TIMER_RANGE  ,byteTimer);                    // set WatchDog range and timer
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,WDT_TIMEOUT_FLAG | WDT_ENABLE | WDT_PULSE | WDT_PSWIDTH_100MS);
                                                                                    // Enable WatchDog, Setting WatchDog configure
}
```

Disable WatchDog

```
void F75111_SetWDTDisable ()
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,0x00);                         // Disable WatchDog
}
```

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.
//-----------------------------------------------------------------------------------------------
#define   WDT_TIMER_RANGE                            0x37  //  0-255 (secord or minute program by WDT_UNIT)
#define   WDT_CONFIGURATION                          0x36  //  Configure WDT Function
#define   WDT_TIMEOUT_FLAG                           0x40  //  When watchdog timeout.this bit will be set to 1.
#define   WDT_ENABLE                                 0x20  //  Enable watchdog timer
#define   WDT_PULSE                                  0x10  //  Configure WDT output mode
                                                           //  0:Level Mode
                                                           //  1:Pulse Mode

#define   WDT_UNIT                                   0x08  //  Watchdog unit select.
                                                           //  0:Select second.
                                                           //  1:Select minute.

#define   WDT_LEVEL                                  0x04  //  When select level output mode:
                                                           //  0:Level low
                                                           //  1:Level high

#define   WDT_PSWIDTH_1MS                            0x00  //  When select Pulse mode: 1 ms.
#define   WDT_PSWIDTH_20MS                           0x01  //  When select Pulse mode: 20 ms.
#define   WDT_PSWIDTH_100MS                          0x02  //  When select Pulse mode: 100 ms.
#define   WDT_PSWIDTH_4000MS                         0x03  //  When select Pulse mode: 4 s.
```

3-6-3 IO Device: F75111 VB6 under Windows

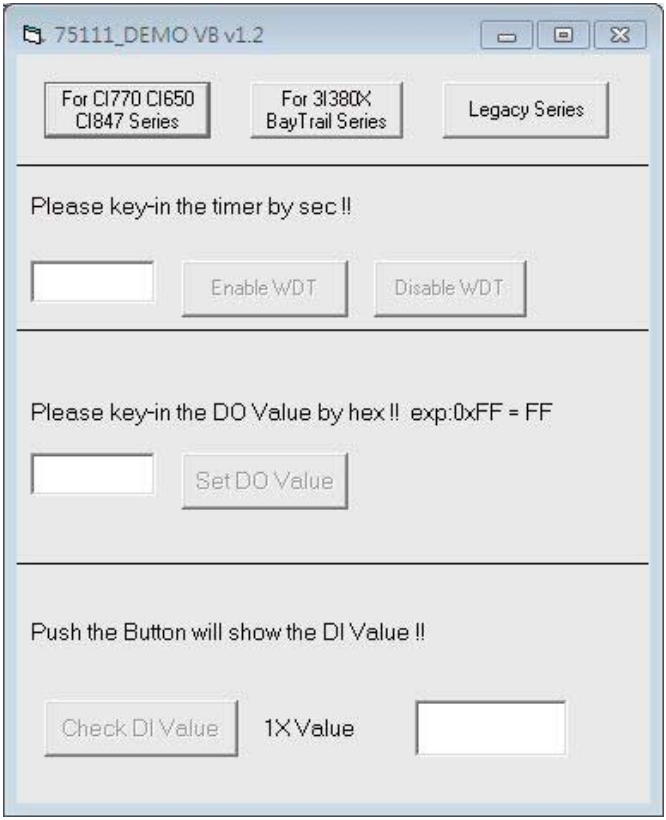
The Sample code source you can download from

Source file: 75111_VB_v1.2.rar http://tprd.info/lexwiki/index.php/IO_Device:F75111_VB6

Binary file: 75111_VB_Src1.2.rar

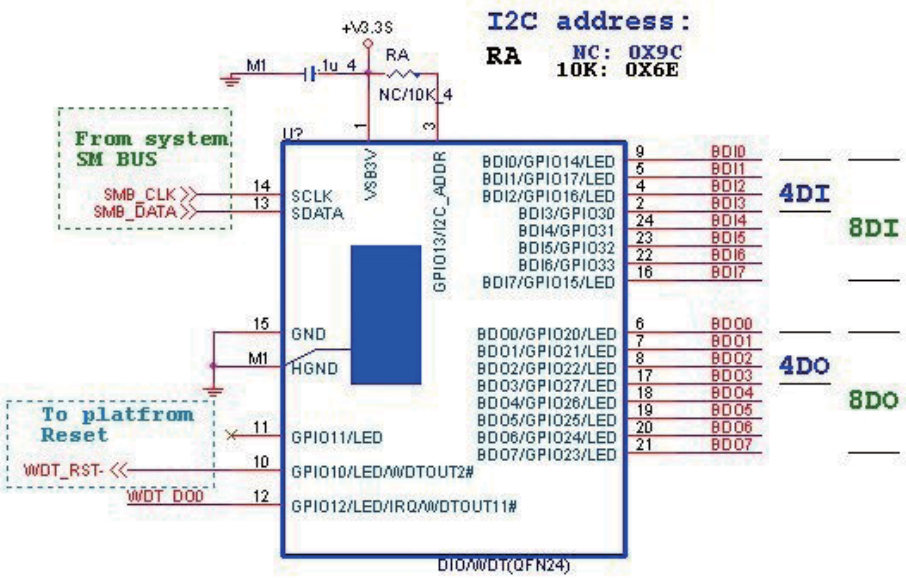
USERNAME & PASSWORD: sf

How to use this Demo Application



- **A Function - Choose your motherboard model**
- **B Function - Enable WDT timer ,Key-in the value by seconds then system will reboot after value which you key-in in left text box !!**
- **C Function - Disable WDT timer ,Push down the button then WDT timer value will be clear !!**
- **D Function - Set DO Value ,Key-in the DO value by hex then push the button !!**
- **E Function - Check DI Value ,The right side two text box will display DI 1X & 2X Value when you push down the button!!**

F75111 Layout Picture



SDK Function Introduction

Function EnableWDT

```
Function EnableWDT(timer As Integer)

Call WriteI2CByte(&H3, &H3)
Call WriteI2CByte(&H37, timer)
Call WriteI2CByte(&H36, &H73)

  End Function
```

Function DisableWDT

```
Function DisableWDT()

Call WriteI2CByte(&H36, &H0)

  End Function
```

Function SetDOValue

```
Function SetDOValue(dovalue As Integer)

Dim Data As Integer
Dim Value As Integer

Data = 0
Value = dovalue

If (Value And &H1) <> 0 Then
   Data = Data + &H1
End If

If (Value And &H2) <> 0 Then
   Data = Data + &H2
End If

If (Value And &H4) <> 0 Then
   Data = Data + &H4
End If

If (Value And &H80) <> 0 Then
   Data = Data + &H8
End If

If (Value And &H40) <> 0 Then
   Data = Data + &H10
End If

If (Value And &H20) <> 0 Then
   Data = Data + &H20
End If

If (Value And &H10) <> 0 Then
   Data = Data + &H40
End If

If (Value And &H8) <> 0 Then
   Data = Data + &H80
End If

Call WriteI2CByte(&H23, &H0)
Call WriteI2CByte(&H20, &HFF)
Call WriteI2CByte(&H2B, &HFF)
Call WriteI2CByte(&H21, Data)

End Function
```

Function CheckDIValue

```
Function CheckDIValue()
Dim GPIO1X     As Integer
Dim GPIO3X     As Integer
Dim DI1Xhex    As String
Dim DI3Xhex    As String

Dim Data As Long

Data = 0

Call ReadI2CByte(&H12, GPIO1X)
Call ReadI2CByte(&H42, GPIO3X)

GPIO1X = GPIO1X And &HF0
GPIO3X = GPIO3X And &HF

If (GPIO1X And &H10) <> 0 Then
   Data = Data + &H1
End If

If (GPIO1X And &H80) <> 0 Then
   Data = Data + &H2
End If

If (GPIO1X And &H40) <> 0 Then
   Data = Data + &H4
End If

If (GPIO3X And &H1) <> 0 Then
   Data = Data + &H8
End If

If (GPIO3X And &H2) <> 0 Then
   Data = Data + &H10
End If

If (GPIO3X And &H4) <> 0 Then
   Data = Data + &H20
End If

If (GPIO3X And &H8) <> 0 Then
   Data = Data + &H40
End If

If (GPIO1X And &H20) <> 0 Then
   Data = Data + &H80
End If

DI1Xhex = Hex(Data)

Text3.Text = "0x" + DI1Xhex

End Function
```

3-6-4 IO Device: F75111 under linux

The Sample code source you can download from

Source file: F75111v2.4L_SRC.tar.gz http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_linux

Binary file: F75111v2.4L_BIN.tar.gz

USERNAME & PASSWORD: sf

How to compile source code

1. Compile source code with Code::Blocks

download and install the Code::Block with command "apt-get install codeblocks"

Open an exist project(F75111.cbp) in Code::Blocks, click the compile button

(add an option 'pkg-config --libs gtk+-2.0 gthread-2.0' in "Project->Build Option->Linker Setting->Other linker option")

2. Compile source code with "make"

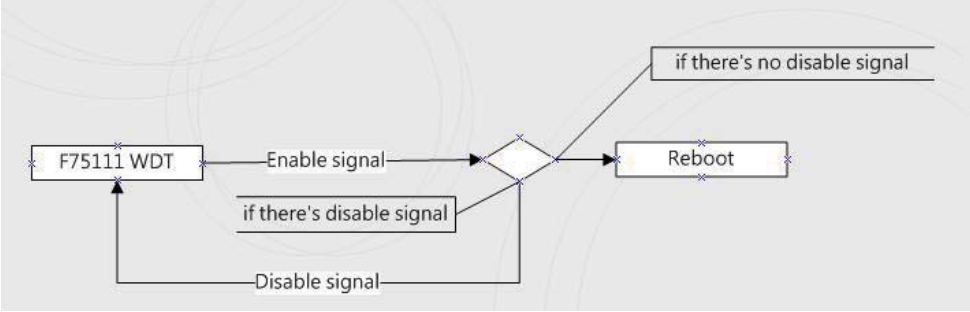
1. cd F75111

1. make

1. src/f75111 // execute the binary file

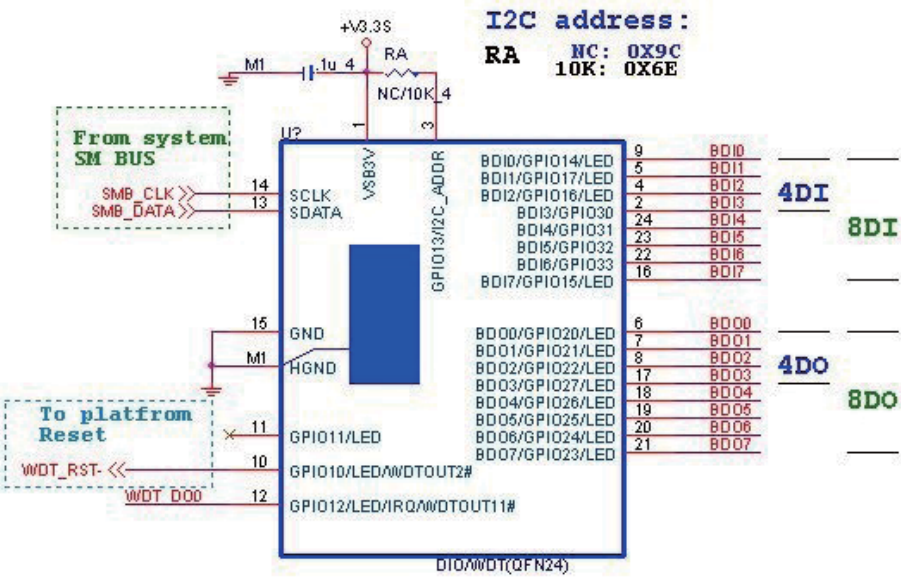
How to use this Demo Application

1. Press the "Start" button to test DIO function
2. Press the "Enable" button to test WDT function
3. Press the "Disable" button to disable WDT
4. Check the "Enable Loop" box and press "Enable" to do WDT loop test
5. Press "Install" to set the system to autorun this application when booting, press "Uninstall" to remove this application when booting.
6. If WDT enable, system icon will be blinking.



p.s.
f75111 send "F75111_SetWDTEnable(BYTE byteTimer)" including a parameter "timer",
if there's no disable signal (F75111_SetWDTDisable()) to stop it before timer countdown to 0, System will reboot.
if there's disable signal received, resent Enable WDT signal, for a loop to prevent from reboot p.s.

