Em104P-i2313

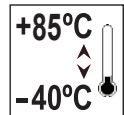## Wide Range Temperature ETX-PC/104-Plus Complex

User's Manual
Version 1.0

2014.11

Revision History

Version	Release Time	Description
1.0	Nov, 2014	Initial release

Contents

Preface

Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Declaration of Conformity
CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1)This device may not cause harmful interference, and

(2)This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction

of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

About This User's Manual
This user's manual provides general information and installation instructions about the product. This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this booklet. Please consult your vendor before further handling.

Warning
Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.

2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.

3. Use a grounded wrist strap when handling computer components.

4. Place components on a grounded antistatic pad or on the bag that comes with the Single Board Computer, whenever components are separated from the system.

Replacing the Lithium Battery
Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash-can. It must be disposed of in accordance with local regulations concerning special waste.

Technical Support
If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

> http://www.arbor.com.tw
>
> E-mail:info@arbor.com.tw

Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

Chapter 1

Introduction

1.1. Packing List

Before starting with the installation, make sure the following items are shipped. If any item appears damaged or is missing, contact your vendor immediately:

Em104P-i2313 PC/104 plus module kit:
1 x EmETX-i2304 ETX CPU Module
1 x PBE-1100-RG R3.3 ETX 3.0 Carrier Board

1 x Driver CD
1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

1.2. Ordering Information

Em104P-i2313-E3825 (BTO)	Wide Range Temperature EmETX-i2304 ETX CPU Module w/ Intel® Atom™ Processor E3825 + PBE-1100-RG R3.3 ETX Carrier Board
Em104P-i2313-E3845 (BTO)	Wide Range Temperature EmETX-i2304 ETX CPU Module w/ Intel® Atom™ Processor E3845 + PBE-1100-RG R3.3 ETX Carrier Board

Optional Accessories

HS-2304-F1	Heat Spreader (114 x 95 x 18mm)
CBK-16-1100-02	Cable kit for PBE-1100 1 x Audio cable 2 x USB cables 2 x COM-port cables 1 x LPT-to-FDD cable 1 x IDE cable 1 x LPT cable 2 x Ethernet cables 1 x VGA cable 1 x KB/MS cable 2 x SATA cables 1 x power cable (4 wires) 1 x power cable (2 wires)

The Installation Paths of CD Driver

Windows 7

Driver	Path
CHIPSET	\Chipset\SetupChipset_10.0.13_PC
Ethernet	\Ethernet\Win7\Install_Win7_7085_05222014
Graphic	\Graphics\WIN7_32\Intel_EMGD.WIN7_PC_Version_36_15_0_1073
	\Graphics\WIN7_64\Intel_EMGD.WIN7_PC_Version_37_15_0_1073
AUDIO	\Audio\32bit_Win7_Win8_Win81_R275
	\Audio\64bit_Win7_Win8_Win81_R275

Windows 8.1

| Driver	Path
CHIPSET	\Chipset\SetupChipset_10.0.13_PC
Ethernet	\Ethernet\Win8_8.1\Install_Win8_8.1_8031_05222014
Graphic	\Graphics\WIN8_32\15.33.22.3621
	\Graphics\WIN8_64\15.33.22.64.3621
AUDIO	\Audio\32bit_Win7_Win8_Win81_R275
	\Audio\64bit_Win7_Win8_Win81_R275
TXE	\TXE\Installers

1.3 Specifications

Form Factor	ETX-PC/104-Plus Complex CPU Module
CPU	Intel® Atom™ Processor E3825 dual-core 1.33GHz or E3845 quad-core 1.91GHz
System Memory	1 x 204-pin SO-DIMM socket up to 8GB DDR3L 1333MT/s SDRAM
Graphic Chipset	SoC integrated Intel® Gen HD graphic
Ethernet	1 x Realtek RTL8105E 10/100 Base-T Ethernet from CPU module
	1 x Realtek RTL8110SCL GbE from PBE-1100-RG
BIOS	Insyde BIOS
Serial ATA	2 x Serial ATA with 300MB/s HDD transfer rate
IDE Interface	1 x IDE (Ultra ATA 33), support 2 IDE devices
	1 x CF II socket shared with IDE1
Serial Port	4 x COM ports (COM1,3,4: RS-232, COM2: RS-232/422/485 selectable)
Parallel Port/ Floppy	1 x SPP/EPP/ECP mode 1 x Floppy connector, (shared with Parallel Port #1)
KB/MS	One 1x6-pin wafer connector for PS/2 interface for keyboard and mouse
Universal Serial Bus	4 x USB 2.0 ports
Graphics Interface	Analog RGB supports resolution up to 2048 x 1536
	24-bit Dual Channel LVDS supported via eDP to LVDS NXP PTN3460
	1 x DDI port connector on the module
Expansion Interface	1 x PCI-104 PCI bus 1 x PC/104 ISA bus
Operating Temp.	-40ºC ~ 85ºC (-40ºF ~ 185ºF)
Watchdog Timer	1~255 levels Reset
Dimension (L x W)	114 x 95 mm (4.5" x 3.7")

1.4. Board Dimensions

Unit:mm
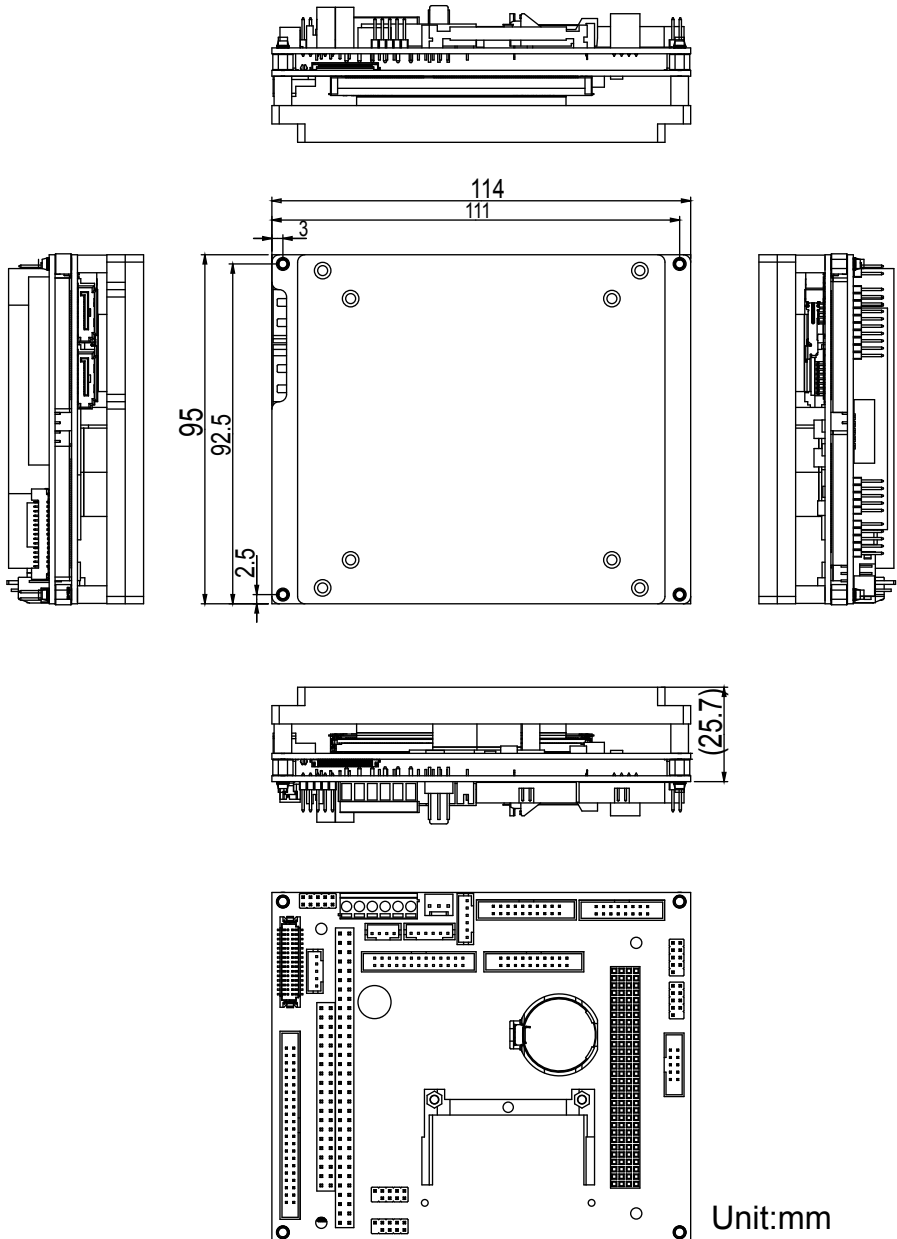
This page is intentionally left blank.

