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# ARTS-3250/3672W

Fanless Train PC w/ Intel® Core™ i7 (ARTS-3672W) &  
Fanless Train PC w/ Intel® Core™ Atom™ D2550 (ARTS-3250)

## User's Manual

Version 1.0



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## Revision History

Version	Release Time	Description
1.0	October 2013	Initial release
1.1	December 2013	Add Appendix E External and Internal Cables
1.1	December 2014	Change ARTS-3672 to ARTS-3672W Revise Page 4 : <ol style="list-style-type: none"><li>1. Operating Temp. : From -25~55°C (-13~131°F), ambient w/ air flow, EN50155 Class T1 to -40 ~ 70°C (-40 ~158°F ), ambient w/ air flow, EN50155 Class TX</li><li>2. Relative Humidity : From 5 ~ 95% @ 40°C (non-condensing) to 5 ~ 95% @ 70°C (non-condensing)</li></ol>

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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

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### 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](mailto: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

- Fanless and rugged design
- M12 connector for DC power input with isolated protection
- Isolated RS-232/485 and GPIO
- Support outside-accessible CFast and SIM slot
- Support optional WiFi or HSUPA wireless connectivity
- Support power on/off delay control
- Compliant with EN50155
- Removable bay: Support 2 x 2.5" drive bays for SATA SSD (ARTS-3672W only)



### 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		
CPU (soldered onboard)	ARTS-3250	Intel® Dual Core Atom™ D2550 1.86GHz
	ARTS-3672W	Intel® Core™ i7-2610UE 1.5GHz
BIOS	AMI BIOS	
Chipset	ARTS-3250	Intel® NM10
	ARTS-3672W	Intel® PCH QM67 for ARTS-3672W
Graphics	ARTS-3250	Integrated Intel® HD Graphics 3650
	ARTS-3672W	Integrated Intel® HD Graphics 3000
Memory	ARTS-3250	One 204-pin SO-DIMM socket that supports DDR3 800/1066MHz SDRAM up to 4GB
	ARTS-3672W	One 204-pin SO-DIMM socket that supports DDR3 1066/1333MHz SDRAM up to 8GB
Serial ATA	ARTS-3250	One serial ATA port with 300MB/s HDD transfer rate
	ARTS-3672W	<ul style="list-style-type: none"> <li>• One internal SATA Disk on Module.</li> <li>• Two external SATA SSD.</li> </ul>
LAN Chipset	ARTS-3250	Three Intel® 82583V GbE controllers
	ARTS-3672W	<ul style="list-style-type: none"> <li>• One Intel® 82579LM GbE PHY</li> <li>• Two Intel® 82583V GbE controllers</li> </ul>
Watchdog Timer	1 ~ 255 levels reset	
I/O Ports		
Serial Port	<ul style="list-style-type: none"> <li>• One RS-232/485 with DB-9 connector, rear side, 2.5 KV isolated protection</li> <li>• Three RS-485 ports with M8-Female 3P connectors, rear side, IP67, 2.5 KV isolated protection</li> </ul>	
USB Port	<ul style="list-style-type: none"> <li>• Two USB 2.0 ports of type A connector, front side</li> <li>• Two M8-Female 4P connectors, IP67, rear side</li> </ul>	
LAN Port	<ul style="list-style-type: none"> <li>• One RJ-45 port for Gigabit Ethernet, front side</li> <li>• Two M12-Female 8P connectors, IP67 for Gigabit Ethernet, rear side, support WOL</li> </ul>	
Video Port	One DVI-I female connector fwith DVI-D and VGA output	
Audio	One M12-female 8P connector, IP67 for Mic-in & Line-out (2W pre-amplified)	

## Introduction

<b>Expansion Bus</b>	<ul style="list-style-type: none"> <li>• One Mini-PCIe slot for optional WiFi/GPS module</li> <li>• One Mini-PCIe slot interconnected with SIM card socket for optional HSUPA/LTE module</li> <li>• One SIM socket (outside accessible)</li> </ul>	
<b>Storage</b>		
<b>Type</b>	<ul style="list-style-type: none"> <li>• <b>ARTS-3250:</b> One 2.5" drive bay for SATA SSD</li> <li>• <b>ARTS-3672W:</b> Two 2.5" drive bays for SATA SSD</li> <li>• One SATA port for SATA Disk on Module</li> <li>• One outside-accessible CFast socket with protection cover</li> </ul>	
<b>Qualification</b>		
<b>Certification</b>	CE, FCC Class A, EN50155-Compliant	
<b>Environment</b>		
<b>Operating Temp.</b>	<b>ARTS-3250</b>	-40~70°C (-40 ~158°F ), ambient w/ air flow, EN50155-TX
	<b>ARTS-3672W</b>	-40 ~ 70°C (-40 ~158°F ), ambient w/ air flow, EN50155 Class TX
<b>Storage Temp.</b>	-40~80°C (-40 ~ 185°F)	
<b>Relative Humidity</b>	5 ~ 95% @ 70°C (non-condensing)	
<b>Damp Heat</b>	55°C, 95% RH (non-operating, EN 50155-10.2.5)	
<b>Vibration</b>	EN61373 Category 1 Class B	
<b>Shock</b>	EN61373 Category 1 Class B	
<b>Mechanical</b>		
<b>Construction</b>	Aluminum alloy	
<b>Mounting</b>	Wall-mount	
<b>Weight</b>	<b>ARTS-3250</b>	4.3 kg (9.47 lb)
	<b>ARTS-3672W</b>	5.07Kg (11.15 lb)
<b>Dimensions (W x D x H)</b>	<b>ARTS-3250</b>	254.6 x 208 x 70 mm (9.99" x 8.18" x 2.75")
	<b>ARTS-3672W</b>	254.6 x 208 x 90 mm (9.99" x 8.18" x 3.54")
<b>Power Requirement</b>		
<b>Power Input</b>	DC 9~36V input, w/ M12 connector, 2KV isolated protection	
<b>Power Consumption</b>	Max. 50W	

## 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:



ARTS-3250



ARTS-3672W

One ARTS-3250 or  
ARTS-3672W Fanless  
Train PC



One Driver CD  
One User's Manual



Power cables

- M12 waterproof 3-pin power cable
- M12 waterproof Gigabit Ethernet cable
- M12 waterproof audio-in/out cable
- M8 waterproof USB 2.0 cable
- M8 waterproof RS-485 cable



One Wall-Mount Kit  
WMK-5000



Keys for HDD/SSD bays & Mini-PCI  
Express cards



Screws for HDD/SSD brackets & Mini-PCI  
Express cards

## 1.5. Ordering Information

<b>ARTS-3250</b>	Train PC barebone system w/ Intel® Atom™ D2550, w/o storage device and memory
<b>ARTS-3672W</b>	Train PC barebone system w/ Intel® Core™ i7-2610UE, w/o storage device and memory, w/ 2 x removable drive bays

### 1.5.1. Optional Accessories

The following items are normally optional, but some vendors may include them as a standard package, or some vendors may not carry all the items.

**PAC-P120W-FSP**      19V/5.96A 120W AC/DC adapter kit



### 1.5.2. 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



**SSD-25016**      Memoright 2.5" 16GB SATAII SSD kit

**HSPA-SI1400**      HSUPA 3.75G module kit & internal wiring



**WIFI-IN1350**      Intel® Centrino® Advanced-N 6205 WiFi module w/ 20cm & 30cm internal wires



**ANT-H11**      2dBi HSUPA antenna



**ANT-D11**      WiFi Dual-band 2.4G/5G antenna

**2GB SO-DIMM**      DDR3-1333 2GB SDRAM

**4GB SO-DIMM**      DDR3-1333 4GB SDRAM



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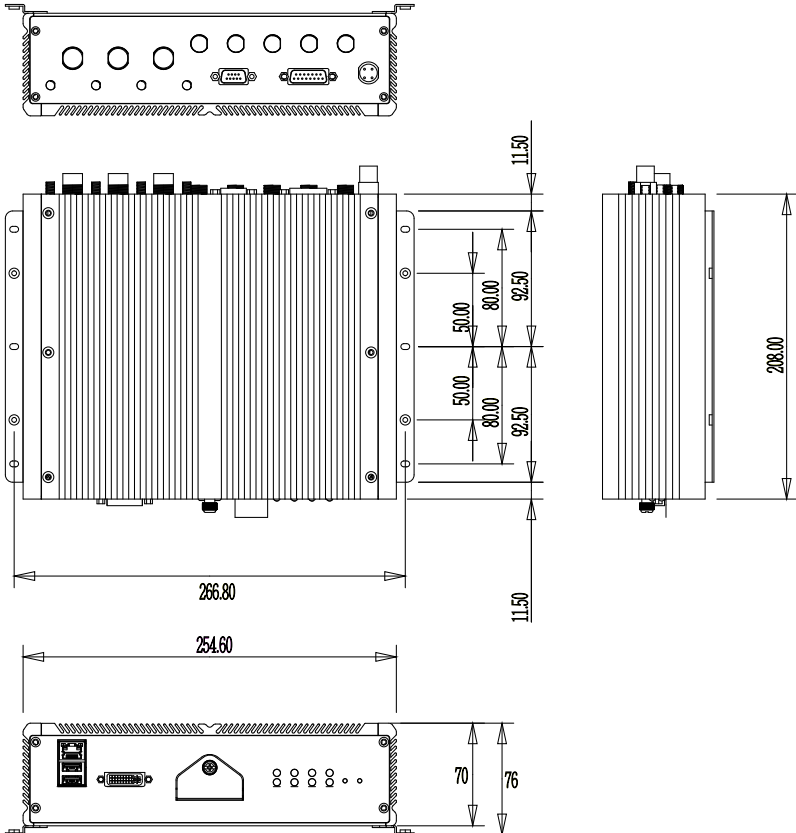
# Chapter 2

## Getting Started

## 2.1. Dimensions

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

### 2.1.1. ARTS-3250





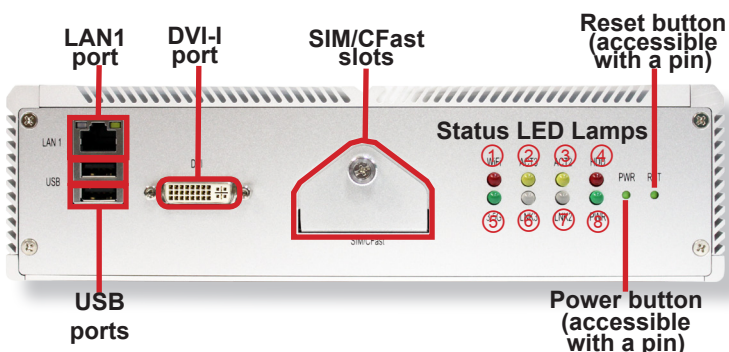


### 2.2. Take A Tour

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

#### 2.2.1. ARTS-3250

##### Front View

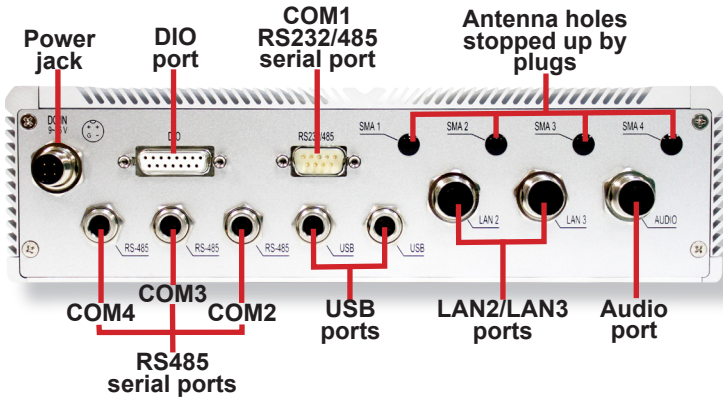


- **Status LED Lamps:**

No.	LED Color	Description
①	Red	This LED lights red when WiFi is on.
②	Yellow	This LED lights yellow when LAN3 port is streaming data.
③	Yellow	This LED lights yellow when LAN2 port is streaming data.
④	Red	This LED lights red when SSD is being accessed.
⑤	Green	This LED lights red when 3G is on.
⑥	Green	This LED lights green when LAN3 port is connected to 100M bit/s network equipment.
	Orange	This LED lights orange when LAN3 port is connected to 1000M bit/s network equipment.
⑦	Green	This LED lights green when LAN2 port is connected to 100M bit/s network equipment.
	Orange	This LED lights orange when LAN2 port is connected to 1000M bit/s network equipment.
⑧	Green	This LED lights when power is on.

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## Rear View



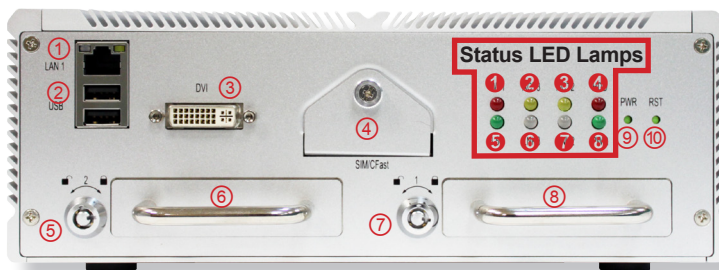
## Side View



## Getting Started

### 2.2.2. ARTS-3672W

#### Front View



#### • I/O

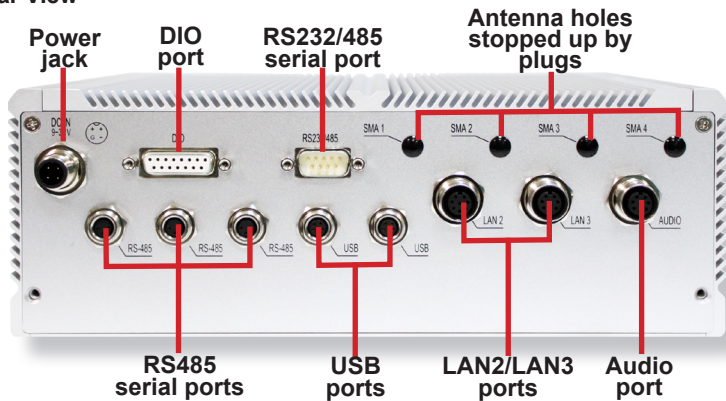
No.	Description	No.	Description
①	LAN1 port	⑥	SSD tray 2
②	USB ports	⑦	Anti-theft lock for HDD/SSD tray 1
③	DVI-I port	⑧	SSD tray 1
④	SIM & CFast slots	⑨	Power button (accessible with a pin)
⑤	Anti-theft lock for SSD tray 2	⑩	Reset button (accessible with a pin)

#### • Status LED Lamps:

No.	LED Color	Description
①	Red	This LED lights red when WiFi is on.
②	Yellow	This LED lights yellow when LAN3 port is streaming data.
③	Yellow	This LED lights yellow when LAN2 port is streaming data.
④	Red	This LED lights red when SSD is being accessed.
⑤	Green	This LED lights red when 3G is on.
⑥	Green	This LED lights green when LAN3 port is connected to 100M bit/s network equipment.
	Orange	This LED lights orange when LAN3 port is connected to 1000M bit/s network equipment.

<b>7</b>	Green	This LED lights green when LAN2 port is connected to 100M bit/s network equipment.
	Orange	This LED lights orange when LAN2 port is connected to 1000M bit/s network equipment.
<b>8</b>	Green	This LED lights when power is on.

**Rear View**



**Side View**



### 2.3. Driver Installation Notes

The computer supports the operating systems of Windows 7. Find the necessary device drivers on the CD that comes with your purchase. DO follow the sequence below to install the drivers to prevent errors:

**Chipset→VGA→Audio→LAN→ME**

Paths to find device drivers on CD:

#### ARTS-3250

Windows 7	
Device	Driver Path
Chipset	\\Chipset\\Win7_x86 (infirst_autol.exe)
VGA	\\VGA\\8.0.0.6.1082_20120614\\win7 (Setup.exe)
Audio	\\LAN\\17.1\\Win7 (PROWinx32.exe)
LAN	\\Audio ALC662\\Windows Vista,7,8(32,64bits) (Vista_Win7_Win8_R270.exe)

#### ARTS-3672W

Windows 7	
Device	Driver Path
Chipset	\\Chipset (infirst_autol.exe)
VGA	\\Graphic\\Win7x86 (win32_15288.exe)
Audio	\\LAN\\17.1\\Win7 (PROWin32.exe)
LAN	\\Audio ALC662\\Windows Vista,7,8(32,64bits) (Vista_Win7_Win8_R270.exe)
Intel® Management Engine	\\ME (Setup.exe)

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# Chapter 3

## System Configuration

### 3.1. Board Layout

The engine of the computer is constructed by a CPU board and a carrier board. Following in this section you will be guided through the CPU boards and carrier board of the computers.

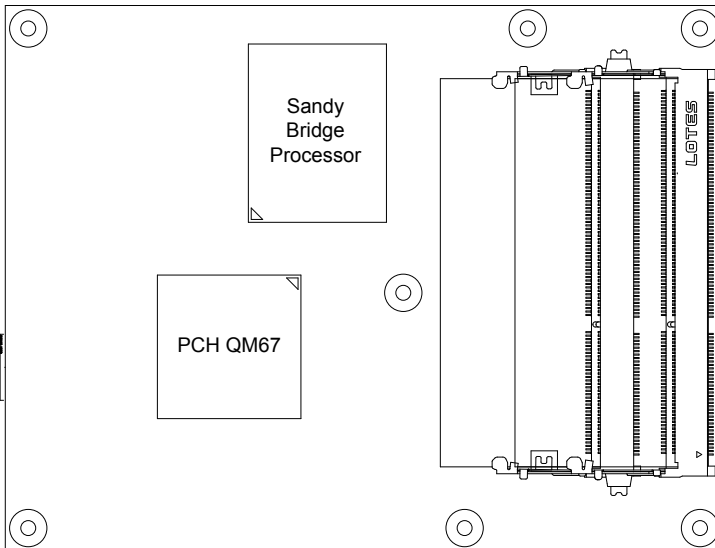
#### 3.1.1. CPU Boards

The CPU board for ARTS-3672W is EmETXe-i67M2 while the CPU board for ARTS-3250 is EmETXe-i250C.

##### 3.1.1.1. ARTS-3672W - EmETXe-i67M2

The CPU board for ARTS-3672W is EmETXe-i67M2, with Intel® Core™ i7-2610UE.

#### Top View

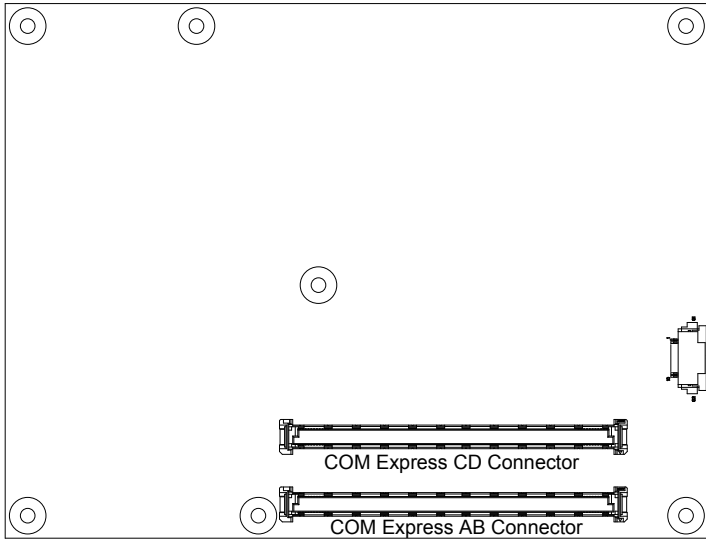




**Bottom View**

COM Express® AB Connector

COM Express® CD Connector



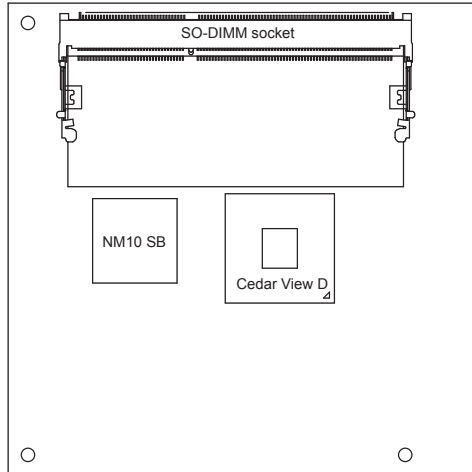
## System Configuration

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### 3.1.1.2. ARTS-3250 - EmETXe-i250C

The CPU board for ARTS-3250 is EmETXe-i250C, with Intel® Atom™ D2550.

