2I610HW

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

All wafer IO

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

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

7 x USB, 2 x COM, Wide Range DC-IN

CAUTION

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

NO. 2I610HW
Release date: July. 02. 2021

Contents

2I610HW

User Manual edition 0.2, July. 02. 2021

Warning !

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

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

3. We will not give further notification in case of changes of product information and manual.

4. SATA interface does not support Hot SWAP function.

5. There might be a 20% inaccuracy of WDT at room temperature.

6. Please make sure the voltage specification meets the requirement of equipment before plugging in.

7. There are two types of SSD, commercial grade and industrial grade, which provide different read/write speed performance, operation temperature and life cycle. Please contact sales for further information before making orders.

8. Caution! Please notice that the heat dissipation problem could cause the MB system unstable. Please deal with heat dissipation properly when buying single MB set.

9. Please avoid approaching the heat sink area to prevent users from being scalded with fanless products.

10. If users repair, modify or destroy any component of product unauthorizedly, We will not take responsibility or provide warranty anymore.

11. DO NOT apply any other material which may reduce cooling performance onto the thermal pad.

12. It is important to install a system fan toward the CPU to decrease the possibility of overheating / system hanging up issues, or customer is suggested to have a fine cooling system to dissipate heat from CPU.

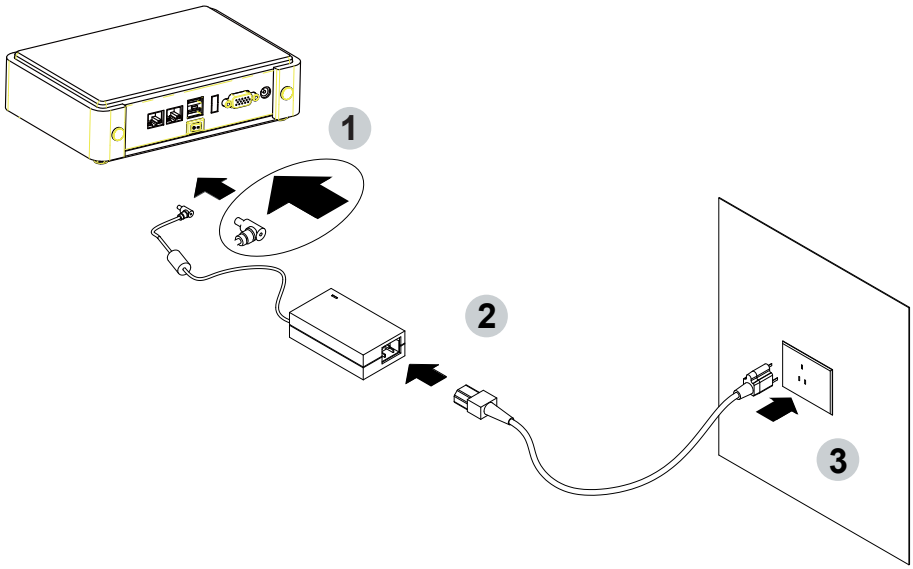
✻ Hardware Notice Guide

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

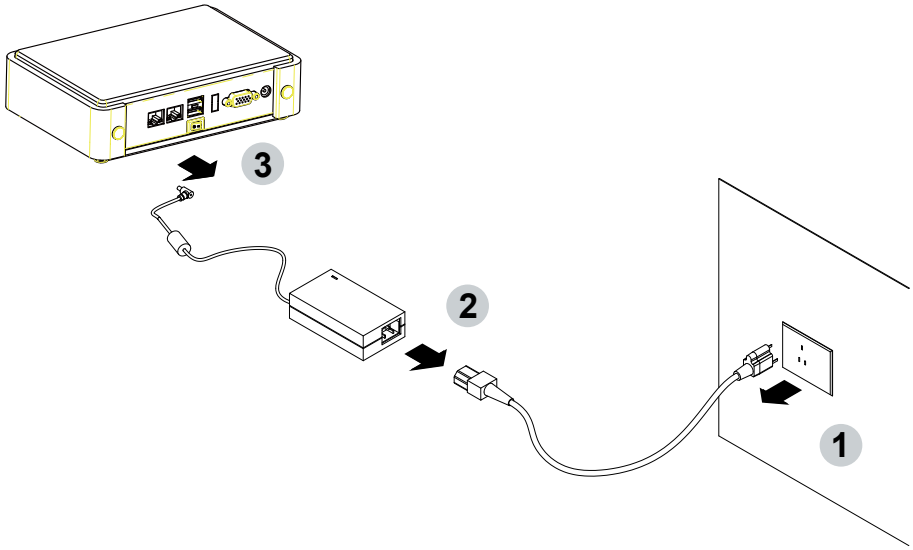
Remark 1:
Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 2I610HW is a 2.5" (102 x 88 mm) motherboard powered with Intel® Skylake-U processor & offered the ideal platform for high performance applications. 2I610HW's all wafer IO design delivers high flexibility toward expanded functions and also provides user hassle-free solution of integrating the SBC board within various mechanical enclosures. The compact size feature makes 2I610HW well suited for many space-limited and thermally constrained embedded applications, such as Automation Control, In-Vehicle, Military, Smart Factory, Industry 4.0 and Robot Technology solution.

The 2I610HW supports high-speed data transfer interfaces such as PCIe gen3, USB 3.0, and SATA 6 Gb/s (SATA III), with one-channel DDR4 2133 MHz memory up to 16 GB SODIMM slot and supports two serial ports RS232 / RS485 / RS422 jumper free auto switch by BIOS and +5V / 12V selectable by jumper. It supports 4 ports of USB 3.0, 3 ports of USB 2.0. The expandable interfaces include 1 full-size PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface, and 1 full-size PCIe Mini card for PCIe x 1 and USB interface and one SATA III ports, as well as graphics interface for HDMI and VGA displays.

The embedded motherboard 2I610HW is specially designed with wide-Range Voltage DC in (9~36V) for widely varying input voltage requirement. All wafer IO design offers superb performance and PC specification in the industry using the specific housing. It supports with two 10 / 100 / 1000 Mbps Ethernet for seamless broadband connectivity. With Wake-On LAN function and the PXE function in BIOS, these are perfect control boards for networking devices. 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.

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 LVDS 2 Channels 48bits, Max up to 1920 x 1080 resolution, HDMI 1.4b up to 3840 x 2160
4. Support USB Touch & backlight power control function
5. DDR4 SODIMM slot x 1, up to 16GB
6. Support 2 x 10 / 100 / 1000 Mbps Intel LAN ports.
7. Support 2 x RS232 auto switch to RS485 / RS422 by BIOS
8. 2 x USB 3.0 and 4 x USB 2.0
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. Support 1 SATA port
11. Hardware digital Input & Output, 4 x DI / 4 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
12. Wide Range DC IN +9V~36V
13. PCB Dimension: 102 x 83 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 1, up to 16GB
3. **Graphics:** Intel 9th generation (Gen 9) LP graphics and media encode / decode engine, Intel® Celeron 3955U 300MHz / 900MHz, Intel® Core i5-6200U 300MHz / 1GHz, Intel® Core i7-6600U 300MHz / 1.05GHz. Support LVDS 2 Channels 48bits, Max up to 1920 x 1080 resolution, HDMI 1.4b up to 3840 x 2160
4. **Touch:** USB Touch
5. **SATA:** Integrated Serial ATA Host Controller 1 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
6. **LAN:** 2 Intel I210-AT LAN chipset with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1
7. **I/O Chip:** F81804U I/O chipset for 2 ports RS232 / RS422 / RS485 auto switch by BIOS
8. **USB:** 2 type A USB 3.0, 4 USB 2.0
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. **BIOS:** Insyde UEFI BIOS
12. **Dimension:** 102 x 83 mm (2.5 inch)
13. **Power:** On board DC +9~36V

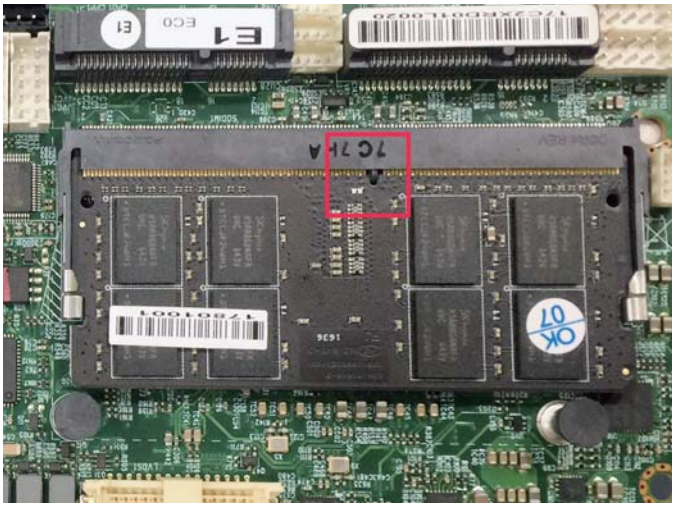
1-3 Installing the SO-DIMM

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

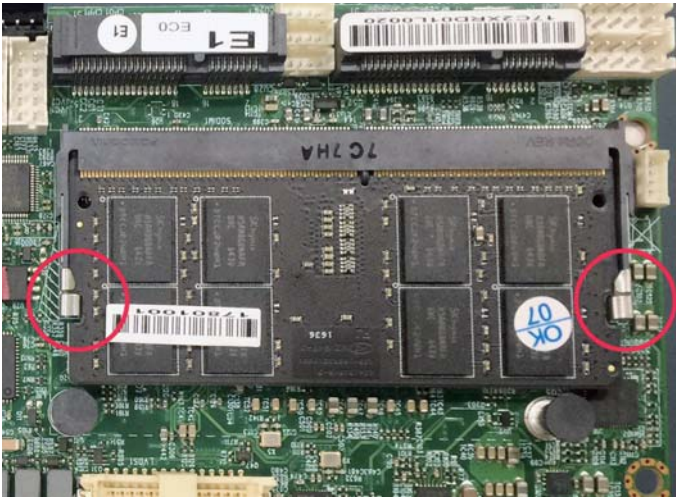
2. Press the SO-DIMM into the connector until you hear a click.

Notices:

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



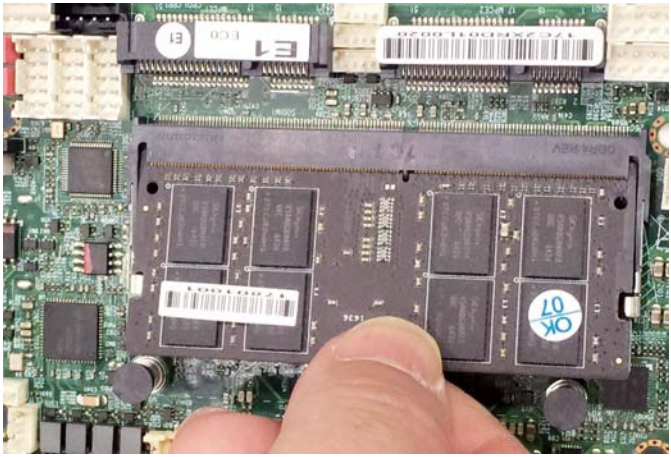
2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.



1-3-1 Removing the SO-DIMM

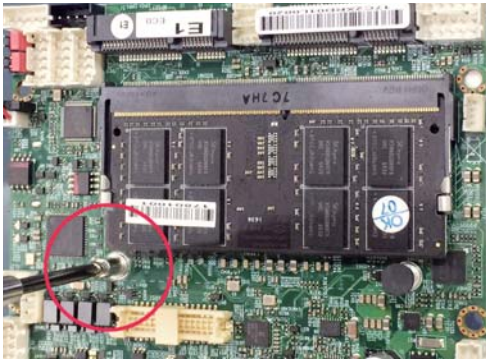
1. Release the SO-DIMM by pulling outward the two retaining clips and the SO-DIMM pops up slightly.

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

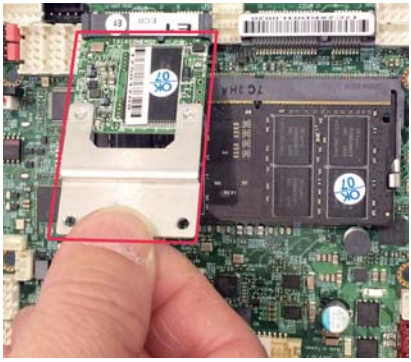


1-4 Installing the Mini PCI-e Card (Full Size)

