
ARES-2367i

**19" 2U Rack-mount Industrial Embedded
Controller with Intel® Atom™ D525**

User's Manual

Version 1.0



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Revision History

Version	Date	Description
1.0	January 2014	Initial release

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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 document 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 the computer 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.

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.

Preface

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)

Important Safety Instructions

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
10. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped or damaged.
 - f. The equipment has obvious signs of breakage.
11. Keep this User's Manual for later reference.

Product Heat



The computer generates heat during operation. Contact the computer's chassis with your body could cause discomfort or even a skin burn.

Warning

The Box PC and its components contain very delicately Integrated Circuits (IC). To protect the Box PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Box PC from the power source when you want to work on the inside.
2. Use a grounded wrist strap when handling computer components.
3. Place components on a grounded antistatic pad or on the bag that came with the Box PC, whenever components are separated from the system.

Replacing 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 consult the user's manual first at: <ftp://ftp.arbor.com.tw/pub/manual>

Please do not hesitate to call or e-mail our customer service when you still cannot find out the answer.

<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 one year 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.

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Chapter 1

Introduction

1.1. Product Highlights

- Applicable for the remote terminal of power generation
- Fanless design
- Rugged design for shock/vibration protection
- 6 x LAN and 6 x serial ports (2 x RS-232 , 4 x RS-232/485 configurable)
- DDR3 SO-DIMM (up to 4GB)
- Easy installation/maintenance
- Intel® SSD compatible
- China electricity certificate level 4
- Redundant power design (dual AC/DC-in ports)



1.2. About this Manual

This manual is meant for the experienced users and integrators with hardware knowledge of personal computers. If you are not sure about the description herein, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

1.3. Specifications

System Kernel	
Processor	Soldered onboard Intel® Atom™ D525 1.8GHz CPU
BIOS	AMI BIOS
Chipset	ICH8M
Graphics	Integrated Intel® GMA3150
Memory	2 x 204-pin DDR3 SO-DIMM sockets up to 4GB at 800MHz
ATA	3 x serial ATA ports with 300MB/s HDD transfer rate
Ethernet Controller	6 x Intel® 82574L GbE controllers
Watchdog Timer	1 ~ 255 levels reset

I/O Ports	
Serial Port	2 x RS-232 ports via two DB-9 connectors 4 x RS-232/485 configurable ports via one 2x10-pin terminal block
USB Port	4 x USB 2.0 ports
LAN Port	6 x RJ-45 ports for GbE
Video Port	1 x DB-15 female connector for Analog RGB (optional)
Expansion Bus	1 x Mini-card socket
	1 x SIM card socket
	1 x PCI/104
Storage	
Type	1 x 2.5" drive bay for HDD/SSD
	2 x 3.5" drive bays for HDD/SSD
	1 x CompactFlash Type II socket
Qualification	
Certification	GB/T 13729 certified (GB/T 17626, GB/T 16935.1) IEC 61850-3 certified (IEC 61000, IEC 60664-1)
Environment	
Operating Temp.	-30 ~ 60°C (-22 ~ 140°F), ambient w/ air flow
	-40 ~ 70°C (-40 ~ 158°F), ambient w/ air flow for ARES-2367i-WT-6L
Storage Temp.	-40 ~ 80°C (-40 ~ 176°F)
Relative Humidity	10 ~ 95% @ 40°C (non-condensing)
	10 ~ 95% @ 70°C (non-condensing) for ARES-2367i-WT-6L
Vibration	2Grms@IEC-68-2-34, random wave, 5~500 Hz, 1 hr per axis
Shock	Operating 20G (11ms)@IEC-68-2-27, half sine wave
Mechanical	
Construction	SECC sheet metal (1.2 mm)
Mounting	Rack-mount
Weight	4 kg (8.82 lb)
Dimensions (W x D x H)	330 x 423 x 88 mm (13" x 16.6" x 3.46") w/o rack-mount ears
Power Requirement	
Power Input	100VAC~240VAC (Redundant)
Power Consumption	45W (Max.)

1.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:



One ARES-2367i industrial embedded controller



- One driver CD
- One user's manual



Two 1x10-pin terminal blocks for serial ports and digital input/output



Two 1x5-pin terminal blocks for power plugs



Two 2U rack-mount ears

1.5. Ordering Information

ARES-2367i-6L	Barebone system w/ 6 LAN ports and w/o storage and memory
ARES-2367i-10L	Barebone system w/ 10 LAN ports and w/o storage and memory (BTO)
ARES-2367i-WT-6L	Wide-temperature barebone system w/ 6 LAN ports and w/o storage and memory
ARES-2367i-WT-10L	Wide-temperature barebone system w/ 10 LAN ports and w/o storage and memory (BTO)

1.5.1. Configure-to-Order Service

Make the computer more tailored to your needs by selecting one or more components from the list below to be fabricated to the computer.

SSD-25032

Memoright 2.5" 32GB SATAII SSD kit



2GB SO-DIMM

DDR3-1333 2GB SDRAM



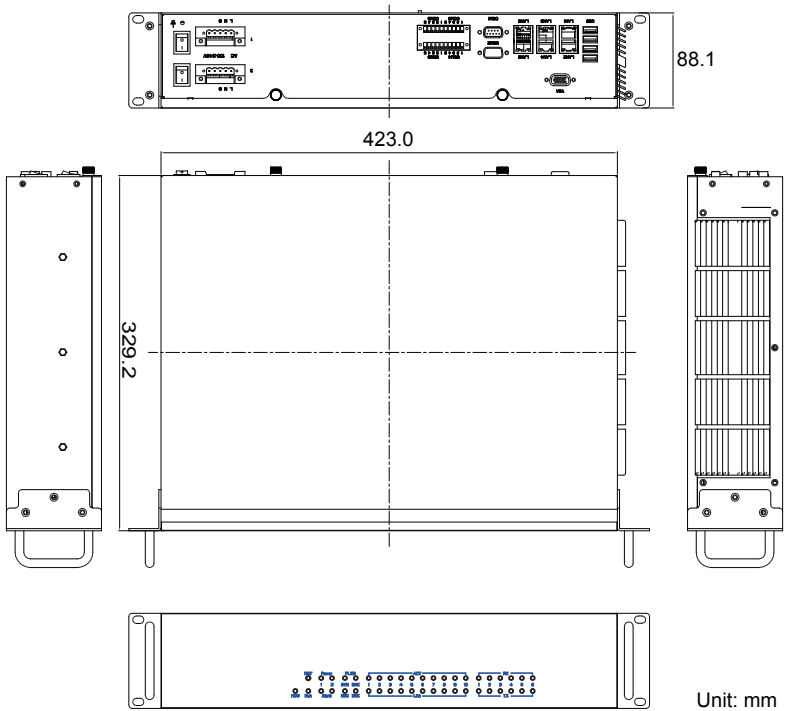
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Chapter 2

Getting Started

2.1. Dimensions

The following illustration shows the dimensions of the computer, with the measurements in width, depth, and height called out.

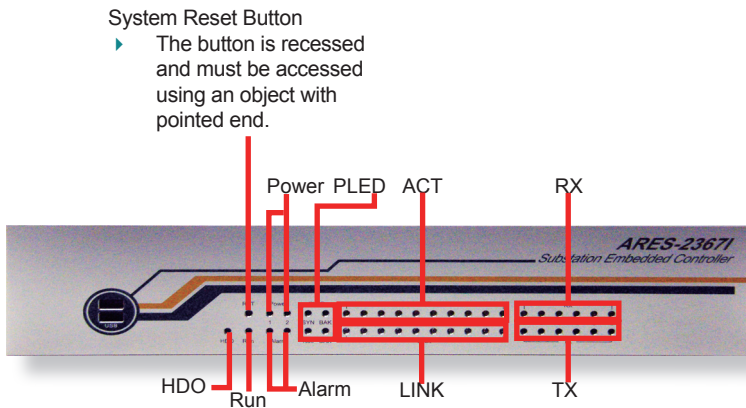


2.2. Take A Tour

The computer has some I/O ports, status LED lamp and controls on the front and rear panels. The following illustrations show all the components called out.

2.2.1. Front View

On the computer's front panel is a series of status LED lamps and two outside-accessible USB ports.



- **Status LED Lamps**

A slew of status LED lamps are recessed on the front side of the computer to draw users' prompt awareness of the computer's contiguous events such as power on/off, data transmission and so on.

These lamps and the notifications delivered are summarized as following:

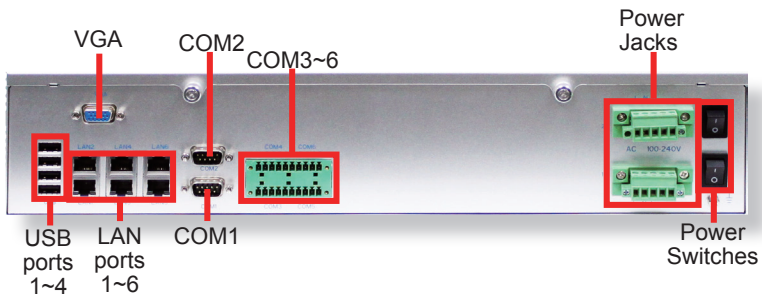
LED Lamp	Description
HDD	Lights when the HDD or SSD is being accessed.
Run	Is a programmable LED lamp (for the user's SCADA needs).
Power #	Lights when power supply is detected at redundant power jack #.

Getting Started

Alarm #	Lights when power supply isn't detected at redundant power jack #.
PLED	Are programmable LED lamps (for the user's SCADA needs).
ACT #	Lights when the LAN port # is streaming data.
LINK #	Lights when the LAN port # is connected to network equipment.
RX #	Lights when the serial port # is receiving data.
TX #	Lights when the serial port # is transmitting data.

*The symbol "#" means a number.

2.2.2. Rear View



2.2.3. Side View



2.3. Driver Installation Notes

The computer supports the operating systems Windows XP, Windows 7 and Linux. For Windows operating systems, find the necessary device drivers on the CD that comes with your purchase. For different Windows editions, the software installation may vary slightly, but generally they are similar. **DO** follow the sequence below to install the drivers to prevent errors:

Chipset→**Graphics**→**Audio**→**LAN**→**USB-to-COM**

Paths to find various drivers on the CD:

Windows XP

Device	Driver Path
Chipset	\\INF\\infinst_autol.exe
LAN	\\LAN\\PRO2KXP_v13_3.exe
Graphics	\\VGA\\XP\\winxp.exe
Audio	\\AUDIO\\XPIWDM_R261.exe
USB-to-COM	USB2COM\\x64\\
	USB2COM\\x32\\

Windows 7

Device	Driver Path
Chipset	\\INF\\infinst_autol.exe
LAN	\\LAN\\PROEFI_v13_3.exe
Graphics	\\VGA\\WIN7\\32\\Win7.exe
	\\VGA\\WIN7\\64\\Win7_64.exe
Audio	\\AUDIO\\WIN7_32_64\\Vista_Win7_R261.exe
USB-to-COM	USB2COM\\x64\\
	USB2COM\\x32\\

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Chapter 3

System Configuration

System Configuration

The computer is constructed based on the mother board FMB-i290G and the daughter board SCDB-3450. If the computer you purchased has so many as 10 LAN ports, an extended daughter board SCDB-1432 is used inside the computer. This section will provide an thorough view of these boards.

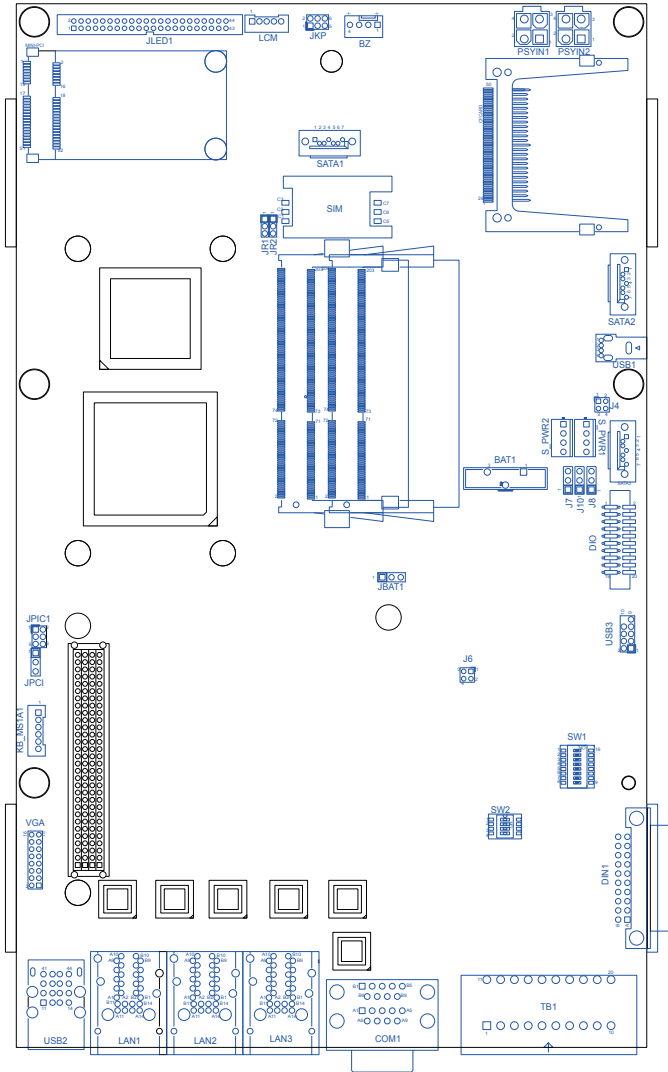
3.1. Mother Board: FMB-i290G

The mother board FMB-i290G features the main components needed by the computer including some important connectors, jumpers and DIP switches. This section will provide an thorough view of this board.

- ▶ To know the mother board layout, see [3.1.1. Board Layout](#) on page [15](#).
- ▶ To know the mother board jumpers, see [3.1.2. Jumpers](#) on page [17](#).
- ▶ To know the mother board DIP switches, see [3.1.3. DIP Switches](#) on page [21](#).
- ▶ To know the mother board connectors, see [3.1.4. Connectors](#) on page [24](#).