Chapter 2

Installation

2.1. Block Diagram
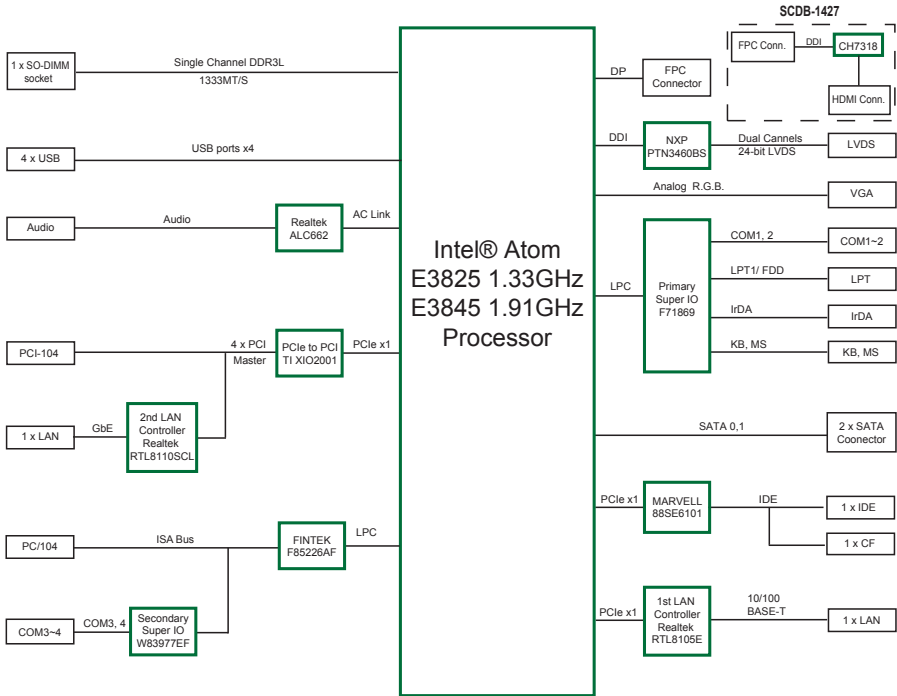
2.2. Jumpers and Connectors

2.2.1. Quick Reference

Jumpers

Label	Function
JCFD1	CF IDE1 mode Selection
JBAT1	Clear CMOS Setting
JVLCD1	LCD Panel Voltage Selection
JWT1	WDT Mode Setting
JRS2	COM2 RS-232/422/485 Selection
JBLON1	LCD Backlight Selection

Connectors

Label	Function
AUDIO1	AC97 Connector
USB1, 2	USB Connectors
VGA1	Analog RGB Connector
COM1_2/ COM3_4	RS-232 Connectors
LPT1	Parallel Port Connector
KBM1	Keyboard & Mouse Connector
FAN2	Fan Power Connector
PWR1	Power Supply Connector
JCOM1	COM2 RS-422/485 Connector
JFRT1	Switches and Indicators
LVDS1	LVDS LCD Connector
INV1	LCD Inverter Connector
IR1	Infrared Connector
IDE1	Primary IDE Connector
CONA1	PC/104 ISA bus Slot
LANLED1, LANLED2	LAN1, LAN2 LED Indicators
CFD1	Compact Flash Disk socket
FAN1	System Fan Power Connector
PC104+	PC/104+ PCI Bus Expansion Slot
SATA1, SATA2	SATA Connectors
DDI	DDI Connector

2.2.2. Jumpers & Connectors Location

PBE-1100

EmETX-i2304

㉜SATA1

SO-DIMM
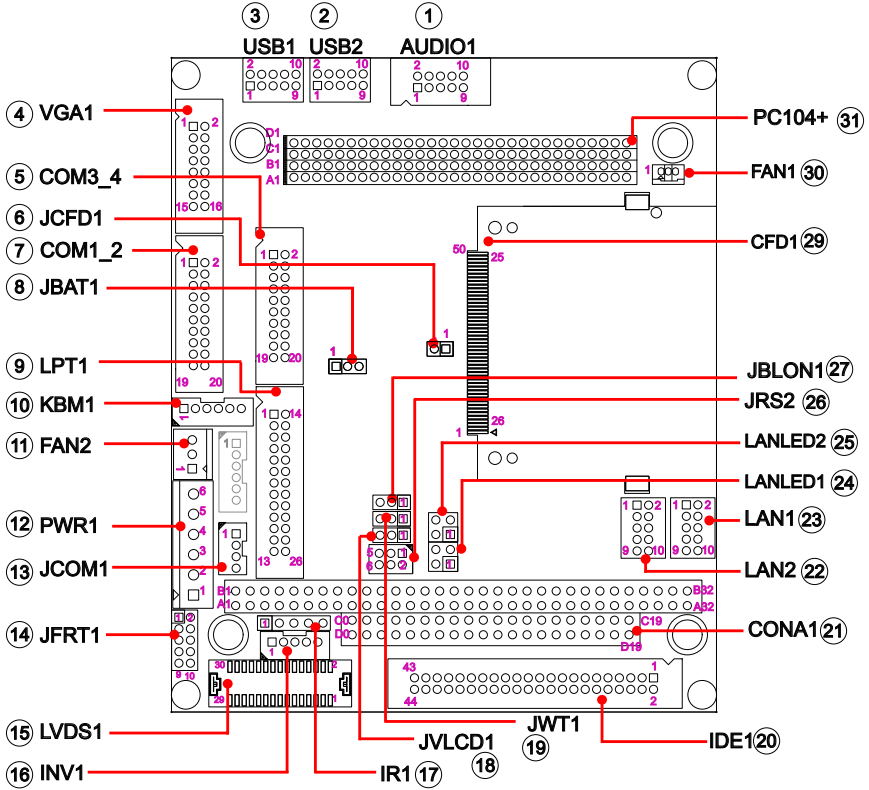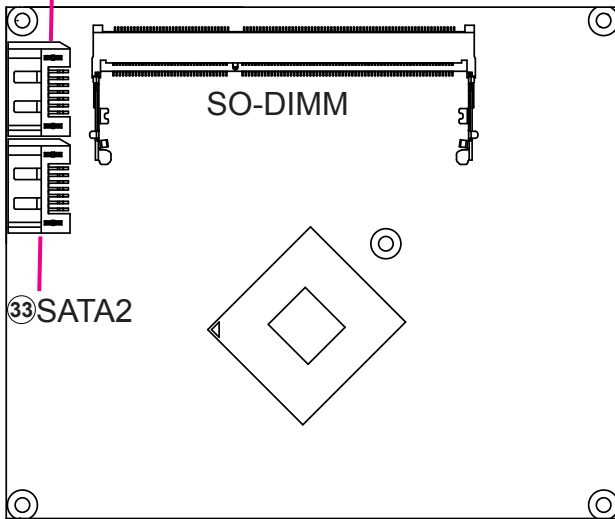
�33SATA2

�34 DDI

2.2.3. Jumpers

JCFD1: CF IDE1 mode Selection (6)
Connector type: 2.00mm pitch 1x2-pin headers.