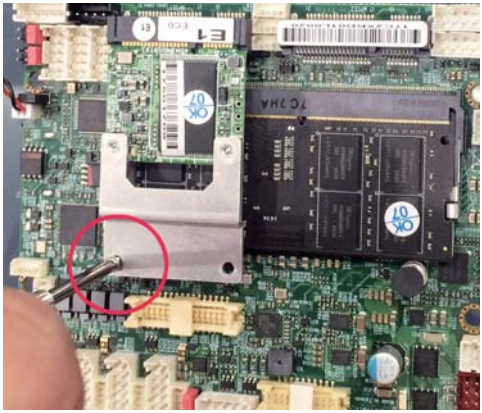
1. Unscrew the screw on the board



2. Plug in the Mini Card in a 45 angle

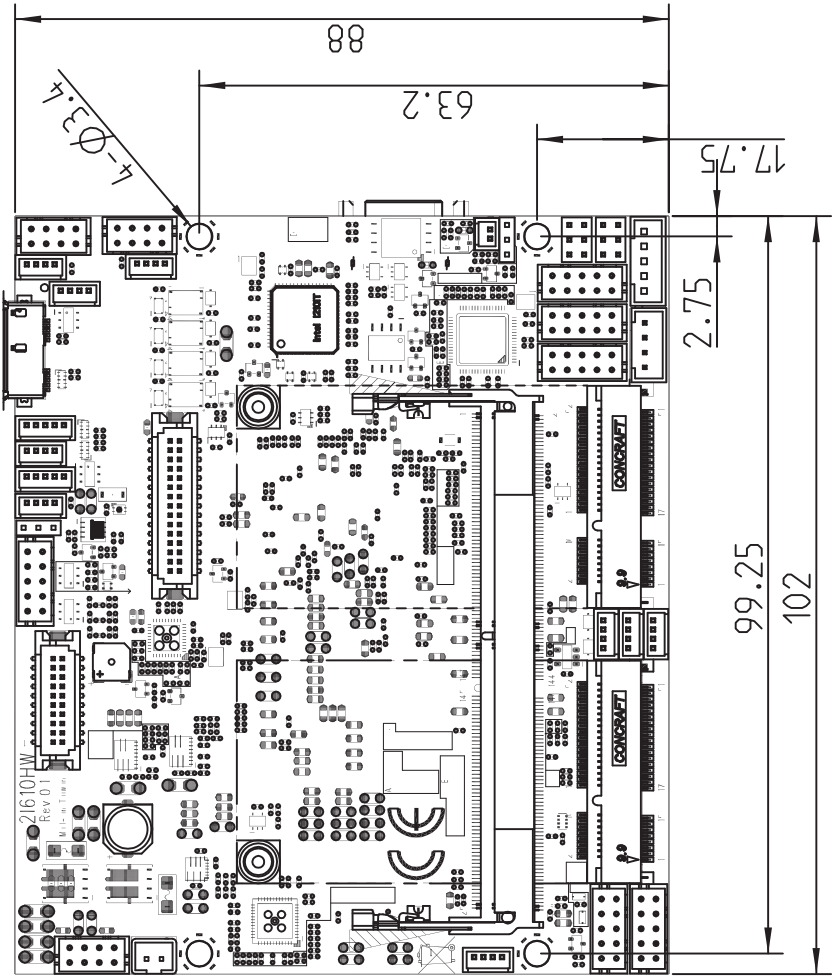


3. Gently push down the Mini Card and screw the screw back.



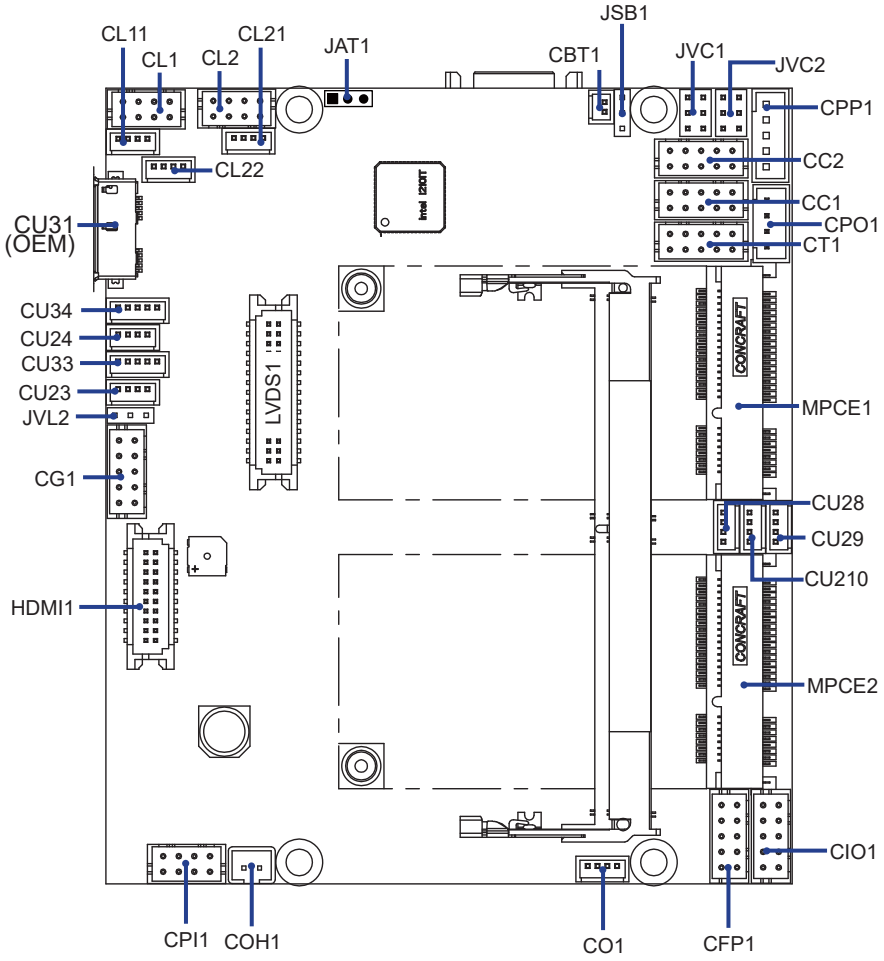
Chapter-2

2-1 Dimension-2I610HW



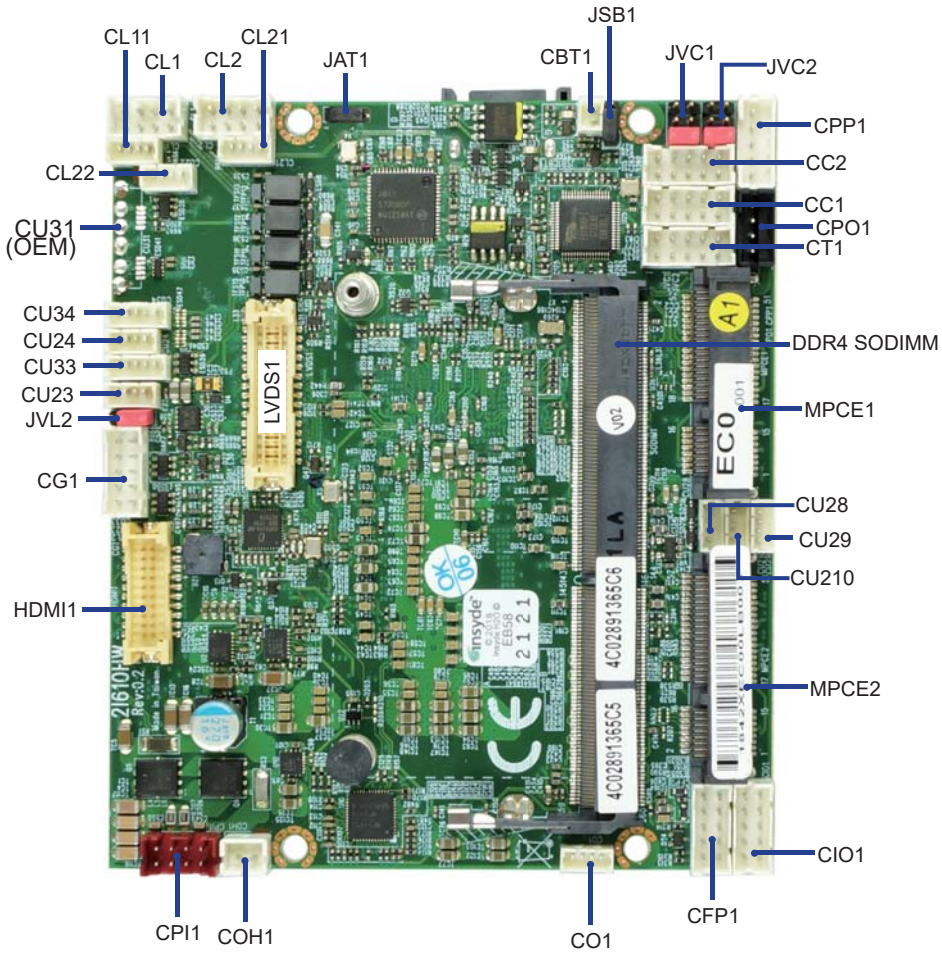
2-2 Layout-2I610HW-Connector and Jumper

TOP



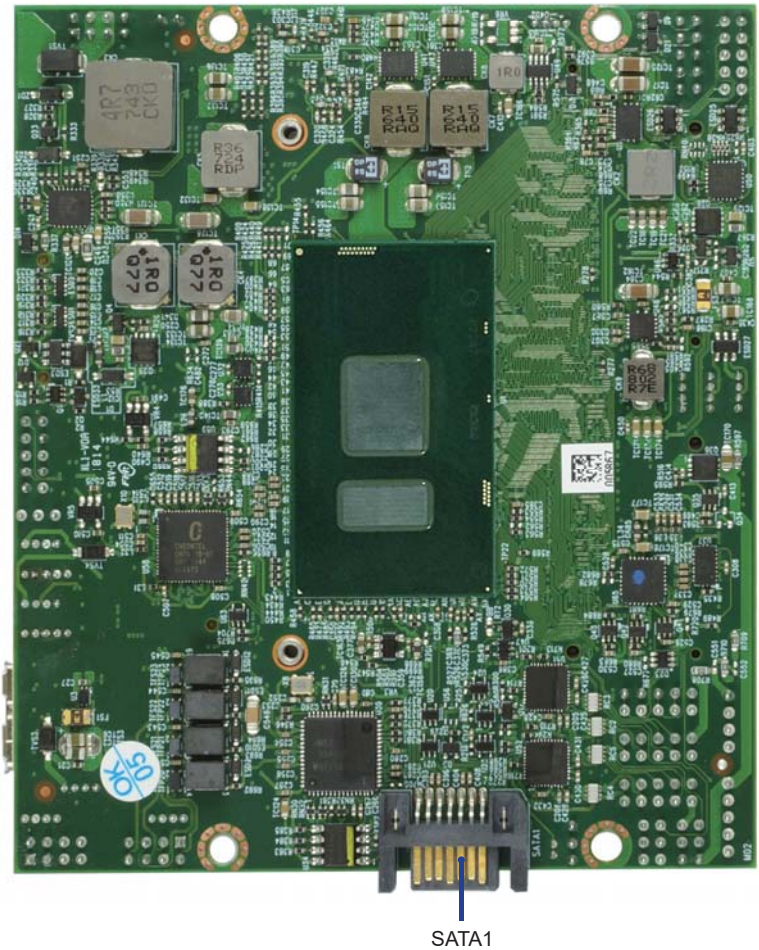
2-3 Diagram- 2I610HW

TOP

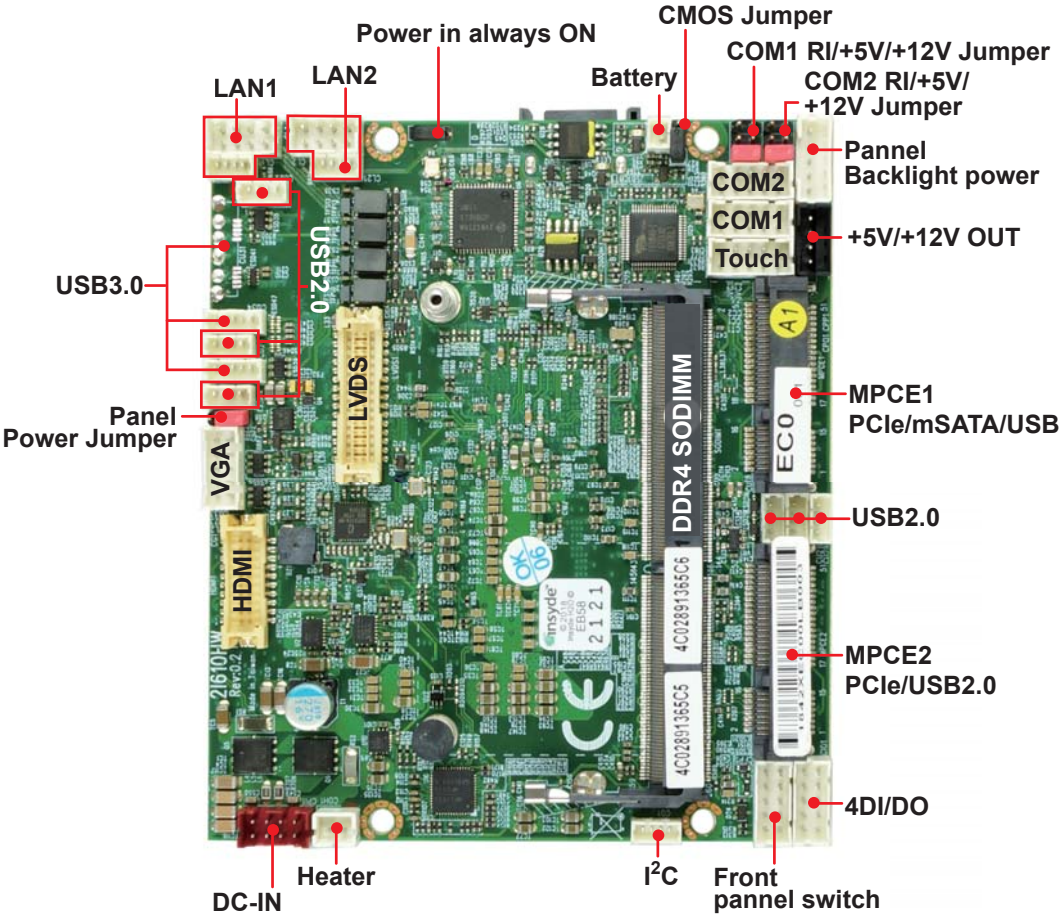


2-3-1 Diagram- 2I610HW

BOT



2-3-2 Function MAP- 2I610HW



2-4 List of Jumpers

JSB1: CMOS DATA Clear
JVL2: LVDS panel power select
JVC1 / 2: COM1 / 2 PIN9 RI / +12V / +5V Select
JAT1: Power in always ON function

2-5 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.

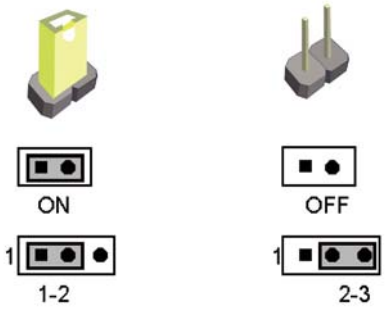


Figure 2.2

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 .

2-6 JSB1: CMOS DATA Clear

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

Close Pin 1 and Pin 2 of JSB1 to store the CMOS data.

To clear the CMOS data, please follow the steps as below:

1. Turn off the system and unplug the AC power.
2. Make sure there is no AC & DC power connect to the system or MB.
3. Close pin 2-3 of JSB1 for a few seconds.
4. Return to default setting by close pin 1-2
5. Connect DC IN power cable back to DC IN Power connector

Note: The Panel resolution & Power failed state will not be restored after CMOS data clear. If your system MUST restore the Panel resolution & Power failed state to default settings, please update the BIOS.

The default settings of Panel resolution is 1024 x 768, power failed state is Keep last state (Last state).