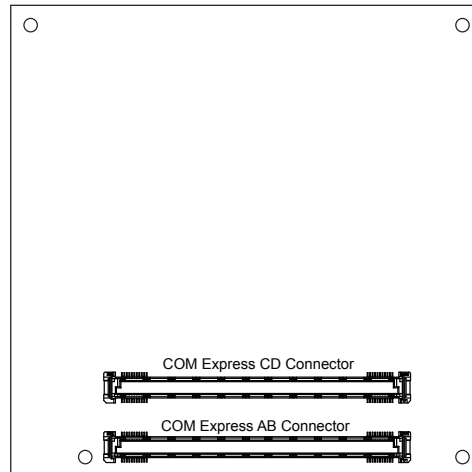
#### Top View



#### Bottom View

COM Express® AB Connector

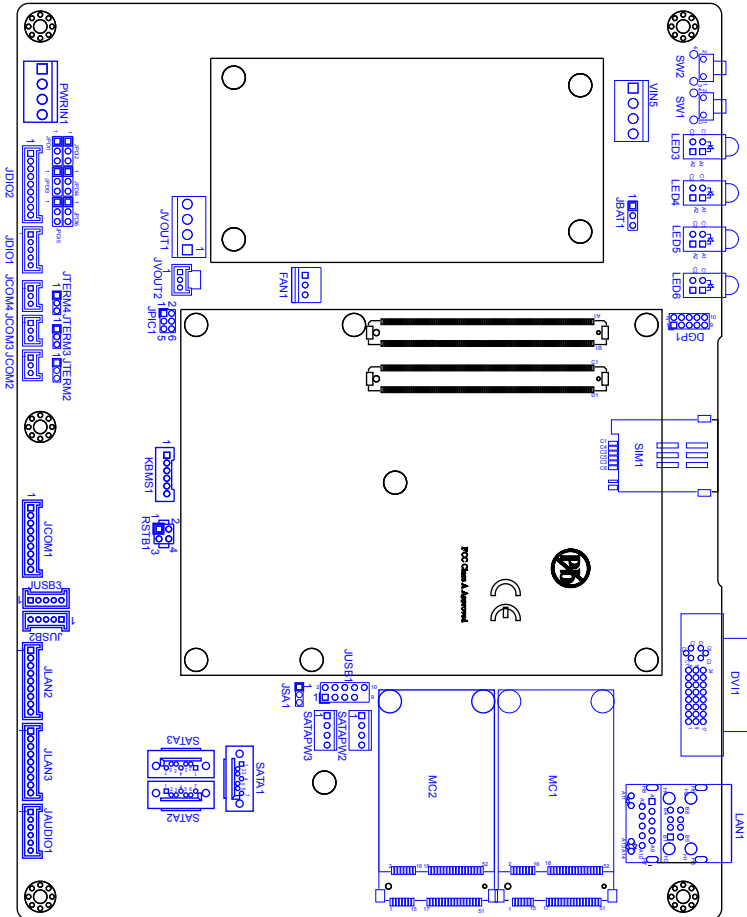
COM Express® CD Connector



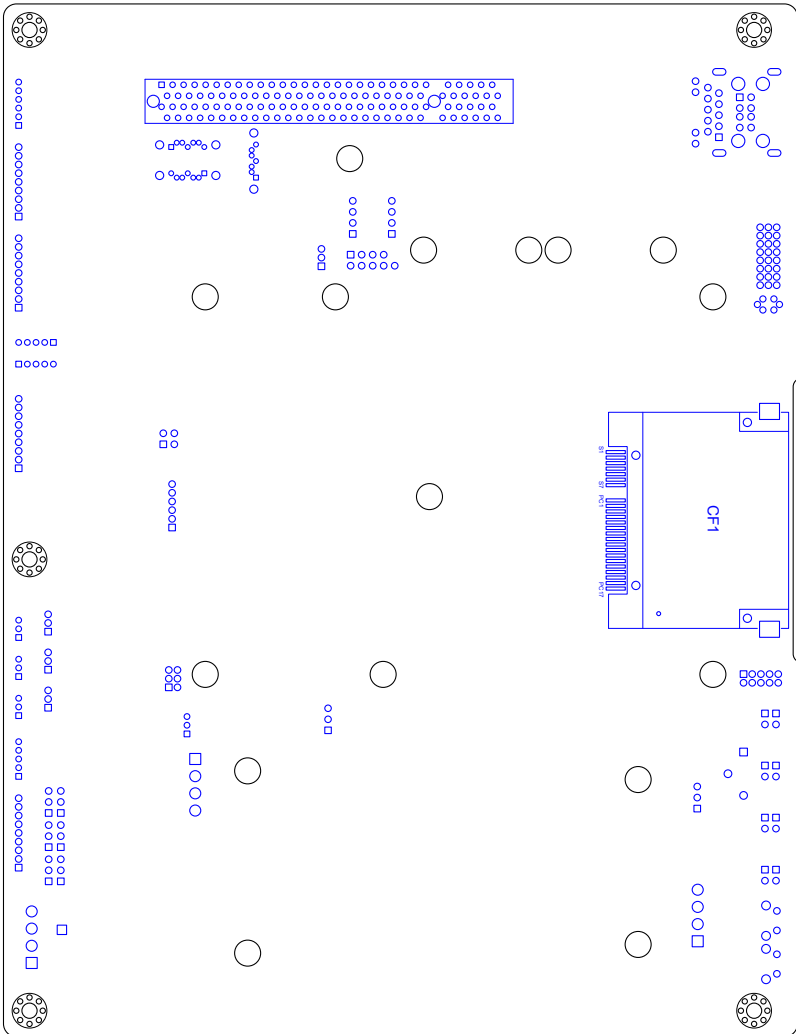
### 3.1.2. Carrier Board

For both ARTS-3250 and ARTS-3672W, **PBC-1914** is the carrier board.

#### PBC-1914: Board Top



PBC-1914: Board Bottom



### 3.2. Jumpers and Connectors

The carrier board PBC-1914 comes with some connectors to join devices and some jumpers to alter the computer's hardware configuration. The following in this chapter will explicate each of these components.

#### 3.2.1. Jumpers

##### JBAT1

**Function:** CMOS Setting

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



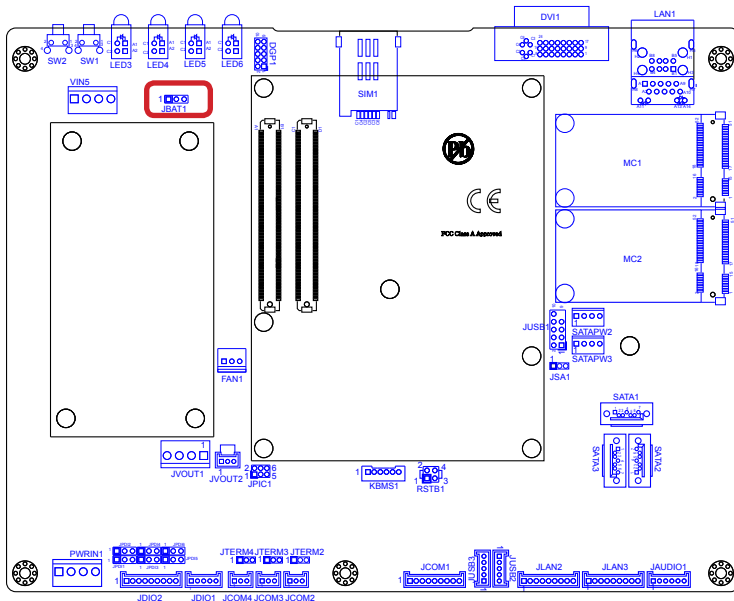
**Setting:** Short pin 1 and pin 2 to keep CMOS.  
(The default setting.)



Short pin 2 and pin 3 to clear CMOS.



##### Board Top



# System Configuration

## JSA1

**Function:** Adjusts the pin 7 of connector SATA1 to GND or +5 VCC for DOM (disk on module) application. See also [SATA1](#) on page 34.

**Jumper Type:** Onboard 2.00mm-pitch 1x3-pin header

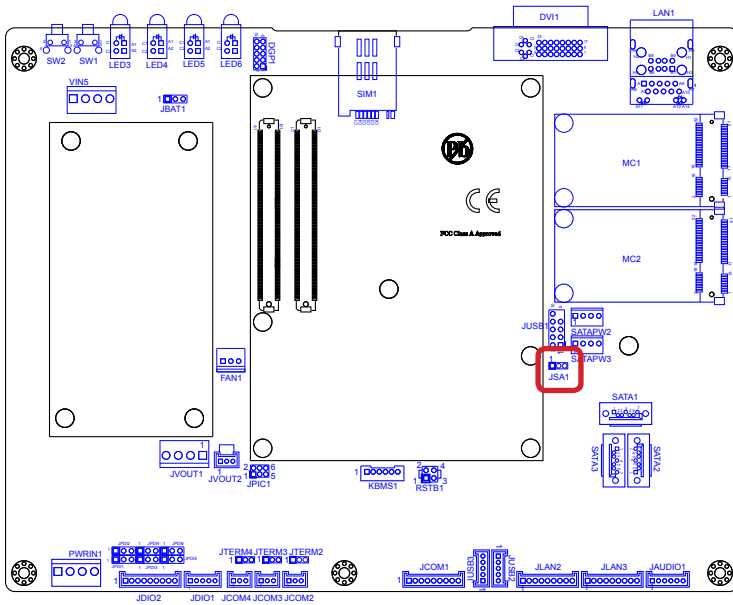
**Setting:** Short pin 1 and pin 2 to set pin 7 to GND.  
(This is the default setting.)



Short pin 2 and pin 3 to set pin 7 to +5 VCC.



## Board Top



**JTERM2**

**Function:** COM2 RS485 terminator setting

**Jumper Type:** Onboard 2.00mm-pitch 1x3-pin header



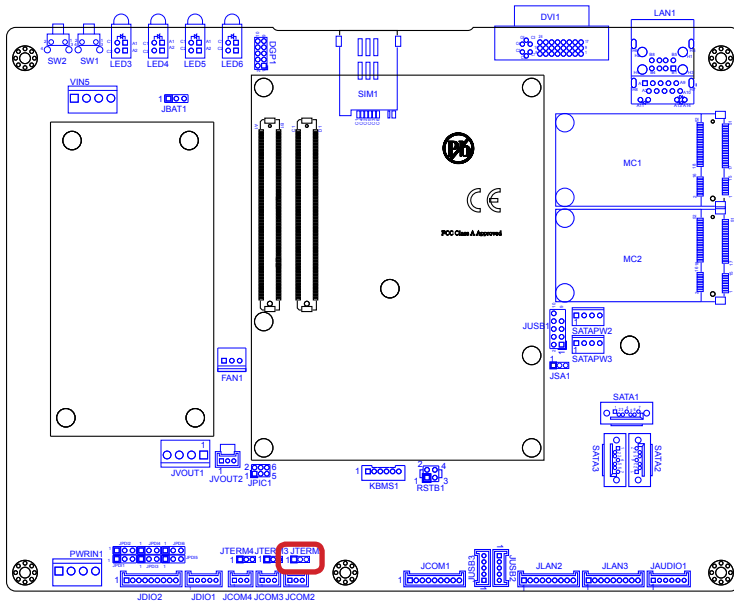
**Setting:** Short pin 1 and pin 2 to set COM2 to RS485 normal mode. (The default setting.)



Short pin 2 and pin 3 to set COM2 to 120 ohm terminator mode..



**Board Top**



# System Configuration

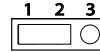
## JTERM3

**Function:** COM3 RS485 terminator setting

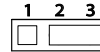
**Jumper Type:** Onboard 2.00mm-pitch 1x3-pin header



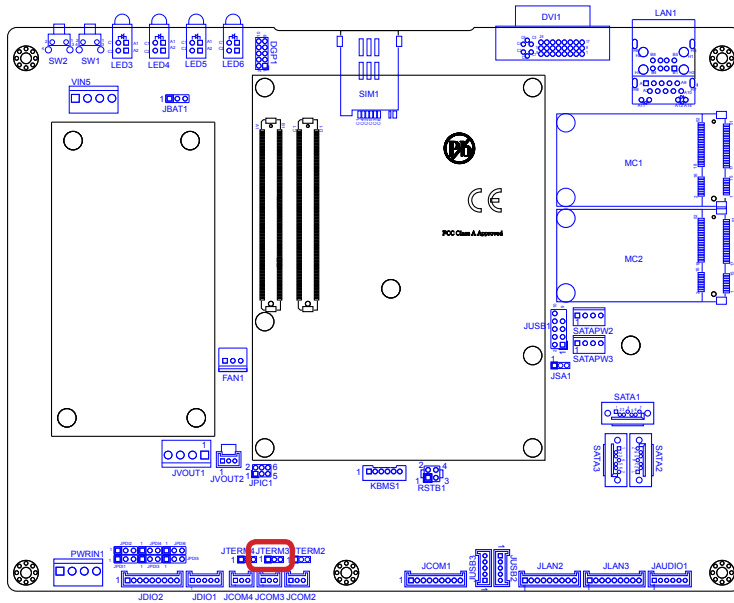
**Setting:** Short pin 1 and pin 2 to set COM3 to RS485 normal mode. (The default setting.)



Short pin 2 and pin 3 to set COM3 to 120 ohm terminator mode..



## Board Top





## JTERM4

**Function:** COM4 RS485 terminator setting

**Jumper Type:** Onboard 2.00mm-pitch 1x3-pin header



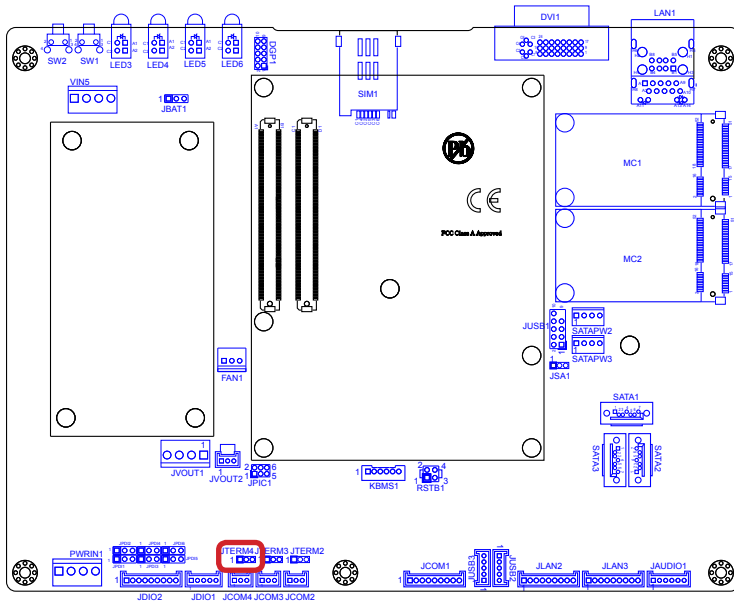
**Setting:** Short pin 1 and pin 2 to set COM4 to RS485 normal mode. (The default setting.)



Short pin 2 and pin 3 to set COM4 to 120 ohm terminator mode..



## Board Top



# System Configuration

## JPDI1

**Function:** Selecting digital input power.

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



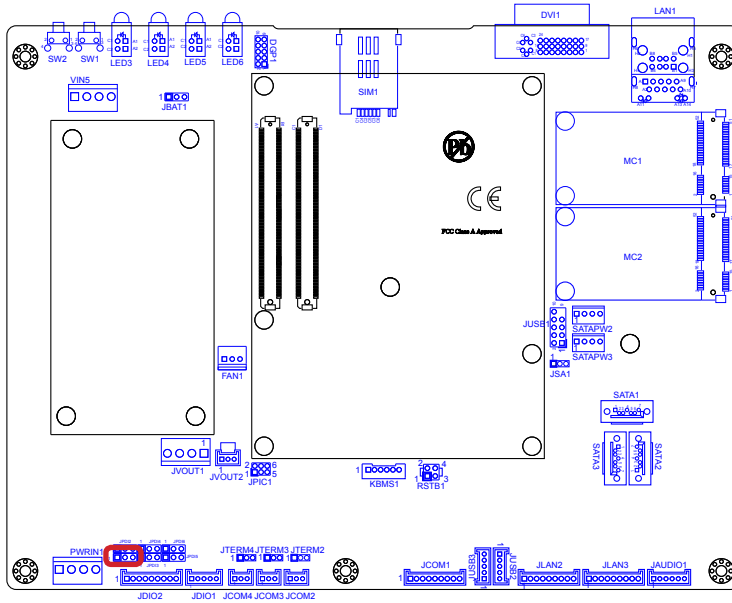
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI1.



Short pin 2 and pin 3 to select DI\_V- for PDI1. (The default setting.)



## Board Top



**JPD12**

**Function:** Selecting digital input power.

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



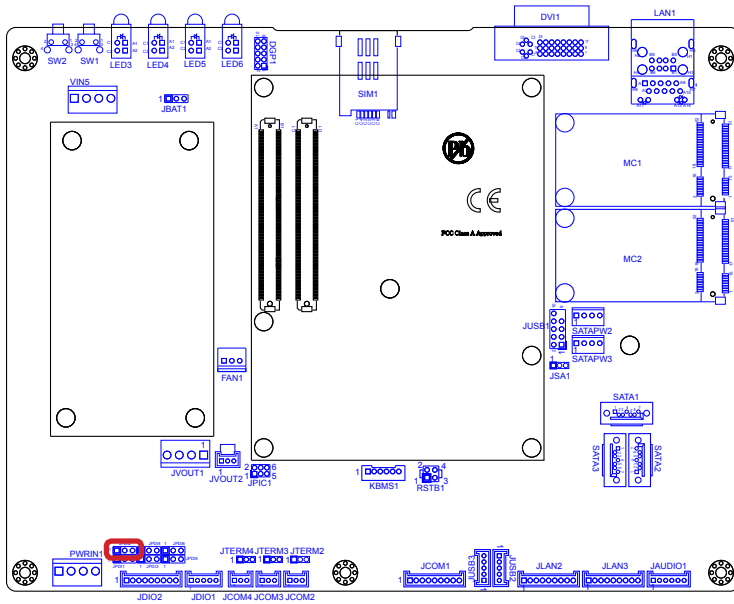
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI2.



Short pin 2 and pin 3 to select DI\_V- for PDI2. (The default setting.)



**Board Top**



# System Configuration

## JPDI3

**Function:** Selecting digital input power.

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



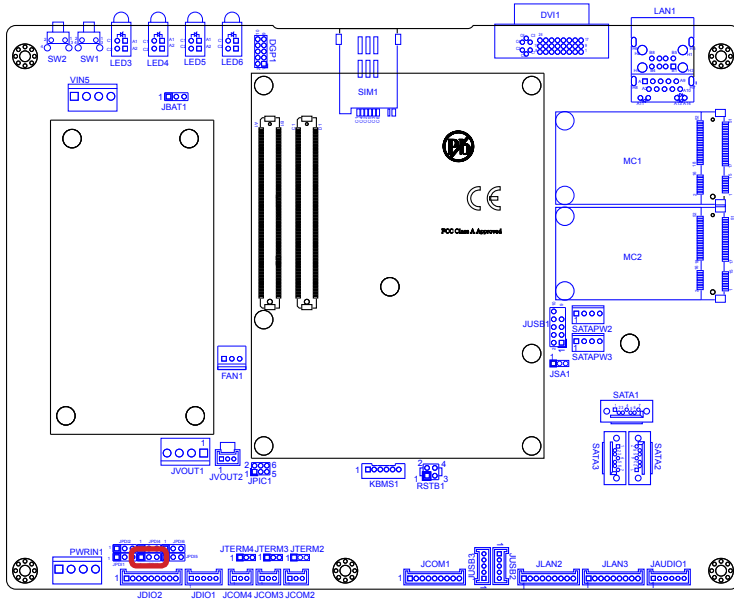
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI3.