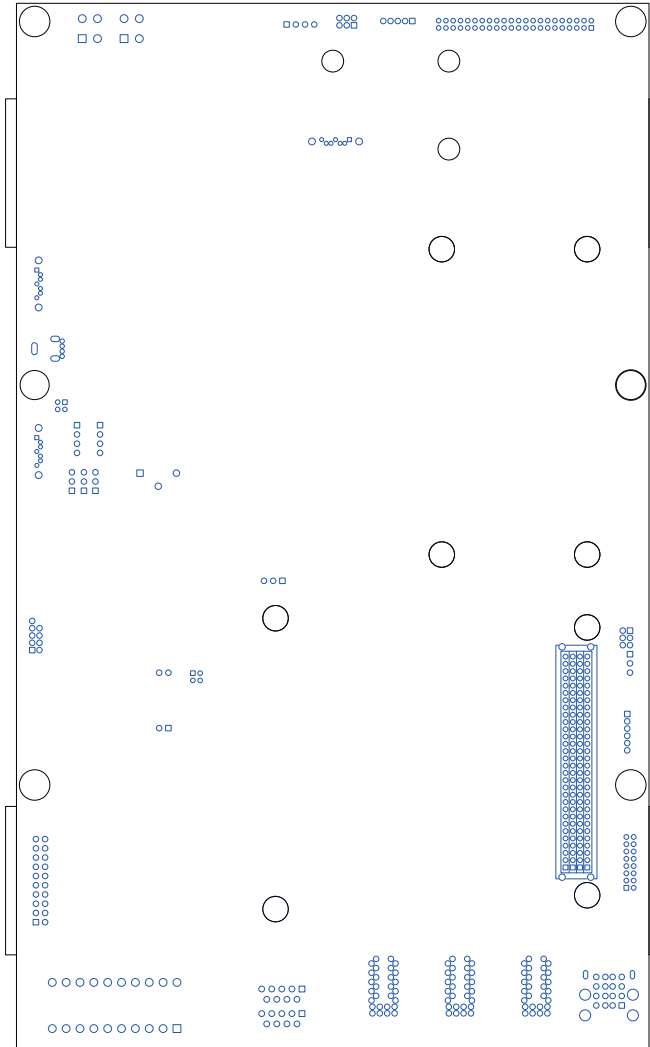
3.1.1. Board Layout

Board Top



System Configuration

Board Bottom



3.1.2. Jumpers



The mother board FMB-i290G comes with some jumpers to alter the computer's hardware configuration. The following will explicate each of these jumpers one-by-one.

JBAT1

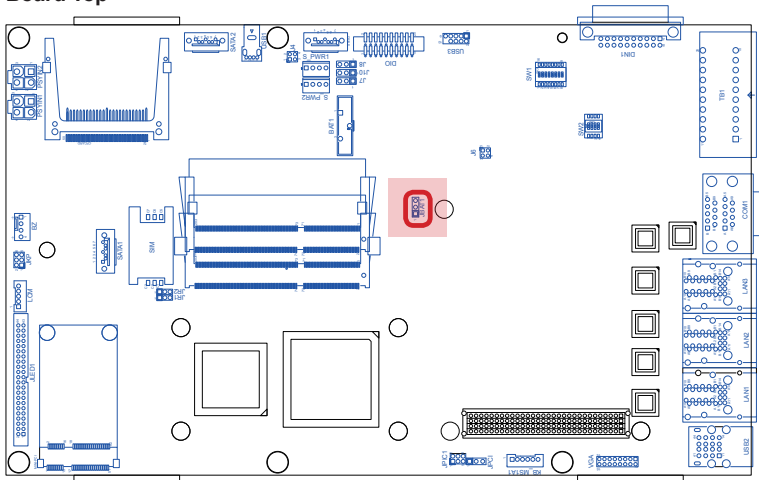
Function: CMOS RTC setting

Jumper Type: Onboard 2.54mm pitch 1x3-pin header

Setting:

Setting		Function
Shorting pin 1 and pin 2 (default)		Keeps CMOS
Shorting pin 2 and pin 3		Resets CMOS

Board Top

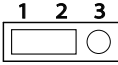
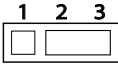


System Configuration

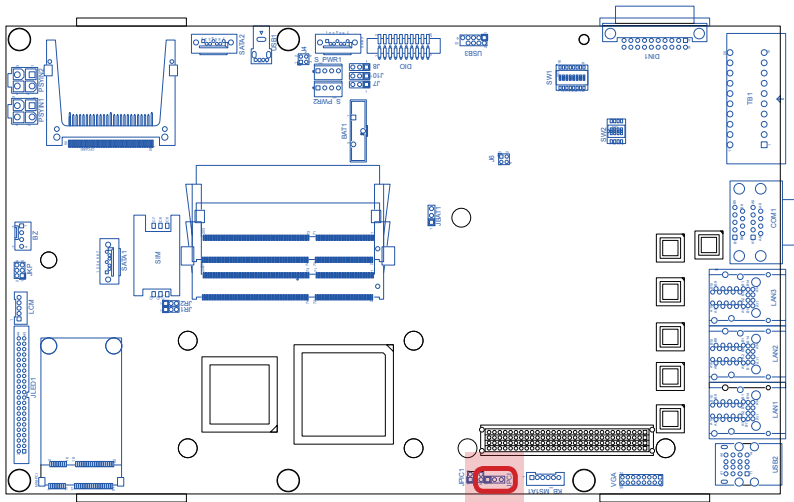
JPCI

Function: Configures PCI VIO power
Jumper Type: Onboard 2.54mm pitch 1x3-pin header

Setting:

Setting		Function
Shorting pin 1 and pin 2		Sets the PCI VIO power to +5V
Shorting pin 2 and pin 3 (default)		Sets the PCI VIO power to +3V

Board Top


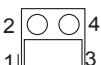


J4

Function: Configures the power-supply to SATA1 pin 7.

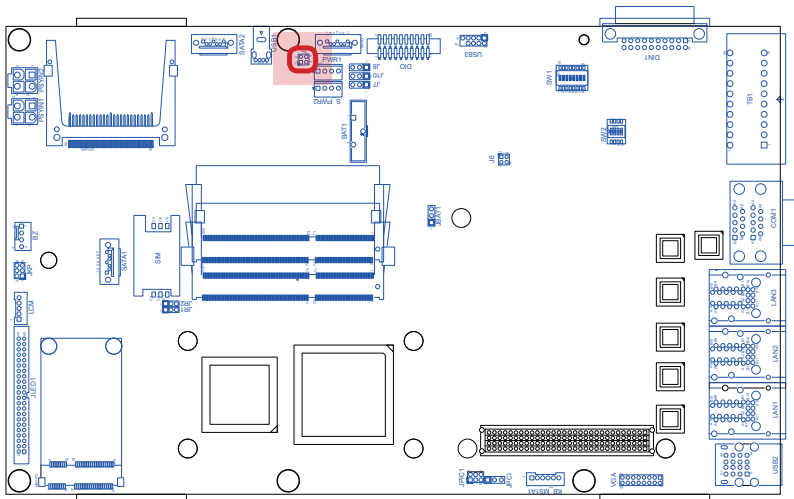
Jumper Type: Onboard 2.54mm pitch 2x2-pin header

Setting:

Setting		Function
Shorting pin 1 & pin 2 and opening pin 3 & pin 4.		Supplies power to SATA1. (for the use of SATA DOM)
Shorting pin 1 & pin 3 and opening pin 2 & pin 4.		Supplies NO power to SATA1. (for the use of SATA HDD)

* All four pins are shorted by default.

Board Top

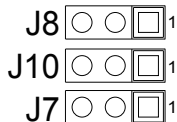


System Configuration







J7, J8, J10

Function: Configures where to take the DIO power and configures the ground isolation.

Jumper Type: Onboard 2.54mm pitch 1x3-pin header

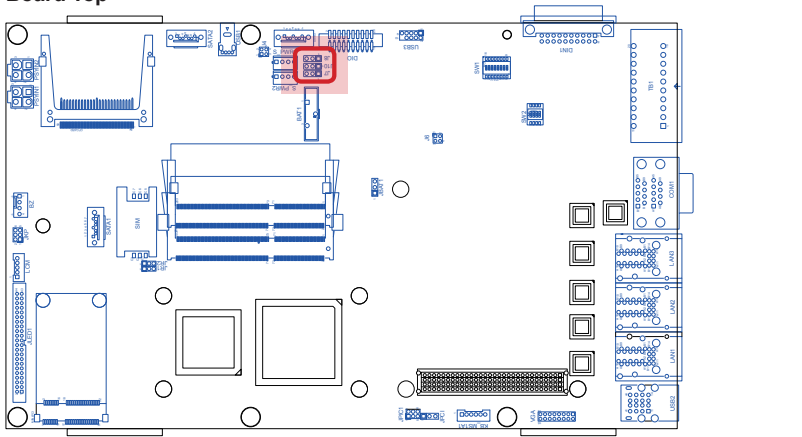


Setting

Jumper	Setting	Description
J7	Shorting pin 1 and pin 2 	The digital IO power is taken from the internal VCC 12V input.
	Shorting pin 2 and pin 3 (default) 	The digital I/O power is taken from the external VCC input.
J8	Shorting pin 1 and pin 2 	The ground isolation is internal ground.
	Shorting pin 2 and pin 3 (default) 	The ground isolation is external ground.
J10	Shorting pin 1 and pin 2 	The digital IO power is taken from the internal VCC input.
	Shorting pin 2 and pin 3 (default) 	The digital I/O power is taken from the external VCC input.

*Note J7/J8/J10 settings should be consistent with each other and shouldn't conflict.

Board Top

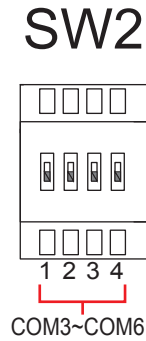
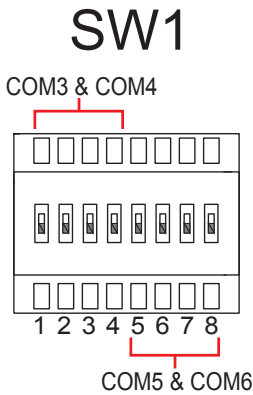


3.1.3. DIP Switches

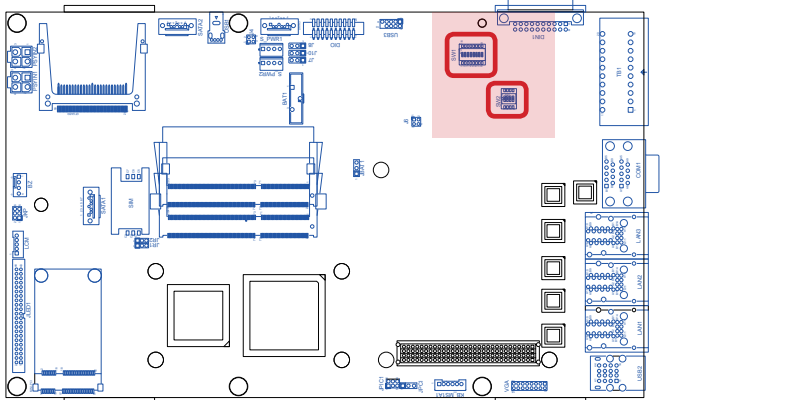
The computer comes with six serial ports, COM1 through COM6. Among these, COM3 to COM6 are provided in terminal block and are configurable between RS422 and RS485 (w/ or w/o 120Ω termination). The mother board FMB-i290G features two DIP switches, both on the top side, to switch COM3 through COM6 to the desired protocol. SW1 is an 8-toggle (16-pin) DIP switch and SW2 is a 4-toggle (8-pin) DIP switch.

For SW1, toggles 1, 2, 3, 4 control COM3 and COM 4 while toggles 5, 6, 7, 8 control COM5 and COM6.

SW2 enables/disables 120Ω termination for RS485.



Board Top



System Configuration

Follow the guide below to configure COM3 through COM6 for data transmission.

- **Settings for COM3 & COM4**

RS-232

Toggle	Position	Setting
1	on	
2	off	
3	on	
4	off	
5	not applicable	
6	not applicable	
7	not applicable	
8	not applicable	

RS485 w/o 120Ω termination

Toggle	Position	Setting	
SW1	1	off	
	2	on	
	3	off	
	4	on	
	5	not applicable	
	6	not applicable	
	7	not applicable	
	8	not applicable	
SW2	1	off	
	2	off	
	3	off	
	4	off	

RS485 w/ 120Ω termination (default)

Toggle	Position	Setting	
SW1	1	off	
	2	on	
	3	off	
	4	on	
	5	not applicable	
	6	not applicable	
	7	not applicable	
	8	not applicable	
SW2	1	on	
	2	on	
	3	not applicable	
	4	not applicable	

- Settings for COM5 & COM6

RS-232

Toggle	Position	Setting
1	not applicable	
2	not applicable	
3	not applicable	
4	not applicable	
5	on	
6	off	
7	on	
8	off	

**RS485
w/o 120Ω
termination**

	Toggle	Position	Setting
SW1	1	not applicable	
	2	not applicable	
	3	not applicable	
	4	not applicable	
	5	off	
	6	on	
	7	off	
	8	on	
SW2	1	not applicable	
	2	not applicable	
	3	off	
	4	off	

**RS485
w/ 120Ω
termination
(default)**

	Toggle	Position	Setting
SW1	1	not applicable	
	2	not applicable	
	3	not applicable	
	4	not applicable	
	5	off	
	6	on	
	7	off	
	8	on	
SW2	1	not applicable	
	2	not applicable	
	3	on	
	4	on	

System Configuration

3.1.4. Connectors

The mother board FMB-i290G comes with some connectors for the computer to join some devices. The following will explicate each of these connectors one-by-one.

JLED1

Description: Connector for the computer's status LED lamps for serial ports COM1 through COM6, LAN ports LAN1 through LAN6, redundant power, alarm, PLED, run, HDD and so on.

