

# **3I847NM / 3I847NX / 3I847D**

**Intel Ivy Bridge Celeron 1047UE  
(processor + Panther Point (PCH)HM76,  
DDR3 1333 MT/s / 4 x PoE LAN / HDMI / Audio /  
USB / PCIe mini card / LAN**

## **All-In-One**

**Intel Mobile Ivy Bridge Celeron 1047UE 1.4GHz CPU , (i3/i7 Processor )  
4 x PoE LAN , 1 x GbE LAN , 2 x PCIe mini slots ,  
Wide Range DC-IN, VGA, HDMI, LVDS, Touch Screen, CPC-Car Power  
Control, Audio, SATA, USB, COM**

**NO. 3I847NM / 3I847NX / 3I847D\_V0.2**

**Release date: Aug. 25. 2015**

# Contents

3I847NM / 3I847NX / 3I847D	
Warning!.....	1
Hardware Notice Guide .....	2
<b>CHAPTER 1 GENERAL INFORMATION</b> .....	4
1-1 MAJOR FEATURE.....	5
1-2 SPECIFICATION .....	6
1-3 DIRECTIONS FOR INSTALLING THE MINI CARD .....	7
1-4 PACKING LIST (3I847NM) .....	8
1-5 PACKING LIST (3I847NX) .....	9
1-6 PACKING LIST (3I847D) .....	10
<b>CHAPTER 2 HARDWARE INSTALLATION</b> .....	11
2-1 UNPACKING PRECAUTION .....	11
2-2 UNPACKING CHECKUP .....	12
2-3 DIMENSION (3I847NM/3I847NX/3I847D) .....	13
2-4 LAYOUT - (3I847NM/3I847NX/3I847D) .....	14
2-5 DIAGRAM - (3I847NM) .....	15
2-5-1 DIAGRAM - (3I847NX) .....	16
2-5-2 DIAGRAM - (3I847D) .....	17
2-5-3 BOTTOM SIDE DIAGRAM (3I847NM) .....	18
2-5-4 BOTTOM SIDE DIAGRAM (3I847NX) .....	19
2-5-4 BOTTOM SIDE DIAGRAM (3I847D) .....	20
2-6 LIST OF JUMPERS .....	21
2-7 JUMPER SETTING DESCRIPTION .....	21
2-8 JVL1: LCD PANEL POWER SELECT .....	23
2-9 SC1: CPC DEFAULT SELECT (1-2 ON) .....	23
<b>CHAPTER 3 CONNECTION</b> .....	22
3-1 LIST OF CONNECTORS.....	23
3-2 DC-IN POWER CONNECTOR .....	24
3-3 CMOS BATTERY IN .....	24
3-4 DC POWER OUTPUT .....	26
3-5 FRONT PANEL CONNECTOR & FAN .....	27
3-6 VGA PORT CONNECTOR .....	28
3-7 LVDS CONNECTOR .....	29
3-8 TOUCH SCREEN DEVICE .....	30
3-9 COM PORT CONNECTOR .....	31
3-10 DIGITAL INPUT / OUTPUT / WATCH DOG TIME .....	32
3-10-1 IO DEVICE : F75111 UNDER DOS .....	33
3-10-2 IO DEVICE : F75111 UNDER WINDOWS .....	34
3-10-3 IO DEVICE : F75111 VB6 UNDER WINDOWS .....	37

3-10-4 IO DEVICE : F75111 UNDER LINUX .....	39
3-11 I <sup>2</sup> C BUS INTERFACE .....	43
3-12 PS2 KEYBOARD / MOUSE CONNECTOR .....	43
3-13 AUDIO INTERFACE .....	43
3-14 LAN INTERFACE .....	44
3-15 USB PORT .....	45
3-16 SATA PORT .....	46
3-17 MINI CARD .....	47
<b>CHAPTER 4 INTRODUCTION OF BIOS .....</b>	<b>48</b>
4-1 ENTER SETUP .....	48
4-2 BIOS MENU SCREEN .....	49
4-3 FUNCTION KEYS .....	49
4-4 GETTING HELP .....	50
4-5 MENU BARS .....	50
4-6 MAIN .....	50
4-7 ADVANCED .....	51
4-7-1 ACPI SETTINGS .....	52
4-7-2 S5 RTC WAKE SETTINGS .....	53
4-7-3 CPU CONFIGURATION .....	54
4-7-4 SATA CONFIGURATION .....	55
4-7-4-1 SATA MODE SELECTION-AHCI MODE .....	55
4-7-5 USB CONFIGURATION .....	56
4-7-6 SMART SETTINGS .....	57
4-7-7 F71869 SUPER IO CONFIGURATION .....	57
4-7-7-1 SERIAL PORT 1 CONFIGURATION .....	58
4-7-7-2 SERIAL PORT 2 CONFIGURATION .....	59
4-7-8 F71869 H/W MONITOR .....	59
4-7-9 NETWORK STACK .....	60
4-8 CHIPSET .....	60
4-8-1 PCH-IO CONFIGURATION .....	61
4-8-1-1 PCI EXPRESS CONFIGURATION .....	61
4-8-1-1-1 MINI PCIE 1/2 .....	62
4-8-1-2 USB CONFUGURATION .....	62
4-8-1-2-1 XHCI MODE .....	63
4-8-1-3 PCH AZALIA CONFUGURATION .....	64
4-8-2 SYSTEM AGENT(SA) CONFUGURATION .....	65
4-8-2-1 GRAPHICS CONFUGURATION .....	65
4-8-2-1-1 LCD CONTROL .....	66
4-9 BOOT .....	67
4-9-1 CSM PARAMETERS .....	68
4-10 SECURITY .....	69

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4-11 SAVE & EXIT .....	69
<b>CHAPTER 5 DRIVER INSTALLATION .....</b>	<b>70</b>
5-1 INF INSTALL INTEL LVY BRIDGE CHIPSET DRIVER .....	72
5-2 VGA INSTALL INTEL LVY BRIDGE VGA DRIVER .....	74
5-3 SOUND INSTALL REALTEK HIGH DEFINITION AUDIO DRIVER .....	76
5-4 USB 3.0 INSTALL INTEL USB 3.0 EXTENSIBLE HOST CONTROLLER DRIVER .....	77
5-5 EMI INSTALL INTEL MANAGEMENT ENGINE INTERFACE DRIVER .....	79
5-6 HOW TO UPDATE AMI BIOS .....	81
APPENDIX A:POWER CONSUMPTION TEST .....	83
APPENDIX B:RESOLUTION LIST .....	85
APPENDIX C: CPC-CAR POWER CONTROL .....	86

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User Manual edition 0.1, Apr. 22. 2014

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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

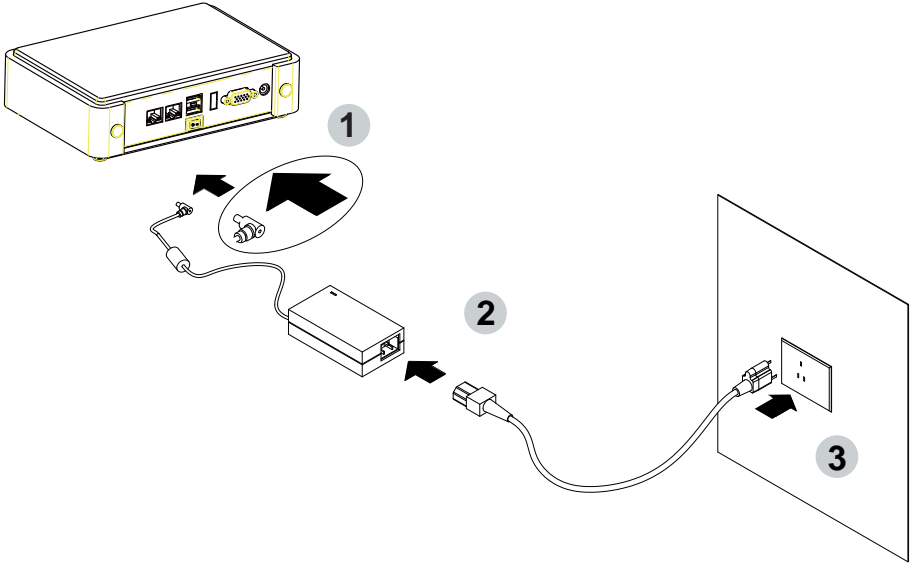
1. Before linking power supply with the motherboard, please attach DC-in adapter to the motherboard first. Then plug the adapter power to AC outlet.  
Always shut down the computer normally before you move the system unit or remove the power supply from the motherboard. Please unplug the DC-in adapter 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:**

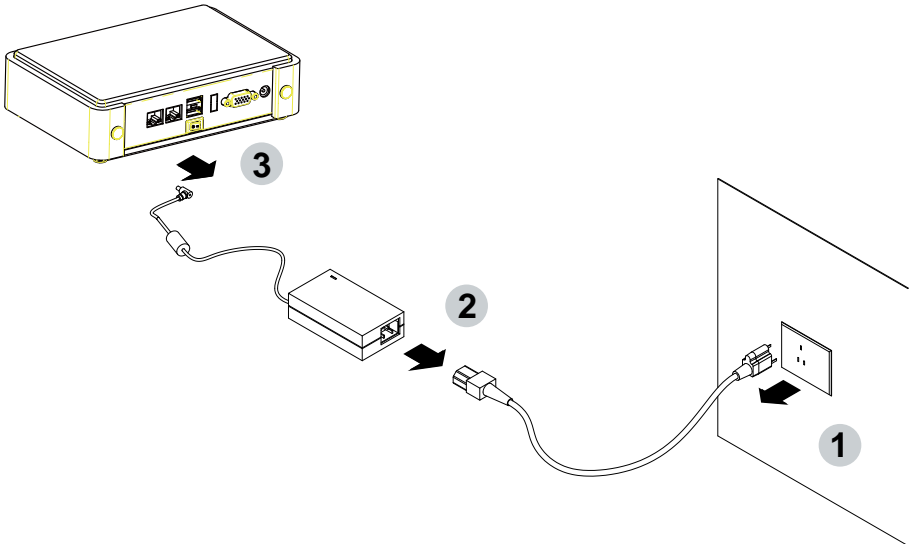
**Always insert/unplug the DC-in horizontally & directly to/from the motherboard. DO NOT twist, it is designed to fit snugly.**  
**Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.**

# Photo 1

# Insert



# Unplug





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# Chapter-1

## General Information

3I847NM / 3I847NX / 3I847D is built to be all-in-one Power over Ethernet solution with combination of all necessary embedded I/O functions, which makes it to be an ideal PoE solution for supplying the power through PoE device such as IP camera, IP phone, Wireless Access Points and many other IP devices. 3I847NM is the perfect platforms for whole range of small form factor, low-power devices.

The embedded motherboard 3I847NM / 3I847NX / 3I847D is specially designed for advanced embedded networking applications where the economical use of power is in high demand. With the sizeable DDR3 1333MT/s 2/4GB on board memory, 3I847NM / 3I847NX / 3I847D ensures the high performance level required of today's most popular networking applications.

3I847NM / 3I847NX / 3I847D 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. With Wake-On LAN function and the PXE function in BIOS, these are perfect control board for networking purpose.

3I847NM / 3I847NX / 3I847D is with Intel Chief River platform; the 2-chip platform consists of a Mobile Ivy Bridge 1047UE/i3/i7 Processor and the Platform Controller Hub (PCH) Panther Point HM76 chipset. The Mobile Ivy Bridge 1047UE processor includes Integrated Display Engine, GPU and Integrated Memory Controller. This integrated platform offers superb performance and PC specification in the industry. It supports up to two serial ports (1xRS232+1xRS485), and 7 ports of USB (3 ports of USB 2.0 in rear side & 4 internal ports of USB 2.0 with 2 ports shard with USB3.0). The expandable interfaces include 2 PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface, and 1 SIM card socket.

The All-In-One motherboard 3I847NM / 3I847NX / 3I847D 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. Ivy Bridge BGA type CPU + HM76
2. Supports Single Channel DDR3 SODRAM ON BOARD 2/4GB,  
DDR3 data transfer rates of 1333 MT/s
3. Support 1 x 10/100/1000 Mbps Intel LAN on Board;  
Support 4 x PoE LAN follows IEEE 802.3af standard
4. Support 2 x PCIe Mini card for PCIe by one and mSATA and USB interface
5. Support up to 2 SATA ports
6. Hardware digital Input & Output, 8 x DI / 8 x DO  
(Standard for 3I847NX/NM, Optional for 3I847D)  
Hardware Watch Dog Timer, 0~255 sec programmable  
(Standard for 3I847NX/NM, Optional for 3I847D)
7. Wide Range DC IN +9V~36V (Standard for 3I847NX/NM)
8. PCB Dimension: 145 x 102 mm
9. 1 SIM card socket
10. Car Power Control (CPC)  
Power input Reverse protection to -60V; Power input Over surge protect.  
Ignition power on/off delay time; Battery under voltage power off (UVP)  
Software selectable power on /off delay time and under voltage level set.

## 1-2 Specification

1. **CPU+Chipset:** Intel Chief River platform; the two-chip platform consists of a Mobile Ivy Bridge 1047UE/i3/i7 Processor and the Platform Controller Hub (PCH) Panther Point HM76 chipset
2. **Memory:** On board DDR3 SDRAM. Single Channel Non-ECC, un-buffered DDR3 SDRAM only. 2GB Capacity for 2Gb SDRAM in x 8 configurations; 4GB Capacity for 4Gb SDRAM in x 8 configurations
3. **VGA:** Intel Mobile Ivy Bridge 1047UE/i3/i7 Processor Integrated Graphics
4. **SATA:** Integrated Serial ATA Host Controller Up to 1 SATA port: 1 SATA port 3.0 Data transfer rates up to 6.0 Gb/s (600 MB/s), 1 SATA ports 2.0 Data transfer rates up to 3.0 Gb/s (300 MB/s), 1 mini card socket for mSATA Data transfer rates up to 6.0 Gb/s (600 MB/s), 1 on board NAND drive (Option)
5. **LAN:** LAN1- Intel 82579LM Gigabit Ethernet PHY / LAN 2-5 - Intel I210-IT Gigabit Ethernet
6. **Serial Port:** 1 x RS232 & 1 x RS485 (Internal); option to RS 232/422/485
7. **USB:** 2 x USB 3.0 (internal); 4 x USB 2.0 (internal); 3 x USB 2.0 (rear side)
8. **Sound:** Intel High Definition Audio Interface
9. **Audio Amplifier:** 2 channel Class D Audio Amplifier; 2.57W/Ch (Typ.) into a 4 $\Omega$ Load, 1.46 W/Ch (Typ.) into a 8 $\Omega$ Load (OPTIONAL)
10. **WDT/DIO:** Hardware digital Input & Output, 8 x DI / 4 x DO (Option) / Hardware Watch Dog Timer, 0~255 sec programmable (Standard for 3I847NX/NM, Optional for 3I847D)
11. **Expansion interface:** 2 PCIe Mini card for PCIe x1 or mSATA (Auto Detection) and USB interface. And One SIM card socket for some 3G mini card use.
12. **BIOS:** AMI UEFI BIOS Version
13. **Dimension:** 145 x 102 mm
14. **Power:** Wide Range DC IN +9V~36V (Standard for 3I847NX/NM)
15. **Power Consumption:** Please refer to Page. 83
16. **3G Wireless:** 3G SIM card reader
17. **LVDS:** LVDS 18/24Bits dual channel 2x15 pin (1.25mm) connector LVDS1
18. **Touch function:** C8051F321 USB interface Touch screen controller support 4- , 5- , 8- wire Analog Resistive touch screen. Resolution is up to 2048 x 2048

## 1-3 Directions for installing the Mini Card

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 (3I847NM)

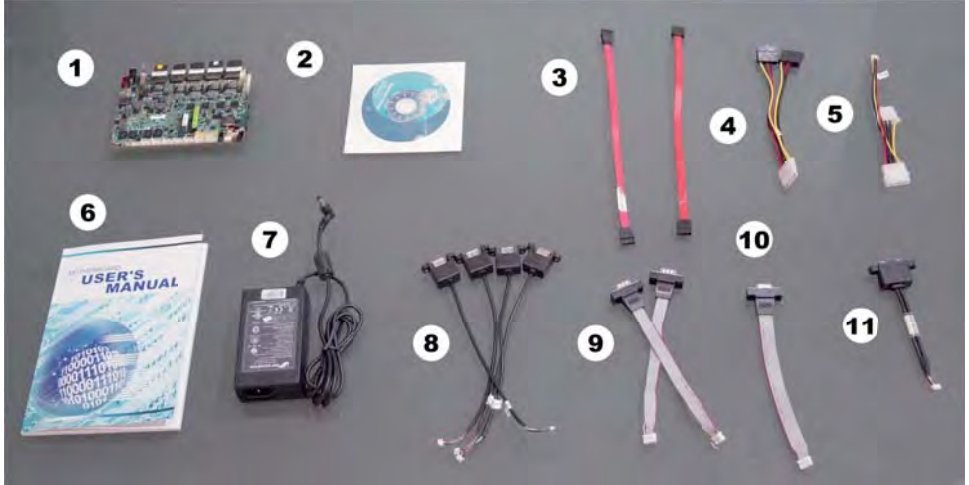


	Material Code	Description	Detail Specification	Quantit
1	7G1901-1381001-0	MB-3I847NM-3C4-H4-001	LF,3I847NM-3C4-H4,Rev.:001	1
2	6G8006-2346-0100	LEX Product Driver DVD	LF,DVD Ver.02, Φ=12cm	1
3	6G6001-2203-0100	SATA DATA Cable (Red)	LF,L=25cm	2
4	6G6003-1003-0100	SATA Power Cable,1 to 2	LF,L=15cm,SATA Power*2/4P	1
5	6G6003-7310-0100	DC PK	LF,2.0 1*4/M4P M/F,L=15/5.5cm	1
6	6G8001-2185-0400	Manual	LF,M/B,3I847NM	1
7	6G6002-8006-0100	USB RK,(USB*1 to 1*4/1.25 Housing)	LF,L=20cm,Intel	4
8	6G6001-2005-0100	COM FK	LF,2.0 2*5P/DB9P,L=15cm	2
9	6G6001-8404-0100	VGA FK	LF,L=15cm,2.0 2*5/DB15pin	1
10	6G6002-8603-0100	PS/2 RK	LF,KB&Mouse Cable,L=10cm	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.