Short pin 2 and pin 3 to select DI\_V- for PDI3. (The default setting.)



## Board Top



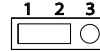
**JPD14**

**Function:** Selecting digital input power.

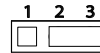
**Jumper Type:** Onboard 2.54mm-pitch 1x3-pin header



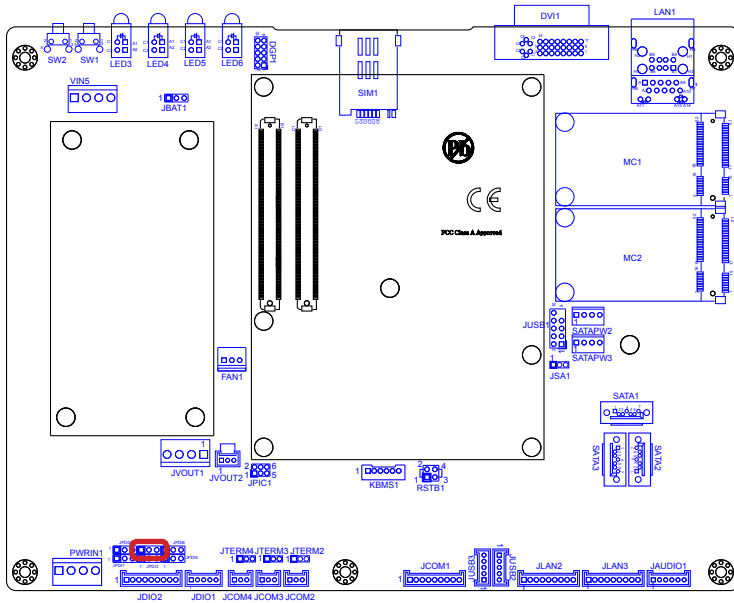
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI4.



Short pin 2 and pin 3 to select DI\_V- for PDI4. (The default setting.)



**Board Top**



# System Configuration

## JPDI5

**Function:** Selecting digital input power.

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



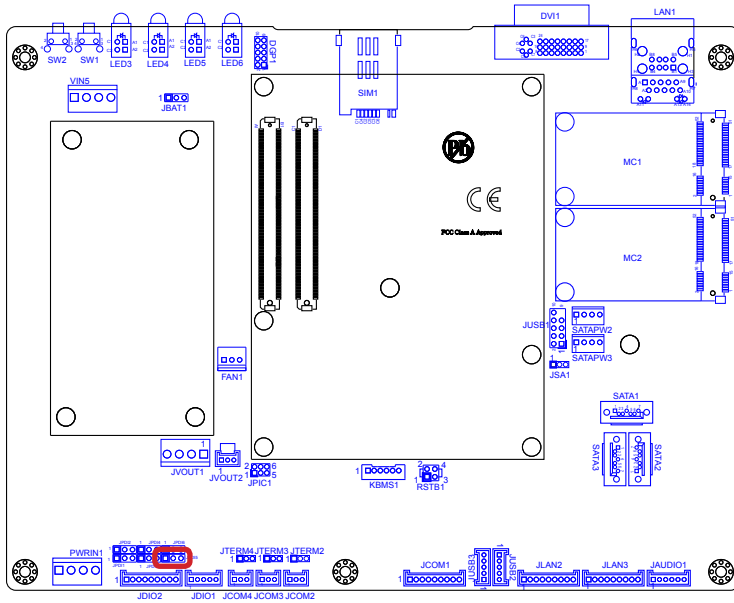
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI5.



Short pin 2 and pin 3 to select DI\_V- for PDI5. (The default setting.)



## Board Top



JPDI6

**Function:** Selecting digital input power.

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



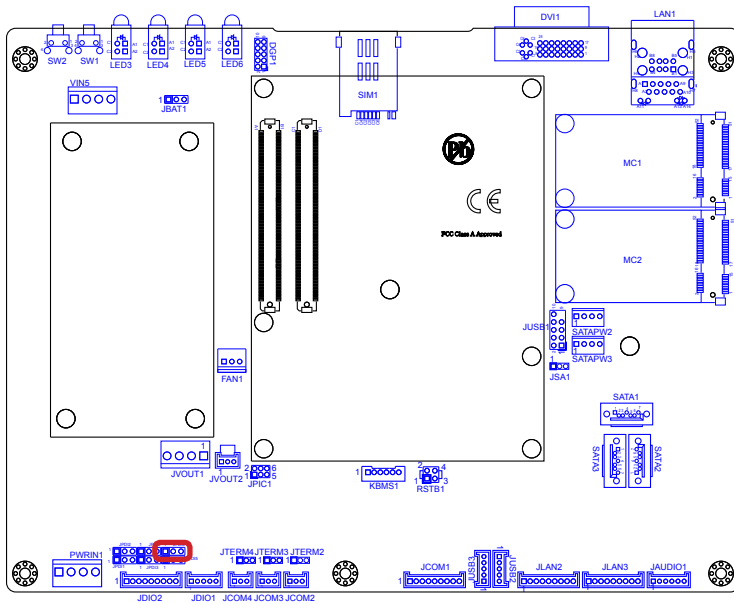
**Setting:** Short pin 1 and pin 2 to select DI\_V+ for PDI6.



Short pin 2 and pin 3 to select DI\_V- for PDI6. (The default setting.)



Board Top





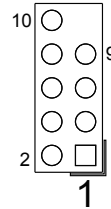


## JUSB1

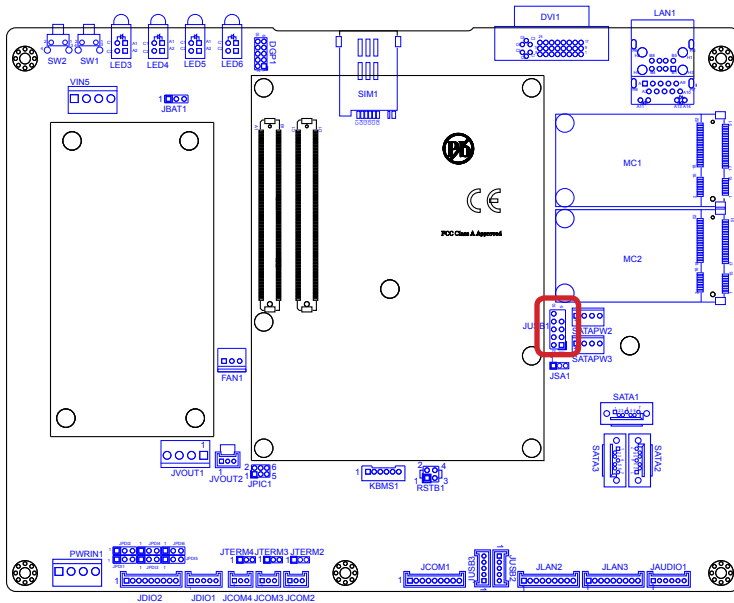
**Description:** USB pin header

**Connector Type:** Onboard 2.54mm-pitch 9-pin header

Pin	Description	Pin	Description
1	VCC5	2	VCC5
3	D-	4	D-
5	D+	6	D+
7	GND	8	GND
		10	GND



## Board Top



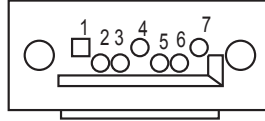
# System Configuration

## SATA1

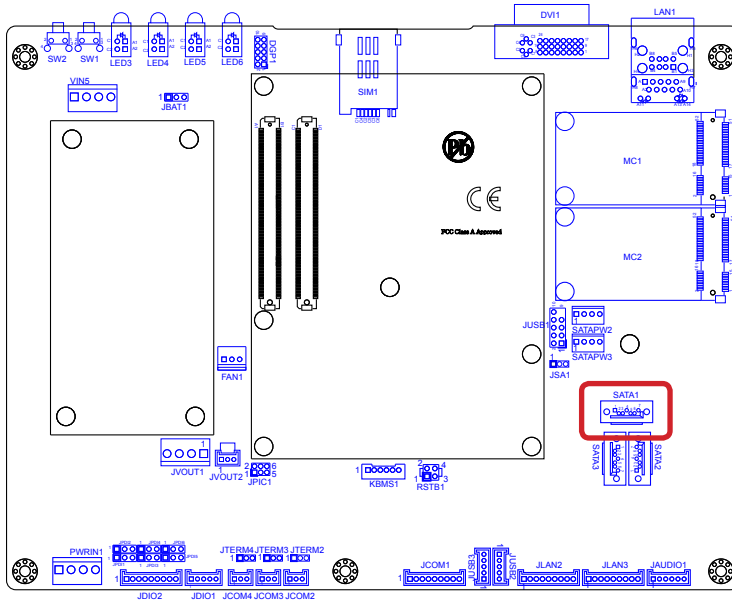
**Description:** Serial ATA connectors for storage devices

**Connector Type:** 7-pin serial ATA connector

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND or +5 VCC (*Use jumper <b>JSA1</b> to adjust this pin to GND or +5 VCC. See also <a href="#">JSA1</a> on page 22.)



## Board Top





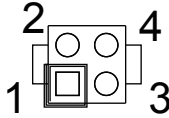
# System Configuration

## RSTB1

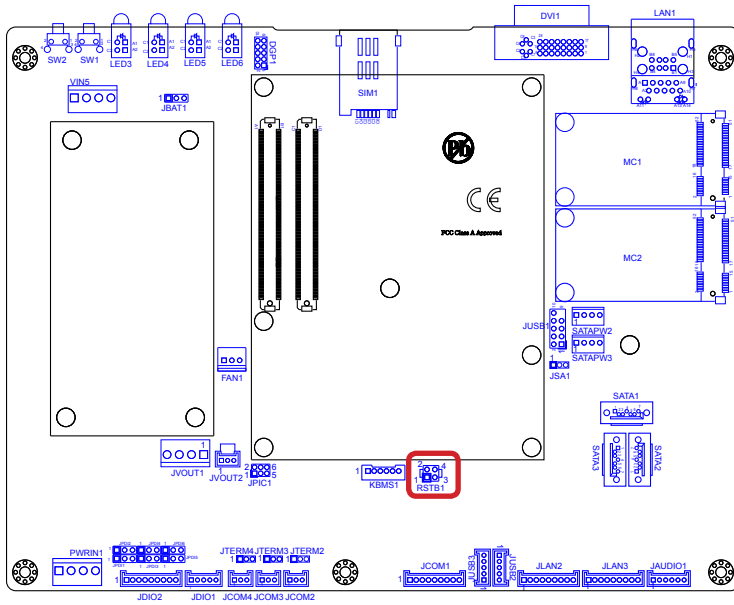
**Description:** Pin header for power button and reset button.

**Connector Type:** Onboard 2.54mm-pitch 4-pin header

Pin	Description
1	SYS_RESET#
2	GND
3	PWR_IN_SW#
4	GND



## Board Top

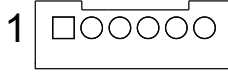


## KBMS1

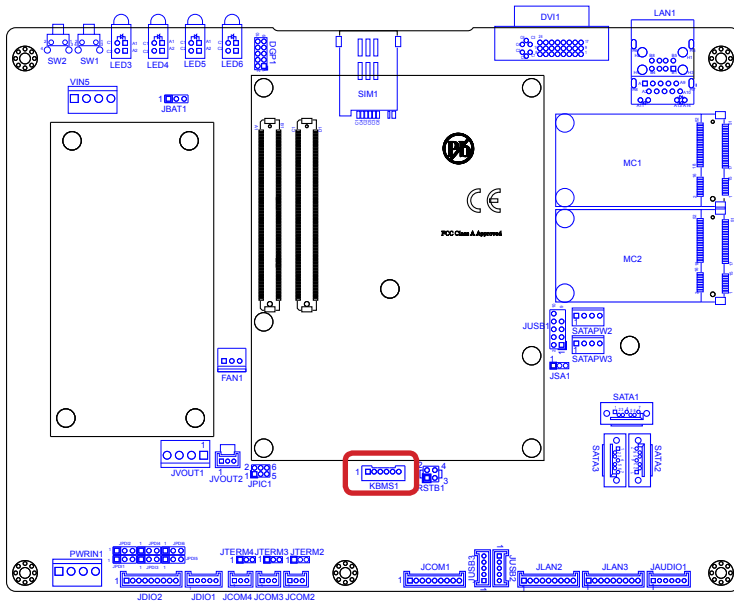
**Destription:** Keyboard/Mouse wafer connector

**Connector Type:** Onboard 2.00mm-pitch 6-pin wafer connector

Pin	Description
1	KB_DATA
2	GND
3	MS_DATA
4	KB_CLK
5	+5V
6	MS_CLK



## Board Top



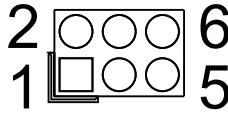
# System Configuration

## JPIC1

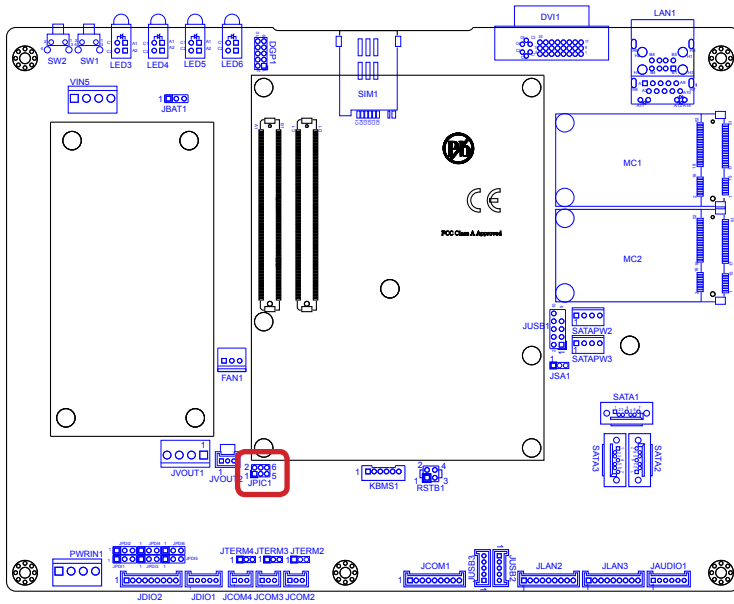
**Destription:** External PIC programming pin header

**Connector Type:** Onboard 2.00mm-pitch 6-pin wafer header

Pin	Description
1	PIC_TX
2	ICSP-CLK
3	ICSP-DAT
4	GND
5	VCC5
6	MCU_RST



## Board Top

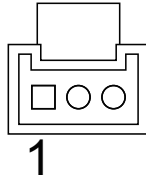


## JVOUT2

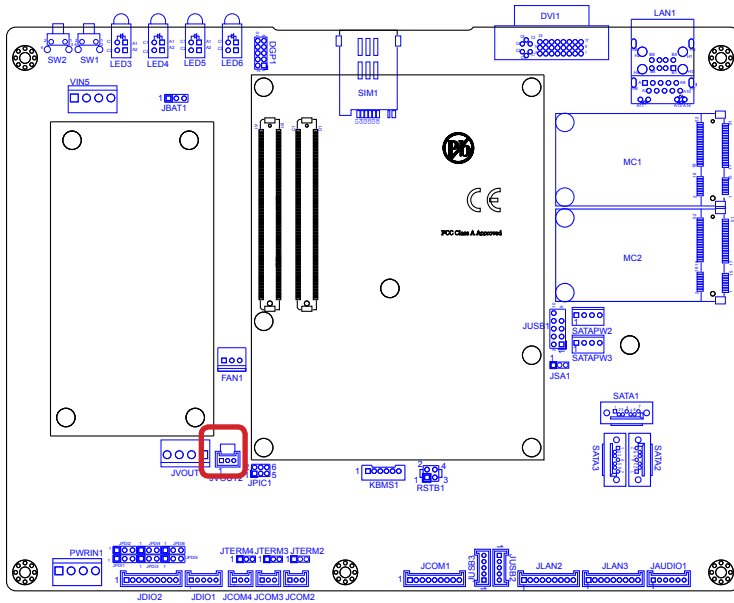
**Description:** Digital input power wafer connector

**Connector Type:** Onboard 2.00mm-pitch 3-pin wafer connector

Pin	Description
1	GND
2	DC_IN
3	N/C



## Board Top



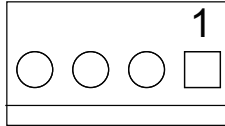
# System Configuration

## JVOUT1

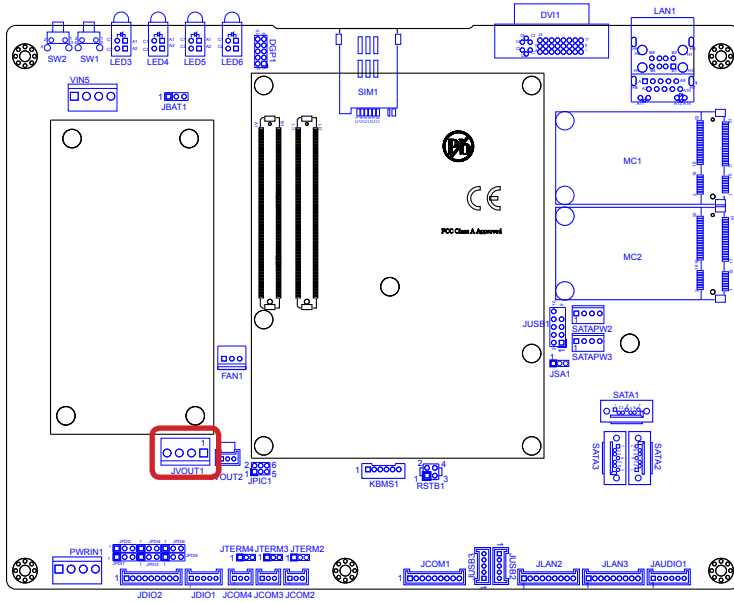
**Description:** DC\_IN to power module wafer connector

**Connector Type:** Onboard 3.96mm-pitch 4-pin wafer connector

Pin	Description
1	DC_IN
2	DC_IN
3	GND
4	GND



## Board Top



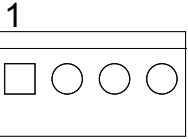


## VIN5

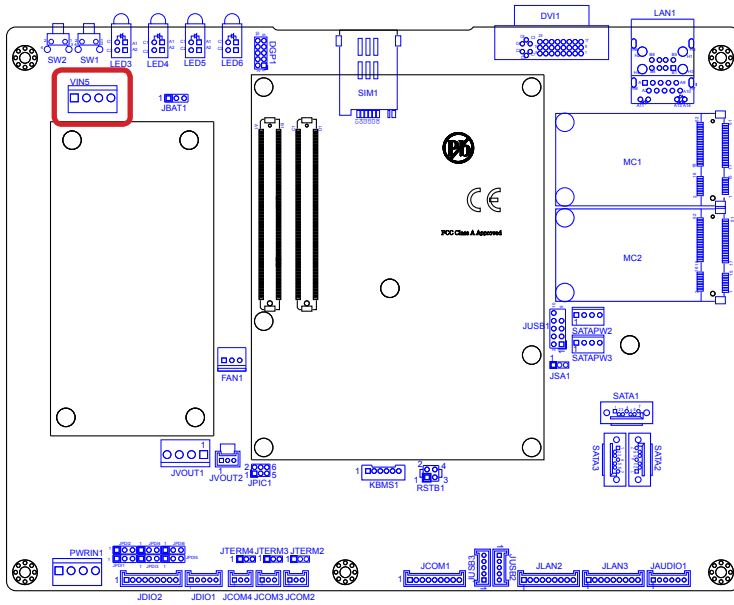
**Destription:** Power module output wafer connector

