3I390AW

Intel Apollo Lake N4200 / N3350 / E3950 SoC CPU, DDR3L 1600 / 1866 MT/s, 2 x LAN / DVI / Audio / USB / COM / PCIe mini card

All-In-One
Intel Apollo Lake N4200 / N3350 / E3950 SoC CPU
VGA, DVI, 2 x mini PCIe,
Audio, LAN, SATA, USB, COM

NO. 3I390AW
Release date: June 6th 2017

Contents

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User Manual edition 0.1, JUN. 30. 2017

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.

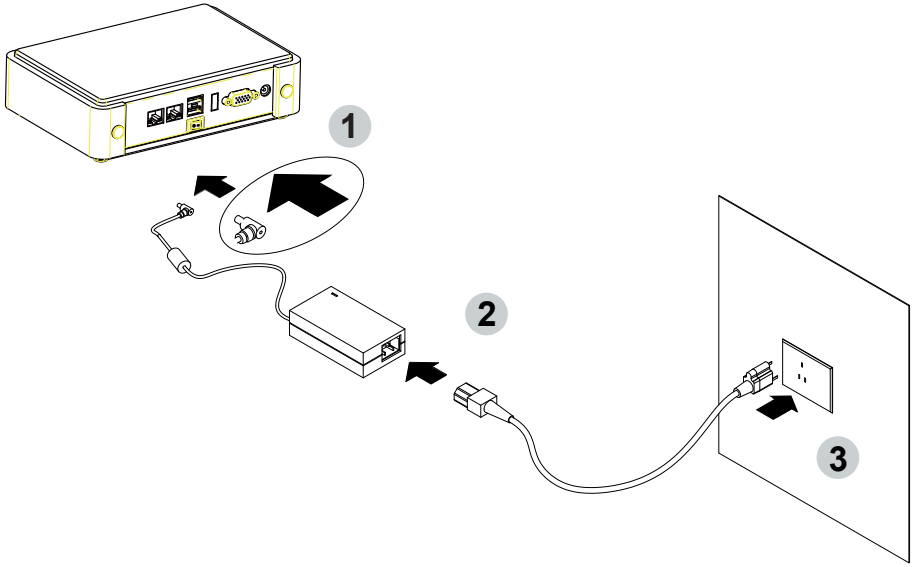
✱ Hardware Notice Guide

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.

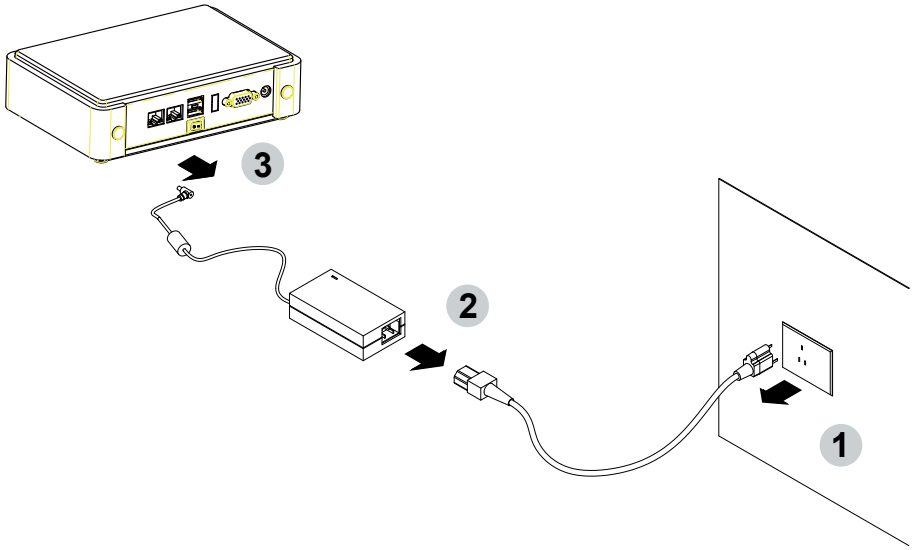
Remark 1:
Always insert/unplug the DC-in horizontally & directly to/from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

3I390AW features the latest Apollo Lake Intel® Atom™ processor E3950, Mobile Intel® Pentium processor N4200 or Mobile Intel® Celeron processor N3350 on-board SoC and one SO-DIMM socket DDR3L 1866MT/s up to 8GB. The integrated 3.5-inch embedded board is highly expandable and customizable. 3I390AW comes two Intel Giga LAN with Wake-On LAN and the PXE function, two serial ports RS232 / RS485 / RS422 jumper free auto switch by BIOS settings and up to 6 RS232. It supports 4 ports of USB 3.0 and 2 ports 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. A SIM card socket on board for expand 3G / 4G module for communication.

The embedded motherboard 3I390AW is specially designed expend more IO by dual type connectors which makes it to be ideal stable, wireless, anti-vibration for transportation and mobile applications. Wide-Range Voltage DC in (9~36V) designed for widely varying input voltage requirement. This integrated platform offers superb performance and PC specification in the industry. Additionally, Its compact and fanless design makes it perfect for use in space constricting environments.

The All-In-One motherboard 3I390AW is fully compatible with industry standards, plus technical enhancements and thousands of software applications developed for IBM PC / AT compatible computers. These control logic provides high-speed performance for the most advanced multi user and multitasking applications available today.

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

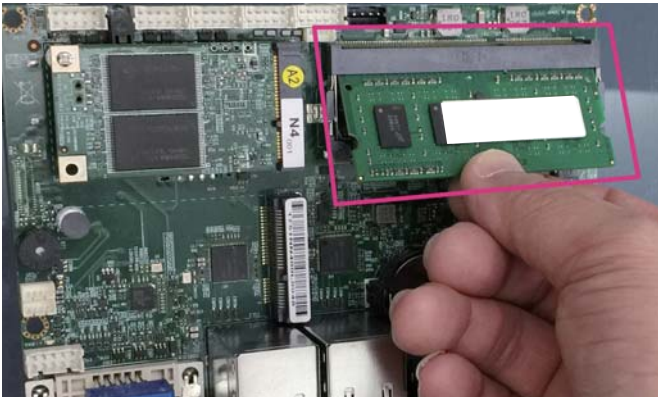
1. Intel® ATOMTM x7 E3950 1.6GHz / 2.0GHz (Quad core), Mobile Intel® Pentium N4200 1.1GHz / 2.5GHz, (Quad core), Mobile Intel® Celeron N3350 1.1GHz / 2.4GHz (Dual core)
2. Apollo-Lake Integrated Graphics chipset, Intel® ATOMTM x7 E3950 500MHz / 650MHz, Mobile Intel® Pentium N4200 200MHz / 700MHz, Mobile Intel® Celeron N3350 200MHz / 650MHz
3. Support 1 DVI 1.2 2048 x 1080, 1 VGA up to 1920 x 1200
4. 1 SO-DIMM socket for DDR3L SDRAM up to 8GB, data transfer rate of 1866MT/s
5. Support 2 x 10 / 100 / 1000 Mbps Intel LAN port.
6. Support 2 x RS232 auto switch to RS485 / RS422 by BIOS, 2 port RS232 external and 2 port RS232 internal
7. 4 x type A USB 3.0 external, 2 x USB 2.0 internal
8. ALC886 HD Audio Specification 1.0 Two channel sound
9. Support extended 1 x full-size Mini PCIe card for PCIe x 1, mSATA and USB interface, 1 x half-size Mini PCIe card for PCIe x 1 and USB interface
10. 1 SIM card socket pair with MPCE2
11. Support 1 SATA port
12. Hardware digital Input & Output, 8 x DI / 8 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
13. Wide Range DC IN +9V~36V
14. PCB Dimension: 102 x 73 mm

1-2 Specification

1. **SOC:** Intel® ATOMTM x7 E3950 1.6GHz / 2.0GHz (Quad core), Mobile Intel® Pentium N4200 1.1GHz / 2.5GHz, (Quad core), Mobile Intel® Celeron N3350 1.1GHz / 2.4GHz (Dual core)
2. **Memory:** 1 SO-DIMM socket for DDR3L SDRAM up to 8GB, data transfer rate of 1866MT/s
3. **Graphics:** 1 x DVI 1.2 & 1 x VGA port
4. **SATA:** Integrated Serial ATA Host Controller 1 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s). SATA signal shared with PCIe Mini card 1
5. **LAN:** Intel I211-AT LAN chipset for N4200 / N3350, I210-IT for E3950
6. **I/O Chip:** F81801U I/O chipset for 2 serial ports and second I/O chipset for 4 RS232
7. **USB:** 4 type A USB 3.0 connector onboard, 2 USB 2.0 (internal)
8. **Sound:** Support line in, line out and MIC in
9. **WDT / DIO:** Hardware digital Input & Output, 8 x DI / 8 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 and USB interface, one full-size Mini PCIe card for PCIe x 1 and USB interface
11. **SIM:** 1 socket pair with MPCE2
12. **BIOS:** Insyde UEFI BIOS
13. **Dimension:** 102 x 73 mm
14. **Power:** DC IN +9V~36V

1-3 Installing the SO-DIMM

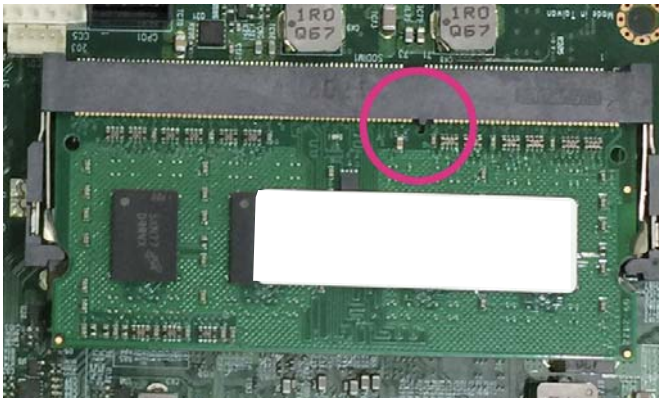
1. Align the SO-DIMM with the connector at a 45 degree angle.



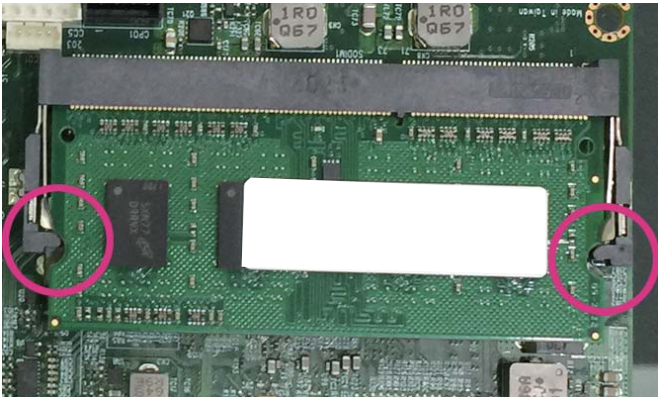
2. Press the SO-DIMM into the connector until you hear a click.