## 1-5 Packing List (3I847NX)

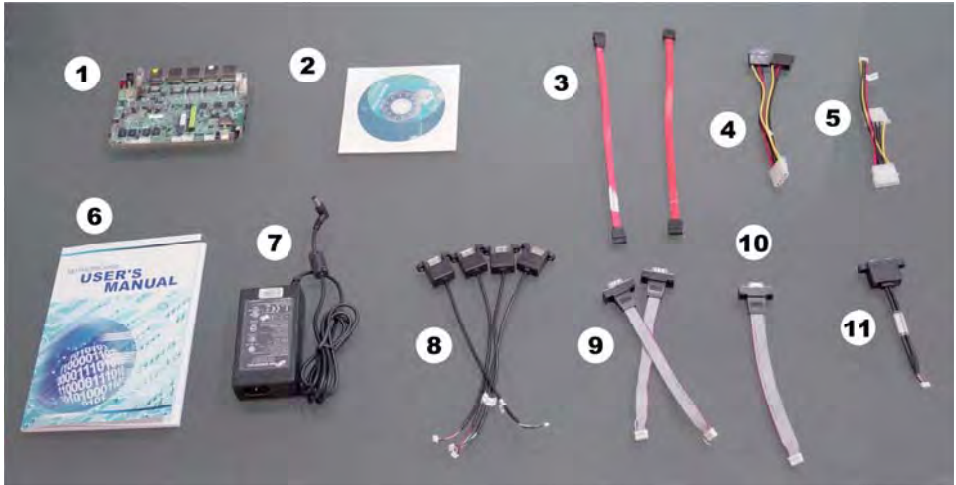


	Material Code	Description	Detail Specification	Quantit
1	7G1901-1391002-0	MB-3I847NX-3C4-H4-002	LF,3I847NX-3C4-H4,Rev.:002	1
2	6G8006-2346-0100	LEX Product Driver DVD	LF,DVD Ver.02, Φ=12cm	1
3	6G6001-2203-0100	SATA DATA Cable (Red)	LF,L=25cm	2
4	6G6003-1003-0100	SATA Power Cable,1 to 2	LF,L=15cm,SATA Power*2/4P	1
5	6G6003-7310-0100	DC PK	LF,2.0 1*4/M4P M/F,L=15/5.5cm	1
6	6G8001-2185-0400	Manual	LF,MB,3I847NM	1
7	6G6002-8006-0100	120W Power Adapter,12V	LF,L Type,FSP120-AHAN2,FSP	1
8	6G6001-2005-0100	USB RK,(USB*1 to 1*4/1.25 Housing)	LF,L=20cm,Intel	4
9	6G6001-8404-0100	COM FK	LF,2.0 2*5P/DB9P,L=15cm	2
10	6G6002-8603-0100	VGA FK	LF,L=15cm,2.0 2*5/DB15pin	1
11	6G6002-8603-0100	PS/2 RK	LF,KB&Mouse Cable,L=10cm	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.

## 1-6 Packing List (3I847D)



	Material Code	Description	Detail Specification	Quantit
1	7G1901-1401002-0	MB-3I847D-3C4-H2-002	LF,3I847D-3C4-H2,Rev.:002	1
2	6G8006-2346-0100	LEX Product Driver DVD	LF,DVD Ver.02, Φ=12cm	1
3	6G6001-2203-0100	SATA DATA Cable (Red)	LF,L=25cm	2
4	6G6003-1003-0100	SATA Power Cable,1 to 2	LF,L=15cm,SATA Power*2/4P	1
5	6G6003-7310-0100	DC PK	LF,2.0 1*4/M4P M/F,L=15/5.5cm	1
6	6G8001-2185-0400	Manual	LF,M/B,3I847NM	1
7	6G6002-8006-0100	60W Power Adapter,12V/5A,2.5	LF,L Type,FSP060-DBAE1,FSP	1
8	6G6001-2005-0100	USB RK,(USB*1 to 1*4/1.25 Housing)	LF,L=20cm,Intel	4
9	6G6001-8404-0100	COM FK	LF,2.0 2*5P/DB9P,L=15cm	2
10	6G6002-8603-0100	VGA FK	LF,L=15cm,2.0 2*5/DB15pin	1
11	6G6002-8603-0100	PS/2 RK	LF,KB&Mouse Cable,L=10cm	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.

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# Chapter-2

## Hardware Installation

### 2-1 Unpacking Precaution

This chapter provides the information how to install the hardware of 3I847NM. Please follow section 1-4,1-5,1-6, 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 3I847NM / 3I847NX / 3I847D.  
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 3I847NM / 3I847NX / 3I847D 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.



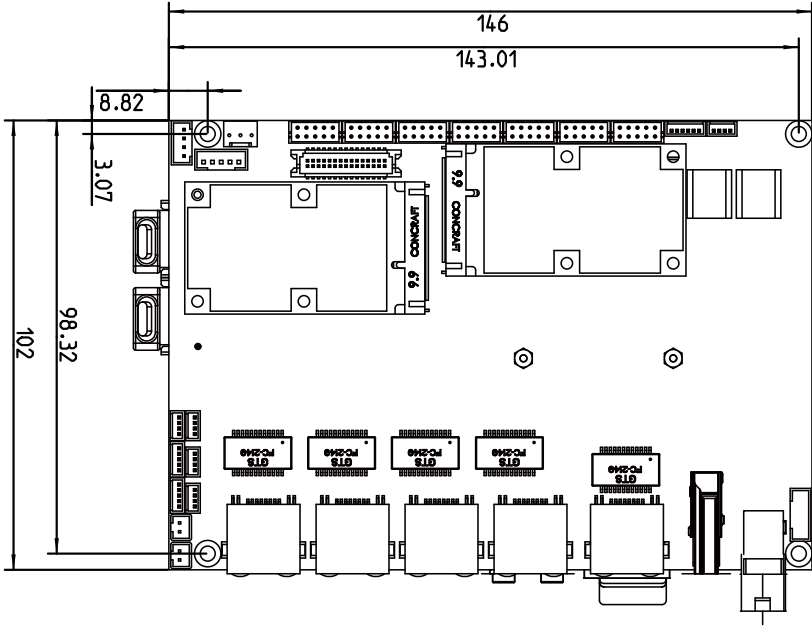
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## 2-2 Unpacking checkup

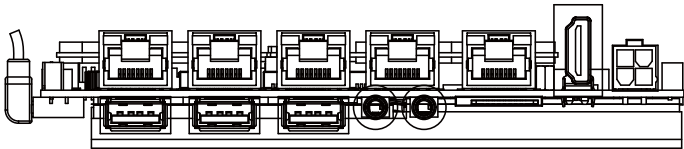
First of all, please follow all necessary steps of section 2-1 to protect 3I847NM / 3I847NX / 3I847D from electricity discharge. With reference to section 1-4 / 1-5 / 1-6, please check the delivery package again with following steps:

1. Unpack the 3I847NM / 3I847NX / 3I847D 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.

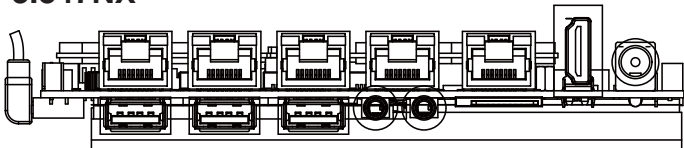
## 2-3 Dimension-3I847NM / 3I847NX / 3I847D



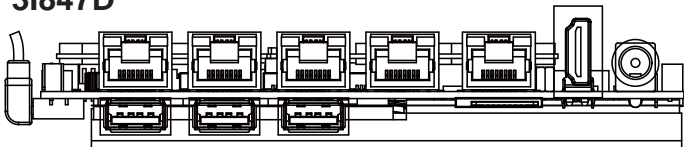
**3I847NM**



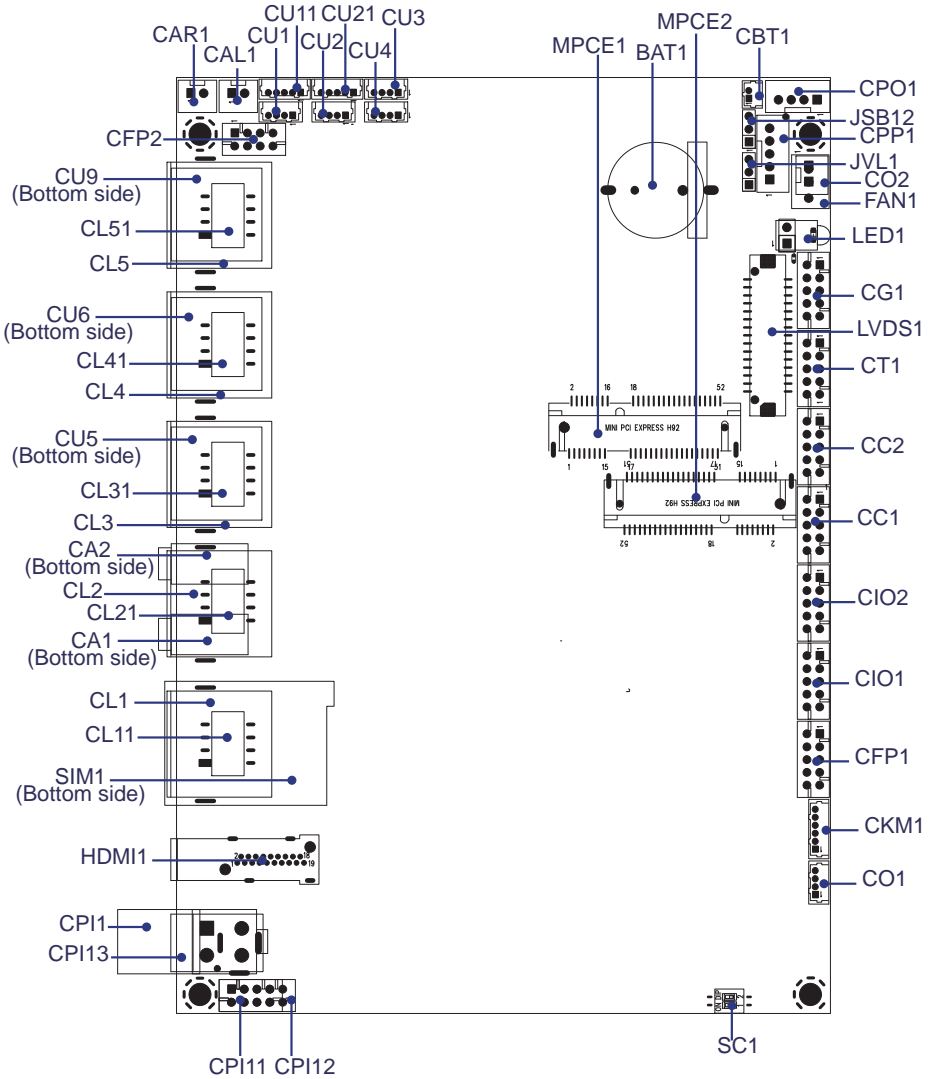
**3I847NX**



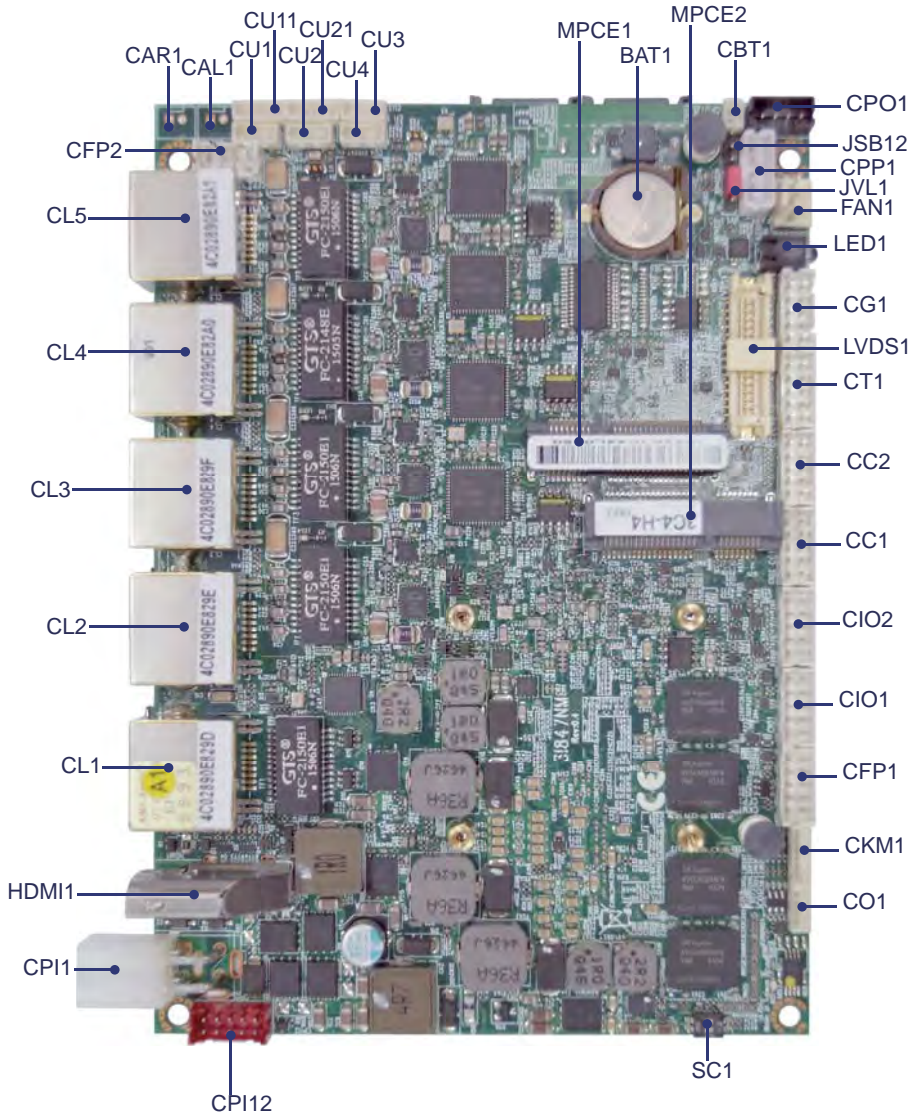
**3I847D**



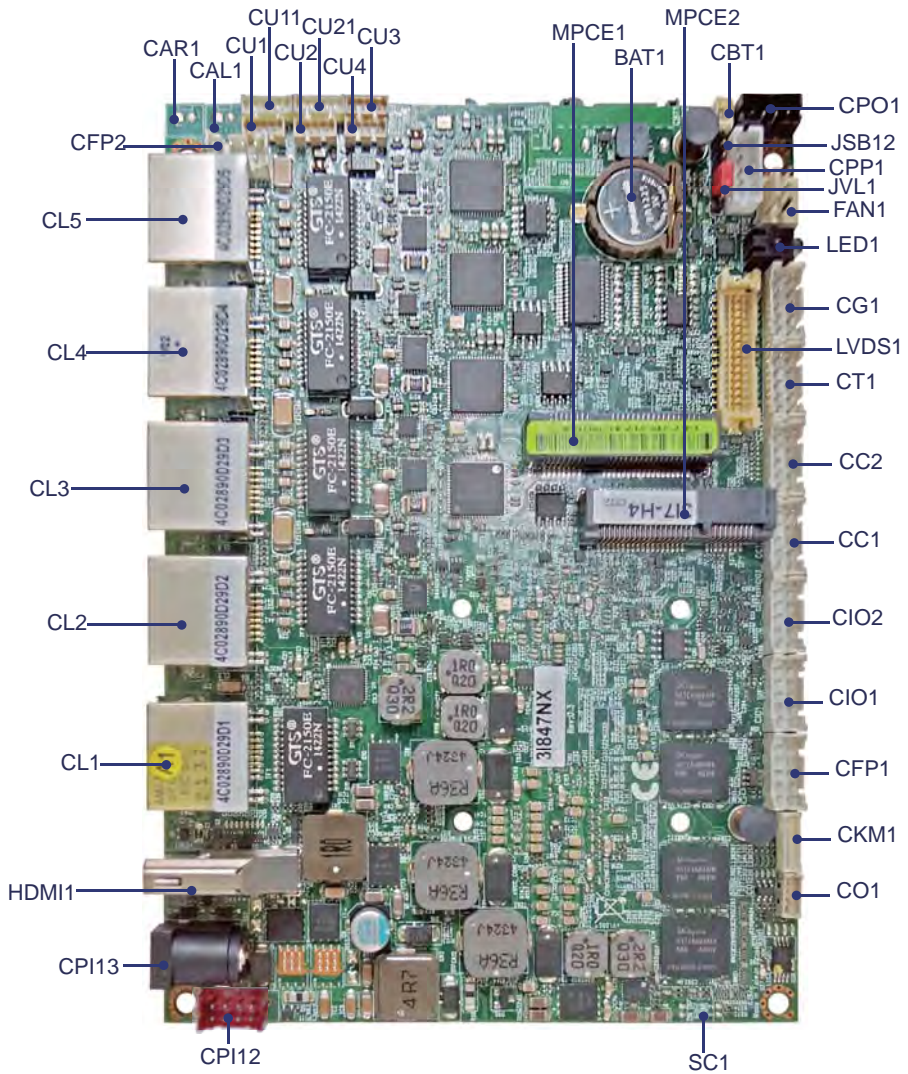
## 2-4 Layout-3I847NM / 3I847NX / 3I847D