**Connector Type:** Onboard 3.96mm-pitch 4-pin wafer connector

Pin	Description
1	+12V
2	+12V
3	GND
4	GND



## Board Top







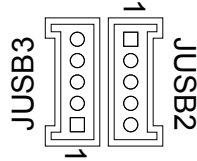
# System Configuration

## JUSB2 & JUSB3

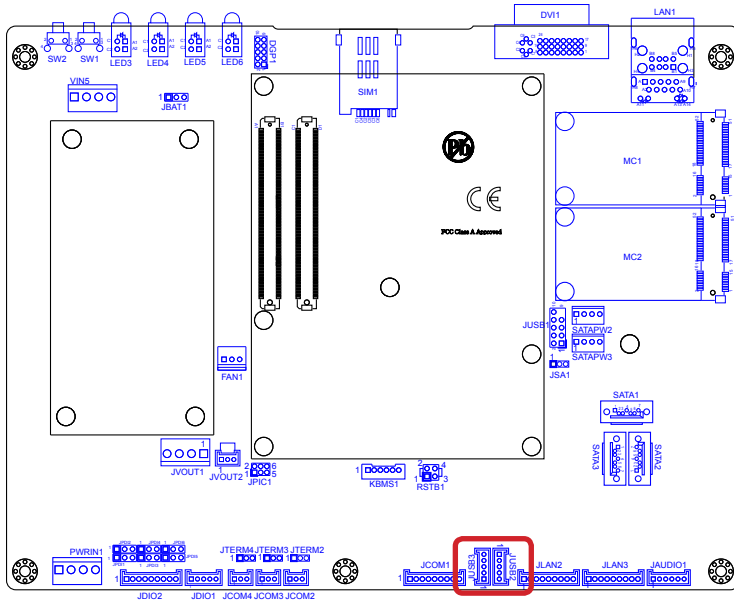
**Destription:** USB wafer connectors

**Connector Type:** Onboard 2.00mm-pitch 5-pin wafer connector

Pin	Description
1	VCC5
2	D-
3	D+
4	GND
5	GND



## Board Top





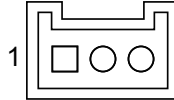
# System Configuration

## JCOM2, JCOM3, JCOM4

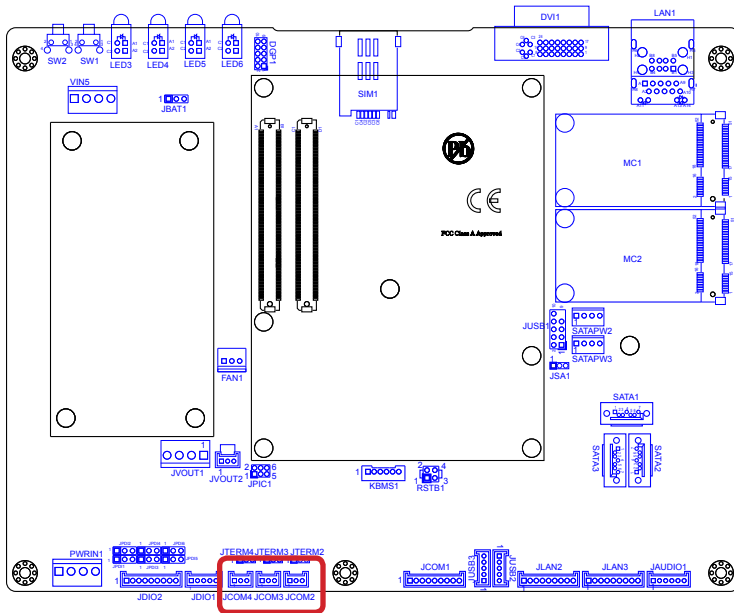
**Destription:** RS-485 wafer connector

**Connector Type:** Onboard 2.00mm pitch 3-pin wafer connector

Pin	Description
1	485+
2	485-
3	GND



## Board Top

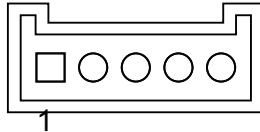


## JDIO1

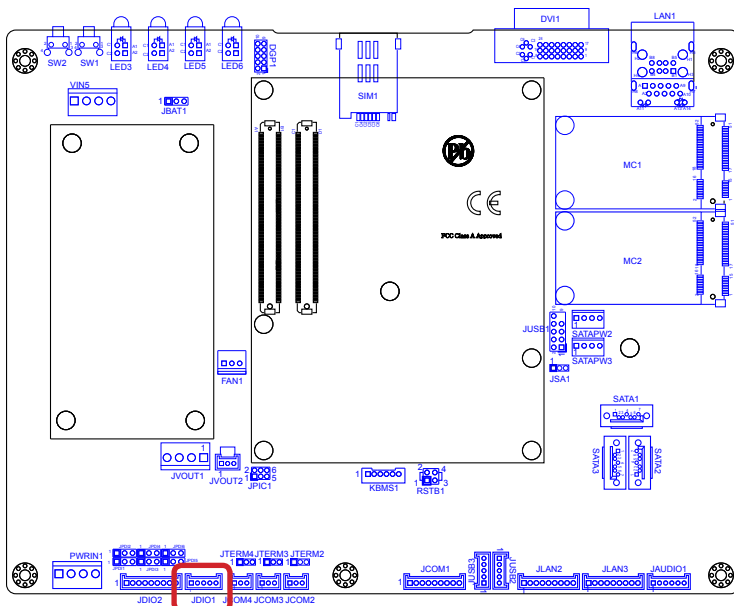
**Description:** Digital output wafer connector

**Connector Type:** Onboard 2.00mm pitch 5-pin wafer connector

Pin	Description
1	Digital Output 1
2	Digital Output 2
3	Digital Output 3
4	Digital Output 4
5	GND



### Board Top



# System Configuration

## JDIO2

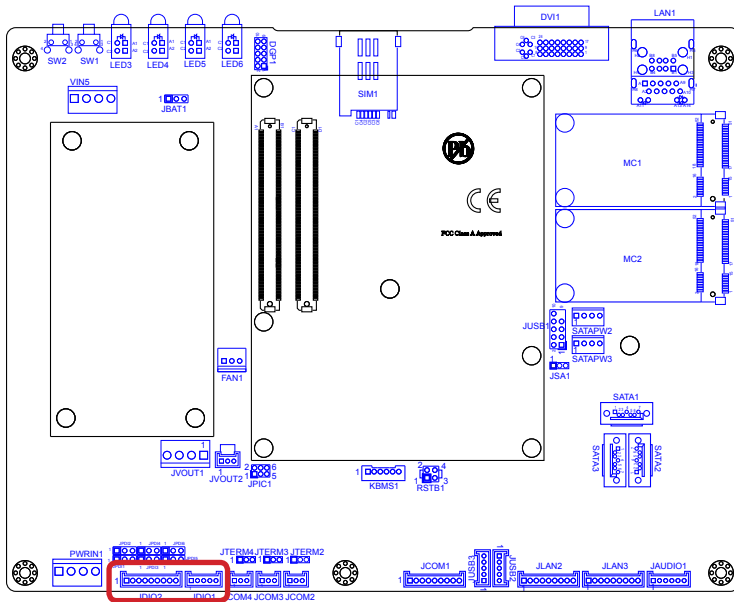
**Description:** Digital input wafer connector

**Connector Type:** Onboard 2.00mm-pitch 9-pin wafer connector

Pin	Description	Pin	Description
1	DI_V-	6	Digital Input 3
2	DI_V+	4	Digital Input 4
3	N/C	8	Digital Input 5
4	Digital Input 1	9	Digital Input 6
5	Digital Input 2		



## Board Top



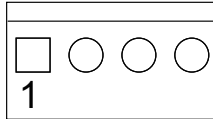


**PWRIN1**

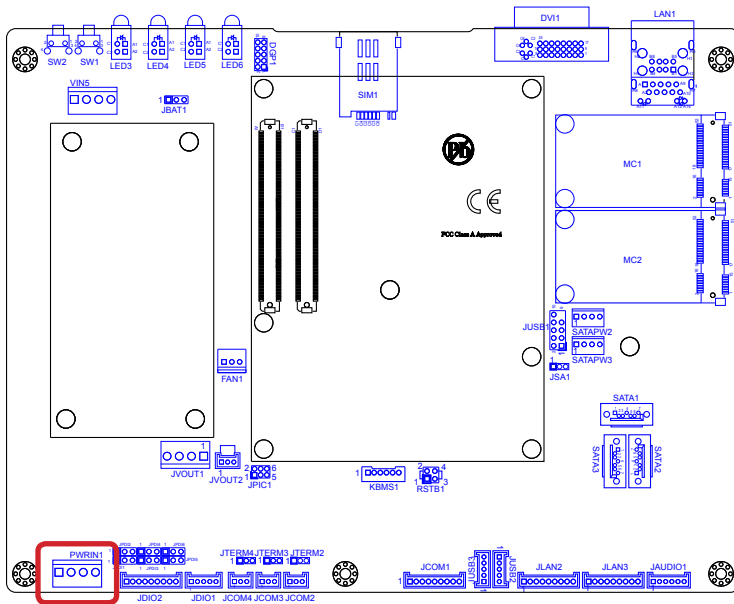
**Description:** External power input wafer connector

**Connector Type:** Onboard 3.96mm-pitch 4-pin wafer connector

Pin	Description
1	Chassis GND
2	Power -
3	Power +
4	Power +



**Board Top**



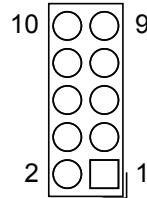
# System Configuration

## DGP1

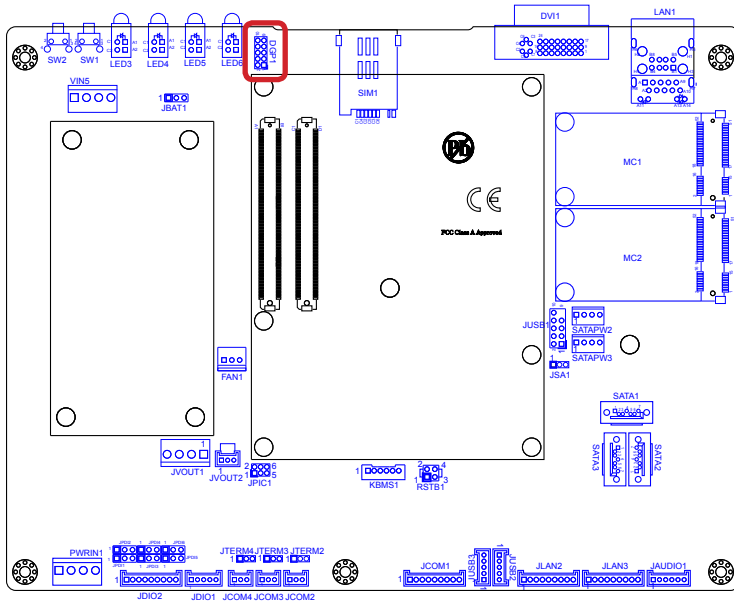
**Description:** External 80 port pin header

**Connector Type:** Onboard 2.0mm-pitch 10-pin header

Pin	Description	Pin	Description
1	CLK	6	N/C
2	GND	7	LAD3
3	FRAME#	8	LAD2
4	LAD0	9	VCC3
5	PLTRST#	10	LAD1

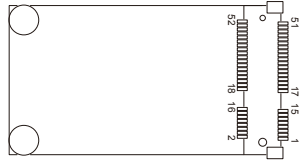


## Board Top



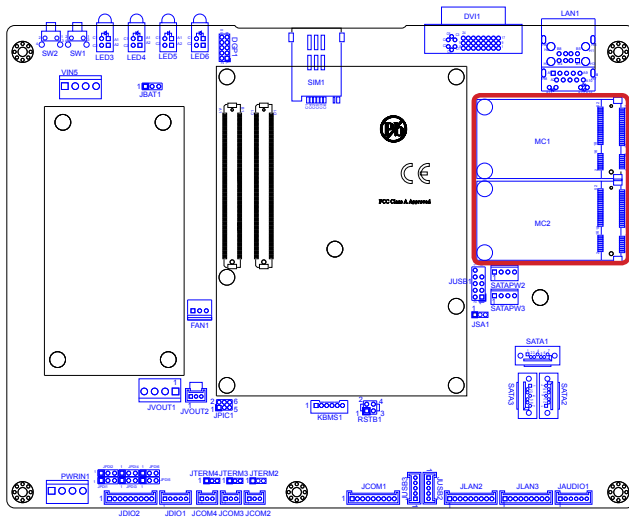
**MC1 & MC2**

**Description:** PCI Express Mini-card sockets  
**Connector Type:** Onboard 0.8mm-pitch 52-pin edge card connector



Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
1	Wake	16	UIM_VPP	31	PETn0	43	GND
2	+3.3V	17	UIM_C8/Reserved	32	SMB_DATA	44	LED_WLAN#
3	COEX1	18	GND	33	PETp0	45	Reserved
4	GND	19	UIM_C4/Reserved	34	GND	46	LED_WPAN#
5	COEX2	20	W_Disable#	35	GND	47	Reserved
6	+1.5V	21	GND	36	USB_D-	48	+1.5V
7	CLKREQ#	22	PERST#	37	GND	49	Reserved
8	UIM_PWR	23	PERn0	38	USB_D+	50	GND
9	GND	24	+3.3V	39	+3.3V	51	Reserved
10	UIM_DATA	25	PERp0	40	GND	52	+3.3V
11	REFCLK-	26	GND	41	+3.3V		
12	UIM_CLK	27	GND	42	LED_WWAN#		
13	REFCLK+	28	+1.5V				
14	UIM_RESET	29	GND				
15	GND	30	SMB_CLK				

**Board Top**

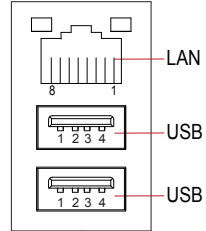


# System Configuration

## LAN1

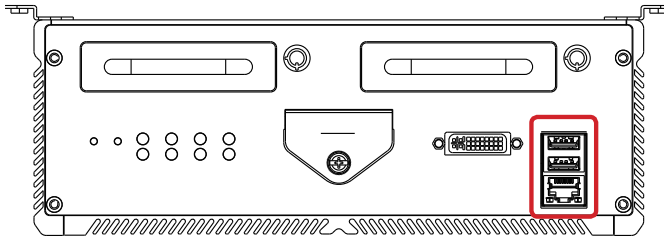
**Description:** One Ethernet port over double-stacked USB 2.0 ports

**Connector Type:** One 8P8C RJ45 connector w/ two type-A USB connectors

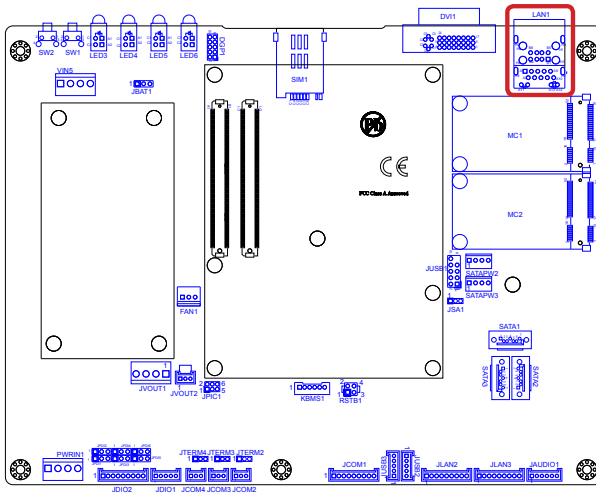


LAN (RJ-45)		USB (Type-A)	
Pin	Desc.	Pin	Desc.
1	MDI0+	1	+5V
2	MDI0-	2	USB-
3	MDI1+	3	USB+
4	MDI1-	4	GND
5	MDI2+		
6	MDI2-		
7	MDI3+		
8	MDI3-		

## Front Panel



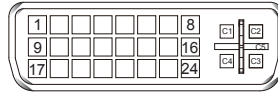
## Board Top



DVI1

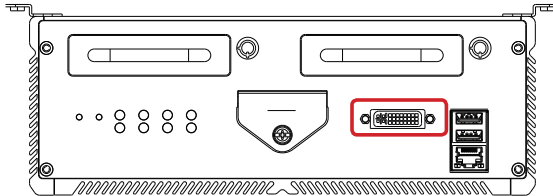
**Description:** DVI-I port (digital and analog)

**Connector Type:** 29-pin DIP-type female connector

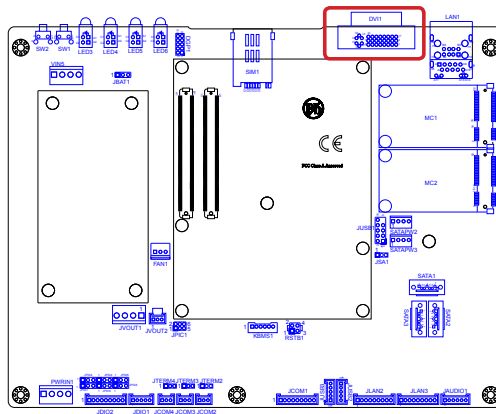


Pin	Desc.	Pin	Desc.	Pin	Desc.
1	T.M.D.S DATA 2-	11	T.M.D.S DATA 1/3 SHIELD	21	T.M.D.S DATA 5+
2	T.M.D.S DATA 2+	12	T.M.D.S DATA 3-	22	T.M.D.S CLOCK SHIELD
3	T.M.D.S DATA 2/4 SHIELD	13	T.M.D.S DATA 3+	23	T.M.D.S CLOCK+
4	T.M.D.S DATA 4-	14	+5V Power	24	T.M.D.S CLOCK-
5	T.M.D.S DATA 4+	15	GND	C1	ANALOG RED
6	DDC CLOCK	16	HOT PLUG DETECT	C2	ANALOG GREEN
7	DDC DATA	17	T.M.D.S DATA 0-	C3	ANALOG BLUE
8	ANALOG VERT. SYNC	18	T.M.D.S DATA 0+	C4	ANALOG HORZ SYNC
9	T.M.D.S DATA 1-	19	T.M.D.S DATA 0/5 SHIELD	C5	ANALOG GROUND
10	T.M.D.S DATA 1+	20	T.M.D.S DATA 5-		

Front Panel



Board Top



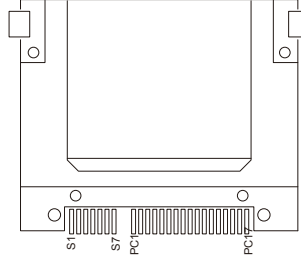


## CF1

**Destription:** CFAST card connector

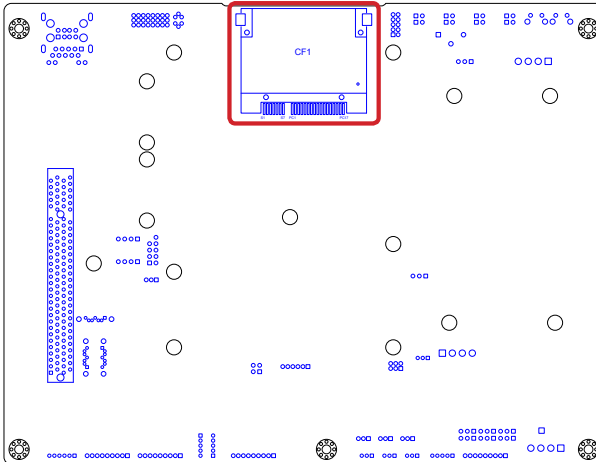
**Connector Type:** 8.35mm-high 24-pin push-insert CFAST connector

Pin	Desc.	Pin	Desc.
S1	GND	PC1	CDI
S2	TX+	PC2	GND
S3	TX-	PC3	NC
S4	GND	PC4	NC
S5	RX+	PC5	NC
S6	RX-	PC6	NC
S7	GND	PC7	GND



Pin	Desc.	Pin	Desc.
PC8	NC	PC13	CFAST VCC
PC9	NC	PC14	CFAST VCC
PC10	NC	PC15	GND
PC11	NC	PC16	GND
PC12	NC	PC17	CDO

## 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

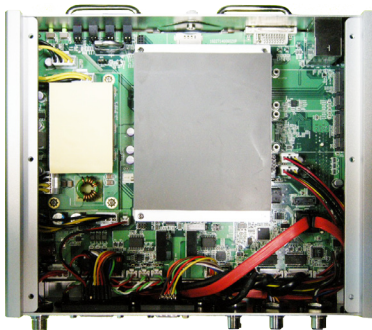
All jumpers, connectors, and PCI Express Mini-card sockets are built on the carrier board. To access these components, the computer's top cover has to go. Follow through the steps below to remove the top cover from the computer.