Notices:

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

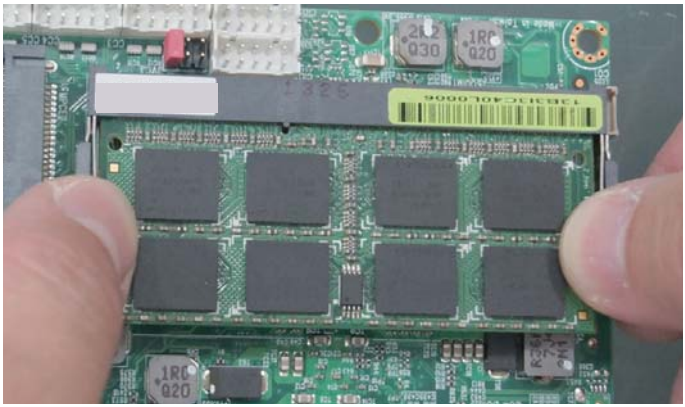


2. Make sure the retaining clips (on two sides of the slot) lock onto the notches of the card firmly.

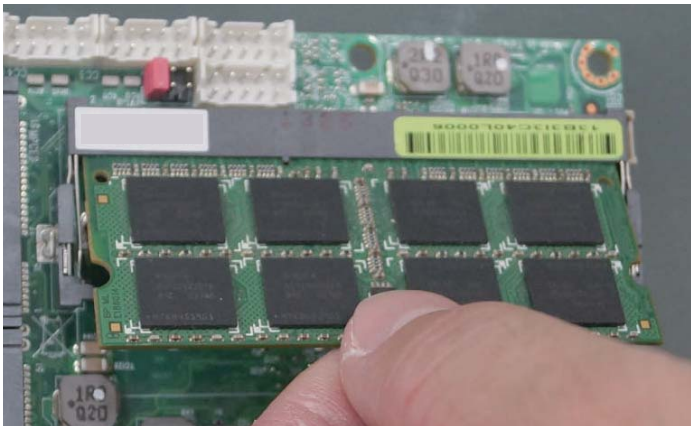


1-3-1.1 Removing the SO-DIMM

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

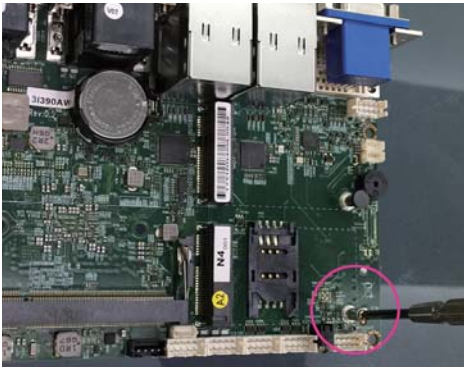


2. Lift the SO-DIMM out of its connector carefully.



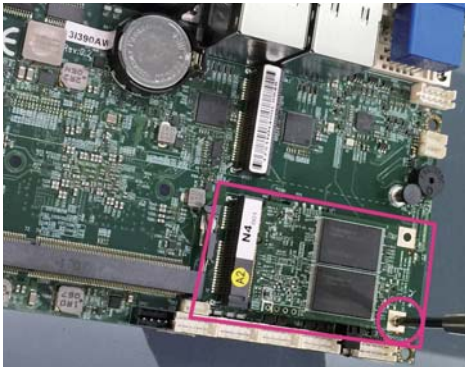
1-4 Directions for installing the Mini PCI-e Card (Full Size)

1. Unscrew the screw on the board

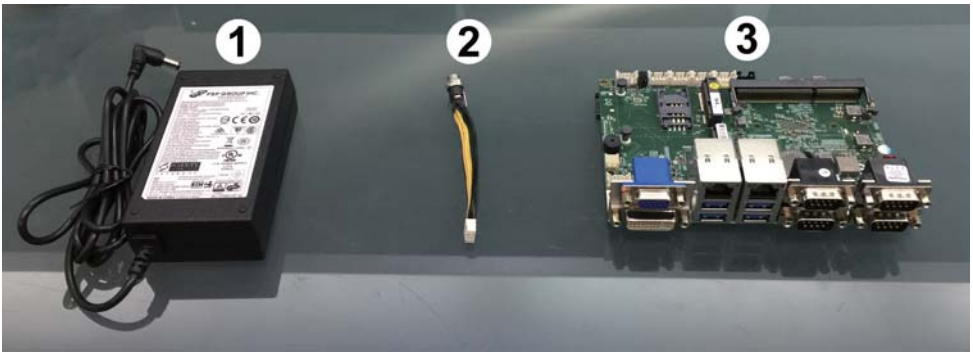


2. Plug in the Mini Card in a 45 angle

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



1-5 Packing List



	Material Code	Description	Detail Specification	Quantit
1	6G5212-0620-0100	60W Power Adapter, 12V / 5A, 2.5Ø	LF, L Type, FSP060-DIBAN2, FSP	1
2	6G6003-7350-0100	Power Cable	LF, 2.0 2*4 / DC JK, L=9cm	1
3	7G1901-1670002-0	MB-3I390AW-N4-002	LF, 3I390AW-N4, Rev.:002	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 3I390AW.
Please follow section 1-5, 2-1 and 2-2 to check the delivery package and unpack carefully. Please follow the jumper setting procedure.

NOTE!

1. Do not touch the board or any other sensitive components without all necessary anti-static protection.
2. Please pay attention to the voltage limitation of DC-IN12V 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 3I390AW.
   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 3I390AW 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 3I390AW from electricity discharge. With reference to section 1-5 please check the delivery package again with following steps:

1. Unpack the 3I390AW 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.

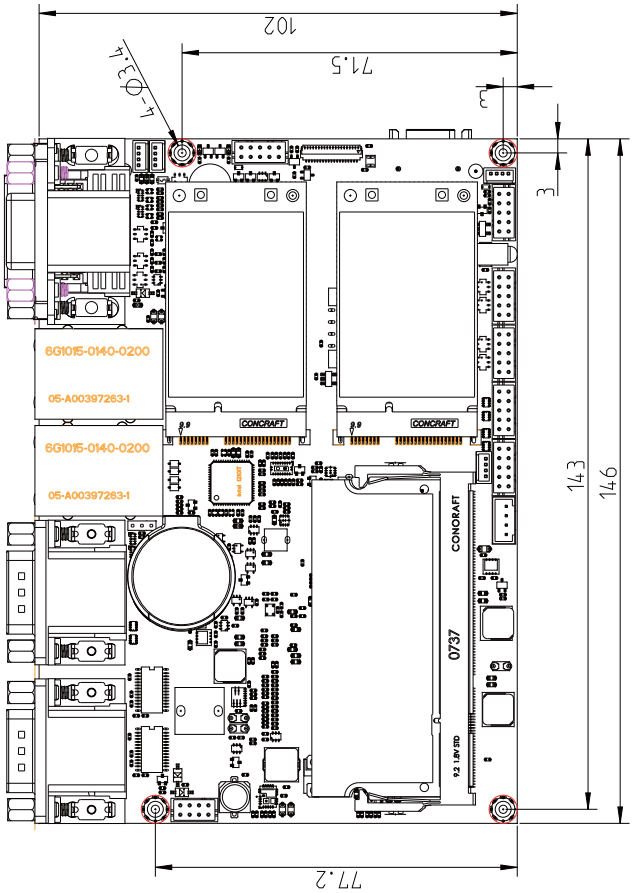
4. Check your optional parts (i.e. DDR, CF etc.), all necessary jumpers setting to jumper pin-set, and CMOS setup correctly.
   Please also refer to all information of jumper settings in this manual.

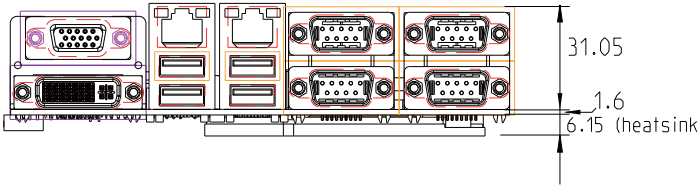
5. Check your external devices (i.e. Add-On-Card, Driver Type etc.) for complete add-in or connection and CMOS setup correctly.
   Please also refer to all information of connector connection in this manual.