Pin	Mode	
Short	Master	**1** ▢ **2**
Open	Slave (Default)	**1** ▢ **2**

JBAT1: Clear CMOS Setting (8)
Connector type: 2.00mm pitch 1x3-pin headers.

Pin	Mode	
1-2	Keep CMOS (Default)	3 2 1
2-3	Clear CMOS	3 2 1

JVLCD1: LCD Panel Voltage Selection (18)
The voltage of LCD panel could be selected by JVLCD1 in +5V or +3.3V.
Connector type: 2.00mm pitch 1x3-pin headers.

Pin	Voltage	
1-2	+5V	3 2 1
2-3	+3.3V (Default)	3 2 1

JWT1: WDT Mode Setting (19)
Connector type: 2.00mm pitch 1x3-pin headers.

Pin	Mode	
1-2	NMI	3 2 1
2-3	RST_SW (Default)	3 2 1
None	Disable WatchDog Timer	

JRS2: COM2 RS-232/422/485 Selection (26)

It can be configured COM2 to operate in RS-232, RS-422 or RS-485 mode.
Connector type: 2.00mm pitch 2x3-pin headers.

Mode	RS-232 (Default)	RS-422	RS-485
1-2	Short	Open	Open
3-4	Open	Short	Open
5-6	Open	Open	Short

JBLON1: LCD Backlight Selection (27)

The LCD panel backlight active mode could be selected by JBLON1 in High or Low.
Connector type: 2.00mm pitch 1x3-pin headers.

Pin	Mode
1-2	Active High (Default)
2-3	Active Low

2.2.4. Connectors

AUDIO1: AC97 Connector (1)
Connector type: 2.00mm pitch 2x5 box headers.

Pin	Description	Pin	Description
1	Line_In_Left	2	Line_In_Right
3	GND	4	GND
5	MIC	6	N/C
7	GND	8	GND
9	Speaker Left	10	Speaker Right
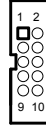
USB1 ~ 2: USB Connectors (2, 3)
Connector type: 2.00mm pitch 2x5-pin headers.

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD-	4	USBD-
5	USBD+	6	USBD+
7	GND	8	GND
9	GND	10	N/C (Key)

VGA1: Analog RGB Connector (4)
Connector type: 2.00mm pitch 2x8-pin box headers.

Pin	Description	Pin	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	N/C	10	GND
11	N/C	12	VDDAT
13	HSYNC	14	VSYNC
15	VDCLK	16	N/C
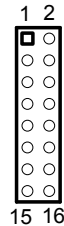
COM1_2/ COM3_4: RS-232 Connectors (5, 7)
Connector type: 2.00mm pitch 2x10-pin box headers.

Pin	Description	Pin	Description
1	DCD#1 / 3	2	RXD1 / 3
3	TXD1 / 3	4	DTR#1 / 3
5	GND	6	DSR#1 / 3
7	RTS#1 / 3	8	CTS#1 / 3
9	RI#1 / 3	10	N/C
11	DCD#2/ 4	12	RXD2/ 4
13	TXD2/ 4	14	DTR#2/ 4
15	GND	16	DSR#2/ 4
17	RTS#2/ 4	18	CTS#2/ 4
19	RI#2/ 4	20	N/C
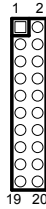
LPT1: Parallel Port Connector (9)
Connector type: 2.00mm pitch 2x13-pin box headers.

Pin	Description	Pin	Description
1	STROBE#	14	AFD#
2	PTD0	15	Error#
3	PTD1	16	INIT#
4	PTD2	17	SLIN#
5	PTD3	18	GND
6	PTD4	19	GND
7	PTD5	20	GND
8	PTD6	21	GND
9	PTD7	22	GND
10	ACK#	23	GND
11	Busy	24	GND
12	PE	25	GND
13	Select	26	N/C
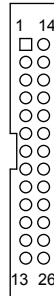
FDD Setting

After connect "LPT to FDD cable" into LPT1 and floppy drive, do below BIOS Setting to active FDD:

- Standard CMOS Features \ Drive A \ 1.44, 3.5 in
- Integrated Peripherals\ SuperIO device\ External FDD controller\ Enabled
- Integrated Peripherals\ SuperIO device\ Onboard Parallel port\ Disabled

Note:
1. When FDD active, LPT is not able to use, vice versa.
2. Floppy drive LED always light on when LPT to FDD cable connected.

KBM1: Keyboard & Mouse Connector (10)
Connector type: 2.0mm pitch 1x6-pin box wafer connector.

Pin	Description
1	KB_DATA
2	GND
3	MS_DATA
4	KB_CLK
5	KB_VCC
6	MS_CLK
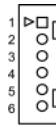
FAN2: Fan Power Connector (11)
FAN2 is a 3-pin headers for the fan. The fan must be a +12V fan.

Pin	Description
1	GND
2	+12V
3	N/C

PWR1: Power Supply Connector (12)
Connector type: Terminal blocks.

Pin	Description
1	+12V
2	GND
3	GND
4	GND
5	+5V
6	+5V
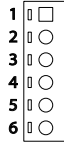
JCOM1: RS-422/485 Output Connector (13)
Connector type: 2.00mm pitch 1x4 box wafer connector.

Pin	RS-422	RS-485
1	TX+	DATA+
2	TX-	DATA-
3	RX+	N/C
4	RX-	N/C

JFRT1: Switches and Indicators (14)
It provides connectors for system indicators that provides light indication of the computer activities and switches to change the computer status.
Connector type: 2.54mm pitch 2x5-pin headers.

Pin	Description	Pin	Description
1	RESET+	2	RESET-
3	POWER_LED+	4	POWER_LED-
5	HDD_LED+	6	HDD_LED-
7	SPEAKER+	8	SPEAKER-
9	ETXSMI	10	GND

LVDS1: LVDS LCD Connector (15)

The LVDS connector on board DF-13-30DP-1.25V and supports 18-bit single channel LVDS.

Pin	Description	Pin	Description
2	VDD	1	VDD
4	N/C	3	TX1CLK+
6	N/C	5	TX1CLK-
8	GND	7	GND
10	N/C	9	TX1D0+
12	N/C	11	TX1D0-
14	GND	13	GND
16	N/C	15	TX1D1+
18	N/C	17	TX1D1-
20	GND	19	GND
22	N/C	21	TX1D2+
24	N/C	23	TX1D2-
26	GND	25	GND
28	N/C	27	N/C
30	N/C	29	N/C

INV1: LCD Inverter Connector (16)

Connector type: 2.00mm pitch 1x5-pin box wafer connector.

Pin	Description
1	+12V
2	GND
3	Backlight on/off
4	Brightness control
5	GND

IR1: Infrared Connector (17)
Connector type: 2.54mm pitch 1x5-pin headers.

Pin	Description
1	+5V
2	N/C
3	IRRX
4	GND
5	IRTX

IDE1: Primary IDE Connector (20)
Connector type: 2.00mm pitch 2x22 box headers
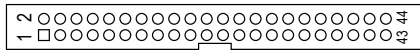
Pin	Description	Pin	Description
1	RESET#	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IRDY	28	IDSEL
29	ACK#	30	GND
31	IRQ	32	N/C
33	AD1	34	ATA66 DETECT
35	AD0	36	AD2
37	CS#2	38	CS#3
39	ACT#	40	GND
41	+5V	42	+5V
43	GND	44	GND

CONA1: PC/104 ISA bus Slot (21)

The pin assignments conform to the industry standard.

LAN1~2: Ethernet Connectors (22, 23)
Connector type: 2.00mm pitch 2x5-pin headers

Pin	Description	Pin	Description
1	TX+	2	TX-
3	RX+	4	N/C
5	N/C	6	RX-
7	N/C	8	N/C
9	N/C	10	N/C (Key)

LANLED1, LANLED2: LAN1, LAN2 LED Indicators (24, 25)

Pin	Description	Pin	Description
1	ACTLED-	2	ACTLED+
3	LILED-	4	LILED+

CFD1 : Compact Flash Disk socket (share with IDE1) (29)

FAN1: System Fan Power Connector (30)
FAN1 is a 3-pin headers for the system fan. The fan must be a +5V fan.

