

# **3I390NX**

**Intel Apollo Lake N4200 / N3350 / E3950 SoC CPU,  
On board DDR3L memory, 5 x LAN (4 x PoE) / HDMI /  
Audio / USB / COM / PCIe mini card**

## **All-In-One**

**Intel Apollo Lake N4200 / N3350 / E3950 SoC CPU  
VGA or DP, HDMI, 2 x mini PCIe, 5 x LAN (4 x PoE)  
Audio, SATA, USB, COM, Wide Range DC-IN**

**NO. 3I390NX**

**Release date: June 6th 2017**

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## 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 from the motherboard will VOID the warranty of the motherboard.
9. Before you install/remove any components or even make any jumper setting on the motherboard, please make sure to disconnect the power supply first.  
(follow the aforementioned instruction guide)
10. "POWERON after PWR-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.

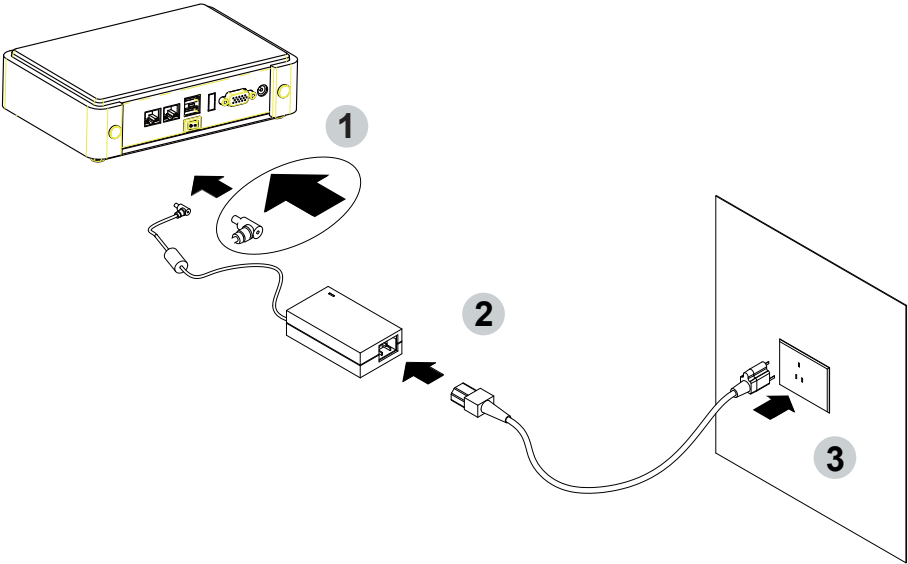
### **Remark 1:**

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

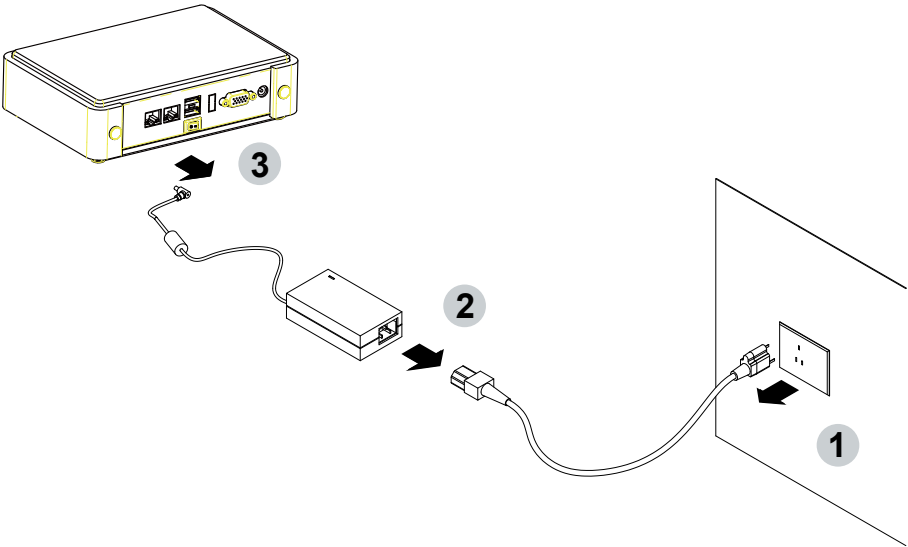
**Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.**

**Photo 1**

**Insert**



**Unplug**



---

# Chapter-1

## General Information

3I390NX is powered by 14nm Intel® Atom™, Pentium® or Celeron® on-board SoC and DDR3L memory as well as triple independent display and fully 4K media playback capable with on-board HDMI & DP output, making it ideal for deployment in kiosk, digital signage and multi-display applications. 3I390NX also supports with one 10/100/1000 Mbps Ethernet for seamless broadband connectivity. Its greatest features are the 4 set of PoE gigabit LAN which follows the IEEE 802.3af standard to supply the necessary power to PoE device such as IP camera and IP phone, Wireless Access Points and many other IP devices. 3I390NX is the perfect platforms for whole range of small form factor low-power devices and perfect control board for networking purpose.

The embedded motherboard 3I390NX is specially designed with the sizeable DDR3L 1600MT/s 4GB on board memory which is steady more than SO-DIMMs and 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. It supports up to two serial ports RS232/RS485 / RS422 jumper free auto switch, and 6 ports of USB (2 ports of USB 3.0 in rear side & 4 internal ports of USB 2.0). The expandable interfaces include 1 PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface, and 1 PCIe Mini card for PCIe x 1 and USB interface

The All-In-One motherboard 3I390NX 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](mailto:info@lex.com.tw)) if you have any further query or want to get the detail information.



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## 1-1 Major Feature

1. Mobile Intel® Pentium N4200 1.1GHz / 2.5GHz, (Quad core), Intel® ATOM™ x7 E3950 1.6GHz / 2.0GHz (Quad core)
2. Apollo-Lake Integrated Graphics chipset, Mobile Intel® Pentium N4200 200MHz / 700MHz, Intel® ATOM™ x7 E3950 500MHz / 650MHz
3. Support eDP 1.3 2 Lanes up to 1920 x 1200, DP 1.2 4096 x 2160, HDMI 1.4b up to 3840 x 2160
4. On board DDR3L SDRAM 4GB Memory, data transfer rate of 1600MT/s
5. Support 1 x 10 / 100 / 1000 Mbps Intel LAN port, support 4 x PoE LAN follows IEEE 802.3af standard
6. Support 2 x RS232 auto switch to RS485/RS422 by BIOS, 1 port external, 1 port internal
7. 2 x type A USB3.0 external and 4 x USB 2.0 internal
8. ALC886 HD Audio Specification 1.0 Two channel sound
9. Support extended 1 x Mini PCIe card for PCIe x 1, mSATA and USB interface, 1 x Mini PCIe card for PCIe x 1 and USB interface
10. Support up to 2 SATA ports
11. Hardware digital Input & Output, 8 x DI / 8 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
12. Wide Range DC IN +9V~36V
13. PCB Dimension: 146 x 102 mm

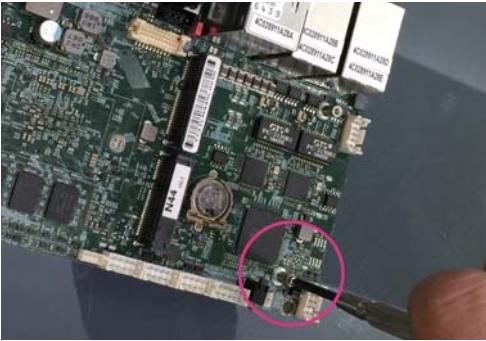
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## 1-2 Specification

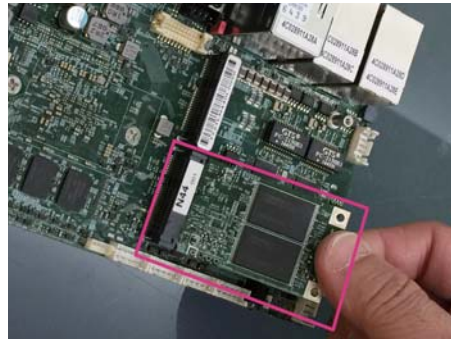
1. **SOC:** Mobile Intel® Pentium N4200 1.1GHz / 2.5GHz, (Quad core), Intel® ATOMTM x7 E3950 1.6GHz / 2.0GHz (Quad core)
2. **Memory:** DDR3L SDRAM 4GB Memory, data transfer rate of 1600MT/s
3. **Graphics:** Apollo-Lake Integrated Graphics chipset, Mobile Intel® Pentium N4200 200MHz / 700MHz, Intel® ATOMTM x7 E3950 500MHz / 650MHz, eDP 1.3 2 Lanes up to 1920 x 1200, DP 1.2 4096 x 2160, HDMI 1.4b up to 3840 x 2160
4. **SATA:** Integrated Serial ATA Host Controller Up to 2 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s). SATA2 signal shared with PCIe Mini card 1
5. **LAN:** Intel I210-IT LAN chipset or Intel I211-AT LAN chipset (Option) with 10 / 100 / 1000 Mbps for PCIe x 1 V2.1 interface with 4 x PoE LAN follows IEEE 802.3af standard
6. **I/O Chip:** F81801U I/O chipset for 2 ports RS232
7. **USB:** 2 type A USB 3.0 connector onboard and 4 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. **BIOS:** Insyde UEFI BIOS
12. **Dimension:** 146 x 102 mm
13. **Power:** DC IN +9V~36V