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-3I390AW

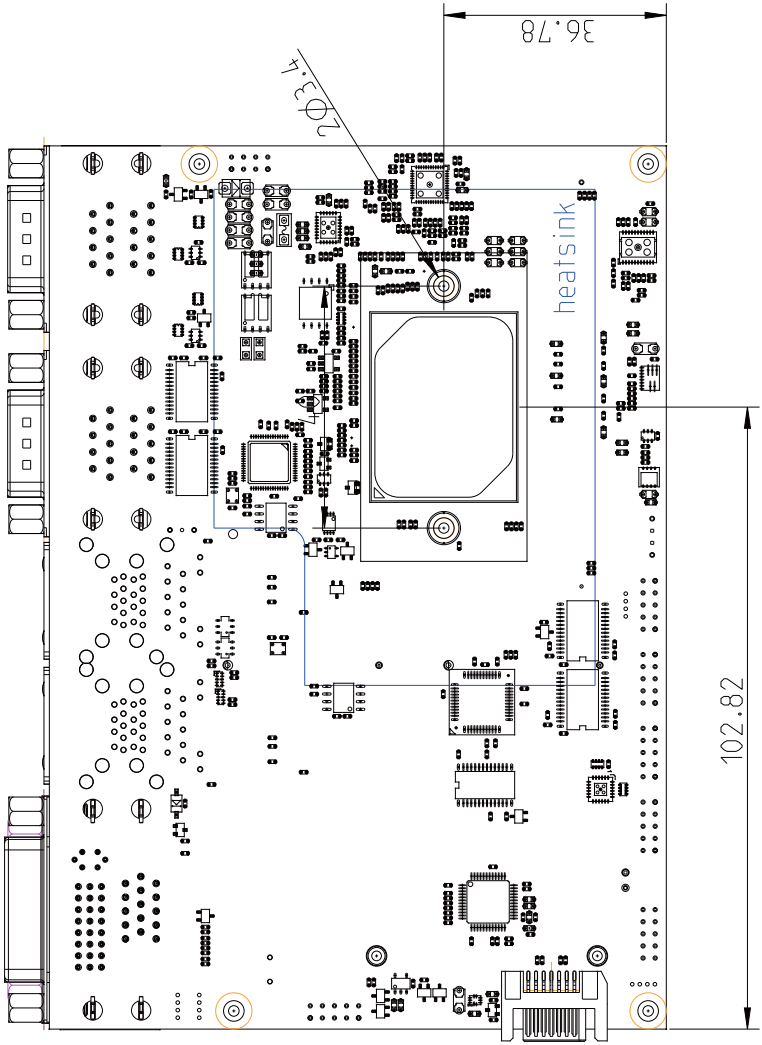
TOP





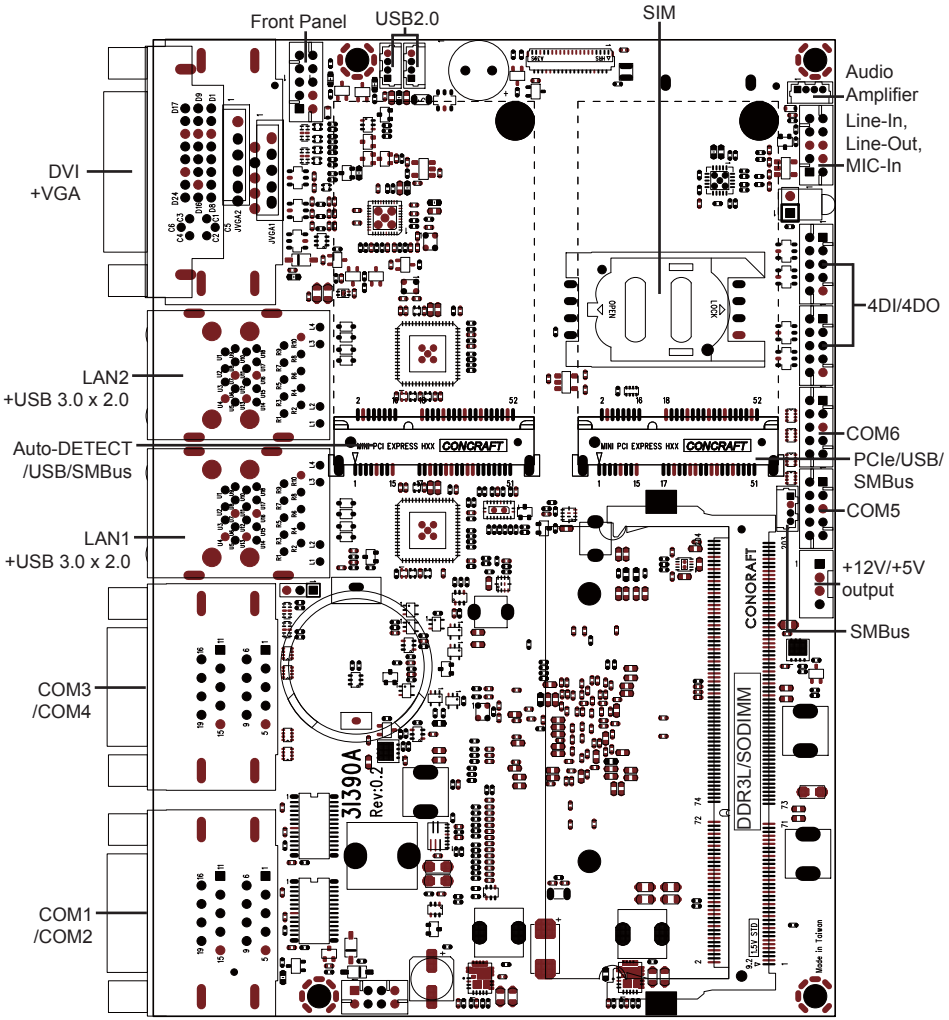
2-3-1 Dimension-3I390AW

BOT



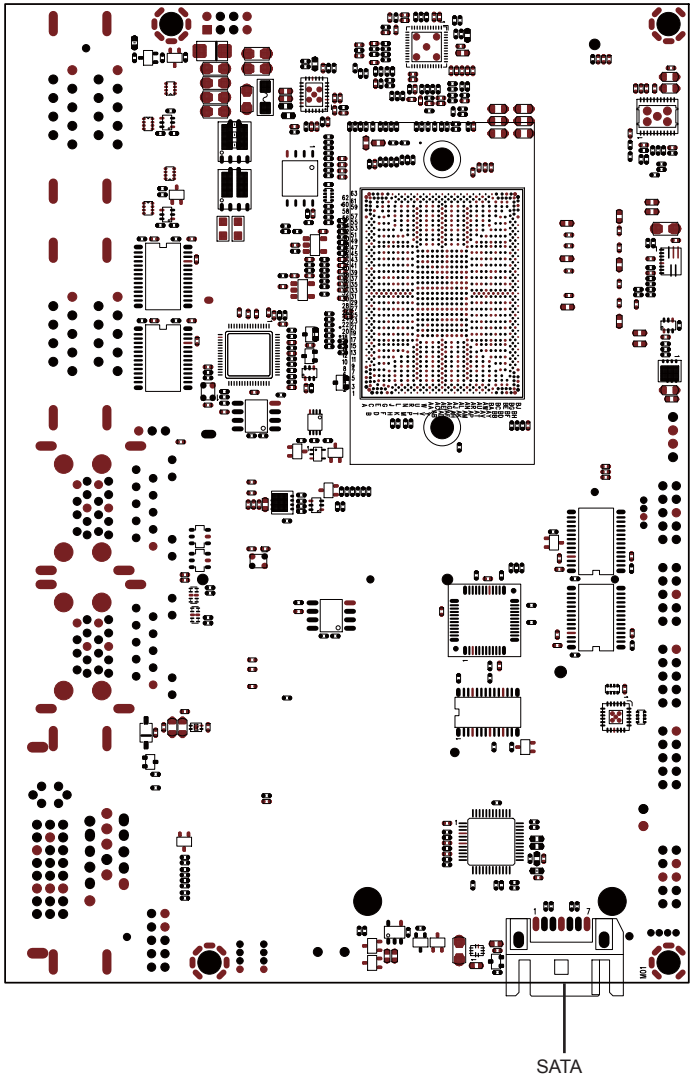
2-4 Layout-3I390AW-Function Map

TOP

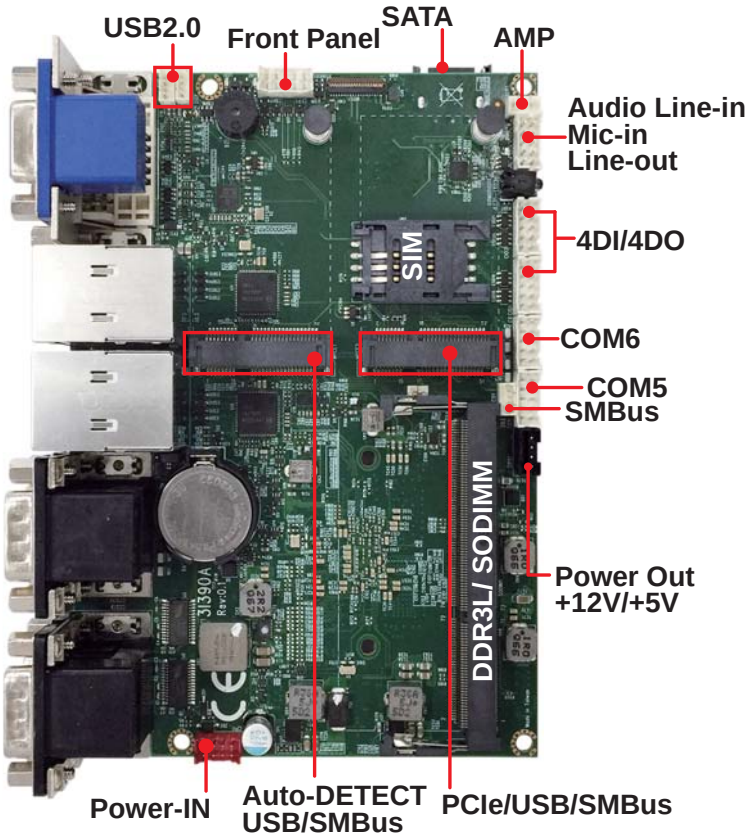


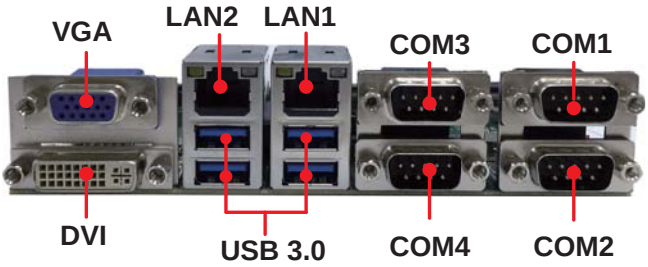
2-4-1 Layout-3I390AW-Function Map

BOT



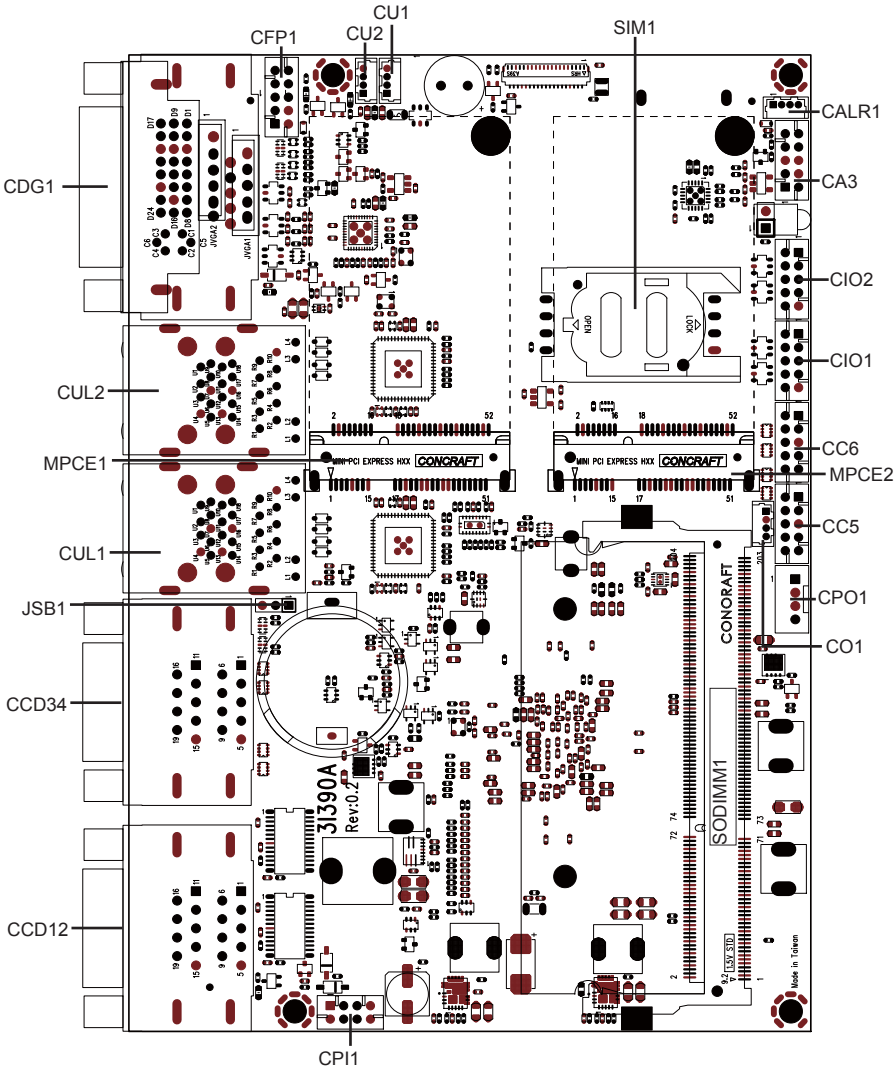
2-5 Function Map-3I390AW





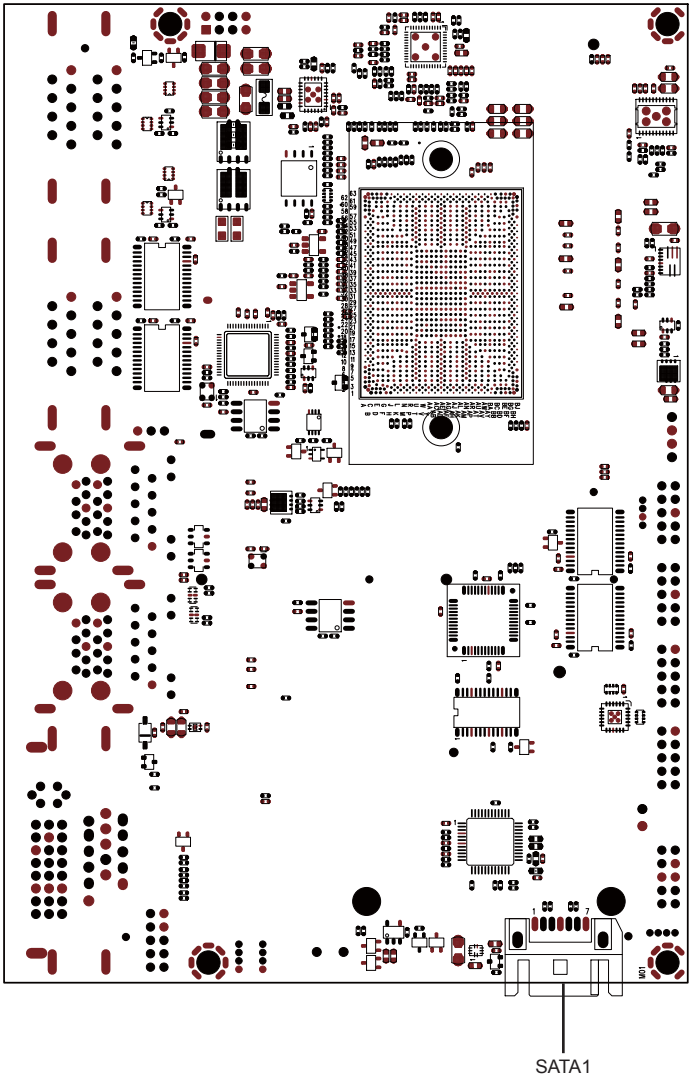
2-6 Connector MAP-3I390AW

TOP

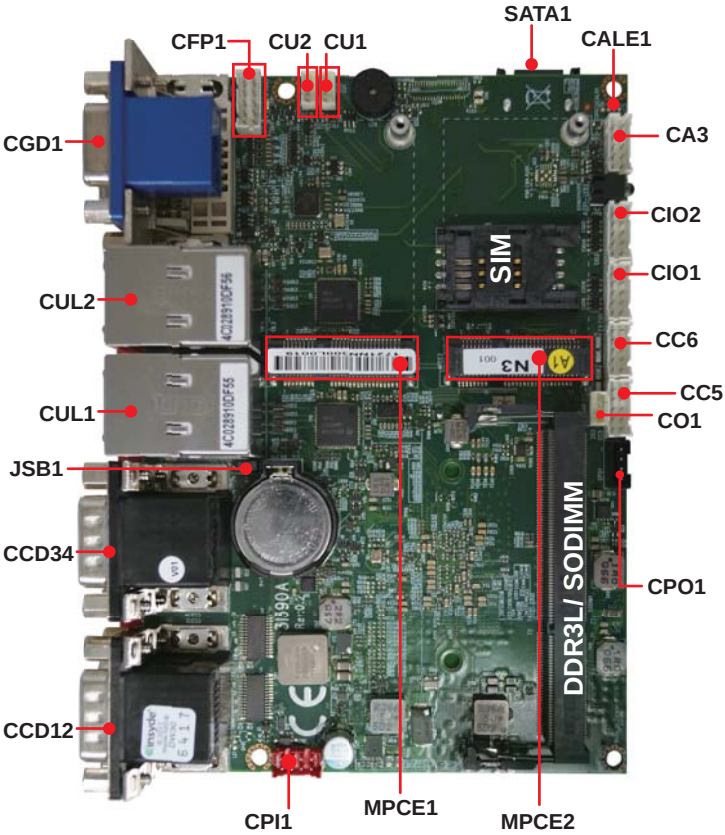


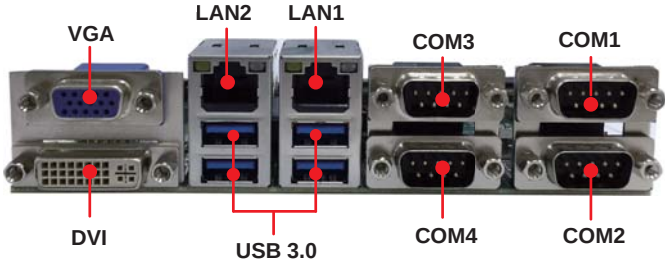
2-6-1 Connector MAP-3I390AW

BOT



2-7 Diagram- 3I390AW





2-8 Install Memory

This motherboard provides one 204-pin Small Outline Dual In-line Memory Module (SODIMM) socket for memory expansion available maximum to of 2GB / 4GB / 8GB DDR3 SDRAM.
DDR3 clock supports: DDR3 1333 / 1600MT/S

Valid Memory Configurations

DIMM1	System Accept or Not	Total Memory
		Max.
DS/SS	Accept	8GB

DS: Double Sided DIMM **SS: Single Sided DIMM**

NOTE!