F75111 Layout Picture



Introduction

IO function In file SMBus.c

```
void SMBusIoWrite(BYTE byteOffset,BYTE byteData)
{
    outb( byteData , m_SMBusMapIoAddr + byteOffset);
}

BYTE SMBusIoRead(BYTE byteOffset)
{
    DWORD dwAddrVal;

    dwAddrVal = inb(m_SMBusMapIoAddr + byteOffset);
    return (BYTE)(dwAddrVal & 0x0FF);
}
```

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;
}
```

Enable WatchDog

```
void F75111_SetWDTEnable (BYTE byteTimer)
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_TIMER_RANGE  ,byteTimer);            // set WatchDog range and timer
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,WDT_TIMEOUT_FLAG | WDT_ENABLE | WDT_PULSE | WDT_PSWIDTH_100MS);
                                                                            // Enable WatchDog, Setting WatchDog configure
}
```

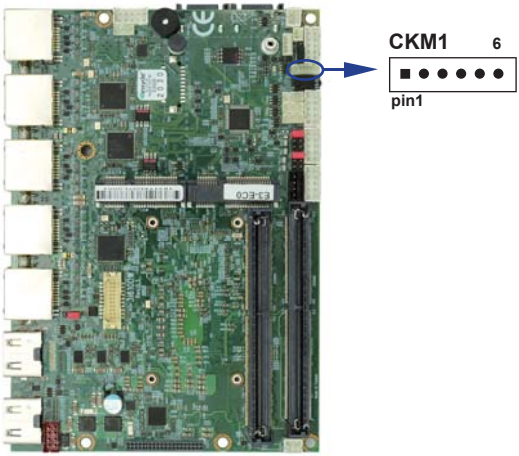
Disable WatchDog

```
void F75111_SetWDTDisable ()
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,0x00);                 // Disable WatchDog
}
```

```
//-----------------------------------------------------------------------------------------------------------
#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 GPIO2X_OUTPUT_DRIVING                                   0x2B    //      Select GPIO2X Output Mode or Input Mode
//-----------------------------------------------------------------------------------------------------------
#define WDT_TIMER_RANGE                                         0x37    //      0-255 (secord or minute program by WDT_UNIT)
//-----------------------------------------------------------------------------------------------------------
#define                 WDT_CONFIGURATION                       0x36    //      Configure WDT Function
#define                 WDT_TIMEOUT_FLAG                        0x40    //      When watchdog timeout.this bit will be set to 1.
#define                 WDT_ENABLE                              0x20    //      Enable watchdog timer
#define                 WDT_PULSE                               0x10    //      Configure WDT output mode
                                                                                //    0:Level  Mode
                                                                                //    1:Pulse  Mode
#define                 WDT_UNIT                                0x08    //      Watchdog unit select.
                                                                                //    0:Select second.
                                                                                //    1:Select minute.
#define                 WDT_LEVEL                               0x04    //      When select level output mode:
                                                                                //    0:Level low
                                                                                //    1:Level high
#define                 WDT_PSWIDTH_1MS                         0x00    //      When select Pulse mode: 1 ms.
#define                 WDT_PSWIDTH_20MS                        0x01    //      When select Pulse mode: 20 ms.
#define                 WDT_PSWIDTH_100MS                       0x02    //      When select Pulse mode: 100 ms.
#define                 WDT_PSWIDTH_4000MS                      0x03    //      When select Pulse mode:  4 s.
//-----------------------------------------------------------------------------------------------------------
typedef struct F75111_Address
{
    BYTE bAddress;
}F75111_Address;
F75111_Address m_F75111;

bool            F75111_Init();
BYTE            F75111_GetDigitalInput ();
void            F75111_SetDigitalOutput(BYTE byteValue);

BYTE            F75111_GetWDTMode();
void            F75111_SetWDTMode(BYTE dwvalue);