## 1-3 Installing the Mini PCI-e Card (Full Size)

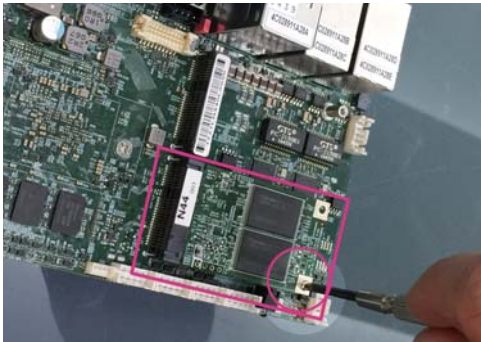
1. Unscrew the screw on the board



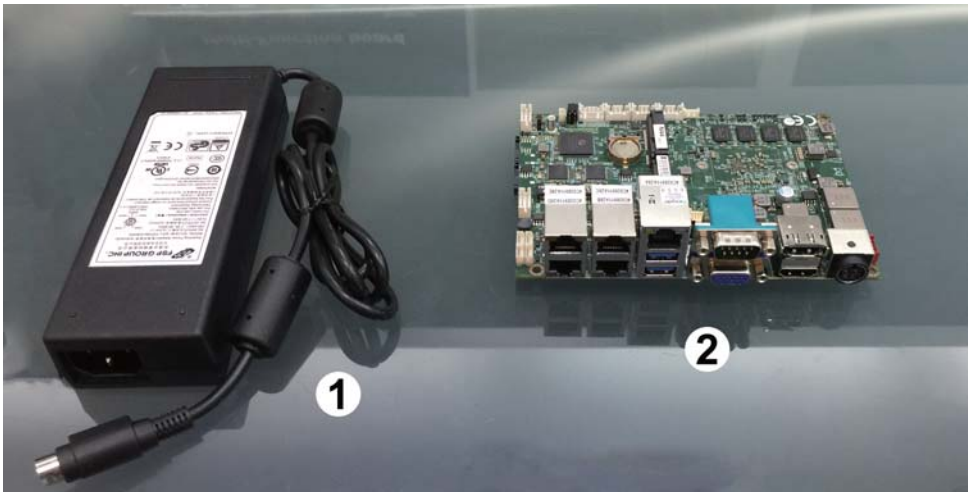
2. Plug in the Mini Card in a 45 angle



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



# 1-4 Packing List



	Material Code	Description	Detail Specification	Quantit
1	6G5212-0801-0200	84W Power Adapter, 12V / 7A	LF, M4p, FSP084-DMBA1, FSP	1
2	7G1901-1660001-0	MB-3I390NX-N44-001	LF, 3I390NX-N44, Rev.:001	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 3I390NX. 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-IN12 V 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 3I390NX.  
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 3I390NX 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

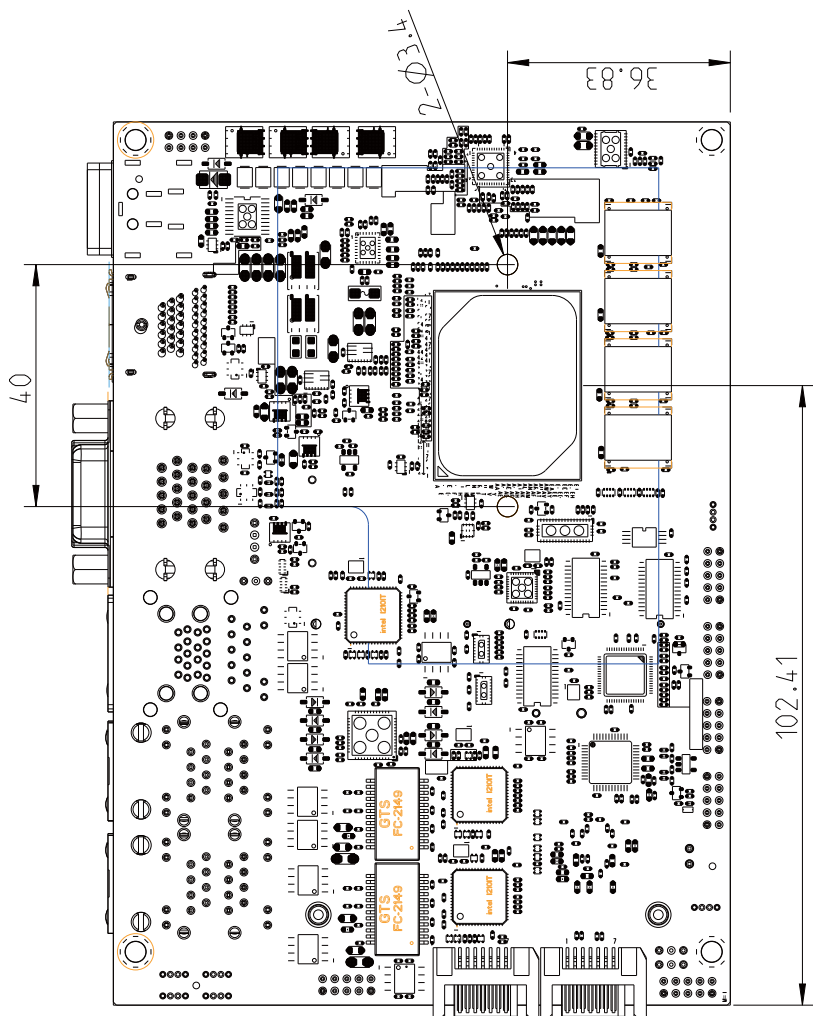
First of all, please follow all necessary steps of section 2-1 to protect 3I390NX from electricity discharge. With reference to section 1-4 please check the delivery package again with following steps:

1. Unpack the 3I390NX 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.

**TOP**



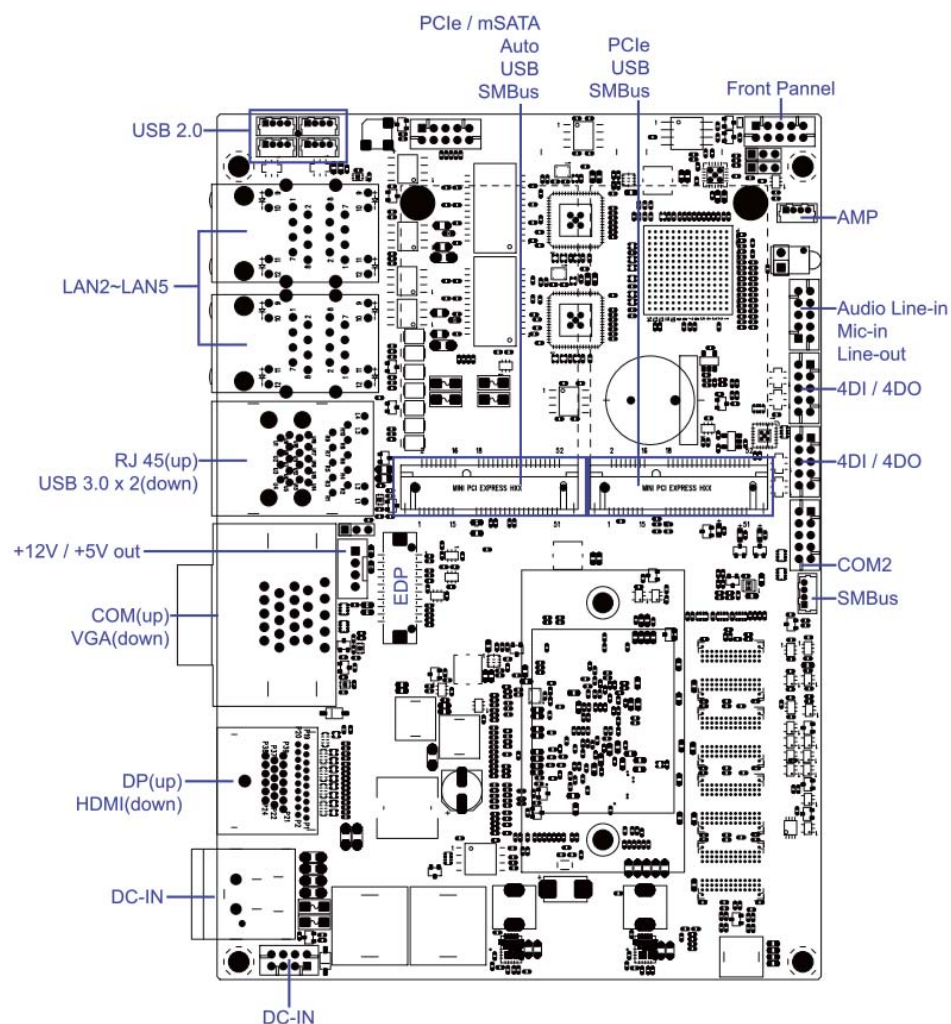
**BOT**





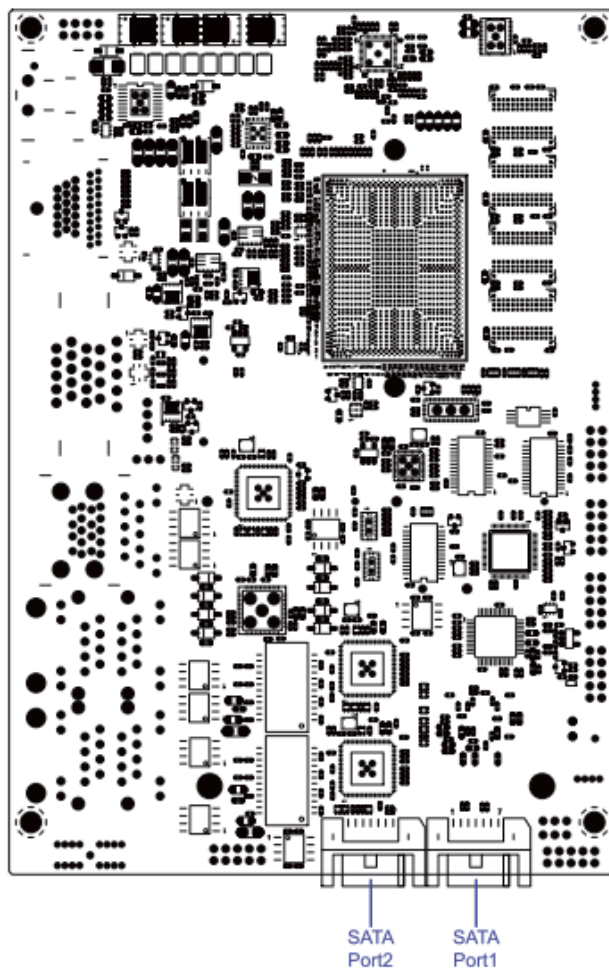
## 2-4 Layout-3I390NX-Function Map

TOP

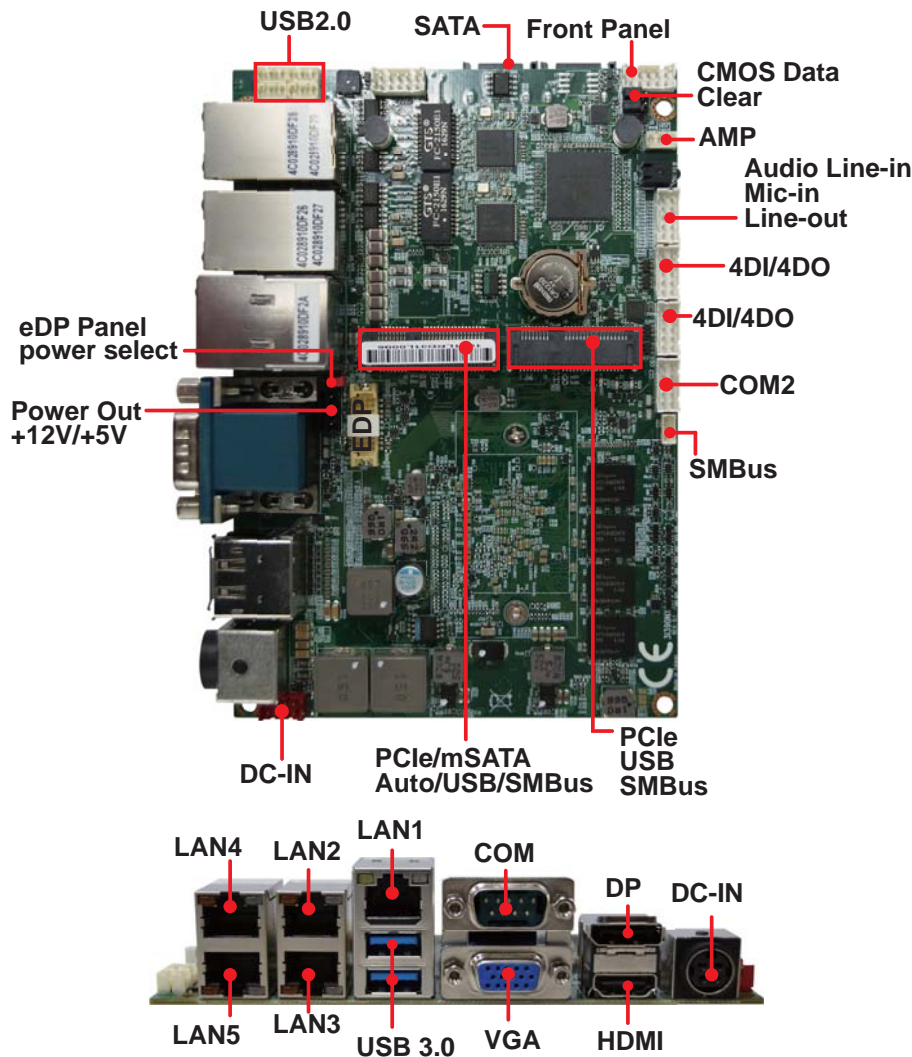


## 2-4-1 Layout-3I390NX-Function Map

BOT

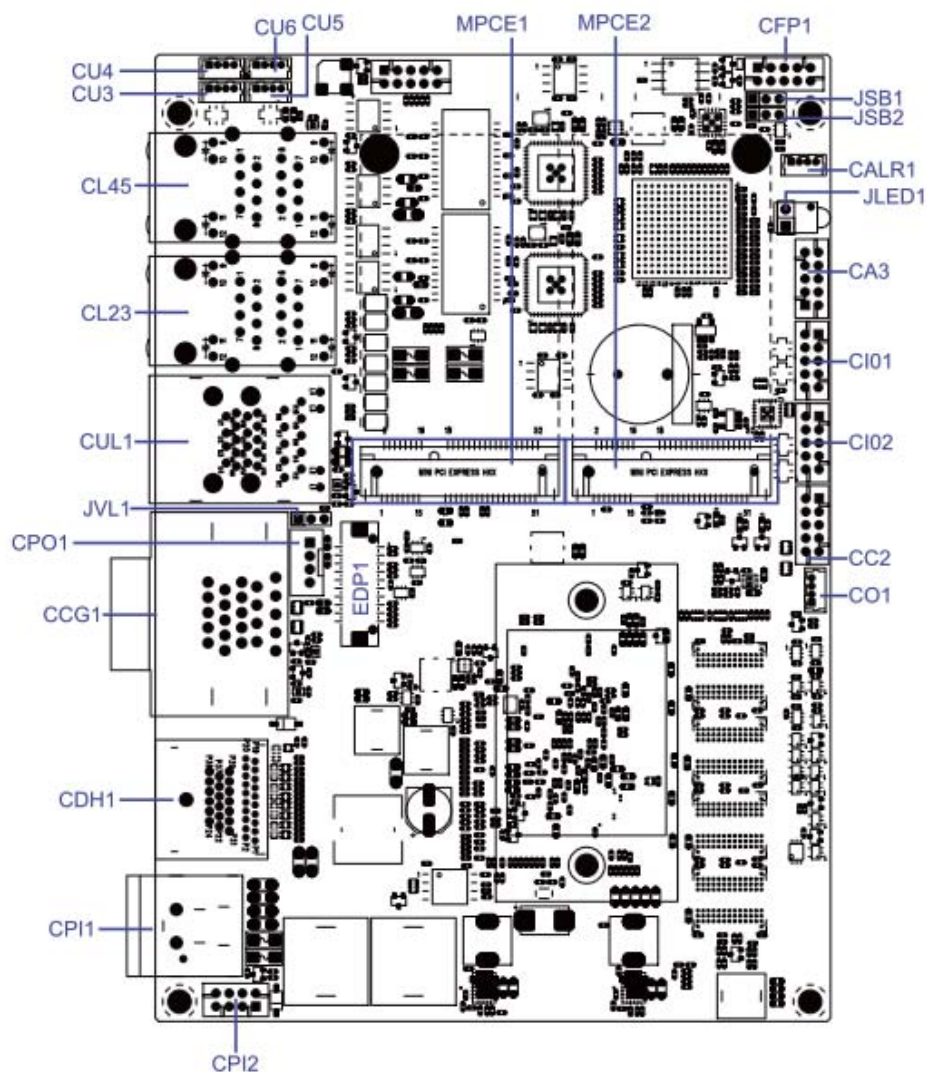


2-5 Function Map-3I390NX



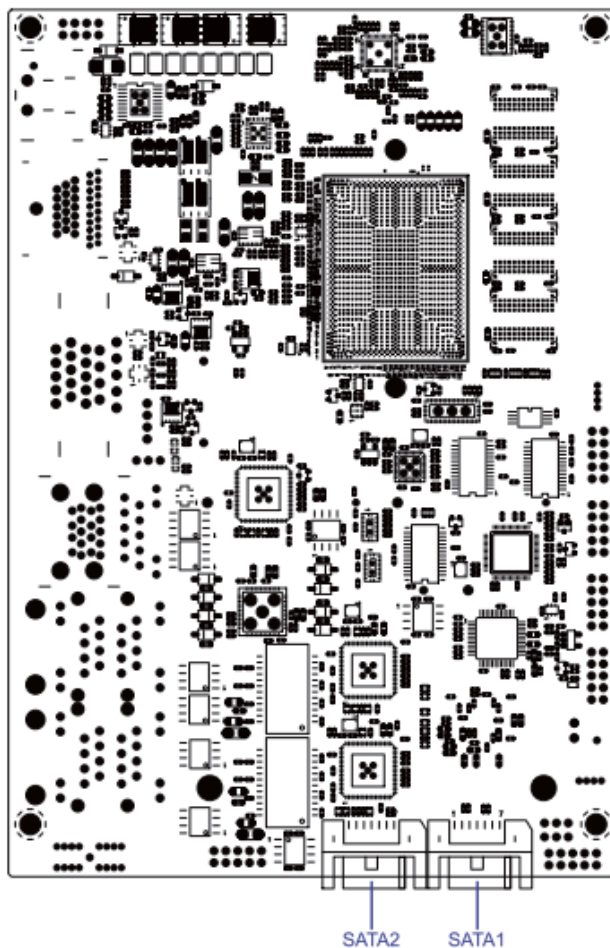
## 2-6 Connector MAP-3I390NX

TOP



## 2-6-1 Connector MAP-3I390NX

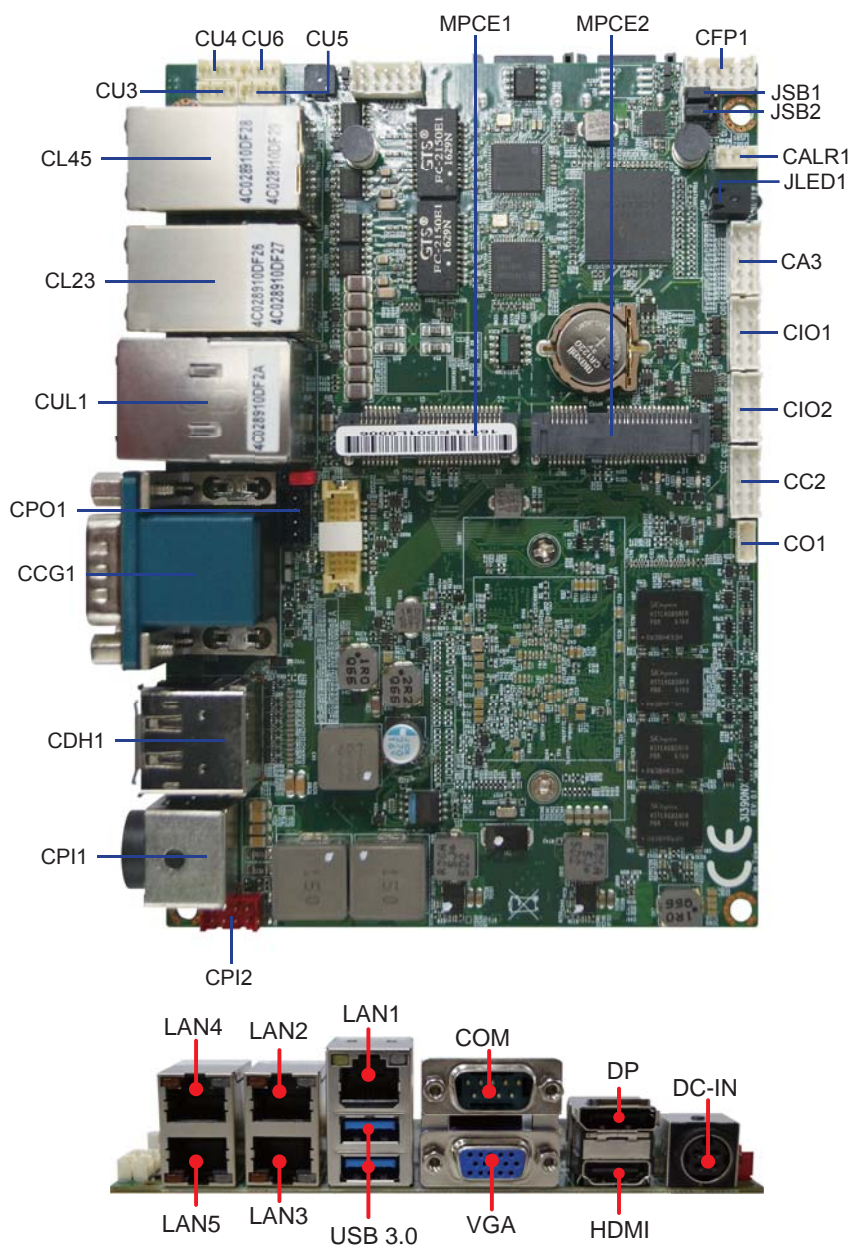
BOT





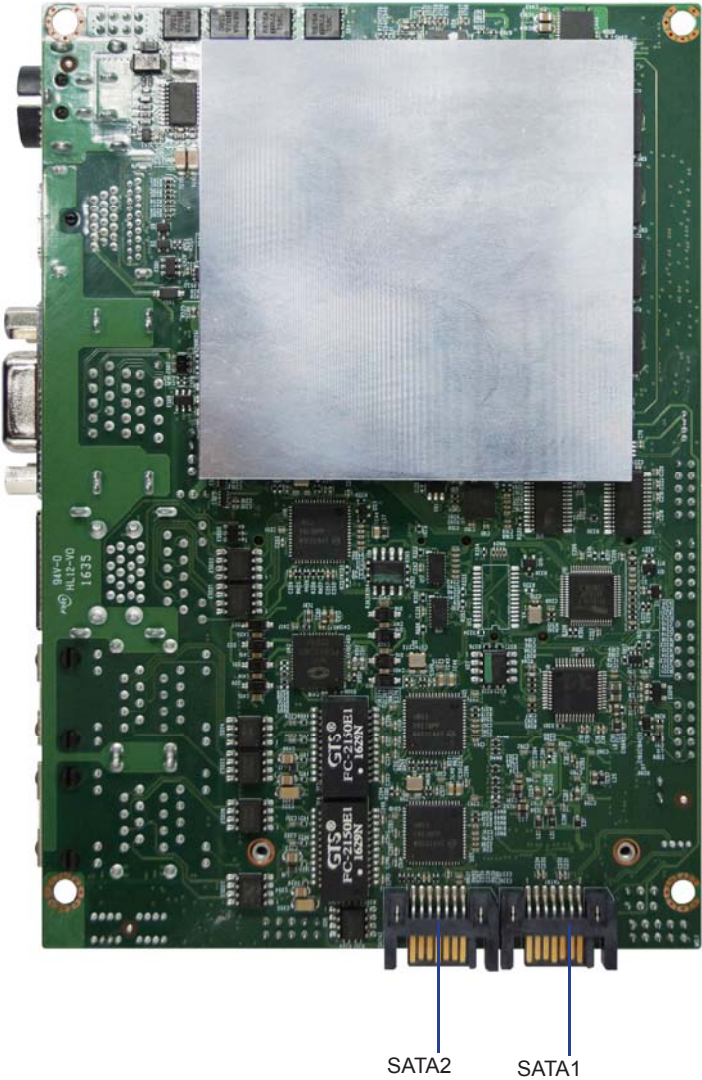
# 2-7 Diagram- 3I390NX

TOP



2-7-1 Diagram- 3I390NX

BOT



## 2-8 List of Jumpers

JSB2: CMOS DATA Clear

JVL1: eDP panel power select

## 2-9 Jumper Setting Description

A jumper is ON as a closed circuit with a plastic cap covering two pins. A jumper is OFF as an open circuit without the plastic cap. Some jumpers have three pins, labeled 1, 2, and 3. You could connect either pin 1 and 2 or 2 and 3. The below figure 2.2 shows the examples of different jumper settings in this manual.

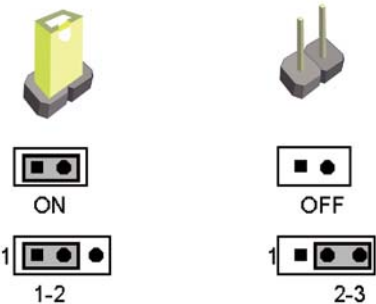


Figure 2.2

All jumpers already have its default setting with the plastic cap inserted as ON, or without the plastic cap as OFF. The default setting may be referred in this manual with a " \* " symbol .



## 2-10 JSB2: CMOS DATA Clear

A battery must be used to retain the motherboard configuration in CMOS RAM.  
Close Pin1 and pin 2 of JSB2 to store the CMOS data.

To clear the CMOS, follow the procedures below:

- 1. Turn off the system and unplug the AC power
- 2. Remove DC IN power cable from DC IN power connector
- 3. Locate JSB2 and close pin 1-2 for few seconds
- 4. Return to default setting by Close pin 1-2
- 5. Connect DC IN power cable back to DC IN Power connector

JSB2	DESCRIPTION
*1-2	Normal set
2-3	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**

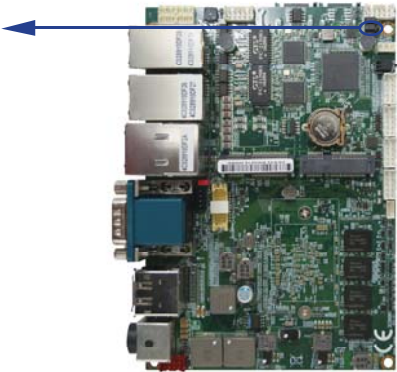
JSB2



\*Normal



COMS