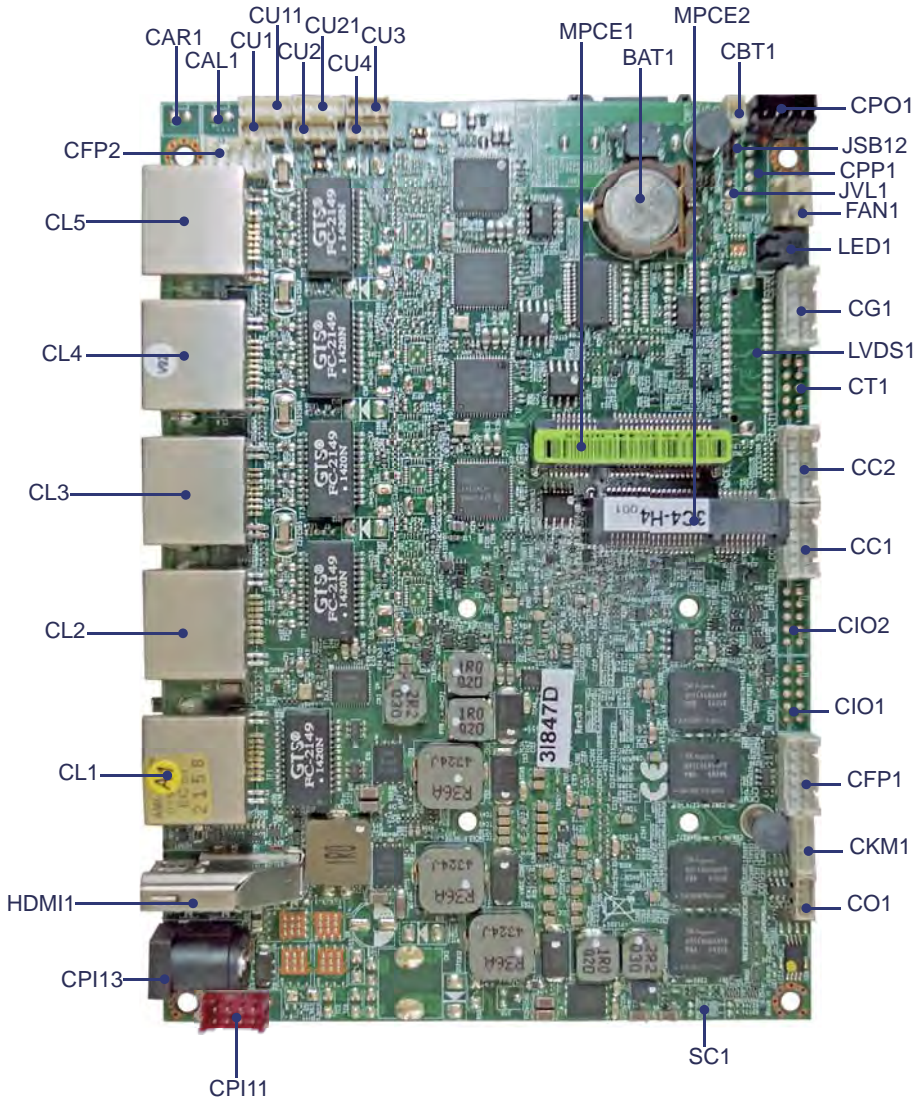
## 2-5 Diagram- 3l847NM



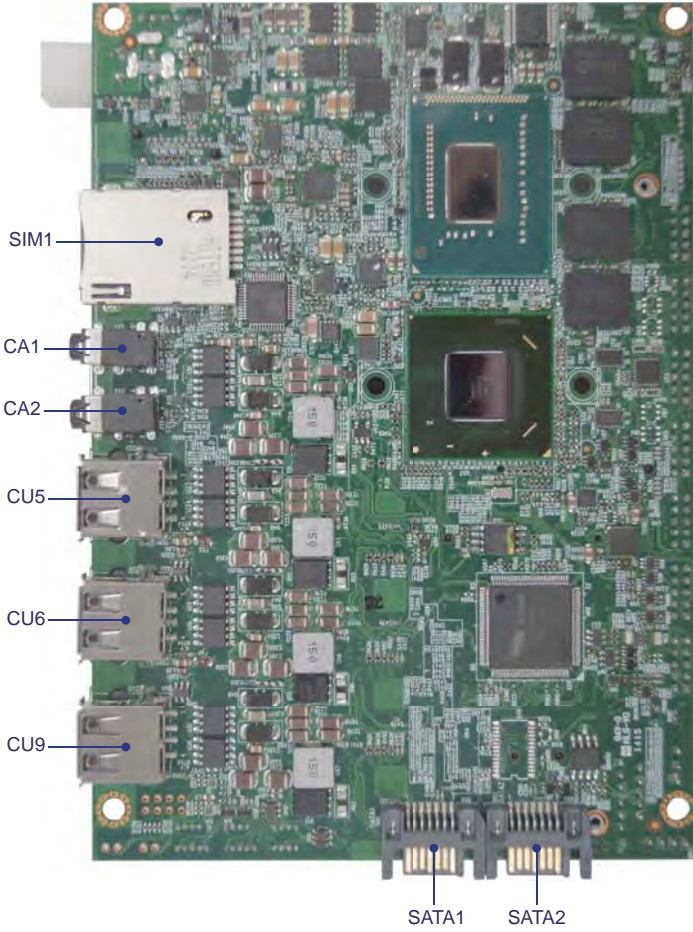
## 2-5-1 Diagram- 3I847NX



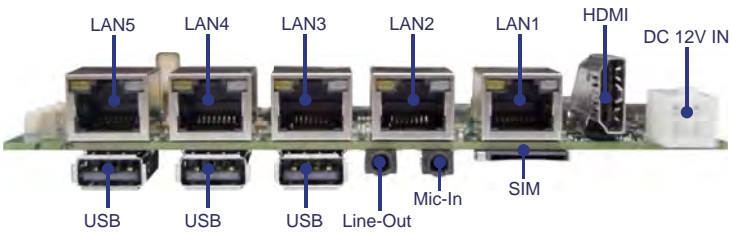
## 2-5-2 Diagram- 3I847D



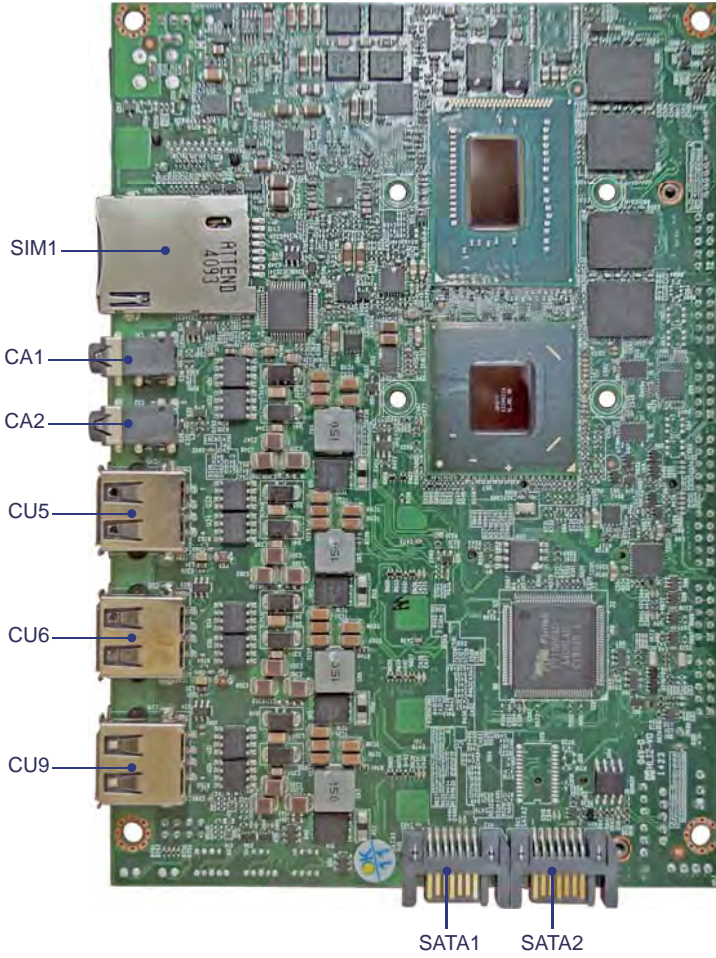
## 2-5-3 Bottom Side Diagram- 31847NM



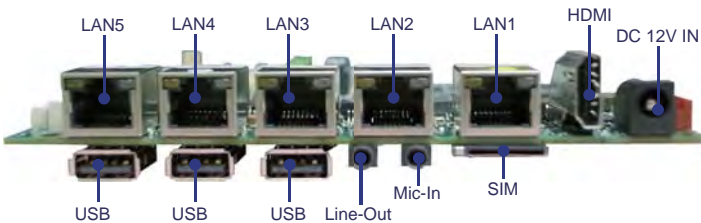
## BACK Panel- 31847NM



## 2-5-4 Bottom Side Diagram- 31847NX

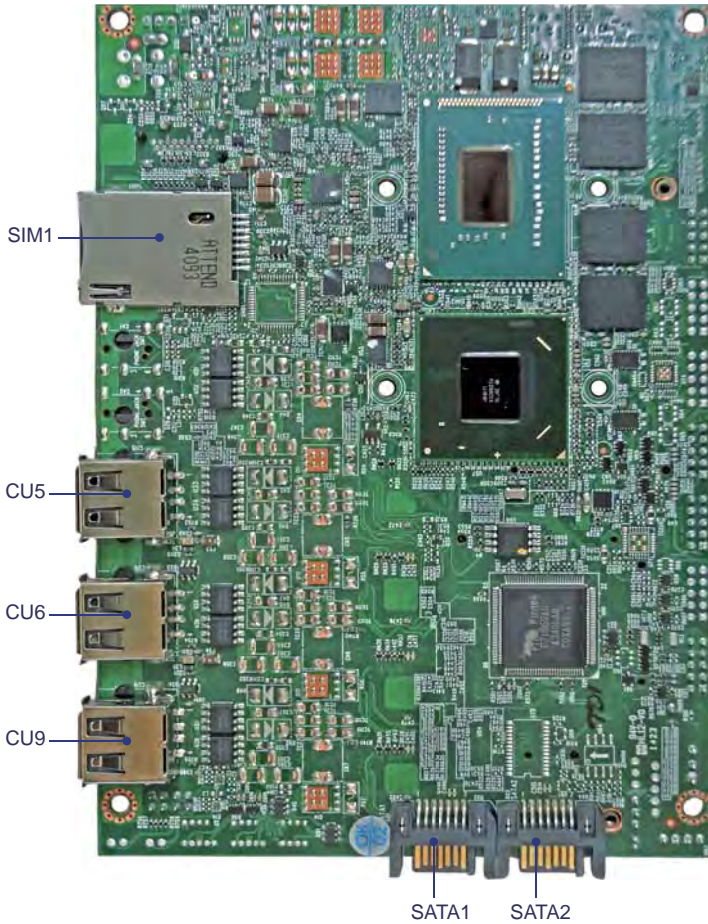


## BACK Panel- 31847NX

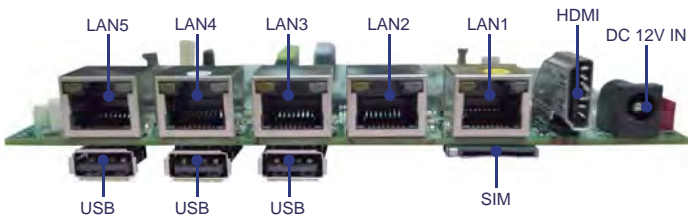




## 2-5-5 Bottom Side Diagram- 3I847D



## BACK Panel- 3I847D



---

## 2-6 List of Jumpers

JSB12: CMOS and ME RTC clear select

JVL1: LCD Panel power select

SC1: CPC default setting

## 2-7 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 .

## JSB12: CMOS & ME RTC Data Clear

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

Close Pin1 and pin 2 of JSB12 to Clear the CMOS data.

Close Pin2 and pin 3 of JSB12 to Clear the ME data.

To clear the CMOS, follow the procedures below:

1. Turn off the system and unplug the AC power
2. Remove DC 12V power cable from DC 12V power connector
3. Locate JSB12 and close pin 1-2 for few seconds
4. Return to default setting by close pin 1-2
5. Connect DC 12V power cable back to DC 12V Power connector

To clear the ME RTC Data, follow the procedures below:

1. Turn off the system and unplug the AC power
2. Remove DC 12V power cable from DC 12V power connector
3. Locate JSB12 and close pin 2-3 for few seconds
4. Return to default setting by close pin 2-3
5. Connect DC 12V power cable back to DC 12V Power connector

JSB12	Description
1-2	CMOS data clear
2-3	ME RTC data clear

Note: Jumper free is default

Note: Do not clear CMOS and ME unless

- 1. Troubleshooting**
- 2. Forget password**
- 3. You fail over-clocking system**

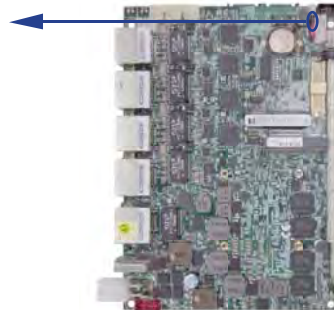
JSB12



CMOS



ME RTC



## 2-8 JVL1: LCD panel power select

JVL1	Description
1-2	+5V
2-3	+3.3V

Note: Attention! Check Device Power in spec.

JVL1



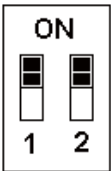
+5V



\*+3.3V

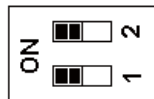


## 2-9 SC1: CPC default setting ( 1-2 ON )



1		2	
CPC function		Mode select	
Up	CPC Enabled	Up	Auto
Down	CPC Disabled	Down	Manual

SC1



---

# 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

CPI1: DC-In 2x2 pin (4pin ATX power 4.20mm) Wafer connector  
CPI11: DC-In 2x4pin(2.0mm) Red Wafer connector (Option)  
CPI12: DC-In 2x5pin(2.0mm) Red Wafer connector  
BAT1: 3V CMOS Battery hold 2pin(BR1225)  
CBT1: 3V CMOS Battery connector 2 pin(1.25mm) Wafer  
CPO1: +12V/+5V power output 4 pin (2.0mm) Black Wafer connector  
CFP1: FP port 2x5 pin (2.0mm) Wafer  
CFP2: Front Side LAN2-5 LED 2x4pin(2.0mm) Wafer  
CG1: VGA port 2x5 pin (2.0mm) Wafer  
LVDS1: LVDS 18/24Bits two ch 2x15 pin (1.25mm) connector  
CPP1: Panel inverter power connector 1x5 pin (2.0mm) Wafer  
CT1: Touch screen device 2x5 pin (2.0mm) Wafer  
CC1: COM1 2x5 pin (2.0mm) Wafer  
CC2: COM2 2x5 pin (2.0mm) Wafer  
CIO1: One DIO 2x5 pin (2.0mm) Wafer  
CIO2: One DIO 2x5 pin (2.0mm) Wafer  
CO1: I C 1x4pin (1.25mm) Wafer  
CL11: LAN 2x4 pin (2.0mm) wafer connector (option)  
CL21: LAN 2x4 pin (2.0mm) wafer connector (option)  
CL31: LAN 2x4 pin (2.0mm) wafer connector (option)  
CL41: LAN 2x4 pin (2.0mm) wafer connector (option)  
CL51: LAN 2x4 pin (2.0mm) wafer connector (option)  
CKM1: PS2 KB/MS 1x6pin(1.25mm) Wafer  
CU1: USB1 port 4pin(1.25mm) Wafer  
CU11: USB1 3.0 port 1x5in(1.25mm) Wafer  
CU2: USB2 port 1x4pin(1.25mm) Wafer  
CU12: USB2 3.0 port 1x5in(1.25mm) Wafer  
CU3: USB3 port 1x4pin(1.25mm) Wafer  
CU4: USB4 port 1x4pin(1.25mm) Wafer  
HDMI1: HDMI type A connector

## List of Connectors

SATA1/2: One SATA connector 7pin

MPCE1/2: Two Mini card socket 52pin

SIM1: SIM port 1 card socket

CO2: +12V power output 2 pin (2.0mm) Wafer connector (option)

## 3-2 DC-IN power connector

### ● CPI1: DC - in Internal connector (4pin ATX power 4.20mm) wafer

PIN NO.	Description
1,2	GND
3	CAR_IN_ACC
4	+12V DC-IN

Note: 1. Very important check DC-in Voltage type for 12V or 9~36V model spec

\*2. Because the system support PSE function, Check the total power consumption of the system used to select safe power cables, please refer to UL1007 specifications

3. Pin3 for card ignition control "Low=off " , "Hi=On"

4. Refer CPC description Appendix A: CPC-Car Power Control

### ● CPI11: DC 12V-in 2x4pin(2.0mm) Red Wafer Internal connector

PIN NO.	Description	PIN NO.	Description
1	GND	2	GND
3	DC-IN(12V)	4	DC-IN(12V)
5	DC-IN(12V)	6	DC-IN(12V)
7	GND	8	GND

Note:

1. Very important check DC-in Voltage type for 12V or 9~36V model spec

\*2. Because the system support PSE function, Check the total power consumption of the system used to select safe power cables, please refer to UL1007 specifications