void            F75111_SetWDTEnable    (BYTE byteTimer);
void            F75111_SetWDTDisable   ();
```

3-7 CKM1: KB/MS port 1x6pin (1.25mm) Wafer

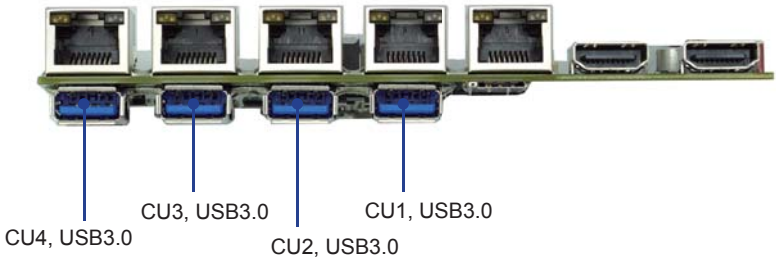
PIN NO.	DESCRIPTION
1	+5V
2	Keyboard Data
3	Keyboard Clock
4	GND
5	Mouse DATA
6	Mouse Clock



3-8 CU1/2/3/4: USB3.0 Port 1/2/3/4 Type A Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBUS	5	SS_RX-
2	D-	6	SS_RX+
3	D+	7	GND
4	GND	8	SS_TX-
		9	SS_TX+

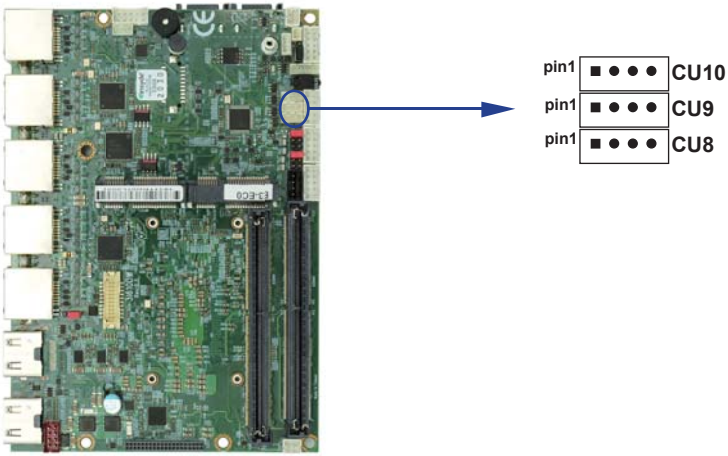
Note: the power supply 0.9A for each USB3.0 respect specification.



3-9 USB 2.0 Interface

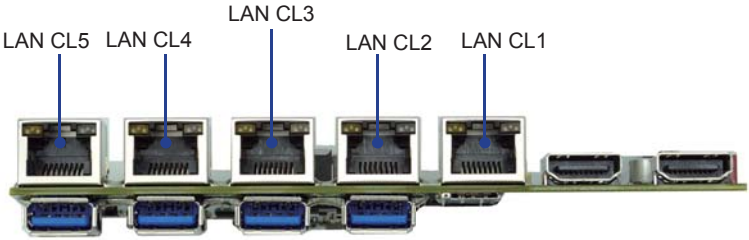
● CU8/9/10 USB2.0 port (1x4pin 1.25mm Wafer)

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



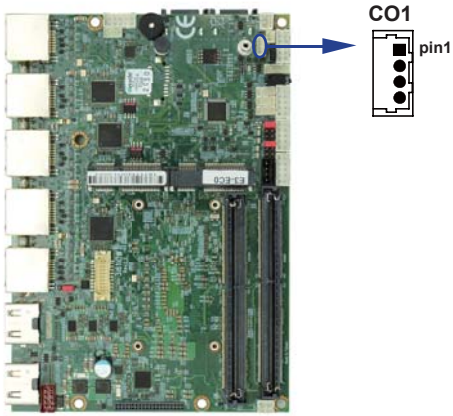
3-10 CL1/2/3/4/5: RJ45 LAN1/2/3/4/5 Connector

PIN NO	DESCRIPTION	PIN NO	DESCRIPTION
1	MDI0+	5	MDI2-
2	MDI0-	6	MDI1-
3	MDI1+	7	MDI3+
4	MID2+	8	MDI3-



3-11 CO1: I^{2}C Bus 4pin (1.25mm) Wafer

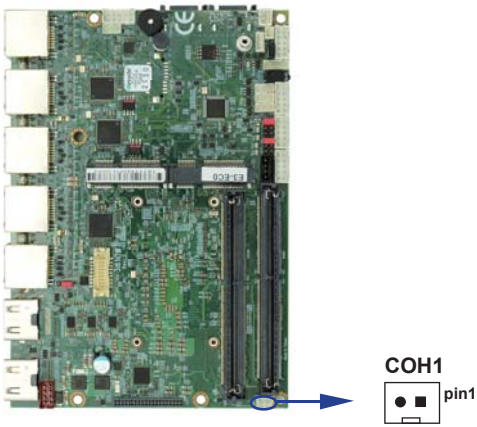
PIN NO	DESCRIPTION
1	+3.3V
2	GND
3	I^{2}C Clock
4	I^{2}C DATA



3-12 COH1: +12V Heater (1x2pin 2.0mm Wafer)

PIN NO	DESCRIPTION
1	+12V
2	GND

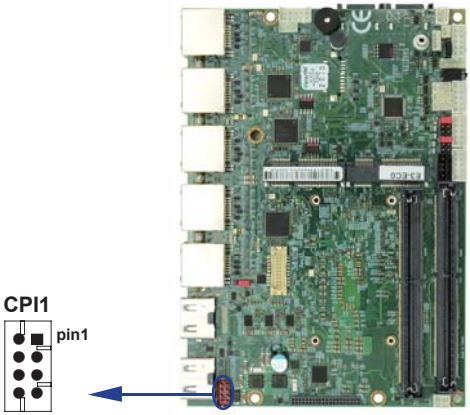
Note: Then +12V will powered when adapter plug-in.



3-13 CPI1: DC Power input (2x4pin 2.0mm Wafer) (Red)

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

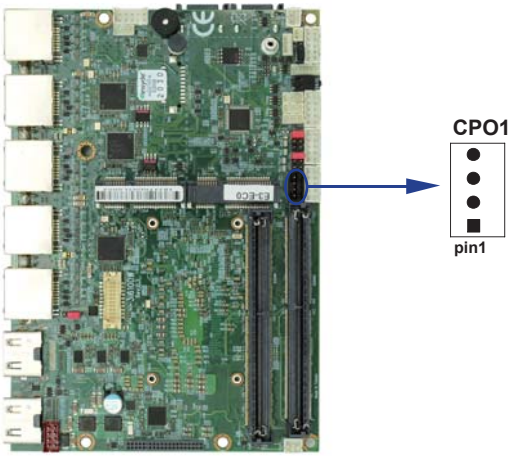
Note: Very important check DC-in Voltage



3-14 CPO1: +12V/+5V DC voltage output wafer connector (Black) (1x4pin 2.0mm)

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

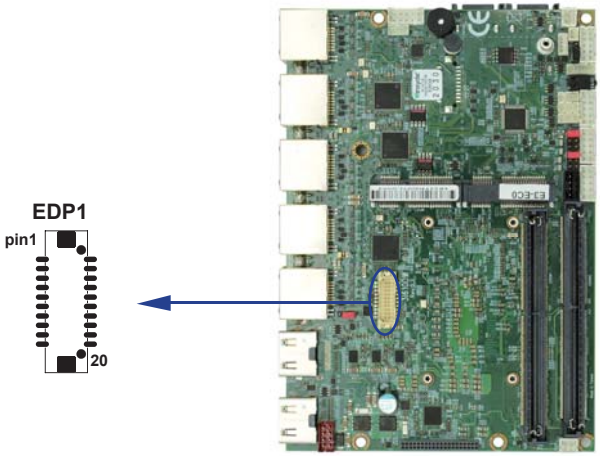
* Note: Attention! Check Device Power in spec



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	I^2C Data	14	+LCD(5V or 3.3V)
15	I^2C Clock	16	+LCD(5V or 3.3V)
17	eDP Aux+	18	+LCD(5V or 3.3V)
19	eDP Aux-	20	GND

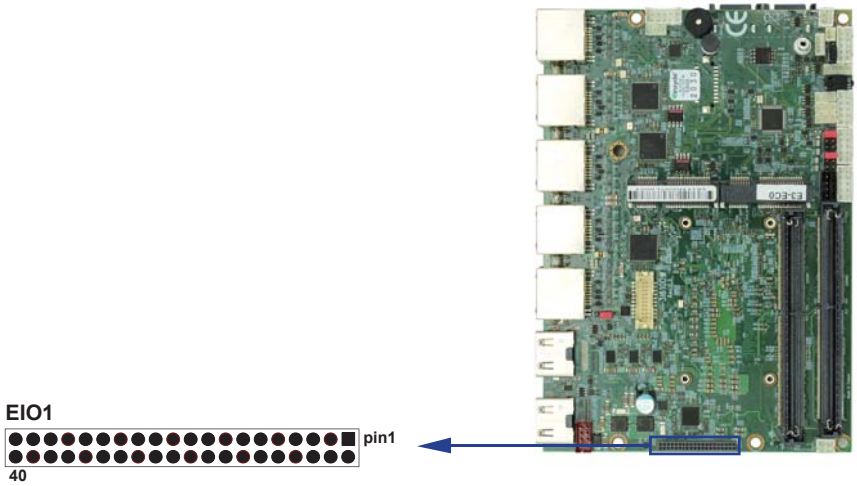
Note:
1. eDP interface support 2 lanes.
2. JVL1: eDP panel +5V/+3.3V (default) Voltage select.
3. eDP1 PIN 9 for panel backlight enable. +3.3V Level
4. eDP1 PIN 11 for panel backlight dimming control



3-16 EIO1: eIO PIN 2x20 PIN HEADER

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+12V	2	+12V
3	GND	4	PLTRST
5	PCIE_RX_P	6	NC
7	PCIE_RX_N	8	GND
9	GND	10	PCIE_TX_N
11	PCIE_CLK_P	12	PCIE_TX_P
13	PCIE_CLK_N	14	GND
15	GND	16	NC
17	NC	18	NC
19	NC	20	GND
21	GND	22	NC
23	NC	24	PCIE_WAKE_N
25	NC	26	GND
27	GND	28	SMB_CLK
29	USB DATA+	30	SMB_DATA
31	USB DATA-	32	GND
33	GND	34	SLP_S3_N
35	+12V	36	PWRBTN_N
37	+12V	38	GND
39	+12V	40	+12V

Note:
that EIO interface only support PCIe X1.
The PIN4,24,34,36 is +3.3V Level signal.



3-17 HDMI1 / HDMI2: HDMI connector