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

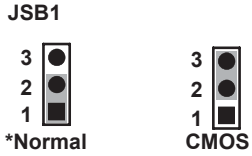
Note: Normal work is open jumper

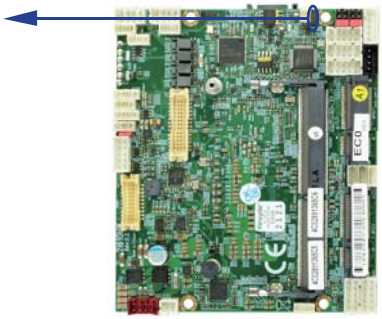
Note: Do not clear CMOS unless

1. Troubleshooting

2. Forget password

3. You fail over-clocking system

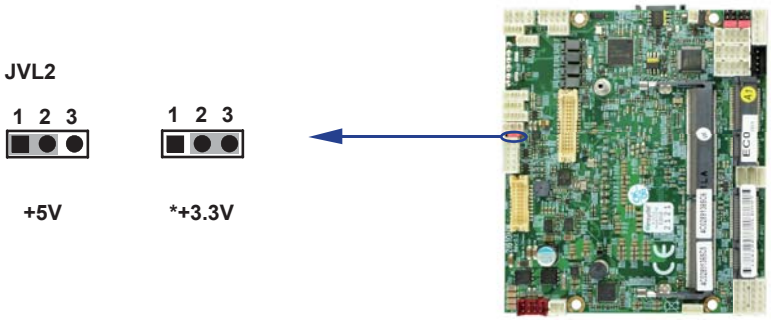




2-7 JVL2: LVDS panel power select

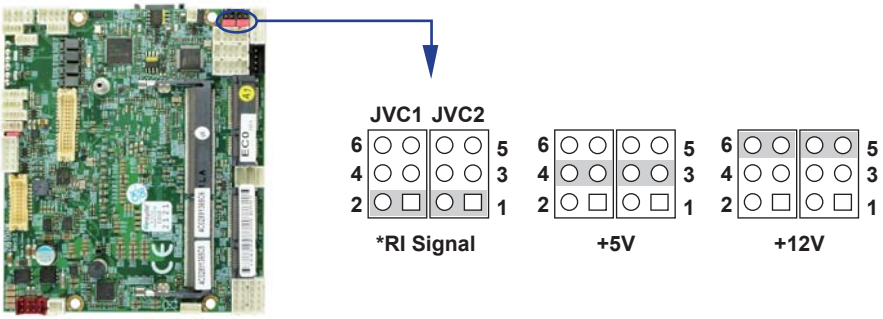
JVL2	DESCRIPTION
1-2	+5V
*2-3	+3.3V

Note: Attention! Check Panel Power in spec



2-8 JVC1/2: COM1/2 PIN9 RI/+12V/+5V Select

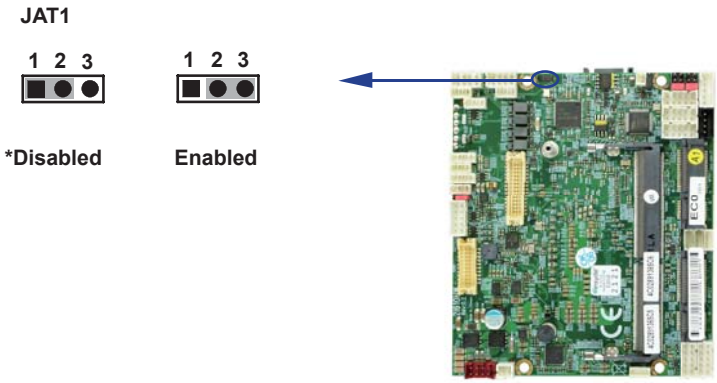
JVC1/2	DESCRIPTION
*1-2	COM port pin9 use RI signal
3-4	COM port pin9 use +5V voltage
5-6	COM port pin9 use +12V voltage



2-9 JAT1: Power in always ON function

JAT1	DESCRIPTION
*1-2	Disabled
2-3	Enabled

NOTE: Power always on function default is disabled.



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
CC1 :	COM1 2x5 pin (2.0mm) wafer
CC2 :	COM2 2x5 pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5 pin (2.0mm) wafer
CG1:	VGA 2x5 pin (2.0mm) Wafer
CIO1:	4DI/4DO 2x5 pin (2.0mm) Wafer
CU31:	Micro USB3.0 connector (Option).
CU33:	USB 3.0 Port 3 1x5 pin (1.25mm) Wafer
CU34:	USB 3.0 Port 4 1x5 pin (1.25mm) Wafer
CU22:	USB 2.0 port 2 4 pin (1.25mm) Wafer
CU23:	USB 2.0 port 3 4 pin (1.25mm) Wafer
CU24:	USB 2.0 port 4 4 pin (1.25mm) Wafer
CU28:	USB 2.0 port 8 4 pin (1.25mm) Wafer
CU29:	USB 2.0 port 9 4 pin (1.25mm) Wafer
CU210:	USB 2.0 port 10 4 pin (1.25mm) Wafer
CL1 :	LAN port 1 2x4 pin (2.0mm) Wafer
CL11 :	LAN port 1 LED 4 pin (1.25mm) Wafer
CL2 :	LAN port 2 2x4 pin (2.0mm) Wafer
CL21 :	LAN port 2 LED 4 pin (1.25mm) Wafer
CO1:	I2C Bus 4 pin (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
CPP1:	Panel Backlight power 1x5 pin (2.00mm) Wafer
CT1:	Touch 2x5 pin (2.0mm) wafer
LVDS1:	LVDS 2x15 pin (1.25mm) connector

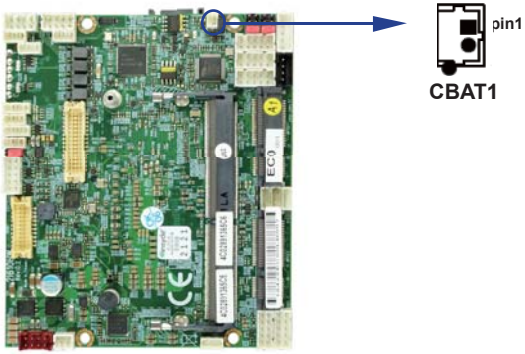
HDMI1:	HDMI1 2x10 pin (1.25mm) connector
SATA1:	SATA connector 7 pin
SODIMM1:	DDR4 Channel 0 SODIMM H: 5.2mm
MPCE1 :	Full size mini card port 1 sockets 52 pin
MPCE2 :	Full size mini card port 2 sockets 52 pin

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 COM interface

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

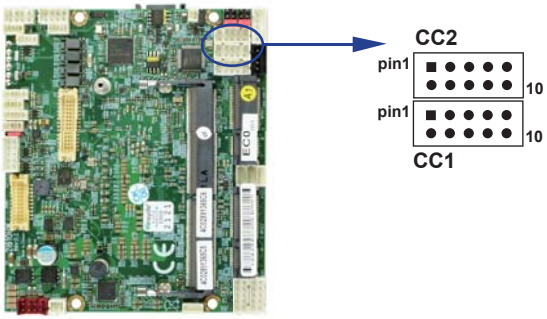
- **RS485 Mode**

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

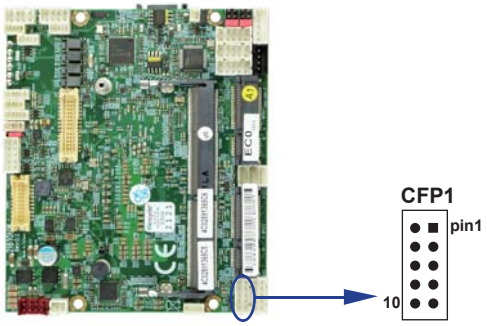
Note:
1. Pin 9 RI and Voltage setting only for COM 1/2 ports, JVC1 for COM1, JVC2 for COM2
2. Default supports RS232 and RS422 / RS485 by BIOS selected



3-4 Front Panel Pin Header

● **CFP1**: **Front Panel connector 2x5pin (2.0mm) wafer**

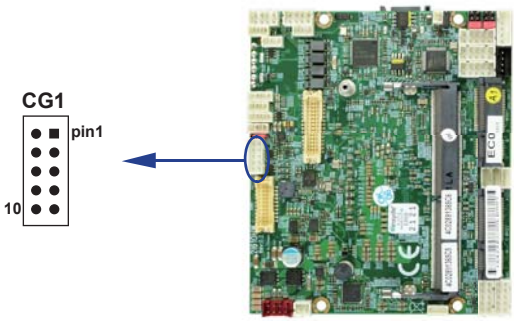
PIN NO.	Description	PIN NO.	Description
1	Power button pin	2	Power button GND
3	Reset pin	4	Reset GND
5	Power LED-	6	Power LED+
7	HDD LED-	8	HDD LED+
9	LAN LED-	10	LAN LED+



3-5 VGA Display interface

● **CG1: VGA 2x5pin (2.0mm) wafer**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	BULE	2	GND
3	GND	4	DDC CLOCK
5	GREEN	6	V-SYNC
7	GND	8	H-SYNC
9	RED	10	DDC DATA

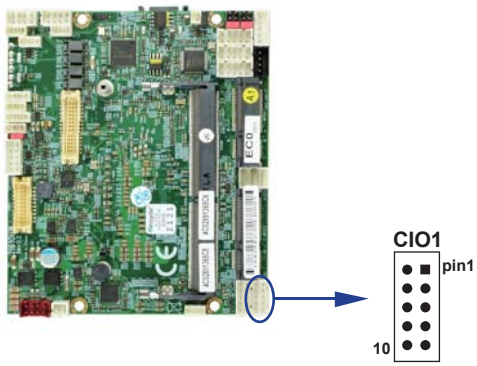


3-6 Digital Input/Output/Watch Dog Time

- 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 C bus address 0x9c



- **WDT For F75111N SMBus watch dog timer device:**

DC spec :
Input low Voltage (VIL):+0.8 Max,
Input High Voltage(VIH) : +2V Min
Output low Current (IOL):10mA (Min) VOL=0.4V
Output High Current (IOH):-10mA (Min) VOH=2.4V
Watch Dog Time value 0~255 sec
The system will be issued reset. When WDT is enable the hardware start down counter to zero.
The reset timer have 10~20% tolerance upon the Temperature.
Note: If want to SDK support. Please contact to sales window.

3-6-1 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

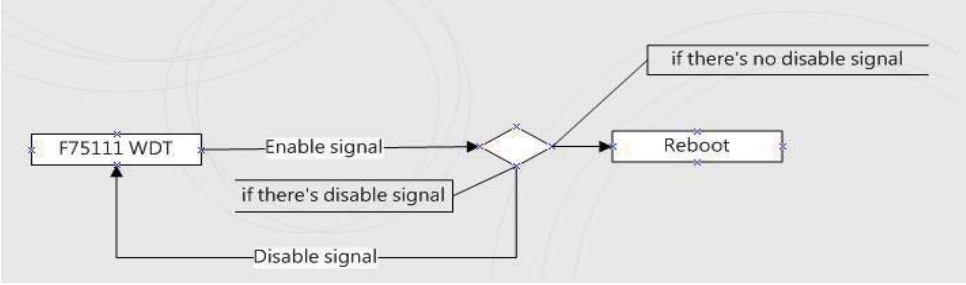
How to use this Demo Application

1.Boot Ms-Dos Operating System

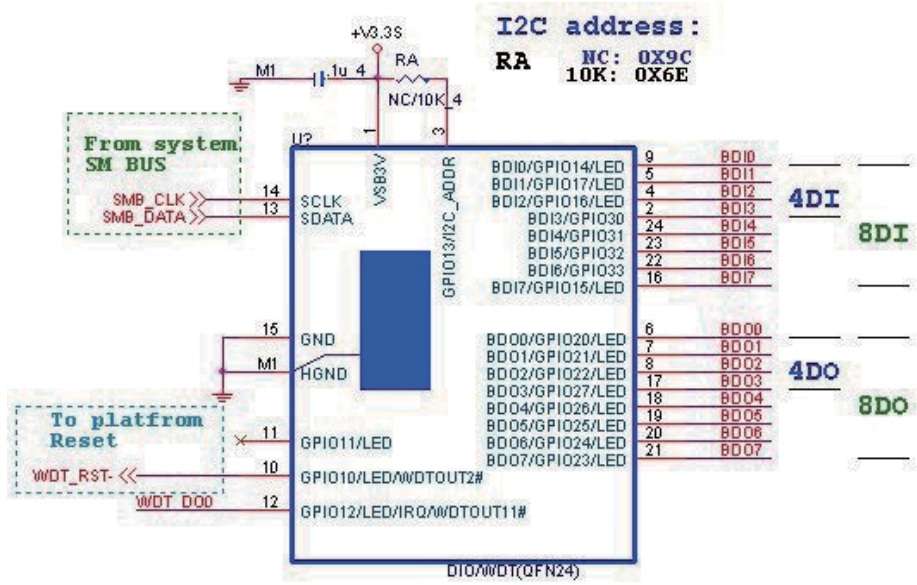
2.execute "75WDT.EXE" binary file

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

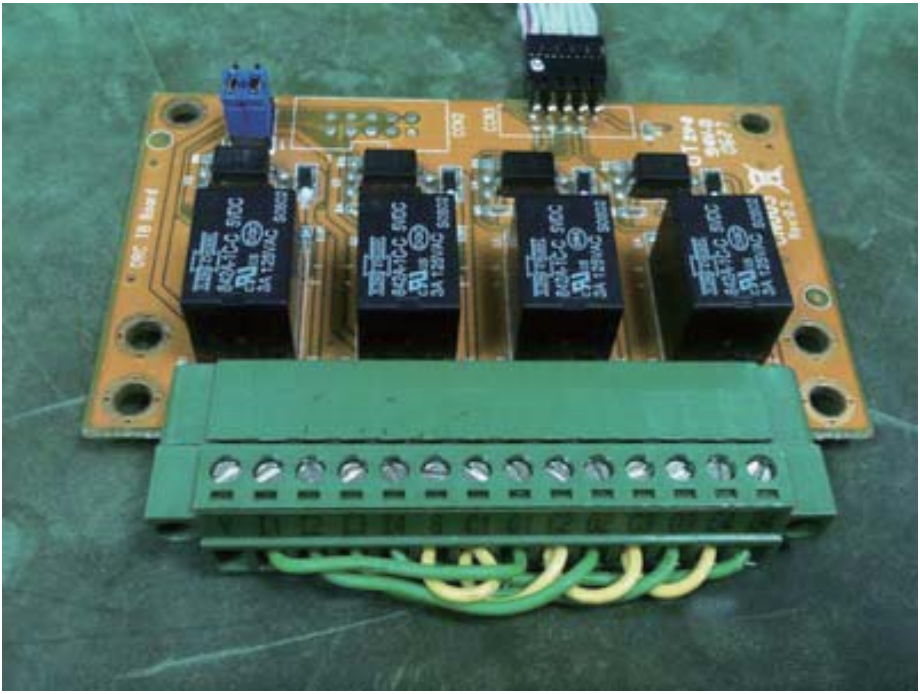
The Sample code source you can download from

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

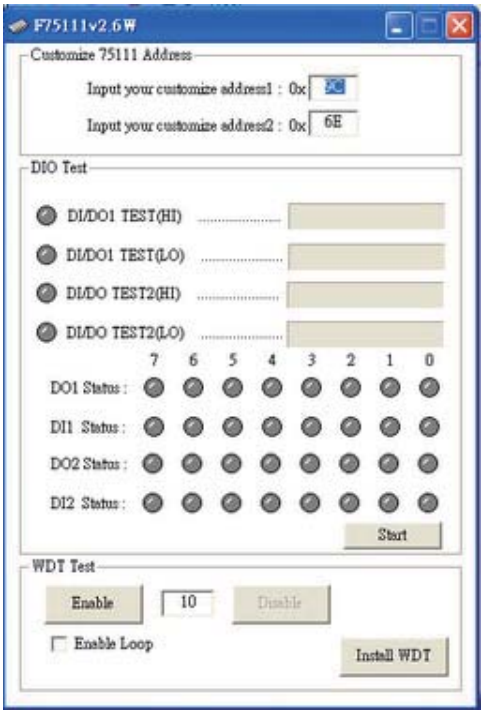
We do the demo test with a test tool which DIx connect to DOx with Relay.