● **CPI12: DC 12V-in 1x5pin(2.0mm) Red Wafer Internal connector**

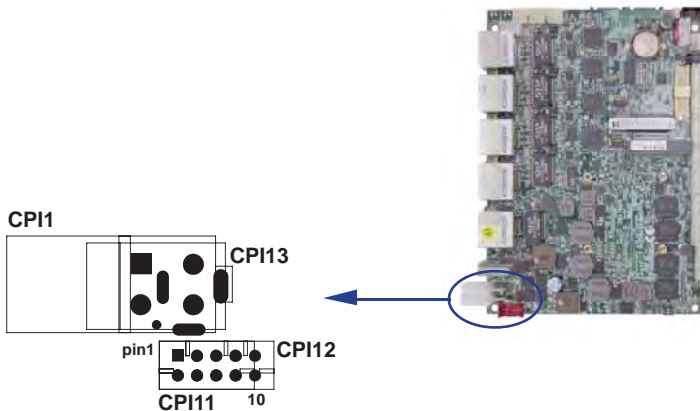
PIN NO.	Description	PIN NO.	Description
1	GND	2	GND
3	DC-IN(12V)	4	DC-IN(12V)
5	DC-IN(12V)	6	DC-IN(12V)
7	GND	8	GND
9	CAR_IN_ACC	10	NC

- Note: 1. Very important check DC-in Voltage type for 12V or 9~36V model spec  
 \*2. Because the system support PSE function, Check the total power consumption of the system used to select safe power cables, please refer to UL1007 specifications  
 3. Pin9 for card ignition control “Low=off “ , “Hi=On”  
 4. Refer CPC description Appendix A: CPC-Car Power Control

● **CPI13: DC 12V-in power Jack**

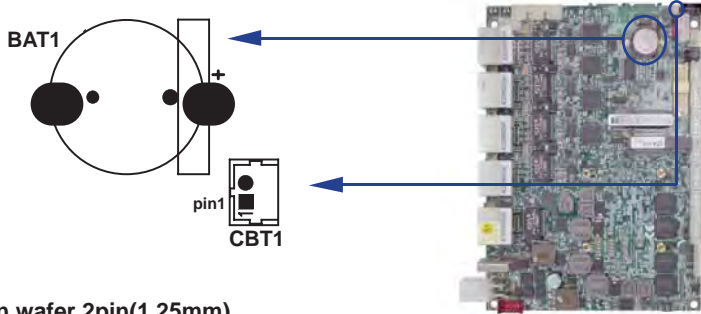
PIN NO.	Description
1	+12V DC-IN
2,3	GND

Note: Very important check DC-in Voltage



### 3-3 CMOS Battery in

- **BAT1: 3V Battery holder 2pin**  
**BAT1: Battery use type Li 3V / 48mAh (BR1225)**



- **CBT1: Battery in wafer 2pin(1.25mm)**

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

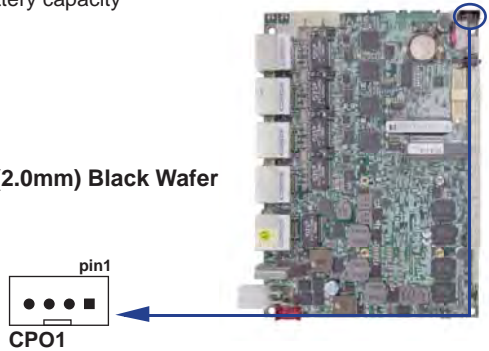
Note: CBT1 for external connector can extend battery capacity

### 3-4 DC Power output

- **DC +5/+12V Voltage output connector**  
**CPO1: +12V/+5V DC voltage output 4pin (2.0mm) Black Wafer**

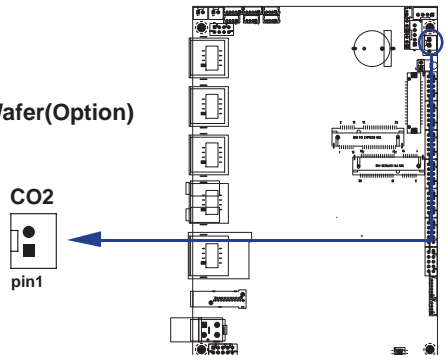
PIN NO.	Description
1	+5V
2	GND
3	GND
4	+12V*

\*Note: Attention! Check Device Power in spec



- **CO2: +12V DC voltage output 2pin (2.0mm) Wafer(Optional)**

PIN NO.	Description
1	+12V
2	GND





### 3-5 Front Panel control & FAN

● CFP1 FP 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+

Note: CFP1 power button function same as SWP1

● CFP2: Front Side LAN2-5 LED 2x4pin (2.0mm) Wafer

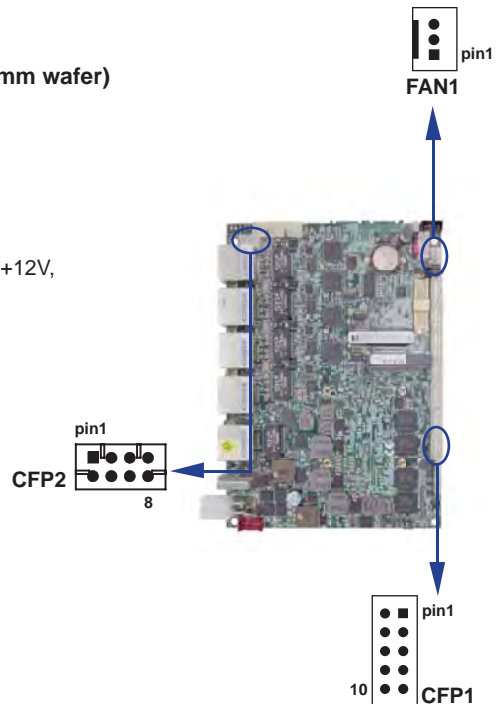
PIN NO.	Description	PIN NO.	Description
1	LAN2 LED-	2	LAN2 LED+
3	LAN3 LED-	4	LAN3 LED+
5	LAN4 LED-	6	LAN4 LED+
7	LAN5 LED-	8	LAN5 LED+

### FAN connectors

● FAN1: CPU FAN connector (3pin 2.5mm wafer)

PIN NO.	Description
1	GND
2	+12V
3	FAN speed detect

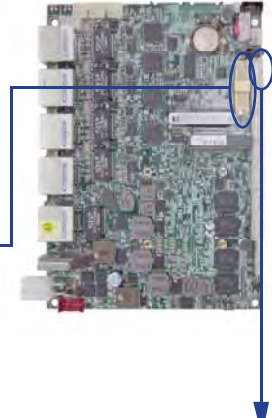
Note: DC in +12V by switch to FAN power +12V, so DC in need stable +12V input



## 3-6 VGA port Connector

### ●CG1: VGA 2x5pin 2.0mm wafer connector

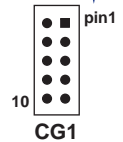
PIN NO.	Description	PIN NO.	Description
1	BLUE	2	GND
3	GND	4	DDC CLOCK
5	GREEN	6	V-SYNC
7	GND	8	H-SYNC
9	RED	10	DDC DATA



## 3-7 LVDS Connector

### ●LVDS1: 18/24bits LVDS interface (2x15pin 1.25mm wafer)

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



Note: 1. LVDS interface support 18/24bits two channel .

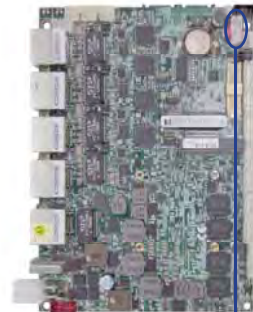
2. JVL1: LVDS panel +5V/+3.3V Voltage select

3. Pin13 is LVDS Panel Cable detected, must be connected to GND.

● **HDMI1: HDMI Connector ( Type A)**

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

\*Note: HDMI support 1.3a Spec



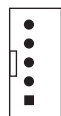
● **CPP1: Panel backlight power (5pin 2.0mm wafer)**

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

Note: 1. Attention ! Check Device Power in spec

- Pin 3 backlight dimming control. provides 200Hz / 275Hz / 380Hz / 20 KHz/25KHz and adjusts PWM duty cycle by software program .
- PWM duty cycle 100 % is Hi level +3.3V by power on default.
- Pin 4 Backlight enables output, Hi enable (+3.3V), Low disable (0V)
- Pin 5 Backlight enables output, Hi enable (+5V), Low disable (0V)

CPP1



pin1

## 3-8 Touch screen device

- **CT1: Touch screen (2x5 pin 2.0mm wafer)**  
Default use USB6 interface.

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

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

Note: For eight wire type cable Pin 3 and Pin4 need to be short-circuited.

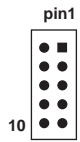
- **For 4- wire type pin define**

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

Note: For four wire type cable Pin 3 and Pin4 need to be short-circuited.

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

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



CT1



### 3-9 COM port connector

#### • Two RS232 ports (2x5pin 2.0mm Wafer)

CC1: COM 1 CC2: COM2

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

- Note: 1. All of the internal COM ports implemented with 2x5, 2.0mm pitch wafer. Pin 10 provides +5V for external device.  
 2. Default BOM set to COM1 RS232, COM2 RS485 Mode.  
 3. Option COM2 RS232 function for OEM BOM request.

#### • Two RS485 ports (2x5pin 2.0mm Wafer)

CC1: COM 1 CC2: COM2

PIN NO.	Description	PIN NO.	Description
1	RS485 TX-	2	RS485 TX+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

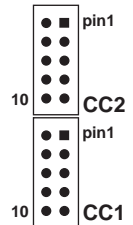
- Note: 1. Default BOM set to COM1 RS232, COM2 RS485 Mode.  
 2. Option COM1 RS485 function for OEM BOM request  
 3. BIOS need setting to RS485 mode

#### • Two RS422 ports (2x5pin 2.0mm Wafer)

CC1: COM 1 CC2: COM2

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

- Note: 1. Default BOM set to COM1 RS232, COM2 RS485 Mode.  
 2. Option RS422 function for OEM BOM request  
 3. BIOS need setting to RS485 mode  
 4. All of the internal COM ports implemented with 2x5, 2.0mm pitch wafer. Pin 10 provides +5V for external device.



## 3-10 Digital Input / Output

### • CIO1 DIO 0 ~ 3 (2x5pin 2.0mm wafer)

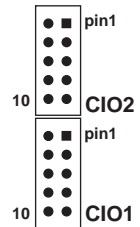
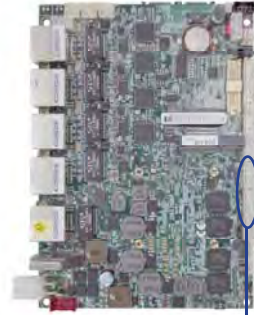
PIN NO.	Description	PIN NO.	Description
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

- Note: 1. DI pin default pull up 10K $\Omega$  to +5V  
 2. Isolated circuits are designed in external DIO board or external isolation adaptor  
 3. F75111N-1 I<sup>2</sup>C bus address 0x9c

### • CIO2 DIO 4 ~ 7 (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. Isolated circuits are designed in external DIO board or external isolation adaptor  
 3. F75111N-1 I<sup>2</sup>C bus address 0x9c



### • WDT For F75111N I<sup>2</sup>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.

is with 10~20% tolerance due to temperature factor

Note: Please refer to "Manual" for sample code for details

## 3-10-1 IO Device:F75111 under DOS

### The Sample code source you can download from

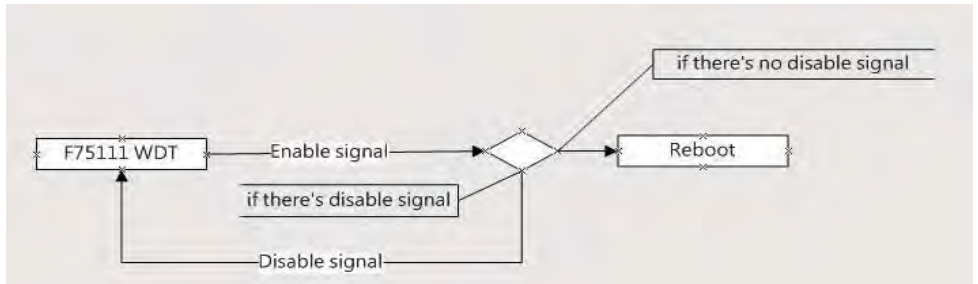
Source file: F75111\_Dos\_Src.rar [http://tprd.info/lexwiki/index.php/IO\\_Device:F75111\\_under\\_DOS](http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_DOS)

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



## Introduction

### How to use this Demo Application

```
Write2CByte(I2CADDR, CONFIG, 0x03); //Set Watch Dog Timer function
Write2CByte(I2CADDR, WDT_TIMER, timer); //Set Watch Dog Timer range from 0-255.
Write2CByte(I2CADDR, WDT_TIMER_CTL, 0x73); //Enable Watch Dog Timer in second and pulse mode
```

### How to use this Demo Application

```
Write2CByte(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;
}
```

## 3-10-2 IO Device: F75111 under Windows

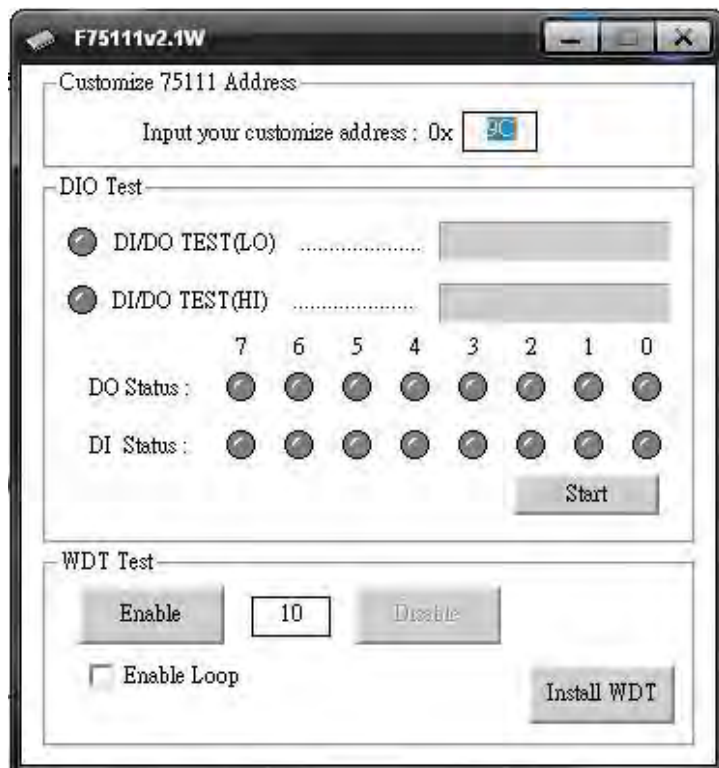
### The Sample code source you can download from



Source file: F75111\_DIOSrc.rar [http://tprd.info/lexwiki/index.php/IO\\_Device:F75111](http://tprd.info/lexwiki/index.php/IO_Device:F75111)

Binary file: F75111\_DemoBin.rar

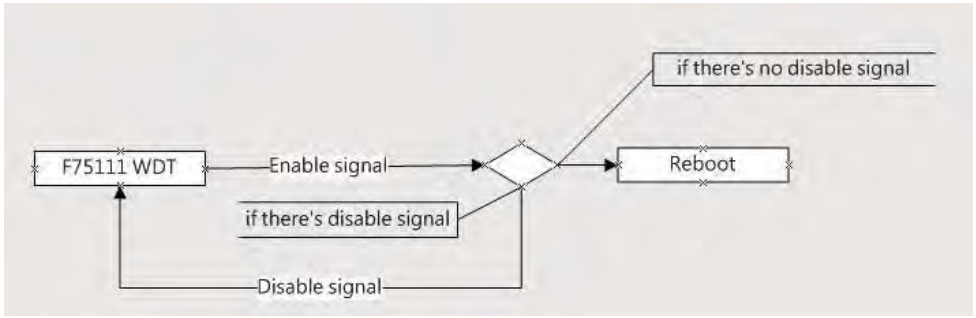
USERNAME & PASSWORD: sf

### 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 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

## 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.
}
  
```

### Sample to setting GP33, 32, 31, 30 output 1mS low pulse signal.