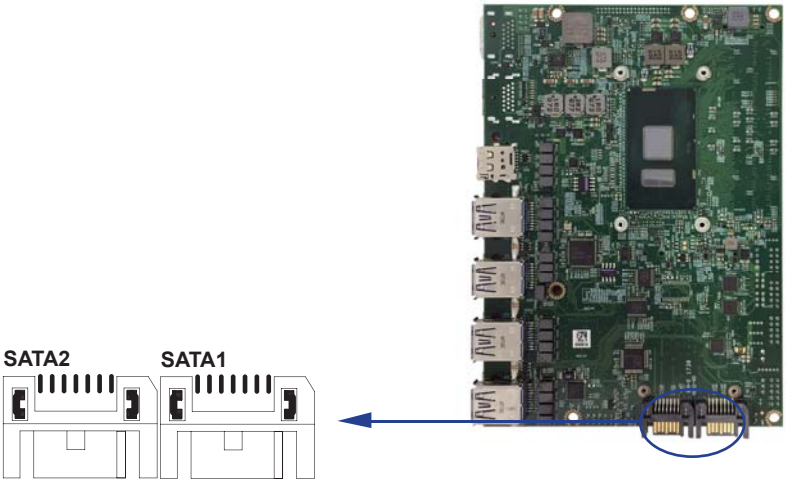
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2+	2	GND
3	TMDS DATA2-	4	TMDS DATA1+
5	GND	6	TMDS DATA1-
7	TMDS DATA0+	8	GND
9	TMDS DATA0-	10	TMDS CLK+
11	GND	12	TMDS CLK-
13	NC	14	NC
15	DDC CLOCK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		

3-18 SATA interface

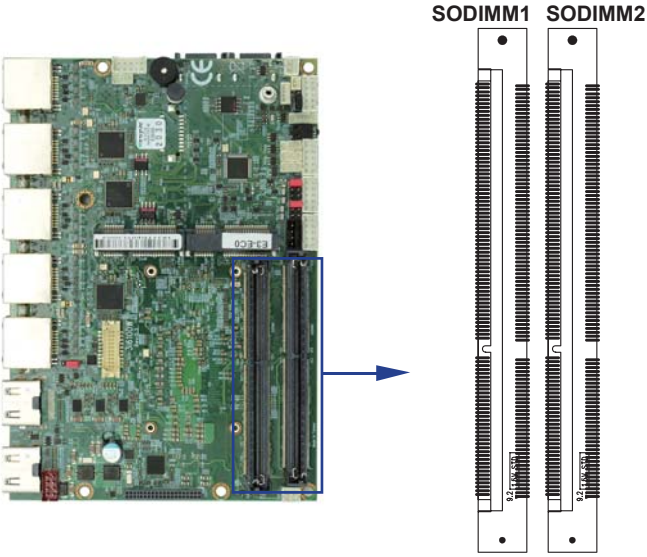
● SATA1/2: SATA port 1x7pin Connector

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

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



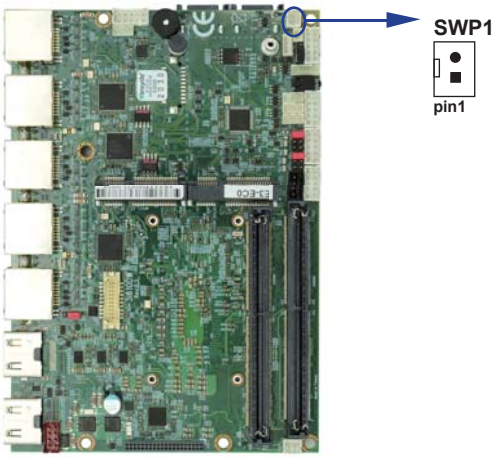
3-19 SODIMM1/2 socket



Note:
1.SODIM1 / SODIM2: SO-DIMM DDR4 1.2V DRAM Socket
2. Only Support un-buffer type module

3-20 SWP1 Power On/off switch Wafer (1x2 pin 2.00mm wafer)

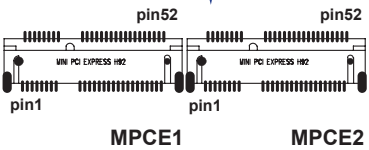
PIN NO.	DESCRIPTION
1	Power button pin
2	Power button GND



3-21 Module socket

● MPCE 1/2 PCI Express mini card

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



Note:

1. MPCE1 Pin51 mSATA / PCIe auto detect function, but MPCE2 PCIe only.

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

Location	CKTS	PITCH	Brand Name	Mating connector	Cable housing
CA1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CALR1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CC1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CC2	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CFP1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CIO1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CKM1	1x6 6Pin	1.25mm	MOLEX	53047-0610	51021-0600
CO1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
COH1	1x2 2Pin	2.00mm	JST	B2B-PH-KL	PHR-2
CPI1	2x4 8Pin	2.00mm	JST	B8B-PHDSS	PHDR-08VS
CPO1	1x4 4Pin	2.00mm	JST	B4B-PH-KL	PHR-4
CU8	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU9	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU10	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
eDP1	2x10 20Pin	1.25mm	HIROSE	DF13-20DS-1.25C	DF13-20DP-1.25V
SWP1	1x2 2Pin	2.00mm	JST	B2B-PH-KL	PHR-2

Chapter-4

Introduction of BIOS

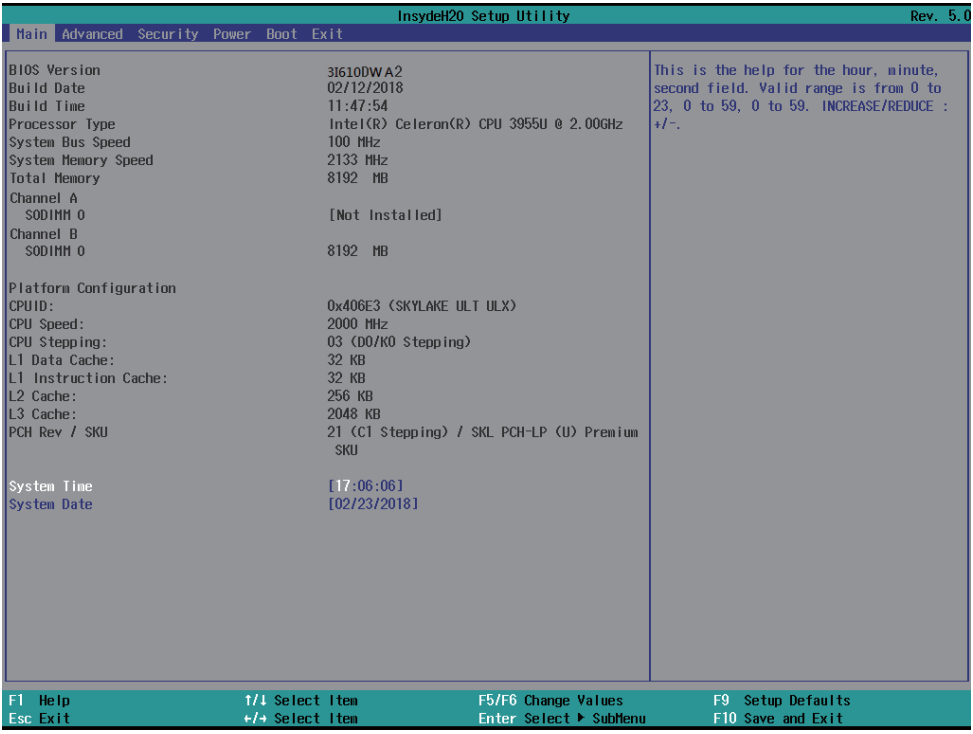
The BIOS is a program located in the Flash Memory on the motherboard.
This program is a bridge between motherboard and operating system.
When you start the computer, the BIOS program gains control.
The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the
necessary 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.

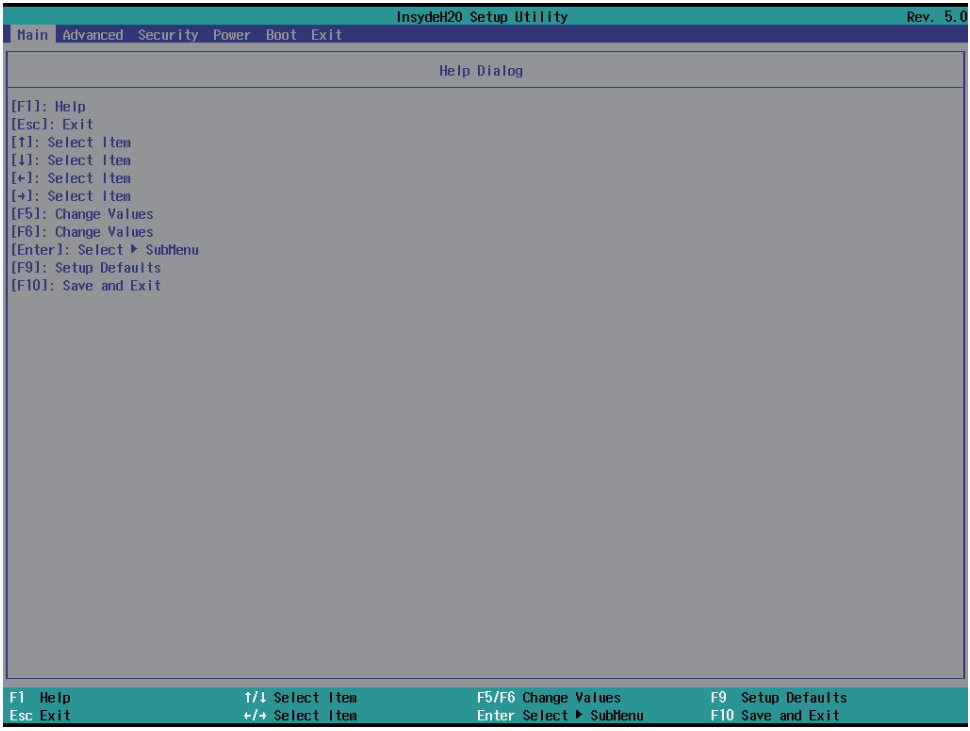
4-2 BIOS Menu Screen & Function Keys



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 ←–→ (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.

4-3 General Help



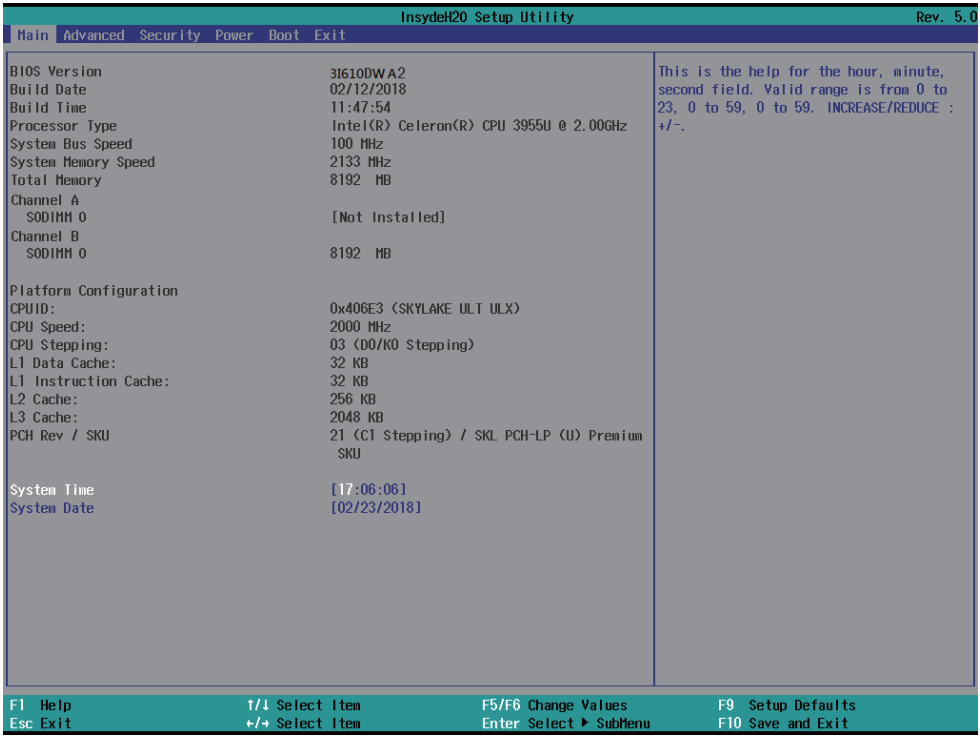