## 2-11 JVL1: eDP panel power select

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

JVL1



+5V



\*+3.3V



---

# 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
CCG1 :	COM1 DB9 + VGA DB15 Connector
CC2 :	COM2 2x5pin (2.0mm) wafer
CFP1:	Front Panel connector 2x5pin (2.0mm) wafer
CIO1:	First DIO 2x5 pin (2.0mm) Wafer
CIO2:	Second DIO 2x5 pin (2.0mm) Wafer
CUL1 :	LAN port 1 RJ45 + USB3.0 Type A x 2 Connector
CL23 :	LAN port 2/3 RJ45 Connector
CL45 :	LAN port 4/5 RJ45 Connector
CO1:	I2C Bus 4pin (1.25mm) Wafer
CPI2:	DC 12V-IN 2x4 pin (2.0mm) Red wafer connector
CPO1:	+12V / +5V power output 4 pin (2.0mm) Black wafer connector
CU3:	USB 2.0 port 4pin (1.25mm) Wafer
CU4:	USB 2.0 port 4pin (1.25mm) Wafer
CU5:	USB 2.0 port 4pin (1.25mm) Wafer
CU6:	USB 2.0 port 4pin (1.25mm) Wafer
EDP1:	eDP 2x10 pin (1.25mm) connector
SATA1:	SATA connector 7pin
SATA2:	SATA connector 7pin
MPCE1:	Full size mini card port 1 sockets 52pin
MPCE2:	Full size mini card port 2 sockets 52pin

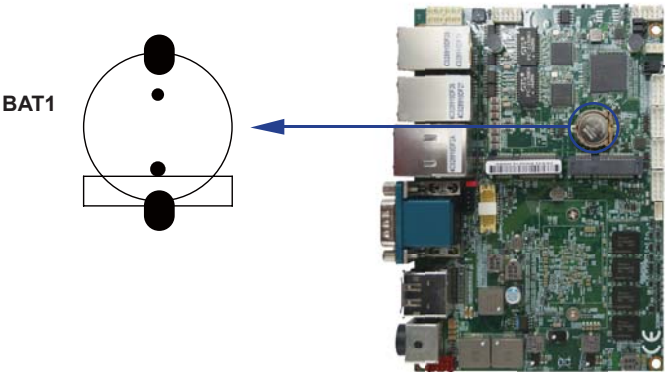
### 3-2 CMOS battery connector

- 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

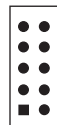


### 3-3 Audio interface

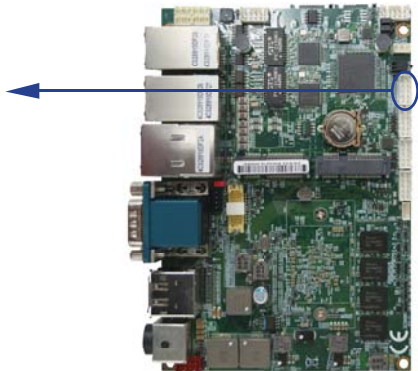
● CA3: Line-out / Line-in / Mic-in 2x5 pin (2.0mm) Wafer

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

CA3



pin1



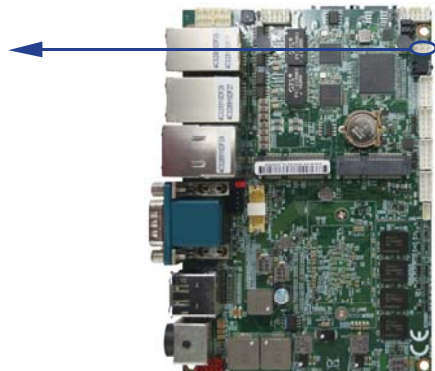
● CALR1: Amplifier Line-out Right / Left channel 4pin (1.25mm) wafer

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

CALR1



pin1



### 3-4 COM1 DB9 Connector (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

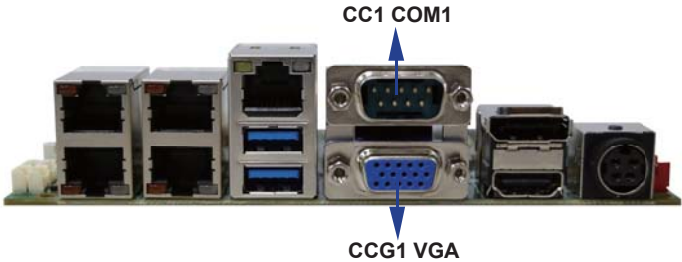
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	6	NC
2	TX+	7	NC
3	RX+	8	NC
4	RX-	9	NC
5	GND		

Note: The COM1 mode decides from BIOS Setup selected.

### 3-5 CCG1: VGA DB15 (Down)

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

Note: VGA and DP is same Digital Display Port signal. Only one connected at same time. If both connected, DP will work.