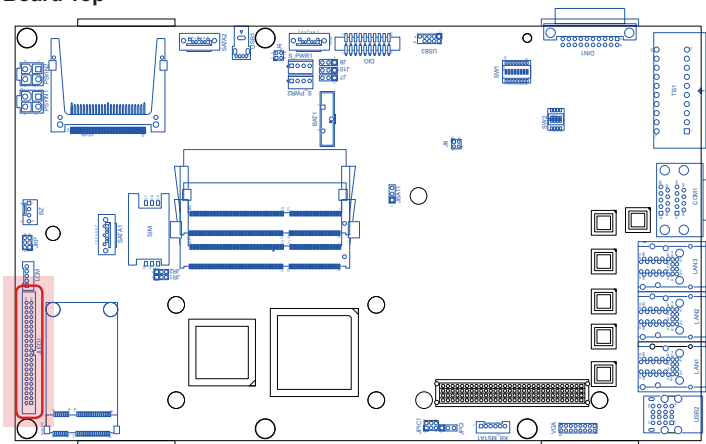
Connector Type: 2.00mm-pitch 2x22-pin box header



JLED1

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
1	GND	12	LAN3_LED_OA	23	LAN4_LED_OA	34	TXD5B
2	GND	13	LAN5_LED_YA	24	LAN1_LED_OA	35	RXD4B
3	ALARM2A	14	LAN2_LED_YA	25	HDD_ACT#A	36	TXD5B
4	POWERIN2A	15	LAN5_LED_GA	26	PRUNB	37	RXD3B
5	ALARM1A	16	LAN2_LED_GA	27	PLED4B	38	TXD3B
6	POWERIN1A	17	LAN5_LED_OA	28	PLED3B	39	RXD2B
7	LAN6_LED_YA	18	LAN2_LED_OA	29	PLED2B	40	TXD2B
8	LAN3_LED_YA	19	LAN4_LED_YA	30	PLED1B	41	RXD_COMB
9	LAN6_LED_GA	20	LAN1_LED_YA	31	RXD6B	42	TXD_COMB
10	LAN3_LED_GA	21	LAN4_LED_GA	32	TXD6B	43	PM_SY SRST# 11,18,32
11	LAN6_LED_OA	22	LAN1_LED_GA	33	RXD5B	44	VCC3V

Board Top

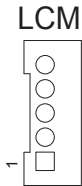


LCM

Description: Connector for the LCD display via COM1 transmitted/received signals

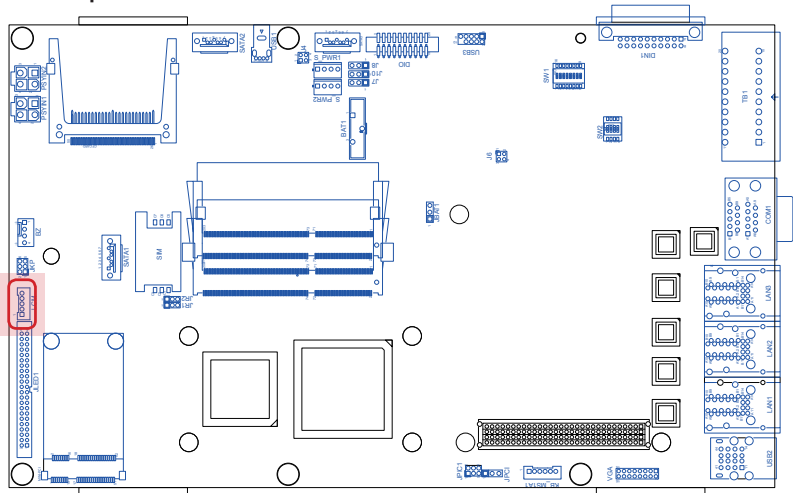
Connector Type: 2.00mm-pitch 1x5-pin 4-wall wafer connector

Pin	Description
1	VCC12
2	VCC5
3	AF_RXD
4	AF_TXD
5	GND



- ▶ See also **BIOS | Advanced | Super IO Configuration | [LCM\(L\)/COM1\(H\)](#)** on page 69 for the BIOS setting.

Board Top



System Configuration

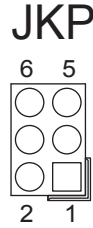
JKP

Description: Connector for panel keypad touch function via W83627 GPI 50, 51, 52, 53, 54

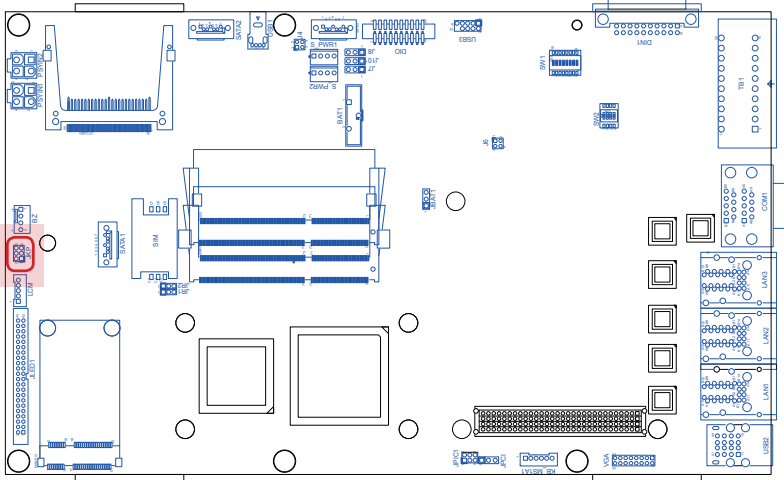
Connector Type: 2.00mm-pitch 3x2-pin header

Pin	Description	Pin	Description
1	KEYPAD1	4	KEYPAD4
2	KEYPAD2	5	KEYPAD5
3	KEYPAD3	6	GND

KEYPAD1=GPI54, KEYPAD2=GPI53,
KEYPAD3=GPI52, KEYPAD4=GPI52,
KEYPAD5=GPI51



Board Top

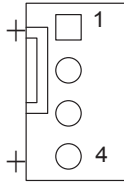


BZ

Description: Connector for 24VDC high power buzzer for redundant power loss

Connector Type: 2.54mm-pitch 1x4-pin one-wall wafer connector

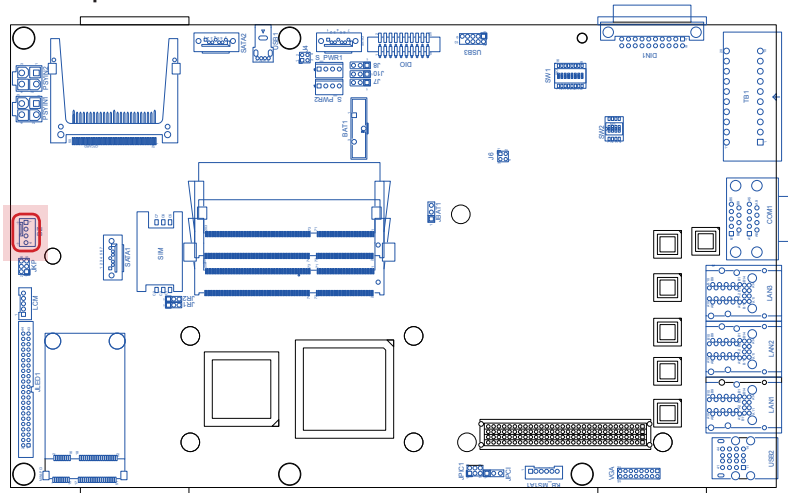
Pin	Description
1	ALM_A
2	GNDA
3	GNDB
4	ALM_B



BZ

Pin 1 and pin 2 alarm for PSYIN1 with no power in.
 Pin 3 and pin 4 alarm for PSYIN2 with no power in.

Board Top

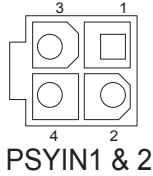


System Configuration

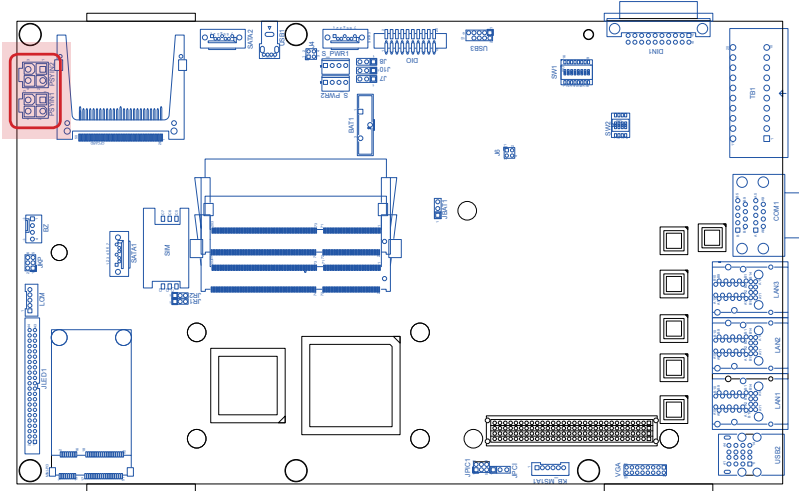
PSYIN1 & PSYIN2

Description: Connector for redundant power input
Connector Type: 2x2-pin ATX-4 power connector

Pin	Description
1	GND
2	GND
3	VinB
4	VinA



Board Top



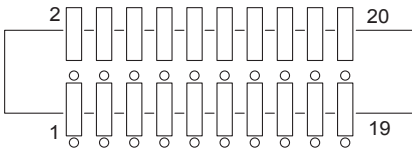
DIO

Description: Defines DIO pins and tests circuit.

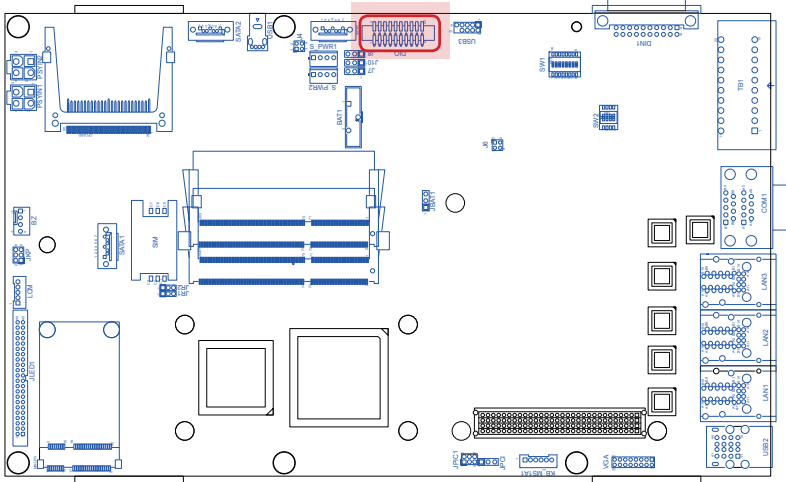
Connector Type: 2.00mm-pitch 2x10-pin box header

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
1	GPIO_out1	6	GPIO_out3	11	GPIO_out5	16	GPIO_out7
2	GPIO_out1	7	GPIO_out4	12	GPIO_out5	17	GPIO_out8
3	GPIO_out2	8	GPIO_out4	13	GPIO_out6	18	GPIO_out8
4	GPIO_out2	9	EXT_VSS_B	14	GPIO_out6	19	EXT_VSS_B
5	GPIO_out3	10	EXT_VDD	15	GPIO_out7	20	EXT_VDD

DIO



Board Top

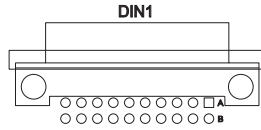


DIN1

System Configuration

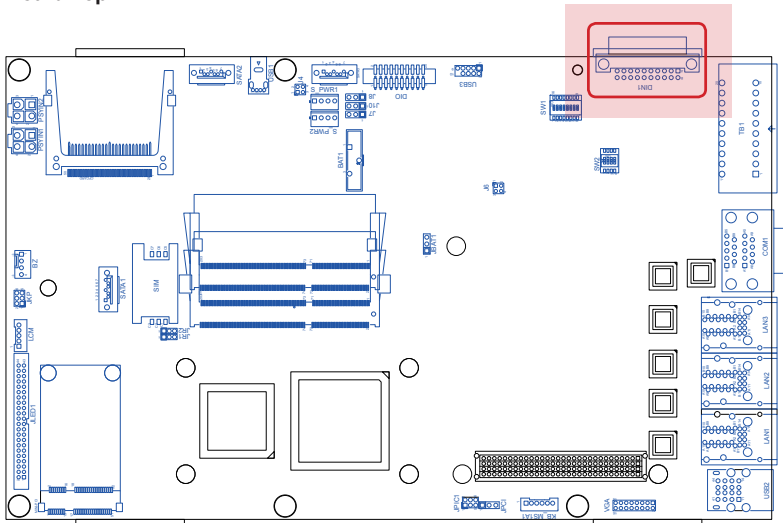
Description: Connector with the extended daughter board SCDB-1432, which features four extra LAN ports.

Connector Type: 3.81mm-pitch 20-pole terminal block



Pin	Description	Pin	Description
A1	VCC5	B1	VCC3
A2	VCC5	B2	VCC3
A3	VCC12	B3	PCIE_RST5#
A4	USB_N1	B4	USB_P1
A5	USB_N2	B5	USB_P2
A6	USB_N3	B6	USB_P3
A7	CLK_PCIE_SL1	B7	CLK_PCIE_SL1#
A8	PCIE_RXP1_SL1	B8	PCIE_RXN1_SL1
A9	PCIE_TXP1_SL1	B9	PCIE_TXN1_SL1
A10	GND	B10	GND

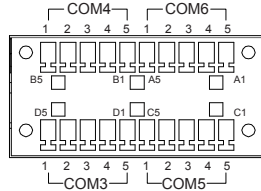
Board Top



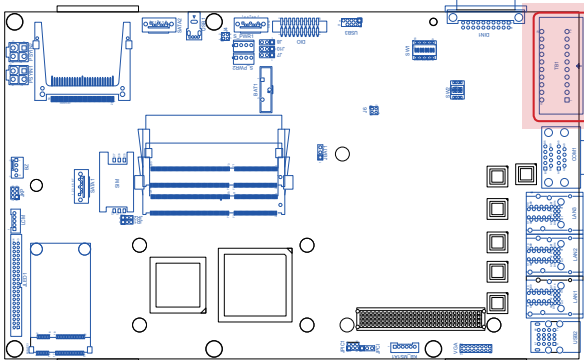
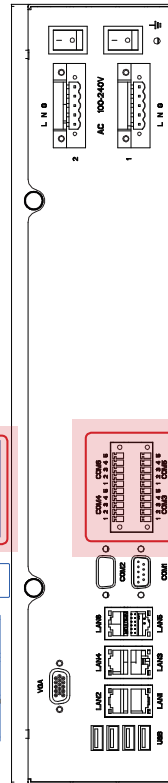
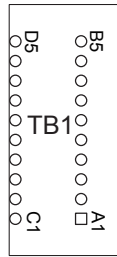
TB1

Description: Connector for serial ports COM3 through COM6 which are configurable between RS232 and RS485. See [3.1.3. DIP Switches](#) for the configuration.