The detected memory size is less than actual installed memory size since some memory has been allocated for system use.
That's how PC works with system memory.

Please refer to page 9 for installation of memory module.

2-9 List of Jumpers

JSB1: CMOS DATA Clear

2-10 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.

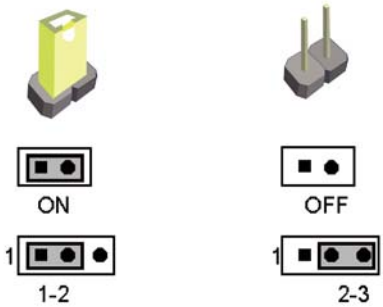


Figure 2.2

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 .

2-11 JSB1: CMOS Data Clear

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

Close Pin1 and pin 2 of JSB1 to store the CMOS data.

To clear the CMOS, follow the procedures below:

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

JSB1	DESCRIPION
*1-2	Normal set
2-3	Second CMOS data clear

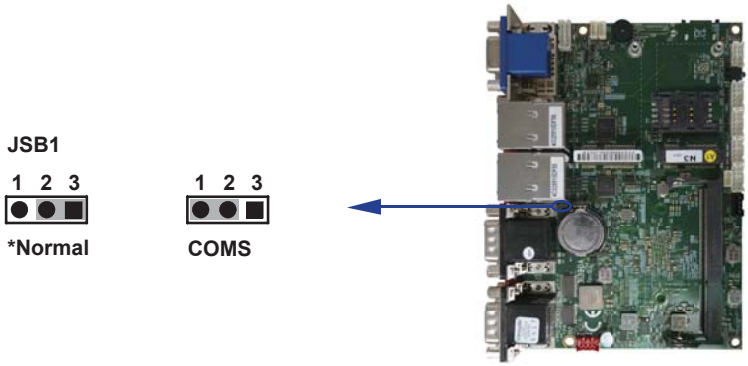
Note: Normal work is open jumper

Note: Do not clear CMOS unless

1. Troubleshooting

2. Forget password

3. You fail over-clocking system



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

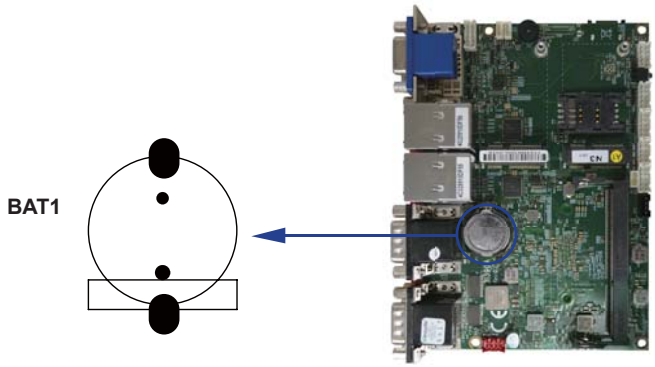
BAT1:	Li 3V battery holder
CA3:	Line-out / Line-in / Mic-in / SPDIF-out 2x5 pin (2.0mm) Wafer
CALR1:	Amplifier Line-out Right / Left channel 4pin (1.25mm) wafer
CGD1 :	VGA DB15 + DVI Connector
CCD12 :	COM1 / 2 Dual DB9 connector
CCD34:	COM3 / 4 Dual DB9 connector
CC5:	COM5 2 x 5pin (2.0mm) wafer
CC6:	COM6 2 x 5pin (2.0mm) wafer
CFP1:	Front Panel connector 2 x 5pin (2.0mm) wafer
CIO1:	First DIO 2 x 5 pin (2.0mm) Wafer
CIO2:	Second DIO 2 x 5 pin (2.0mm) Wafer
CUL1 :	LAN port 1 RJ45 + USB3.0 Type A x 2 Connector
CUL2 :	LAN port 1 RJ45 + USB3.0 Type A x 2 Connector
CO1:	I2C Bus 4pin (1.25mm) Wafer
CPI1:	DC 12V-IN 2 x 4 pin (2.0mm) Red wafer connector
CPO1:	+12V / +5V power output 4 pin (2.0mm) Black wafer connector
CU1:	USB 2.0 port 4pin (1.25mm) Wafer
CU2:	USB 2.0 port 4pin (1.25mm) Wafer
MPCE1 :	Full size mini card port 1 sockets 52pin
MPCE2 :	Full size mini card port 2 sockets 52pin
SATA1:	SATA connector 7pin.
SIM1 :	SIM socket.
SODIM1 :	DDR3L SO-DIMM socket 204pin.

3-2 CMOS battery connector

- BAT1: Batter use Li 3V / 40mA (CR2032)

PIN NO.	DESCRIPTION
1	+VRTC 3.3V
2	GND

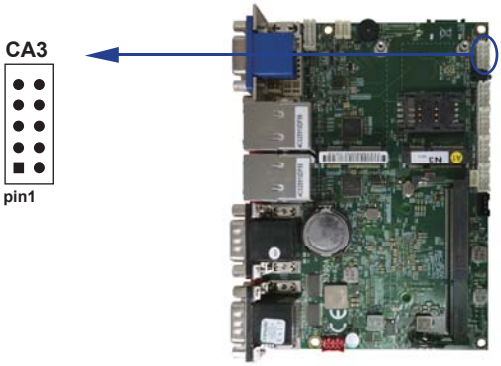
Note :
1.When board without Adaptor plug in, this board power RTC consumption 2.7uA
2.If adaptor always plug in RTC power consumption 0.1uA



3-3 Audio interface

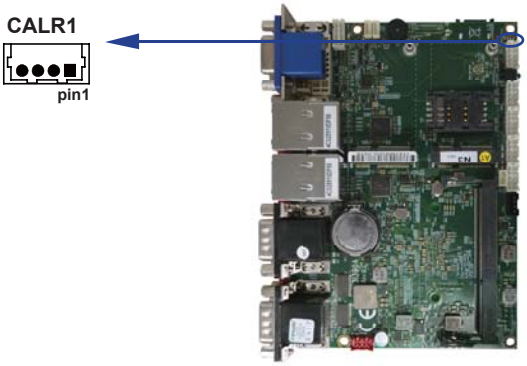
● CA3: Line-out / Line-in / Mic-in 2 x 5 pin (2.0mm) Wafer

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 DVI-D / VGA Connector

● CDG1: DVI 12bit connector down side (DB Connector)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data 2-	9	Data 1-	17	Data 0-
2	Data 2+	10	Data 1+	18	Data 0+
3	GND	11	GND	19	GND
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	I2C-CLK	14	+5V	22	GND
7	I2C-DATA	15	GND	23	CLK+
8	NC	16	DVI-DETECT	24	CLK-

● CDG1: VGA DB15 Connector Up side (D-SUB 15PIN)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	DDC DATA
3	BULE	8	GND	13	H-SYNC
4	NC	9	NC	14	V-SYNC
5	GND	10	GND	15	DDC CLOCK

3-5 COM1 DB9 Connector (CCD12:Up)

- **RS232 Mode**

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

Note: The pin9 RI can be modify to Power to supply device. The power voltage can be set +12V or +5V. The RI change Voltage function is OEM need change BOM. Default is RI signal.

- **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		

- **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		

Note: The COM1 mode decides from BIOS Setup selected.

3-6 COM2 DB9 Connector (CCD12:Down)

- **RS232 Mode**

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

Note: The pin9 RI can be modify to Power to supply device. The power voltage can be set +12V or +5V. The RI change Voltage function is OEM need change BOM. Default is RI signal.

● **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		

● **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		

Note: The COM2 mode decides from BIOS Setup selected.

3-7 COM3 DB9 Connector (CCD34:Up)

● **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		

3-8 COM4 DB9 Connector (CCD34:Down)

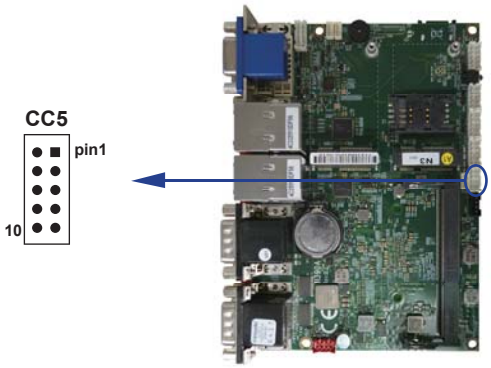
● **RS232 Mode**

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

3-9 COM5 2 x 5pin (2.0mm) wafer

- **RS232 Mode**

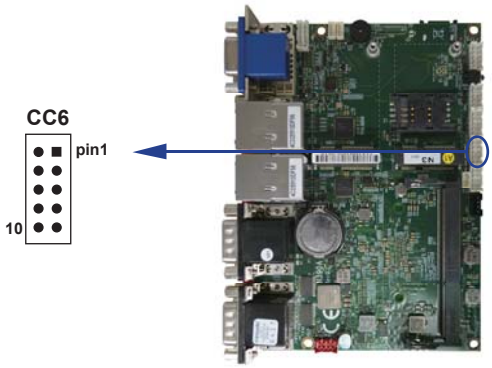
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	+5V



3-10 COM6 2 x 5pin (2.0mm) wafer

- **RS232 Mode**

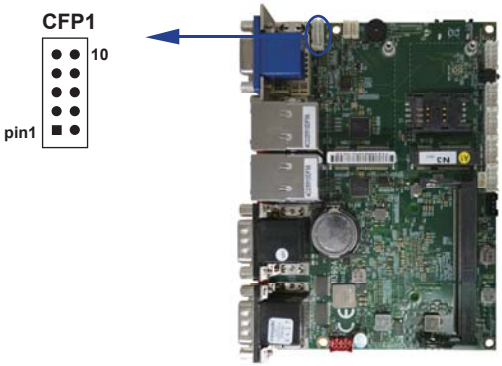
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	+5V



3-11 CFP1 Front Panel connector 2x5pin (2.0mm) wafer

- **RS232 Mode**

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+



3-12 Digital Input / Output / Watch Dog Time

● CIO1 DIO 0--3 (2 x 5pin 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

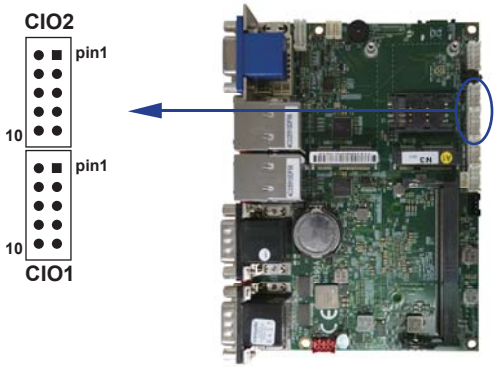
● CIO2 DIO 0--3 (2 x 5pin 2.0mm wafer)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DI-4	2	DO-7
3	DI-5	4	DO-6
5	DI-6	6	DO-5
7	DI-7	8	DO-4
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 0 x 9c

● For F75111N I C 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.