### 3-6 COM2 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

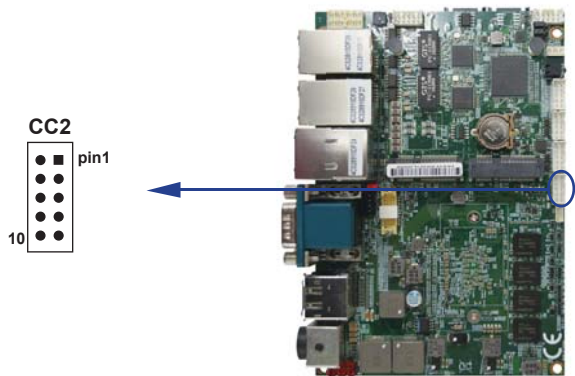
● RS485 Mode

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

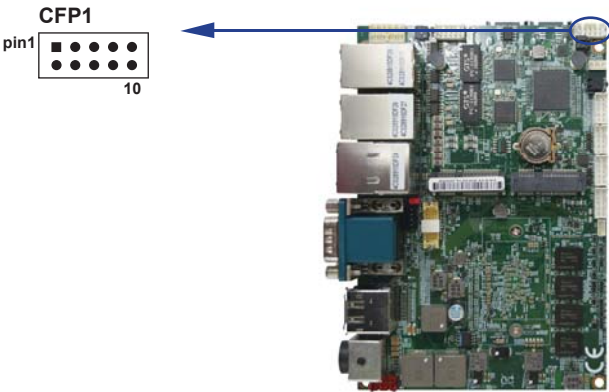
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX-	6	NC
2	TX+	7	NC
3	RX+	8	NC
4	RX-	9	NC
5	GND	10	+5V

Note: The COM2 mode decides from BIOS Setup selected.



### 3-7 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+





### 3-8 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

#### • CIO2 DIO 0--3 (2x5pin 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 10K $\Omega$  to +5V
2. If use need isolate circuit to control external device
3. F75111N-1 I<sup>2</sup>C bus address 0x9c

#### • For F75111N I C watch dog timer device:

DC spec:

Input low Voltage (VIL) \ +0.8 Max

Input High Voltage (VIH): +2V Min

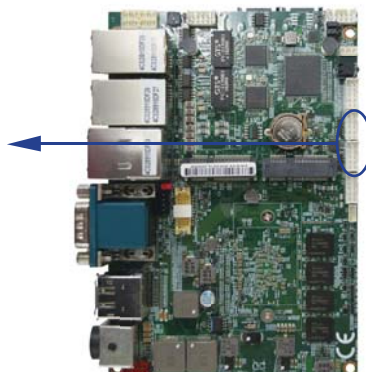
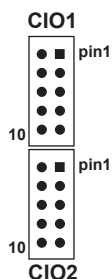
Output low Current (IOL): 10mA (Min) VOL=0.4V

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.



## 3-8-1 IO Device: F75111 under DOS

The Sample code source you can download from

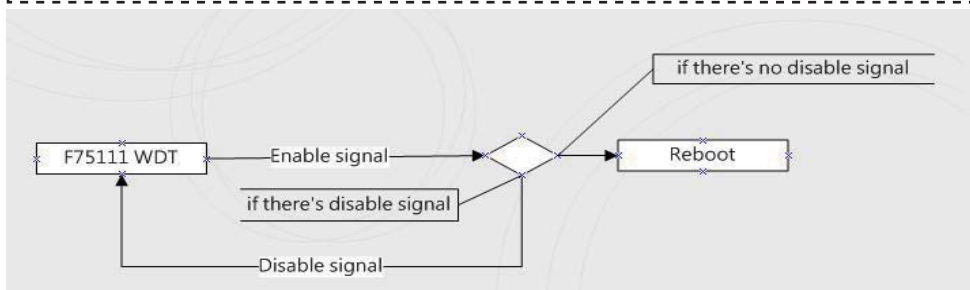
Source file: F75111\_Dos\_Src.rar [http://tprd.info/lexwiki/index.php/IO\\_Device:F75111\\_under\\_DOS](http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_DOS)

Binary file: F75111\_Dos\_Bin.rar

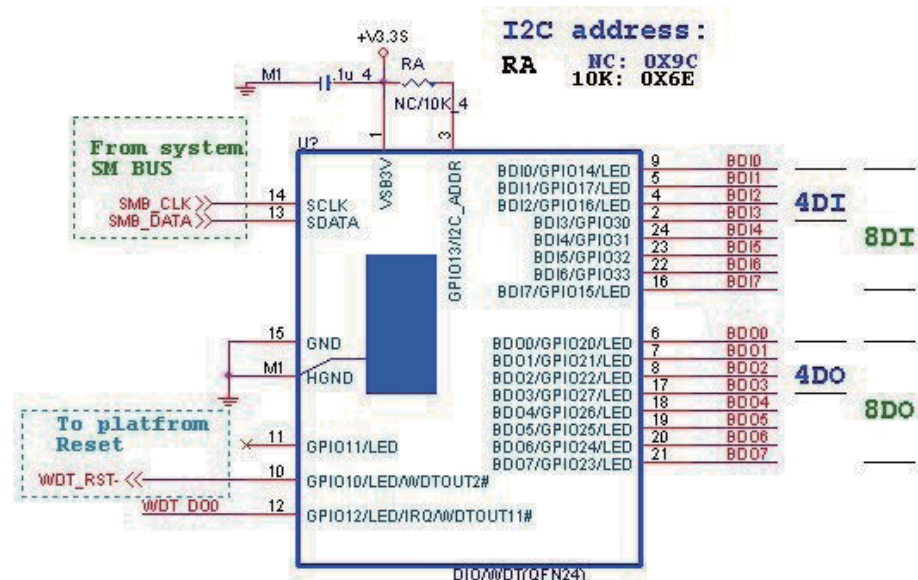
USERNAME & PASSWORD: sf

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;
}
```

---

### 3-8-2 IO Device: F75111 under Windows

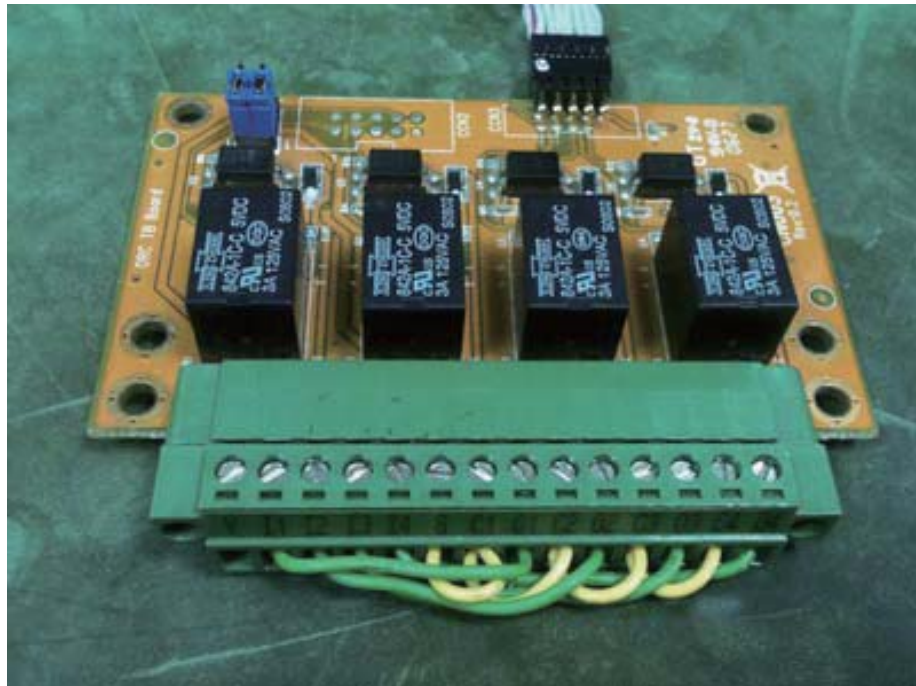
The Sample code source you can download from

Source file: F75111\_DIO\_Src\_v2.8W(32bit).zip [http://tprd.info/lexwiki/index.php/IO\\_Device:F75111](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 Dlx connect to DOx with Relay.



## How to use this Demo Application

one F75111

two F75111

Customize 75111 Address

Input your customize address1 : 9C

Input your customize address2 :

DIO Test

☒ DI/DO1 TEST(HI) .....

☒ DI/DO1 TEST(LO) .....

☐ DI/DO2 TEST(HI) .....

☐ DI/DO2 TEST(LO) .....

7 6 5 4 3 2 1 0

DO1 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

DI1 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

DO2 Status : ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

DI2 Status : ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Start

WDT Test

Enable 10 Disable

☐ Enable Loop

Install WDT

Customize 75111 Address

Input your customize address1 : 0x

Input your customize address2 : 0x 6E

DIO Test

☒ DI/DO1 TEST(HI) .....

☒ DI/DO1 TEST(LO) .....

☒ DI/DO2 TEST(HI) .....

☒ DI/DO2 TEST(LO) .....

7 6 5 4 3 2 1 0

DO1 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

DI1 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

DO2 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

DI2 Status : ☒ ☒ ☒ ☒ ☒ ☒ ☒ ☒

Start

WDT Test



Enable 10 Disable

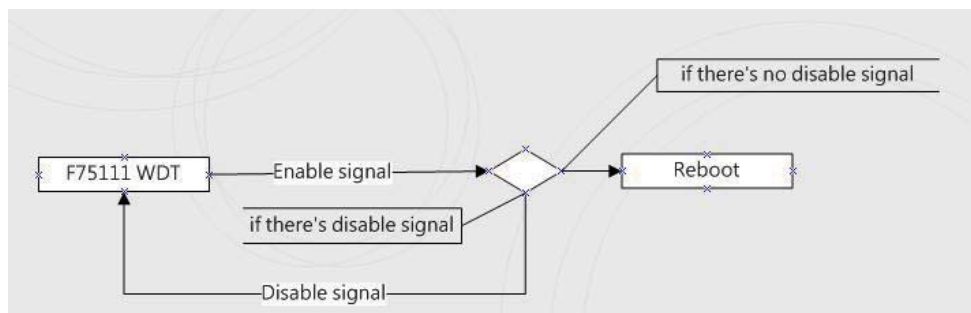
☐ Enable Loop

Install WDT

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 



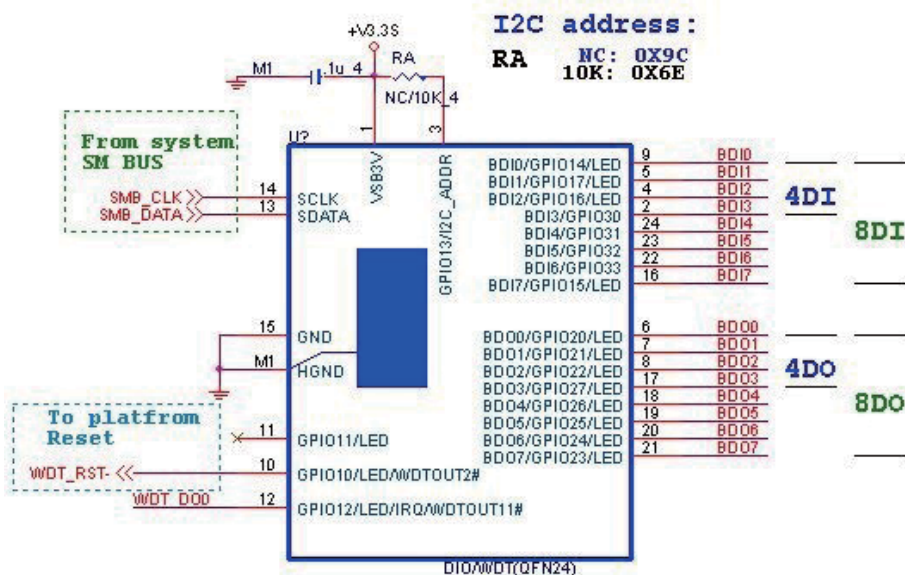
p.s.

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 (second 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.