Status Page Setup Menu / Option Page Setup Menu

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
Security Password settings
Power PME & Power button settings
Boot 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.

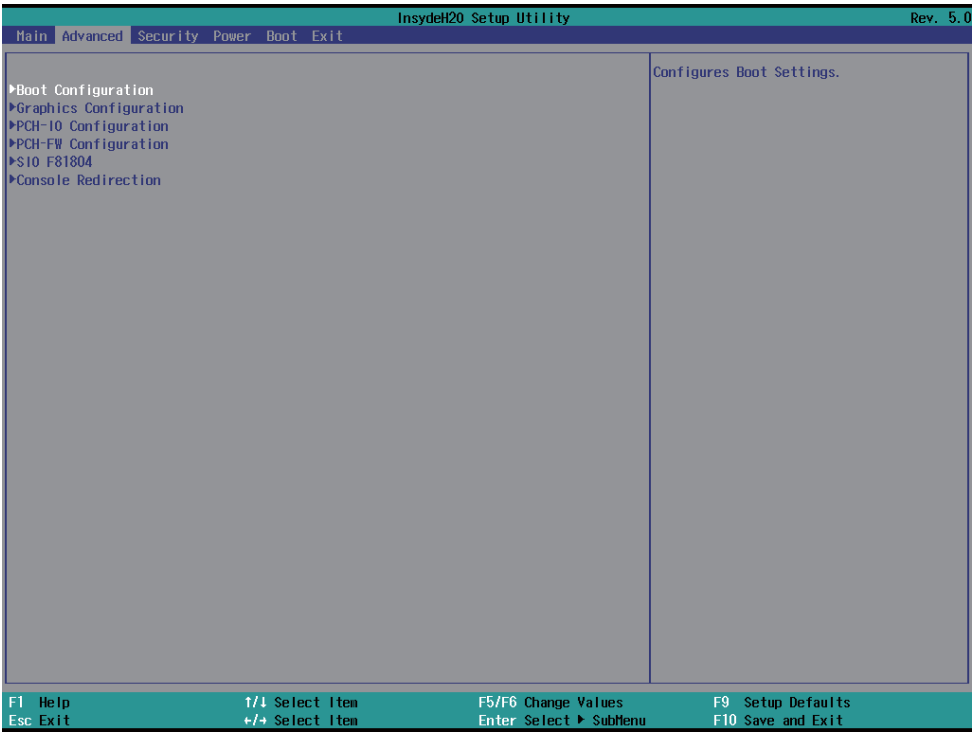
4-5 Main



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

Graphics Configuration
Please refer section 4-6-2

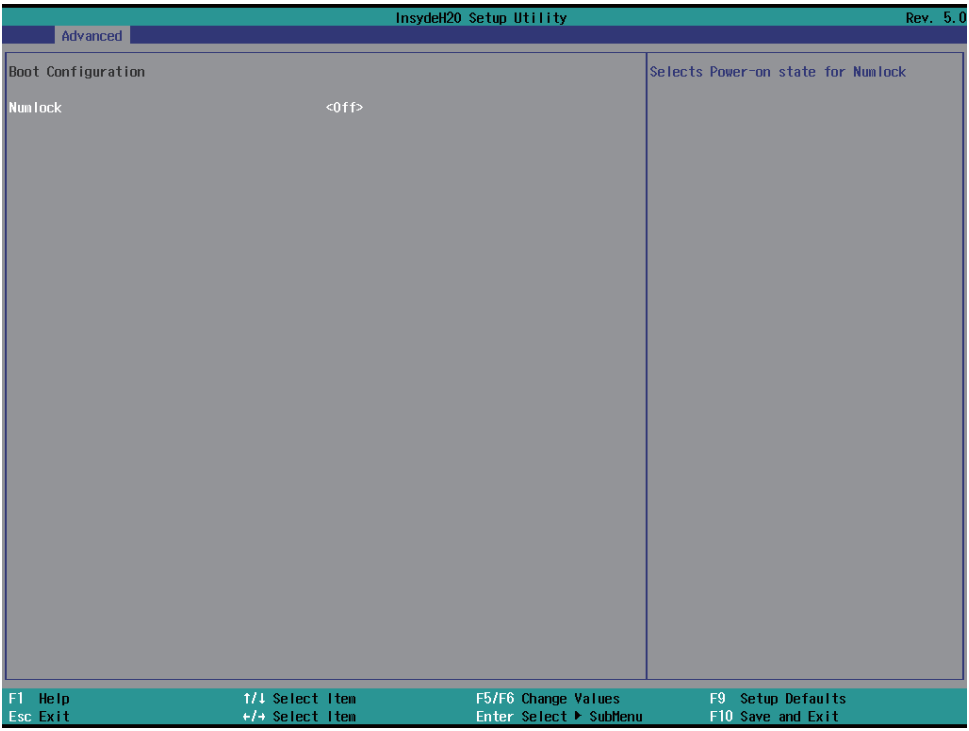
PCH-IO Configuration
Please refer section 4-6-3

PCH-FW Configuration
Please refer section 4-6-4

SIO F81804
Please refer section 4-6-5

Console Redirection
Please refer section 4-6-6

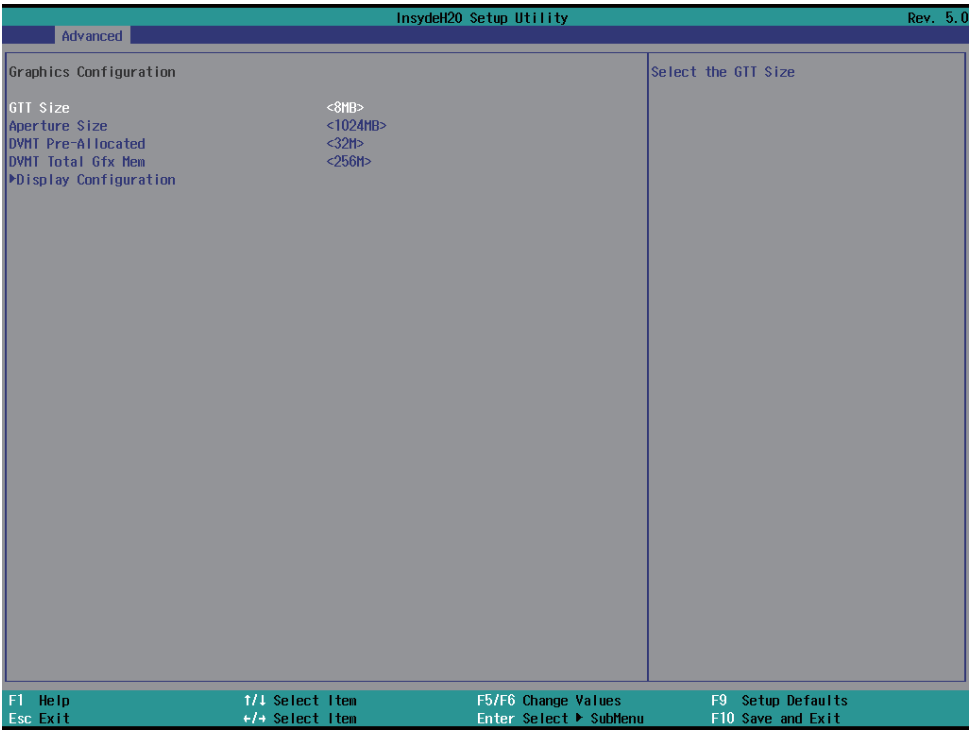
4-6-1 Boot Configuration



Numlock

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

4-6-2 Graphics Configuration



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

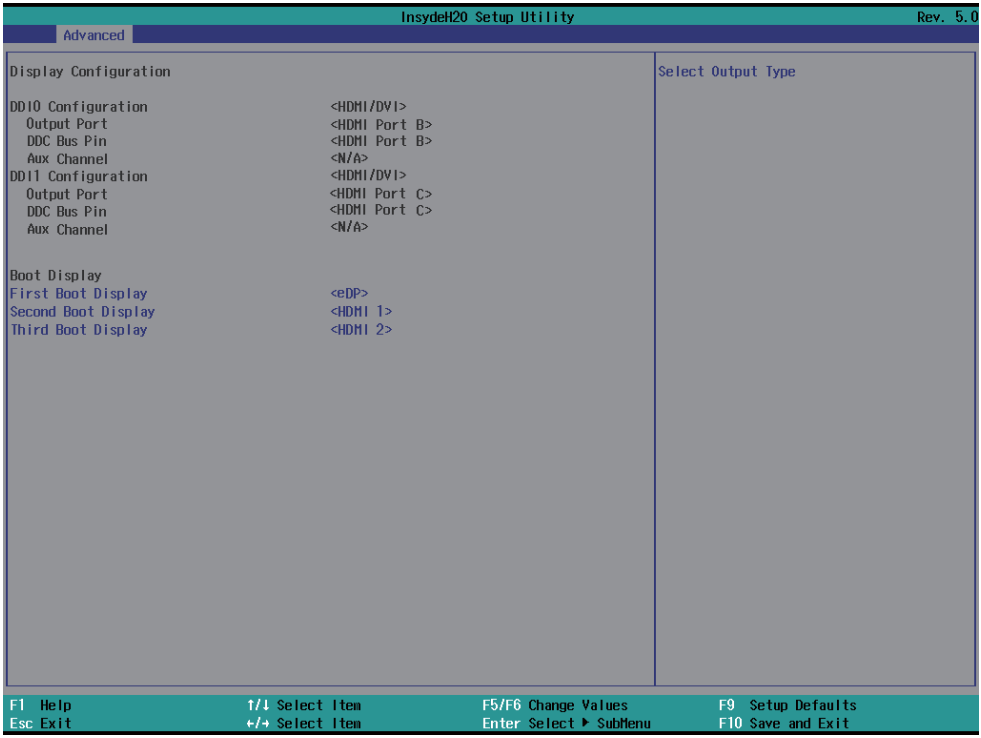
Aperture Size
The optional settings are: 128MB, 256MB, 512MB, 1024MB (default), 2048MB

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 4-6-2-1

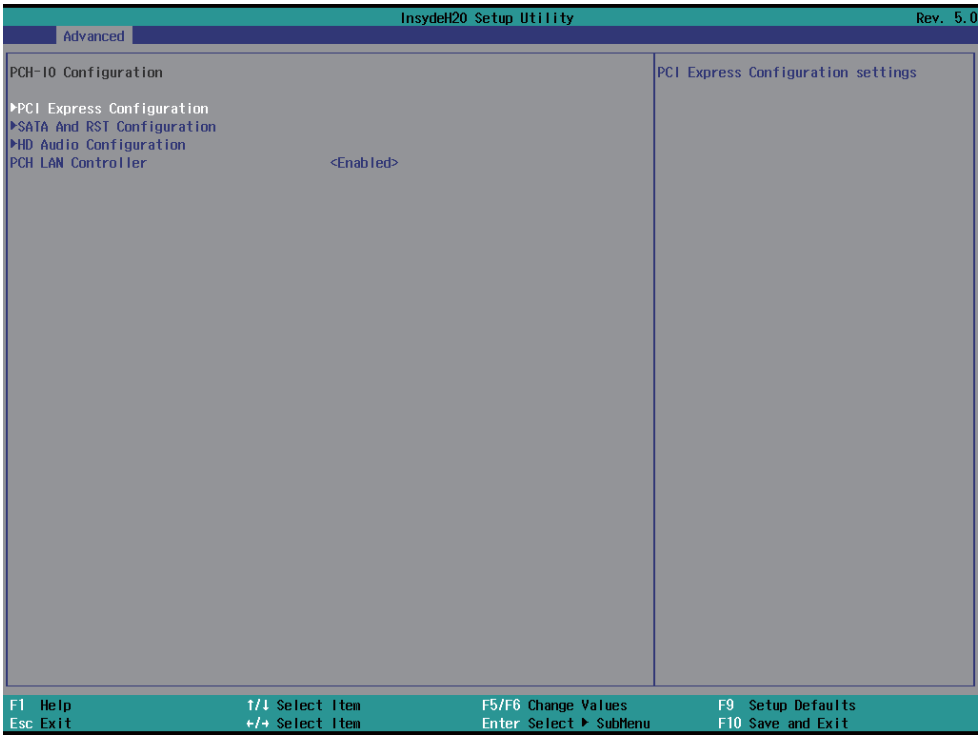
4-6-2-1 ► Display Configuration



Boot Display

To select the displays priority to eDP, HDMI 1 or HDMI 2

4-6-3 PCH-IO Configuration



PCI Express Configuration

Please refer section 4-6-3-1

SATA And RST Configuration

Please refer section 4-6-3-2

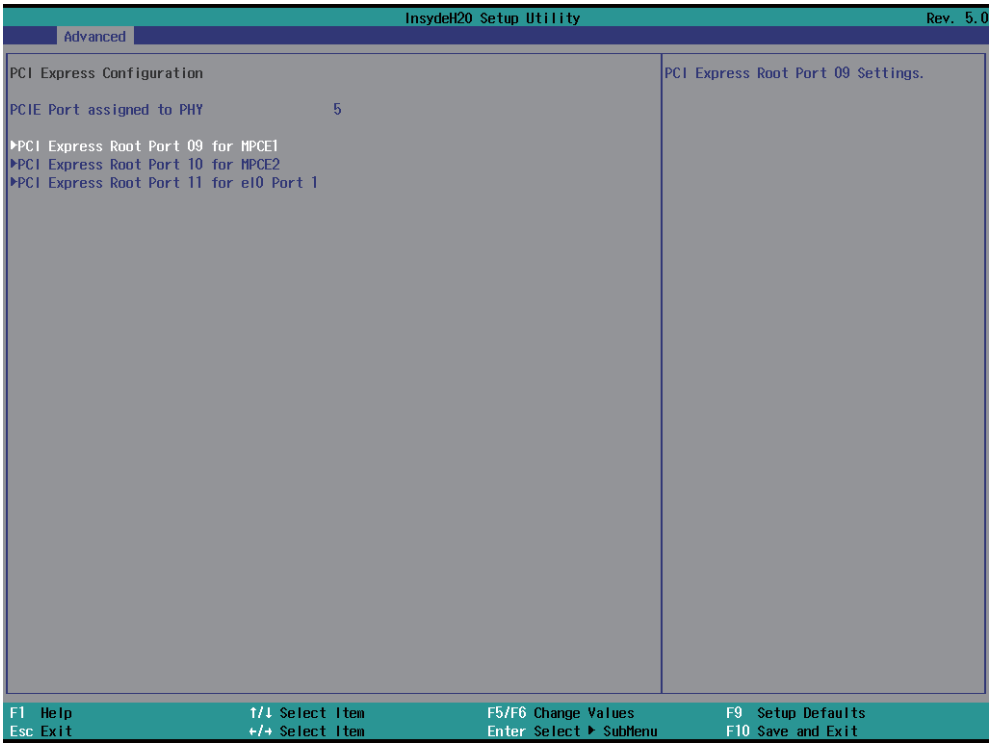
HD Audio Configuration

Please refer section 4-6-3-3

PCH LAN Controller

To enable / disable onboard NICs.

4-6-3-1 ► PCI Express Configuration



PCI Express Root Port 09 for MPCE1

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

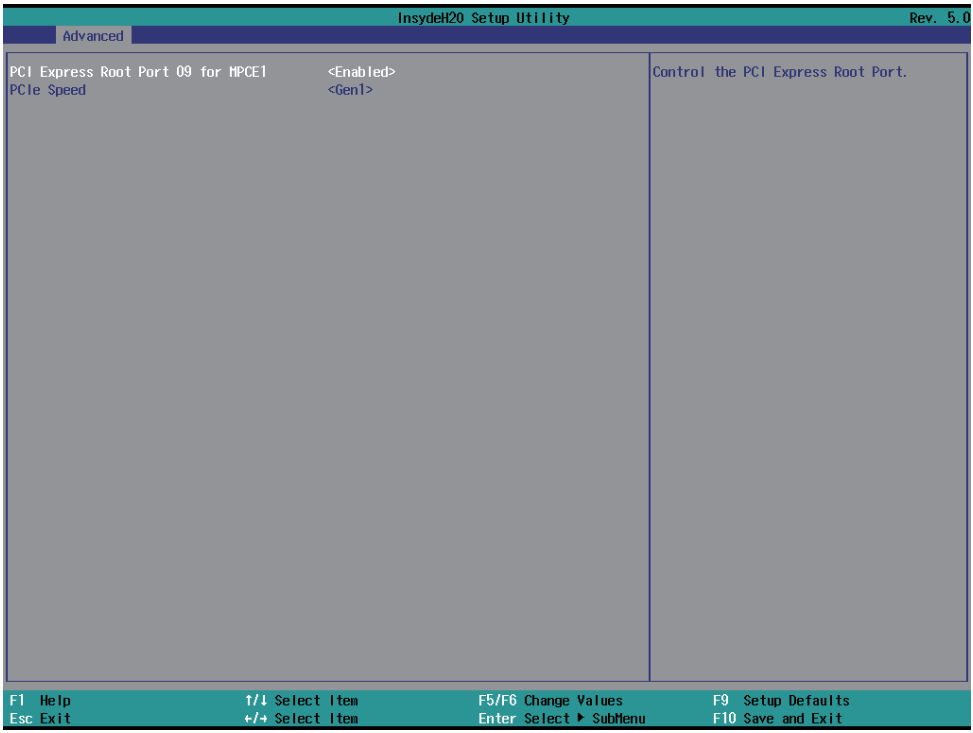
PCI Express Root Port 10 for MPCE2

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

PCI Express Root Port 11 for eIO port 1

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

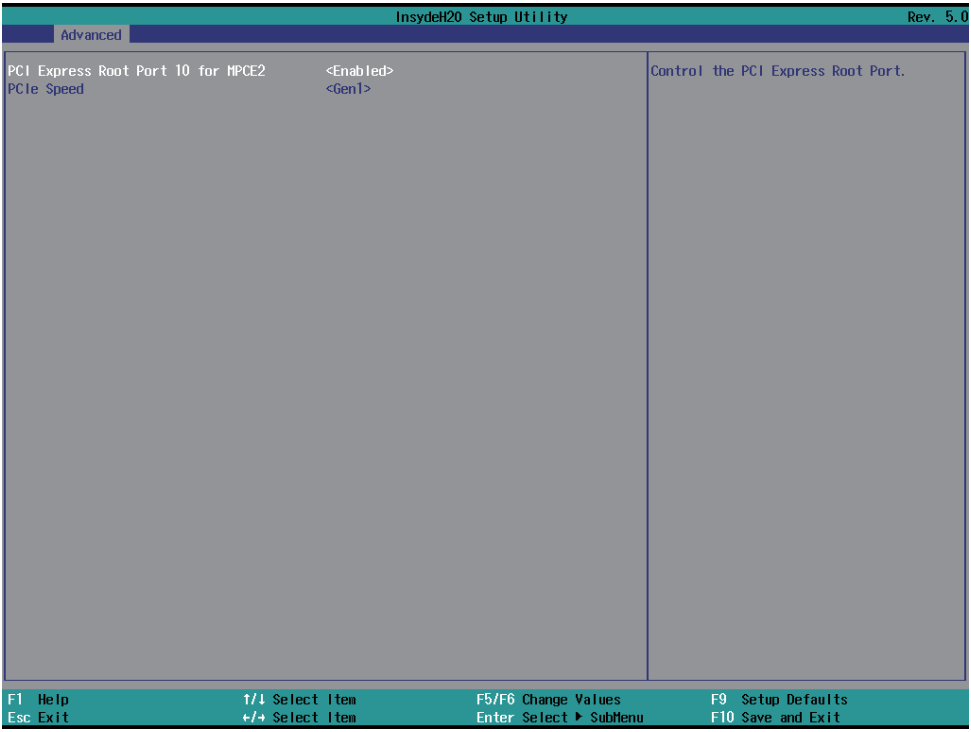
4-6-3-1-1 ► PCI Express Root Port 09 for MPCE1



PCI Express Root Port 09 for MPCE1
The optional settings are: Enabled(default), Disabled.

Select PCI Express port speed.
The optional settings are: Auto, Gen1(default), Gen2, Gen3

4-6-3-1-2 ► PCI Express Root Port 10 for MPCE2



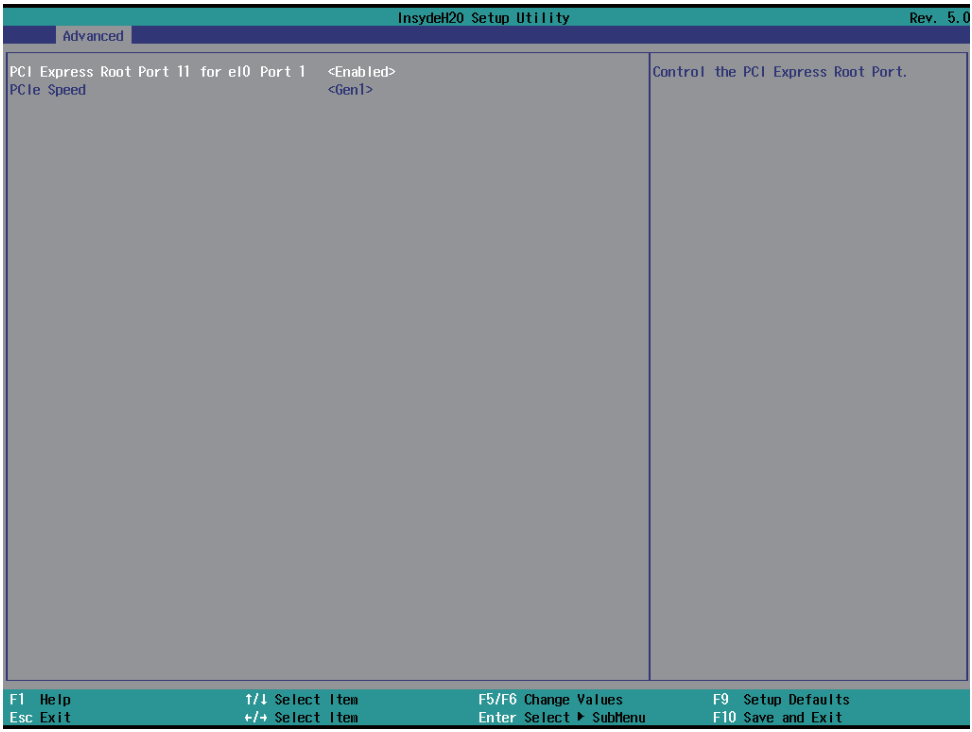
PCI Express Root Port 10 for MPCE2

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

Select PCI Express port speed.

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

4-6-3-1-3 ► PCI Express Root Port 11 for eIO port 1



PCI Express Root Port 11 for eIO port 1

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

Select PCI Express port speed.

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

4-6-3-2 ► SATA And RST Configuration