```

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 & 0x08 )? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x10 )? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20 )? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x40 )? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x80 )? 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  
}
```

## 3-10-3 IO Device: F75111 VB6 under Windows

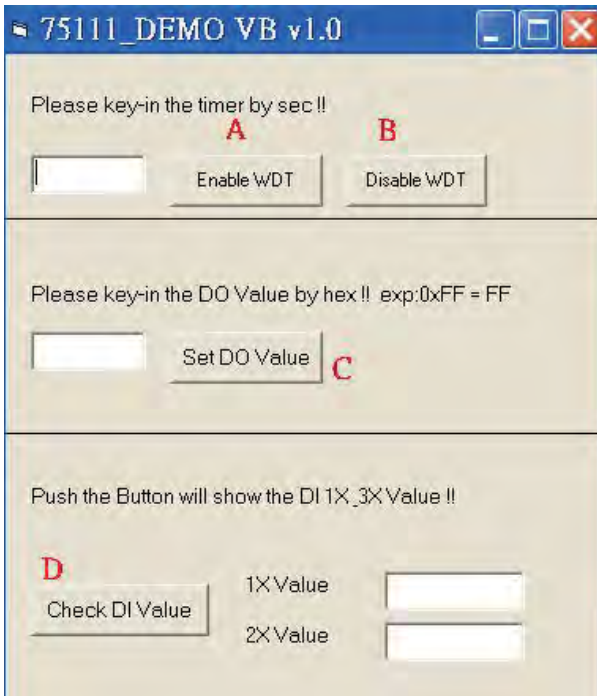
### The Sample code source you can download from

Source file: 75111\_VB\_v10.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\_Src.rar

USERNAME & PASSWORD: sf

### How to use this Demo Application



**A Function - Enable WDT timer ,Key-in the value by seconds then system will reboot after value which you key-in in left text box !!**

**B Function - Disable WDT timer ,Push down the button then WDT timer value will be clear !!**

**C Function - Set DO Value ,Key-in the DO value by hex then push the button !!**

**D Function - Check DI Value ,The right side two text box will display DI 1X & 2X Value when you push down the button!!**

## 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)

Call Writel2CByte(&H23, &H0)

Call Writel2CByte(&H20, &HFF)

Call Writel2CByte(&H2B, &HFF)

Call Writel2CByte(&H21, dovalue)

End Function

### Function CheckDIValue

Function CheckDIValue()

Dim GPIO1X As Integer

Dim GPIO3X As Integer

Dim DI1Xhex As String

Dim DI3Xhex As String

Call Readl2CByte(&H12, GPIO1X)

Call Readl2CByte(&H42, GPIO3X)

DI1Xhex = Hex(GPIO1X)

DI3Xhex = Hex(GPIO3X)

Text3.Text = "0x" + DI1Xhex

Text4.Text = "0x" + DI3Xhex

End Function

## 3-10-4 IO Device: F75111 under linux

### The Sample code source you can download from

Source file: F75111v2.0L.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: F75111v2.0LBin.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
```

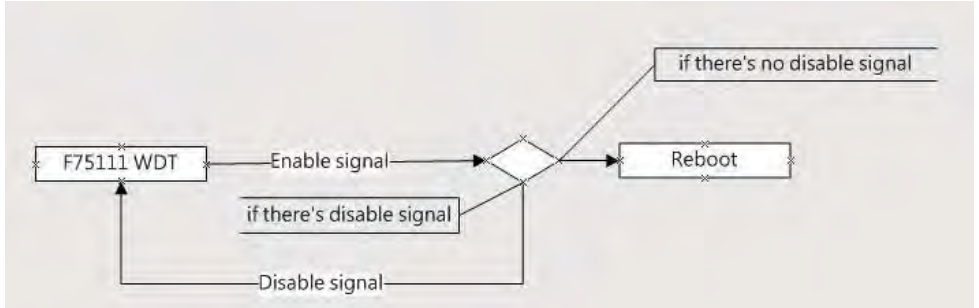
```
1.make
```

```
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.

## 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 & 0x08)? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x10)? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20)? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x40)? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x80)? 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
}
```



### 3-11 I<sup>2</sup>C Bus Interface

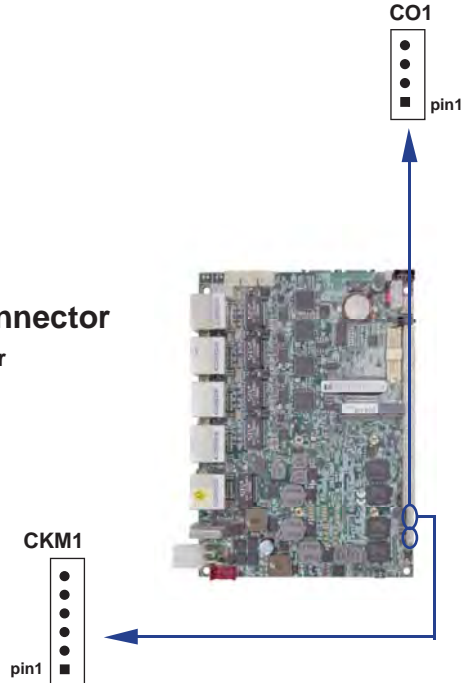
- CO1: I<sup>2</sup>C Bus 4 pin (1.25mm) Wafer

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

### 3-12 PS2 Keyboard / Mouse connector

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

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



### 3-13 Audio interface

- Audio Amplifier class D Two channel

2.57 W/Ch (Typ.) into a 4ΩLoad

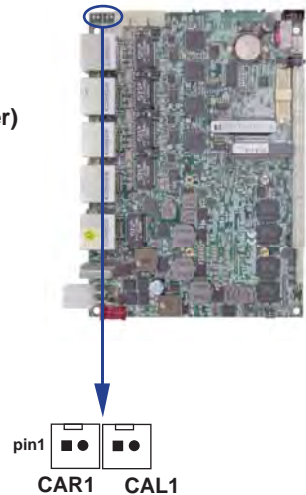
1.46 W/Ch (Typ.) into a 8ΩLoad

- CAR1: Audio Amplifier Line Out Right (2pin 2.0mm wafer)

PIN NO.	Description
1	LINE-OUT_R+
2	LINE-OUT_R-

- CAL1: Audio Amplifier Line Out Left (2pin 2.0mm wafer)

PIN NO.	Description
1	LINE-OUT_L+
2	LINE-OUT_L-



### 3-14 LAN Interface

● **CL1,CL2,CL3,CL4,CL5: LAN Giga/100Mb (RJ45 Jack)**

PIN NO.	Description	PIN NO.	Description
1	TD0+/TX+	5	TD2-/NC
2	TD0-/TX-	6	TD1-/RX-
3	TD1+/RX+	7	TD3+/NC
4	TD2+/NC	8	TD3-/NC



● **RJ45 LAN Connector--- LED define Giga/100MB Connector**

Back side con	RED LED	GREEN LED	YELLOW LED
Indicate	GIGA LAN Link(light)	100Mb LAN Link(light)	Active LED Link(Blink)

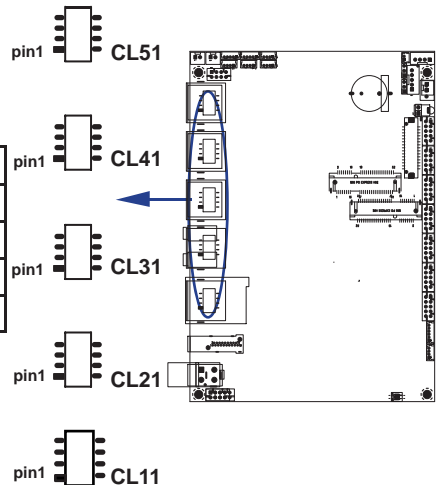
● **LAN LED**

Intel 82579LM

Speed	10 Mbps			100 Mbps			1000 Mbps		
	Back Side		Fornt Side	Back Side		Fornt Side	Back Side		Fornt Side
	Link Led	ACT Led	ACT Led	Link Led	ACT Led	ACT Led	Link Led	ACT Led	ACT Led
LAN light		Orange	Orange	Green	Orange	Orange	Red	Orange	Orange

● **CL11,CL21,CL31,CL41,CL51: LAN signal out (2x4pin wafer 2.0mm)**

PIN	Signal	PIN	Signal
1	TR0-	5	TR1-
2	TR0+	6	TR2+
3	TR2+	7	TR3-
4	TR1+	8	TR3+



● **CL11,CL21,CL31,CL41,CL51 Wafer to RJ45**

RJ45 PIN	CL11,CL21,CL31, CL41,CL51 PIN	Description	RJ45 PIN	CL11,CL21,CL31, CL41,CL51 PIN	Description
1	2	TR0+/TX+	5	6	TR2-/NC
2	1	TR0-/TX-	6	5	TR1-/RX-
3	4	TR1+/RX+	7	8	TR3+/NC
4	3	TR2+/NC	8	7	TR3-/NC

Note: 1. The definition of RJ45 connector and RJ45 pin header is different, please refer to above table for pin header definition

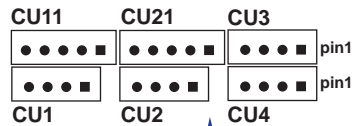
2. RJ45 PIN to CL11,CL21,CL31,CL41,CL51 cable check table

3. Can use CL001,CL002 connector board to RJ45 connector

### 3-15 USB port

● **CU5/CU6/CU9: USB 5/6/9 ports ( USB Type A connector )**

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



● **Internal USB connector (4pin 1.25mm Wafer)**

**CU1/CU2: USB 1/2 ports**

**CU3/CU4: USB 3/4 ports**

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



● **CU1/CU11: USB2.0/3.0 port (1x4pin + 1x5pin 1.25mm Wafer)**

**CU2/CU21: USB2.0/3.0 port**

PIN NO.	CU1/CU2(1x4pin 1.25mm)	PIN NO.	CU11/CU21(1x5pin 1.25mm)
1	+5V	1	USB3.0 TX+
2	USB 2.0 D-	2	USB3.0 TX-
3	USB 2.0 D+	3	GND
4	GND	4	USB3.0 RX+
		5	USB3.0 RX-

Note: 1. Can use CU001 connector Board to USB 3.0 Type A

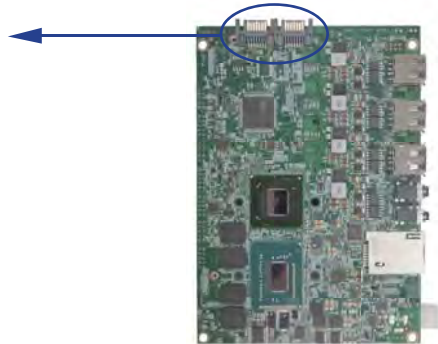
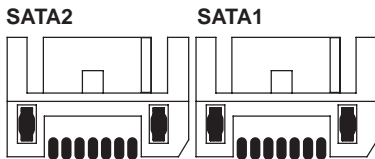
2. USB2.0/3.0 Keyboard and Mouse cannot work during the process of OS installation. due to driver issue.

## 3-16 SATA port

### • SATA1/2: SATA connector (7pin wafer)

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

Note: CPO1 provide SATA HDD power.

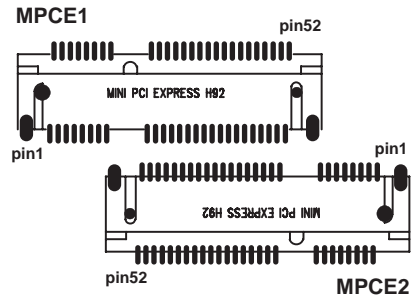


## 3-17 Mini card

● **MPCE1: Full size mini card (Mini card socket 52pin)**

**MPCE2: Full size mini card (Mini card socket 52pin)**

PIN NO.	Description	PIN NO.	Description
1	NC (Wake up)	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC (CLKREQ-)	8	NC
9	GND	10	NC
11	PCIe-CLK-	12	NC
13	PCIe-CLK+	14	NC
15	GND	16	NC
KEY	KEY	KEY	KEY
17	NC	18	GND
19	NC	20	NC
21	GND	22	PRST-
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	NC ( mSATA detect)	52	+3.3V



Note: 1. MPCE1: Default support USB / PCIe interface / mSATA 3.0(auto detect)  
 2. MPCE2: Default support USB / PCIe interface / mSATA 2.0(auto detect)

---

# 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.

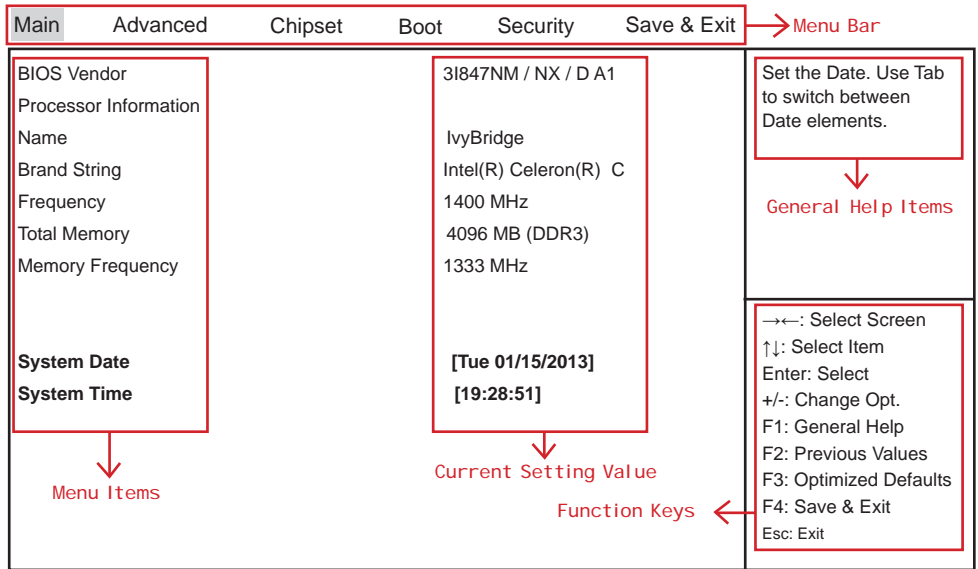
### 4-1 Enter Setup

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. You may also restart the system by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.

## 4-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen



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## 4-3 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 <+>/<-> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous value.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to quit the BIOS Setup.

## 4-4 Getting Help

### Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

### Status Page Setup Menu/Option Page Setup Menu

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

## 4-5 Menu Bars

There are six menu bars on top of BIOS screen:

- Main** To change system basic configuration
- Advanced** To change system advanced configuration
- Chipset** To change chipset configuration
- Boot** To change boot settings
- Security** Password settings
- Save & 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.

## 4-6 Main

Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Vendor			3I847NM / NX / D A1		Set the Date. Use Tab to switch between Date elements.
Processor Information					
Name			IvyBridge		
Brand String			Intel(R) Celeron(R) C		
Frequency			1400 MHz		
Total Memory			4096 MB (DDR3)		
Memory Frequency			1333 MHz		
System Date			[Tue 01/15/2013]		→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
System Time			[19:28:51]		

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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.

## 4-7 Advanced

Main   **Advanced**   Chipset   Boot   Security   Save & Exit

<ul style="list-style-type: none"><li>▶ ACPI Settings</li><li>▶ S5 RTC Wake Settings</li><li>▶ CPU Configuration</li><li>▶ SATA Configuration</li><li>▶ USB Configuration</li><li>▶ SMART Settings</li><li>▶ F71869 Super IO Configuration</li><li>▶ F71869 H/W Monitor</li><li>▶ Network Stack</li></ul>	<p>System ACPI Parameters</p> <hr/> <p>→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit Esc: Exit</p>
---	---

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### ACPI Settings

Please refer section 4-7-1

### S5 RTC Wake Setting

Please refer section 4-7-2

### CPU Configuration

Please refer section 4-7-3

### SATA Configuration

Please refer section 4-7-4

### USB Configuration

Please refer section 4-7-5

### SMART Settings

Please refer section 4-7-6

## F71869 Super IO Configuration

Please refer section 4-7-7

## F71869 H/W Monitor

Please refer section 4-7-8

## Network Stack

Please refer section 4-7-9

## 4-7-1 ACPI Settings

Main	<b>Advanced</b>	Chipset	Boot	Security	Save & Exit
ACPI Settings					Enables or Disables BIOS ACPI Auto Configuration.
Enable	ACPI AUTO Configuration			<b>[Disabled]</b>	
Enable	Hibernation			<b>[Enabled]</b>	
ACPI	Sleep State			<b>[S1 only(CPU Stop C..)]</b>	
					→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Enable ACPI Auto Configuration

This item allows you to Enabled/Disabled the Advanced Configuration and Power Management (ACPI).

### Enable Hibernation

This item allows you to Enabled/Disabled the Hibernate feature.

### ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

The optional settings: Suspend Disabled / S1 only(CPU Stop Clock) / S3 only(Suspend to RAM) / Both S1 and S3 available for OS choose from.

## 4-7-2 S5 RTC Wake Settings

Main   **Advanced**   Chipset   Boot   Security   Save & Exit

Wake system with Fixed Time	[Disabled]	Enable or disable System wake on alarm event. When enable, System will wake on the hr :: min :: sec specified
Wake system with Dynamic Time	[Disabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Wake system with Fixed Time

Use this item to Enable or Disable system wake on alarm event. When set as Enabled, system will wake on the hour/min/sec specified.

### Wake system with Dynamic Time

Use this item to Enable or Disable system wake on alarm event. When set as Enabled, system will wake on the current time + Increase minute(s).

## 4-7-3 CPU Configuration

Main **Advanced** Chipset Boot Security Save & Exit

CPU Configuration		Number of cores to enable in each processor package.
Intel(R) Celeron(R) CPU 1047UE @ 1.40GHz		
CPU Signature	306a9	
Microcode Path	10	→←: Select Screen
Max CPU Speed	1400 MHZ	↑↓: Select Item
Min CPU Speed	800 MHZ	Enter: Select
CPU Speed	1400 MHZ	+/-: Change Opt.
Processor Cores	2	F1: General Help
Intel HT Technology	Not Supported	F2: Previous Values
Intel VT-x Technology	Supported	F3: Optimized Defaults
Intel SMX Technology	Not Supported	F4: Save & Exit
64-bit	Supported	Esc: Exit
L1 Data Cache	32 KB x 4	
L1 Code Cache	32 KB x 4	
L2 Cache	256 KB x 4	
L3 Cache	2048 KB	
Active Processor Cores	<b>[All]</b>	
Execute Disable Bit	<b>[Enabled]</b>	
Intel Virtualization Technology	<b>[Disabled]</b>	

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### Active Processor Cores

Use this item to select number of cores to enable in each processor package.

### Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.)

The optional settings are: Disabled, Enabled.

### Intel Virtualization Technology

When set as Enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

The optional settings: Enabled, Disabled.

## 4-7-4 SATA Configuration

Main **Advanced** Chipset Boot Security Save & Exit

SATA Controller(s)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[IDE]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### SATA Controller(s)

Use this item to Enable or Disable SATA Device.

### SATA Mode Selection

Determine how SATA controller(s) operate.

The optional settings are: IDE Mode, AHCI Mode.

## 4-7-4-1 SATA Mode Selection - AHCI Mode

Main **Advanced** Chipset Boot Security Save & Exit

SATA Controller(s)	[Enabled]	Enable or disable SATA Device.
SATA Mode Selection	[AHCI]	
SATA Controller Speed	[Gen3]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

The optional settings: Gen1, Gen2, Gen3.