1. Place the computer on a flat surface. Loosen and remove the 6 screws from the top cover as marked in the illustration below.



2. Dismount the top cover.

The inside of the computer comes to view.



- ▶ To adjust jumpers or connect/disconnect devices to/from the carrier board, see [3.2.1. Jumpers](#) on page [21](#) and [3.2.2. Connectors](#) on page [32](#).
- ▶ To install a 3G module of **PCI Express Mini-card** form factor, see [Appendix C: HSPA-S11400 Hardware/Software Installation](#) on page [123](#).
- ▶ To install a Wi-Fi module of **PCI Express Mini-card** form factor, see [Appendix D: WIFI-IN1350 Hardware/Software Installation](#) on page [133](#).

## Installation & Maintenance

### 4.1.2. Install/uninstall SIM Card

The computer supports a SIM card for mobile networking and comes with an outside-accessible SIM card slot. Follow through the guide below to install a SIM card to the computer.

#### To install the SIM card:

1. On the front panel of the computer, find the door to the SIM card slot. Loosen the screw that locks the door.

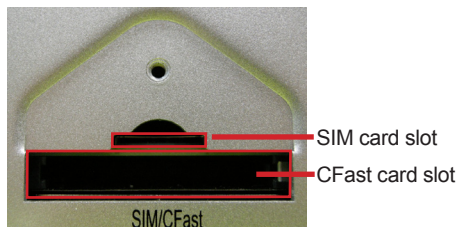
ARTS-3250 Front



ARTS-3672W Front



2. Once the screw is loosened enough, the door can be opened. Open the door to see the SIM card slot and CFast card slot.



3. Position the SIM card at the slot as directed in the illustration below. Push-insert the SIM card.



Push-insert the SIM card.

4. Restore the card door.

**To uninstall the SIM card:**

1. Loosen the card door screw and open the card door.
2. Push-eject the SIM card.
3. Remove the SIM card.
4. Restore the card door.

Note to restore the card door each time the SIM card is installed or uninstalled.

See also [Appendix C](#) to install a 3G module.

## Installation & Maintenance

### 4.1.3. Install/uninstall CFast Card

The computer supports a CFast card for storage and comes with an outside-accessible CFast slot. Follow through the guide below to install a CFast card to the computer.

**Note:** Be sure to turn off the computer before installing or uninstalling the CF card if the OS is installed on the card.

#### To install the CFast card:

1. On the front panel of the computer, find the door to the CFast slot. Loosen and remove the screw that locks the door.

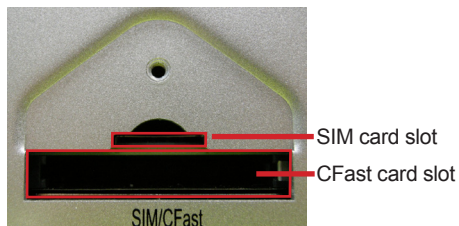
ARTS-3250 Front



ARTS-3672W Front



2. Once the screw is loosened enough, the door can be opened. Open the door to see the SIM card slot and CFast card slot.



3. Position the CFast card at the slot as directed in the illustration below. Push-insert the CFast card.



Push-insert the CFast card.

**To uninstall the CFast card:**

1. Loosen the card door screw and open the card door.
2. Push-eject the CFast card.
3. Remove the CFast card.
4. Restore the card door.

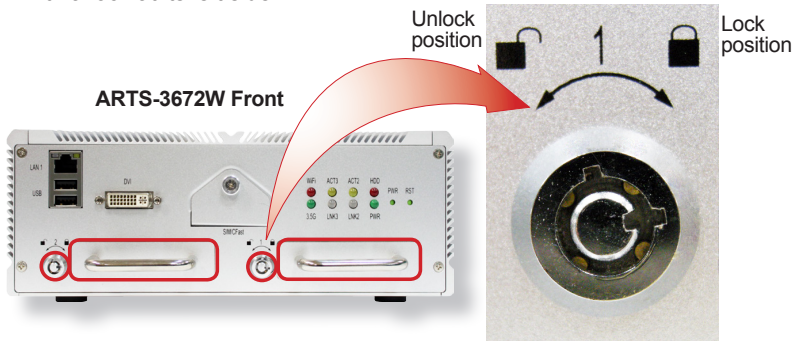
Note to restore the card door each time the CFast card is installed or uninstalled.

## Installation & Maintenance

### 4.1.4. Install SATA HDD/SSD (ARTS-3672W only)

The ARTS-3672W supports two 2.5-inch HDD/SSD storage devices. To install a 2.5" HDD/SSD to the computer, follow through the guide below:

1. On the front panel of the computer, find the two drawer-like brackets, each with a lock at its left side.

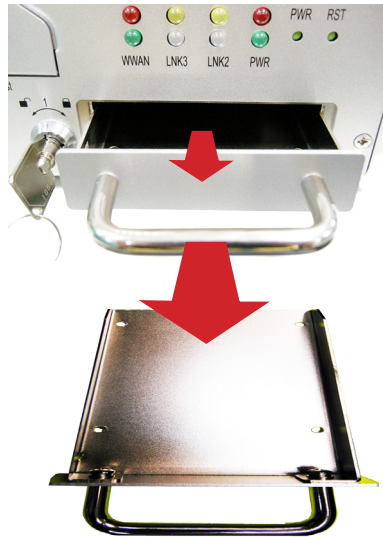


2. Have the key from the accessories. Stick the key and turn the lock to the unlock position.

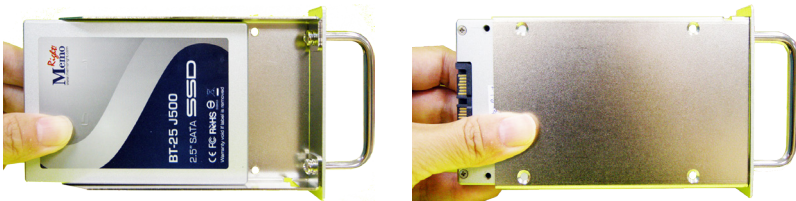




3. Pull out and remove the bracket from the computer.



4. Slide a 2.5-inch SSD into the bracket.

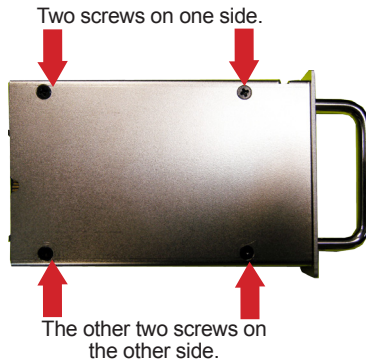


Slide a 2.5-inch SSD into the bracket.

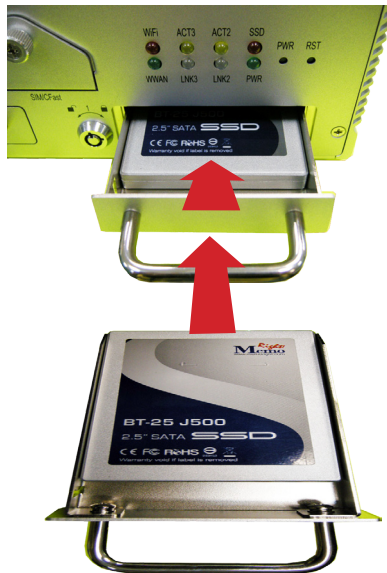
## Installation & Maintenance

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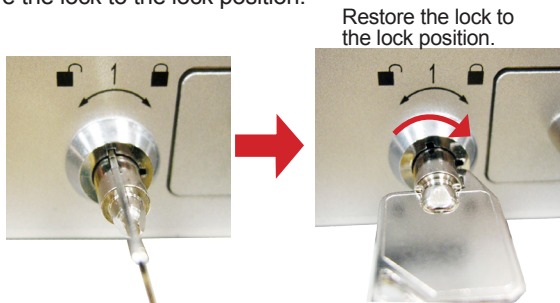
5. Fix the assemblage with four screws.



6. Plug the bracket (with the SSD) back to the computer.



7. Restore the lock to the lock position.



#### 4.1.5. Install Wireless Modules

The computer comes with two **Mini-card** sockets to load the computer with the wireless modules of **PCI Express Mini-card** form factor. The configure-to-order wireless modules available with the computer are the 3G module **HSPA-SI1400** and the Wi-Fi module **WIFI-IN1350**:



HSPA-SI1400  
HSUPA 3.75G module kit & internal wiring



WIFI-IN1350  
Intel® Centrino® Advanced-N 6205 WiFi module w/ 20cm & 30cm internal wires

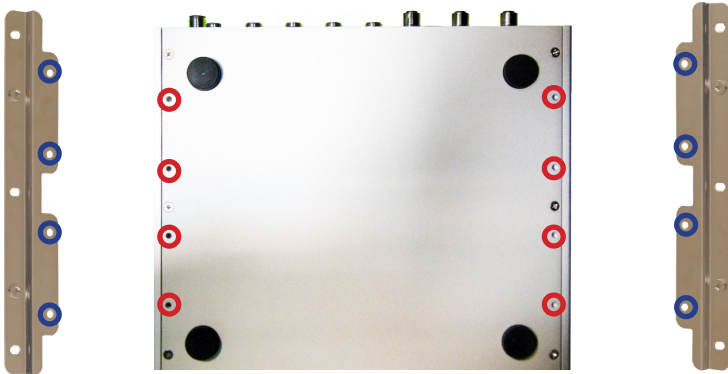
(See also [1.5.2. Configure-to-Order Service](#) on page 6.)

- If you have ordered the 3G module **HSPA-SI1400**, see [Appendix C](#) to know how to install the hardware and software for the module.
- If you have ordered the Wi-Fi module **WIFI-IN1350**, see [Appendix D](#) to know how to install the hardware and software for the module.

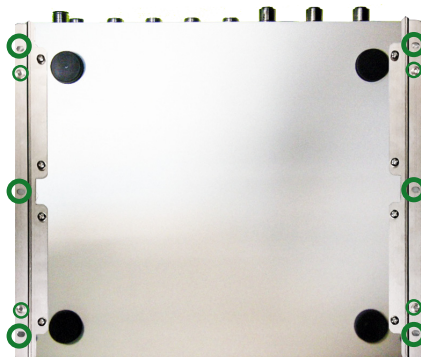
### 4.2. Mount the Computer

Integrate the computer to where it works by mounting it to a wall in the surroundings. Such integration relies on a wall-mount kit, which comes with the computer. Follow through the guide below to assemble the kit to the computer:


1. Place the computer on a flat surface, with the bottom facing up. Find the eight screw holes at its bottom as marked in the red circles in the illustration below:



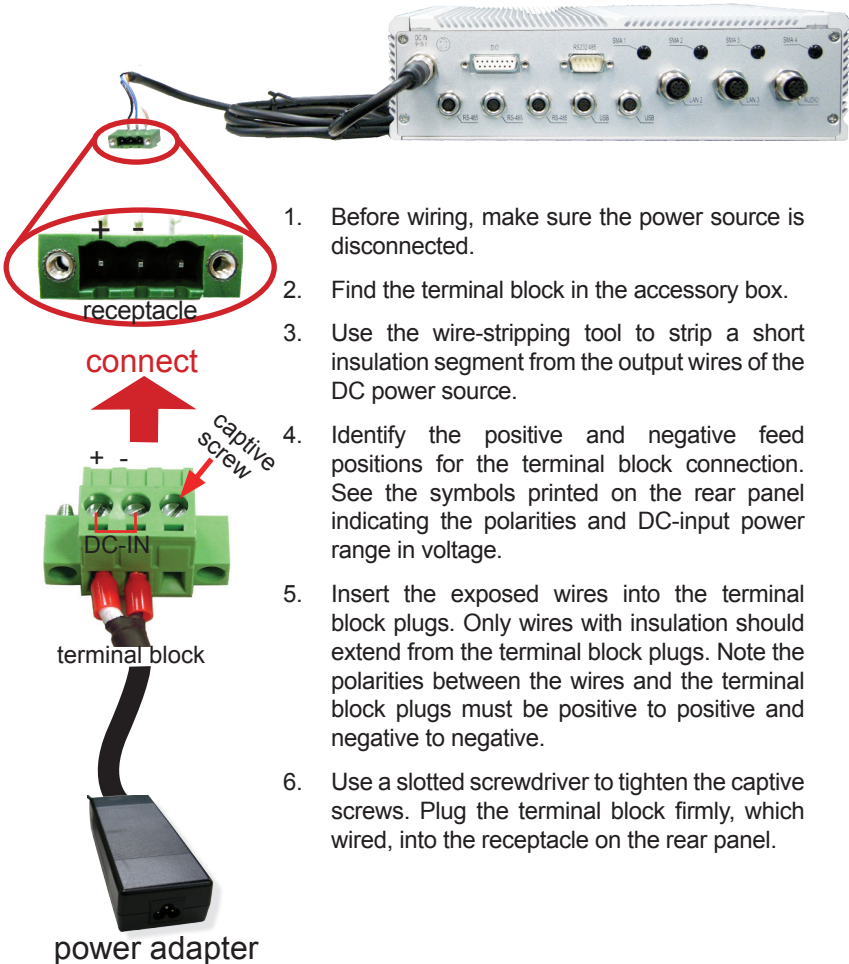
2. Have the two wall-mount brackets. Use the screws included in the wall-mount kit to assemble the brackets to the computer's bottom. (See the illustration above).
3. Use the other screw holes and cutouts on both wall-mount brackets to mount the computer to a wall. (See the green circles in the illustration below).



### 4.3. Wire DC-in 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 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.

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# 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.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

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

BIOS Information BIOS Vendor Core Version Compliance BIOS version Build Date and Time	American Megatrends 4.6.5.1 UEFI 2.3; PI 1.2 ARTS-3250-D25 1.00 08/01/2013 14:09:19	Set the Date. Use Tab to switch between Data elements.
System Date System Time	[Sat 02/07/2009] [17:38:10]	
Access Level	Administrator	

→←: Select Screen  
 ↓↑: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F9: Optimized Defaults  
 F10: Save and Exit Setup  
 ESC: Exit

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The BIOS Setup utility features the following menus:

Model	Menu	Description
<b>ARTS-3250</b>	<b>Main</b>	See <a href="#">5.1.1. Main</a> on page <a href="#">74</a> .
	<b>Advanced</b>	See <a href="#">5.1.2. Advanced</a> on page <a href="#">75</a> .
	<b>Chipset</b>	See <a href="#">5.1.3. Chipset</a> on page <a href="#">86</a> .
	<b>Boot</b>	See <a href="#">5.1.4. Boot</a> on page <a href="#">92</a> .
	<b>Security</b>	See <a href="#">5.1.5. Security</a> on page <a href="#">94</a> .
	<b>Save &amp; Exit</b>	See <a href="#">5.1.6. Save &amp; Exit</a> on page <a href="#">95</a> .



ARTS-3672W	<b>Main</b>	See <a href="#">5.2.1. Main</a> on page <a href="#">96</a> .
	<b>Advanced</b>	See <a href="#">5.2.2. Advanced</a> on page <a href="#">97</a> .
	<b>Chipset</b>	See <a href="#">5.2.3. Chipset</a> on page <a href="#">110</a> .
	<b>Boot</b>	See <a href="#">5.2.4. Boot</a> on page <a href="#">115</a> .
	<b>Security</b>	See <a href="#">5.2.5. Security</a> on page <a href="#">117</a> .
	<b>Save &amp; Exit</b>	See <a href="#">5.2.6. Save &amp; Exit</a> on page <a href="#">118</a> .

## 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.
<b>Enter</b>	Selects an highlighted item/field.
<b>Esc</b>	<ul style="list-style-type: none"> <li>▶ On the top menus: Use <b>Esc</b> to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select <b>OK</b> or <b>Cancel</b> to exit discarding changes.</li> <li>▶ On the submenus: Use <b>Esc</b> to quit current screen and return to the top menu.</li> </ul>
<b>Page Up / +</b>	Increases current value to the next higher value or switches between available options.
<b>Page Down / -</b>	Decreases current value to the next lower value or switches between available options.
<b>F1</b>	Opens the <b>Help</b> of the BIOS Setup utility.
<b>F10</b>	Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select <b>OK</b> or <b>Cancel</b> 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.

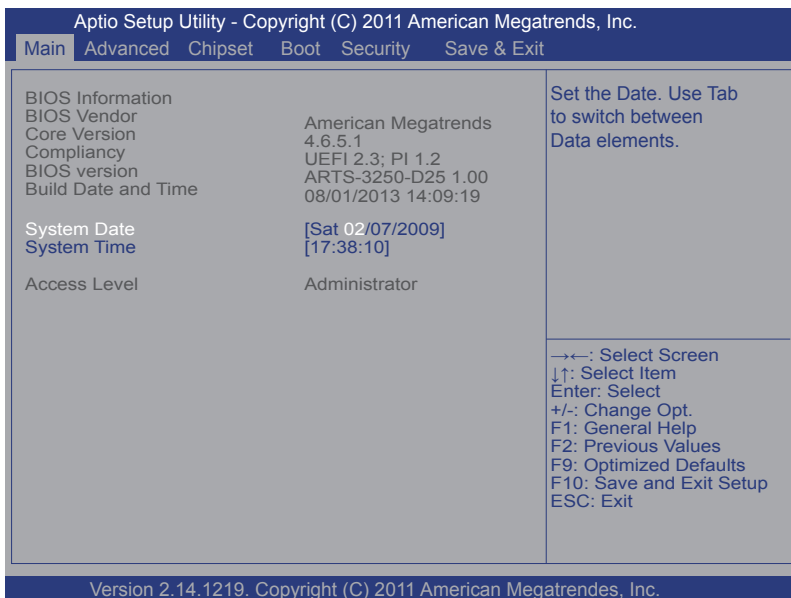
# BIOS

## 5.1. ARTS-3250

This section will guide you to the the BIOS Setup utility featured by the ARTS-3250.

### 5.1.1. Main

The **Main** menu features the settings of **System Date** and **System Time** and also displays some BIOS info and system info.



The BIOS info displayed are:

Group	Info	Description
BIOS Information	BIOS Vendor	Delivers the provider of this BIOS Setup utility.
	Core Version	Delivers the version of the core.
	Compliance	Delivers the UEFI support.
	BIOS Version	Delivers the system's BIOS version.
	Build Date and Time	Delivers the date and time while the BIOS Setup utility was created/updated.
Access Level		Delivers the level that the BIOS is being accessed at the moment. (Only <b>Administrator Level</b> is available.)

The featured settings are:

Setting	Description
<b>System Time</b>	Sets system time.
<b>System Date</b>	Sets system date.

### 5.1.2. Advanced

Access the **Advanced** menu to manage the computer’s system configuration including the Super IO chip.



The featured settings and submenus are:

Setting	Description
<b>Legacy OpROM Support</b>	<b>Launch PXE OpROM</b> Enables/disables the boot option for legacy network devices. ▶ <b>Disabled</b> is the default ▶ “PXE” means “Preboot Execution Environment”, a series of methods to get a typical Windows-based computer to boot up without a hard drive or boot diskette.
	<b>Launch Storage OpROM</b> Enables/disables the boot option for the legacy mass storage devices with Option ROM. ▶ <b>Enabled</b> is the default.

## BIOS

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<b>ACPI Settings</b>	See <a href="#">5.1.2.1. ACPI Settings</a> on page <a href="#">77</a> .
<b>CPU Configuration</b>	See <a href="#">5.1.2.2. CPU Configuration</a> on page <a href="#">78</a> .
<b>SATA Configuration</b>	See <a href="#">5.1.2.3. SATA Configuration</a> on page <a href="#">79</a> .
<b>USB Configuration</b>	See <a href="#">5.1.2.4. USB Configuration</a> on page <a href="#">80</a> .
<b>H/W Monitor</b>	See <a href="#">5.1.2.5. H/W Monitor</a> on page <a href="#">81</a> .
<b>Super IO Configuration</b>	See <a href="#">5.1.2.6. Super IO Configuration</a> on page <a href="#">82</a> .
<b>UART switch setting</b>	See <a href="#">5.1.2.7. UART Switch Setting</a> on page <a href="#">83</a> .
<b>Second Super IO Configuration</b>	See <a href="#">5.1.2.8. Second Super IO Configuration</a> on page <a href="#">84</a> .