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

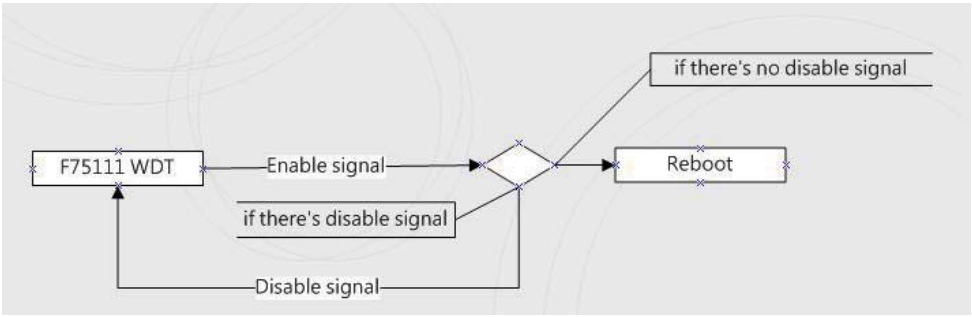
2. Press the "Enable" button to test WDT function

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** 



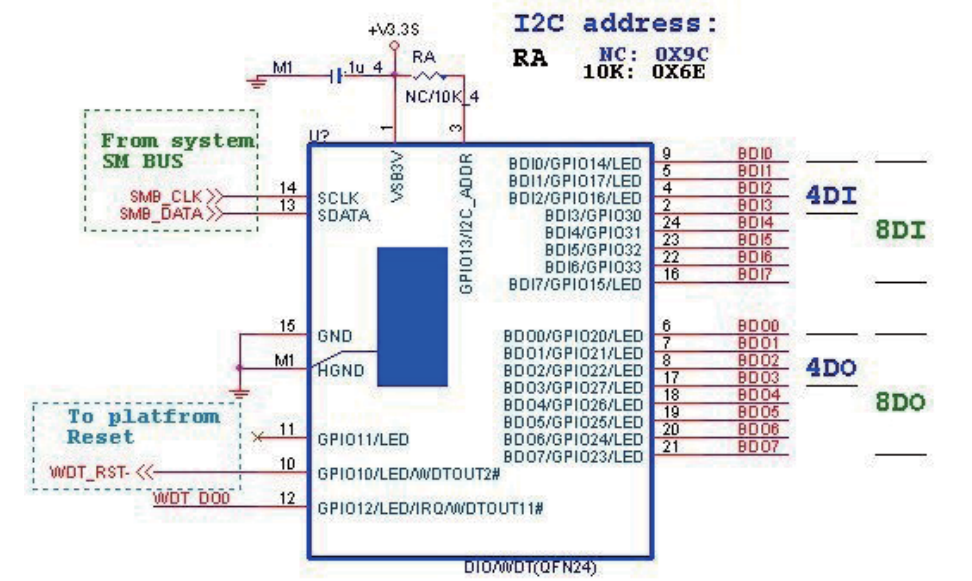
p.s.

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

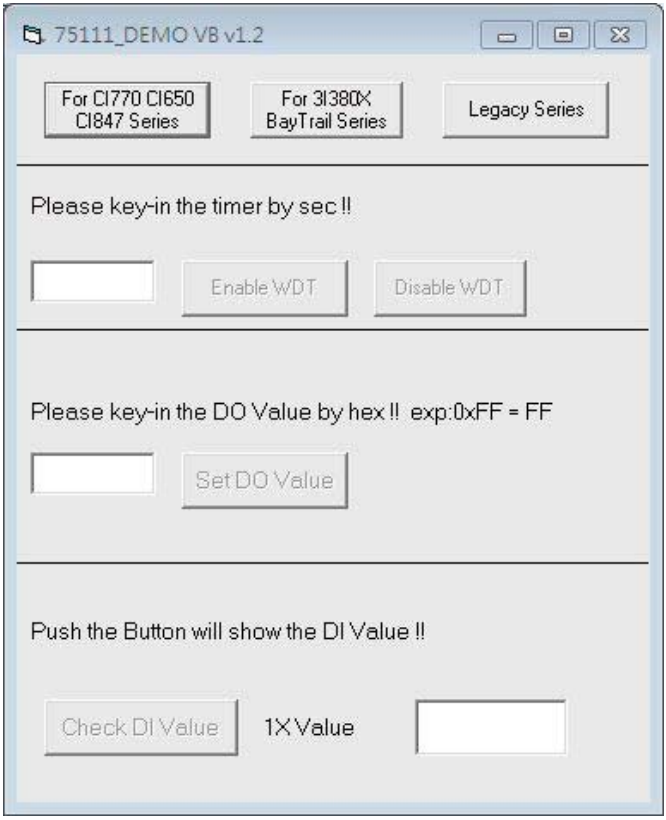
The Sample code source you can download from

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

Binary file: 75111_VB_Src1.2.rar

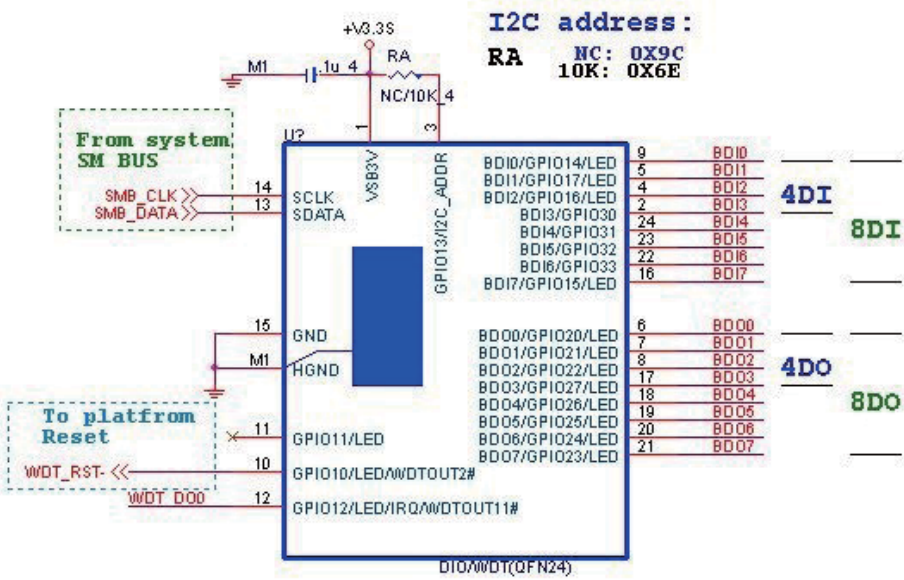
USERNAME & PASSWORD: sf

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

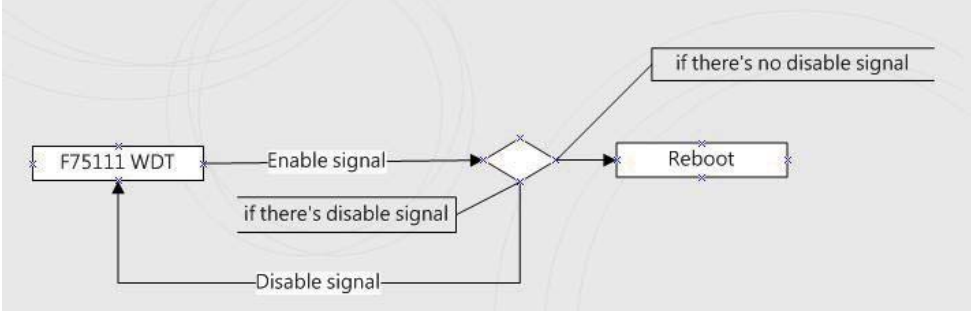
(add an option 'pkg-config --libs gtk+-2.0 gthread-2.0' in "Project->Build Option->Linker Setting->Other linker option")