## 4-7-5 USB Configuration

Main **Advanced** Chipset Boot Security Save & Exit

USB Configuration		Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.
USB Devices:		
1 Keyboard, 2 Mice, 2 Hubs		
Legacy USB Support	<b>[Enabled]</b>	
USB3.0 Support	<b>[Enabled]</b>	
XHCI Hand-off	<b>[Enabled]</b>	
EHCI Hand-off	<b>[Disabled]</b>	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

### USB3.0 Support

Use this item to turn on/off USB3.0 Controller support.

The optional settings are: Enabled, Disabled.

### XHCI Hand-off

This is a workaround for OSES without XHCI handoff support.

The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: Enabled, Disabled..

### EHCI Hand-off

This is a workaround for OSES without EHCI handoff support.

The EHCI ownership change should be claimed by EHCI driver.

The optional settings are: Enabled, Disabled.

## 4-7-6 SMART Settings

Main **Advanced** Chipset Boot Security Save & Exit

Smart Settings		Run SMART Self Test on all HDDs during POST.
Smart Self Test	<b>[Disabled]</b>	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### SMART Self Test

Run Smart Self Test on all HDDs during POST.

The optional settings are: Disabled, Enabled.

## 4-7-7 F71869 Super IO Configuration

Main **Advanced** Chipset Boot Security Save & Exit

F71869 Super IO Configuration		Set Parameters of Serial Port 1(COMA)
F71869 Super IO Chip	F71869	
▶ Serial Port 1 Configuration		
▶ Serial Port 2 Configuration		
Power Failure	<b>[Keep last state]</b>	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Serial Port 1 Configuration

Please refer section 4-7-7-1

### Serial Port 2 Configuration

Please refer section 4-7-7-1

### Power Failure

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

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

[Bypass mode] Restores the system to the bypass mode.

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

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

## 4-7-7-1 Serial Port 1 Configuration

Main **Advanced** Chipset Boot Security Save & Exit

Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Change Settings	[AUTO]	
COM1 422/485 control flow	[Disabled]	

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### Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

### Device Settings

Serial Port 1 IO=3F8h; IRQ=4;

### Change Settings

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

The optional settings are:

AUTO

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3,4,5,6,7,10,11,12;

IO=2F8h; IRQ=3,4,5,6,7,10,11,12;

IO=3E8h; IRQ=3,4,5,6,7,10,11,12;

IO=2E8h; IRQ=3,4,5,6,7,10,11,12;

### COM1 422/485 control flow

Use this item to enable or disable serial port (COM) Auto flow

The optional settings are: Enabled, Disabled.



## 4-7-7-2 Serial Port 2 Configuration

Main **Advanced** Chipset Boot Security Save & Exit

Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=2F8h; IRQ=3;	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Change Settings	[AUTO]	
COM1 422/485 control flow	[Enabled]	

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### Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

### Device Settings

Serial Port 2 IO=2F8h; IRQ=3

### Change Settings

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

The optional settings are:

AUTO

IO=2F8h; IRQ=3;

IO=3F8h; IRQ=3,4,5,6,7,10,11,12;

IO=2F8h; IRQ=3,4,5,6,7,10,11,12;

IO=3E8h; IRQ=3,4,5,6,7,10,11,12;

IO=2E8h; IRQ=3,4,5,6,7,10,11,12;

### COM2 422/485 control flow

Use this item to enable or disable serial port (COM) Auto flow

The optional settings are: Enabled, Disabled.

## 4-7-8 F17869 H/W Monitor

### F17869 H/W Monitor

Press [Enter] to view PC health status.

This section shows the status of your CPU, Fan, and overall system.

This is only available when there is Hardware Monitor function onboard.

## 4-7-9 Network Stack

Main **Advanced** Chipset Boot Security Save & Exit

<p>Network stack <span style="float: right;">[Disabled Link]</span></p>	<p>Enable/Disable UEFI network stack.</p> <hr/> <p>→←: Select Screen          ↑↓: Select Item          Enter: Select          +/-: Change Opt.          F1: General Help          F2: Previous Values          F3: Optimized Defaults          F4: Save &amp; Exit          Esc: Exit</p>
---	---

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### Network Stack

Enable/Disable UEFI network stack.

The optional settings are: Disable Link, Enable.

## 4-8 Chipset

Main Advanced **Chipset** Boot Security Save & Exit

<p>▶ PCH-IO Configuration          ▶ System Agent (SA) Configuration</p>	<p>PCH Parameters</p> <hr/> <p>→←: Select Screen          ↑↓: Select Item          Enter: Select          +/-: Change Opt.          F1: General Help          F2: Previous Values          F3: Optimized Defaults          F4: Save &amp; Exit          Esc: Exit</p>
--	---

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### PCH-IO Configuration

Please refer section 4-8-1

### System Agent (SA) Configuration

Please refer section 4-8-2

## 4-8-1 PCH-IO Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

Intel PCH SKU Name	HM76	PCI Express Configuration settings
Intel PCH Rev ID	04/C1	
▶ PCI Express Configuration		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
▶ USB Configuration		
▶ PCH Azalia Configuration		
Wake on LAN	<b>[Disabled]</b>	

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### PCI Express Configuration

Please refer section 4-8-1-1

### USB Configuration

Please refer section 4-8-1-2

### PCH Azalia Configuration

Please refer section 4-8-1-3

### Wake on LAN

Use this item to enable or disable integrated LAN to wake the system.

## 4-8-1-1 PCI Express Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

PCI Express Configuration		PCI Express Configuration settings
▶ Mini PCIe 1		
▶ Mini PCIe 2		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Mini PCIe 1

Please refer section 4-8-1-1-1

## Mini PCIe 2

Please refer section 4-8-1-1-1

### 4-8-1-1-1 Mini PCIe 1 / 2

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

PCI Express Root Port 7/8 PCIe Speed	<b>[Enabled]</b> <b>[Gen1]</b>	Control the PCI Express Root Port.  →←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
---	-----------------------------------	---

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#### PCI Express Root Port 7/8

Control the PCI Express Root Port.

The optional settings are: Enabled, Disabled.

#### PCIe Speed

Select PCI Express port speed.

The optional settings are: Auto, Gen1, Gen2.

### 4-8-1-2 USB Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

USB Configuration		Enable or disable XHCI Pre-Boot Driver support.
XHCI Pre-Boot Driver	<b>[Disabled]</b>	→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
xHCI Mode	<b>[Disabled]</b>	
EHCI1	<b>[Enabled]</b>	
EHCI2	<b>[Enabled]</b>	
USB Ports Per-Port Disable Control	<b>[Disabled]</b>	

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#### XHCI Pre-Boot Driver

Use this item to enable or disable XHCI Pre-Boot Driver Support.

## xHCI Mode

Mode of operation of xHCI controller.

The optional settings are: Smart Auto, Auto, Enabled, Disabled.

Please refer section 4-8-1-2-1

## EHCI1/ EHCI2

Use this item to enable or disable USB EHCI (USB 2.0) support.

One EHCI controller must always be enabled.

The optional settings are: Enabled, Disabled.

## USB Port Pre-Port Disable Control

Use this item to control each of the USB ports (0~13) disabling.

The optional settings are: Disabled, Enabled.

## 4-8-1-2-1 xHCI Mode

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					Enable or disable XHCI Pre-Boot Driver support.
XHCI Pre-Boot Driver				[Enabled]	
xHCI Mode				[Smart Auto]	→←: Select Screen
HS Port #1 Switchable				[Enabled]	↑↓: Select Item
HS Port #2 Switchable				[Enabled]	Enter: Select
HS Port #3 Switchable				[Enabled]	+/-: Change Opt.
HS Port #4 Switchable				[Enabled]	F1: General Help
xHCI Streams				[Enabled]	F2: Previous Values
EHCI1				[Enabled]	F3: Optimized Defaults
EHCI2				[Enabled]	F4: Save & Exit
USB Ports Per-Port Disable Control				[Disabled]	Esc: Exit

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### HS Port #1 Switchable

### HS Port #2 Switchable

### HS Port #3 Switchable

### HS Port #4 Switchable

Always for HS port switching between xHCI and EHCI. If disabled,

port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

The optional settings are: Disabled, Enabled.

## xHCI Streams

Use this item to enable or disable xHCI Maximum Primary Stream Array Size.  
The optional settings are: Disabled, Enabled.

## 4-8-1-3 PCH Azalia Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

PCH Azalia Congiguration		Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled Enabled = Azalia will be unconditionally Enabled Auto = Azalia will be enabled if present, disabled otherwise.
Azalia	[Auto]	
Azalia Docking Support	[Disabled]	
Azalia Internal HDMI Codec	[Enabled]	
Azalia HDMI Codec	[Enabled]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Azalia

Use this item to enable, disable or auto control detection of the Azalia device.

### Azalia Dcoking Support

Use this item to enable or disable Audio Controller of Azalia Docking.

### Azalia Internal HDMI Codec

Use this item to enable or disable internal HDMI codec for Azalia.

### Azalia HDMI Codec

Use this item to enable or disable internal HDMI codec Port for Azalia.

## 4-8-2 System Agent (SA) Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

System Agent Bridge Name	IvyBridge	Config Graphics Settings.
System Agent RC Version	1.2.0.0	
▶ Graphics Configuration		→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Graphics Configuration

Please refer section 4-8-2-1

### 4-8-2-1 Graphics Configuration

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

Graphics Configuration		Graphics turbo IMON current values supported (14-31)
IGFX VBIOS Version	2170	→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
IGfx Frequency	350 MHz	
Graphics Turbo IMON Current	31	
Aperture Size	<b>[256MB]</b>	
DVMT Pre-Allocated	<b>[64M]</b>	
DVMT Total Gfx Mem	<b>[256M]</b>	
▶ LCD Control		

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### Graphics Turbo IMON Current

Graphics turbo IMON current values supported (14-31)

### Aperture Size

The optional settings are: 128MB,256MB,512MB.

### DVMT Total Gfx Mem

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

32/64/96/128/160/192/224/256/288/320/352/384/416/448/480/512/1024M

## 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, MAX.

## LCD Control

Please refer section 4-8-2-1-1

## 4-8-2-1-1 LCD Control

Main    Advanced    **Chipset**    Boot    Security    Save & Exit

Graphics Configuration		
Primary IGFX Boot Display	[CRT]	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
Secondary IGFX Boot Display	[HDMI]	
LCD Panel Type	[VBIOS Default]	
Panel Color Depth	[18 Bit]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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### Primary IGFX Boot Display

Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

The optional settings are: VBIOS Default, CRT, HDMI, LVDS.

### Secondary IGFX Boot Display

The optional settings are: Disabled, CRT, HDMI, LVDS.



## LCD Panel Type

This item allows you to select the panel resolution

1. VBIOS Default
2. 1024 X 600 LVDS
3. 800 X 600 LVDS
4. 1024 X 768 LVDS1
5. 1280 X 1024 LVDS
6. 1440 X 1050 (RB) LVDS1
7. 1440 X 1050 LVDS2
8. 1600 X 1200 LVDS
9. 1366 X 768 LVDS
10. 1680 X 1050 LVDS
11. 1920 X 1200 LVDS
12. 1440 X 900 LVDS
13. 1600 X 900 LVDS
14. 1024 X 768 LVDS2
15. 1280 X 800 LVDS
16. 1920 X 1080 LVDS
17. 2048 X 1536 LVDS

## Panel Color Depth

Use this item to select the LFP Panel Color Depth 18Bit or 24Bit.

## 4-9 Boot

Main    Advanced    Chipset    **Boot**    Security    Save & Exit

Boot Configuration		Select the keyboard NumLock state
Bootup NumLock State	<b>[On]</b>	
Quiet Boot	<b>[Enabled]</b>	
CSM16 Module Version	07.69	→←: Select Screen
GateA20 Active	<b>[Upon Request]</b>	↑↓: Select Item
Boot Option Priorities		Enter: Select
▶ CSM parameters		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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### Bootup NumLock State

Use this item to select keyboard NumLock State.

The optional settings are: On, Off.

### Quiet Boot

The optional settings are: Enabled, Disabled.

## Gate A20 Active

UPON REQUEST- GA20 can be disabled using BIOS services.  
ALWAYS- do not allow disabling GA20.

## CSM parameters

Please refer section 4-9-1

### 4-9-1 CSM parameters

Main    Advanced    Chipset    **Boot**    Security    Save & Exit

Boot option filter	[Legacy only]	This option controls what devices system can boot to
Launch PXE OpROM policy	[Do not launch]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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#### Boot option filter

This option controls what devices system can boot to.

The optional settings are: UEFI and Legacy, legacy only, UEFI only.

#### Launch PXE OpROM policy

This option controls the execution of UEFI and Legacy PXE OpROM.

The optional settings are: Do not launch, UEFI only, Legacy only.

## 4-10 Security

Main    Advanced    Chipset    Boot    **Security**    Save & Exit

<p>Password Description</p> <p>If ONLY the Administrator's password is set, Then this only limits access to Setup and is only asked for when entering Setup.</p> <p>If ONLY the User's password is set, then this Is a power on password and must be entered to Boot or enter Setup. In Setup the User will Have Administrator right.</p> <p>The password length must be In the following range:</p> <table border="0"> <tr> <td>Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password</p> <p>User Password</p>	Minimum length	3	Maximum length	20	<p>Set Administrator Password</p> <hr/> <p>→←: Select Screen          ↑↓: Select Item          Enter: Select          +/-: Change Opt.          F1: General Help          F2: Previous Values          F3: Optimized Defaults          F4: Save &amp; Exit          Esc: Exit</p>
Minimum length	3				
Maximum length	20				

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### Administrator Password & User Password

To set up an administrator password:

1. Select Administrator 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 20 characters.
3. Hit [Enter] key to submit.

## 4-11 Save & Exit

Main    Advanced    Chipset    Boot    Security    **Save & Exit**

<p>Save Changes and Reset</p> <p>Restore Defaults</p> <p>Boot Override</p>	<p>Reset the system after saving the changes.</p> <hr/> <p>→←: Select Screen          ↑↓: Select Item          Enter: Select          +/-: Change Opt.          F1: General Help          F2: Previous Values          F3: Optimized Defaults          F4: Save &amp; Exit          Esc: Exit</p>
---	---

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### Save Changes and Reset

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

### Restore Defaults

Use this item to restore /load default values for all the setup options.

---

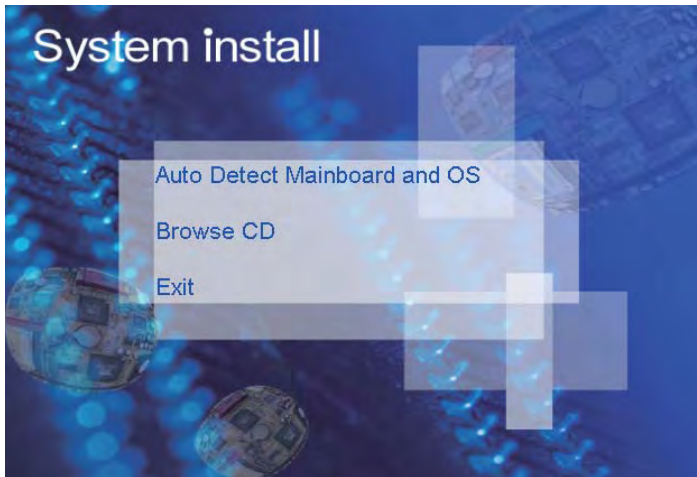
# Chapter-5

## DRIVER INSTALLATION

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

### SYSTEM INSTALL Supports Windows XP/Windows 7/Windows 8/8.1

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

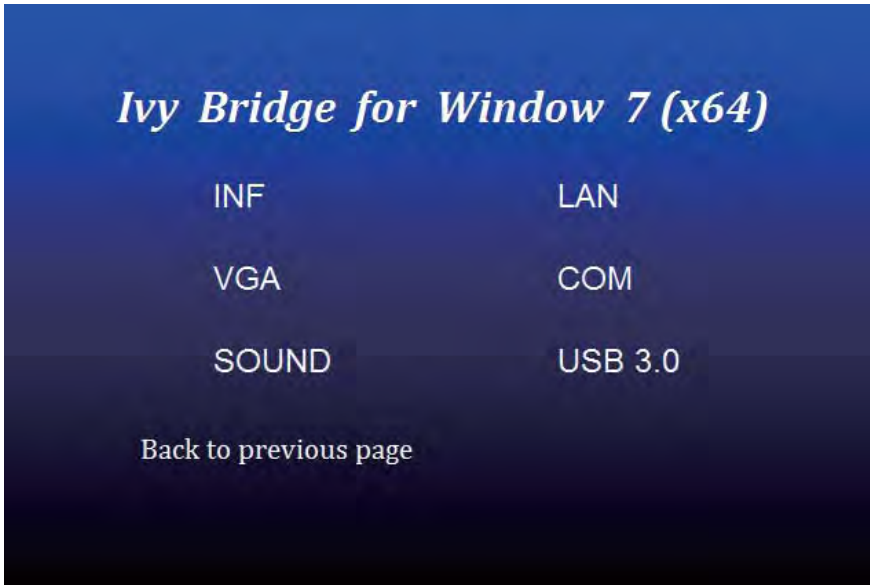


### Make your selection from SYSTEM INSTALL menu:

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

---

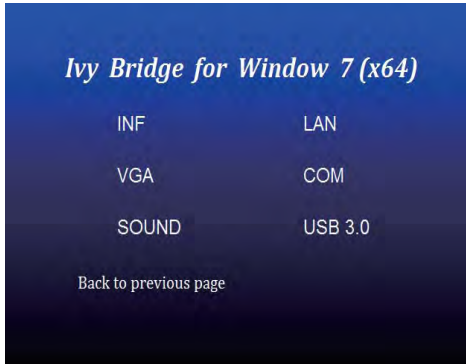
## AUTOMATIC DRIVER INSTALLATION menu



1. INF                   install Intel Ivy Bridge chipset driver
2. VGA                   install onboard VGA driver
3. SOUND               install VIA HD Audio Codec driver
4. LAN                   to the LAN driver Readme file
5. COM                   to the COM driver Readme file
6. USB 3.0             install Intel USB 3.0 extensible Host Controller driver

Each selection is illustrated below:

## 5-1 INF Install Intel Ivy Bridge Chipset Driver



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



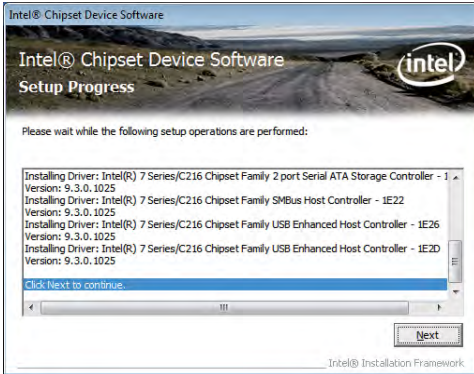
2. At the "Intel® Chipset Device Software" screen, click "Next".