```

### 3-8-3 IO Device: F75111 VB6 under Windows

The Sample code source you can download from

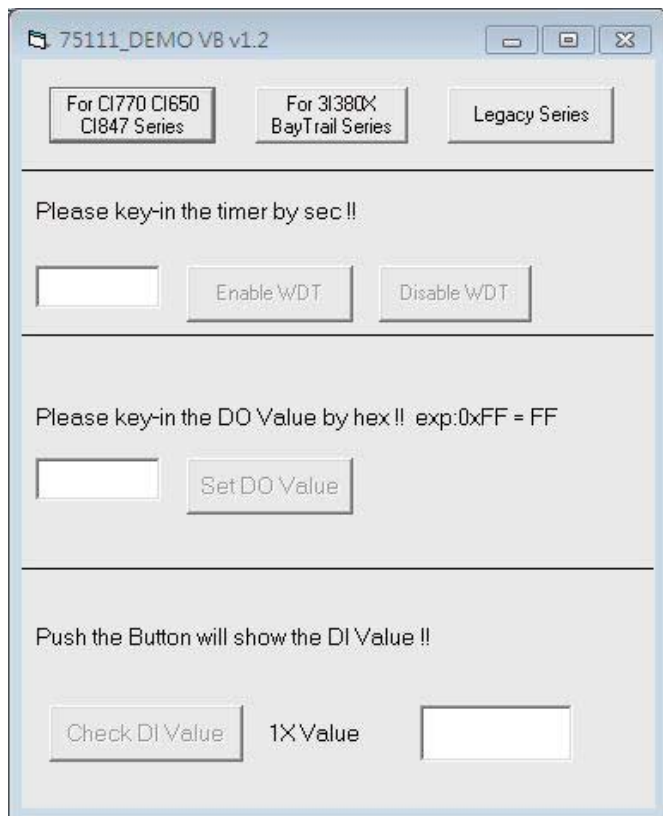
Source file: 75111\_VB\_v1.2.rar

[http://tprd.info/lexwiki/index.php/IO\\_Device:F75111\\_VB6](http://tprd.info/lexwiki/index.php/IO_Device:F75111_VB6)

Binary file: 75111\_VB\_Src1.2.rar

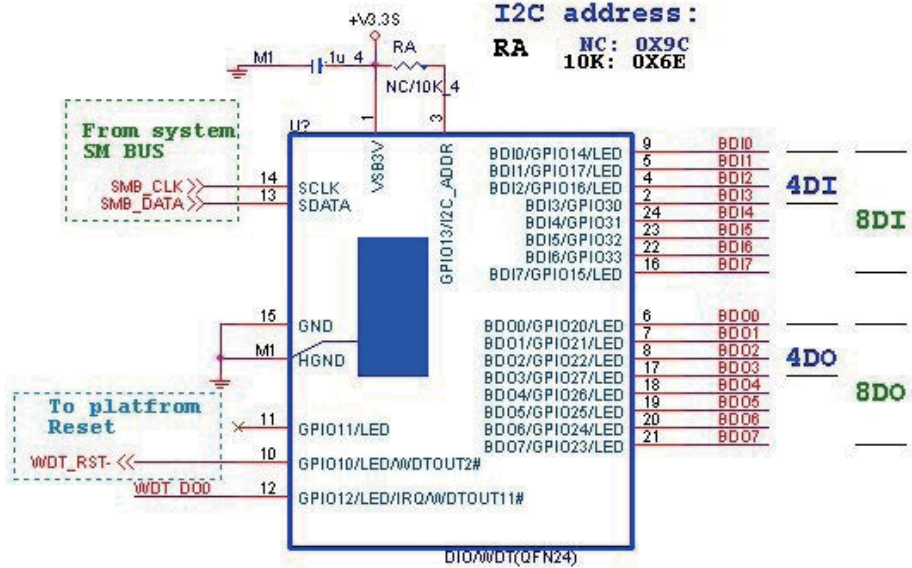
USERNAME & PASSWORD: sf

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 Writel2CByte(&H3, &H3)  
 Call Writel2CByte(&H37, timer)  
 Call Writel2CByte(&H36, &H73)

End Function

### Function DisableWDT

Function DisableWDT()

Call Writel2CByte(&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 Writel2CByte(&H23, &H0)
```

```
Call Writel2CByte(&H20, &HFF)
```

```
Call Writel2CByte(&H2B, &HFF)
```

```
Call Writel2CByte(&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
```

### 3-8-4 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](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

**F75111v2.3L**

Customize F75111 Address : 0x

---

**DIO Test**

DI / DO Test ( Low ) .....

DI / DO Test ( High ) .....

7 6 5 4 3 2 1 0

DO Status ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

DI Status ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

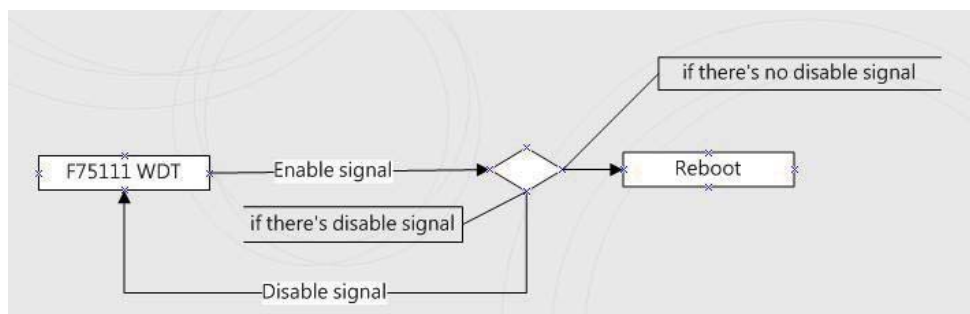
---

**WDT Test**

☐ Enable Loop Test

WDT Stand by .....

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.



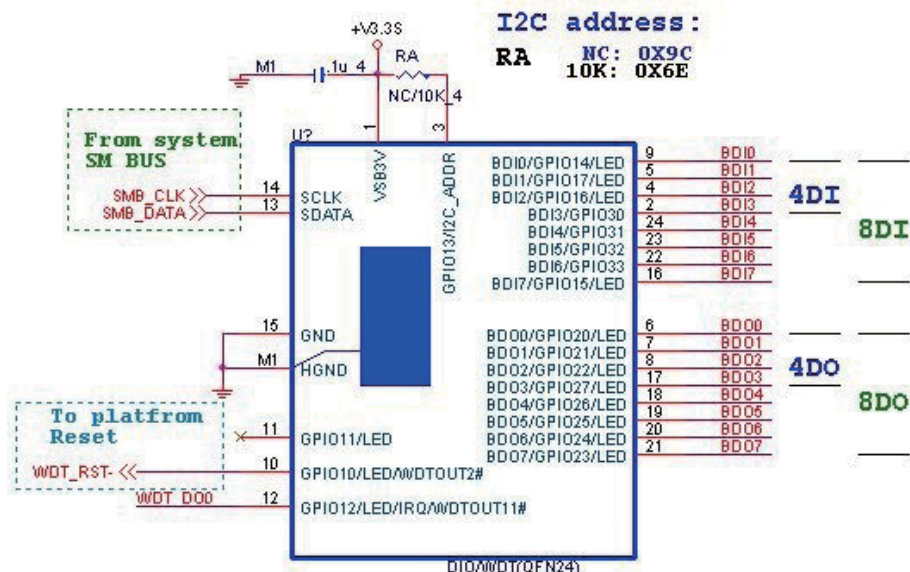
p.s.

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 & 0xFF);
}
```