2. Compile source code with "make"

1. **cd F75111**
1. **make**
1. **src/f75111 // execute the binary file**

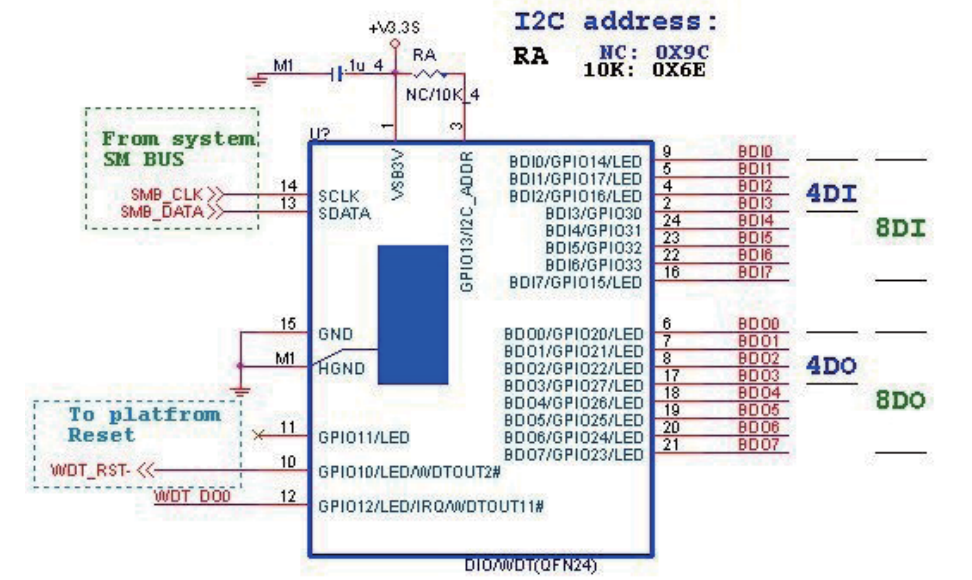
How to use this Demo Application

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   ();
```

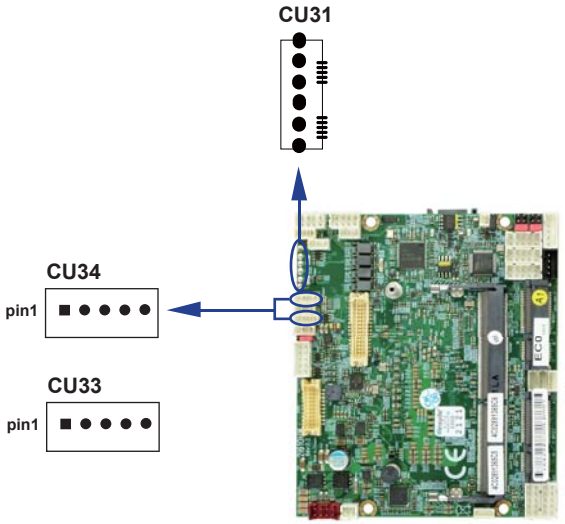
3-7 USB Interface

- **CU31: Micro USB3.0 Port 1 (option)**

PIN NO.	1	2	3	4	5	6	7	8	9	10
USB3.0	VBUS	DATA-	DATA+	NC	GND					
USB2.0	VBUS					U3_TX-	U3_TX+	GND	U3_RX-	U3_RX+

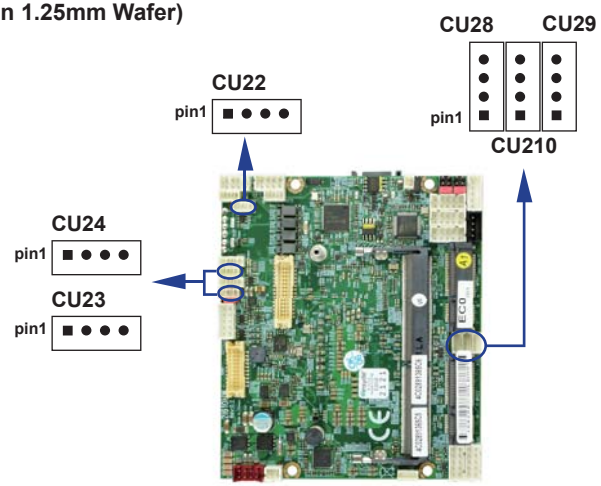
- **CU33/34: USB3.0 Port 3/4 1x5pin 1.25mm wafer**

PIN NO.	DESCRIPTION
1	USB3_TX_P
3	USB3_TX_N
5	GND
7	USB3_RX_P
9	USB3_RX_N



- **CU22/23/24/28/29/210**
  USB2.0 port 2,3,4,8,9,10 (1x4pin 1.25mm Wafer)

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

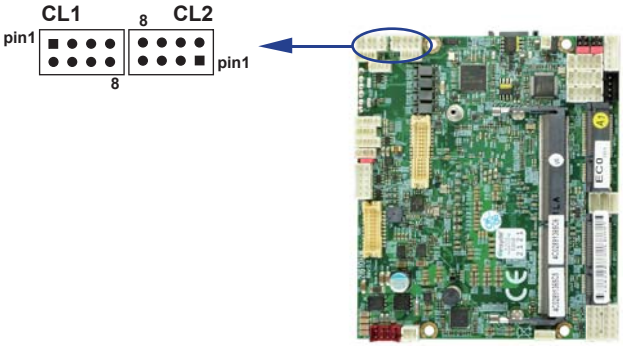


Note:
1.CU23,CU24 and CU33,CU34 both power rail is same and maximum power 1A of each port.
2.CU28,CU29,CU210 these power rail is same.

3-8 LAN Interface

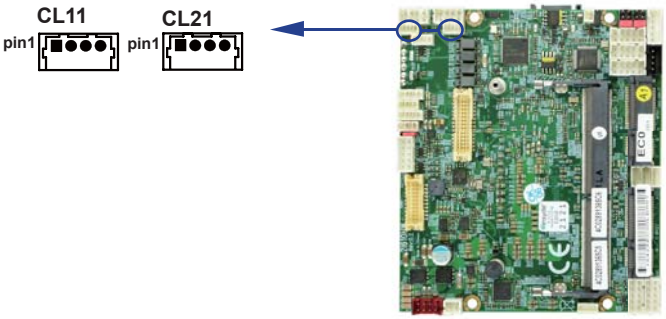
• CL1/2: LAN1/2 (2x5pin 2.0mm wafer)

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



• CL11/21: LAN1/2 LED indicator (1x4pin 1.25mm wafer)

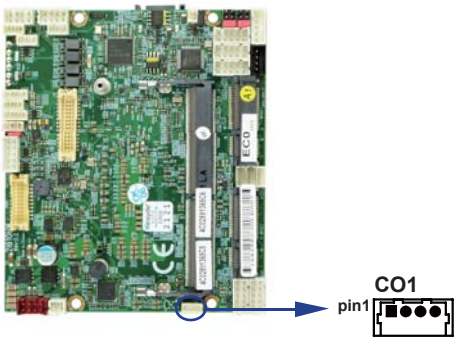
PIN NO.	Description
1	VCC
2	Speed 10M
3	Speed 100M
4	Speed 1000M



3-9 SMBus Interface

● CO1: SMBus 4pin (1.25mm) Wafer

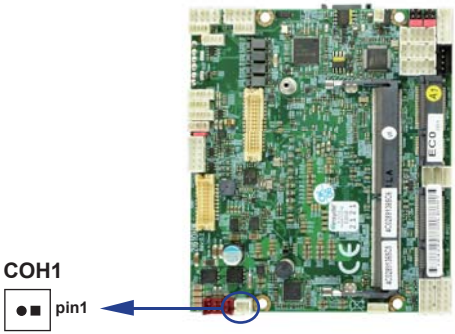
PIN NO.	Description
1	+3.3V
2	GND
3	SMBus Clock
4	SMBus DATA



3-10 COH1: +12V Heater (1x2pin 2.0mm Wafer)

PIN NO.	Description
1	+12V
2	GND

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

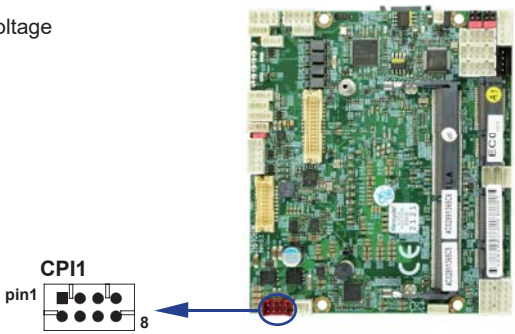


3-11 DC Power Input

- **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

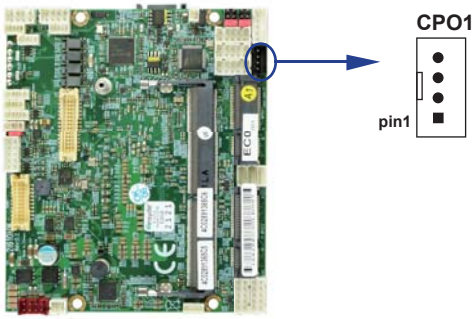


3-12 DC +12V/+5 Voltage Power Output

- **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

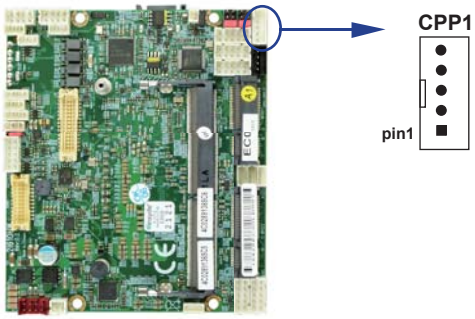


3-13 Panel Inverter Power Interface

- **CPP1: Panel backlight power (1x5 pin 2.0mm wafer)**

PIN NO.	Description
1	+12V
2	GND
3	PWM dimming
4	ENBKL (3.3V)
5	ENBKL (5V)

Note: 1. CPP1 PIN 3 and LVDS1 PIN1 is same signal.



3-14 CT1: Touch screen (2x5 pin 2.0mm wafer) COM interface

- **CT1: For 8-wire type pin define**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Bottom	2	Bottom Sense
3	Top Sense	4	Top
5	Right	6	Right Sense
7	Left	8	Left Sense
9	GND	10	NC

Note: For eight wire type cable Pin 3 and Pin4 need short

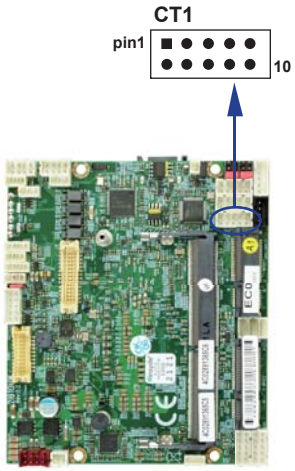
- **CT1: For 4-wire type pin define**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Bottom	2	N/A
3	N/A	4	Top
5	Right	6	N/A
7	Left	8	N/A
9	GND	10	NC

Note: 1. For four wire type cable Pin 3 and Pin4 need short.

- **CT1: For 5-wire type pin define**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	UR(H)	2	N/A
3	Sense	4	UL(Y)
5	LR(X)	6	N/A
7	LL(L)	8	N/A
9	GND	10	NC

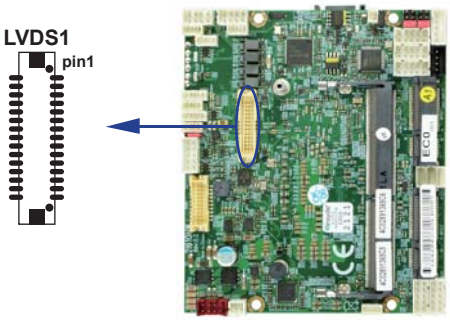


3-15 LVDS1: LVDS interface (2x15 pin 1.25mm wafer)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PWM dimming	2	+5V
3	+LCD(5V or 3.3V)	4	+LCD(5V or 3.3V)
5	Channel-1-DATA3+	6	Channel-0-DATA3+
7	Channel-1-DATA3-	8	Channel-0-DATA3-
9	Channel-0-DATA2+	10	Channel-0-CLK+
11	Channel-0-DATA2-	12	Channel-0-CLK-
13	GND	14	GND
15	Channel-0-DATA1+	16	Channel-0-DATA0+
17	Channel-0-DATA1-	18	Channel-0-DATA0-
19	GND	20	GND
21	+LCD(5V or 3.3V)	22	+LCD(5V or 3.3V)
23	Channel-1-DATA2+	24	Channel-1-CLK+
25	Channel-1-DATA2-	26	Channel-1-CLK-
27	Channel-1-DATA1+	28	Channel-1-DATA0+
29	Channel-1-DATA1-	30	Channel-1-DATA0-

Note:

1. LVDS interface supports 18/24bits two channel.
2. JVL2: LVDS panel +5V/+3.3V (default) Voltage select.
3. LVDS1 PIN 1 for panel backlight dimming control.