Pin	Description
1	N/C
2	+5V
3	GND

PC104+: PC/104+ PCI Bus Expansion Slot (31)
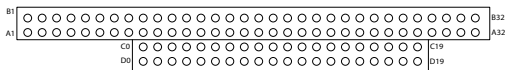
The pin assignments conform to the industry standard.

SATA1, SATA2 Connectors (32,33)

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND
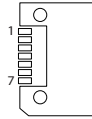
DDI Connector (34)

Connector type: FH12-30S-0.5SH (Hirose)

Pin	Description
1	GND
2	GND
3	GND
4	GND
5	+5VS
6	+5VS
7	+5VS
8	+5VS
9	HPDET#
10	DDC_AUX_SEL
11	N/C
12	GND
13	CTLDATA_AUXN
14	CTLCLK_AUXP
15	GND
16	N/C
17	N/C
18	GND
19	TXP3
20	TXN3
21	GND
22	TXP2
23	TXN2
24	GND
25	TXP1
26	TXN1
27	GND
28	TXP0
29	TXN0
30	GND
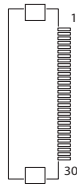
This page is intentionally left blank.

Chapter 3

BIOS

The BIOS Setup utility is featured by Insyde BIOS to configure the system settings stored in the system's BIOS ROM. Insyde BIOS is activated once the computer powers on.

After entering the utility, use the left/right arrow keys to navigate between the top menus and use the down arrow key to access one.

Menu	Description
Main	See 3.1. Main on page 26
Advanced	See 3.2. Advanced on page 27
Security	See 3.3. Security on page 35
Power	See 3.4. Power on page 36
Boot	See 3.5. Boot on page 39
Exit	See 3.6. Exit on page 41

NOTE: For system stability and performance, this BIOS utility is constantly improved. The screenshots demonstrated and descriptions hereinafter are for reference only and may not exactly meet what is presented onscreen.

Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and configure the utility.

Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
Enter	Selects an highlighted item/field.
Esc	▶ On the top menus: Use **Esc** to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select **OK** or **Cancel** to exit discarding changes. ▶ On the submenus: Use **Esc** to quit current screen and return to the top menu.
F5	Increases current value to the next higher value or switches between available options.
F6	Decreases current value to the next lower value or switches between available options.
F1	Opens the **Help** of the BIOS Setup utility.
F9	Restore the Setup Default (The screen then prompts a message asking you to select **OK** or **Cancel** to restore to default.)
F10	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select **OK** or **Cancel** to exit saving changes.)

Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have onscreen.

3.1. Main

The **Main** menu displays some BIOS info and features the settings of **System Date** and **System Time**.
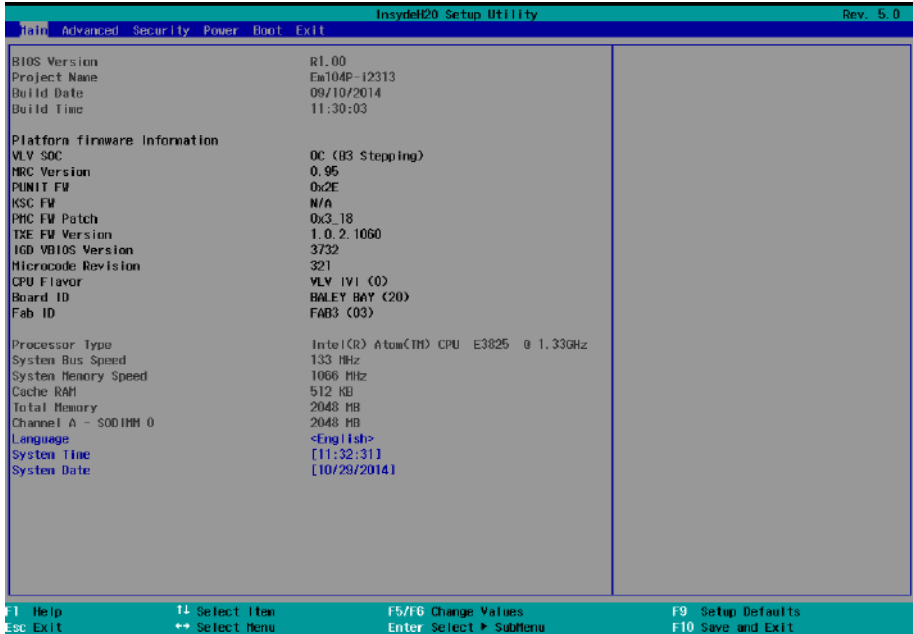
The BIOS info displayed is:

Info Item	Description
BIOS Version	Delivers the computer's BIOS version.
Project name	Delivers the name of the project
Build Date and Time	Delivers the date and time when the BIOS Setup utility was created/updated.
Platform firmware Information	Delivers the Platform firmware Information

The featured settings are:

Setting	Description
Language	Select the current default language used by the InsydeH20
System Time	Sets system time.
System Date	Sets system date.