### 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 (second 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 ();

```

### 3-9 LAN Interface

●CUL1: RJ45 LAN1 Connector (Up)

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

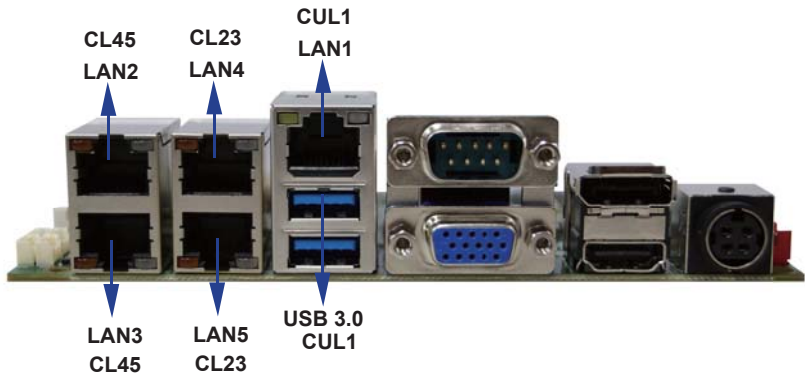
●CUL1: USB 3.0 Port 1/2 Connector (Down)

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+

●CL23: RJ45 LAN2 / LAN3 Connector

CL45: RJ45 LAN4 / LAN5 Connector

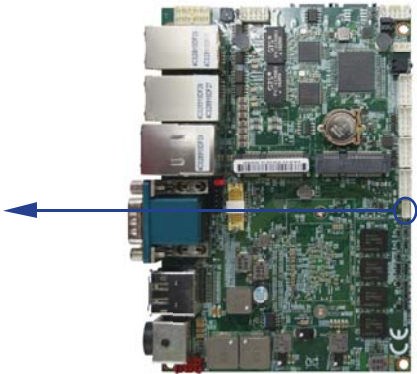
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MDI0+	5	MDI2-
2	MDI0-	6	MDI1-
3	MDI1+	7	MDI3+
4	MID2+	8	MDI3-



### 3-10 I<sup>2</sup>C Bus Interface

• CO1: I<sup>2</sup>C Bus 4pin (1.25mm) Wafer

PIN NO.	DESCRIPTION
1	+3.3V
2	GND
3	I <sup>2</sup> C Clock
4	I <sup>2</sup> C DATA

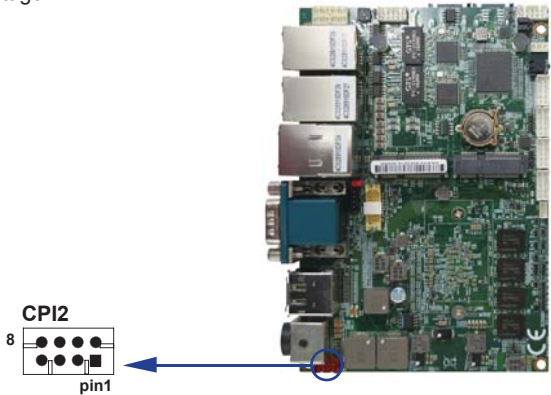


### 3-11 DC power input

● **CPI2: DC Power input (2x4pin 2.0mm Wafer) (Red)**

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

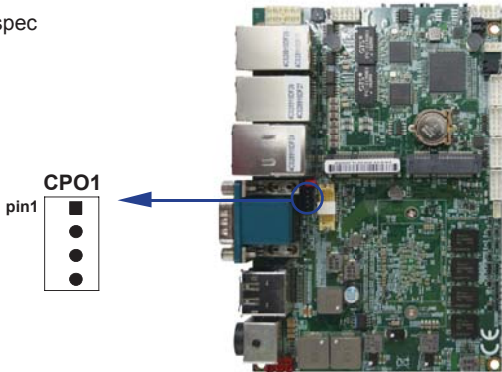
Note: Very important check DC-in Voltage



● **CPO1: +12V / +5V DC voltage output wafer connector(Black)**  
(1x4pin 2.0mm)

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

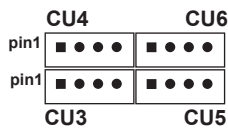
\* Note: Attention! Check Device Power in spec



### 3-12 USB Interface

- CU3 / CU4 / CU5 / CU6 USB2.0 port (1x4pin 1.25mm Wafer)

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



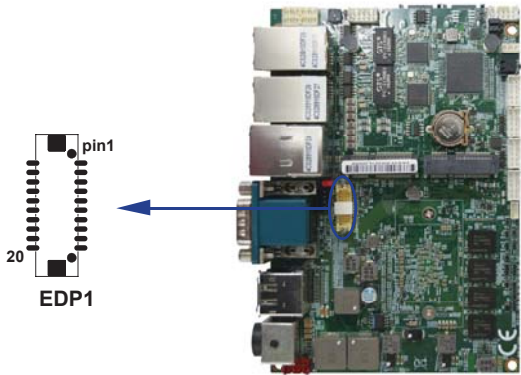
### 3-13 Display & Touch Interface

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

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

Note:

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



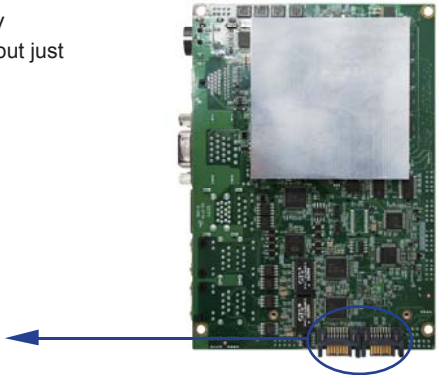
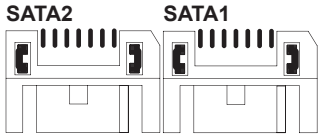
### 3-14 SATA interface

● **SATA 1/2: SATA port 1x7pin Connector**

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

Note:

- 1. CPO1 provide SATA HDD power +12V, GND, +5V
- 2. The SATA2 signal share with mSATA of MPCE1, but just one can be worked in same time.

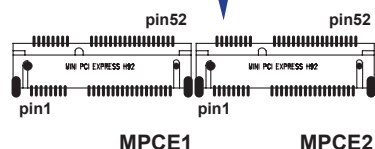




## 3-15 Module socket

### • MPCE 1/2 PCI Express mini card

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



Note:

1. MPCE1 Pin51 mSATA / PCIe auto detect function, but MPCE2 PCIe only.
2. The mSATA of MPCE1 signal share with SATA2, but just one can be worked in same time.

### 3-16 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
CC2	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
CPI2	2x4 8Pin	2.0mm	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
CU3	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
CU4	1x4 4Pin	1.25mm	MOLEX	53047-0410	51021-0400
eDP1	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.

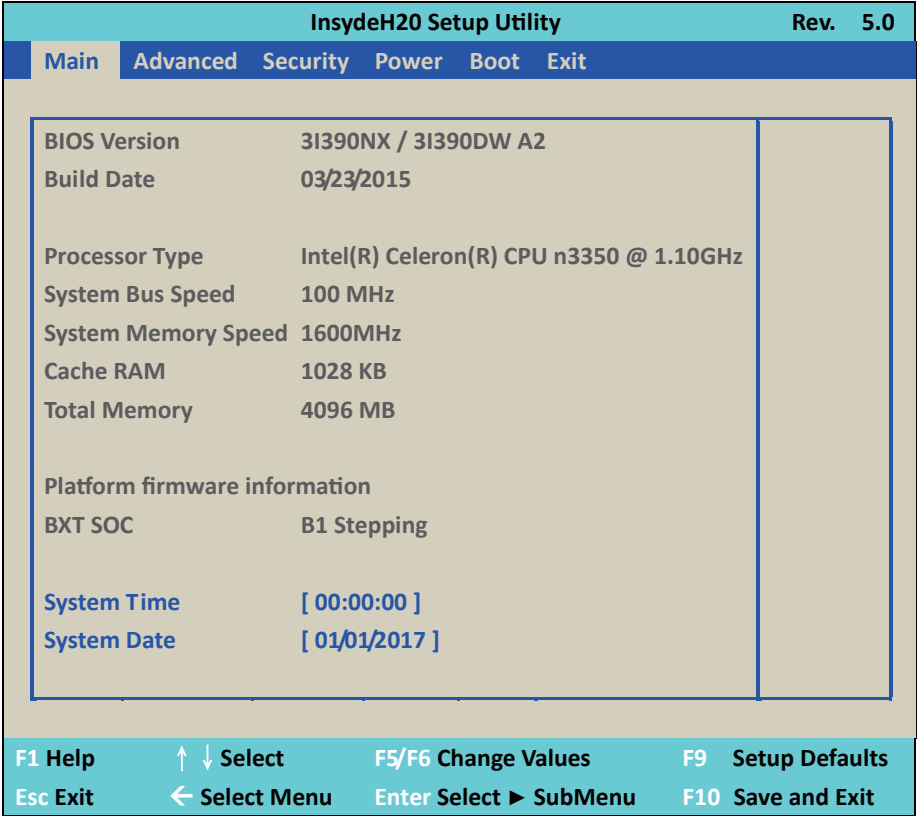
Press Page Up/Page Down or +/- keys to modify the BIOS parameters for the active option.

## 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.

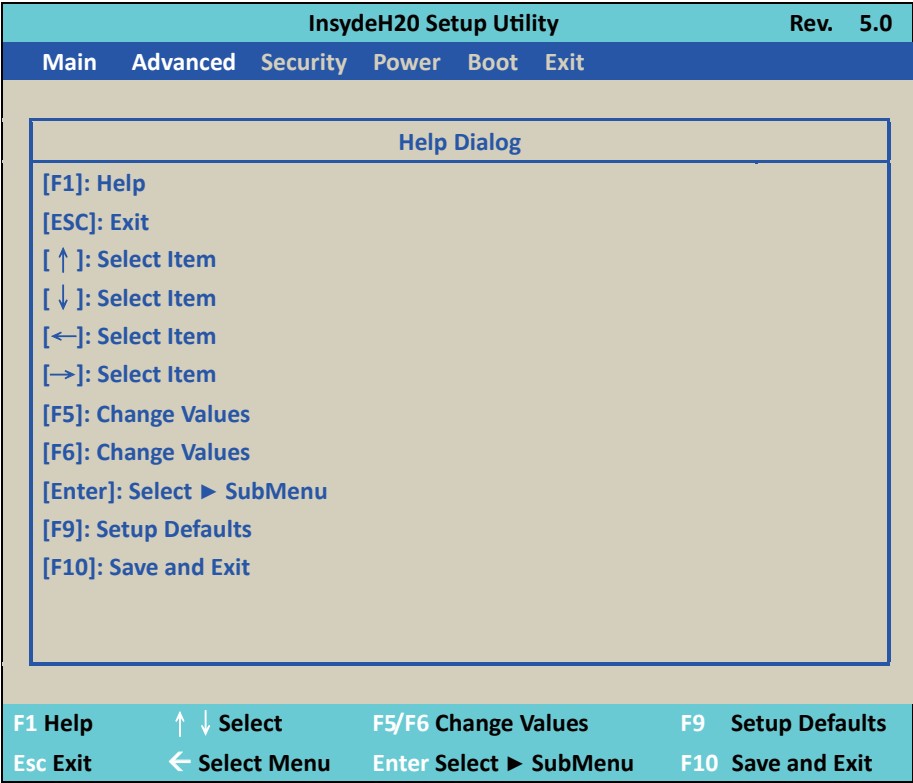
## 4-2 BIOS Menu Screen & Function Keys



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

InsydeH20 Setup Utility		Rev. 5.0
Main	Advanced	Security Power Boot Exit
BIOS Version 3I390NX / 3I390DW A2		
Build Date 03/23/2015		
Processor Type Intel(R) Celeron(R) CPU n3350 @ 1.10GHz		
System Bus Speed 100 MHz		
System Memory Speed 1600MHz		
Cache RAM 1028 KB		
Total Memory 4096 MB		
Platform firmware information		
BXT SOC B1 Stepping		
System Time [ 00:00:00 ]		
System Date [ 01/01/2017 ]		
F1 Help	↑ ↓ Select	F5/F6 Change Values F9 Setup Defaults
Esc Exit	← Select Menu	Enter Select ► SubMenu F10 Save and Exit

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.

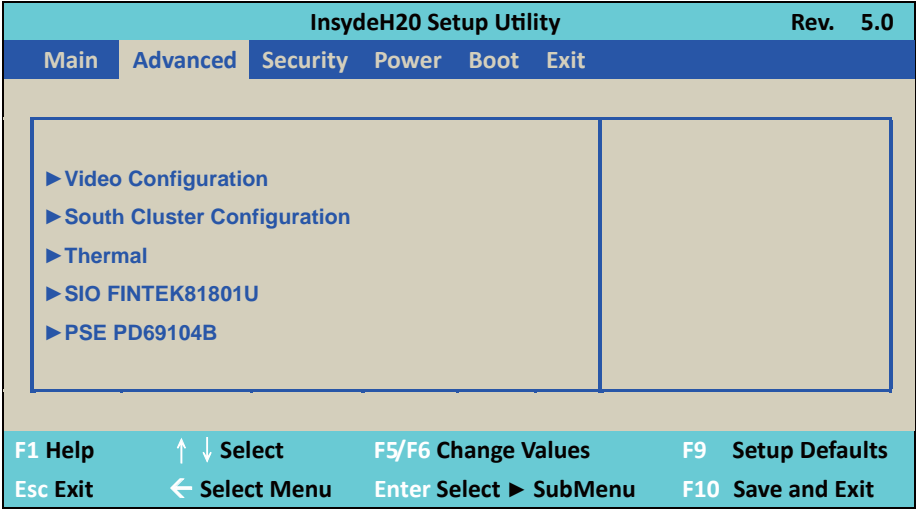
### System Date

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

**PSE PD69104B**

Please refer section 4-6-6

## 4-6-1 Video Configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
<b>IGD Configuration</b>		<b>Selects the Aperture Size</b>
Aperture Size	<256MB>	
DVMT Pre-Allocated	<64M>	
DVMT Total Gfx Mem	<256M>	
F1 Help	↑ ↓ Select	F5/F6 Change Values
Esc Exit	← Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults
		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

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
<div><div>▶ HD-Audio Configuration</div><div>▶ PCI Express Configuration</div><div>▶ SATA Drives</div></div>		
F1 Help	↑ ↓ Select	F5/F6 Change Values
Esc Exit	← Select Menu	Enter Select ▶ SubMenu
		F9 Setup Defaults
		F10 Save and Exit