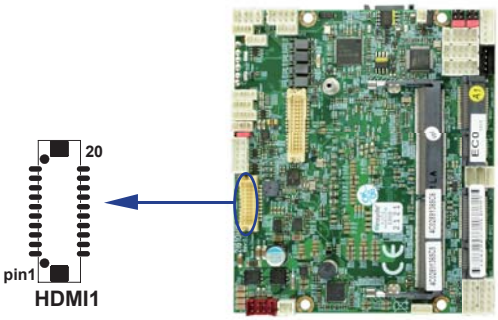
LVDS Panel resolution table list

Item	Resolution	Channel	bits
1	640 x 480	1	18
2	800 x 600	1	18
3	1024 x 768	1	18
4	800 x 480	1	18
5	1024 x 600	1	18
6	1280 x 800	1	18
7	1366 x 768	1	18
8	800 x 600	1	24
9	1024 x 768	1	24
10	1280 x 800	1	24
11	1366 x 768	1	24
12	1280 x 1024	2	24
13	1440 x 900	2	24
14	1600 x 1200	2	24
15	1920 x 1080	2	24

The item 3 is default resolution.

3-16 HDMI1: HDMI interface (2x10 pin 1.25mm wafer)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS_D2_N	2	NC
3	TMDS_D2_P	4	NC
5	TMDS_D1_N	6	GND
7	TMDS_D1_P	8	GND
9	TMDS_D0_N	10	GND
11	TMDS_D0_P	12	GND
13	TMDS_CLK_N	14	+5V
15	TMDS_CLK_P	16	+5V
17	CLOCK	18	+5V
19	DATA	20	Hot Plug Detect

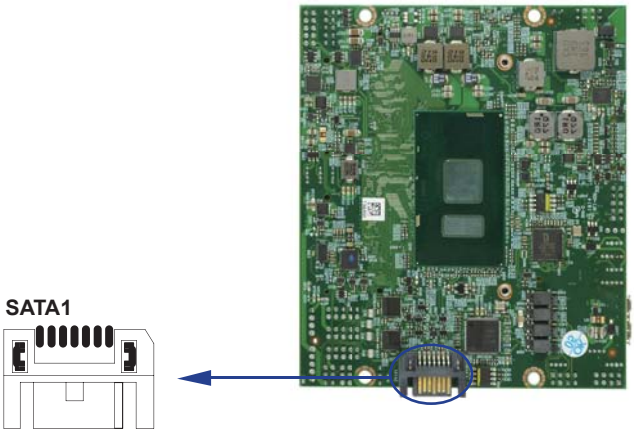


3-17 SATA Interface

- **SATA1: 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.



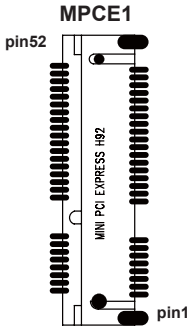
3-18 PCI Express Mini card

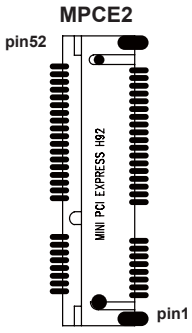
● MPCE1/2 PCI Express Mini card

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.
2 .MPCE1 USB uses as port 6 and MPCE2 as port 7.





3-19 Connector wafer of Compatible Brand and part number list

Location	CKTS	PITCH	Brand Name	Mating connector	Cable housing
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
CG1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CIO1	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CU31	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CU32	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CU33	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CU34	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
CU21	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU22	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU23	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU24	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU28	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU29	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU210	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CL1	2x4 8Pin	2.0mm	JST	B8B-PHDSS	PHDR-08VS
CL2	2x4 8Pin	2.0mm	JST	B8B-PHDSS	PHDR-08VS
CL11	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CL21	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
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
CPP1	1x5 5Pin	2.00mm	JST	B5B-PH-KL	PHR-5
CT	2x5 10Pin	2.00mm	JST	B10B-PHDSS	PHDR-10VS
LVDS1	2x15 30Pin	1.25mm	HIROSE	DF13-30DS-1.25C	DF13-30DP-1.25V
HDMI1	2x10 20Pin	1.25mm	HIROSE	DF13-20DS-1.25C	DF13-20DP-1.25V

Chapter-4

Introduction of BIOS

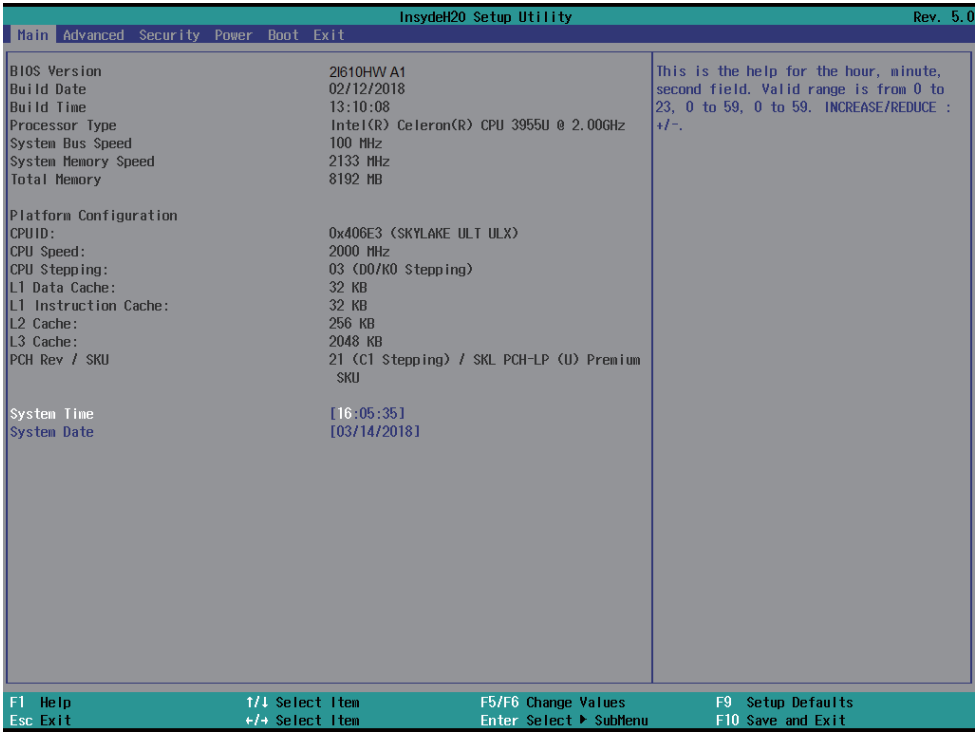
The BIOS is a program located in the Flash Memory on the motherboard.
This program is a bridge between motherboard and operating system.
When you start the computer, the BIOS program gains control.
The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the necessary hardware, it detects the entire hardware devices and configures the parameters of the hardware synchronization. After these tasks are completed, BIOS will give control of the computer back to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate with, it is the key factor of system stability and of ensuring your system performance at best.
In the BIOS Setup main menu, you can see several options. We will explain these options in the following pages. First, let us see the function keys you may use here:

Press <Esc> to quit the BIOS Setup.
Press ↑↓←→(up, down, left, right) to choose the option you want to confirm or modify.
Press <F10> to save these parameters and to exit the BIOS Setup menu after you complete the setup of BIOS parameters.
Press Page Up/Page Down or +/- keys to modify the BIOS parameters for the active option.