3.2. Advanced

The Advanced menu controls the system's CPU, IDE, Super IO, AHCI and USB. It also helps users monitor hardware health.

```
                          InsydeH20 Setup Utility                              Rev. 5.0
  Main  Advanced  Security  Power  Boot  Exit

                                                    Configures Boot Settings.
 ▶Boot Configuration
 ▶IDE Configuration
 ▶USB Configuration
 ▶Audio Configuration
 ▶LAN Configuration
 ▶LPSS & SCC Configuration
 ▶Miscellaneous Configuration
 ▶Security Configuration
 ▶Video Configuration
 ▶SATA Configuration
 ▶ACPI Table/Features Control
 ▶Super I/O Configuration




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

The featured submenus are:

Submenu	Description
Boot Configuration	See 3.2.1. Boot Configuration on page 28
IDE Configuration	See 3.2.2. IDE Configuration on page 28
USB Configuration	See 3.2.3. USB Configuration on page 28
Audio Configuration	See 3.2.4. Audio Configuration on page 29
LAN Configuration	See 3.2.5. LAN Configuration on page 29
LPSS & SCC Configuration	See 3.2.6. LPSS & SCC Configuration on page 29
Miscellaneous Configuration	See 3.2.7. Miscellaneous Configuration on page 30
Security Configuration	See 3.2.8. Security Configuration on page 30
Video Configuration	See 3.2.9. Video Configuration on page 31
SATA Configuration	See 3.2.10. SATA Configuration on page 33
ACPI Table/Feature Control	See 3.2.11. ACPI Table/Feature Control on page 34
Super I/O Configuration	See 3.2.12. Super I/O Configuration on page 34

3.2.1. Boot Configuration

Setting	Description
Numlock	Select Power-on state for Num lock

3.2.2. IDE Configuration

Configures IDE by the following settings:

Setting	Description
IDE Channel 1 Support	▸ IDE Channel 1 Support ▸ Enables/Disables IDE Channel 1 Support ▸ Enables/Disables Ultra DMA-66/100 Support

3.2.3. USB Configuration

Select this submenu to view the status of the USB ports and configure USB features.

The featured settings are:

Setting	Description
USB Per-Port Control	Enables/Disables USB Per-port control
USB Port #0123	Enables/Disables USB Port

3.2.4. Audio Configuration

The featured settings are:

Setting	Description
Audio Controller	Enables/Disables Azalia Controller
Azalia VCi Enable	Enables/Disables Virtual Channel 1 of Audio Controller
Azalia HDMI Codec	Enables/Disables Internal HDMI codec for Azalia

3.2.5. LAN Configuration

The featured settings are:

Setting	Description
LAN Configuration	Enables/Disables LAN Configuration.

3.2.6. LPSS & SCC Configuration

The featured settings are:

Setting	Description
LPSS & SCC Device Mode	Set the mode of LPSS & SCC Device Options are ACPI mode(default)/PCI mode
OS Selection	Set the mode of OS Selection Options are Windows(default)/Android
LPSS DMA #1 Support	Enables/disables LPSS DMA #1 Support
LPSS DMA #1 Support	Enables/disables LPSS DMA #2 Support
LPSS I2C #1 Support	Enables/disables LPSS I2C #1 Support

3.2.7. Miscellaneous Configuration

The featured settings are:

Setting	Description / Available Options
HPET - HPET support	Enables/Disables HPET support in Windows XP
State After G3	Set the state of System when power is re-applied after a Power failure (G3 state) Options are S0 State(default)/S5 State
Clock Spread Spectrum	Enables/Disables Clock Spread Spectrum
Bios Lock	Enables/Disables BIOS SPI region write protect
Force Legacy Free	Enables/Disables Force Legacy Free (Force Disable KBC)
Serial IRQ	Enables/Disables Serial IRQ
Serial IRQ Mode	Set the Serial IRQ Mode. Options are Quiet Mode/Continuous Mode.

3.2.8. Security Configuration

The featured settings are:

Submenu/Setting	Description
TXE	Enables/Disables TXE
TXE HMRFP0	Enables/Disables TXE HMRFP0
TXE Firmware Update	Enables/Disables Firmware Update
TXE EOP Message	Enables/Disables Sending EOP Message Bofore OS
TXE Unconfiguration Perform	Enables/Disables TXE Temporary Disable function

3.2.9. Video Configuration

Configure video settings

The featured setting is:

3.2.9.1 Video Configuration

Setting	Description
Logo & SCU Resolution	Set Logo & SCU Resolution. Options are Auto/640 x480/800 x 600/1024 x 768

3.2.9.2 VBT Hook Configuration

Setting	Description
Configure CRT as	Set the option of CRT. Options are Default / CRT / No Device
CRT EDID Support	Enables/Disables CRT EDID Support
Configure DDI0 as	Set the option of DDI0. Options are Default / DisplayPort / HDMI/DVI / DisplayPort with HDMI/DVI Compatible / No Device
Configure DDI1 as	Set the option of DDI1. Options are Default/ eDP/ DisplayPort/ HDMI/DVI / DisplayPort with HDMI/DVI Compatible / No Device
Configure eDP Panel Number as	Set the option of VBIOS eDP Panel Number. Options are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16.
LFP EDID Support	Enables/Disables LFP EDID Support
EFP EDID Support	Enables/Disables EFP EDID Support

3.2.9.3 PTN3460 (eDP to LVDS) Configuration

Setting	Description
PTN3460 Output Format	Set the Output Format of PTN3460. Options are (00) VESA (24bpp) / (01) VESA or JEIDA (18bpp) / (10) JEIDA (24bpp) / (11) JEIDA (24bpp)
PTN3460 Channel Control	Set the Channel of PTN3460. Options are Single(default) / Dual.
PTN3460 EDID Table	Set the EDID Table of PTN3460.

3.2.9.4 GOP Configuration

Setting	Description
GOP Brightness Level	Set the Brightness Level of GOP.
GOP Driver	Enables/Disables GOP Driver

3.2.9.5 IGD Configuration

Setting	Description
Integrated Graphics Device	Enables/disables Intergrated Graphics Device.
Primary Display	Set IGD or PCI graphic device as the Primary Display. Options are Auto/IGD/PCie.
RC6 (Render Standby)	Enables/Disables Render standby support.
PAVC	Enables/disables Protected Audio Video control
Power Management lock	Enables/disables Power mangement lock.
DOP CG	Enables/disables DOP Clock gating.
GTT Size	Set the GTT Size Options are 1MB/2MB
Apeture Size	Set the Aperture size Options are 128MB/256MB/512MB
IGD-DVMT Pre-Allocated	Set the DVMT5.0 Pre-Allocated (Fixed) Graphics Memory size used by the IGD.
IGD-DVMT total Gfx Mem	Set the size of DVMT 5.0 used by IGD
IGD Turbo	Enables/disables IGD Turbo
IGD Thermal	Enables/disables IGD Thermal
Spread Spectrum clock	Enables/disables Spread Spectrum clock

3.2.9.6 IGD- LCD Control

Setting	Description
Force Lid Status	Set mode of as the Primary Display. Options are ON (default) / OFF / Auto.
BIA	Set the mode of BIA. Options are Auto (default) /Disabled / Level 1 /Level 2 /Level 3 /Level 4 /Level 5.
ALS Support	Enables/Disables ALS support.
IGD Flat Panel	Set resolution of IGD Flat Panel.
IGD Boot Type	Set the Boot Type of IGD
Panel Scaling	Set the Scaling of Panel Options are Auto(default) / Centering / Stretching.
GMCH BLC Control	Set the mode of GMCH BLC Control Options are Auto(default) / PWM-Inverted / GMBus-Inverted / PWM-Normal / GMBus-Normal

3.2.10. SATA Configuration

Select this submenu to configure the SATA controller and HD.

Setting	Description
SATA Controller(s)	Enables/disables the present SATA controller. ▸　**Enabled** is the default.
SATA Test Mode	Enables/disables the SATA test mode.
Configures SATA Mode	Configures how to sun the SATA drives. ▸　Options available are **AHCI** (default) and **IDE**.
SATA Port 0 Hot Plug Capability	Enables/disables hot-pluggable feature for the SATA port.
SATA Port 1 Hot Plug Capability	▸　**Enabled** is the default.
SATA Port 0 Connect to an ODD	Enables/disables the SATA port connect to an ODD If enabled, when you connect an ODD to a SATA port.
SATA Port 1 Connect to an ODD	The software auto detection for media insert and tray will be enabled. ▸　**Disabled** is the default.
Serial ATA Port 0	Delivers the SATA port Media information and Security Mode.
Serial ATA Port 1	

3.2.11. ACPI Table/Feature Control

Setting	Description
FACP - RTC S4 Wakeup	This function will be avalible only when ACPI is enabled. Enables/disables S4 Wakup from RTC.
APIC - IO APIC Mode	This item is valid only for WIN2K and WINXP. Also, a frech install of the OS must occur when APIC mode is desired. Enables/disables the APIC mode
DSDT - ACPI S3	Enables/disables ACPI S3 state
DSDT - ACPI S4	Enables/disables ACPI S4 state
BGRT - ACPI BGRT	Enables/disables ACPI BGRT Table

3.2.12. Super I/O Configuration

Configures SIO by the following settings:

Setting	Description
Power Loss mode	Set the state of Power Loss mode Options are Always On(default)/Always Off
Serial Port 1/3/4	▶ Serial Port Enables/disables the Serial port. ▶ Base I/O Address Setup the Base I/O Address of the Serial Port. ▶ Interrupt Setup the Interrupt of the Serial Port
Serial Port 2	▶ Serial Port 2 Enables/disables the Serial port. ▶ RS-232/RS-485 Setting Set the mode of Serial port. Options are RS232 (default), RS485 ▶ Base I/O Address Setup the Base I/O Address of the Serial Port. ▶ Interrupt Setup the Interrupt of the Serial Port
LPT Port 2	▶ LPT Port Enables/disables the LPT port. ▶ Base I/O Address Setup the Base I/O Address of the LPT Port. ▶ Interrupt Setup the Interrupt of the LPT Port

3.3. Security

The **Security** menu sets up the password for the system's administrator account. Once the administrator password is set up, this BIOS Setup utility is limited to access and will ask for the password each time any access is attempted.

```
                              InsydeH20 Setup Utility                          Rev. 5.0
  Main  Advanced  Security  Power  Boot  Exit

                                                        Install or Change the password and the
  Supervisor Password              Not Installed        length of password  must be greater than
                                                        one character.
  Set Supervisor Password




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

The featured setting is:

Setting	Description
Set Supervisor Password	To set up an administrator password: 1.　Select **Set Supervisor Password**. 　　An **Create New Password** dialog then pops up onscreen. 2.　Enter your desired password that is no less than 3 characters and no more than 20 characters. 3.　Hit [Enter] key to submit.