Connector Type: 3.81mm-pitch 20-pole terminal block



Pin	Description	Pin	Description
A1	N-RXD3	C1	N-RXD4
A2	N-TXD3P	C2	N-TXD4P
A3	N-485_3+P	C3	N-485_4+P
A4	N-485_3-	C4	N-485_4-
A5	GND_ISO1	C5	GND_ISO1
B1	N-RXD5	D1	N-RXD6
B2	N-TXD5P	D2	N-TXD6P
B3	N-485_5+P	D3	N-485_6+P
B4	N-485_5-	D4	N-485_6-
B5	GND_ISO1	D5	GND_ISO1



Board Top

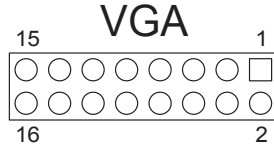
Rear Panel

System Configuration

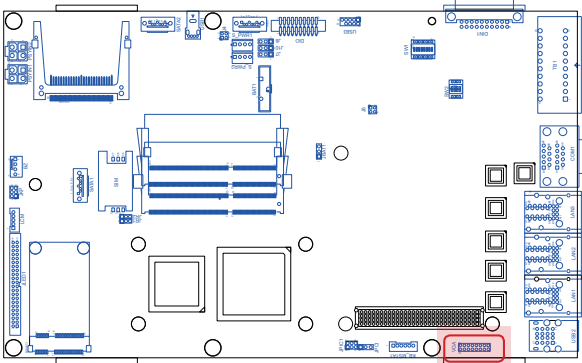
VGA

Description: Connector for analog RGB output

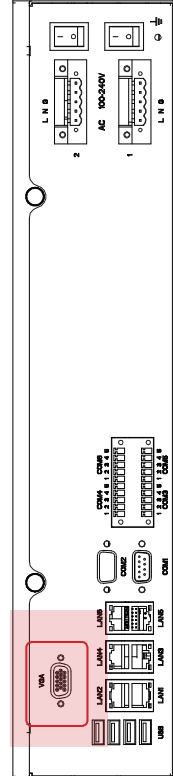
Connector Type: 2.00mm-pitch 2x8-pin header



Pin	Desc.	Pin	Desc.
1	CRT_R	9	CRT_VCC5
2	CRT_G	10	CRT_DETECT
3	CRT_B	11	N/A
4	N/A	12	VGA_DDC_DATA
5	VGAGND	13	VGA_HSYNC
6	AGND_VGA	14	VGA_VSYNC
7	AGND_VGA	15	VGA_DDC_CLK
8	AGND_VGA	16	N/A



Board Top



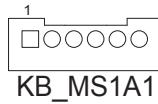
Rear Panel

KB_MS1A1

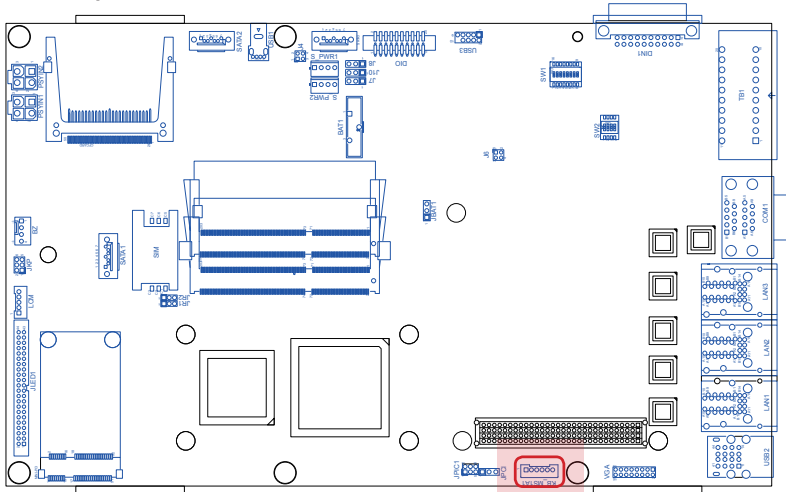
Description: Connector for PS2 keyboard and mouse

Connector Type: 2.00mm-pitch 1x6-pin wafer connector

Pin	Description
1	KMVCC
2	KBDT
3	KBCK
4	MSDT
5	MSCK
6	GND



Board Top



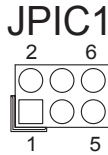
System Configuration

JPIC1

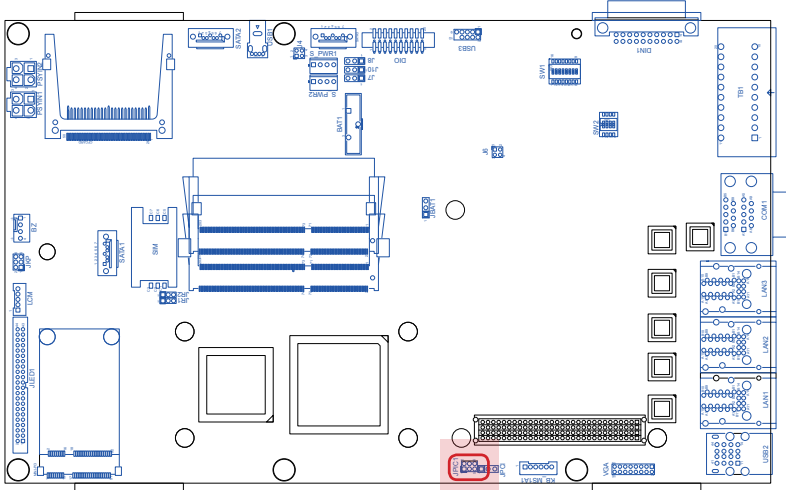
Description: Connector to install PICF690 firmware

Connector Type: 2.00mm-pitch 2x3-pin header

Pin	Description
1	N/A
2	ICSP-CLK
3	ICSP-DAT
4	GND
5	+MCU
6	MCU_RST



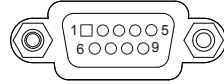
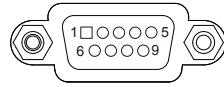
Board Top



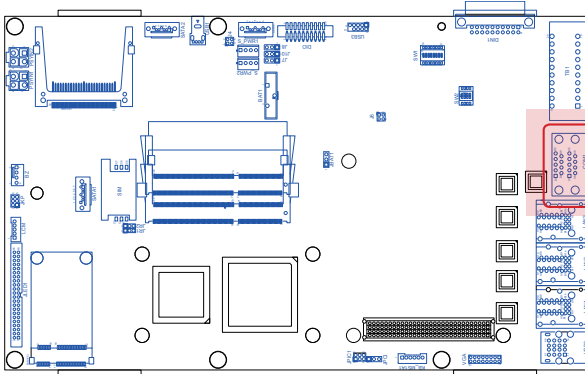
COM1

Description: Connectors for serial ports COM1 and COM2 that are RS-232 interfaced. See [5.2.3. Super IO Configuration](#) on page 69 to know how to configure the base address and IRQ.

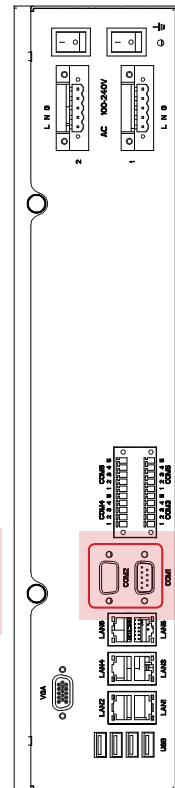
Connector Type: 2.00mm-pitch 2x8-pin header
9-pin male DB connector



Pin	Description	Pin	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		



Board Top



Rear Panel

3.2. Daughter Board: SCDB-3450

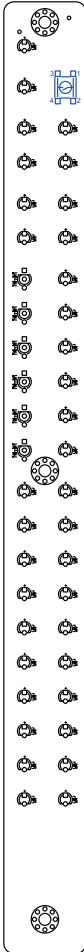
The daughter board SCDB-3450 features a slew of status LED lamps, two connectors and a push-button. This section will provide a thorough view of this board.

- ▶ To know the board layout, see [3.2.1. Board Layout](#) on page [37](#).
- ▶ To know the connectors on this board, see [3.2.2. Connectors](#) on page [38](#).
- ▶ To know the push-button on this board, see [3.2.3. Push-Button](#) on page [40](#).

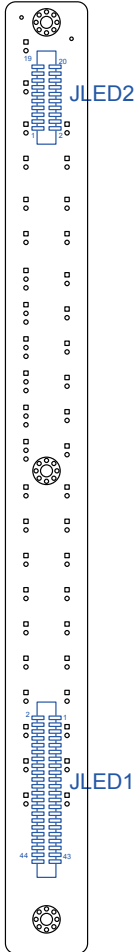
3.2.1. Board Layout

for ARES-2367i-6L & ARES-2367i-WT-6L

Board Top

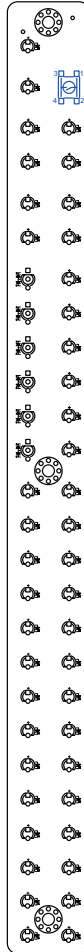


Board Bottom

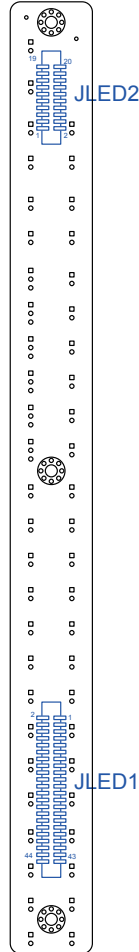


for ARES-2367i-10L & ARES-2367i-WT-10L

Board Top



Board Bottom



System Configuration

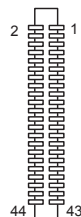
3.2.2. Connectors

The daughter board SCDB-3450 features two connectors to connect with the mother board to deliver status LED lamps for the computer.

JLED1

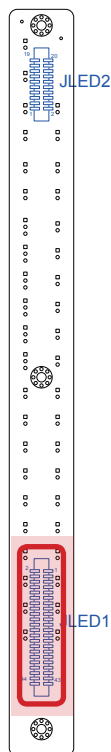
Description: Connector for the computer's status LED lamps for serial ports COM1 through COM6, LAN ports LAN1 through LAN6, redundant power, alarm, PLED, run, HDD and so on.

Connector Type: 2.00mm-pitch 2x22-pin box header



Pin	Desc.	Pin	Desc.
2	GND	1	GND
4	POWERIN2A	3	ALARM2A
6	POWERIN1A	5	ALARM1A
8	LAN3_LED_YA	7	LAN6_LED_YA
10	LAN3_LED_GA	9	LAN6_LED_GA
12	LAN3_LED_OA	11	LAN6_LED_OA
14	LAN2_LED_YA	13	LAN5_LED_YA
16	LAN2_LED_GA	15	LAN5_LED_GA
18	LAN2_LED_OA	17	LAN5_LED_OA
20	LAN1_LED_YA	19	LAN4_LED_YA
22	LAN1_LED_GA	21	LAN4_LED_GA
24	LAN1_LED_OA	23	LAN4_LED_OA
26	PRUNB	25	HDD_ACT#A
28	PLED3B	27	PLED4B
30	PLED1B	29	PLED2B
32	TXD6B	31	RXD6B
34	TXD5B	33	RXD5B
36	TXD5B	35	RXD4B
38	TXD3B	37	RXD3B
40	TXD2B	39	RXD2B
42	TXD_COMB	41	RXD_COMB
44	VCC3V	43	RESET#

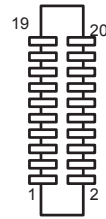
Board Bottom



JLED2

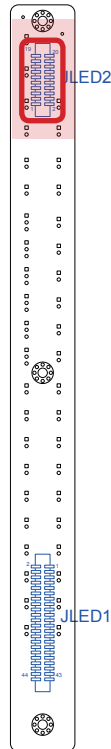
Description: Connector for the status LED lamps for the extra LAN ports featured by the extended daughter board SCDB-1432.

Connector Type: 2.00mm-pitch 2x10-pin box header



Pin	Desc.	Pin	Desc.
19	GND	20	GND
17	TXD14 A	18	RXD14 A
15	TXD13 A	16	RXD13 A
13	TXD12 A	14	RXD12 A
11	TXD11 A	12	RXD11 A
9	TXD10 A	10	RXD10 A
7	TXD9 A	8	RXD9 A
5	TXD8 A	6	RXD8 A
3	TXD7 A	4	RXD7 A
1	VCC3V	2	VCC5

Board Bottom



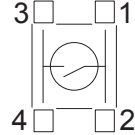
System Configuration

3.2.3. Push-Button

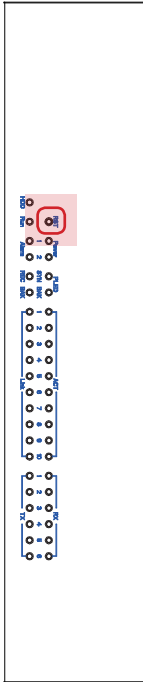
The daughter board SCDB-3450 also features a push button for system reset.

Description: A push-button for system reset

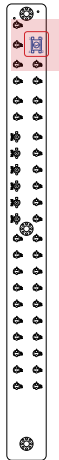
Pin	Desc.	Pin	Desc.
3	GND	1	RESET#
4	GND	2	VCC3V



Front Panel



for ARES-2367i-6L &
ARES-2367i-WT-6L
Board Top



for ARES-2367i-10L &
ARES-2367i-WT-10L
Board Top



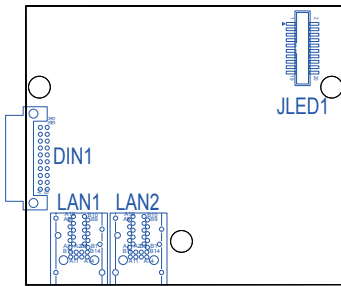
3.3. Daughter Board: SCDB-1432 (for ARES-2367i-10L & ARES-2367i-WT-10L only)

The daughter board SCDB-1432 features four LAN ports to bring four extra LAN ports to the computer (ARES-2367i-10L & ARES-2367i-WT-10L). This section will provide a thorough view of this board.