3-12-1 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

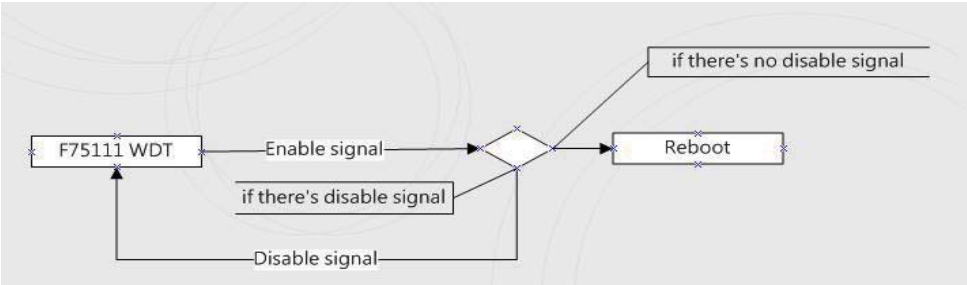
How to use this Demo Application

1.Boot Ms-Dos Operating System

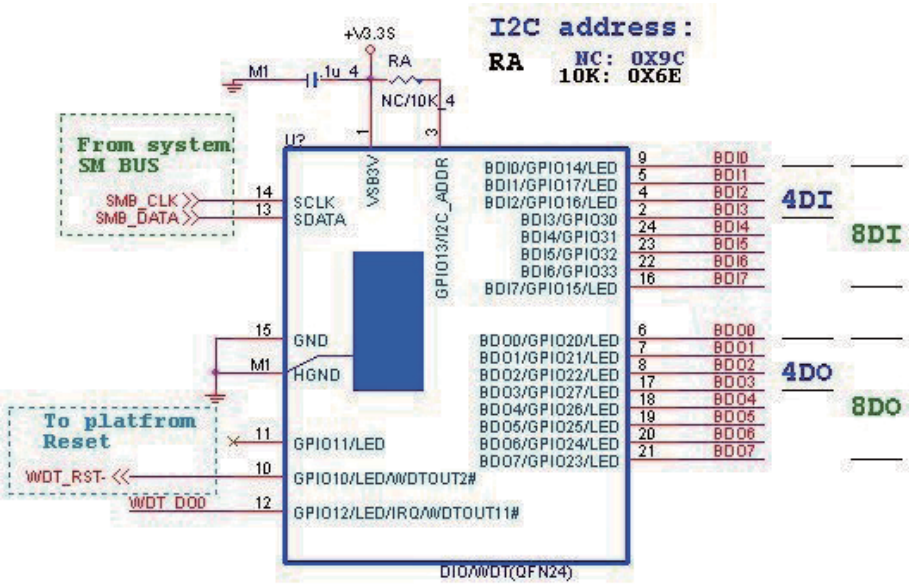
2.execute "75WDT.EXE" binary file

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;
  }
```

3-12-2 IO Device: F75111 under Windows

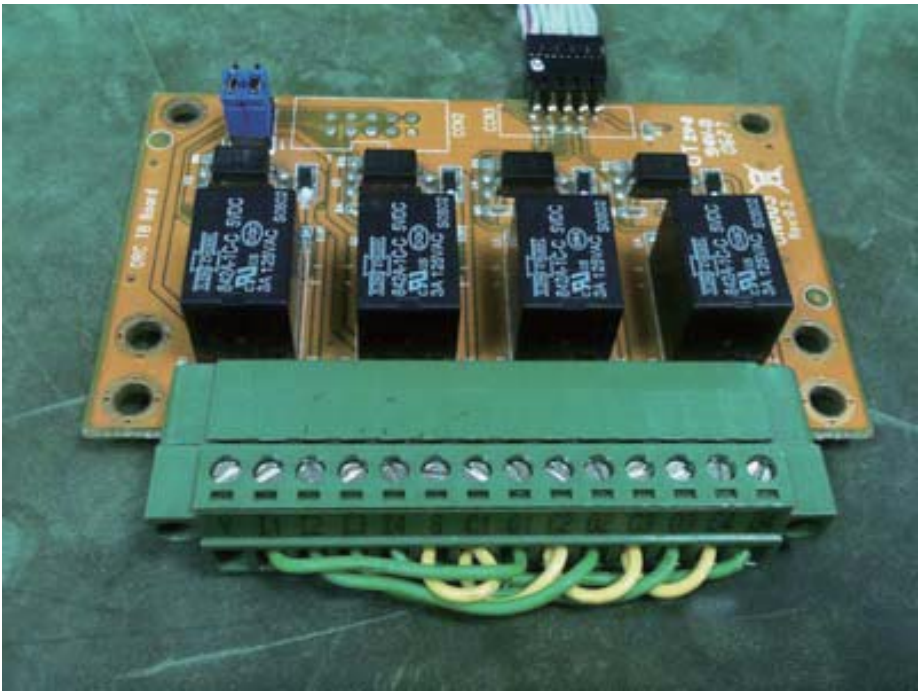
The Sample code source you can download from

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

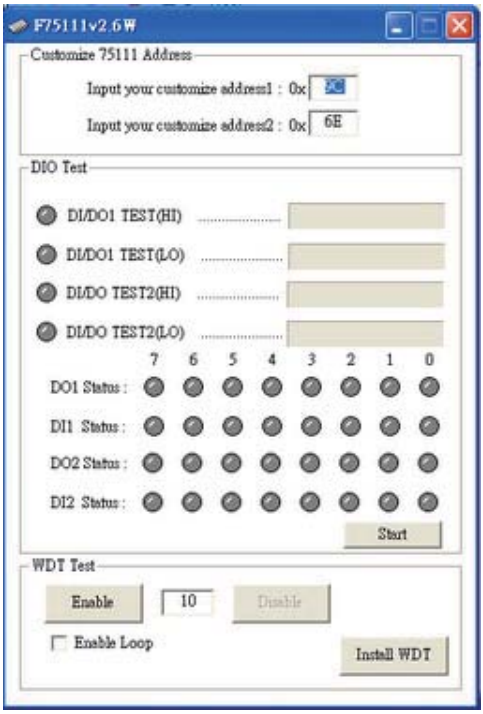
We do the demo test with a test tool which DIx connect to DOx with Relay.



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

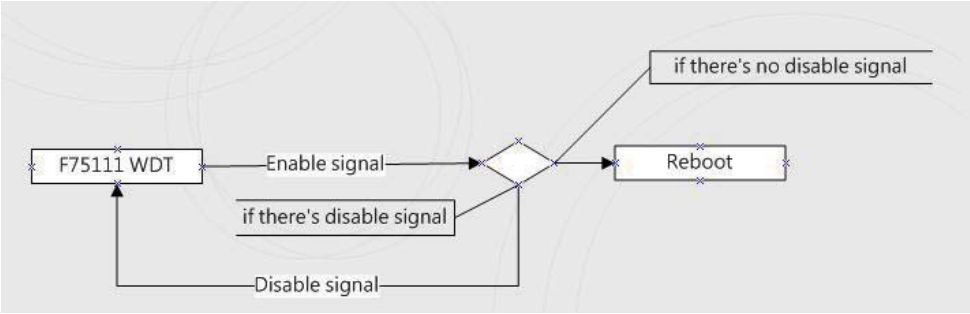
2. Press the "Enable" button to test WDT function

3. Press the "Disable" button to disable WDT

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

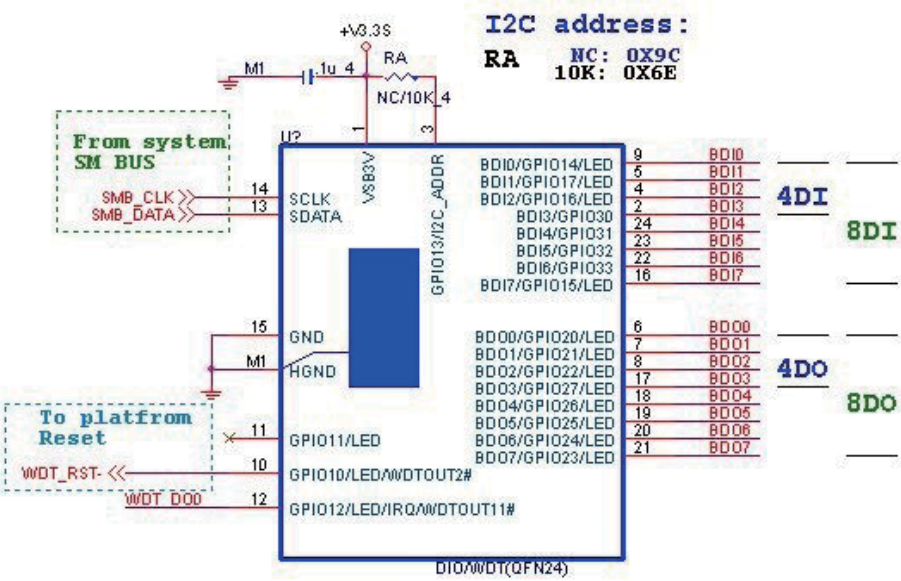
5. Press "Install WDT" to set the system to autorun this application when booting, press again to remove this application when booting.

**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.
```

3-12-3 IO Device: F75111 VB6 under Windows

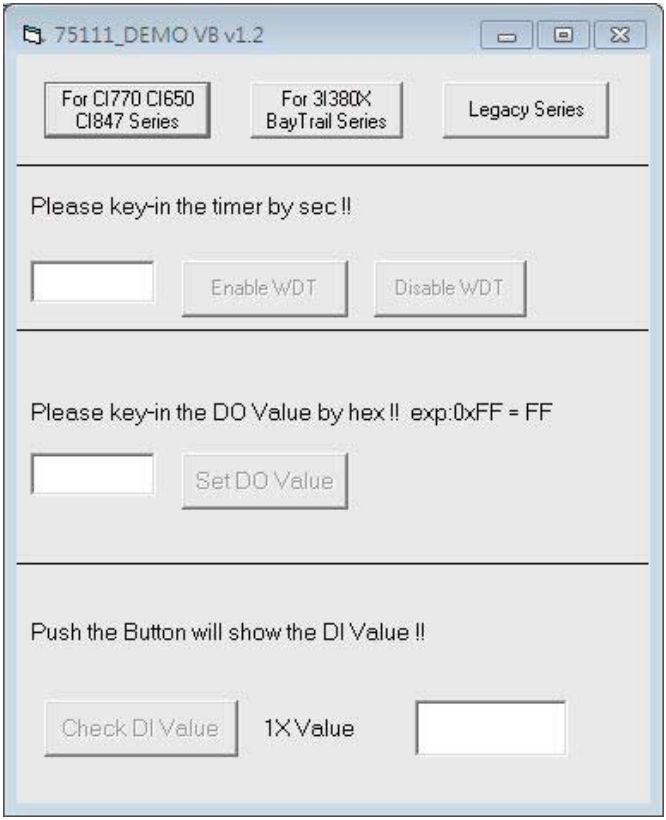
The Sample code source you can download from

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

Binary file: 75111_VB_Src1.2.rar

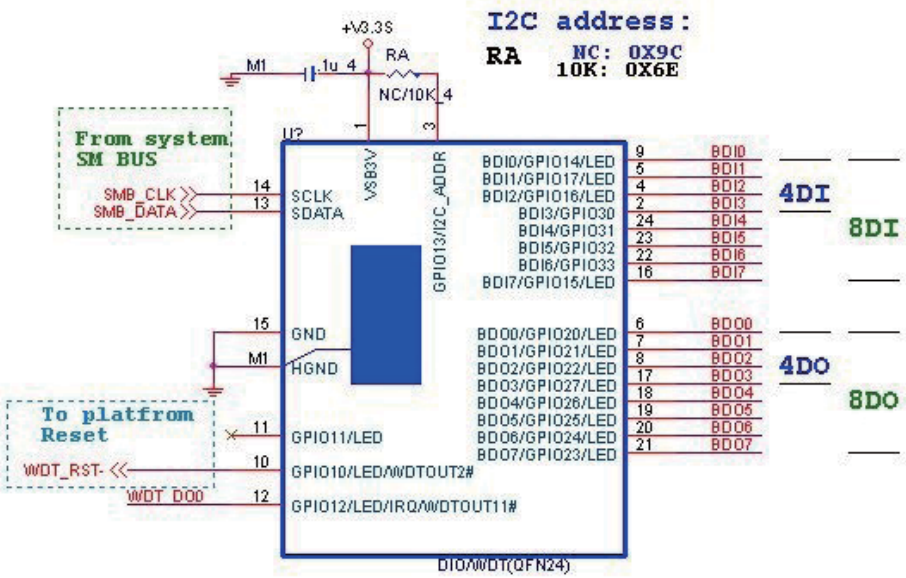
USERNAME & PASSWORD: sf

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
```

3-12-4 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"

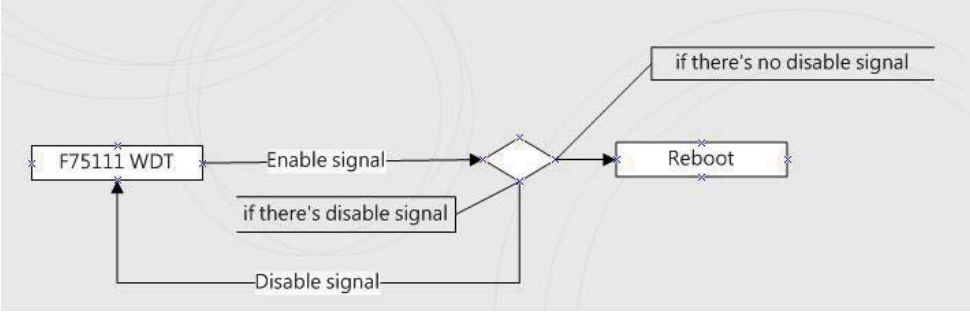
1. cd F75111

1. make

1. src/f75111 // execute the binary file

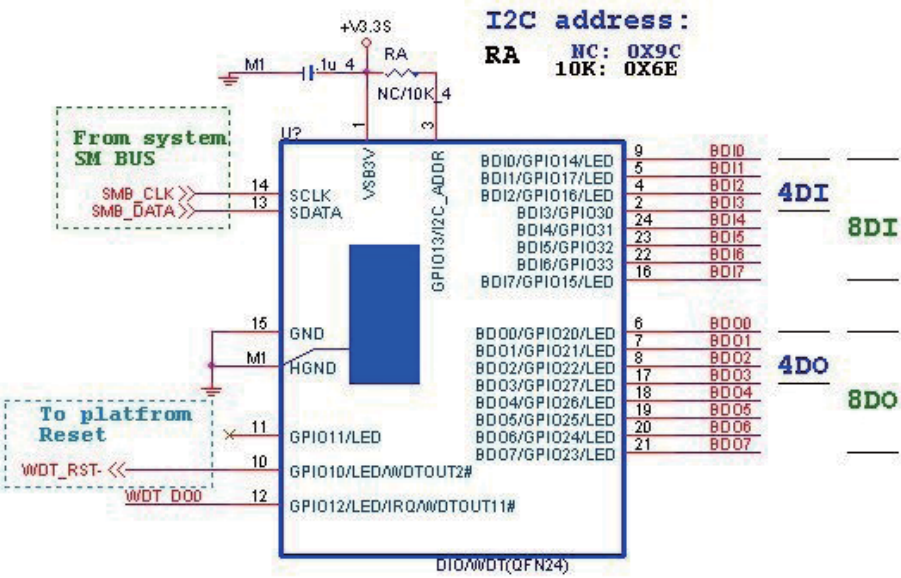
How to use this Demo Application

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   ();
```