```
                          InsydeH20 Setup Utility                          Rev. 5.0
 Advanced

 SATA And RST Configuration                                  Enable/Disable SATA Device.

 SATA Controller(s)                    <Enabled>
 SATA Mode Selection                   <AHCI>

 Serial ATA Port 0                     Empty
   Port 0                              <Enabled>
   SATA Device Type                    <Hard Disk Drive>
 Serial ATA Port 1                     Empty
   Port 1                              <Enabled>
   SATA Device Type                    <Hard Disk Drive>
 Serial ATA Port 2                     Empty
   Port 2                              <Enabled>
   SATA Device Type                    <Hard Disk Drive>

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

SATA Controller

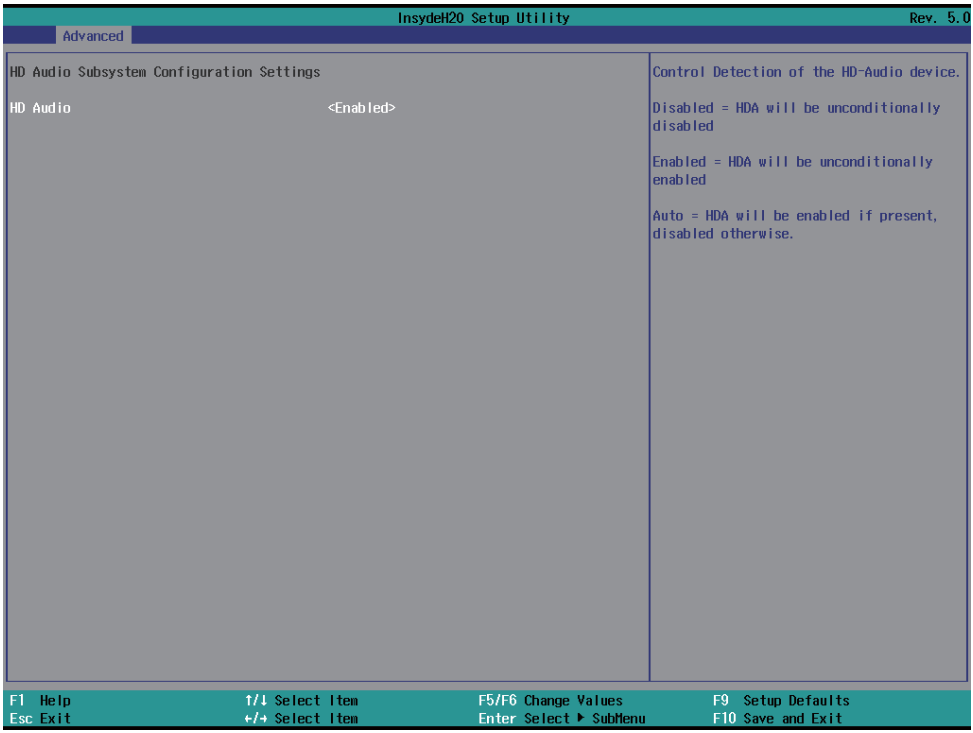
Use this item to Enable or Disable SATA Device.

The optional settings are: Enabled(default) or Disabled

SATA Mode Selection

Support AHCI Mode only.