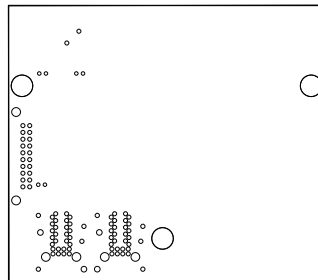
- ▶ To know the board layout, see [3.3.1. Board Layout](#) on page [41](#).
- ▶ To know the connectors on this board, see [3.3.2. Connectors](#) on page [42](#).

3.3.1. Board Layout

Board Top



Board Bottom



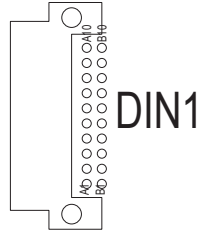
System Configuration

3.3.2. Connectors

DIN1

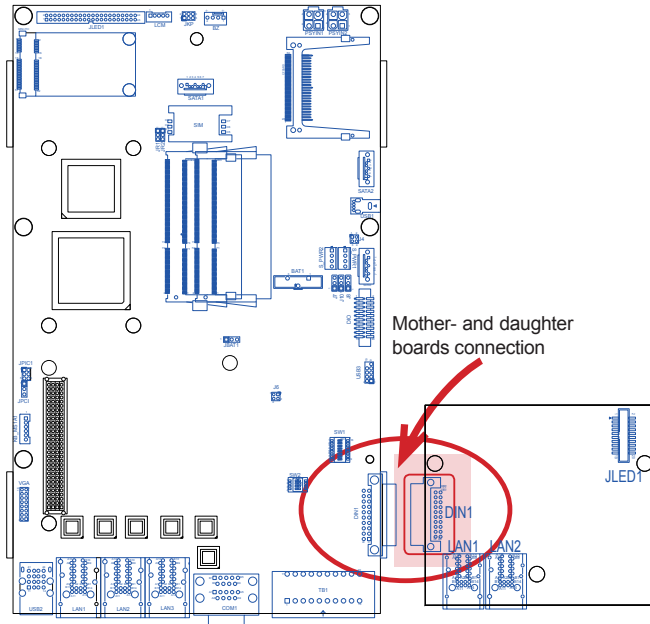
Description: Connector to connect with the mother board FMB-i290G.
Connector Type: 10x2-pin DIN 41612 B type male connector

Pin	Description	Pin	Description
A10	GND	B10	GND
A9	PCIE_TXP_SL1	B9	PCIE_TXN1_SL1
A8	PCIE_RXP_SL1	B8	PCIE_RXN1_SL1
A7	CLK_PCIE_SL1	B7	CLK_PCIE_SL1#
A6	N/A	B6	N/A
A5	N/A	B5	N/A
A4	N/A	B4	N/A
A3	VCC12	B3	PCIE_RSTN_R
A2	VCC5	B2	VCC3
A1	VCC5	B1	VCC3



FMB-i290G Board Top

SCDB-1423 Board Top

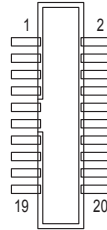


JLED1

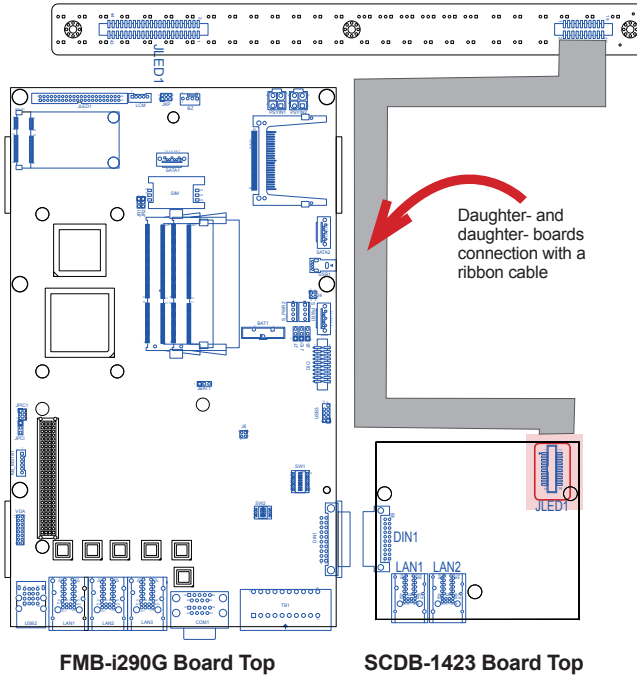
Function: Connects with the daughter board SCDB-3450's JLED2 to deliver the status LED lamps for the extra four LAN ports

Connector Type: 2x10-pin box header with surface-mounted cap

Pin	Desc.	Pin	Desc.
1	VCC3V	2	VCC5
3	TXD7_A	4	RXD7_A
5	TXD8_A	6	RXD8_A
7	TXD9_A	8	RXD9_A
9	TXD10_A	10	RXD10_A
11	TXD11_A	12	RXD11_A
13	TXD12_A	14	RXD12_A
15	TXD13_A	16	RXD13_A
17	TXD14_A	18	RXD14_A
19	GND	20	GND



SCDB-3450 Board Bottom



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Chapter 4

Installation and Maintenance

4.1. Install Hardware

The Computer is constructed based on modular design to make it easy for users to add hardware or to maintain the computer. The following sections will guide you to the simple hardware installations for the computer.

4.1.1. Open the Computer

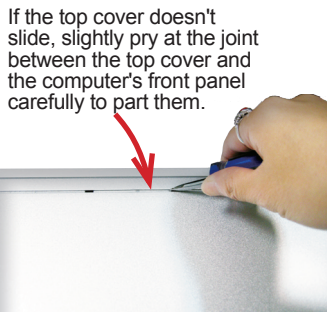
Most of the jumpers, connectors and DIP switches are built on the top side of the mother board. To access said components, the computer's top cover has to go. Follow through the steps below to remove the top cover from the computer. Note the top cover is only removable without the rack-mount ears.

1. Place the computer on a flat surface. Loosen the 2 knobs at the rear panel as marked in the illustration below.

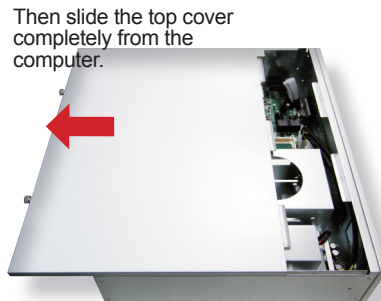


the computer's rear panel

2. Try to slide the top cover from the computer. If the top cover doesn't slide, slightly pry at the joint between the top cover and the computer's front panel carefully to part them from each other. Then slide the top cover completely from the computer.

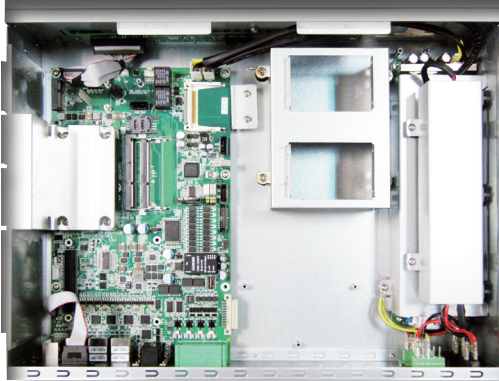


If the top cover doesn't slide, slightly pry at the joint between the top cover and the computer's front panel carefully to part them.



Then slide the top cover completely from the computer.

The inside of the computer comes to view.

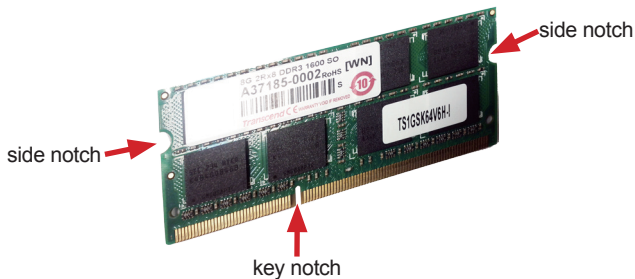


Installation & Maintenance

- ▶ To use the jumpers on the mother board to configure some hardware, see [3.1.2. Jumpers](#) on page [17](#).
- ▶ To use the DIP switches on the mother board to configure the transmission interfaces for COM3 through COM6, see [3.1.3. DIP Switches](#) on page [21](#).
- ▶ To connect/disconnect devices to/from the mother board, see [3.1.4. Connectors](#) on page [24](#).
- ▶ To install a memory module to the computer, see [4.1.2. Install Memory Module](#) on page [49](#).
- ▶ To install a 2.5" SSD drive, see [4.1.3. Install 2.5" SSD/HDD](#) on page [52](#).
- ▶ To install a wireless module based on **PCI Express Mini-card** form factor, see [4.1.4. Install Wireless Module](#) on page [54](#).

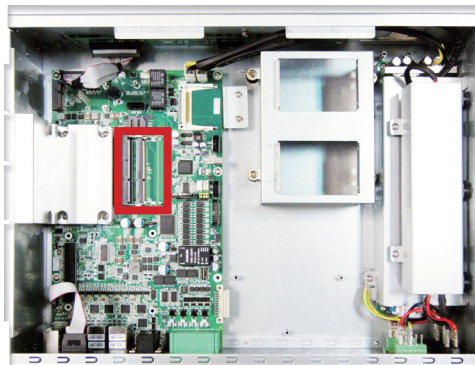
4.1.2. Install Memory Module

The mother board has two dual-inline memory module (DIMM) sockets. Load the computer with one or two memory modules to make programs run faster. The memory module for the computer's SO-DIMM socket should be a 204-pin DDR3 with a "key notch" off the centre among the pins, which enables the memory module for particular applications. There are another two notches at each left and right side of the memory module to help fix the module in the socket.



To install a DDR3 memory module:

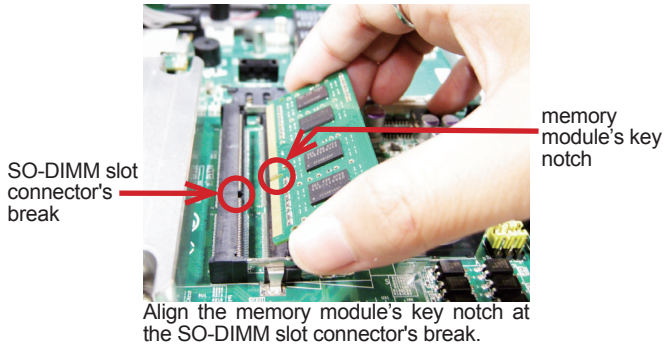
1. Remove the top cover from the computer as described in [4.1.1. Open the Computer](#) on page [46](#).
2. Find the two SO-DIMM sockets on the board as marked in the illustration below.



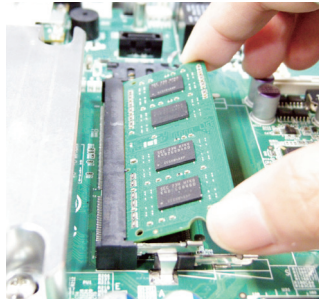
The SO-DIMM sockets are horizontal type, each with two spring-loaded locks to fix the memory module.

Installation & Maintenance

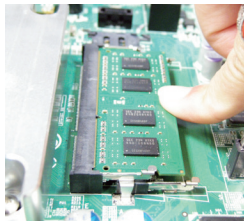
3. Confront the memory module's edge connector with the SO-DIMM slot connector. Align the memory module's key notch at the break on the SO-DIMM slot connector.



4. Fully plug the memory module until it cannot be plugged any more.



5. Press down the memory module until it gets auto-locked in place.



6. Restore the top cover to the computer.

To uninstall the DDR3 memory module:

1. Pull back both locks from the memory module.

The DDR3 memory module will be auto-released from the socket.

2. Remove the memory module.
3. Restore the top cover to the computer.

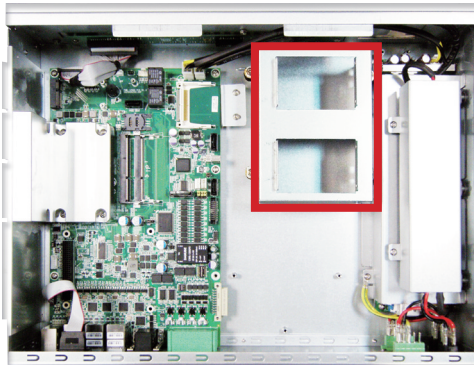
Installation & Maintenance

4.1.3. Install 2.5" SSD/HDD

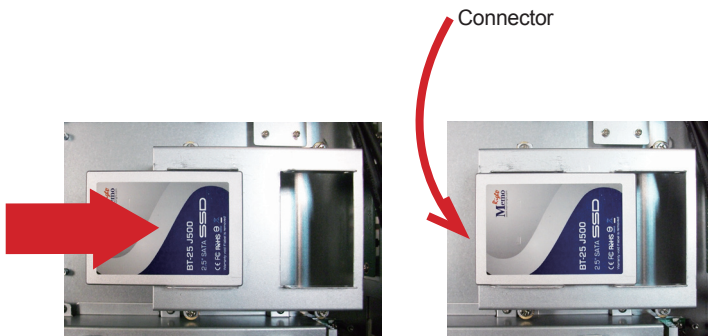
1. Remove the top cover from the computer as described in [4.1.1. Open the Computer](#) on page [46](#).

The inside of the computer comes to view.

2. See the illustration below and find the bracket for a storage device.



3. Place a 2.5-inch SSD/HDD onto the bracket and slide the SSD/HDD in place as the illustration below shows.



Slide a 2.5-inch SSD along the track.

4. Fix the SSD/HDD with four screws - two screws on each side of the bracket.



5. Use a SATA signal cable and a SATA power cable to connect the SSD/HDD storage with the motherboard.



Connect the SATA power/signal cables..