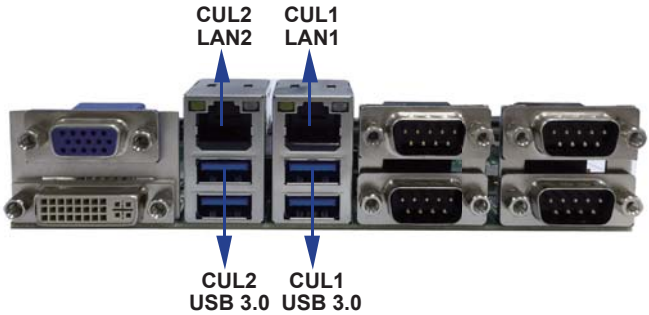
3-13 LAN Interface

● CUL1 / CUL2: RJ45 LAN1 / LAN2 Connector (Up)

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

•CUL1 / CUL2: USB3.0 Port 1/2/3/4 Connector (Down)

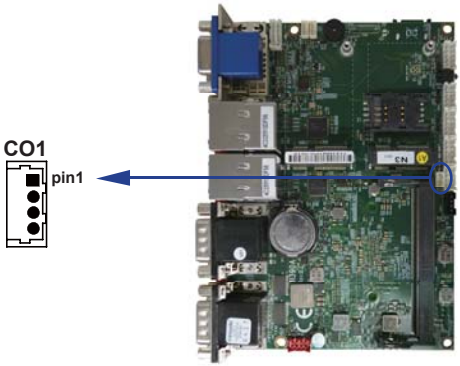
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VBUS	5	SS_RX-
2	D-	6	SS_RX+
3	D+	7	GND
4	GND	8	SS_TX-
		9	SS_TX+



3-14 I²C Bus Interface

● CO1: I²C Bus 4pin (1.25mm) Wafer

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

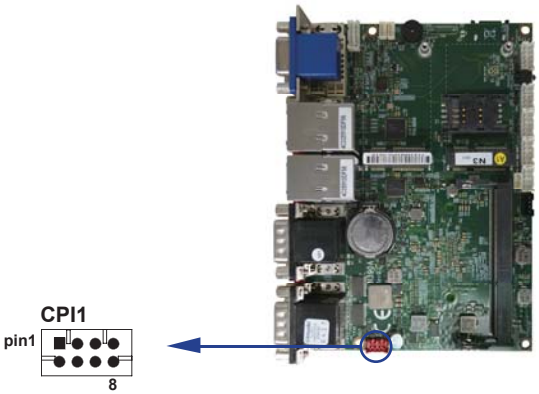


3-15 DC power input

● CPI1: DC Power input (2x4pin 2.0mm Wafer) (Red)

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

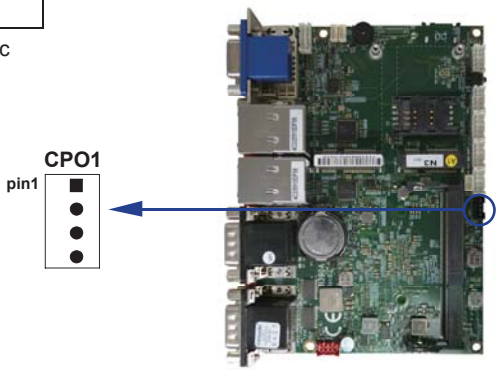
Note: Very important check DC-in Voltage



● CPO1: +12V/+5V DC voltage output

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

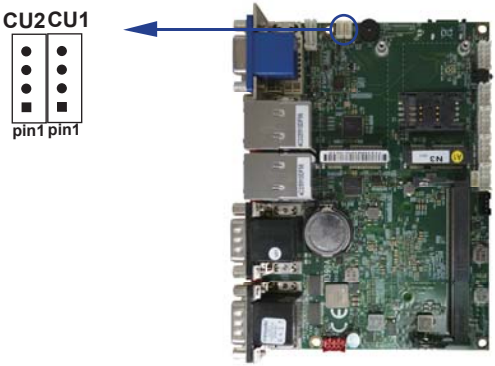
Note: Attention! Check Device Power in spec



3-16 USB Interface

● CU1/2 USB2.0 port (1x4pin 1.25mm Wafer)

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

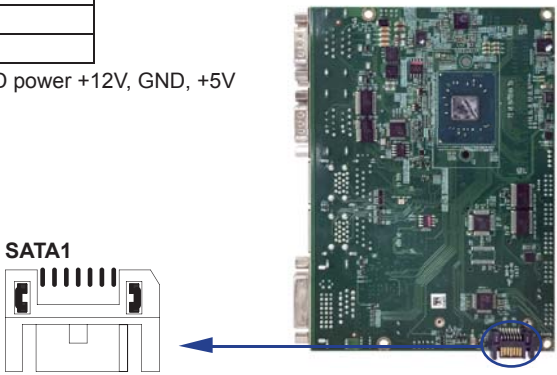


3-17 SATA interface

● SATA1: SATA port 1x7pin Connector

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

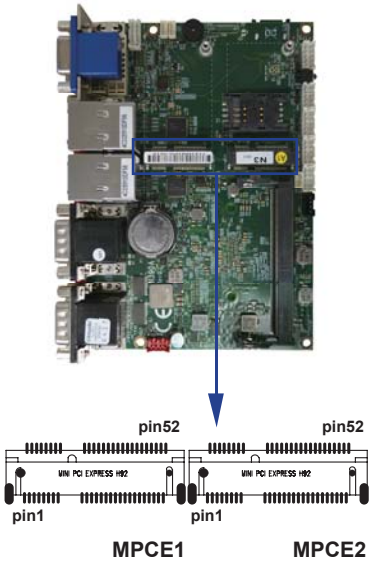
Note: 1. CPO1 provide SATA HDD power +12V, GND, +5V



3-18 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	SIM Power
9	GND	10	SIM Data
11	PCIe-CLK-	12	SIM CLK
13	PCIe-CLK+	14	SIM Reset
15	GND	16	SIM RFU
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



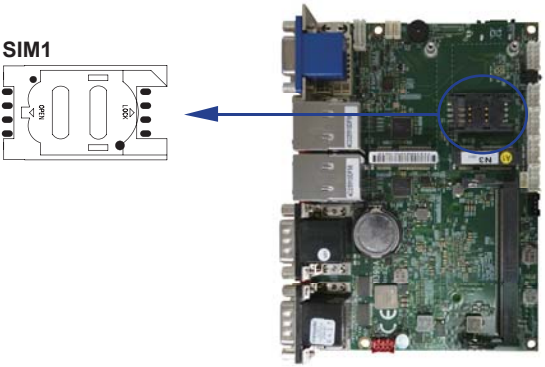
Note:
1. MPCE1 Pin51 mSATA / PCIe auto detect function, but MPCE2 PCIe only.
2. Pin8 ~ Pin16 SIM signal only for MPCE2

3-19 SIM Card socket

● **SIM1: SIM card socket pin define is follow ISO 7816-2 smart card standard**

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

Note: 1. MPCE2 Pin 8,10,12,14,16 for SIM1 card reader use.



3-20 Connector wafer of Compatible Brand and part number list

Location	CKTS	PITCH	Brand Name	Mating connector	Cable housing
CA3	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CALR1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CC5	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CC6	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CFP1	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CIO1	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CIO2	2x5 10Pin	2.0mm	JST	B10B-PHDSS	PHDR-10VS
CO1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CPI1	2x4 8Pin	2.0mm	JST	JST B8B-PHDSS	PHDR-08VS
CPO1	1x4 4Pin	2.0mm	JST	B4B-PH-KL	PHR-4
CU1	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU2	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400

Chapter-4

Introduction of BIOS

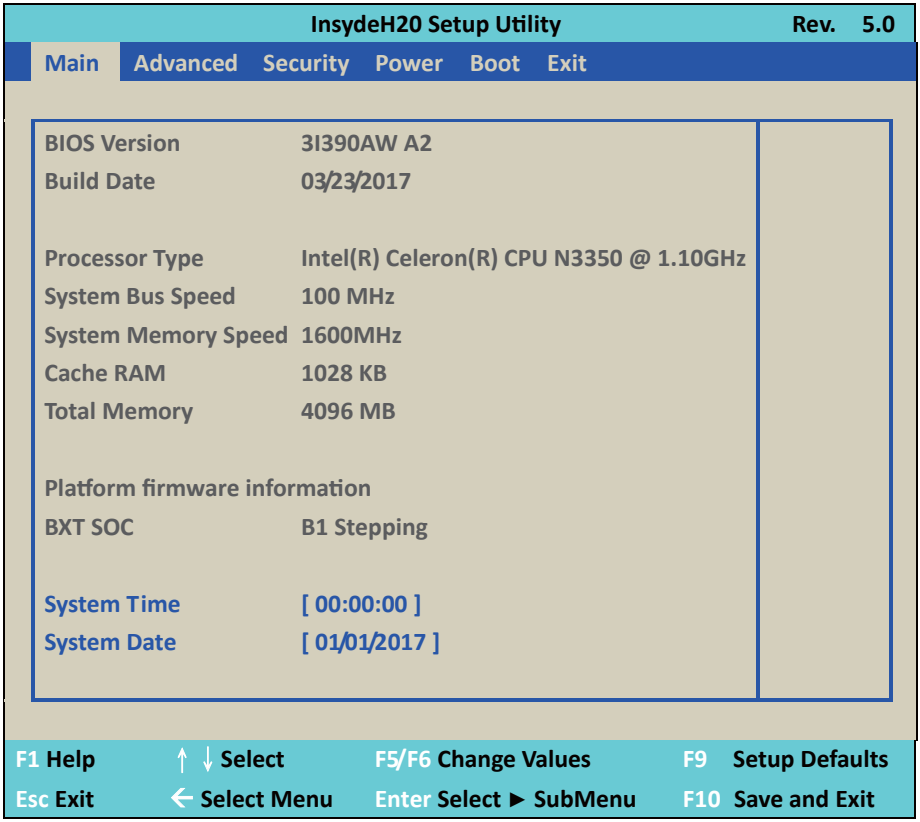
The BIOS is a program located in the Flash Memory on the motherboard.
This program is a bridge between motherboard and operating system.
When you start the computer, the BIOS program gains control.
The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the
necessary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