### 4-6-2-1 ▶ HD-Audio Configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
<div><div>HD-Audio Configuration</div><div>HD-Audio Support &lt;Enabled&gt;</div></div> <div>Enable / Disable HD-Audio Support</div>		
F1 Help	↑ ↓ Select	F5/F6 Change Values
Esc Exit	← Select Menu	Enter Select ▶ SubMenu
		F9 Setup Defaults
		F10 Save and Exit

**HD-Audio Support.**

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

## 4-6-2-2 ► PCI Express Configuration

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
<div>PCI Express Configuration</div> <div>► Mini PCI Express 1</div> <div>► Mini PCI Express 2</div>		
F1 Help	↑ ↓ Select	F5/F6 Change Values
Esc Exit	← Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults
		F10 Save and Exit

### 4-6-2-2-1 ► Mini PCI Express 1/2

InsydeH20 Setup Utility		Rev. 5.0
Advanced		
<div>Mini PCI Express 1/2</div> <div>PCIe Speed</div> <div>&lt;Enabled&gt;</div> <div>&lt;Auto&gt;</div>		
F1 Help	↑ ↓ Select	F5/F6 Change Values
Esc Exit	← Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults
		F10 Save and Exit

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

**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

InsydeH2O Setup Utility

Rev. 5.0

Advanced

Thermal Configuration Parameters

Critical Trip Point<110 °C>

Passive Trip Point<105 °C>

This value controls the temperature of The ACPI Critical Trip Point – the point in Which the OS will Shut the system off.

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
Esc Exit	← Select Menu	Enter Select ► SubMenu
		F9 Setup Defaults
		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.

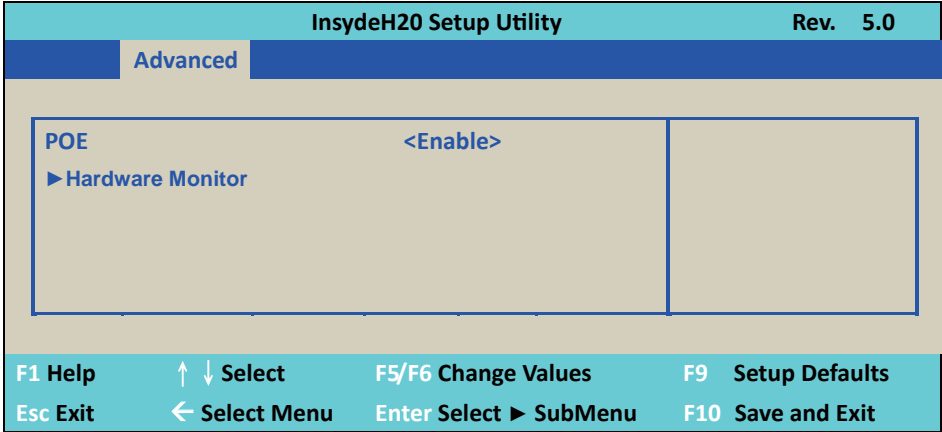
**Power Failure**

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 PSE PD69104B



**POE**

This item use disable or enable (default) POE function.

**Hardware Monitor**

This page monitor POE main power voltage and Port1~4 voltage when established PD.  
The main power voltage always about 52V.  
The Port1 to Port 4 normal same as main voltage, if not established without PD or not connect RJ45 cable, the port 1~4 still detect PD device that will shows on the voltage rows of Port1~4.so you will see the voltage is variable value.

## 4-7 Security

InsydeH20 Setup Utility				Rev. 5.0	
Main	Advanced	Security	Power	Boot	Exit
Supervisor Password		Not Install		Install or Change the password and the length of password must be greater than one character.	
Set Supervisor Password					
F1 Help	↑ ↓ Select	F5/F6 Change Values	F9	Setup Defaults	
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10	Save and Exit	

### 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

InsydeH20 Setup Utility				Rev. 5.0	
Main	Advanced	Security	Power	Boot	Exit
Wake On USB		<Disabled>			
Wake on LAN		<Disabled>			
ACPI S3		<Disabled>			
F1 Help	↑ ↓ Select	F5/F6 Change Values	F9	Setup Defaults	
Esc Exit	← Select Menu	Enter Select ► SubMenu	F10	Save and Exit	

### 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

InsydeH20 Setup Utility		Rev. 5.0			
Main	Advanced	Security	Power	Boot	Exit
Boot Type		<UEFI Boot Type>			
Quiet Boot		<Enabled>			
Network Stack		<Disabled>			
PXE Boot capability		<Disabled>			
▶ EFI					
F1 Help	↑ ↓ Select	F5/F6 Change Values	F9	Setup Defaults	
Esc Exit	← Select Menu	Enter Select ▶ SubMenu	F10	Save and Exit	

### 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

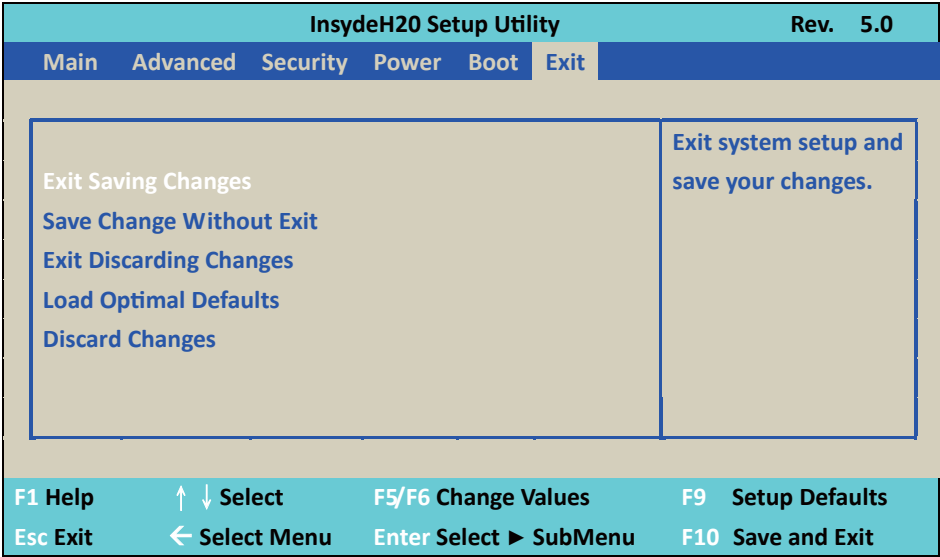
This is not modifying item. When above item settings disable.

### 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.

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## 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 3I390NX 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 3I390NX.ROM -BIOS -ALL

3I390NX.ROM is the file name of the latest BIOS.

It may be 3I390NX.ROM or 3I390NX.ROM, etc.

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

By Bay Trail series mainboard, please type

X:\: H2OFFT-D.EXE 3I390NX.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
Memory	DDR3L 1600 4GB
Operating System	Windows 10
Test Program	3D Mark 06
HDD 2.5" SATA	Slim Type HDD
mSATA	16GB

## Test Result for reference only !

Hard Disk	Processor	Power off	Start up		Operation Maximum	Shut down Maximum	In Put Voltage
			Maximum	Stable			
Slim Type HDD	N4200	0.13A	1.78A	1.31A	1.83A	1.61A	12V
		0.1A	0.89A	0.72A	0.91A	0.83A	24V
mSATA	N4200	0.12A	1.58A	1.18A	1.76A	1.52A	12V
		0.1A	0.91A	0.69A	0.87A	0.83A	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 )