6. Restore the top cover to the computer .

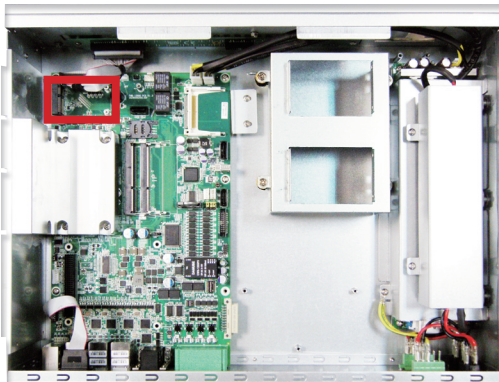
Installation & Maintenance

4.1.4. Install Wireless Module

The computer has a PCI Express Mini-card socket. It is therefore able to network with WiFi or 3G as long as a wireless module of that form factor is installed at the socket. This section will guide you to install a wireless module at the Mini-card socket.

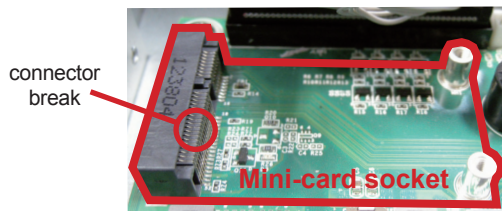
1. Remove the computer's top cover as described in [4.1.1. Open the Computer](#) on page [46](#).

The inside of the computer comes to view.



2. Find the **PCI Express Mini-card** socket for 3G modules as the illustration above shows.

The socket has a break among the connector .



3. Have a wireless module, 3G or WiFi, of PCI Express Mini-card form factor. Confront the wireless module's connector with the socket's connector. Plug the wireless module to the socket by a slanted angle. Fully plug the module. Note the notch on the wireless module should meet the break of the connector.



Fully plug the module.

4. Press down the module and fix the module in place using two screws.



5. Have an RF antenna. Connect the RF antenna to the wireless module's "MAIN" connector.



Connect the RF antenna's MHF connector to the 3G module's "MAIN" connector.

6. Pull the other end of the RF antenna out of the chassis of the computer. Fix an external antenna to the RF antenna's SMA connector.

Installation & Maintenance

7. Restore the computer's top cover.

4.1.5. Install SIM Card

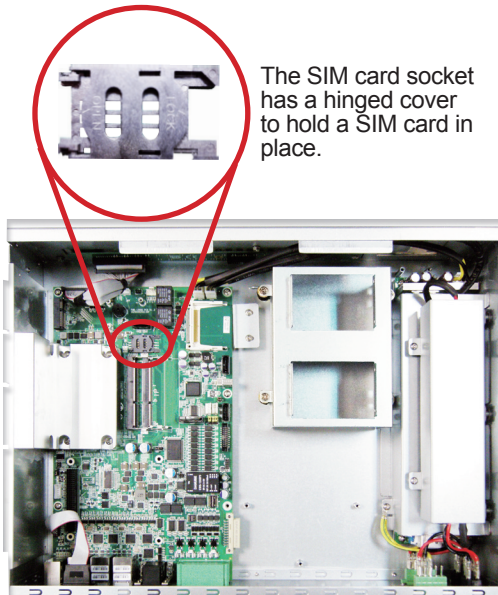
The computer comes with a SIM socket for 3G networking. Follow through the guide below to install a SIM card to the computer.

Note: To make use of a SIM card for 3G networking, a 3G module is also needed on the computer, see [4.1.4. Install Wireless Module](#) to install the 3G module.

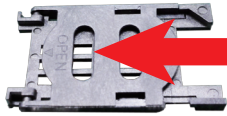
1. Remove the top cover from the computer as described in [4.1.1. Open the Computer](#) on page 46.

The inside of the computer comes to view.

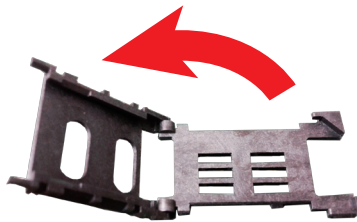
2. See the illustration below and find the **SIM Card** socket for 3G networking.



3. Push back the hinged cover to open the socket.



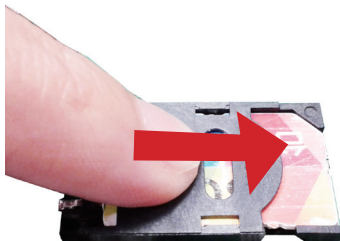
4. Swivel the hinged cover.



5. The hinged cover is also the card holder. Slide a SIM card along the hinged cover. Note the notch on the SIM card should meet the notch on the socket.



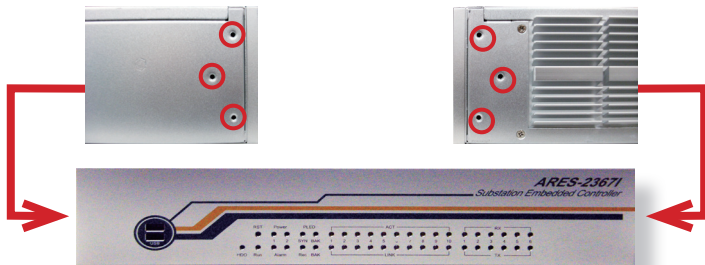
6. Put down the hinged cover and push it forward to lock the SIM card in place.



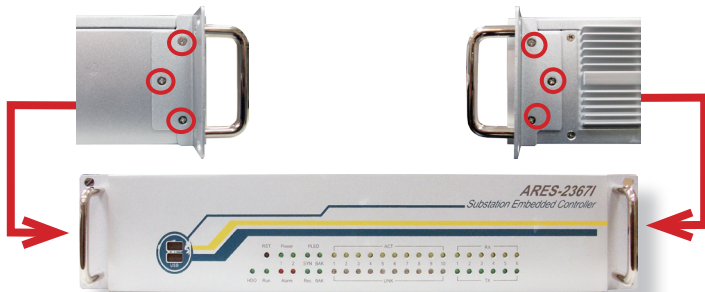
4.2. Rack-mount the Computer

Two 2U ears are included in the accessories of the computer to support rack-mount. Follow the guide below to install the ears and mount the computer.

1. Find the three mounting holes at each of the computer's lateral sides, close to the computer's front panel..



2. Attach a ear to each of the computer's lateral side, with the mounting holes on the ear aligned with those on the computer's lateral side.
3. Fix the ear to the lateral side by fastening three screws that is included in the rack-mount ear kit. Do the same thing to the other ear.



4. Place the computer onto your computer rack by using the ears.

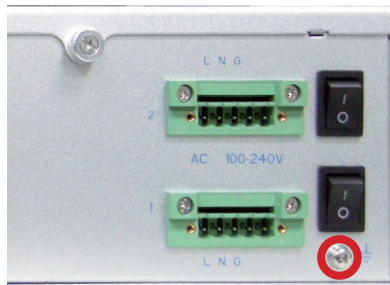
4.3. Ground the Computer

Follow the instructions below to ground the computer onto land. Be sure to follow every grounding requirement in your place.



Warning Whenever installing the unit, the ground connection must always be made first of all and disconnected lastly.

1. See the illustration below. Remove the ground screw from the lower-right of the rear panel.



2. Attach a ground wire to the rear panel with the screw.

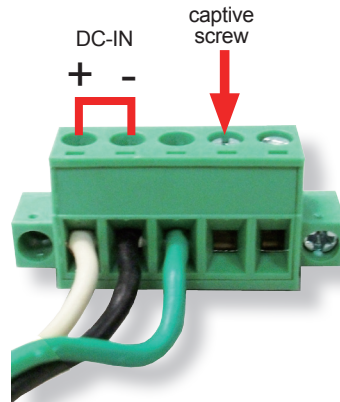
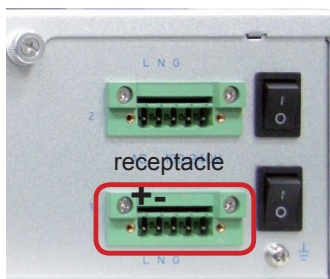
4.4. Wire DC-Input Power Source



Warning Only trained and qualified personnel are allowed to install or replace this equipment.

Follow the instructions below for connecting the computer to a DC-input power source.

1. Before wiring, make sure the power source is disconnected.
2. Find the terminal block in the accessory box.
3. Use the wire-stripping tool to strip a short insulation segment from the output wires of the DC power source.
4. Identify the positive and negative feed positions for the terminal block connection. See the symbols printed on the rear panel indicating the polarities and DC-input power range in voltage.
5. Insert the exposed wires into the terminal block plugs. Only wires with insulation should extend from the terminal block plugs. Note that the polarities between the wires and the terminal block plugs must be positive to positive and negative to negative.
6. Use a slotted screwdriver to tighten the captive screws. Plug the terminal block firmly, which wired, into the receptacle on the rear panel.



terminal block

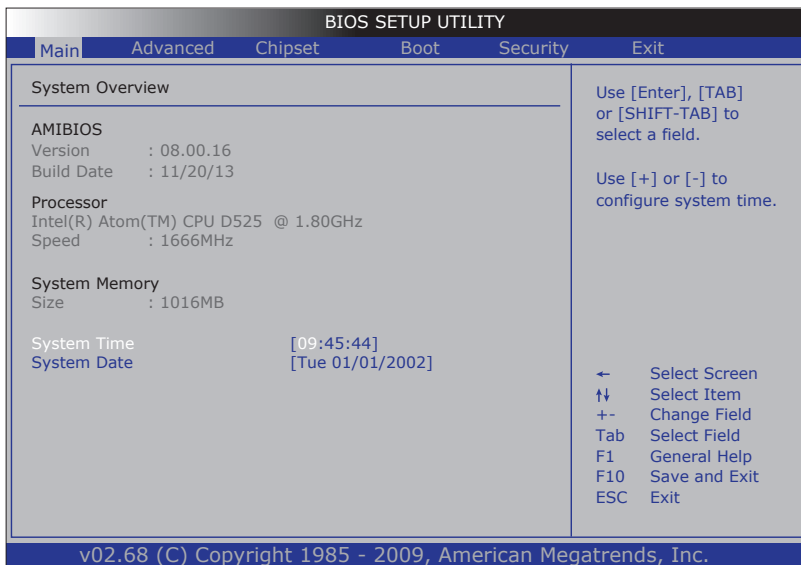
Chapter 5

BIOS

BIOS

The BIOS Setup utility for the computer is featured by American Megatrends Inc to configure the system settings stored in the system's BIOS ROM. The BIOS is activated once the computer powers on. When the computer is off, the battery on the main board supplies power to BIOS RAM.

To enter the BIOS Setup utility, keep hitting the “Delete” key upon powering on the computer.



The BIOS' featured menus are:

Menu	Description
Main	See 5.1. Main on page 64 .
Advanced	See 5.2. Advanced on page 65 .
Chipset	See 5.3. Chipset on page 74 .
Boot	See 5.4. Boot on page 78 .
Security	See 5.5. Security on page 79 .
Save & Exit	See 5.6. Save & Exit on page 80 .

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	<ul style="list-style-type: none"> ▶ 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.
Page Up / +	Increases current value to the next higher value or switches between available options.
Page Down / -	Decreases current value to the next lower value or switches between available options.
F1	Opens the Help of the BIOS Setup utility.
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.)

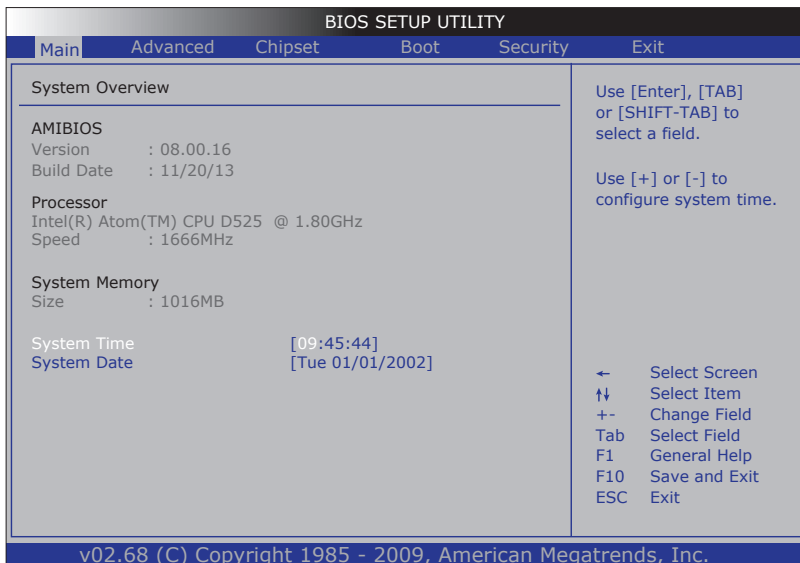
Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

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.

BIOS

5.1. Main

This menu features the settings of **System Date** and **System Time** and delivers a system overview.



The info displayed are:

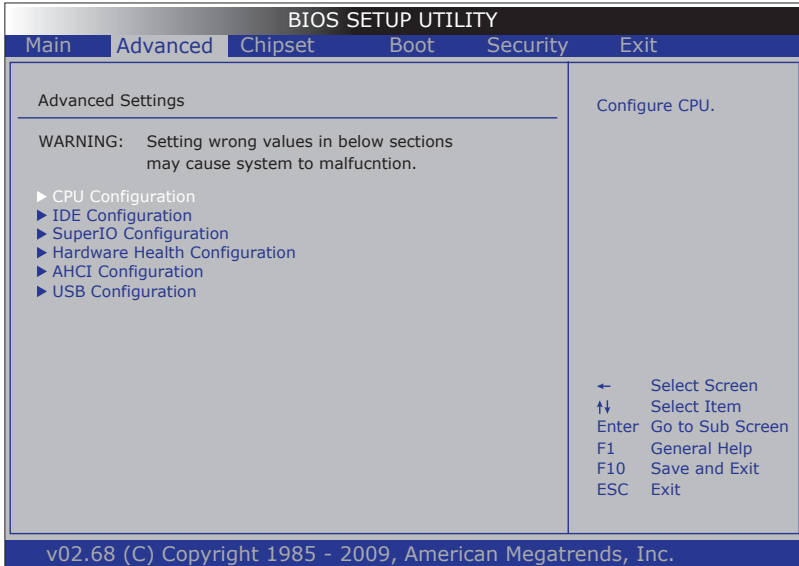
Group	Info	Description
AMIBIOS	Version	Delivers the system's BIOS version.
	Build Date	Delivers the date when the BIOS Setup utility was created/updated.
Processor		Displays processor info, which includes the following: ▶ Speed: The processor's max speed.
System Memory		Delivers the capacity of the DDR3 SDRAM present in the system.

The featured settings are:

Setting	Description
System Time	Sets system time.
System Date	Sets system date.