4-1 Enter Setup

Power on the computer and press <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



There are six menu bars on top of BIOS screen:

Main To change system basic configuration

Advanced To change system advanced configuration

Security Password settings

Power ACPI and wake device settings

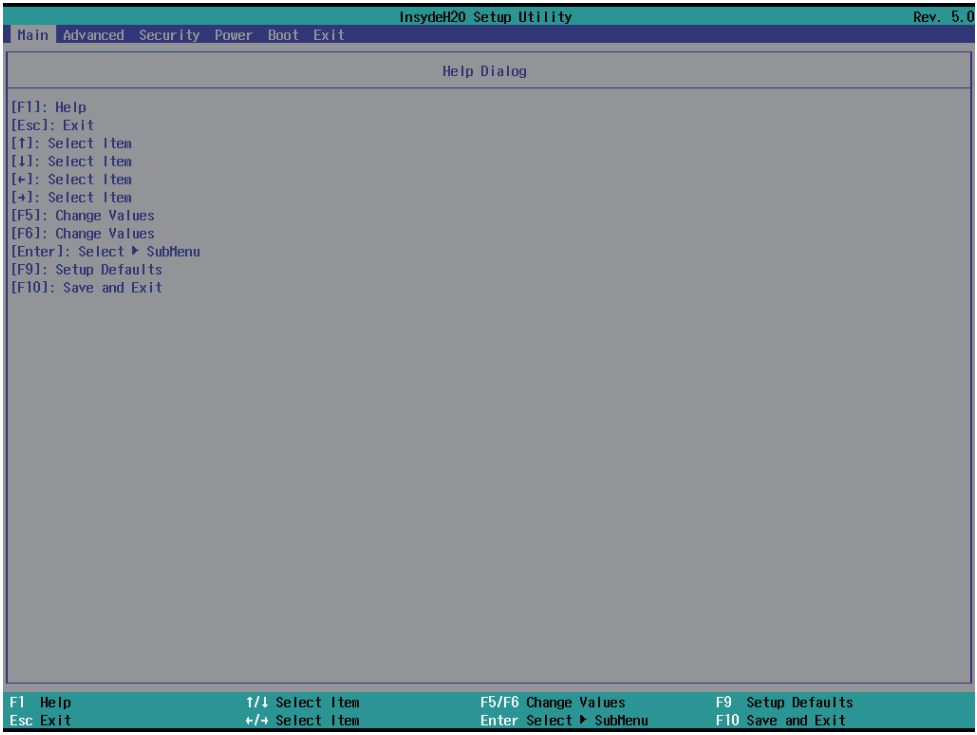
Boot To change system boot configuration

Exit Save setting, loading and exit options.

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

The selected one is highlighted.

4-3 Getting Help



Status Page Setup Menu / Option Page Setup Menu

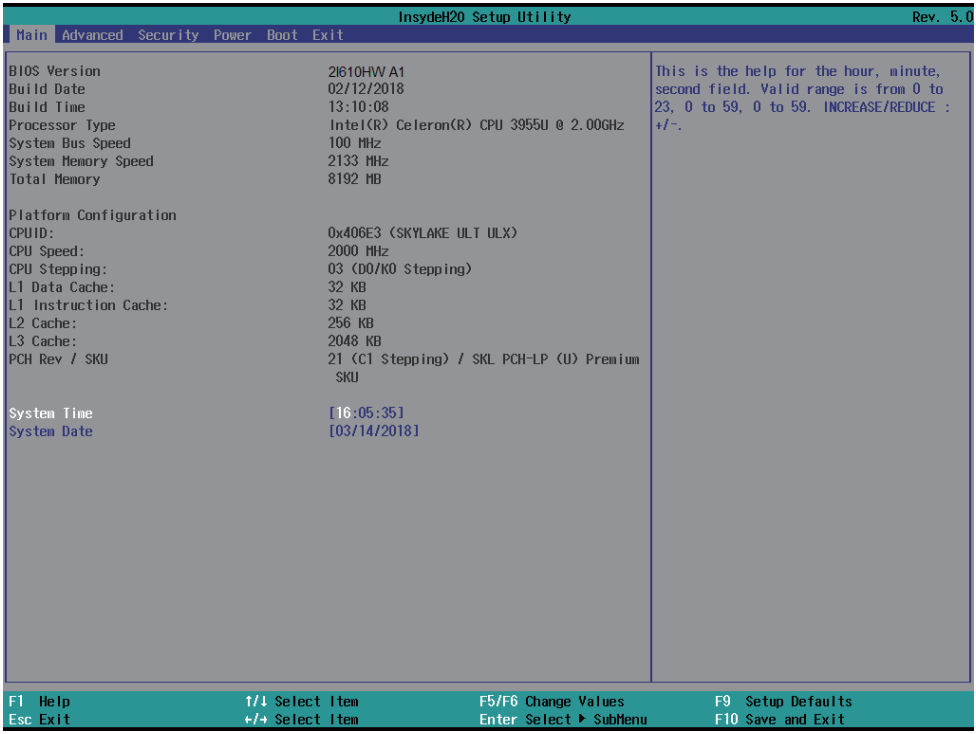
Press F1 to pop up a help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

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.

4-4 Main



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

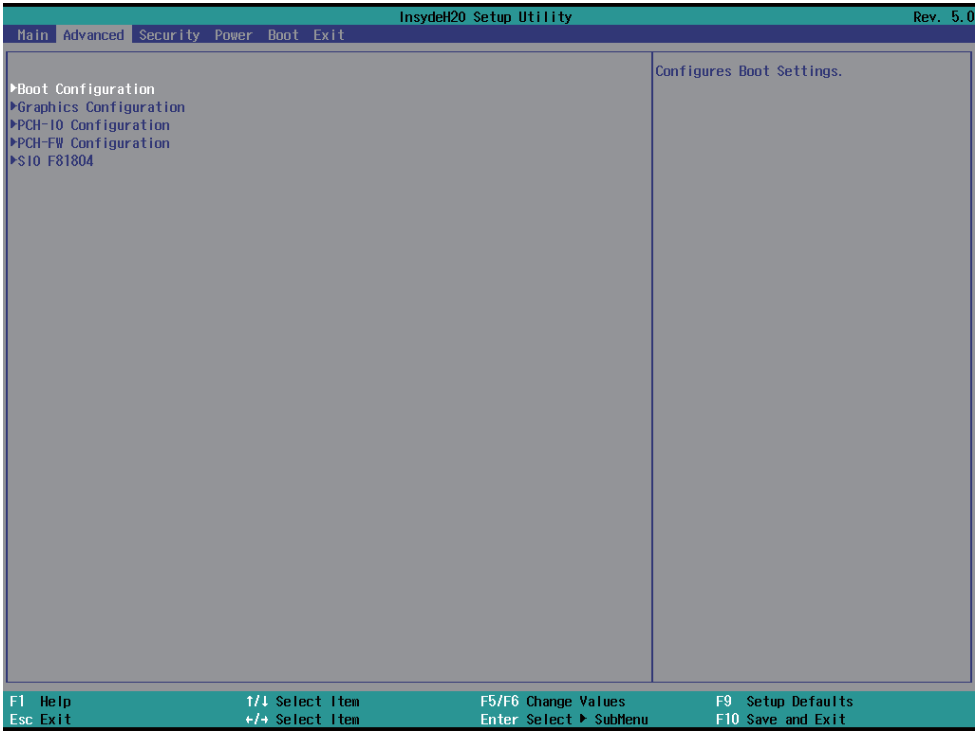
System Date

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

System Time

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

4-5 Advanced



Boot Configuration
Please refer section 4-5-1

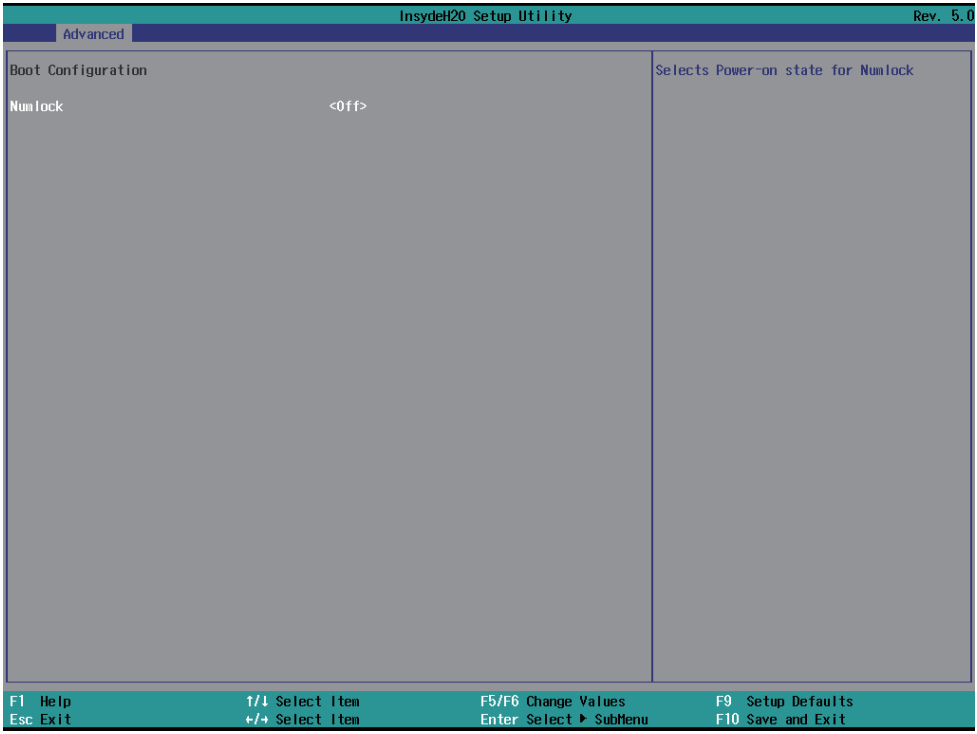
Graphics Configuration
Please refer section 4-5-2

PCH-IO Configuration
Please refer section 4-5-3

PCH-FW Configuration
Please refer section 4-5-4

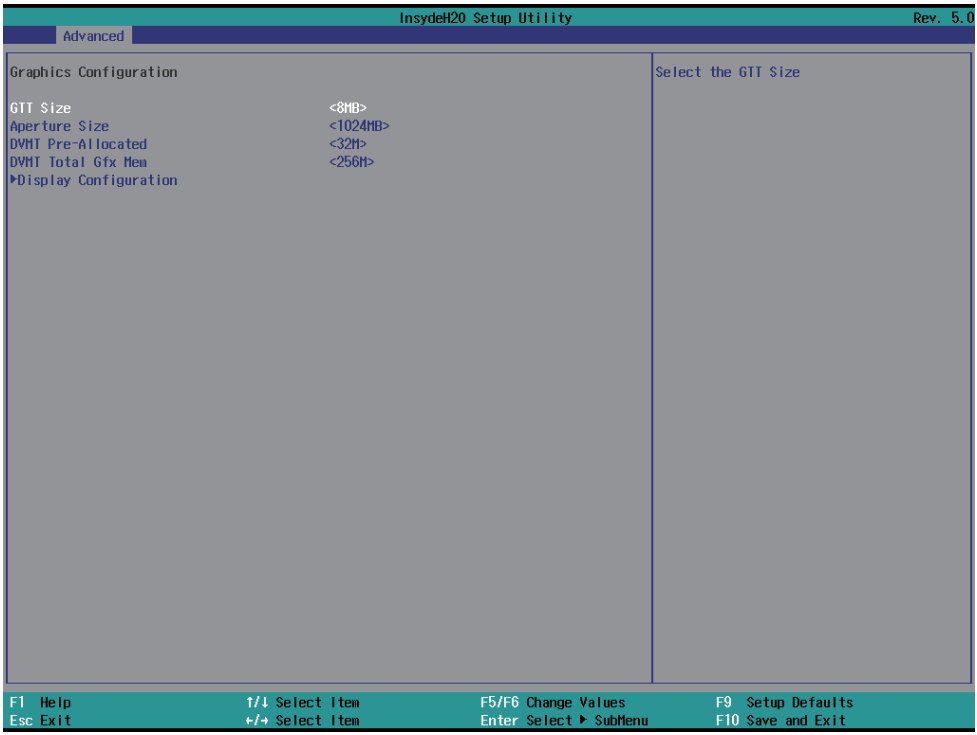
SIO FINTEK81804
Please refer section 4-5-5

4-5-1 Boot Configuration



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

4-5-2 Graphics Configuration



GTT Size

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

Aperture Size

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

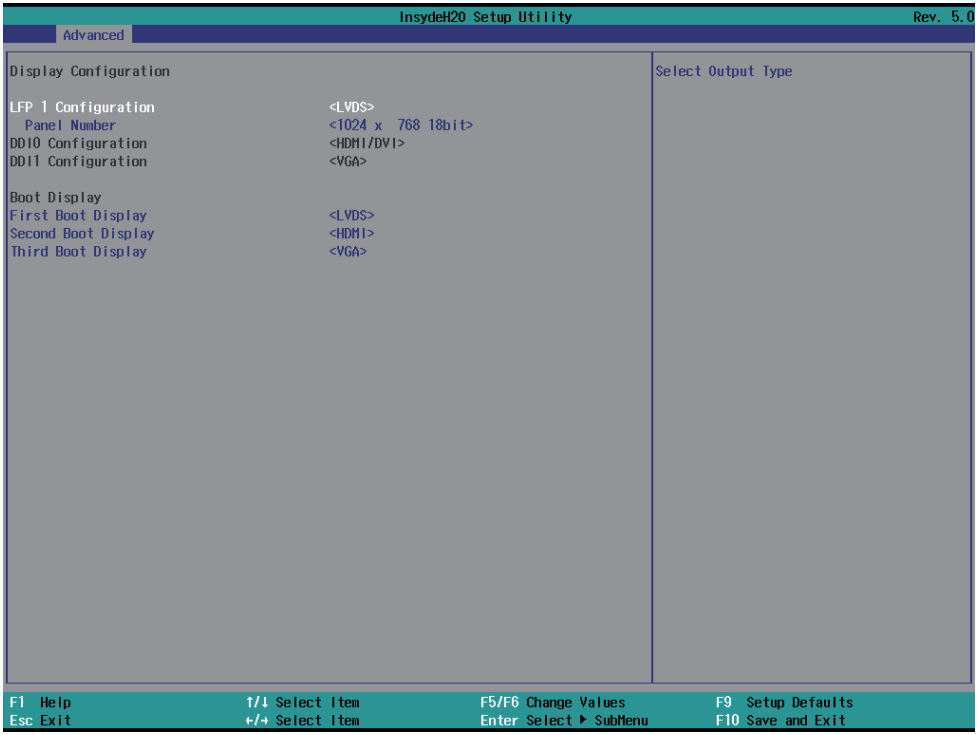
Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device

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

Display Configuration

Please refer section 4-5-2-1

4-5-2-1 ► Display Configuration



LFP 1 Configure to LVDS Panel, default is Disabled

The Panel resolution supported are below:

640 x 480 18bit

800 x 600 18bit

1024 x 768 18bit (default)

800 x 480 18bit

1024 x 600 18bit

1280 x 800 18bit

1366 x 768 18bit

800 x 600 24bit

1024 x 768 24bit

1280 x 800 24bit

1366 x 768 24bit

1280 x 1024 48bit

1440 x 900 48bit

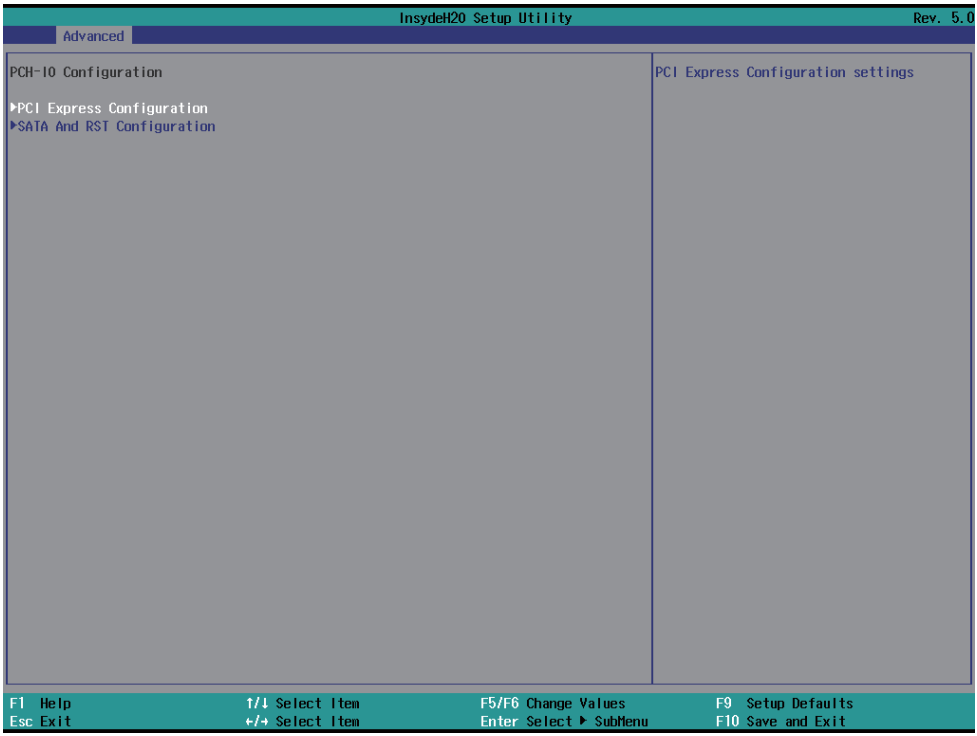
1600 x 1200 48bit

1920 x 1080 48bit

Boot Display

To select the displays priority to LVDS, HDMI or VGA

4-5-3 PCH-IO Configuration



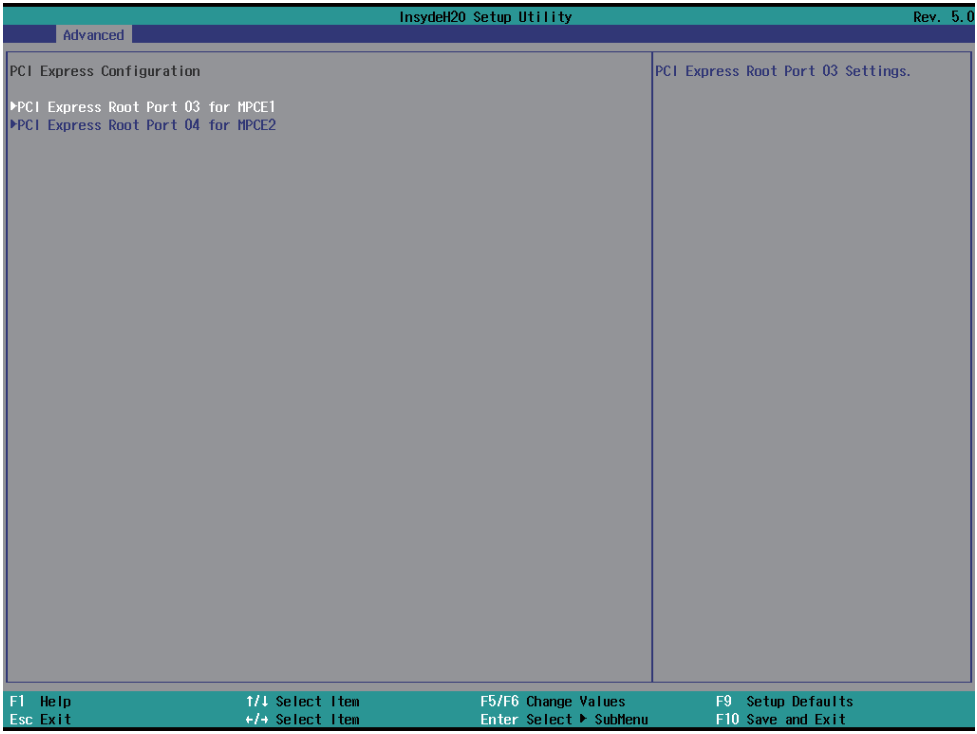
PCI Express Configuration

Please refer section 4-5-3-1

SATA And RST Configuration

Please refer section 4-5-3-2

4-5-3-1 ► PCI Express Configuration



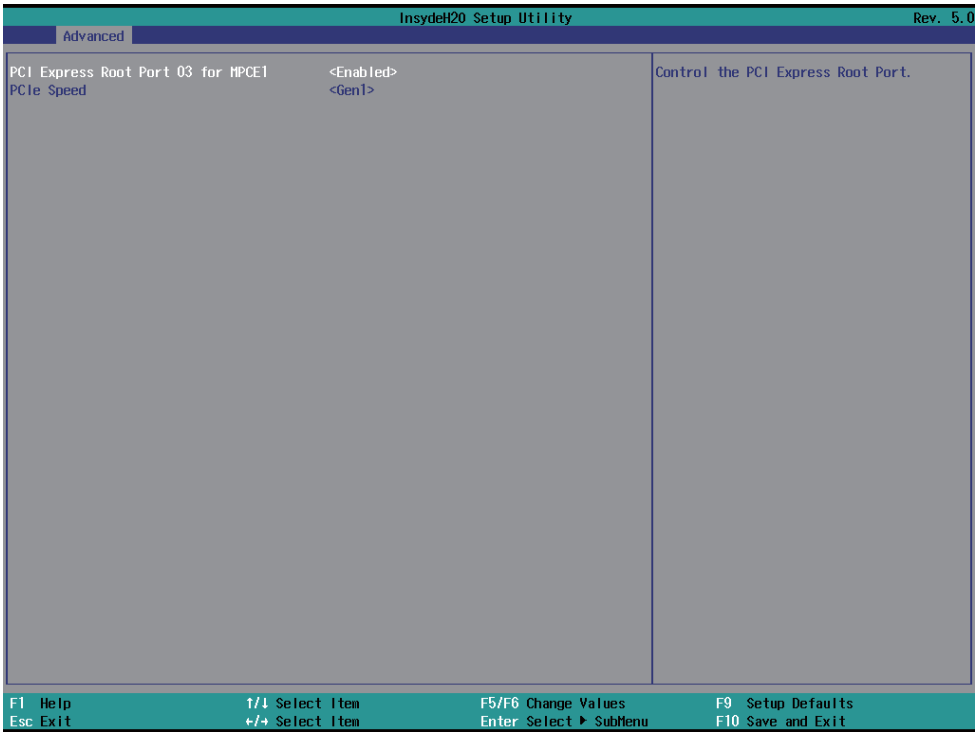
PCI Express Root Port 03 for MPCE1

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

PCI Express Root Port 04 for MPCE2

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

4-5-3-1-1 ► PCI Express Root Port 03 for MPCE1



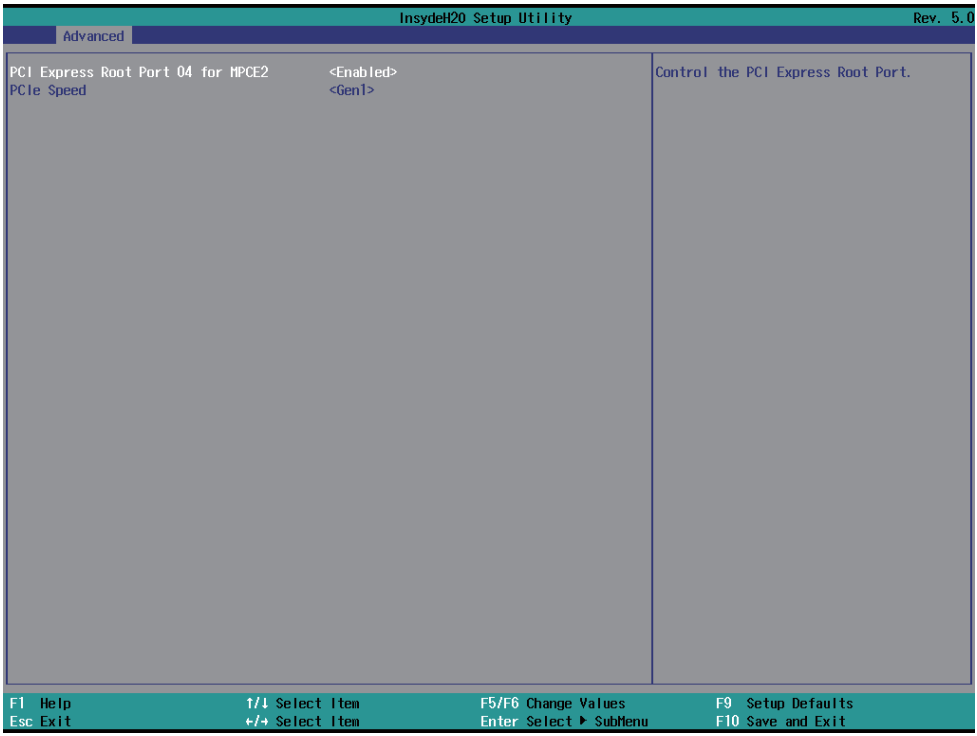
PCI Express Root Port 03 for MPCE1

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

Select PCI Express port speed.

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

4-5-3-1-2 ► PCI Express Root Port 04 for MPCE2



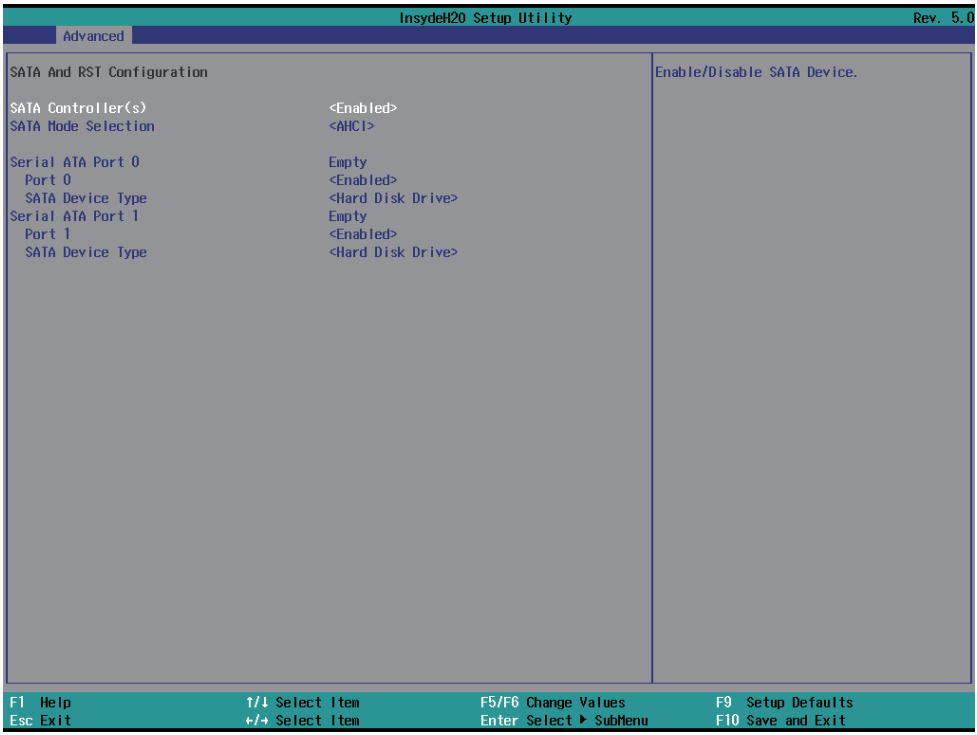
PCI Express Root Port 04 for MPCE2

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

Select PCI Express port speed.

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

4-5-3-2 ► SATA And RST Configuration



SATA Controller

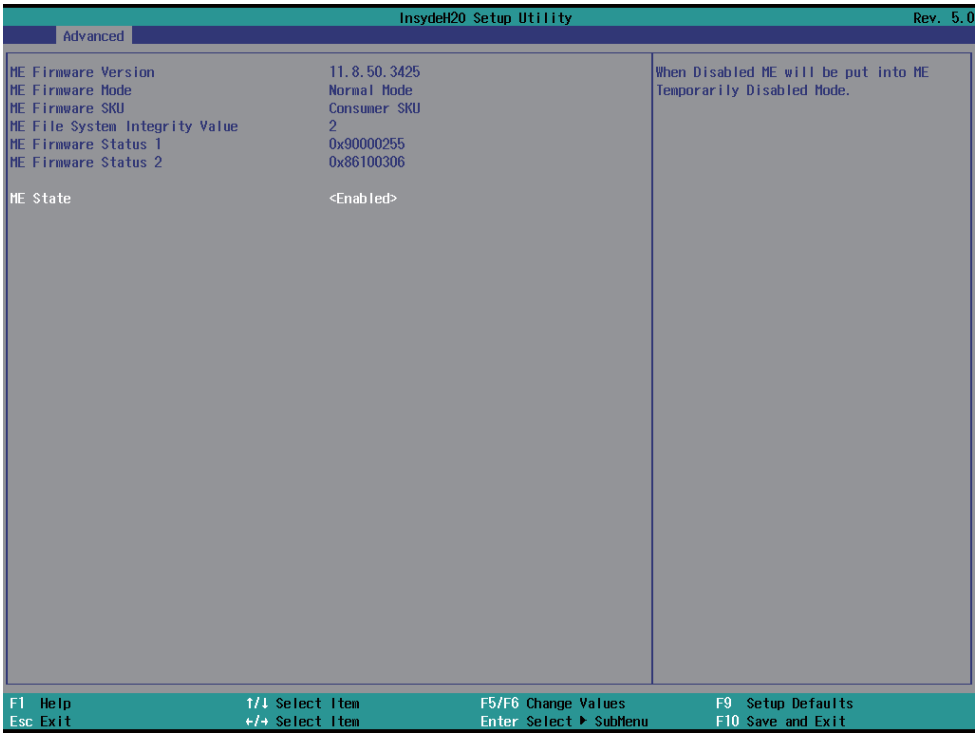
Use this item to Enable or Disable SATA Device.

The optional settings are: Enabled(default) or Disabled

SATA Mode Selection

Support AHCI Mode only.

4-5-4 PCH-FW Configuration



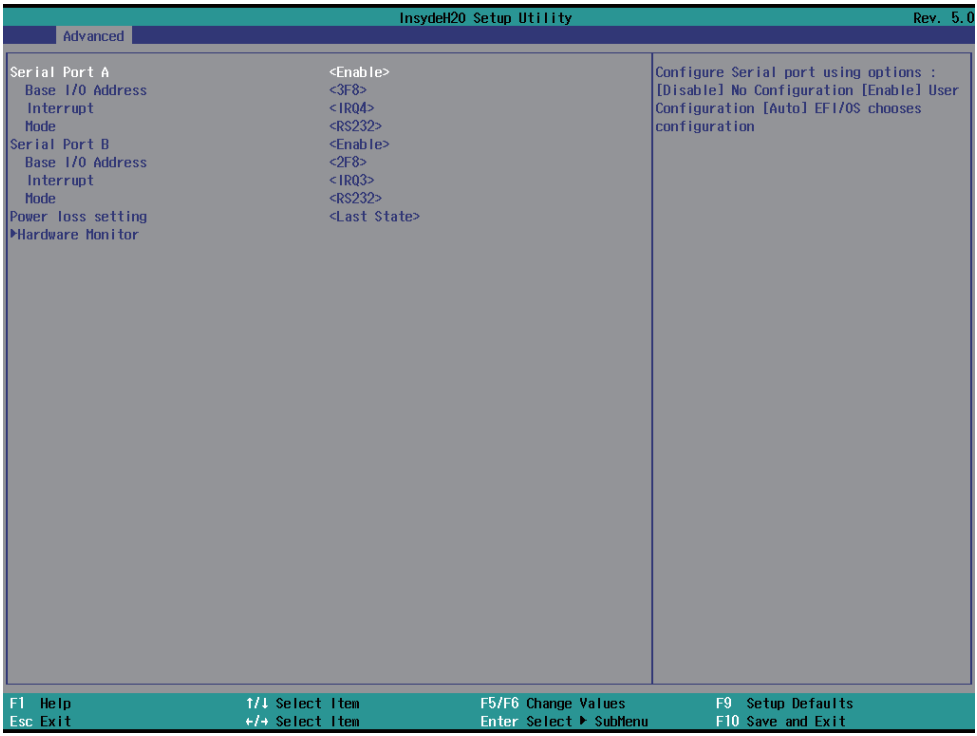