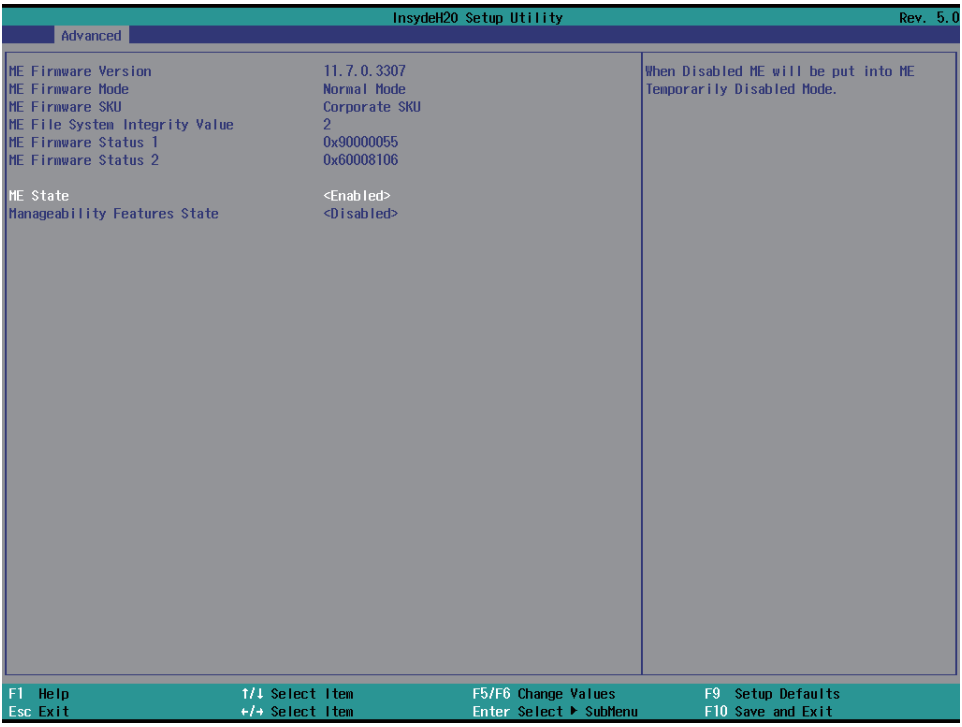
4-6-3-3 ► HD Audio Configuration



HD-Audio Supported.

The optional settings are: Enabled (default) or Disabled

4-6-4 PCH-FW Configuration



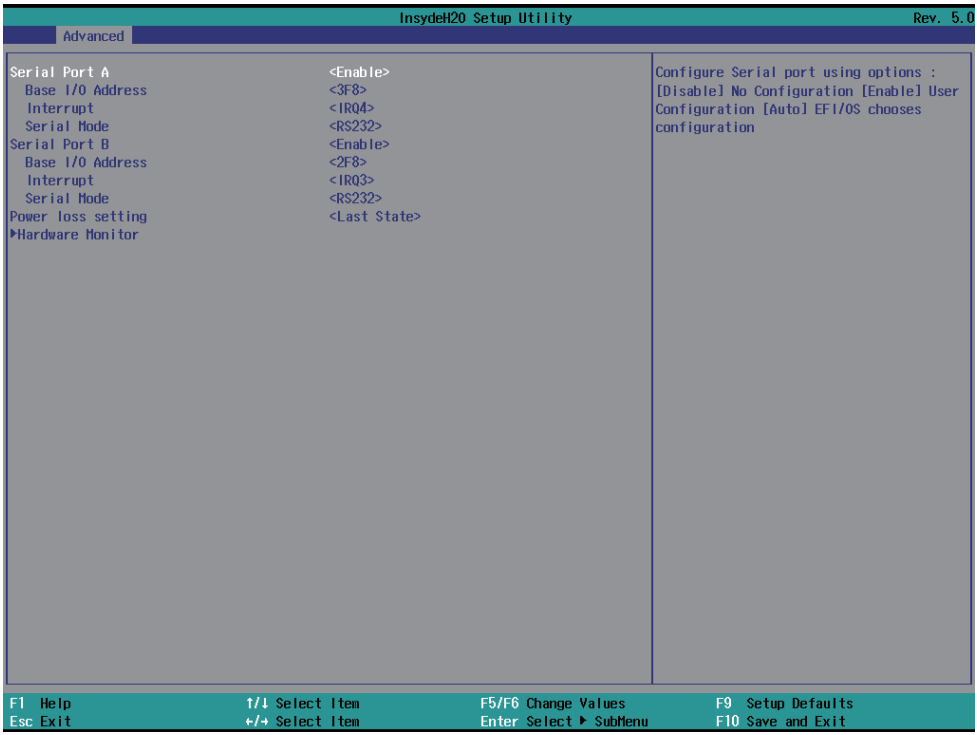
ME State

The optional settings are: Enabled (default) or Disabled

Manageability Features State

The optional settings are: Enabled or Disabled (default)

4-6-5 SIO F81804



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.

[Keep 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.

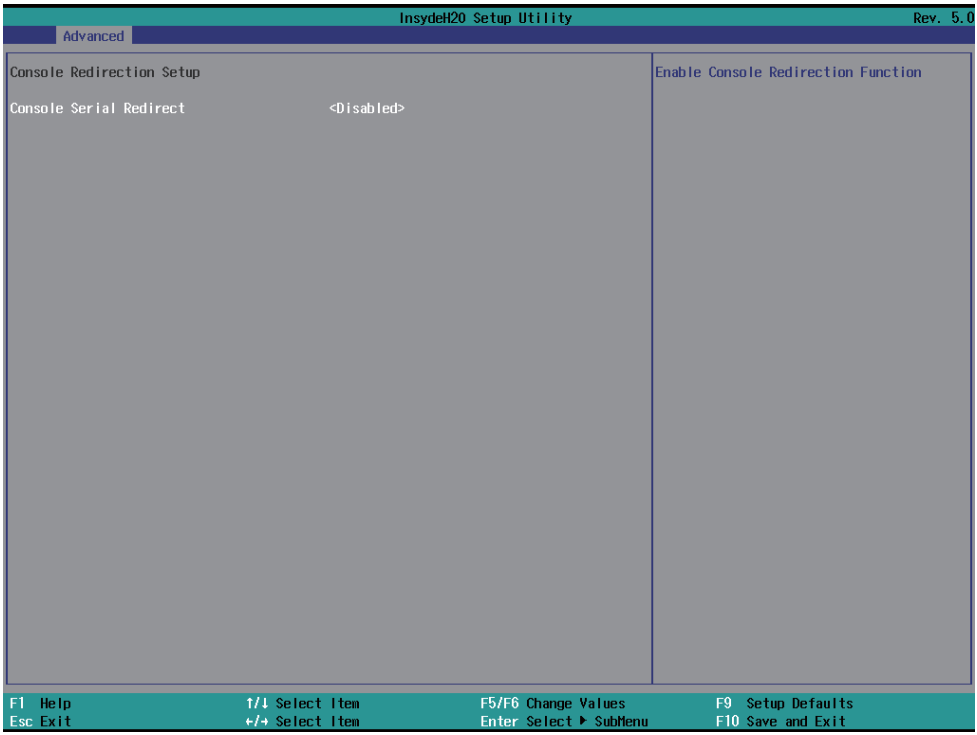
Hardware Monitor
Please refer section 4-6-5-1