5.2. Advanced

Access this menu to manage the computer's system configuration including the Super IO chip.



The featured settings and submenus are:

Setting	Description
CPU Configuration	Configures CPU. See 5.2.1. CPU Configuration on page 66 .
IDE Configuration	Configures the IDE device(s). See 5.2.2. IDE Configuration on page 67 .
Super IO Configuration	Configures the SuperIO Chipset Win627UHG. See 5.2.3. Super IO Configuration on page 69 .
Hardware Health Configuration	Configures/monitors the hardware health. See 5.2.4. Hardware Health Configuration on page 70 .
AHCI Configuration	See 5.2.5. AHCI Configuration on page 71 .
USB Configuration	Configures the system's USB support. See 5.2.6. USB Configuration on page 73 .

BIOS

5.2.1. CPU Configuration

Select this submenu to run a report of the CPU's details including: model name, processor speed, processor caches, and so on. See the depiction below:

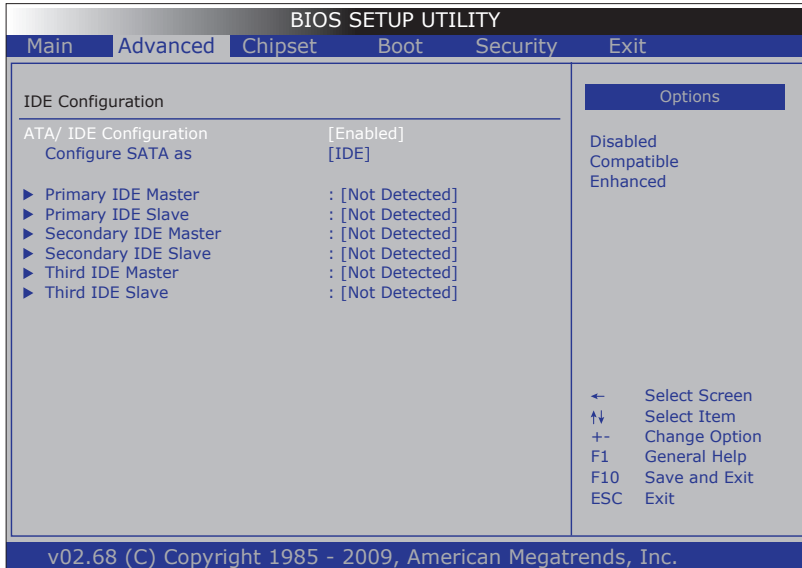
BIOS SETUP UTILITY	
Advanced	
Configure advanced CPU settings	
Manufacture: Intel Intel(R) Atom(TM) CPU D525 @ 1.80GHz Frequency : 1.80GHz FSB Speed : 800MHz Cache L1 : 48 KB Cache L2 : 1024 KB Ratio Actual Value: 9	Enabled for Windows XP and Linux4 (OS optimized for Hyper Threading Thchnology) and disabled for other OS (OS not optimized for Hyper-Threading Technology)
Hyper Threading Technology [Enabled] Intel (R) SpeedStep(tm) tech [Enabled]	
	← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
v02.68 (C) Copyright 1985 - 2009, American Megatrends, Inc.	

The submenu also features the following settings:

Setting	Description
Hyper Threading Technology	Enables/disables the processor's Hyper-Threading feature. <ul style="list-style-type: none"> ▶ Select Enabled for Windows XP and Linux, which are optimized for Hyper-Threading Technology. ▶ Select Disabled for other OS that are not optimized for Hyper-Threading. ▶ Enabled is the default. ▶ When disabled, only one thread per enabled core is enabled.
Intel (R) SpeedStep(tm) tech	Enables/disables SpeedStep™ technology for better power saving. <ul style="list-style-type: none"> ▶ SpeedStep™ is a technology built into some Intel® processors that allows the processor's clock speed to be dynamically changed by software. ▶ Disabled is the default.

5.2.2. IDE Configuration

Access this submenu to configure the system's IDE (Integrated Device Electronics) devices.



The featured settings are:

Setting	Description			
ATA/IDE Configuration	Configures the system's ATA/IDE port. <ul style="list-style-type: none"> ▶ Available options are Disabled, Compatible and Enhanced (default). ▶ Select Compatible to have SATA as primary IDE channel and PATA as secondary. ▶ Select Disabled to disable the ATA/IDE port. ▶ Leave it as Enhanced to configure SATA channels to IDE or AHCI (Advanced Host Controller Interface). When set to Enhanced, the following setting becomes available: 			
	<table border="1"> <thead> <tr> <th>Setting</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Configure SATA as</td> <td>Configures the SATA feature between IDE (default) and AHCI.</td> </tr> </tbody> </table>	Setting	Description	Configure SATA as
Setting	Description			
Configure SATA as	Configures the SATA feature between IDE (default) and AHCI .			

		Each channel features the following settings:	
		Setting	Description
Primary IDE Master	Type		Sets the type of the IDE device connected to the system, or leaves it on BIOS auto-detection. <ul style="list-style-type: none"> Available options are: Not Installed, Auto (default), CD/DVD, and ARMD, which means "ATAPI removable media device", a type of computing storage.
	LBA/ Large Mode		Enables/disables LBA (logical block address) mode. <ul style="list-style-type: none"> Select Disabled to disable LBA mode. Select Auto to enable LBA mode if supported by the device and the device isn't formatted with LBA mode disabled. Auto is the default.
Primary IDE Slave	Block (Multi-Sector Transfer)		Sets whether the data transfer from/to the device occurs one sector or multiple sector at a time. <ul style="list-style-type: none"> Select Disabled to transfer data from/to the device one sector at a time. Select Auto to transfer data from/to the device multiple sectors at a time if supported by the device. Auto is the default.
Secondary IDE Master	PIO Mode		Sets PIO (Programmed I/O) mode for the IDE drive, or leaves it on BIOS auto-configuration <ul style="list-style-type: none"> Available options are Auto (default), 0, 1, 2, 3, and 4. Select Auto to let the BIOS auto-detect the IDE drive's maximum PIO mode supported.
	DMA Mode		Configure the DMA (Direct Memory Address) feature, or leaves it on BIOS auto-detection <ul style="list-style-type: none"> Auto is the only available option.
Secondary IDE Slave	S.M.A.R.T.		Enables/disables S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology), or leaves it on BIOS auto-detection. <ul style="list-style-type: none"> S.M.A.R.T. is a utility to monitor the disk status to predict hard disk failure The available options are Auto (default), Disabled and Enabled.
	32Bit Data Transfer		Enables/disables 32-bit to maximize the IDE hard disk data transfer rate. <ul style="list-style-type: none"> Enabled is the default.

5.2.3. Super IO Configuration

Access this submenu to configure the system's two RS232-interfaced serial ports COM1 and COM2 that are provided via two DB-9 connectors. See also [COM1](#) on page 35 to know the pin definition of these serial ports.

BIOS SETUP UTILITY	
Advanced	
Configure Win627UHG Super IO Chipset	
Serial Port1 Address	[3F8]
Serial Port1 IRQ	[4]
Serial Port2 Address	[2F8]
Serial Port2 IRQ	[3]
LCM(L)/COM1(H)	[High]
Allows BIOS To Select Serial Port1 Base Addresses.	
← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit	
v02.68 (C) Copyright 1985 - 2009, American Megatrends, Inc.	

The featured settings are:

Setting	Description
Serial Port1 Address	Sets COM1 base addresses. ▶ Options available are: Disabled , 3F8 (default), 3E8 and 2E8 .
Serial Port1 IRQ	Sets COM1 IRQ. ▶ Options available are: 3 , 4 (default), 10 , 11 .
Serial Port2 Address	Sets COM2 base addresses. ▶ Options available are: Disabled , 2F8 (default), 3E8 and 2E8 .
Serial Port2 IRQ	Sets COM2 IRQ. ▶ Options available are: 3 (default), 4 , 10 , 11 .
LCM(L)/COM1(H)	Switches COM1 between LCM and serial port. ▶ Options available are: High (default) and Low . ▶ Select High to set the GPIO to LCM. ▶ Select Low to set the GPIO to serial port.

BIOS

5.2.4. Hardware Health Configuration

Access this submenu to view the system's hardware health status.

The screenshot shows the BIOS Setup Utility interface. At the top, it says "BIOS SETUP UTILITY" and "Advanced". The main area is titled "Hardware Health Configuration" and displays the following data:

System Temperature	: 43°C/109°F
Vcore	:1.032 V
5V	:5.134 V
DDR3 Vcc	:1.472 V
1.05V	:1.560 V
3.3V	:3.296 V

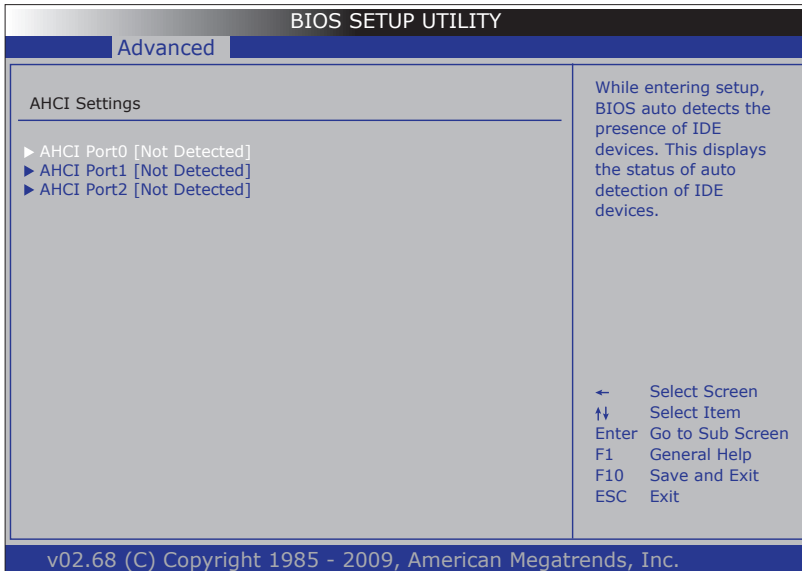
Navigation instructions are listed on the right side:

- ← Select Screen
- ↕ Select Item
- F1 General Help
- F10 Save and Exit
- ESC Exit

At the bottom, the version and copyright information is displayed: "v02.68 (C) Copyright 1985 - 2009, American Megatrends, Inc."

5.2.5. AHCI Configuration

Access this submenu to view the presence of any IDE device. This submenu also configures the system's AHCI feature.



The featured submenus are:

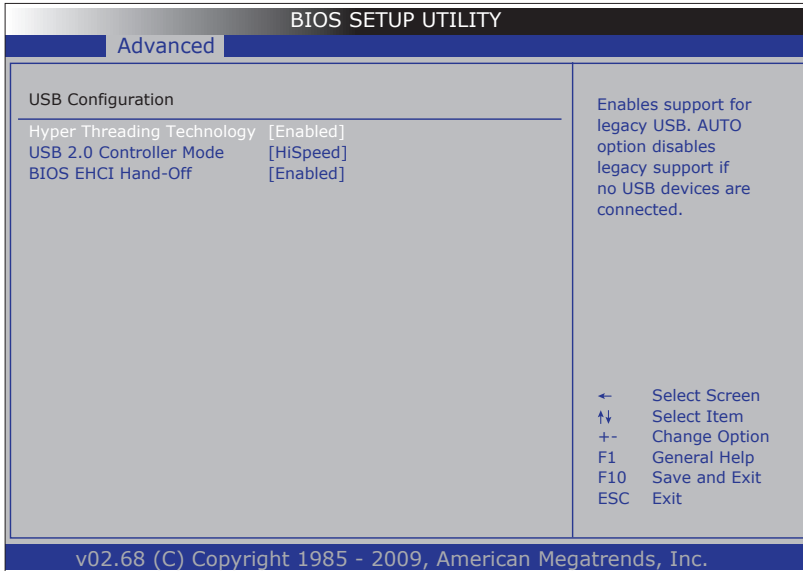
Submenu	Description	
AHCI Port0	Provides the following settings:	
	Setting	Description
	SATA Port0	Sets the type of the IDE device connected to the system, or leaves it on BIOS auto-detection. ▶ Available options are: Auto (default) and Not Installed .
S.M.A.R.T.	Enables/disables S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology). ▶ S.M.A.R.T. is a utility to monitor the disk status to predict hard disk failure ▶ Available options are Disabled and Enabled (default).	

BIOS

AHCI Port1	Provides the following settings:	
	Setting	Description
	SATA Port1	Sets the type of the IDE device connected to the system, or leaves it on BIOS auto-detection. ▶ Available options are: Auto (default) and Not Installed .
S.M.A.R.T.	Enables/disables S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology). ▶ S.M.A.R.T. is a utility to monitor the disk status to predict hard disk failure ▶ Available options are Disabled and Enabled (default).	
AHCI Port2	Provides the following settings:	
	Setting	Description
	SATA Port2	Sets the type of the IDE device connected to the system, or leaves it on BIOS auto-detection. ▶ Available options are: Auto (default) and Not Installed .
S.M.A.R.T.	Enables/disables S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology). ▶ S.M.A.R.T. is a utility to monitor the disk status to predict hard disk failure ▶ Available options are Disabled and Enabled (default).	

5.2.6. USB Configuration

Access this submenu to configure the system's USB features.