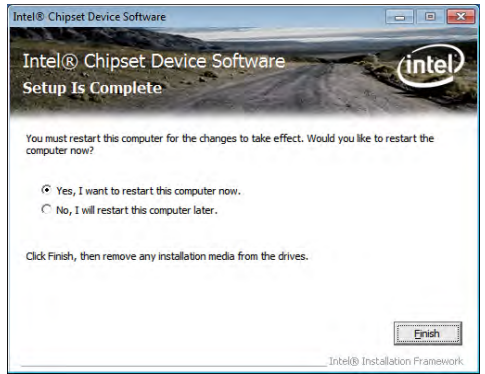
3. At the "License Agreement" screen, click "Yes".



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



5. Click "Next"



6. Click "Finish" to restart computer

**NOTE: SYSTEM INSTALL will auto detect file path**

**For Windows XP 64/32-bit, Windows 7 64/32-bit and windows 8 64/32-bit**

**X:\driver\INTEL\IVY\_SAN\inf\inst\_autol.exe**

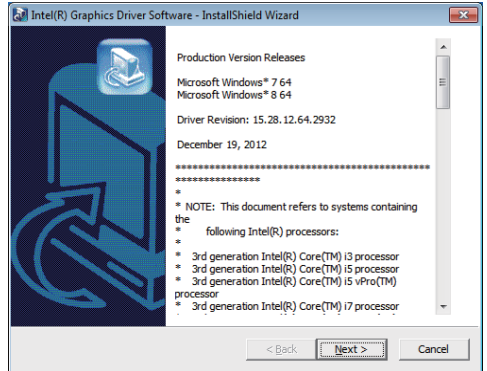
**For Windows 8.1 64/32-bit**

**X:\driver\INTEL\IVY\_SAN\inf\WIN8.1\Setup.exe**

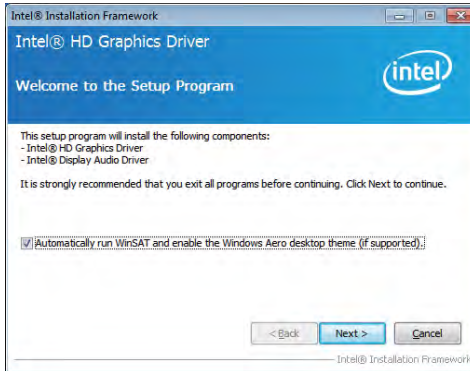
## 5-2 VGA Install Intel Ivy Bridge VGA Driver



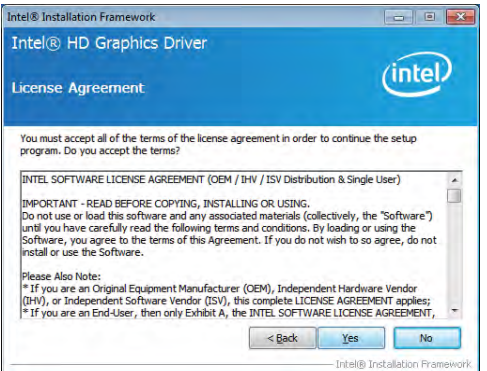
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "VGA".



2. At the "Intel® HD Graphics Driver" screen, Click "Next".

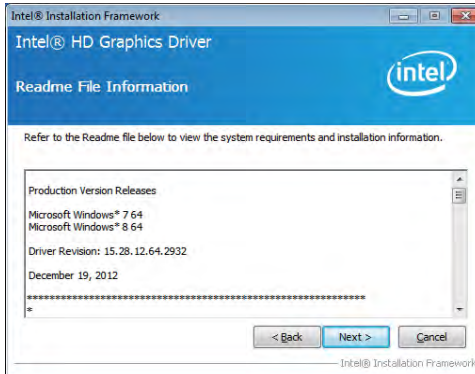


3. At the "Welcome to the Setup Program" screen, Click "Next".

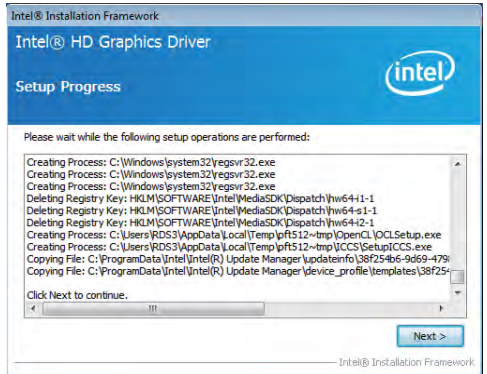


4. At the "License Agreement" screen, Click "Yes".





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



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



7. Click "Finish" to restart computer

**NOTE: SYSTEM INSTALL will auto detect file path**

**For Windows XP 64bit**

**X:\driver\INTEL\IVY\_SAN\vgal\winxp64\winxp64\_145110.exe**

**For Windows XP 32bit**

**X:\driver\INTEL\IVY\_SAN\vgal\winxpl\winxp\_145110.exe**

**For Windows 7 64bit and Windows 8 64bit**

**X:\driver\INTEL\IVY\_SAN\vgal\WIN\_7\_8\_64\ win64\_152812.exe**

**For Windows 7 32bit and Windows 8 32bit**

**X:\driver\INTEL\IVY\_SAN\vgal\WIN\_7\_8\_32\ win32\_152812.exe**

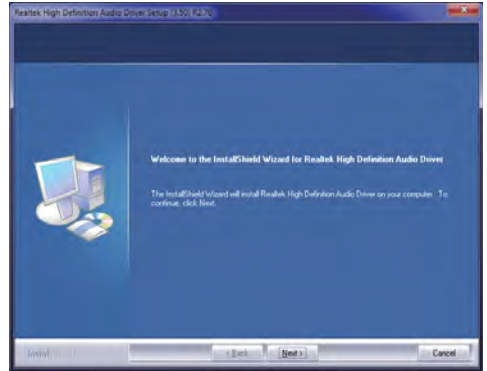
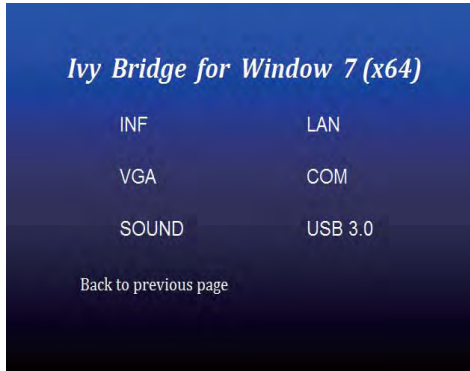
**For Windows 8.1 64bit**

**X:\driver\INTEL\IVY\_SAN\vgal\WIN8.1\IVY\X64\ Setup.exe**

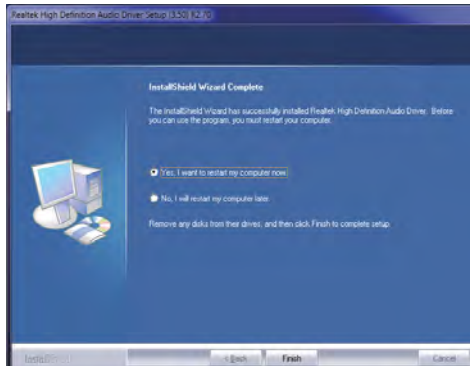
**For Windows 8.1 32bit**

**X:\driver\INTEL\IVY\_SAN\vgal\WIN8.1\IVY\X86\Setup.exe**

## 5-3 SOUND Install Realtek High Definition Audio Driver



1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "SOUND".
2. Click "Next".



3. Click "Finish" to restart computer

**NOTE: SYSTEM INSTALL will auto detect file path**

For Windows XP 32/64 bit

X:\driver\INTEL\IVY\_SAN\SOUND\WDM\_R270.exe

For Windows 7 32/64 bit and Windows 8 32/64 bit

X:\driver\INTEL\IVY\_SAN\SOUND\Vista\_Win7\_Win8\_R270.exe

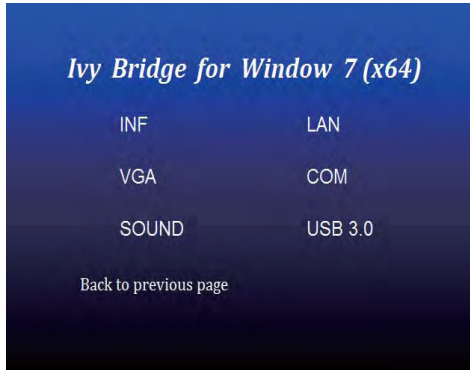
For Windows 8.1 32bit

X:\driver\INTEL\IVY\_SAN\SOUND\Win8.1\32bit\_Win7\_Win8\_Win81\_R273.exe

For Windows 8.1 64bit

X:\driver\INTEL\IVY\_SAN\SOUND\Win8.1\64bit\_Win7\_Win8\_Win81\_R273.exe

## 5-4 USB 3.0 Install Intel USB 3.0 extensible Host Controller Driver



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



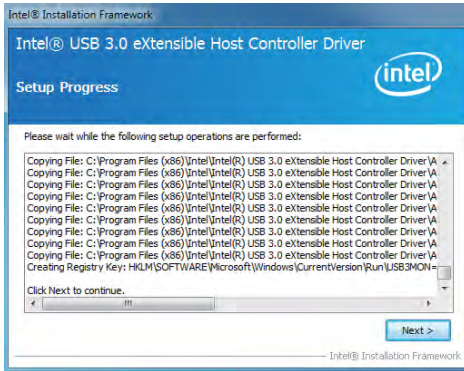
2. At the "Intel® USB 3.0 extensible Host Controller Driver" screen, Click "Next".



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



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



5. Click "Next".



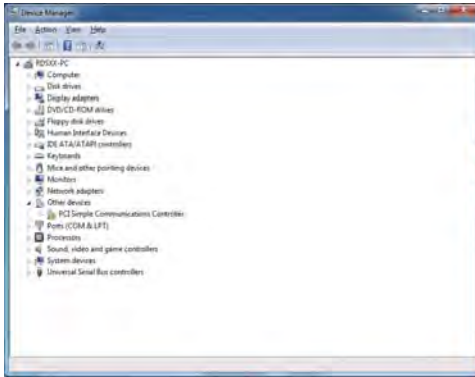
6. Click "Finish" to restart computer

**NOTE:** The path of the file

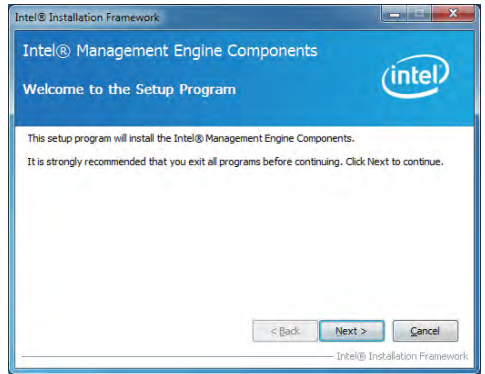
**For Windows 7 32/64-bit**

**X:\driver\INTEL\IVY\_SAN\USB3\_0\INTEL\Setup.exe**

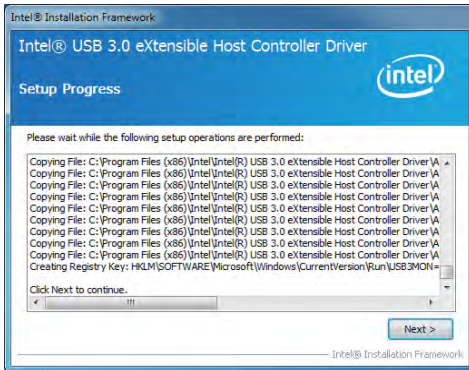
## 5-5 ME Install Intel Management Engine Interface Driver



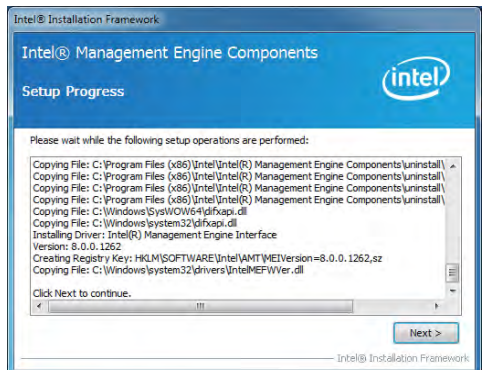
1. Please Check Device Manager  
"PCI Simple Communications Controllers"



2. At the "Intel® Management Engine  
Components" screen, Click "Next".



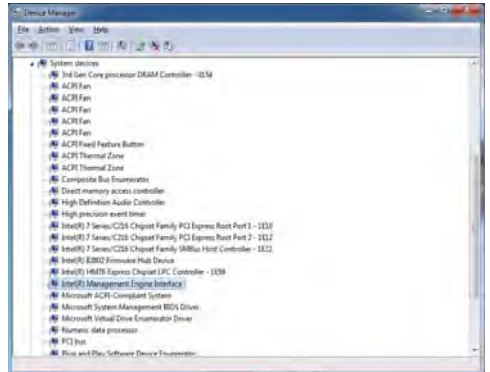
3. At the "Setup Progress" screen,  
Click "Next".



4. Click "Next".



5. Click "Finish".



6. Please Check Device Manager  
"PCI Simple Communications Controllers"

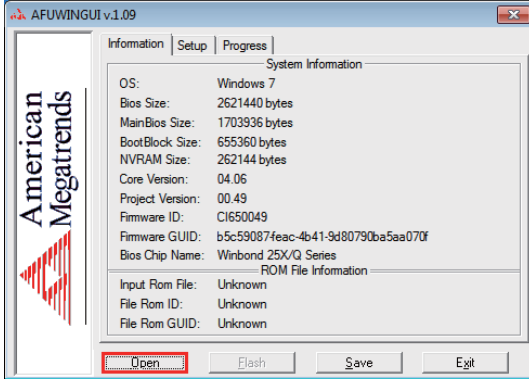
**NOTE:** The path of the file

For Windows XP 32/64 bit and Windows 7 32/64-bit

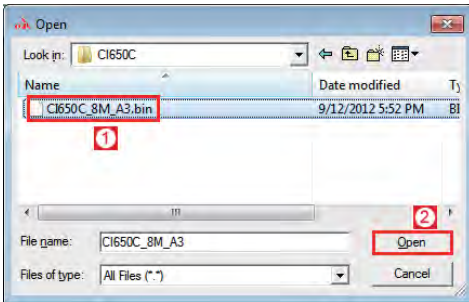
X:\driver\INTEL\ME TOOL\MEI-Only Installer\MEISetup.exe

# 5-6 How to update AMI BIOS

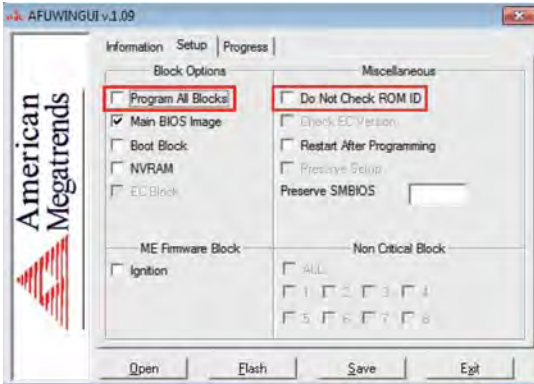
Step 1. To run afuwingui.exe then click "Open"



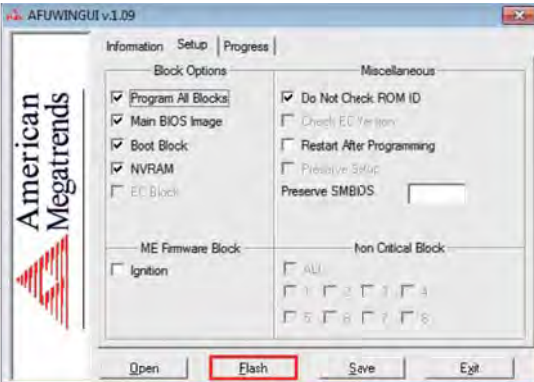
Step 2. Click the new version BIOS (download from the website)



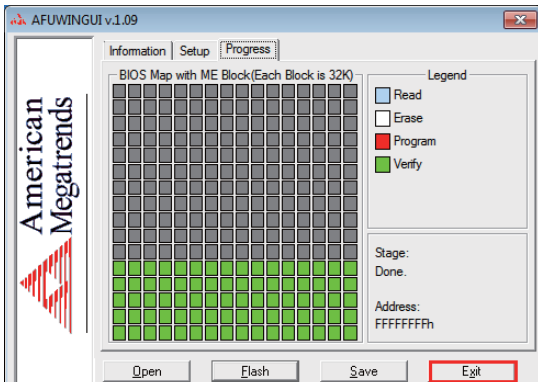
Step 3. Choose "ProgramAll Blocks" and "Do Not Check ROM ID"



Step 4. Click "Flash"



Step 5. Click "Exit" and restart computer.