### 5.1.2.1. ACPI Settings

Access this submenu to configure the system's ACPI (Advanced Configuration and Power Interface). The featured settings are:

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Advanced

<p>ACPI Settings</p> <p>Enable Hibernation [Enabled]</p> <p>ACPI Sleep State [S1 (CPU Stop Clock)]</p>	<p>Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.</p> <hr/> <p>→←: Select Screen                  ↓↑: Select Item                  Enter: Select                  +/-: Change Opt.                  F1: General Help                  F2: Previous Values                  F9: Optimized Defaults                  F10: Save and Exit Setup                  ESC: Exit</p>
--	---

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The featured settings are:

Setting	Description
<b>Enable Hibernation</b>	Enables/disables the system to/from hibernation (OS/S4 Sleep State). <ul style="list-style-type: none"> <li>▶ This option may not be effective with some OS.</li> <li>▶ <b>Enabled</b> is the default.</li> </ul>
<b>ACPI Sleep State</b>	Sets the highest ACPI sleep state that system enters when the suspend button is hit. <ul style="list-style-type: none"> <li>▶ Options available are <b>Suspend Disabled</b> and <b>S1 (CPU Stop Clock)</b> (default).</li> </ul>

# BIOS

## 5.1.2.2. CPU Configuration

Select **CPU Configuration** to run a report of the CPU's details including the hardware version, software version, model name, processor speed, microcode revision, max./min. processor speeds, the amount of processor core(s), and CPU caches. See the depiction below:

The screenshot shows the Aptio Setup Utility interface. At the top, it says 'Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.' and 'Advanced' is selected. The main area is titled 'CPU Configuration' and lists various processor details. A legend on the right side explains the navigation keys.

CPU Configuration	
Processor Type	Intel(R) Atom(TM) CPU
EMT64	Supported
Processor Speed	1865 MHz
System Bus Speed	533 MHz
Ratio Status	14
Actual Ratio	14
System Bus Speed	533 MHz
Processor Stepping	30661
Microcode Revision	269
L1 Cache RAM	2x56 k
L2 Cache RAM	2x512 k
Processor Core	Dual
Hyper-Threading	Supported

→←: Select Screen  
↓↑: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F9: Optimized Defaults  
F10: Save and Exit Setup  
ESC: Exit

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### 5.1.2.3. SATA Configuration

**SATA Configuration** delivers SATA device(s) information and configures SATA device(s).

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

SATA Port0	Not Present	SATA Ports (0-3) Device Names if Present and Enabled.
SATA Port1	Not Present	
SATA Controller(s)	[Enabled]	
Configure SATA as	[AHCI]	
SATA Port 0	[Enabled]	
SATA Port 0 Hot Plug	[Enabled]	
SATA Port 1	[Enabled]	
SATA Port 1 Hot Plug	[Enabled]	

→←: Select Screen  
 ↓↑: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F9: Optimized Defaults  
 F10: Save and Exit Setup  
 ESC: Exit

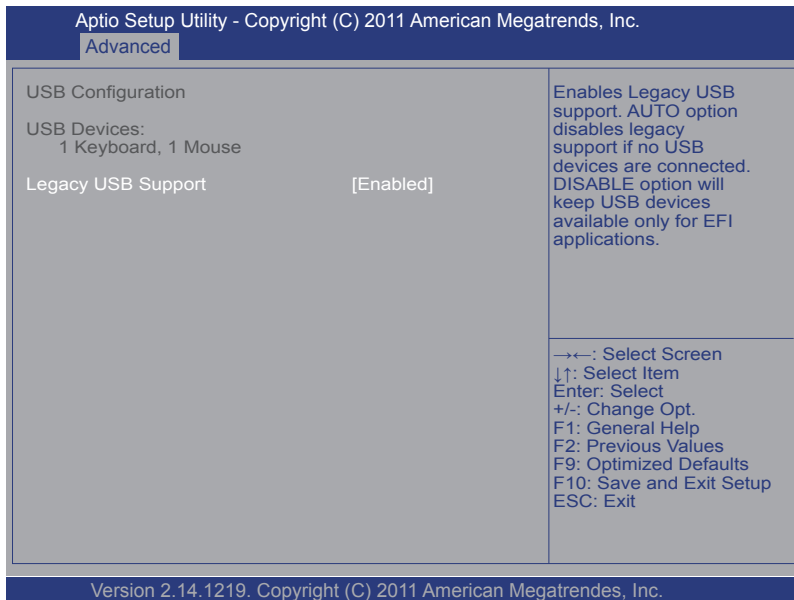
Version 2.14.1219. Copyright (C) 2011 American Megatrendes, Inc.

The featured settings are:

Setting	Description										
<b>SATA Controller(s)</b>	Enables/disables SATA device(s). ▶ <b>Enabled</b> is the default.										
<b>Configure SATA as</b>	Configures how SATA controller(s) operate. ▶ Options available are <b>AHCI</b> (default) and <b>IDE</b> . ▶ When set to <b>AHCI</b> , the following settings become available:										
	<table border="1"> <thead> <tr> <th>Setting</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>SATA Port 0</b></td> <td>Enables/disables SATA port 0.                              ▶ <b>Enabled</b> is the default.</td> </tr> <tr> <td><b>SATA Port 0 Hot Plug</b></td> <td>Enables/disables the hot pluggable feature for SATA port 0.                              ▶ <b>Enabled</b> is the default.</td> </tr> <tr> <td><b>SATA Port 1</b></td> <td>Enables/disables SATA port 1.                              ▶ <b>Enabled</b> is the default.</td> </tr> <tr> <td><b>SATA Port 1 Hot Plug</b></td> <td>Enables/disables the hot pluggable feature for SATA port 1.                              ▶ <b>Enabled</b> is the default.</td> </tr> </tbody> </table>	Setting	Description	<b>SATA Port 0</b>	Enables/disables SATA port 0. ▶ <b>Enabled</b> is the default.	<b>SATA Port 0 Hot Plug</b>	Enables/disables the hot pluggable feature for SATA port 0. ▶ <b>Enabled</b> is the default.	<b>SATA Port 1</b>	Enables/disables SATA port 1. ▶ <b>Enabled</b> is the default.	<b>SATA Port 1 Hot Plug</b>	Enables/disables the hot pluggable feature for SATA port 1. ▶ <b>Enabled</b> is the default.
	Setting	Description									
	<b>SATA Port 0</b>	Enables/disables SATA port 0. ▶ <b>Enabled</b> is the default.									
	<b>SATA Port 0 Hot Plug</b>	Enables/disables the hot pluggable feature for SATA port 0. ▶ <b>Enabled</b> is the default.									
<b>SATA Port 1</b>	Enables/disables SATA port 1. ▶ <b>Enabled</b> is the default.										
<b>SATA Port 1 Hot Plug</b>	Enables/disables the hot pluggable feature for SATA port 1. ▶ <b>Enabled</b> is the default.										

### 5.1.2.4. USB Configuration

**USB Configuration** displays the info of the connected USB devices and configures USB parameters.



The featured setting is:

Setting	Description
<b>Legacy USB Support</b>	<p>Enables/disables legacy USB support.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Enabled</b> (default), <b>Disabled</b> and <b>Auto</b>.</li> <li>▶ Select <b>Auto</b> to disable legacy support if no USB device are connected.</li> <li>▶ Select <b>Disabled</b> to keep USB devices available only for EFI applications.</li> </ul>



### 5.1.2.5. H/W Monitor

**H/W Monitor** monitors the computer's hardware status. Select this submenu to run a report of the info including CPU/system temperatures, CPU speed and other voltage info.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

Advanced

Pc Health Status	
CPU temperature	: +54° c
System temperature	: +49° c
+5V	: +5.087 V
+1.5V	: +1.488 V
+12V	: +11.880 V
+3.3V	: +3.288 V

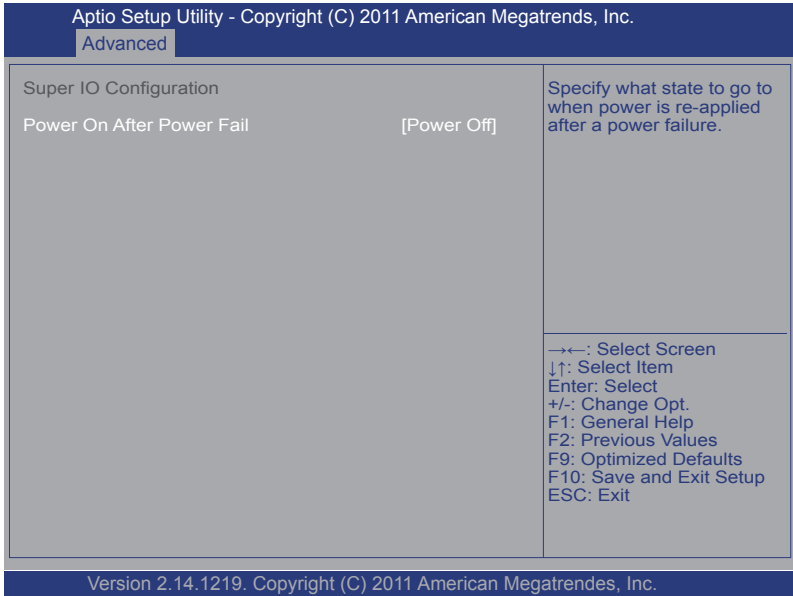
→←: Select Screen  
↓↑: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F9: Optimized Defaults  
F10: Save and Exit Setup  
ESC: Exit

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## BIOS

### 5.1.2.6. Super IO Configuration

**Super IO Configuration** is a submenu to control the system's Super IO chip Fintek F71869E. It configures the serial port on the system.

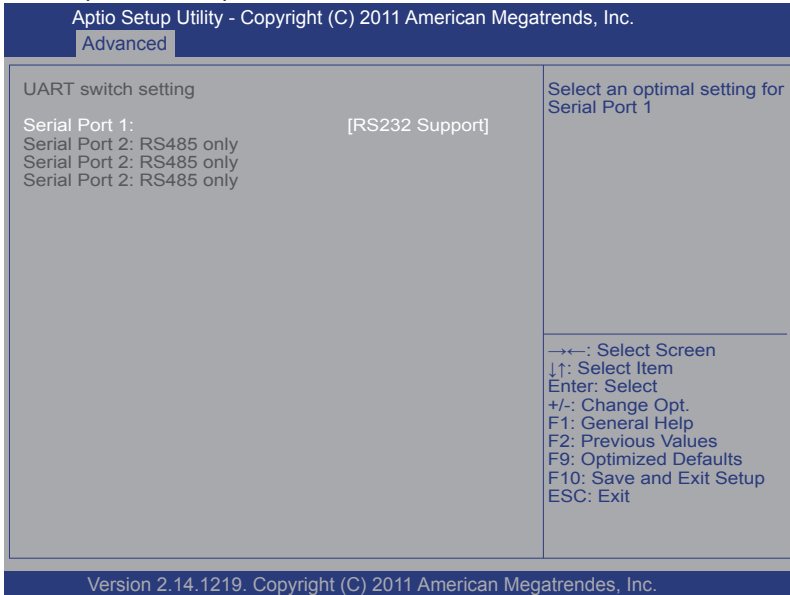


The featured setting is:

Setting	Description
<b>Power On After Power Fail</b>	Defines the state for the computer to go to when power is resumed after a power failure. <ul style="list-style-type: none"><li>▶ Options available are <b>Power Off</b> (default) and <b>Power On</b>.</li></ul>

### 5.1.2.7. UART Switch Setting

Access this **UART Switch Setting** to set the data transmission iinterface for the computer's serial port COM1.

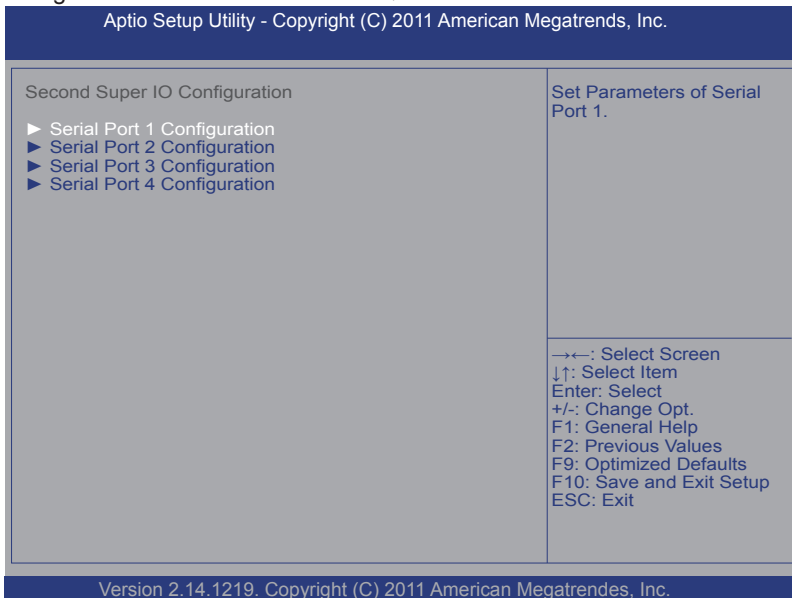


The featured setting is:

Setting	Description
<b>Serial Port 1 :</b>	Configures the data transmission interface for the computer's serial port COM1. ▶ Options available are <b>RS232 Support</b> (default) and <b>RS485 Support</b> .

### 5.1.2.8. Second Super IO Configuration

Use this submenu to enable/disable the computer’s serial ports 1~4 and to configure their I/O addresses and IRQ.



The featured submenus are:

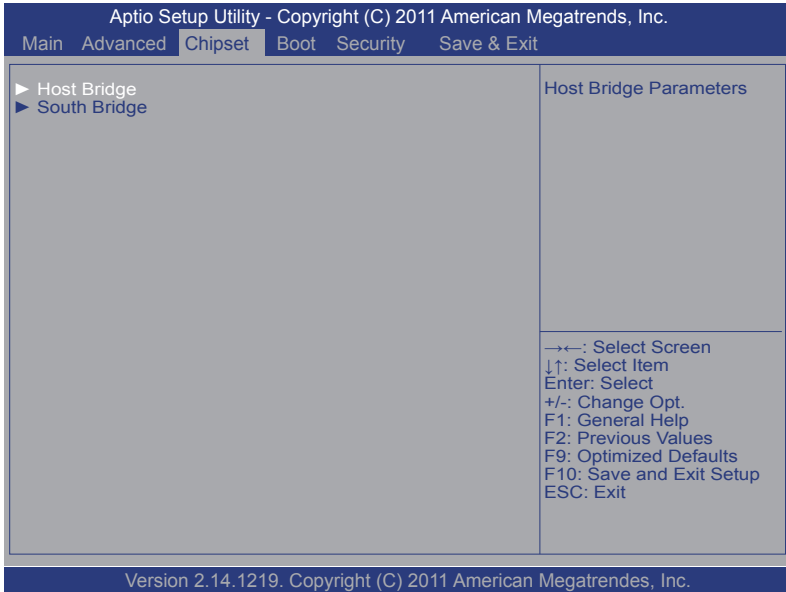
Submenu	Description	
Serial Port 1 Configuration	Configures the computer's COM1, which is configurable between RS232 and RS485. The featured settings are:	
	Setting	Description
	Serial Port	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
Change Settings	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=3F8h; IRQ=4;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	

Serial Port 2 Configuration	Configures the computer's COM2, which is fixed to RS485 and cannot be changed. The featured settings are:	
	Setting	Description
	Serial Port	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
Change Settings	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=2F8h; IRQ=3;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	
Serial Port 3 Configuration	Configures the computer's COM3 which is fixed to RS485 and cannot be changed. The featured settings are:	
	Setting	Description
	Serial Port	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
Change Settings	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=3E8h; IRQ=10;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	
Serial Port 4 Configuration	Configures the computer's COM4, which is fixed to RS485 and cannot be changed. The featured settings are:	
	Setting	Description
	Serial Port	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
Change Settings	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=2e8h; IRQ=11;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	

# BIOS

## 5.1.3. Chipset

The **Chipset** menu controls the system's chipset, including the north bridge and the south bridge.



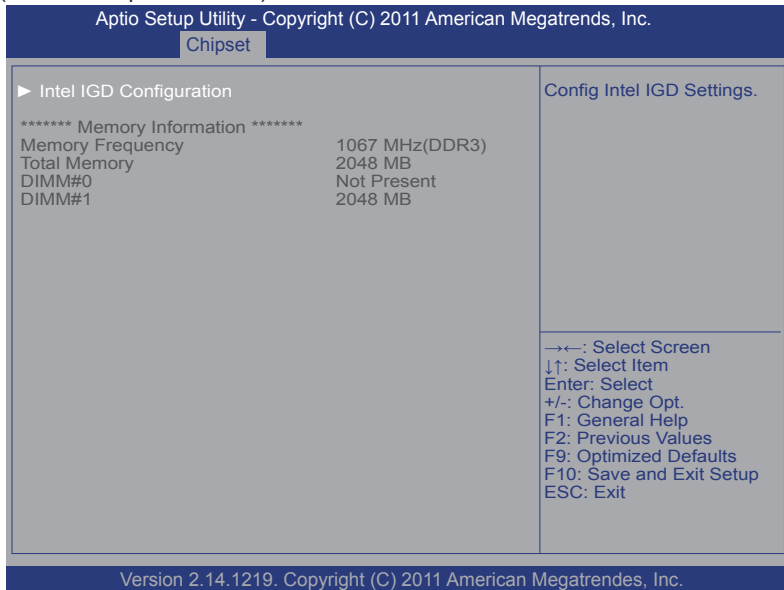
The featured submenus are **North Bridge** and **South Bridge**, which are detailed in the following of this section.

Submenu overview:

Submenu	Description
<b>North Bridge</b>	Configures the north bridge. See <a href="#">5.1.3.1. Host Bridge</a> on page <a href="#">87</a> for the settings.
<b>South Bridge</b>	Configures the south bridge. See <a href="#">5.1.3.2. South Bridge</a> on page <a href="#">88</a> for the settings.