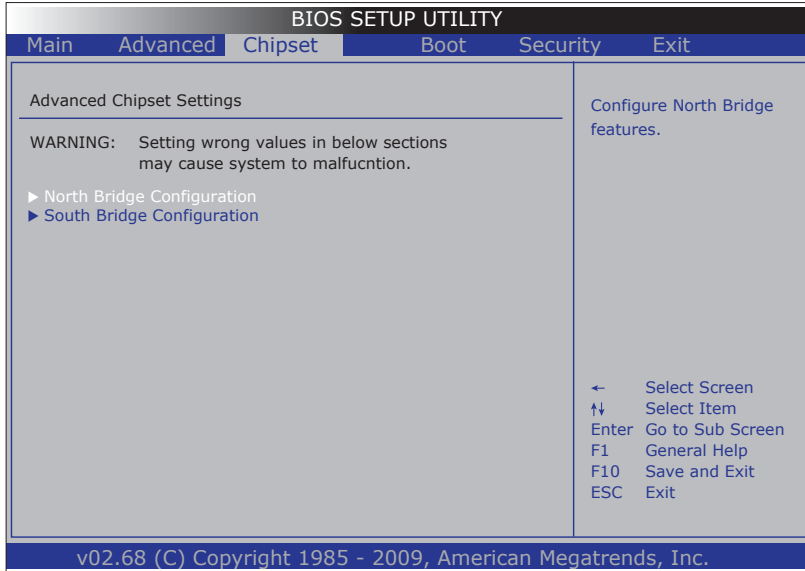


The featured settings are:

Setting	Description / Available Options
Legacy USB Support	Enables/disables legacy USB support including USB flash drives and USB hard drives. <ul style="list-style-type: none"> ▶ Options available are Disabled and Enabled (default).
USB 2.0 Controller Mode	Sets the USB 2.0 controller to HiSpeed (480Mbps) or FullSpeed (12Mbps). <ul style="list-style-type: none"> ▶ HiSpeed is the default.
BIOS EHCI Hand-Off	Enables/disables a workaround for the operating systems that have no EHCI hand-off support. <ul style="list-style-type: none"> ▶ Enabled is the default.

5.3. Chipset

Access this menu to configure the system’s chipset-specific features including graphics configuration and USB enabling/disabling.

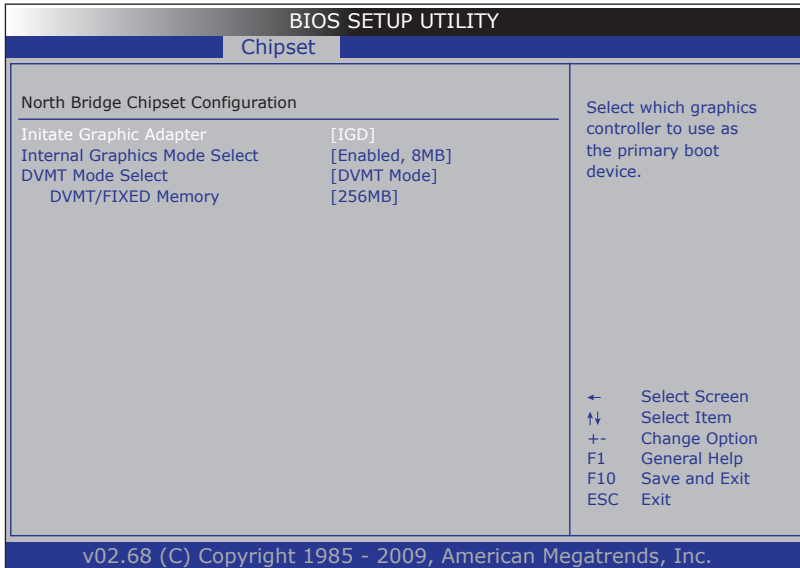


The featured submenus are:

Submenu	Description
North Bridge Configuration	Configures the north bridge features. See 5.3.1. North Bridge Configuration on page 75 .
South Bridge Configuration	Configures the south bridge features. See 5.3.2. South Bridge Configuration on page 77 .

5.3.1. North Bridge Configuration

Access this menu to configure the north bridge features as described below:



The featured settings are:

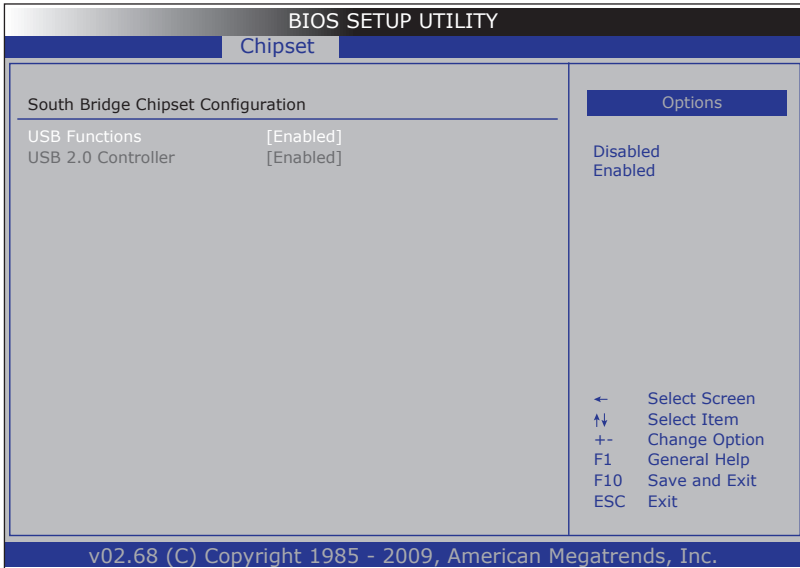
Setting	Description
Initiate Graphic Adapter	Sets which graphics controller to use as the primary boot device. ▶ Options available are: IGD (default) and PCI/IGD .
Internal Graphics Mode Select	Sets the amount of system memory used by the internal graphics device. ▶ It is enabled by default and set to 8MB, with no other option available.
DVMT Mode Select	Sets how to allocate system memory to the CPU and graphics processor. ▶ Available options are: Fixed Mode: A fixed portion of graphics memory is reserved as graphics memory. DVMT Mode: The default. Graphics memory is dynamically allocated according to system and graphics needs.

BIOS

DVMT/FIXED Memory	Sets the maximum amount of system memory that can be allocated as graphics memory. <ul style="list-style-type: none">▶ Available options are: 128MB, 256MB (default) and Maximum DVMT.
--------------------------	---

5.3.2. South Bridge Configuration

Access this submenu to configure the south bridge features as described below:



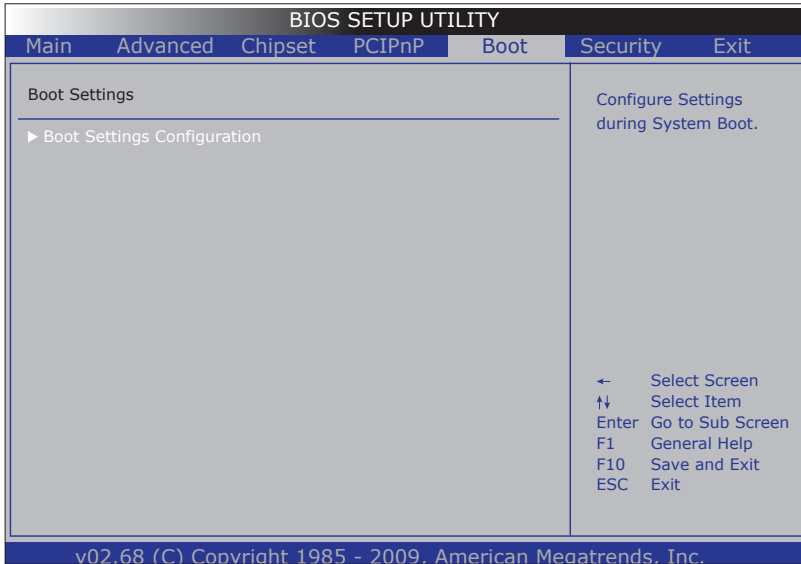
The featured setting is:

Setting	Description
USB Functions	Enables/disables the USB ports. ▶ Enabled is the default.

BIOS

5.4. Boot

Access this menu to configure how to boot up the system.

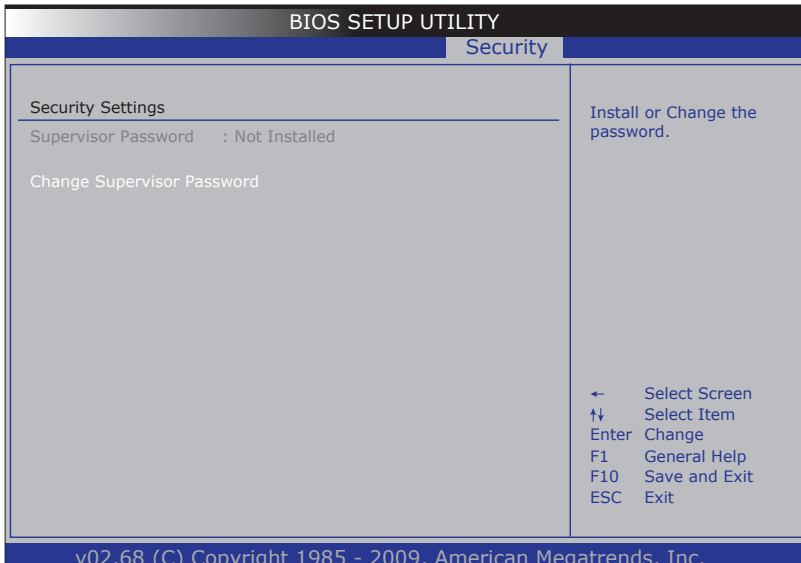


The featured submenu is:

Submenu	Setting	Description
Boot Settings Configuration	Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. ▶ Select Disabled to display the normal POST message, which is the default.
	Bootup NumLock	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. ▶ Options available are On (default) and Off .

5.5. Security

Access this menu to view the current security settings applied in the system. This menu also enables users to set up or change the security setting.

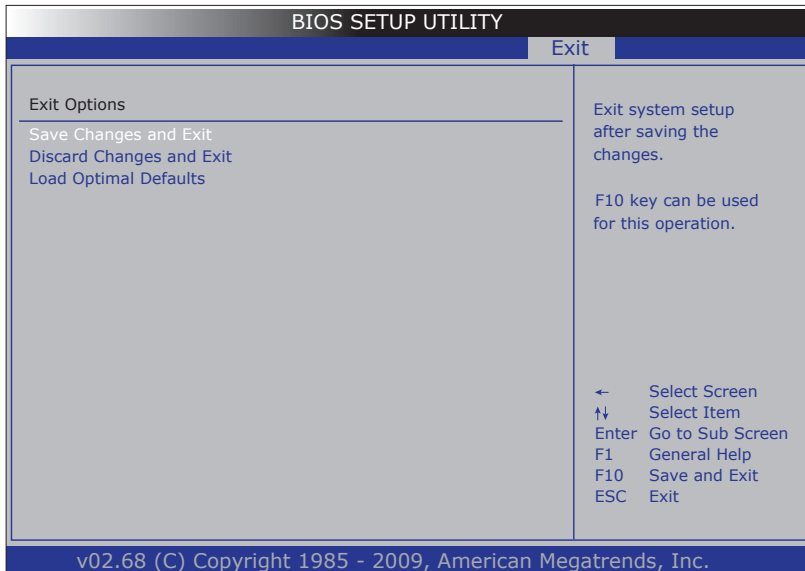


The featured setting is:

Setting	Description
Change Supervisor Password	Sets up or changes the "Supervisor" password. ▶ The "Supervisor" is a super user of the system who is able to administrate the system.

5.6. Save & 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
Save Changes and Exit	Saves the changes and quits the BIOS Setup utility.
Discard Changes and Exit	Quits the BIOS Setup utility without saving the change(s).
Save Changes and Reset	Saves the changes and restarts the system.

Appendices

A: Digital I/O Setting

Digital I/O can read from or write to a line or an entire digital port, which is a collection of lines. This mechanism helps users achieve various applications such as industrial automation, customized circuit, and laboratory testing. Take the source code below that is written in C for the digital I/O application example

Sample Codes:

```
/*----- Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

#define sioIndex          0x2E          /* or 0x4E */
#define sioData           0x2F          /* or 0x4F */

/*----- routing, sub-routing -----*/
void main()
{
    unsigned char DataIn;

    Digital_Output(0x55);
    delay(2000);

    DataIn = Digital_Input();
    printf(" Input : %2x \n",DataIn);
    delay(2000);

    Digital_Output(0xAA);
    delay(2000);

    DataIn = Digital_Input();
    printf(" Input : %2x \n",DataIn);
    delay(2000);
}

unsigned char Digital_Input(void)
{
    unsigned char iData;

    outportb(sioIndex, 0x87); /* SIO - Enable */
    outportb(sioIndex, 0x87);

    outportb(sioIndex, 0x07); /* LDN - GPIO */
    outportb(sioData, 0x07);

    outportb(sioIndex, 0x30); /* GPIO - Enable */
    outportb(sioData, 0x03);
}
```

```
    outportb(sioIndex, 0xE0);      /* Set DIO_in 1~8 Input mode */
    outportb(sioData, 0xFF);

    outportb(sioIndex, 0xE1);      /* DIO_in 1~8 - Status */
    iData = inportb(sioData);      /* iData bit 7~0 mapped DIO_in 8~1*/

        outportb(sioIndex, 0xAA); /* SIO - Disable */

    return iData;
}

void Digital_Output(unsigned char oData)
{
    outportb(sioIndex, 0x87); /* SIO - Enable */
    outportb(sioIndex, 0x87);

    outportb(sioIndex, 0x07);      /* LDN - GPIO */
    outportb(sioData, 0x07);

    outportb(sioIndex, 0x30);      /* GPIO - Enable */
    outportb(sioData, 0x03);

    outportb(sioIndex, 0xE4);      /* Set DIO_out 1~8 Output mode
*/
    outportb(sioData, 0x00);

    outportb(sioIndex, 0xE5);      /* DIO_out 1~8 - Data */
    outportb(sioData, oData);      /* oData bit 7~0 mapped DIO_out
8~1*/

        outportb(sioIndex, 0xAA); /* SIO - Disable */

}
```

B: Watchdog Timer (WDT) Setting

WDT is widely used for industry application to monitor the activity of CPU. Application software depends on its requirement to trigger WDT with adequate timer setting. Before WDT time out, 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 assembly program example to disable and load WDT.

Sample Codes:

```
/*----- Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

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

/*----- routing, sub-routing -----*/
void main()
{
    outportb(sioIndex, 0x87);        /* SIO - Enable */
    outportb(sioIndex, 0x87);

    outportb(sioIndex, 0x07);        /* LDN - WDT */
    outportb(sioData, 0x08);

    outportb(sioIndex, 0x30);        /* WDT - Enable */
    outportb(sioData, 0x03);

    outportb(sioIndex, 0xF5);        /* WDT - Configuration */
    outportb(sioData, 0x04);

    outportb(sioIndex, 0xF6);        /* WDT - Timeout Value */
    outportb(sioData, 0x05);

    outportb(sioIndex, 0xF7);        /* WDT - Control & Status */
    outportb(sioData, 0x00);

    outportb(sioIndex, 0xAA);        /* SIO - Disable */
}
```

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