## Appendix A: Power Consumption Test

### Condition

Item	Spec
CPU	Intel Ivy Bridge 1047UE 1.4 Ghz
SDRAM	DDR3 1333 / 4GB
Operating System	Windows 7 / SP1
Test Program	3D Mark Vantage
HDD 3.5" SATA	Standard HDD
HDD 2.5" SATA	Slim Type HDD
mSATA	16GB

### Test Result for reference only!

Hard Disk	Power off	Start up		Operation Maximum	Shut down Maximum	In Put Voltage
		Maximum	Stable			
Standard HDD	0.15A	3.48A	2.08A	3.33A	2.5A	9V
	0.13A	2.58A	1.56A	2.51A	1.87A	12V
	0.1A	1.28A	0.81A	1.24A	0.95A	24V
	0.1A	0.97A	0.61A	0.95A	0.73A	32V
	0.1A	0.96A	0.61A	0.92A	0.72A	36V
Slim Type HDD	0.15A	2.53A	1.58A	2.93A	2.03A	9V
	0.13A	1.91A	1.22A	2.14A	1.47A	12V
	0.1A	1.0A	0.68A	1.09A	0.82A	24V
	0.1A	1.74A	0.52A	0.83A	0.63A	32V
	0.1A	0.66A	0.47A	0.72A	0.55A	36V
mSATA	0.15A	2.19A	1.54A	2.69A	1.96A	9V
	0.13A	1.66A	1.18A	2.11A	1.46A	12V
	0.1A	0.86A	0.62A	1.02A	0.79A	24V
	0.1A	0.62A	0.47A	0.77A	0.58A	32V
	0.1A	0.54A	0.41A	0.7A	0.51A	36V

The power consumption depends on your device choice!

### Condition ( With 4 IP Camera )

Item	Spec
CPU	Intel Ivy Bridge 1047UE 1.4 Ghz
SDRAM	DDR3 1333 / 4GB
Operating System	Windows 7 / SP1
Test Program	3D Mark Vantage
HDD 3.5" SATA	Standard HDD
HDD 2.5" SATA	Slim Type HDD
mSATA	16GB
Camera	IP Camera *4 Pieces
Application	IE8 with HD-Network ActiveX

### Test Result for reference only!

Hard Disk	Power off	Start up		Operation Maximum	Shut down Maximum	In Put Voltage
		Maximum	Stable			
Standard HDD	0.15A	7.41A	6.15A	7.63A	7.05A	9V
	0.13A	4.95A	4.18A	4.95A	4.70A	12V
	0.10A	2.33A	2.01A	2.39A	2.24A	24V
	0.10A	1.56A	1.35A	1.64A	1.56A	36V
Slim Type HDD	0.15A	5.55A	4.90A	5.84A	5.68A	9V
	0.13A	3.81A	3.43A	4.02A	3.95A	12V
	0.10A	1.87A	1.70A	1.96A	1.92A	24V
	0.10A	1.27A	1.14A	1.31A	1.29A	36V
mSATA	0.15A	5.42A	4.80A	5.63A	5.55A	9V
	0.13A	3.65A	3.25A	3.75A	3.73A	12V
	0.10A	1.69A	1.59A	1.85A	1.82A	24V
	0.10A	1.18A	1.09A	1.25A	1.24A	36V

**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 )

## Appendix C: CPC-Car Power Control

### Introduction:

CPC is designed specifically for the car, with the over-current protection.

Acceptable input 9V ~ 36V wide voltage input, and can prevent momentary surge caused by excessive input voltage causes damage to the motherboard parts protection mechanisms, and there are, input power protection device to prevent reverse the negative.

CPC can be set when the output power or when to turn off the power when the car is started and shut down time, and when the car out of battery power will be automatically cut off the output power to protect the battery. When not in use the current consumption of approximately <2mA to protect the vehicle battery will not be too much load current of the battery is dead

### Operation

There are two modes operating: Auto Mode and Manual Mode.

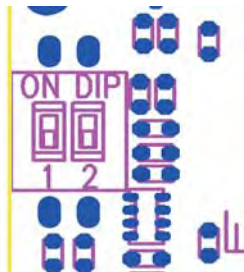
The default setting is "Auto Mode"

### For 31847NM only

#### CPC-Car Power Control

SC1 CPC & Control mode switch.

SC1: Board Top view



<b>ON</b> 		1		2	
		CPC function		Mode select	
Up	CPC Enabled	Up	Auto		
Down	CPC Disabled	Down	Manual		

Note: 1.If CPC was disabled which have not under low voltage protection and timing delay function and power output continually until the out of car battery.

2. In Auto Mode. Can't setting OS Delay off timer.

3. Default, CPC function enabled, Mode is Auto

4. It need reset power when switch setting finish.

5. default setting 1 - 2 ON

---

## **Auto Mode**

### **Provides power:**

When Key is inserted into the ACC stalls, CPC default through (Delay Main Power On setting within) delay 20 seconds before providing power to the motherboard

### **Boot-Up :**

CPC provides power to the motherboard, the power will be executed.

### **The shutdown :**

When Key switch back to the OFF position, CPC default (set value of the OS Delay Off) at 5 minutes after the motherboard through the shutdown.

**Note:** Do When using CPC OS Delay off, use the system to do OS update!

### **Turn off the main power supply:**

After the motherboard shutdown, CPC default ( set value of the Main Power Off delay ) by five seconds after the main power board off!

### **Power saving mode:**

If you close more than 10 minutes, CPC will enter power-saving mode.  
Then the total current consumption <2mA, in order to protect the car battery .

### **When the battery voltage is low :**

When the battery does not have enough electricity for 10 minutes,  
CPC will immediately turn off the power to the motherboard, To protect the battery.  
By default, When CPC will wait Key switch back to the OFF position, the battery will start to detect, and in factory mode, low battery detection protection is not turned on!

## **Manual mode:**

### **When you start :**

When Key is inserted into the ACC stalls, CPC default through ( Delay Main Power On setting within ) delay 20 seconds before providing power to the motherboard!

### **Boot-Up :**

CPC provides power to the motherboard, the then need to manually press the PW switch to start the M / B.

### **The shutdown :**

When Key switch back to OFF position, the need to manually press the PW switch to close the M / B, under normal circumstances, CPC does not automatically turn off M / B, unless there is a detected low battery voltage conditions.

### **Turn off the main power supply:**

After the M / B shutdown, CPC default ( set value of the Main Power Off delay ) by 5 seconds after the main power supply / B off !

### **Power saving mode:**

If you close more than 10 minutes, CPC will enter power-saving mode.  
Then the total current consumption <2mA, in order to protect the car battery.

### **When the battery voltage is low :**

When the battery does not have enough electricity for 10 minutes, CPC will immediately turn off the power to the motherboard, To protect the battery.

By default , When CPC will wait Key switch back to the OFF position, the battery will start to detect, and in factory mode, low battery detection protection is not turned on!

**Note:** Manual mode is not OS Delay off the set !

## **Delay Time and Under Voltage Level setting explain**

### **Delay Main Power On:**

When plug-in the key and turn to ACC mode, CPC will delay few seconds then output +12V!  
There are 14 options for this delay time setting: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min,10min, 15min,30min, 45min Default setting is "20 sec"

**Note:** Recommends user to ignite /start the car during this delay time.

**Please turn the ignition back to OFF mode, when the users are not able to start the car in the delay time or not able to ignite it properly.**

**System will offer next run delay time (default 20 seconds) again.**

### **OS Delay Off:**

When ignition is at OFF mode, CPC will turn off the MB via PW cable in the setting time.  
There are 18 options as OS delay off setting: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min, 10min, 15min, 30min, 45min, 1hour, 2hour, 3hour, ∞.  
The default setting is 5 minutes.

**Note:** 1. This delay time is only workable under "AUTO mode"

2. The recommend delay time should be longer than the MB turn off time.  
If the MB is not able to shut down properly within 10 minutes, PW201 will auto switch off the MB after 10 minutes.
3. "∞" setting is only available after user starts the "Under voltage" function.
4. Please avoid updating the OS when you turn off the MB. This could cause OS not able to boot the system next time.

### **Main Power Off delay:**

When the MB is shutdown, CPC will cut off power output after a few seconds.  
There are 17 options for the delay time: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min, 10min, 15min, 30min, 45min, 1hour, 2hour, and 3hour.  
The default setting is 5 sec.

**Note:** We recommend 5 seconds delay time here if uses don't have to need to execute other functions after shut down the MB.

### **Battery Low Voltage Level setting:**

When the battery voltage is lower than the setting voltage, the system will define it as "Under voltage".

The below list with the options of battery levels user may choose depend on its 12V or 24V battery.

Level	12V Battery	24V Battery
1	11.75V	23.75V
2	11.50V	23.50V
3	11.25V	23.25V
4	11.00V	23.00V
5	10.75V	22.75V
6	10.50V	22.50V
7	10.25V	22.25V
8	10.00V	22.00V
9	9.75V	21.75V
10	9.50V	21.50V
11	9.25V	21.25V
12	9.00V	21.00V

- Note:**
1. "Under voltage"function is not active under the default setting.
  2. "Under voltage"function could be active when the ignition is at ACC or key plug-out.
  3. When the battery is "Under voltage"-CPC constantly monitors the setting low voltage of battery 10 times / 10 minutes; CPC will set out the alarm via CPC AP. After 10 minutes, CPC will turn off the MB & cut off the power output and hold the status.CPC will only output +12V power when the Key is back to ignition at ACC mode.
  4. Please check if your car battery is 12V or 24 before starting the "Under Voltage" feature. Otherwise, "Under voltage" function is not workable at wrong battery setting.
  5. The default "Under voltage" is 10.5V for +12V battery; 22.5V for +24V battery

### **Auto mode:**

Simply speaking, Auto Mode means CPC will decide when to turn on / off the MB; there is no need of additional power switch.

### **Manual mode:**

Simply speaking, manual Mode means User can decide when to turn on / off the MB; the additional power switch is necessary.

## Car Power Control (CPC) LED behavior.

CPC provides an on-board LED to show the current situation.

LED	Function	Active
Green	CPC Status indicator	
	Delay Main Power On	ON:0.3sec,OFF:1sec
	OS Delay Off	ON:0.3sec x2, OFF:1sec
	Main Power Off delay	ON:1sec, OFF:1sec
	Battery Low Voltage	ON:0.3sec, OFF:0.3sec

CPC LED, is being implemented various stages of delay, LED will be action! When finished LED would not operate!

## Car Power Control (CPC) application Introduction

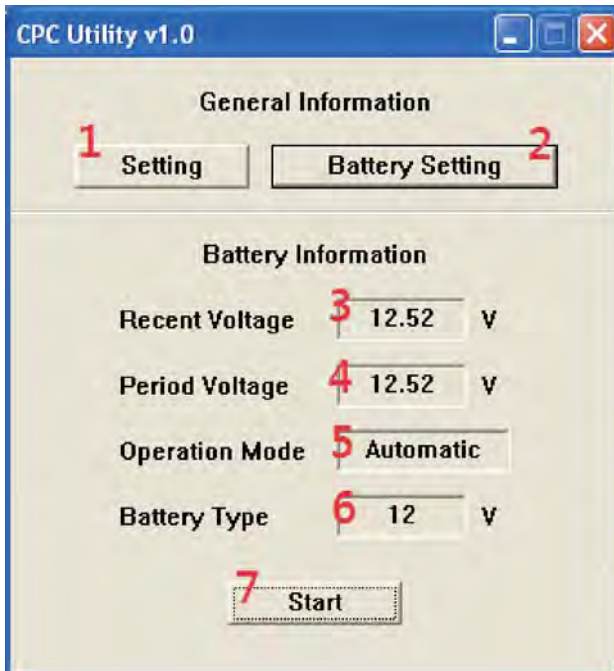
### About CPC info on LEX WiKi:

Users can download the CPC AP form LEX WiKi- CPC AP can set the delay time and start the "Under Voltage" protection.

The CPC AP introduction from LEX WiKi:

[http://tprd.info/lexwiki/index.php/CPC\\_Utility\\_under\\_Windows](http://tprd.info/lexwiki/index.php/CPC_Utility_under_Windows)

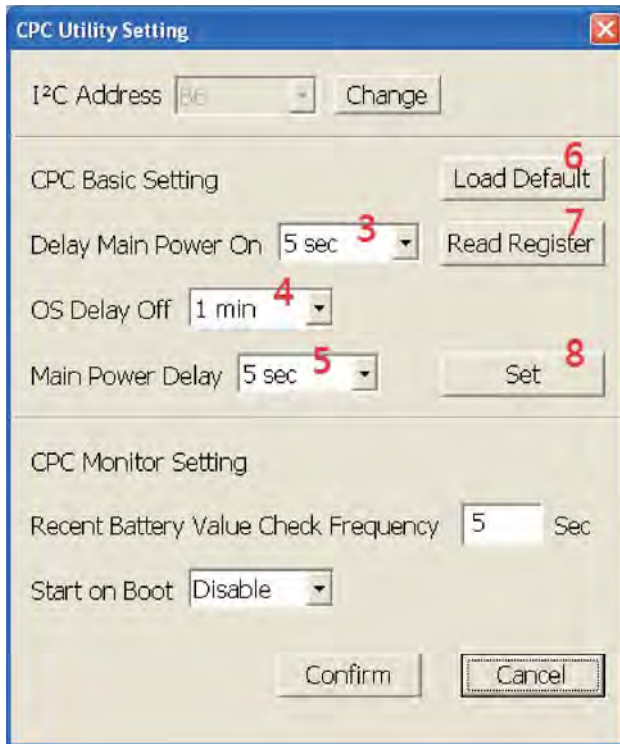
Main Page:





- Number 1: Delay time setting & interval setting of checking battery capacity.
- Number 2: Options about battery "Under voltage" setting.
- Number 3: Show the recent /current battery voltage according to the interval time you set under the previous "Setting" option.
- Number 4: This item is only workable after setting the "Under Voltage" protection. The voltage value here is the voltage that MCU detects very minute.
- Number 5: The operating Mode you used.
- Number 6: The battery type currently you used with: 12V or 24V.
- Number 7: To "Start" monitoring the battery capacity!

**Setting Page:**



**I<sup>2</sup>C Address Default is "B6".**

Press the submit button when finish selecting I<sup>2</sup>C address, then CPC Basic Setting section and CPC Monitor Setting section will be enable to set.

**3. Delay Main Power On**

Set the delay time which CPC turn on the computer. There are 14 options for this delay time setting: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min,10min, 15min,30min, 45min. default setting is "20 sec"

---

#### 4. OS Delay Off

Set delay time which CPC turn off the computer. There are 18 options as OS delay off setting: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min, 10min, 15min, 30min, 45min, 1hour, 2hour, 3hour, ∞. The default setting is 5 minutes.

**NOTE:**

1. This delay time is only workable under "AUTO mode"
2. "∞" setting is only available after user starts the "Under voltage" function.

#### 5. Main Power Delay

Set delay time of cutting off the power output after computer is turned off.

There are 17 options as OS delay off setting: 0sec, 5sec, 10sec, 15sec, 20sec, 30sec, 45sec, 1min, 3min, 5min, 10min, 15min, 30min, 45min, 1hour, 2hour and 3hour. default setting is "5 sec"

#### Load Default Button

Press this button will load default value of CPC basic setting section.

\* In CPC basic setting section, the initial value is read from users.

#### Read Register Button

Press this button will read the current value set from user.

#### Set Button

Press this button to set when finish selecting what you want to set in CPC basic setting section.

#### Recent Battery Value Check Frequency:

Set the time interval of checking the battery capacity ( from 5 sec to 60 sec )

**Note:** User "MUST" set this checking interval in advance. Otherwise, it will pop up the error message while pressing the "Start" button in Main Page.

#### Start On Boot:

Monitor the battery capacity when user boot the system.

## Battery Setting Page:

**Battery Under Voltage Setting**

Disable Battery Low Voltage Detect

Battery Type: 12 V Change

Battery Low Voltage: 11.75 V 4

ACC Active: Key-In 5 Triggered

Under Voltage Warning: Disable 6

Read Register 7 Confirm 8 Cancel 9

### Disable Battery Low Voltage Detect:

This button is to close the battery low voltage protection function.

The default setting is to click this item (Disable ULV)

If select this option, you don't have to set other things in the battery setting window. Besides, Period Voltage and Battery Type are also be hidden in main window when starting to monitor.

### Battery Low Voltage:

Set a voltage value as low voltage criteria. If the period voltage value CPC detected is smaller than this criteria ten times, computer will be turned off.

#### For 12V Battery:

11.75V, 11.50V, 11.25V, 11.00V, 10.75V, 10.50V, 10.25V, 10.00V, 9.75V, 9.50V, 9.25V, 9.00V. Default setting: 10.50V

#### For 24V Battery:

23.75V, 23.50V, 23.25V, 23.00V, 22.75V, 22.50V, 22.25V, 22.00V, 21.75V, 21.50V, 21.25V, 21.00V. Default setting: 22.50V

---

**Battery Low Voltage:** To start the under voltage protection, set the under voltage value & monitor the under voltage status.

Key-In: To start monitoring the battery under voltage while Key-in

Key-out: To start monitoring the battery under voltage while Key-out

**ACC Active Triggered:** Choose if it pop-up the alarm window when the battery is under voltage.

**Read Register:** Read the setting of battery under voltage protection in MCU.

**Confirm:** Write the above setting into MCU.