ME State

The optional settings are: Enabled (default) or Disabled

Manageability Features State

The optional settings are: Enabled or Disabled (default)

4-5-5 SIO FINTEK81804



Serial Port 1/2

Use this item to enable or disable serial port.

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

Serial Port A Base IO Address / Interrupt / Serial Mode

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

The optional settings are:

IO=3F8h; IRQ=4 (default)

IO=3E8h; IRQ=3,4

IO=2E8h; IRQ=3,4

IO=2F8h; IRQ=3,4

Serial Port B Base IO Address / Interrupt / Serial Mode

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

The optional settings are:

IO=2F8h; IRQ=3(default)

IO=2E8h; IRQ=3,4

IO=3E8h; IRQ=3,4

IO=3F8h; IRQ=3,4

Mode

RS232(default)/RS485/RS422

Power Loss setting

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

[Last state] Restores the system to the status before power failure or interrupt occurred.

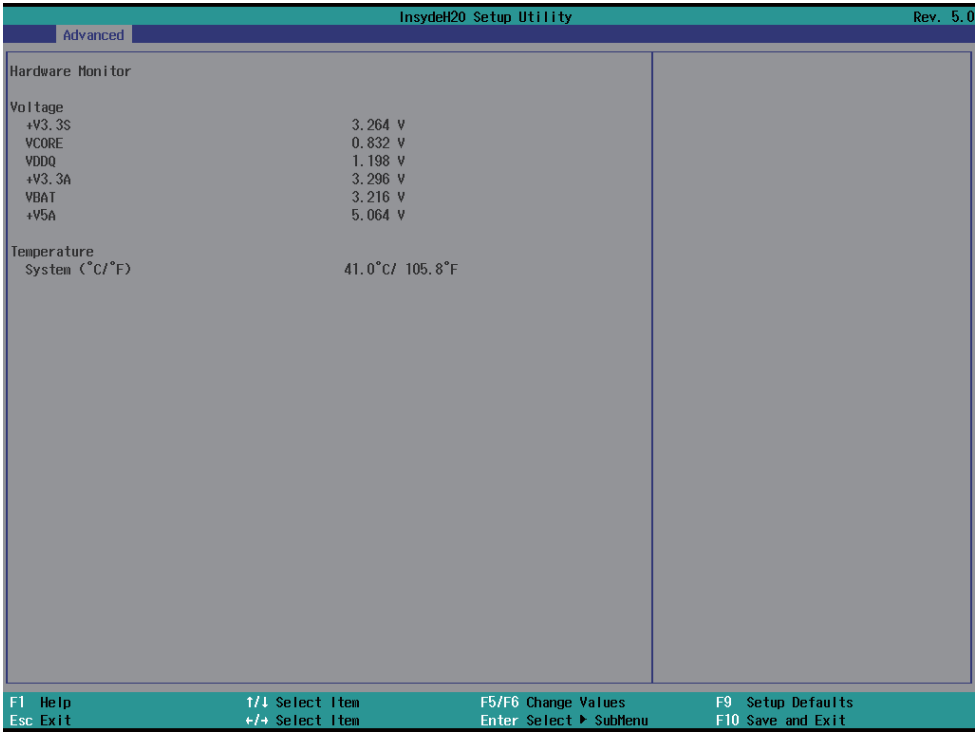
[Always on] Leaves the computer in the power on state.

[Always off] Leaves the computer in the power off state.

Hardware Monitor

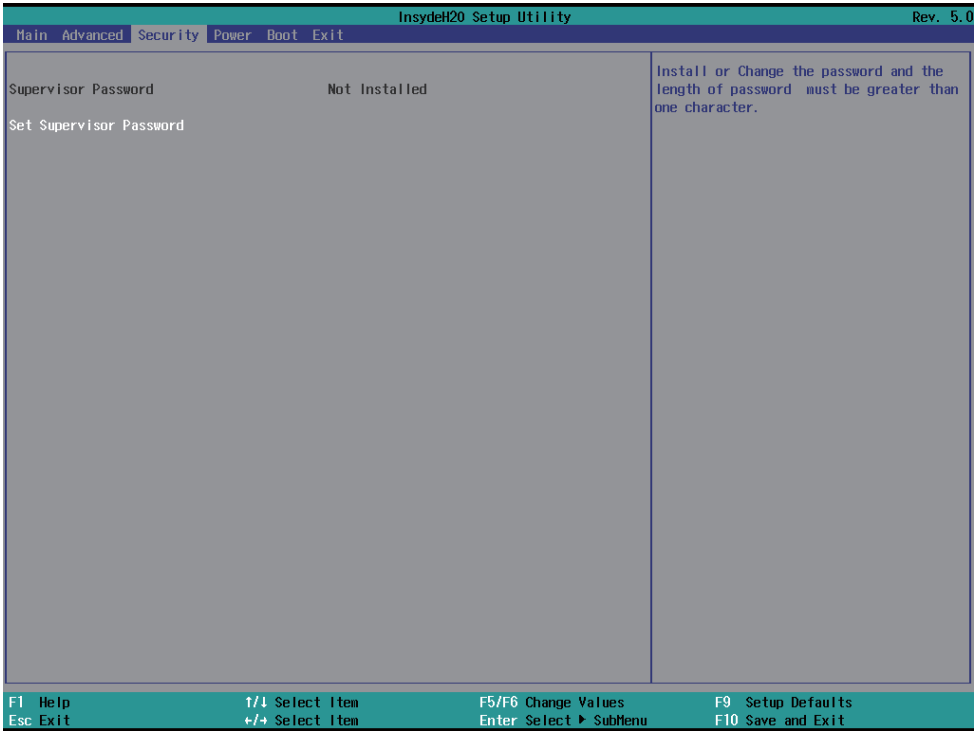
Please refer section 4-5-5-1

4-5-5-1 ► Hardware Monitor



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

4-6 Security



Supervisor Password

To set up an Supervisor password

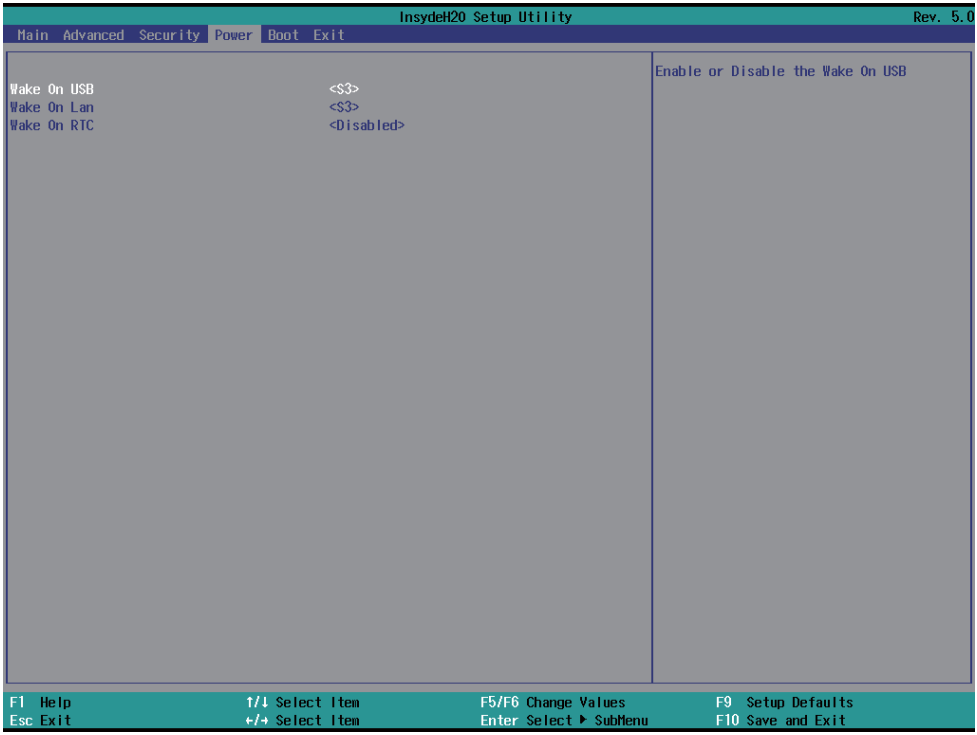
1. Select Supervisor Password.

The screen then pops up an Create New Password dialog.

2. Enter your desired password that is no less than 3 characters and no more than 10 characters.

3. Hit [Enter] key to submit.

4-7 Power



Wake On USB

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

The optional settings: S3(default), Disabled

Wake On LAN

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

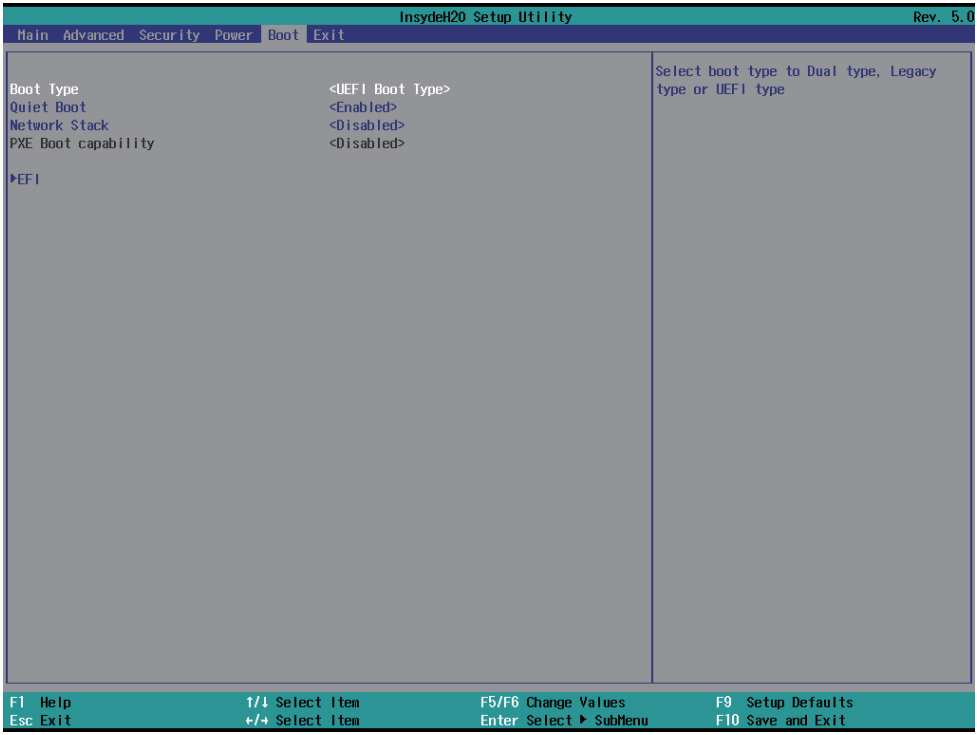
The optional settings: S3(default), S5, S3/S5, Disabled

Wake On RTC

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

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

4-8 Boot



Boot type

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

Quiet Boot

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

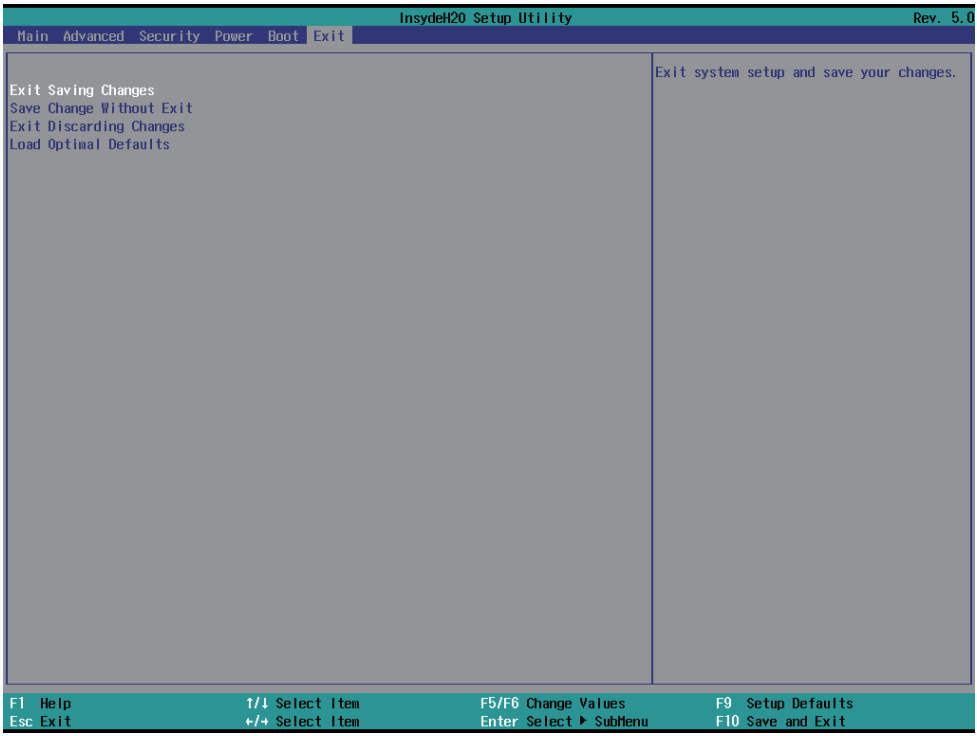
Network Stack

Enabled for PXE function, default is disabled.

EFI

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

4-9 EXIT



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

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

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

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

4-10 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 2I610HW 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 2I610HWA2.ROM –BIOS -ALL

2I610HWA2.ROM is the file name of the latest BIOS.

It may be 2I610HWA1.ROM or 2I610HWA2.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 2I610HWA2.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 (2I610HW)

Item	Spec
CPU	Celeron 3955U 2.00GHz / i5-6200U 2.30GHz / i7-6600U 2.60GHz
Memory	DDR4 2133 16GB
Operating System	Windows 10 Enterprise 64bit
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	0.13A	1.32A	0.62A	1.48A	1.12A	12V
		0.11A	0.69A	0.35A	0.79A	0.61A	24V
	i5-6200U	0.13A	1.7A	0.59A	2.67A	1.44A	12V
		0.11A	0.97A	0.39A	1.22A	0.75A	24V
	i7-6600U	0.13A	2.52A	0.58A	2.63A	1.66A	12V
		0.11A	1.05A	0.34A	1.31A	0.78A	24V
mSATA	Celeron 3955U	0.13A	1.2A	0.58A	2.17A	0.89A	12V
		0.11A	0.64A	0.33A	1.14A	0.53A	24V
	i5-6200U	0.13A	1.94A	0.57A	1.81A	1.01A	12V
		0.11A	0.95A	0.34A	0.93A	0.62A	24V
	i7-6600U	0.13A	2.14A	0.55A	2.52A	1.16A	12V
		0.11A	1.05A	0.32A	1.28A	0.57A	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)