3.4. Power

The **Power** menu sets up the power option of system
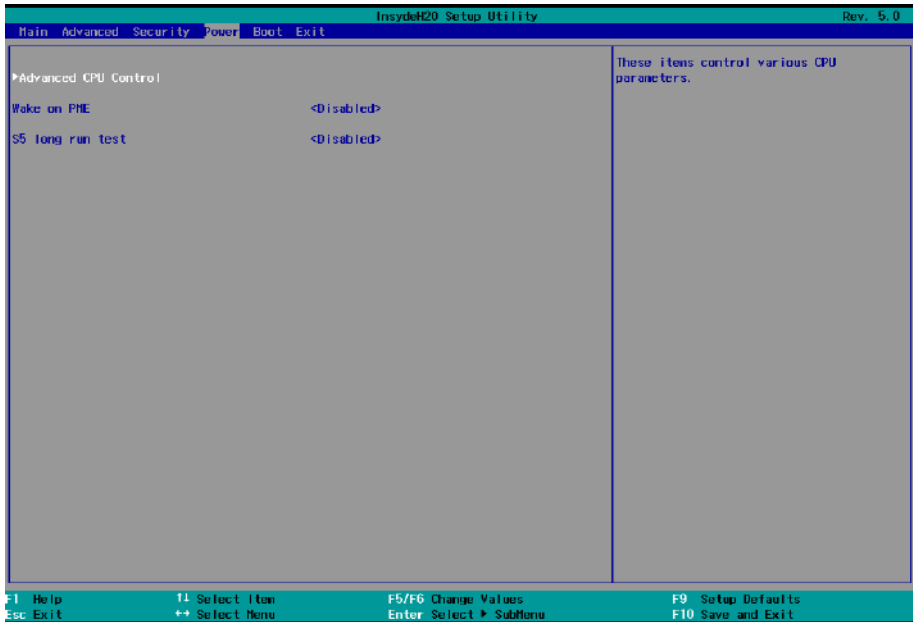
The featured setting is:

Setting	Description
Advanced CPU Control	See 3.4.1 Advanced CPU Control on page 37
Wake on PME	Enables or diables Wake on PME. Determines the action taken when the system power is off and a PCI Power Management Enable wake up event occurs.
S5 Long run test	If enabled, force the system to enable RTC S5 wake up, even if OS disable it. Support ipwrtest to do RTC S5 wakeup. Options are Enabled/Disabled.

3.4.1 Advanced CPU Control

Setting	Description
Use XD Capability	Enables or disables processor XD capability.
Limit CPUID Max value	Sets whether the processor should limit the maximum CPUID input value to 03h when the operating system queries it upon startup. ▸ Select **Enabled** to allow a processor with Intel® Hyper-Threading technology to work with an operating system that doesn't support it. ▸ **Disabled** is the default.
Bi-Directional PROCHOT#	When a processor thermal sensor trips(either core), the PROCHOT# will be driven. If Bi-Directional is enable, external agents can drive PROCHOT# to throttle.
VTX-2	Enables/disables the CPU's VTX-2 function.
TM1 and TM2	Enable/disables TM1/TM2
AESNI Feature	Enable/disables AESNI
DTS	Enable/disables CPU Digital Thermal Sensor function.
Active Processor Cores	Set the Number of cores to enable in each processor package. Options are ALL/1
P-States(IST)	Enables/disables processor performance states (P-States)

Boot Performance Mode	Select the performance state that BIOS will set before OS handoff
Turbo Mode	Enables/disables processor Turbo mode (EMTTM enabled is required)
C-States	Enables/disables processor idle power saving states (C-states)
Enhanced C-States	Enables/disables P-state transitions to occur in combination with C-states.
Max C-States	Set the Max CPC state C7/C6/C1
S0ix	Enables/disables the platform to configure S0ix support.

3.5. Boot

The **Boot** menu configures how to boot up the system such as the configuration of boot device priority.
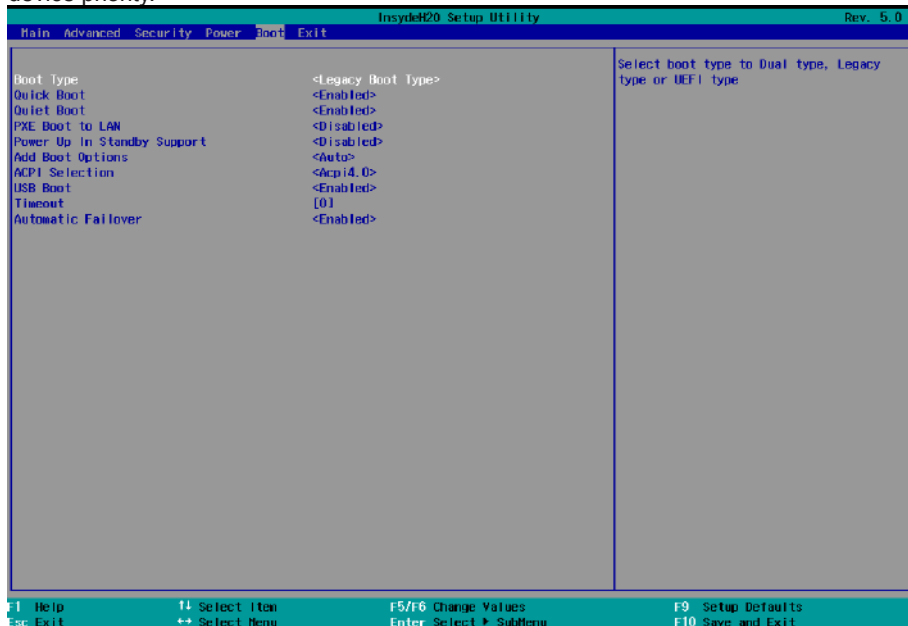
The featured settings are:

Setting	Description
Boot type	Set the boot type. Options are Legacy Boot Type.
Quick Boot	Allow InsydeH20 to Skip certain tests while booting . This will decrease the time need to boot the system.
Quiet Boot	Disables or enables booting in text mode.
PXE boot to LAN	Disables or enables PXE boot to LAN.
Power Up In Standby Support	Disable or enable Power Up In Standby Support.
Add Boot Option	Position in Boot Order for Shell, Network and Removables. Options are First, Last, and Auto.
APCI Selection	Select boot to Acpi 3.0/Acpi 1.0B Options are Acpi 1.0B/Acpi 3.0/Acpi 4.0/Acpi 5.0

USB Boot	Disables or enables booting to USB boot devices.
Timeout	Set the waiting seconds before booting the default boot selection
Automatic Failover	Enables/disables the Automatic Failover.

Legacy

Setting	Description
Normal Boot Menu	Set the boot Menu. Options are Normal / Advance.
Boot Type Order	Set the boot type order. Options are USB / Hard Disk Drive / Floppy Drive / CD/DVD-ROM Drive / Others.