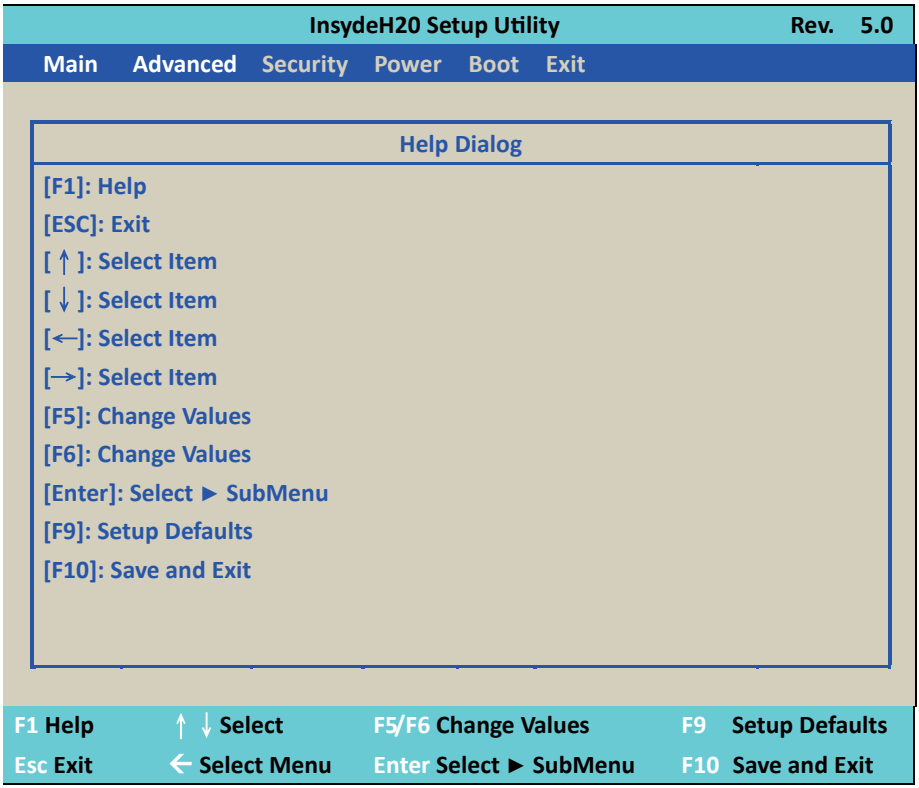
4-2 BIOS Menu Screen & Function Keys



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

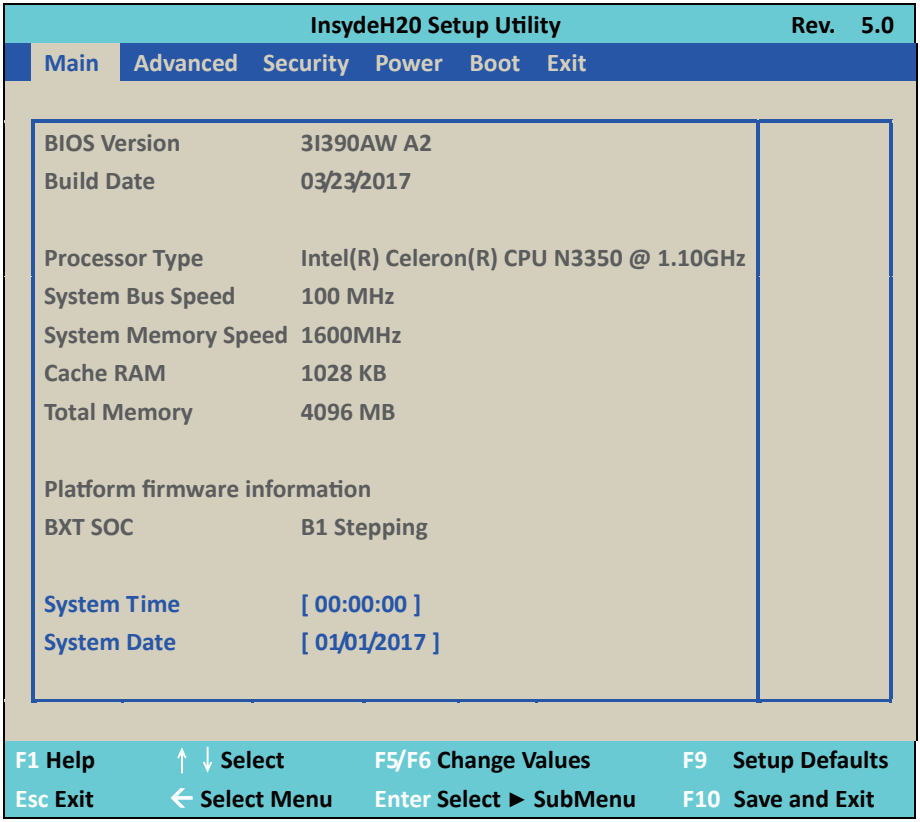


Status Page Setup Menu / Option Page Setup Menu
Press F1 to pop up a help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

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 ACPI and wake device 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

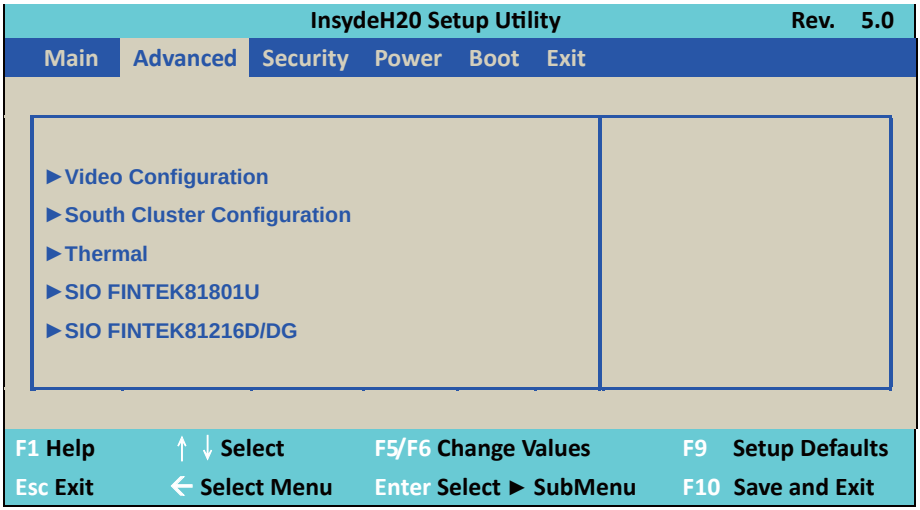
4-5 Main



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



Video Configuration
Please refer section 4-6-1

South Cluster Configuration
Please refer section 4-6-2

Thermal
Please refer section 4-6-4

SIO FINETEK 81801U
Please refer section 4-6-5

SIO FINTEK 81216D / DG
Please refer section 4-6-6

4-6-1 Video Configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
IGD Configuration		Selects the Aperture Size
Aperture Size	<256MB>	
DVMT Pre-Allocated	<64M>	
DVMT Total Gfx Mem	<256M>	

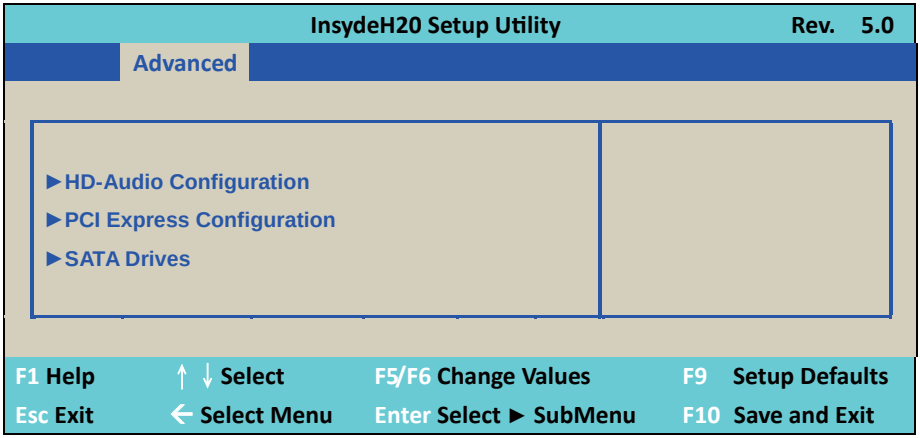
F1 Help	↑ ↓ Select	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10 Save and Exit

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

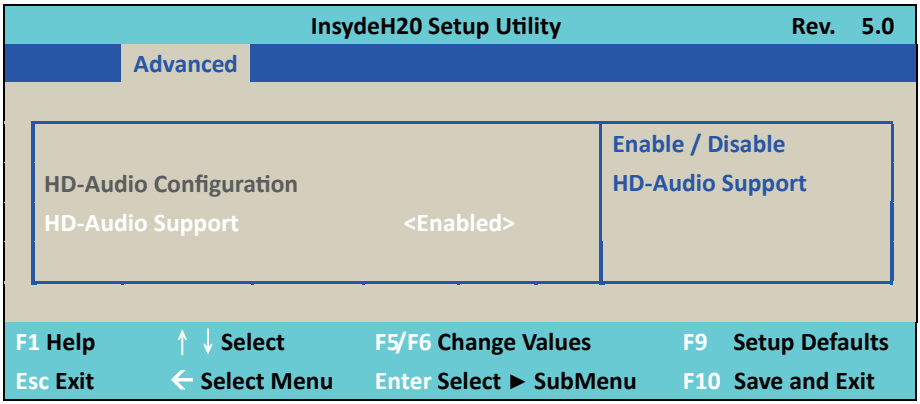
IGD - DVMT Pre-Allocated
Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.
The optional settings are: 64 (default) / 128 / 256 / 512MB

IGD - 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:128M, 256M (default), MAX

4-6-2 South Cluster Configuration

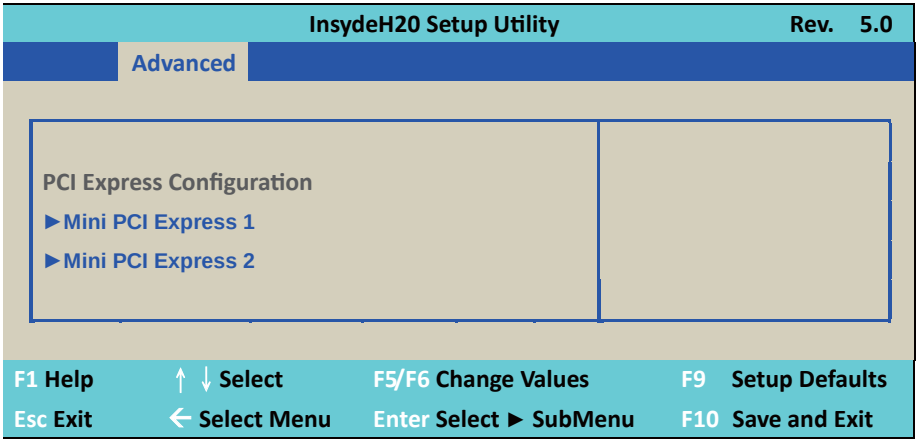


4-6-2-1 ► HD-Audio Configuration

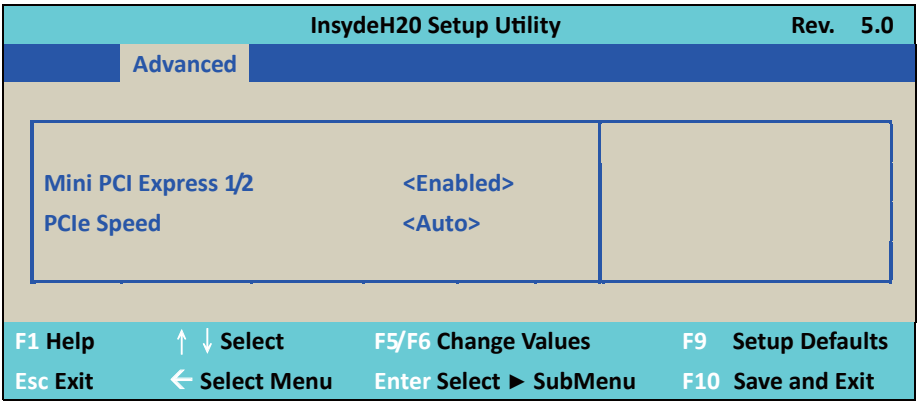


HD-Audio Support.
The optional settings are: Enabled (default), Disabled.

4-6-2-2 ► PCI Express Configuration



4-6-2-2-1 ► Mini PCI Express 1/2



Mini PCI Express 1/2
The optional settings are: Disabled, Enabled (default) for MPCE1/2.

PCIe speed.
This item that setting PCIe speed: Auto (default), Gen1, Gen2

4-6-2-3 ► SATA Drives Configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
Chipset-SATA Controller configuration		
Chipset SATA	<Enabled>	
SATA Mode Selection	<AHCI>	
SATA Interface Speed	<Gen3>	
SATA Port 0	[Not Installed]	
SATA Port 1	[Not Installed]	

F1 Help	↑ ↓ Select	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10 Save and Exit

Chipset SATA
Use this item to Enable or Disable SATA function.
The optional settings are: Enabled (default) or Disabled

SATA Mode Select
This does not selected item, it will always work in ACHI mode.

SATA Interface Speed
This item will determine the SATA speed.
The optional settings are: Gen1, Gen2, Gen3 (default)

4-6-3 Thermal

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
Thermal Configuration Parameters		This value controls the temperature of The ACPI Critical Trip Point – the point in Which the OS will Shut the system off.
Critical Trip Point	<110 ℃>	
Passive Trip Point	<105 ℃>	NOTE: 100C is the Plan of Record (POR) For all Intel mobile processors.