### 5.1.3.1. Host Bridge

This submenu opens showing the memory information such as memory frequency, total memory and the memory module(s) presence. This submenu also features one submenu - **Intel IGD Configuration** to configure Intel IGD (Internal Graphics Device):

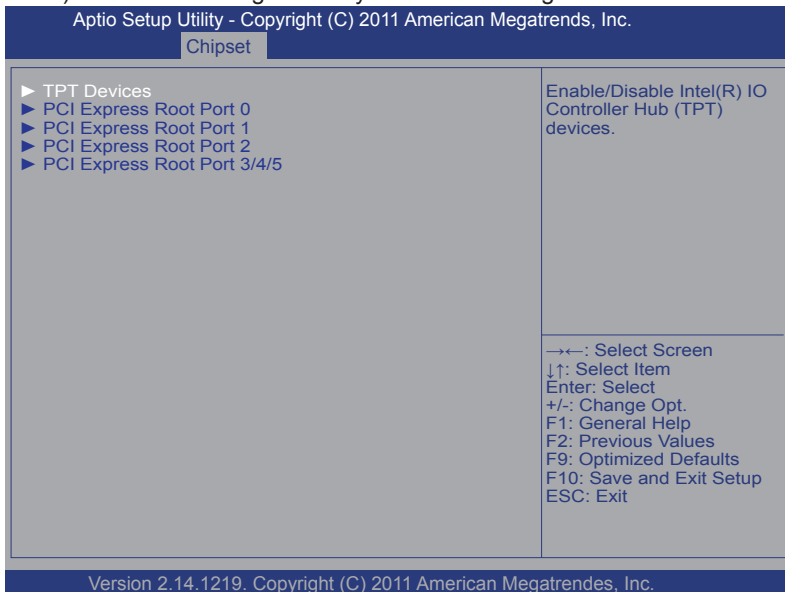


The featured submenu is:

Submenu	Description	
Intel IGD Configuration	Configures Intel IGD (internal graphics device) by the following settings:	
	Setting	Description
	<b>Auto Disable IGD</b>	Sets whether to auto-disable the internal graphics device upon detecting any external one. <ul style="list-style-type: none"> <li>▶ This setting is <b>Enabled</b> by default.</li> </ul>
<b>IGFX - Boot Type</b>	Sets the video device to activate during POST. <ul style="list-style-type: none"> <li>▶ This setting has no effect if an external graphics device is detected.</li> <li>▶ Options available are <b>CRT</b>, <b>DVI</b> and <b>CRT / DVI</b> (default) .</li> </ul>	

### 5.1.3.2. South Bridge

Select this submenu to view the south bridge's CIM (common information model) version and configure the system's south bridge:



The featured submenus and settings are:

Submenu / Setting	Description
<b>TPT Devices</b>	Enables/disables Intel® IO Controller Hub (TPT) devices. ▶ See <a href="#">5.1.3.2.1. TPT Devices</a> on page <a href="#">90</a> for more details.
<b>PCI Express Root Port 0</b>	Configures PCI Express root port 0. ▶ See <a href="#">5.1.3.2.2. PCI Express Root Port 0</a> on page <a href="#">90</a> for more details.
<b>PCI Express Root Port 1</b>	Configures PCI Express root port 1. ▶ See <a href="#">5.1.3.2.3. PCI Express Root Port 1</a> on page <a href="#">90</a> for more details.
<b>PCI Express Root Port 2</b>	Configures PCI Express root port 2. ▶ See <a href="#">5.1.3.2.4. PCI Express Root Port 2</a> on page <a href="#">91</a> for more details.
<b>PCI Express Root Port 3/4/5</b>	Configures PCI Express root port 3/4/5. ▶ See <a href="#">5.1.3.2.5. PCI Express Root Port 3/4/5</a> on page <a href="#">91</a> for more details.



<b>SLP_S4 Assertion Width</b>	<p>Sets the minimum assertion width of the SLP_S4# signal.</p> <ul style="list-style-type: none"> <li>▶ Options available are:           <table style="margin-left: 20px;"> <tr> <td><b>1-2 Seconds</b></td> <td><b>3-4 Seconds</b></td> </tr> <tr> <td><b>2-3 Seconds</b></td> <td><b>4-5 Seconds (default)</b></td> </tr> </table> </li> </ul>	<b>1-2 Seconds</b>	<b>3-4 Seconds</b>	<b>2-3 Seconds</b>	<b>4-5 Seconds (default)</b>
<b>1-2 Seconds</b>	<b>3-4 Seconds</b>				
<b>2-3 Seconds</b>	<b>4-5 Seconds (default)</b>				

### 5.1.3.2.1. TPT Devices

This submenu provides users with the following settings:

Setting	Description														
<b>Azalia Controller</b>	<p>Enables/disables Intel® High Definition Audio.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Disabled</b> and <b>HD Audio</b> (default).</li> </ul>														
<b>Select USB Mode</b>	<p>Configures how to control the USB ports.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>By Ports</b> and <b>By Controllers</b> (default).</li> <li>▶ When set to <b>By Ports</b>, the following setting becomes available:           <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="background-color: #d9ead3;">Setting</th> <th style="background-color: #d9ead3;">Description</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d9ead3;"><b>USB Function</b></td> <td> <p>Enables one or more USB ports, or disables all USB ports.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Disabled</b>, <b>1 USB Port</b>, <b>2 USB Ports</b>, <b>3 USB Ports</b>, <b>4 USB Ports</b>, <b>5 USB Ports</b>, <b>6 USB Ports</b>, <b>7 USB Ports</b>, and <b>8 USB Ports</b> (default).</li> </ul> </td> </tr> </tbody> </table> </li> <li>▶ When set to <b>By Controllers</b>, the following settings become available:           <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="background-color: #d9ead3;">Setting</th> <th style="background-color: #d9ead3;">Description</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d9ead3;"><b>UHCI #1 (ports 0 and 1)</b></td> <td> <p>Enables/disables USB ports 0 and 1 by enabling/disabling USB 1.1 controller UHCI #1.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul> </td> </tr> <tr> <td style="background-color: #d9ead3;"><b>UHCI #2 (ports 2 and 3)</b></td> <td> <p>Enables/disables USB ports 2 and 3 by enabling/disabling USB 1.1 controller UHCI #2.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul> </td> </tr> <tr> <td style="background-color: #d9ead3;"><b>UHCI #3 (ports 4 and 5)</b></td> <td> <p>Enables/disables USB ports 4 and 5 by enabling/disabling USB 1.1 controller UHCI #3.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul> </td> </tr> <tr> <td style="background-color: #d9ead3;"><b>UHCI #4 (ports 6 and 7)</b></td> <td> <p>Enables/disables USB ports 6 and 7 by enabling/disabling USB 1.1 controller UHCI #4.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul> </td> </tr> </tbody> </table> </li> </ul>	Setting	Description	<b>USB Function</b>	<p>Enables one or more USB ports, or disables all USB ports.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Disabled</b>, <b>1 USB Port</b>, <b>2 USB Ports</b>, <b>3 USB Ports</b>, <b>4 USB Ports</b>, <b>5 USB Ports</b>, <b>6 USB Ports</b>, <b>7 USB Ports</b>, and <b>8 USB Ports</b> (default).</li> </ul>	Setting	Description	<b>UHCI #1 (ports 0 and 1)</b>	<p>Enables/disables USB ports 0 and 1 by enabling/disabling USB 1.1 controller UHCI #1.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>	<b>UHCI #2 (ports 2 and 3)</b>	<p>Enables/disables USB ports 2 and 3 by enabling/disabling USB 1.1 controller UHCI #2.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>	<b>UHCI #3 (ports 4 and 5)</b>	<p>Enables/disables USB ports 4 and 5 by enabling/disabling USB 1.1 controller UHCI #3.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>	<b>UHCI #4 (ports 6 and 7)</b>	<p>Enables/disables USB ports 6 and 7 by enabling/disabling USB 1.1 controller UHCI #4.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>
Setting	Description														
<b>USB Function</b>	<p>Enables one or more USB ports, or disables all USB ports.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Disabled</b>, <b>1 USB Port</b>, <b>2 USB Ports</b>, <b>3 USB Ports</b>, <b>4 USB Ports</b>, <b>5 USB Ports</b>, <b>6 USB Ports</b>, <b>7 USB Ports</b>, and <b>8 USB Ports</b> (default).</li> </ul>														
Setting	Description														
<b>UHCI #1 (ports 0 and 1)</b>	<p>Enables/disables USB ports 0 and 1 by enabling/disabling USB 1.1 controller UHCI #1.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>														
<b>UHCI #2 (ports 2 and 3)</b>	<p>Enables/disables USB ports 2 and 3 by enabling/disabling USB 1.1 controller UHCI #2.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>														
<b>UHCI #3 (ports 4 and 5)</b>	<p>Enables/disables USB ports 4 and 5 by enabling/disabling USB 1.1 controller UHCI #3.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>														
<b>UHCI #4 (ports 6 and 7)</b>	<p>Enables/disables USB ports 6 and 7 by enabling/disabling USB 1.1 controller UHCI #4.</p> <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>														

## BIOS

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<b>USB 2.0 (EHCI) Support</b>	Enables/disables USB 2.0 (EHCI) support. ▶ Options available are <b>Disabled</b> and <b>Enabled</b> (default).
-------------------------------	---

### 5.1.3.2.2. PCI Express Root Port 0

Access this submenu for the following settings:

Setting	Description
<b>PCI Express Port 0</b>	Enables/disables PCI Express root port 0. ▶ <b>Enabled</b> is the default.
<b>Port 0 IOxAPIC</b>	Enables/disables the I/O APIC of PCI Express root port 0. ▶ <b>Disabled</b> is the default.
<b>Automatic ASPM</b>	Enables/disables ASPM (Active State Power Management) based on the reported capabilities and known issues. ▶ Options available are <b>Manual</b> (default) and <b>Auto</b> .
<b>ASPM L0s</b>	Enables/disables PCI Express ASPM L0s. ▶ Options available are <b>Disabled</b> (default), <b>Root Port Only</b> , <b>Endpoint Port Only</b> and <b>Both Root and Endpoint Ports</b> .
<b>ASPM L1</b>	Enables/disables PCI Express ASPM L1. ▶ Options available are <b>Disabled</b> (default) and <b>Enabled</b> .

### 5.1.3.2.3. PCI Express Root Port 1

Access this submenu for the following settings:

Setting	Description
<b>PCI Express Port 1</b>	Enables/disables PCI Express root port 1. ▶ <b>Enabled</b> is the default.
<b>Port 0 IOxAPIC</b>	Enables/disables the I/O APIC of PCI Express root port 1. ▶ <b>Disabled</b> is the default.
<b>Automatic ASPM</b>	Enables/disables ASPM (Active State Power Management) based on the reported capabilities and known issues. ▶ Options available are <b>Manual</b> (default) and <b>Auto</b> .
<b>ASPM L0s</b>	Enables/disables PCI Express ASPM L0s. ▶ Options available are <b>Disabled</b> (default), <b>Root Port Only</b> , <b>Endpoint Port Only</b> and <b>Both Root and Endpoint Ports</b> .
<b>ASPM L1</b>	Enables/disables PCI Express ASPM L1. ▶ Options available are <b>Disabled</b> (default) and <b>Enabled</b> .

---

#### 5.1.3.2.4. PCI Express Root Port 2

Access this submenu for the following settings:

Setting	Description
PCI Express Port 2	Enables/disables PCI Express root port 2. ▶ <b>Enabled</b> is the default.
Port 0 IOxAPIC	Enables/disables the I/O APIC of PCI Express root port 2. ▶ <b>Disabled</b> is the default.
Automatic ASPM	Enables/disables ASPM (Active State Power Management) based on the reported capabilities and known issues. ▶ Options available are <b>Manual</b> (default) and <b>Auto</b> .
ASPM L0s	Enables/disables PCI Express ASPM L0s. ▶ Options available are <b>Disabled</b> (default), <b>Root Port Only</b> , <b>Endpoint Port Only</b> and <b>Both Root and Endpoint Ports</b> .
ASPM L1	Enables/disables PCI Express ASPM L1. ▶ Options available are <b>Disabled</b> (default) and <b>Enabled</b> .

#### 5.1.3.2.5. PCI Express Root Port 3/4/5

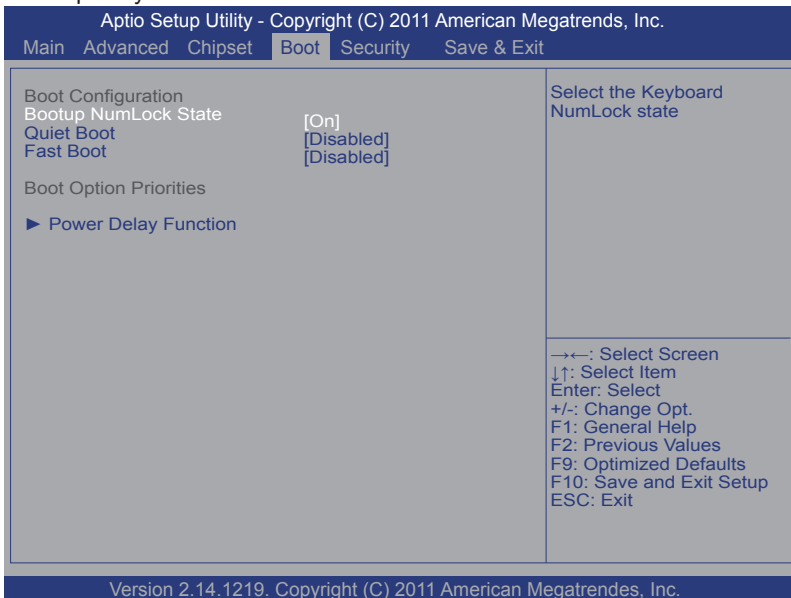
Access this submenu for the following settings:

Setting	Description
PCI Express Port 3	Enables/disables PCI Express root port 3, or leaves it on BIOS auto-configuration ▶ Options available are <b>Disabled</b> , <b>Enabled</b> and <b>Auto</b> (default).
Port 0 IOxAPIC	Enables/disables the I/O APIC of PCI Express root port 3. ▶ <b>Disabled</b> is the default.
Automatic ASPM	Enables/disables ASPM (Active State Power Management) based on the reported capabilities and known issues. ▶ Options available are <b>Manual</b> (default) and <b>Auto</b> .
ASPM L0s	Enables/disables PCI Express ASPM L0s. ▶ Options available are <b>Disabled</b> (default), <b>Root Port Only</b> , <b>Endpoint Port Only</b> and <b>Both Root and Endpoint Ports</b> .
ASPM L1	Enables/disables PCI Express ASPM L1. ▶ Options available are <b>Disabled</b> (default) and <b>Enabled</b> .

# BIOS

## 5.1.4. Boot

Access this **Boot** menu to configure how to boot up the system such as boot device priority.



The featured settings and submenu are:

Group	Setting	Description
Boot Configuration	Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. ▶ Options available are <b>On</b> (default) and <b>Off</b> .
	Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. ▶ Leave it as <b>Disabled</b> , which is the default, to display the normal POST message.
	Fast Boot	Enables/disables initializing only a minimal set of devices required to launch the active boot options when booting up the system. ▶ <b>Disabled</b> is the default. ▶ This setting has no effect for BBS (BIOS Boot Specification) options.

<b>Boot Option Priorities</b>	Sets the boot priority among the available device types.	
<b>Power Delay Function</b>	Configures power delay function by the following settings:	
	<b>Setting</b>	<b>Description</b>
	<b>Power Delay Function</b>	Enables/disables power delay function: <ul style="list-style-type: none"> <li>▶ <b>Enable</b> is the default.</li> <li>▶ Select <b>Disabled</b> to manually power on/off..</li> </ul>
	<b>Power on delay</b>	Configures how much time should be delayed for the system to power on. <ul style="list-style-type: none"> <li>▶ Options available are <b>Immediately</b>, <b>04 Seconds</b> (default), <b>08 Seconds</b> and <b>16 Seconds</b>.</li> </ul>
<b>Power off delay</b>	Configures how much time should be delayed for the system to power off. <ul style="list-style-type: none"> <li>▶ Options available are <b>Immediately</b> (default), <b>30 Seconds</b>, <b>60 Seconds</b> and <b>90 Seconds</b>.</li> </ul>	

## BIOS

### 5.1.5. 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.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.

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

Password Description	Set Administrator Password
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length                   3 Maximum length                   20	
Administrator Password	→←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit Setup ESC: Exit

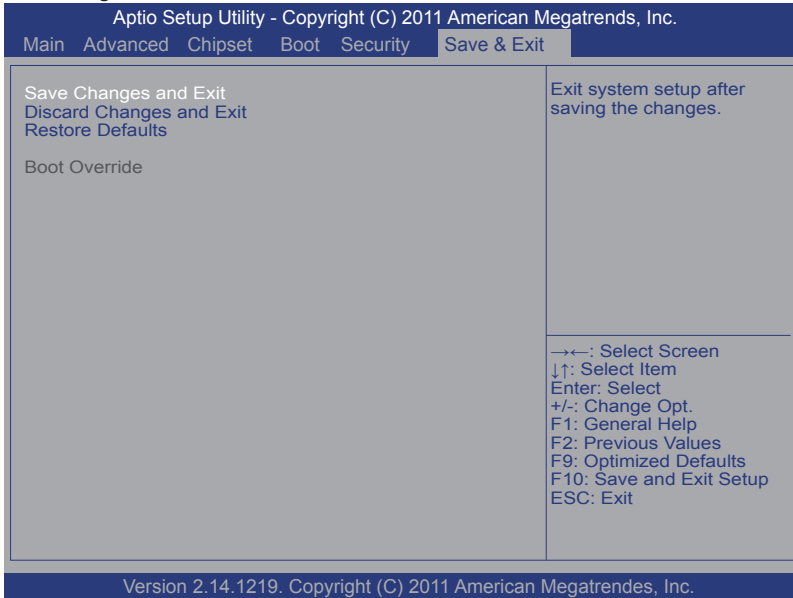
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

The featured setting is:

Setting	Description
<b>Administrator Password</b>	To set up an administrator password: <ol style="list-style-type: none"><li>1. Select <b>Administrator Password</b>. An <b>Create New Password</b> dialog then pops up onscreen.</li><li>2. Enter your desired password that is no less than 3 characters and no more than 20 characters.</li><li>3. Hit [Enter] key to submit.</li></ol>

### 5.1.6. 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 featured settings are:

Setting	Description
<b>Save Changes and Exit</b>	Saves the changes and exits the BIOS setup. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.
<b>Discard Changes and Exit</b>	Quits the BIOS Setup utility without saving the change(s).
<b>Restore Defaults</b>	Restores all settings to factory defaults. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.
<b>Boot Override</b>	Shows a list of the available boot devices in the system so users can boot up the system by any of the listed devices regardless of the currently configured boot priority. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.

## BIOS

### 5.2. ARTS-3672W

This section will guide you to the the BIOS Setup utility featured by the ARTS-3672W.

#### 5.2.1. Main

The **Main** menu features **System Date** and **System Time** settings while also displaying some BIOS info.

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Main Advanced Chipset Boot Security Save & Exit

BIOS Information		Set the Date. Use Tab to switch between Data elements.
BIOS Vendor	American Megatrends	
Core Version	4.6.4.0	
Compliency	UEFI 2.1	
BIOS version	ARTS-3672-2610UE 1.0	
Build Date and Time	07/17/2013 16:35:27	
System Date	[Mon 01/05/2009]	
System Time	[19:07:21]	
Access Level	Administrator	

←→: Select Screen  
↓↑: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F9: Optimized Defaults  
F10: Save and Exit  
ESC: Exit

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The BIOS info displayed is:

Item	Description
<b>BIOS Vendor</b>	Delivers the provider of the BIOS Setup utility.
<b>Core Version</b>	Delivers the version of the core.
<b>Compliency</b>	Delivers UEFI support.
<b>BIOS Version</b>	Delivers BIOS version.
<b>Build Date and Time</b>	Delivers the date and time the BIOS Setup utility was made/ updated.

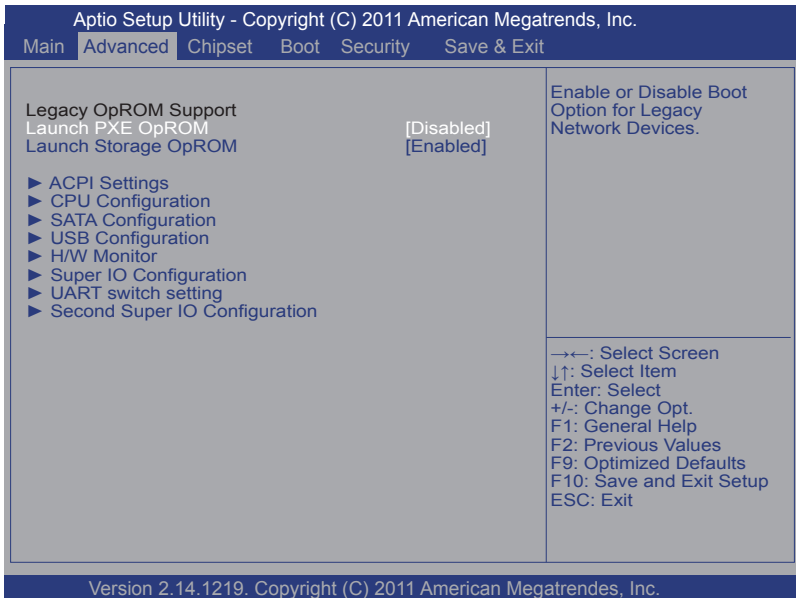


The featured settings are:

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

### 5.2.2. Advanced

The **Advanced** menu configures the system’s ACPI (Advanced Configuration and Power Interface), CPU, SATA, USB, Super IO and others.