4-6-5-1 ► Hardware Monitor

```
                          InsydeH20 Setup Utility                          Rev. 5.0
   Advanced

Hardware Monitor

Voltage
  VCC3                                  3.344 V
  VCC_CORE                              0.760 V
  VDDQ                                  1.200 V
  VCCIO                                 0.976 V
  VCC5                                  5.003 V
  VASB3                                 3.360 V
  VBAT                                  3.424 V
  VASB5                                 4.872 V

Temperature
  CPU (°C/°F)                         77.0°C/ 170.6°F
  System (°C/°F)                      57.0°C/ 134.6°F

Fan Speed
  FAN1                                   0 RPM

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

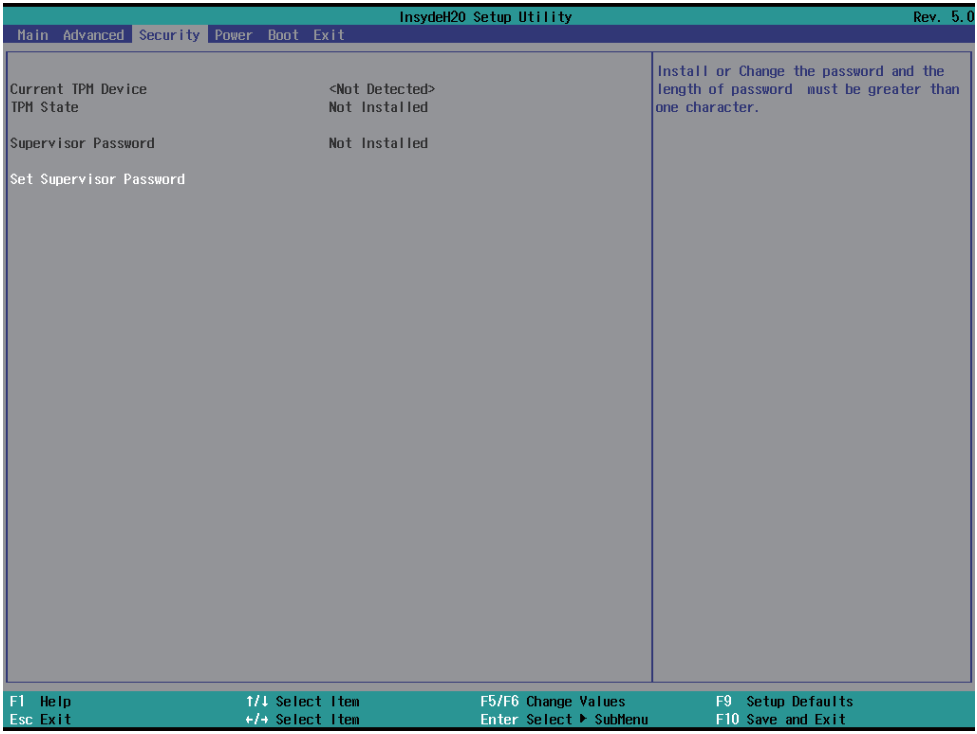
Press [Enter] to view PC health status.
This section shows the status of your CPU, Fan, and overall system.
This is only available when there is Hardware Monitor function onboard.

4-6-6 Console Redirection



Console Serial Redirect
Use this item to enable or disable Console Redirection.
The optional settings are: Enabled, Disabled (default).

4-7 Security

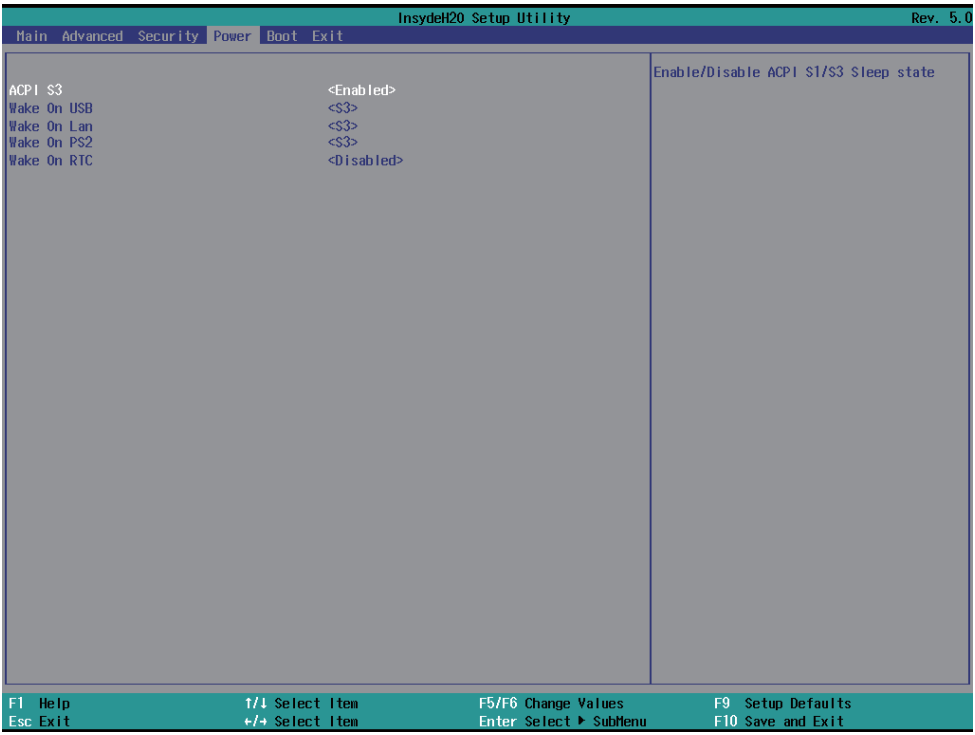


Supervisor Password

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.

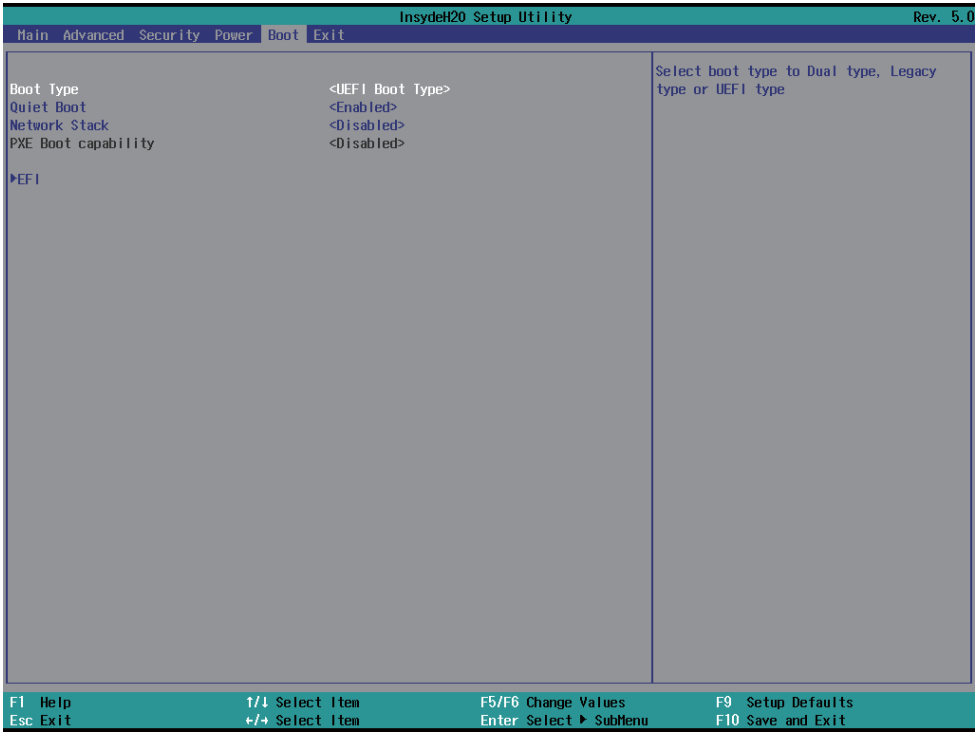
4-8 Power



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 PS2
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

4-9 Boot



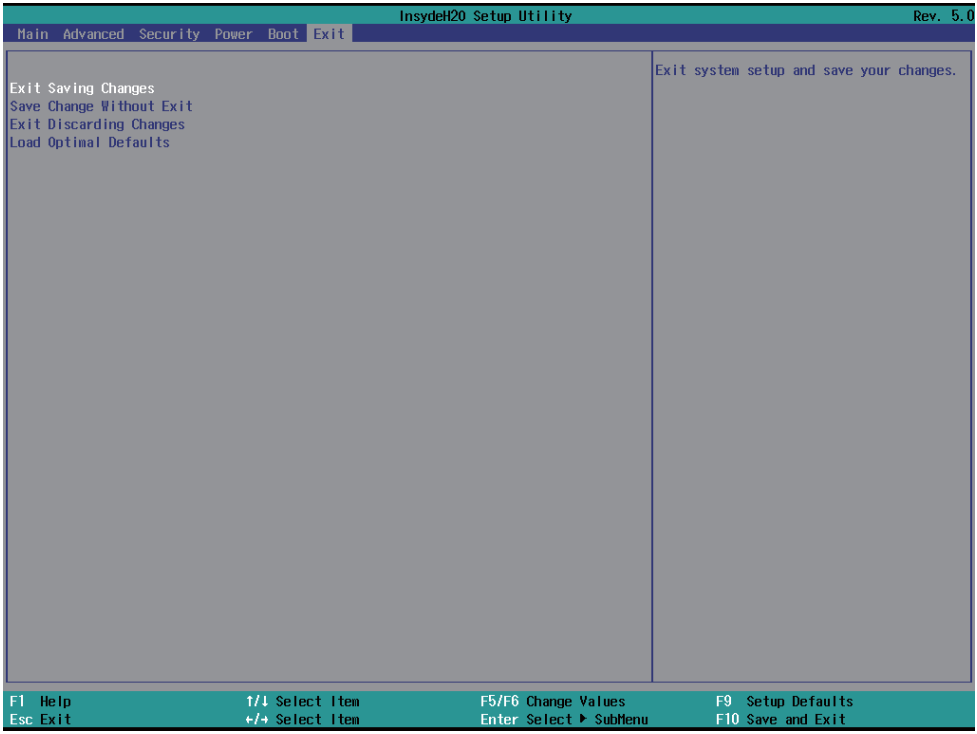
Boot type
Select boot type for Dual type, Legacy boot type or UEFI boot type, default is UEFI boot type

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.

4-10 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

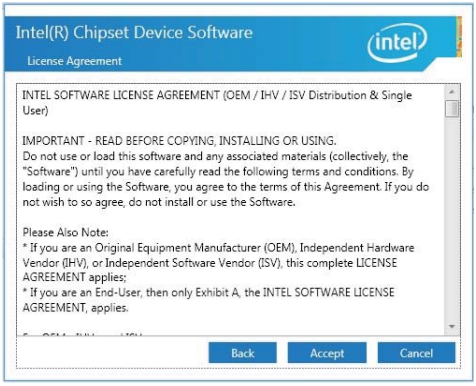
note 1: For Windows 7 Ultimate and i7 CPU only

Each selection is illustrated below:

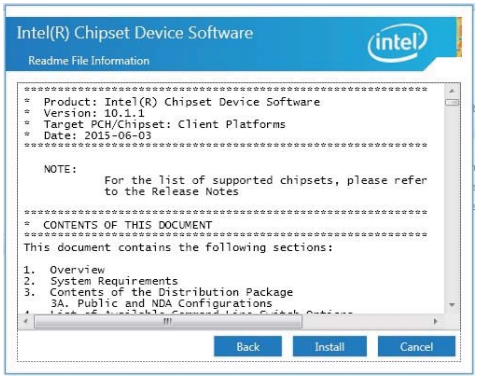
5-1 INF Install Intel Skylake Kaby Lake Chipset Driver (example for WIN10 64bit)

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

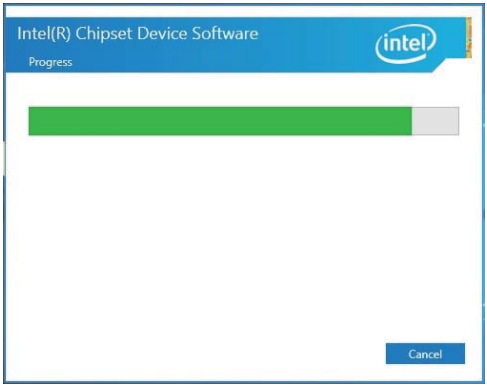
2. At the "Intel® Chipset Device Software" screen, click "Next".



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



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



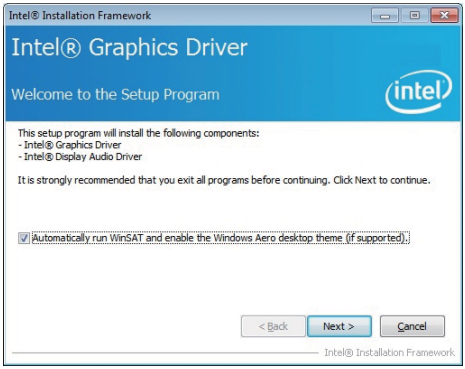
5. Progressing

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

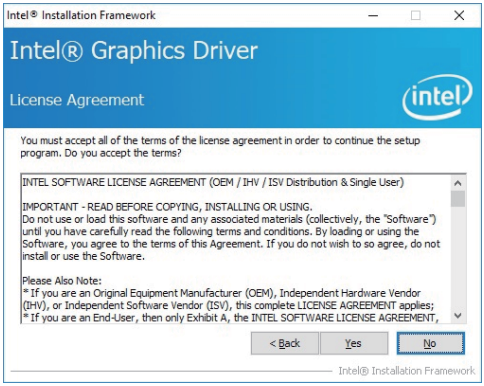
NOTE: SYSTEM INSTALL will auto detect file path X:\driver\sky_lake\INF\SetupChipset.exe

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

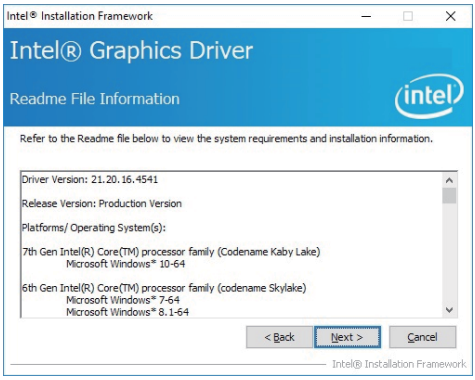
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "VGA".



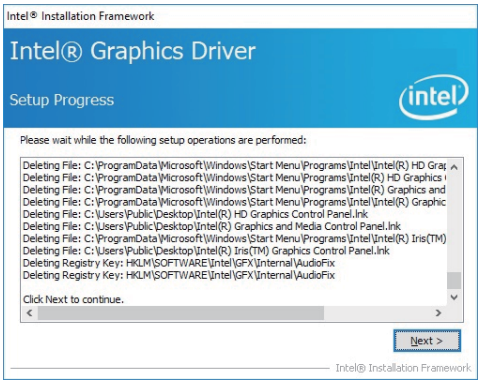
2. At the "Welcome to the Setup Programscreen, Click "Next".



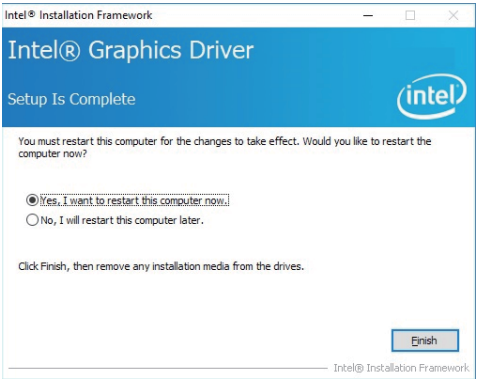
3. At the "License Agreement" screen, Click "Yes".



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



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

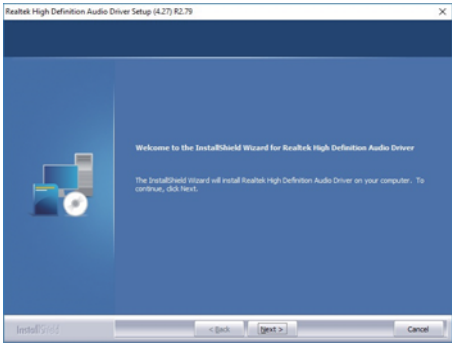


6. Click "Finish" to restart the computer.

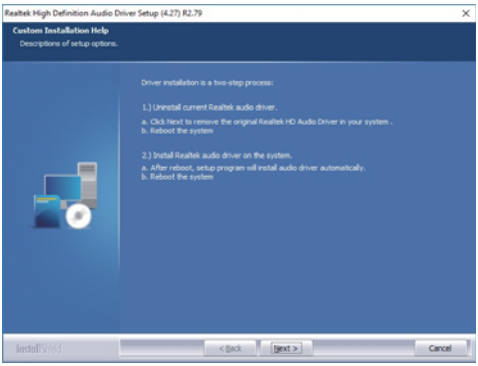
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 64-bit
X: \driver\sky_lake\VGA\X64\Setup.exe
For Windows 32-bit
X:\driver\sky_lake\VGA\X86\Setup.exe

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

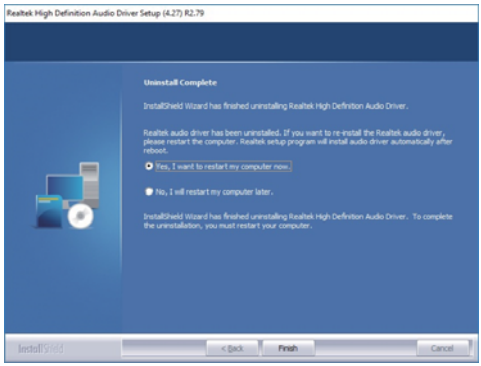
1. At the "AUTOMATIC DRIVER INSTALLATION menu".



2. Click "Next".



3. Click "Next".

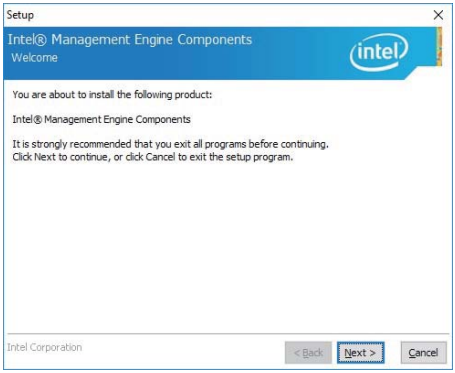


4. Click "Finish" then to restart the computer.

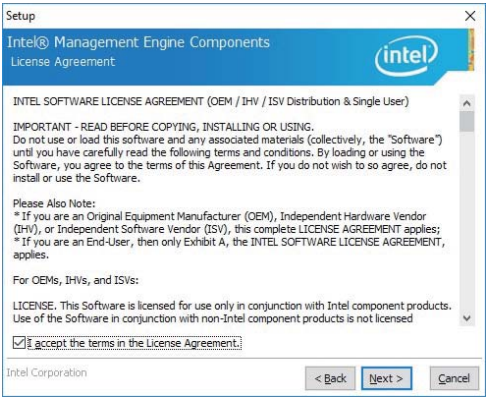
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 64-bit,
X:\driver\sky_lake\Audio\0006-64bit_Win7_Win8_Win81_Win10_R279
For Windows 32-bit
X: \driver\sky_lake\Audio\Win7_Win8_Win81_R273

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

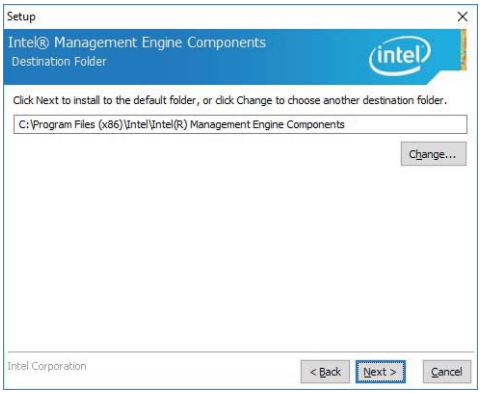
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "ME Tool".



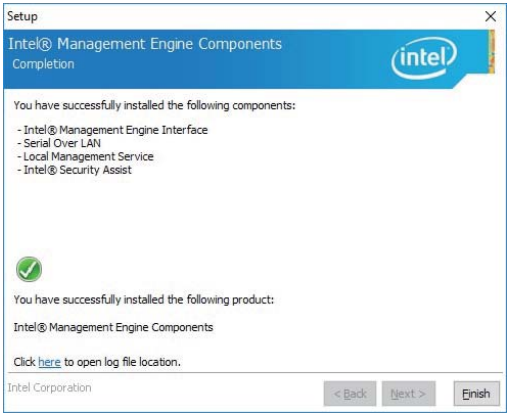
2. At the "Welcome to the Setup Programscreen, Click "Next".



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



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

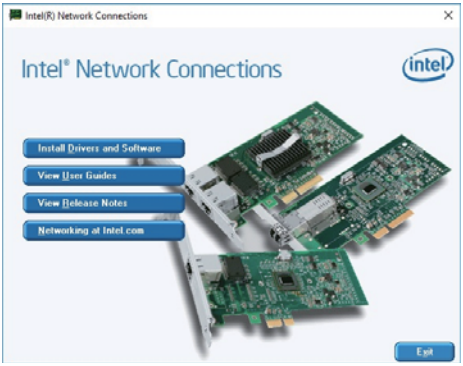


NOTE: SYSTEM INSTALL will auto detect file path
X: \driver\sky_lake\ME\SetupME

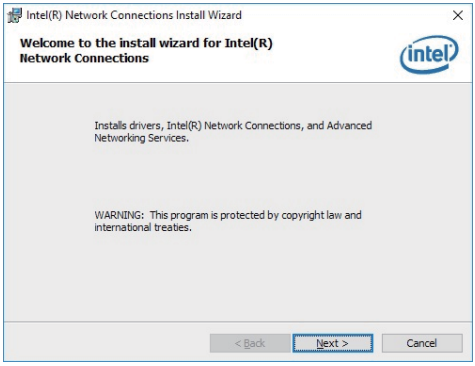
5. Click "Finish" to finish the setup.

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

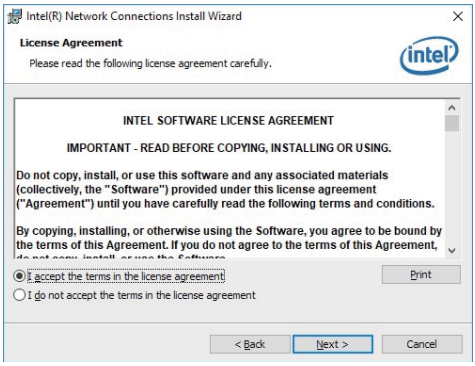
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "LAN".



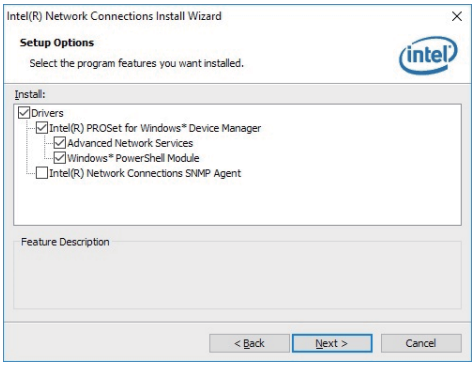
2. At the "Intel Network Connections" screen, Click "Install Drivers and Software".



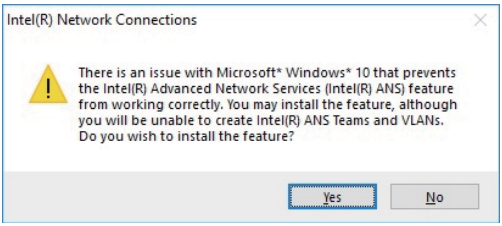
3. Click "Next".



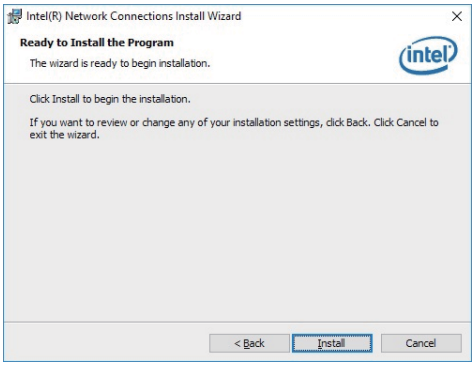
4. At the "License Agreement" screen, Click "☑" "Next".



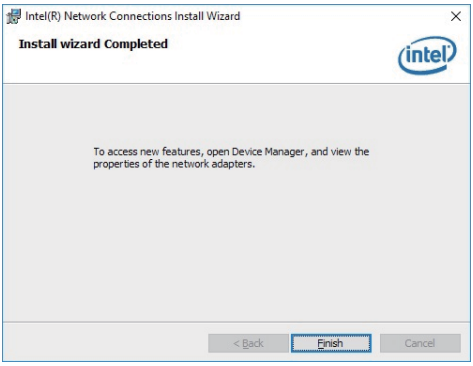
5. Click "Next".



6. Click "Yes".



7. Click "Install".



8. Click "Finish" to finish the setup.

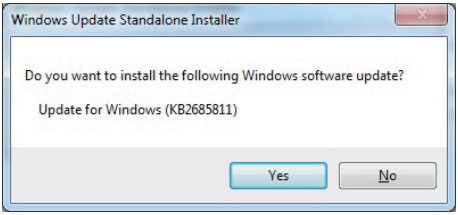
NOTE: SYSTEM INSTALL will auto detect file path
X:\driver\sky_lake\LAN\Autorun.exe

5-6 Items for Windows 7 installation

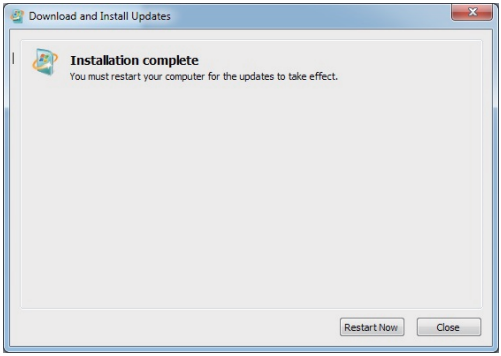
Note : Before Windows 7 installation, USB 3.0 Driver MUST rebuild in a new DVD or in a pen-drive. Please following the steps as below
step1 Create a folder X:/win7/boot & X:/win7/install X:/win7/image
step2 unzip usb3.0 driver to X:/win7/usb3.0
step3 Copy the files on the disc D:\sources\install.wim 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".

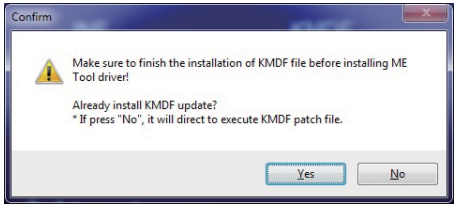


3. Click "Restart Now" to restart the computer.

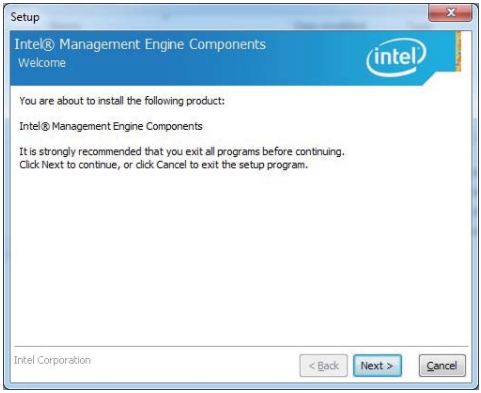
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64-bit,
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x64
For Windows 7 32-bit,
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x86

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

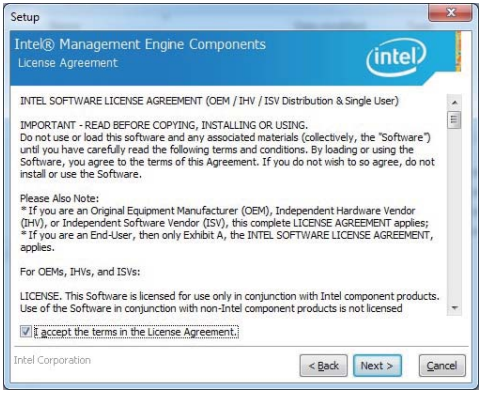
1. At the "AUTOMATIC DRIVER INSTALLATION menu", click "ME Tool".



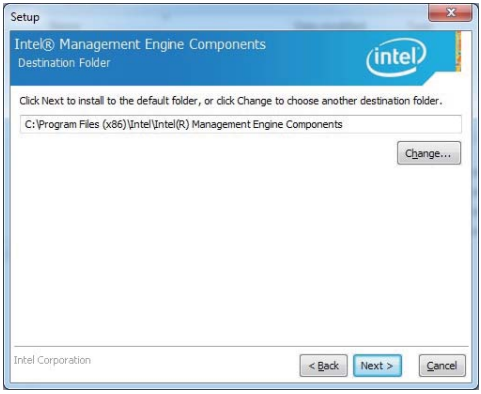
2. Click "Yes". KMDF file must being installed before ME Tool installation.



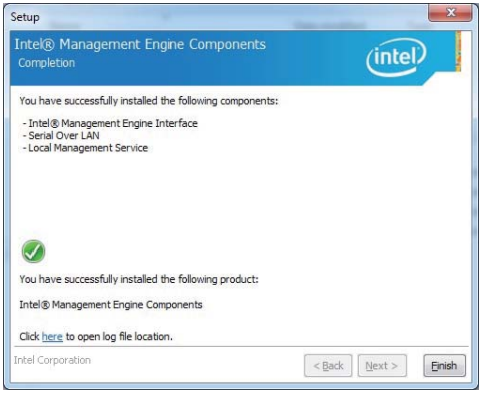
3. Click "Next".



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".

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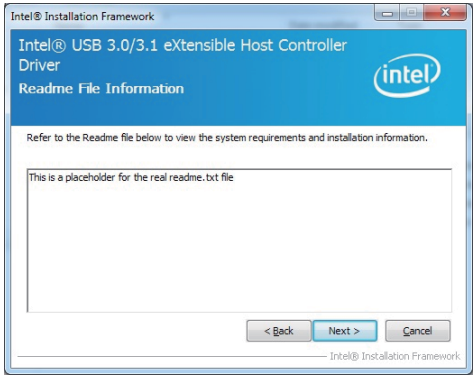
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,

3. Click "Yes".



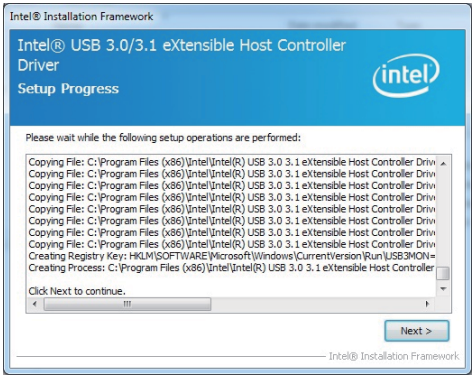
Intel® USB 3.0/3.1 eXtensible Host Controller Driver

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

5-11 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 3I610DW 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 3I610DW.ROM –BIOS -ALL

3I610DW.ROM is the file name of the latest BIOS.

It may be 3I610DW.ROM or 3I610DW.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 3I610DW.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 A: Power Consumption Test

Condition

Item	Spec
CPU	Celeron 3955U 2.00GHz and i7 6600U 2.60GHz
Memory	DDR4 2133 16GB x 2
Operating System	Windows 10 Enterprise 64 bit
Test Program	3D Mark 06
HDD 2.5" SATA	500GB
mSATA	16GB

Test Result for reference only !

Storage	Processor	Power off	Start up		Operation Maximum	Shut down Maximum	In Put Voltage
			Maximum	Stable			
2.5" HDD	Celeron 3955U	0.14A	1.46A	0.68A	2.67A	1.24A	12V
		0.11A	0.76A	0.4A	1.37A	0.69A	24V
	i7 6600U	0.15A	1.75A	0.72A	3.34A	1.78A	12V
		0.11A	0.9A	0.42A	1.52A	0.78A	24V
mSATA	Celeron 3955U	0.14A	1.35A	0.65A	2.55A	1.06A	12V
		0.11A	0.72A	0.37A	1.3A	0.61A	24V
	i7 6600U	0.14A	2.49A	0.61A	2.99A	1.52A	12V
		0.11A	1.03A	0.35A	1.31A	0.79A	24V

The power consumption depends on your device choice!

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)