F1 Help	↑ ↓ Select	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10 Save and Exit

Thermal Configuration Parameters

This Value controls the temperature of the ACPI Critical Trip Point, the point in which the OS will shutdown the system.

Critical Trip point is the shutdown temperature, the default value is 110˚

The CPU frequency will auto reduce when CPU temperature arrived to passive Trip point.

The default of the passive trip point is 105˚

4-6-4 SIO FINTEK81801U configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
Serial Port A	<Enable>	
Base I/O Address	<3F8>	
Interrupt	<IRQ4>	
Serial Mode	<RS232>	
Serial Port B	<Enable>	
Base I/O Address	<2F8>	
Interrupt	<IRQ3>	
Serial Mode	<RS232>	
Power Fail	<Keep State>	
►Hardware Monitor		

F1 Help	↑ ↓ Select	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10 Save and Exit

Serial Port A/B
Use this item to enable or disable serial port (COM1 or COM2).
The optional settings are: Enabled (default), Disabled.

Serial Port A/B Base IO Address / Interrupt
Use this item to select an optimal setting for super IO device.
These optional settings are:
IO=3F8h; IRQ=3,4
IO=3E8h; IRQ=3,4
IO=2E8h; IRQ=3,4
IO=2F8h; IRQ=3,4
The port A default value as IO=3F8h; IRQ=4
The port B default value as IO=2F8h; IRQ=3

Serial Mode
RS232 driver (default) : When hardware select to RS232 or RS422 mode, please enter to RS232 driver.
RS485 driver : When hardware select to RS485 mode, please enter to RS485 driver. It is the auto flow function for RS485.

Power Failure
This item specifies whether your system will reboot after a power failure or interrupt occurs.
[Keep state] Restores the system to the status before power failure or interrupt occurred. (default)
[Always on] Leaves the computer in the power on state.
[Always off] Leaves the computer in the power off state.

Hardware Monitor
These are system voltage and temperature message.
The voltage shows the 3 type: VCC3, VCORE, VNN
The Temperature is sense from system not CPU.

4-6-5 SIO F81801D/DG

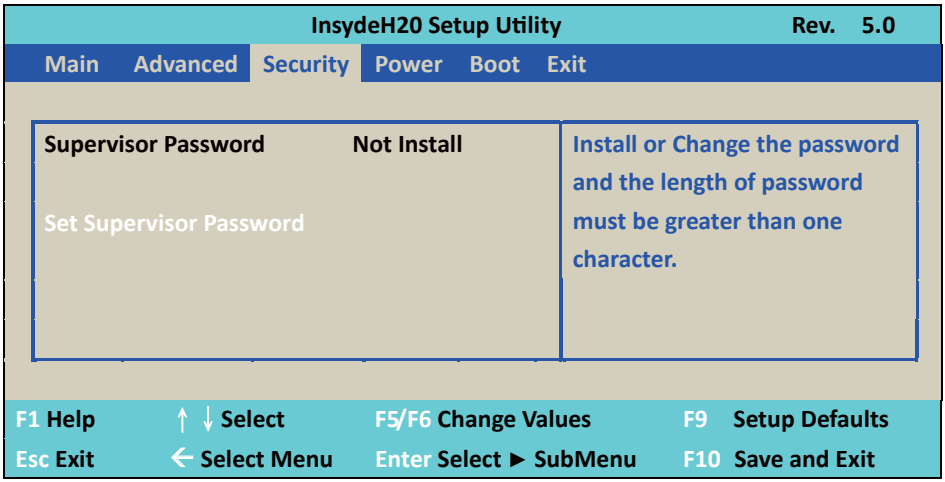
InsydeH20 Setup Utility		Rev. 5.0
Advanced		
Serial Port C	<Enable>	
Base I/O Address	<3E8>	
Interrupt	<IRQ4>	
Serial Mode	<RS232>	
Serial Port B	<Enable>	
Base I/O Address	<2F8>	
Interrupt	<IRQ3>	
Serial Mode	<RS232>	
Power Fail	<Keep State>	
►Hardware Monitor		

F1 Help	↑ ↓ Select	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10 Save and Exit

Serial Port 3 / 4 / 5 / 6
Use this item to enable or disable serial port (COM3 ~ COM6).
The optional settings are: Enabled (default), Disabled.

Serial Port 3 / 4 / 5 / 6 Base IO Address / Interrupt
Use this item to select an optimal setting for super IO device.
These optional settings are:
IO=3F8h; IRQ=3,4,5,6,7,10,11
IO=3E8h; IRQ=3,4,5,6,7,10,11
IO=2F8h; IRQ=3,4,5,6,7,10,11
IO=2E8h; IRQ=3,4,5,6,7,10,11
IO=4F8h; IRQ=3,4,5,6,7,10,11
IO=4E8h; IRQ=3,4,5,6,7,10,11
The port 3 default value as IO=3E8h; IRQ=10
The port 4 default value as IO=2E8h; IRQ=10
The port 5 default value as IO=4F8h; IRQ=10
The port 6 default value as IO=4E8h; IRQ=10

4-7 Security



Supervisor Password

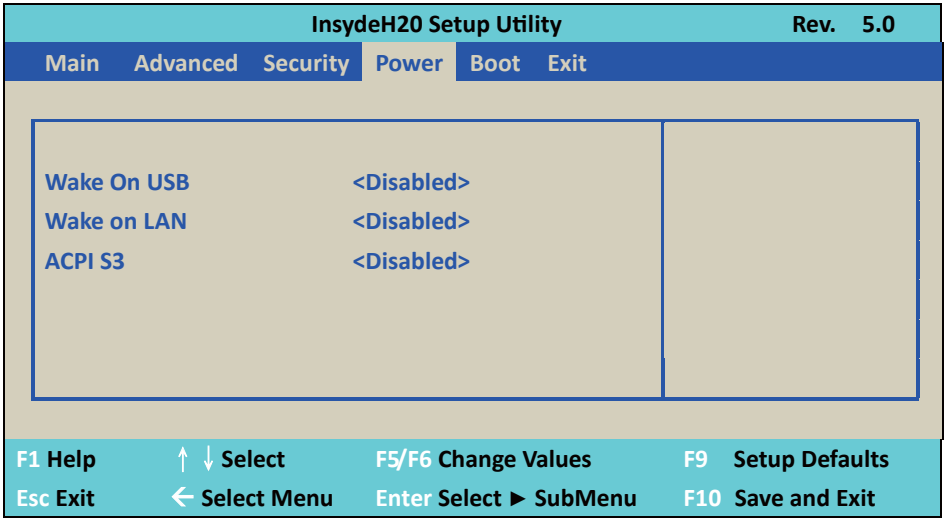
To set up an Supervisor password

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

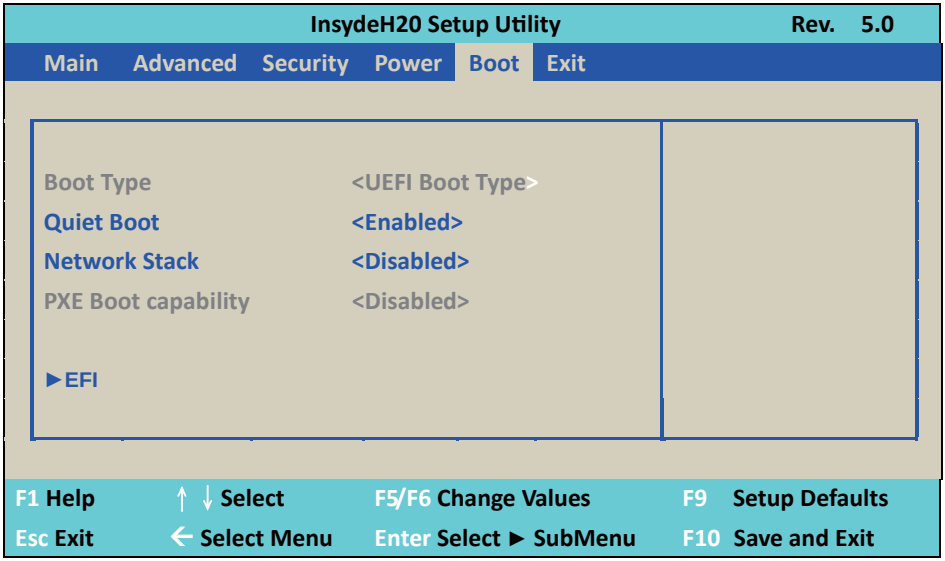


Wake On USB
Wake On USB form mouse or keyboard when system in S3 state.
The optional settings: S3, Disabled (default)

Wake on LAN
Wake On LAN from LAN1 when system in S3 or S5 state or both.
The optional settings: S3, S5, S3 / S5, Disabled (default)

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

4-9 Boot



Boot type
The boot type only work in UEFI Boot mode.

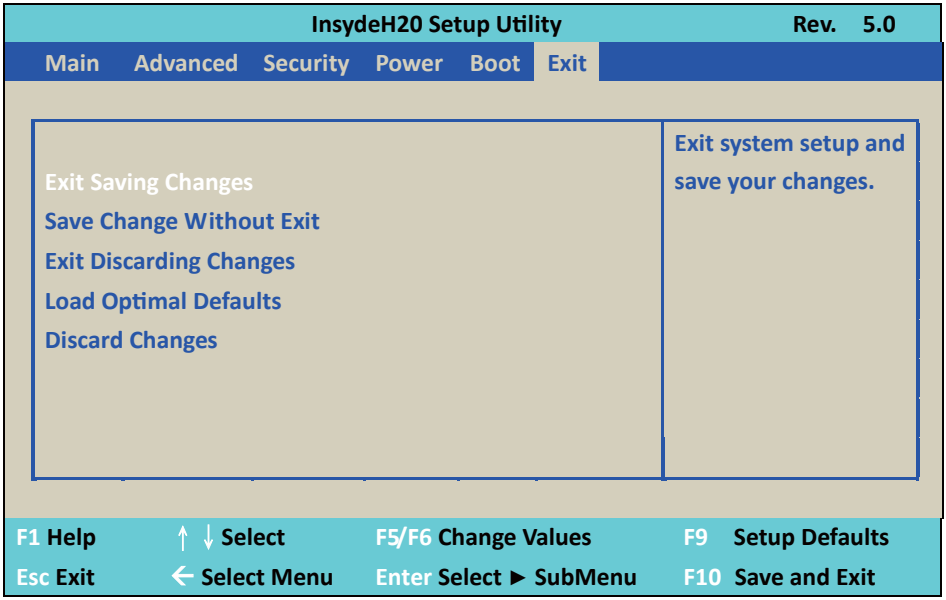
Quiet Boot
The optional settings are: Enabled (default), Disabled.

Network Stack
If use PXE function need enable otherwise disable (default)

PXE Boot capability
The item determines what protocol operation in PXE, these values are: Disabled (default), UEFI: IPv4, UEFI: IPv6
This is not modifying item. When above item settings disable.

EFI
Determine which EFI storage device too booting. If storage no EFI system that will not shows on the page.

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.

Discard Changes
Use this item to cancel all the setup options.

4-11 How to update Insyde BIOS

Under DOS Mode

STEP 1. Prepare a bootable disc.
(Storage device could be USB FDD or USB pen drive.)

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

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

STEP 4. (Here take 3I390AW 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 3I390AW.ROM –BIOS -ALL

3I390AW.ROM is the file name of the latest BIOS.

It may be 3I390AW.ROM or 3I390AW.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 3I390AW.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	Intel Pentium N4200 1.10Ghz / Celeron N3350 1.10Ghz
Memory	DDR3L 1600 4GB
Operating System	Windows 10
Test Program	3D Mark 06
HDD 2.5" SATA	Slim Type HDD
mSATA	32GB

Test Result for reference only !

Hard Disk	Processor	Power off	Start up		Operation	Shut down	In Put
			Maximum	Stable	Maximum	Maximum	Voltage
Slim Type HDD	N4200	0.12A	1.14A	0.54A	1.57A	1.23A	12V
		0.1A	0.6A	0.35A	0.82A	0.64A	24V
	N3350	0.11A	0.84A	0.52A	1.38A	0.82A	12V
		0.09A	0.49A	0.33A	0.74A	0.46A	24V
mSATA	N4200	0.12A	0.94A	0.52A	1.45A	1.02A	12V
		0.1A	0.54A	0.3A	0.81A	0.41A	24V
	N3350	0.11A	0.8A	0.51A	1.33A	0.75A	12V
		0.09A	0.42A	0.29A	0.7A	0.31A	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)