3.6. Exit

The **Save & Exit** menu features a handful of commands to launch actions from the BIOS Setup utility regarding saving changes, quitting the utility and recovering defaults.
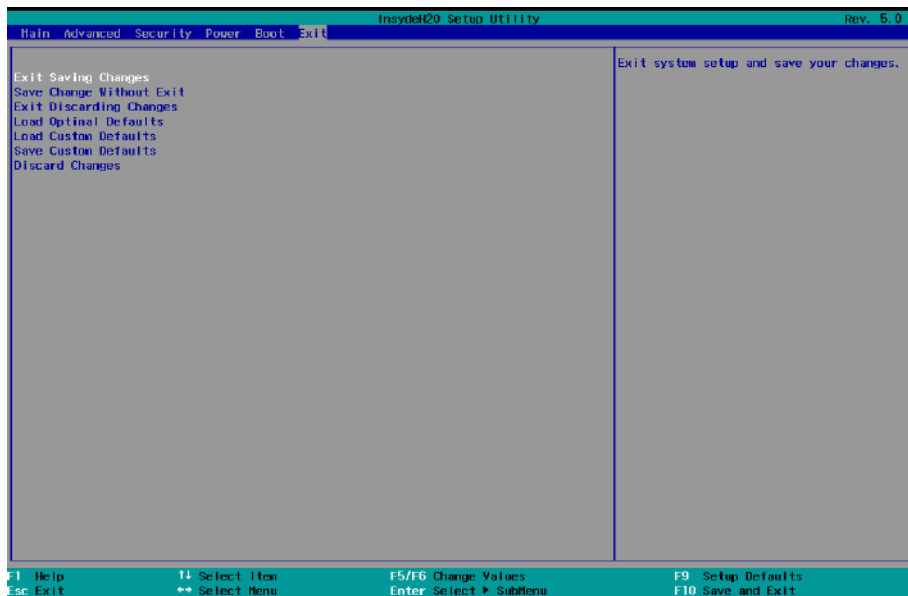
The features settings are:

Setting	Description
Exit Saving Changes	Saves the changes and quits the BIOS Setup utility.
Save Changes Without Exit	Save Changes but does not quit the BIOS.
Exit Discard Changes	Quits the BIOS Setup utility without saving the change(s).
Load Optimal Defaults	Restores all settings to defaults. ▶ This is a command to launch an action from the BIOS Setup utility rather than a setting.
Load Custom Default	Load custom default values
Save Custom Default	Save current setting as custom default
Discard Changes	Discard all changes without Exit.

This page is intentionally left blank.

Appendix

Appendix A. Watchdog Timer (WDT) Setting

WDT is widely used for industrial application to monitor CPU activities. The application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT timeout, the functional normal system will reload the WDT. The WDT never time-out for a normal system. The WDT will not be reloaded by an abnormal system, then WDT will time-out and auto-reset the system to avoid abnormal operation.

This computer supports 255 levels watchdog timer by software programming I/O ports.

Below is an program example to disable and load WDT.

Sample Codes:

```
#include "math.h"
#include "stdio.h"
#include "dos.h"

#define SIO_INDEX       0x2E          /* or index = 0x4E */
#define SIO_DATA        0x2F          /* or data  = 0x4F */

void main()
{
        outportb(sioIndex, 0x87);                        /* Enable Super I/O */
        outportb(sioIndex, 0x87);

        outportb(sioIndex, 0x07);                        /* Select logic device – WDT */
        outportb(sioData,  0x07);

        outportb(sioIndex, 0x30);                        /* Enable WDT */
        outportb(sioData,  0x01);

        outportb(sioIndex, 0xF0);                        /* Enable WDTRST# Output */
        outportb(sioData,  0x80);

        outportb(sioIndex, 0xF6);                        /* Set WDT Timeout value */
        outportb(sioData,  0x05);

        outportb(sioIndex, 0xF5);                        /* Set Configure and Enable WDT
timer, Start countdown */
        outportb(sioData,  0x32);

        outportb(sioIndex, 0xAA);                        /* Disable Super I/O */
}
```

Appendix B. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.
The following table lists the I/O port addresses used.

Address	Device Description
0x000003F8-0x000003FF	Communications Port (COM1)
0x000002F8-0x000002FF	Communications Port (COM2)
0x000003E8-0x000003EF	Communications Port (COM3)
0x000002E8-0x000002EF	Communications Port (COM4)
0x00000378-0x0000037F	ECP Printer Port (LPT1)
0x00000778-0x0000077F	ECP Printer Port (LPT1)
0x00002000-0x00002FFF	Ethernet Controller
0x00000060-0x00000060	Microsoft PS/2 Mouse
0x00000064-0x00000064	Microsoft PS/2 Mouse
0x00000070-0x00000077	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000080-0x0000008F	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00000400-0x0000047F	Motherboard resources
0x00000500-0x000005FE	Motherboard resources
0x00000000-0x0000006F	PCI bus
0x00000078-0x00000CF7	PCI bus
0x00000D00-0x0000FFFF	PCI bus
0x00003000-0x000030FF	PCI standard PCI-to-PCI bridge
0x00003000-0x000030FF	PCI standard PCI-to-PCI bridge
0x00001000-0x0000100F	PCI standard PCI-to-PCI bridge
0x00002000-0x00002FFF	PCI standard PCI-to-PCI bridge

Address	Device Description
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x00003000-0x000030FF	Realtek RTL8169/8110 Family PCI Gigabit Ethernet NIC (NDIS 6.20)
0x00004000-0x0000401F	SM Bus Controller
0x00004048-0x0000404F	Standard AHCI 1.0 Serial ATA Controller
0x0000405C-0x0000405F	Standard AHCI 1.0 Serial ATA Controller
0x00004040-0x00004047	Standard AHCI 1.0 Serial ATA Controller
0x00004058-0x0000405B	Standard AHCI 1.0 Serial ATA Controller
0x00004020-0x0000403F	Standard AHCI 1.0 Serial ATA Controller
0x00001018-0x0000101F	Standard Dual Channel PCI IDE Controller
0x00001024-0x00001027	Standard Dual Channel PCI IDE Controller
0x00001010-0x00001017	Standard Dual Channel PCI IDE Controller
0x00001020-0x00001023	Standard Dual Channel PCI IDE Controller
0x00001000-0x0000100F	Standard Dual Channel PCI IDE Controller
0x00000060-0x00000060	Standard PS/2 Keyboard
0x00000064-0x00000064	Standard PS/2 Keyboard
0x00004050-0x00004057	Standard VGA Graphics Adapter

Address	Device Description
0x000003B0-0x000003BB	Standard VGA Graphics Adapter
0x000003C0-0x000003DF	Standard VGA Graphics Adapter
0x00000070-0x00000077	System CMOS/real time clock
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer

Appendix C. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 10	Communications Port (COM3)
IRQ 11	Communications Port (COM4)
IRQ 7	Ethernet Controller
IRQ 22	High Definition Audio Controller
IRQ 8	High precision event timer
IRQ 81	Microsoft ACPI-Compliant System
IRQ 82	Microsoft ACPI-Compliant System
IRQ 83	Microsoft ACPI-Compliant System
IRQ 84	Microsoft ACPI-Compliant System
IRQ 85	Microsoft ACPI-Compliant System
IRQ 86	Microsoft ACPI-Compliant System
IRQ 87	Microsoft ACPI-Compliant System
IRQ 88	Microsoft ACPI-Compliant System
IRQ 89	Microsoft ACPI-Compliant System
IRQ 90	Microsoft ACPI-Compliant System
IRQ 91	Microsoft ACPI-Compliant System
IRQ 92	Microsoft ACPI-Compliant System
IRQ 93	Microsoft ACPI-Compliant System
IRQ 94	Microsoft ACPI-Compliant System
IRQ 95	Microsoft ACPI-Compliant System
IRQ 96	Microsoft ACPI-Compliant System
IRQ 97	Microsoft ACPI-Compliant System
IRQ 98	Microsoft ACPI-Compliant System
IRQ 99	Microsoft ACPI-Compliant System
IRQ 100	Microsoft ACPI-Compliant System
IRQ 101	Microsoft ACPI-Compliant System
IRQ 102	Microsoft ACPI-Compliant System

Level	Function
IRQ 103	Microsoft ACPI-Compliant System
IRQ 104	Microsoft ACPI-Compliant System
IRQ 105	Microsoft ACPI-Compliant System
IRQ 106	Microsoft ACPI-Compliant System
IRQ 107	Microsoft ACPI-Compliant System
IRQ 108	Microsoft ACPI-Compliant System
IRQ 109	Microsoft ACPI-Compliant System
IRQ 110	Microsoft ACPI-Compliant System
IRQ 111	Microsoft ACPI-Compliant System
IRQ 112	Microsoft ACPI-Compliant System
IRQ 113	Microsoft ACPI-Compliant System
IRQ 114	Microsoft ACPI-Compliant System
IRQ 115	Microsoft ACPI-Compliant System
IRQ 116	Microsoft ACPI-Compliant System
IRQ 117	Microsoft ACPI-Compliant System
IRQ 118	Microsoft ACPI-Compliant System
IRQ 119	Microsoft ACPI-Compliant System
IRQ 120	Microsoft ACPI-Compliant System
IRQ 121	Microsoft ACPI-Compliant System
IRQ 122	Microsoft ACPI-Compliant System
IRQ 123	Microsoft ACPI-Compliant System
IRQ 124	Microsoft ACPI-Compliant System
IRQ 125	Microsoft ACPI-Compliant System
IRQ 126	Microsoft ACPI-Compliant System
IRQ 127	Microsoft ACPI-Compliant System
IRQ 128	Microsoft ACPI-Compliant System
IRQ 129	Microsoft ACPI-Compliant System
IRQ 130	Microsoft ACPI-Compliant System
IRQ 131	Microsoft ACPI-Compliant System
IRQ 132	Microsoft ACPI-Compliant System
IRQ 133	Microsoft ACPI-Compliant System
IRQ 134	Microsoft ACPI-Compliant System
IRQ 135	Microsoft ACPI-Compliant System

Level	Function
IRQ 136	Microsoft ACPI-Compliant System
IRQ 137	Microsoft ACPI-Compliant System
IRQ 138	Microsoft ACPI-Compliant System
IRQ 139	Microsoft ACPI-Compliant System
IRQ 140	Microsoft ACPI-Compliant System
IRQ 141	Microsoft ACPI-Compliant System
IRQ 142	Microsoft ACPI-Compliant System
IRQ 143	Microsoft ACPI-Compliant System
IRQ 144	Microsoft ACPI-Compliant System
IRQ 145	Microsoft ACPI-Compliant System
IRQ 146	Microsoft ACPI-Compliant System
IRQ 147	Microsoft ACPI-Compliant System
IRQ 148	Microsoft ACPI-Compliant System
IRQ 149	Microsoft ACPI-Compliant System
IRQ 150	Microsoft ACPI-Compliant System
IRQ 151	Microsoft ACPI-Compliant System
IRQ 152	Microsoft ACPI-Compliant System
IRQ 153	Microsoft ACPI-Compliant System
IRQ 154	Microsoft ACPI-Compliant System
IRQ 155	Microsoft ACPI-Compliant System
IRQ 156	Microsoft ACPI-Compliant System
IRQ 157	Microsoft ACPI-Compliant System
IRQ 158	Microsoft ACPI-Compliant System
IRQ 159	Microsoft ACPI-Compliant System
IRQ 160	Microsoft ACPI-Compliant System
IRQ 161	Microsoft ACPI-Compliant System
IRQ 162	Microsoft ACPI-Compliant System
IRQ 163	Microsoft ACPI-Compliant System
IRQ 164	Microsoft ACPI-Compliant System
IRQ 165	Microsoft ACPI-Compliant System
IRQ 166	Microsoft ACPI-Compliant System
IRQ 167	Microsoft ACPI-Compliant System
IRQ 168	Microsoft ACPI-Compliant System
IRQ 169	Microsoft ACPI-Compliant System

Level	Function
IRQ 170	Microsoft ACPI-Compliant System
IRQ 171	Microsoft ACPI-Compliant System
IRQ 172	Microsoft ACPI-Compliant System
IRQ 173	Microsoft ACPI-Compliant System
IRQ 174	Microsoft ACPI-Compliant System
IRQ 175	Microsoft ACPI-Compliant System
IRQ 176	Microsoft ACPI-Compliant System
IRQ 177	Microsoft ACPI-Compliant System
IRQ 178	Microsoft ACPI-Compliant System
IRQ 179	Microsoft ACPI-Compliant System
IRQ 180	Microsoft ACPI-Compliant System
IRQ 181	Microsoft ACPI-Compliant System
IRQ 182	Microsoft ACPI-Compliant System
IRQ 183	Microsoft ACPI-Compliant System
IRQ 184	Microsoft ACPI-Compliant System
IRQ 185	Microsoft ACPI-Compliant System
IRQ 186	Microsoft ACPI-Compliant System
IRQ 187	Microsoft ACPI-Compliant System
IRQ 188	Microsoft ACPI-Compliant System
IRQ 189	Microsoft ACPI-Compliant System
IRQ 190	Microsoft ACPI-Compliant System
IRQ 12	Microsoft PS/2 Mouse
IRQ 11	PCI Encryption/Decryption Controller
IRQ 18	PCI standard PCI-to-PCI bridge
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 17	PCI standard PCI-to-PCI bridge
IRQ 4294967294	PCI standard PCI-to-PCI bridge
IRQ 19	Realtek RTL8169/8110 Family PCI Gigabit Ethernet NIC (NDIS 6.20)
IRQ 10	SM Bus Controller
IRQ 19	Standard AHCI 1.0 Serial ATA Controller
IRQ 18	Standard Dual Channel PCI IDE Controller
IRQ 23	Standard Enhanced PCI to USB Host Controller
IRQ 1	Standard PS/2 Keyboard
IRQ 0	System timer

Appendix D. BIOS Memory Map

Address	Device Description
0x90600000-0x906FFFFF	Ethernet Controller
0x90400000-0x904FFFFF	Ethernet Controller
0x90A00000-0x90A03FFF	High Definition Audio Controller
0xFED00000-0xFED003FF	High precision event timer
0xFF000000-0xFFFFFFFF	Intel(R) 82802 Firmware Hub Device
0xE0000000-0xEFFFFFFF	Motherboard resources
0xFED01000-0xFED01FFF	Motherboard resources
0xFED03000-0xFED03FFF	Motherboard resources
0xFED04000-0xFED04FFF	Motherboard resources
0xFED0C000-0xFED0FFFF	Motherboard resources
0xFED08000-0xFED08FFF	Motherboard resources
0xFED1C000-0xFED1CFFF	Motherboard resources
0xFEE00000-0xFEEFFFFF	Motherboard resources
0xFEF00000-0xFEFFFFFF	Motherboard resources
0xFED40000-0xFED44FFF	Motherboard resources
0x80000000-0x8FFFFFFF	PCI bus
0xA0000-0xBFFFF	PCI bus
0xC0000-0xDFFFF	PCI bus
0xE0000-0xFFFFF	PCI bus
0x90900000-0x909FFFFF	PCI Encryption/Decryption Controller
0x90800000-0x908FFFFF	PCI Encryption/Decryption Controller
0x90700000-0x907000FF	PCI standard PCI-to-PCI bridge
0x90700000-0x907000FF	PCI standard PCI-to-PCI bridge
0x90500000-0x905001FF	PCI standard PCI-to-PCI bridge
0x90600000-0x906FFFFF	PCI standard PCI-to-PCI bridge
0x90400000-0x904FFFFF	PCI standard PCI-to-PCI bridge
0x90700000-0x907000FF	Realtek RTL8169/8110 Family PCI Gigabit Ethernet NIC (NDIS 6.20)
0x90A06000-0x90A0601F	SM Bus Controller
0x90A04000-0x90A047FF	Standard AHCI 1.0 Serial ATA Controller
0x90500000-0x905001FF	Standard Dual Channel PCI IDE Controller
0x90A05000-0x90A053FF	Standard Enhanced PCI to USB Host Controller

Address	Device Description
0x90000000-0x903FFFFF	Standard VGA Graphics Adapter
0x80000000-0x8FFFFFFF	Standard VGA Graphics Adapter
0xA0000-0xBFFFF	Standard VGA Graphics Adapter
0xFED40000-0xFED44FFF	Trusted Platform Module 1.2

Appendix E. Direct Memory Access

Resource	Device
Channel 0	ECP Printer Port (LPT1)