The featured settings and submenus are:

Setting / Submenu		Description
Legacy OpROM Support	Launch PXE OpROM	Enables/disables the boot option for legacy network devices. <ul style="list-style-type: none"> <li>▶ <b>Disabled</b> is the default</li> <li>▶ “PXE” means “Preboot Execution Environment”, a series of methods to get a typical Windows-based computer to boot up without a hard drive or boot diskette.</li> </ul>
	Launch Storage OpROM	Enables/disables the boot option for the legacy mass storage devices with Option ROM. <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>



The featured settings are:

Setting	Description
<b>Enable Hibernation</b>	Enables/disables the system to/from hibernation (OS/S4 Sleep State). <ul style="list-style-type: none"> <li>▶ This option may not be effective with some OS.</li> <li>▶ <b>Enabled</b> is the default.</li> </ul>
<b>ACPI Sleep State</b>	Sets the highest ACPI sleep state that system enters when the suspend button is hit. <ul style="list-style-type: none"> <li>▶ Options available are <b>Suspend Disabled</b> and <b>S1 (CPU Stop Clock)</b> (default).</li> </ul>

### 5.2.2.2. CPU Configuration

Select **CPU Configuration** to run a report of the CPU's details including the processor's model name, stepping, microcode revision, max./min. speeds, the amount of processor core(s), and CPU caches. See the depiction below:

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.

Advanced

CPU Configuration Intel(R) Core(TM) i7-2610UE CPU @ 1.50GHz Processor Stepping 206a7 Microcode Revision 26 Max Processor Speed 1500 MHz Min Processor Speed 800 MHz Processor Speed 1500 MHz Processor Cores 2 Intel HT Technology Supported EMT64 Supported Hyper-threading [Enabled]	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
→←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit	

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## BIOS

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The featured setting is:

Setting	Description
<b>Hyper Threading Technology</b>	Enables/disables the processor's Hyper-threading feature. <ul style="list-style-type: none"><li>▶ Select <b>Enabled</b> for Windows XP and Linux, which are optimized for Hyper-threading technology.</li><li>▶ Select <b>Disabled</b> for other OS that are not optimized for Hyper-threading.</li><li>▶ <b>Enabled</b> is the default.</li><li>▶ When disabled, only one thread per enabled core is enabled.</li></ul>

### 5.2.2.3. SATA Configuration

**SATA Configuration** delivers SATA device(s) information and also configures SATA device(s).

Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.

Advanced

SATA Controller(s) SATA Mode Selection  Serial ATA Port 1 Software Preserve Port 1 Serial ATA Port 2 Software Preserve Port 2 Serial ATA Port 3 Software Preserve Port 3 Serial ATA Port 4 Software Preserve Port 4	[Enabled] [AHCI]  Empty Unknown [Enabled] Empty Unknown [Enabled] Empty Unknown [Enabled] Empty Unknown [Enabled]	Enable or disable SATA Device.           →←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit
---	---	---

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The featured settings are:

Setting	Description
<b>SATA Controller(s)</b>	Enables/disables SATA device(s). ▶ <b>Enabled</b> is the default.
<b>SATA Mode Selection</b>	Configures how SATA controller(s) operate. ▶ Options available are <b>IDE</b> , <b>AHCI</b> (default) and <b>RAID</b> . ▶ This setting is only available when <b>SATA Controller(s)</b> is enabled.
<b>Port #</b>	Enables/disables SATA port #. ▶ <b>Enabled</b> is the default. ▶ This setting is only available when <b>SATA Mode Selection</b> is set to <b>AHCI</b> or <b>RAID</b> , the following settings become available:

# BIOS

## 5.2.2.4. USB Configuration

**USB Configuration** displays the info of the connected USB devices and configures USB parameters.

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Advanced

USB Configuration		Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
USB Module Version	8.10.26	
USB Devices: 1 Keyboard, 2 Hubs		
Legacy USB Support	[Enabled]	
EHCI Hand-off	[Enabled]	
USB Mass Storage Driver Support	[Enabled]	
USB Hardware delays and time-outs:		
USB transfer time-out	[20 sec]	
Device reset time-out	[20 sec]	
Device power-up delay	[Auto]	
→←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit		

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The featured settings are:

Setting	Description
<b>Legacy USB Support</b>	Enables/disables legacy USB support. <ul style="list-style-type: none"> <li>▶ Options available are <b>Enabled</b> (default), <b>Disabled</b> and <b>Auto</b>.</li> <li>▶ Select <b>Auto</b> to disable legacy support if no USB device are connected.</li> <li>▶ Select <b>Disabled</b> to keep USB devices available only for EFI applications.</li> </ul>
<b>EHCI Hand-off</b>	Enables/disables a workaround for the operating systems that have no EHCI hand-off support. <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>
<b>USB Mass Storage Driver Support</b>	Enables/disables USB mass storage driver support. <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>

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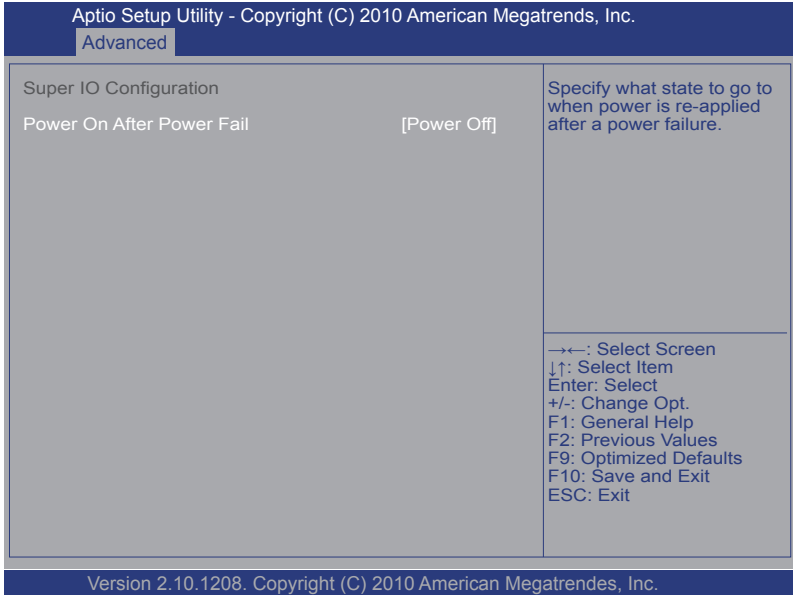
<b>USB transfer time-out</b>	Sets the timeout for Control/Bulk/Interrupt transfers. <ul style="list-style-type: none"><li>▶ Options available are <b>1 sec</b>, <b>5 sec</b>, <b>10 sec</b> and <b>20 sec</b> (default).</li></ul>
<b>Device reset time-out</b>	Sets the time for POST to wait for a USB device to start. <ul style="list-style-type: none"><li>▶ Options available are <b>10 sec</b>, <b>20 sec</b> (default), <b>30 sec</b> and <b>40 sec</b>.</li></ul>
<b>Device power-up delay</b>	Sets the maximum time that elapses before a USB device reports itself to the controller. <ul style="list-style-type: none"><li>▶ Select <b>Auto</b> (default) to apply a 100 ms delay to the root port and make the hub port use the delay from Hub descriptor.</li><li>▶ Select <b>Manual</b> to customize a delay from 1 to 40 seconds.</li></ul>

## BIOS

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### 5.2.2.5. Super IO Configuration

**Super IO Configuration** is a submenu to control the system's Super IO chip Fintek F71869E. It configures the serial port on the system.



The featured setting is:

Setting	Description
<b>Power On After Power Fail</b>	Defines the state for the computer to go to when power is resumed after a power failure. <ul style="list-style-type: none"><li>▶ Options available are <b>Power Off</b> (default) and <b>Power On</b>.</li></ul>



### 5.2.2.6. H/W Monitor

**H/W Monitor** monitors the computer's hardware status. Select this submenu to run a report of the info including CPU/system temperatures, CPU speed and other power info.

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Advanced

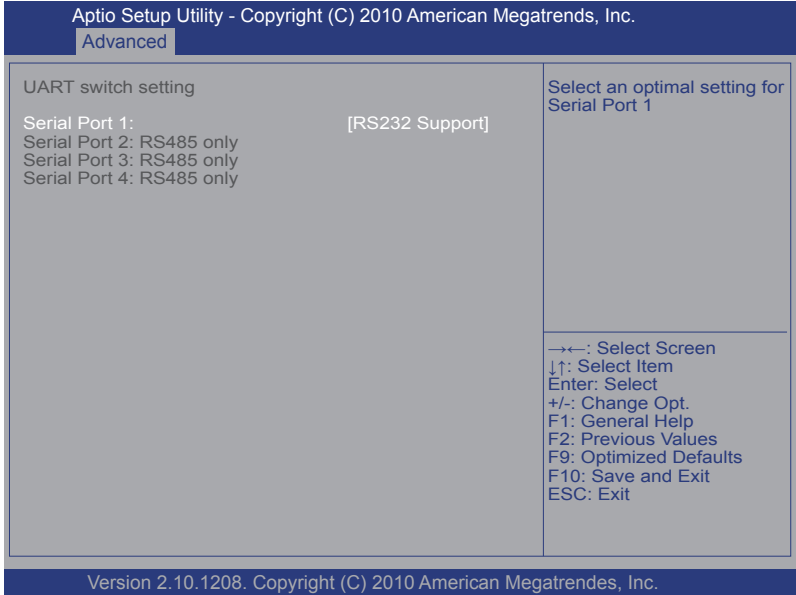
Pc Health Status	
CPU temperature	: +50°c
System temperature	: +50°c
+5V	: +5.045 V
+1.5V	: +1.500 V
+12V	: +11.880 V
+3.3V	: +3.288 V

→←: Select Screen  
↓↑: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F9: Optimized Defaults  
F10: Save and Exit  
ESC: Exit

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### 5.2.2.7. UART Switch Setting

Access this **UART Switch Setting** to set the data transmission interface for the computer's serial port COM1.

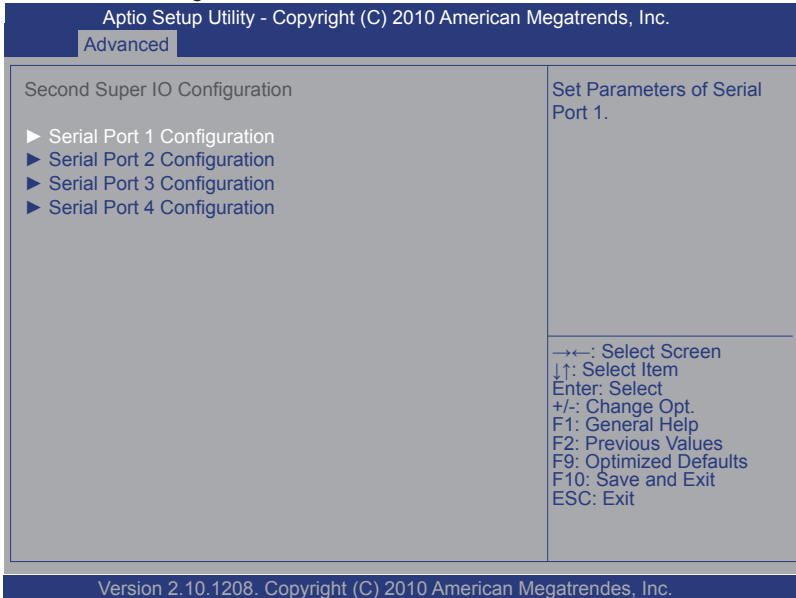


The featured setting is:

Setting	Description
<b>Serial Port 1 :</b>	Configures the data transmission interface for the computer's serial port COM1. ▶ Options available are <b>RS232 Support</b> (default) and <b>RS485 Support</b> .

### 5.2.2.8. F81216 Second Super IO Configuration

Use this submenu to enable/disable the computer's serial ports 1 through port 4 and also to configure their I/O addresses and IRQ.



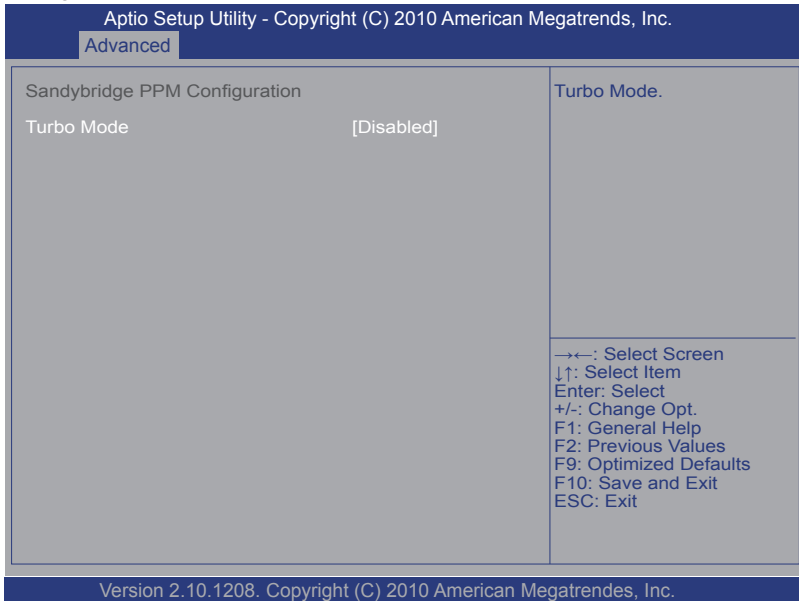
The featured submenus are:

Submenu	Description	
Serial Port 1 Configuration	Configures the computer's COM1 by the following settings:	
	Setting	Description
	Serial Port	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
Change Settings	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=3F8h; IRQ=4;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	

<b>Serial Port 2 Configuration</b>	Configures the computer's COM2 by the following settings:	
	<b>Setting</b>	<b>Description</b>
	<b>Serial Port</b>	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
<b>Change Settings</b>	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=2F8h; IRQ=3;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	
<b>Serial Port 3 Configuration</b>	Configures the computer's COM3 by the following settings:	
	<b>Setting</b>	<b>Description</b>
	<b>Serial Port</b>	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
<b>Change Settings</b>	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=3E8h; IRQ=10;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	
<b>Serial Port 4 Configuration</b>	Configures the computer's COM4 by the following settings:	
	<b>Setting</b>	<b>Description</b>
	<b>Serial Port</b>	Enables/disables the serial port. ▶ <b>Enabled</b> is the default.
<b>Change Settings</b>	Sets the optimal IO address and IRQ info for the serial port. ▶ Options available are: <b>IO=2e8h; IRQ=11;</b> (default) <b>IO=3F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2F8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=3E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> <b>IO=2E8h; IRQ=3,4,5,6,7, 9,10,11,12;</b> ▶ This setting is only available when the serial port is enabled.	

### 5.2.2.9. Sandybridge PPM Configuration

This submenu controls the processor's power management by the following settings:

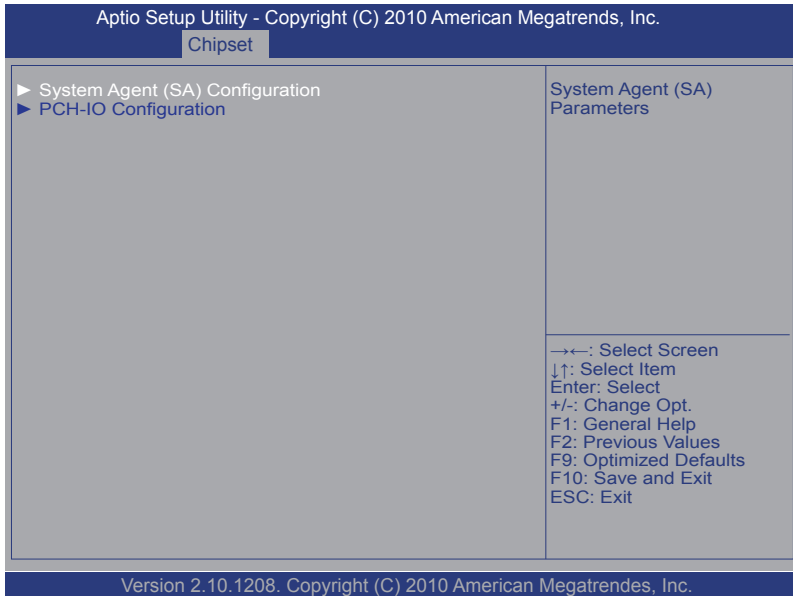


Setting	Description
<b>Turbo Mode</b>	Enables/disables the turbo mode, in which the CPU performance can be boosted without generating extra heat. ▶ <b>Disabled</b> is the default.

## BIOS

### 5.2.3. Chipset

Use this **Chipset** menu to configure the system's chipset.

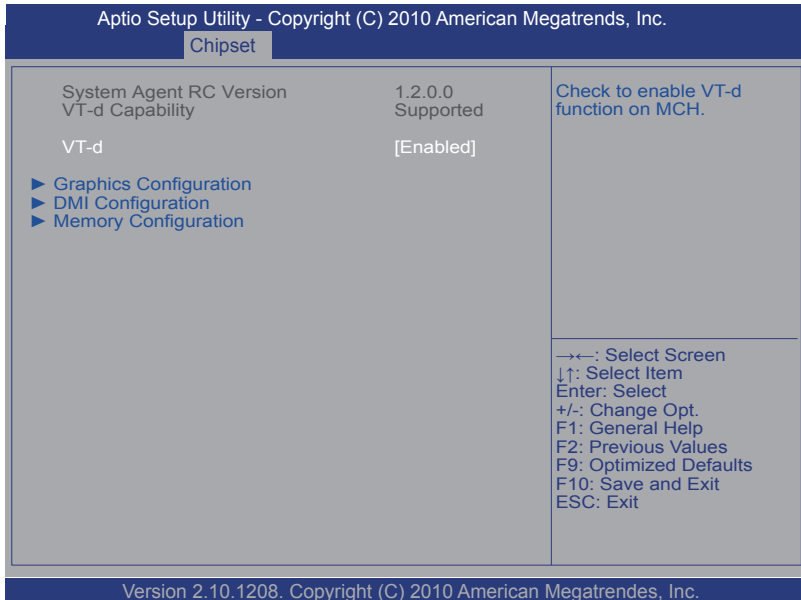


The featured submenu are **System Agent (SA) Configuration** and **PCH-IO Configuration**, which are explicated in the following sections.

Submenu	Description
<b>System Agent (SA) Configuration</b>	See <a href="#">5.2.3.1. System Agent (SA) Configuration</a> on page <a href="#">111</a> .
<b>PCH-IO Configuration</b>	See <a href="#">5.2.3.2. PCH-IO Configuration</a> on page <a href="#">112</a> .

### 5.2.3.1. System Agent (SA) Configuration

This submenu configures **System Agent (SA)**, i.e. the north bridge.



The featured submenus and setting are:

Setting / Submenu	Description
VT-d	Enables/disables Intel® virtualization technology for directed I/O on the MCH (memory controller hub). ▶ <b>Enabled</b> is the default.

<b>Graphics Configuration</b>	Select <b>Graphics Configuration</b> to view graphics info and accesses graphics settings. The featured submenu is <b>LCD Control</b> that features the following setting:	
	Setting	Description
	<b>Primary IGFX Boot Display</b>	<p>Sets the graphics device to activate during POST.</p> <ul style="list-style-type: none"> <li>▶ This setting has no effect if an external graphics is present.</li> <li>▶ The setting for the secondary boot display will become available depending on your selection.</li> <li>▶ VGA modes are only supported on the primary display.</li> <li>▶ Options available are <b>CRT</b>, <b>DVI</b> and <b>CRT / DVI</b> (default).</li> </ul>
<b>DMI Configuration</b>	Delivers the system's DMI (Direct Media Interface) configuration.	
<b>Memory Configuration</b>	Delivers the system's memory configuration that includes memory RC version, memory frequency, total memory, DIMM presence, CAS latency and minimum delay time.	

### 5.2.3.2. PCH-IO Configuration

**PCH-IO Configuration** shows the system's PCH configuration and also configures PCH parameters.



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Chipset

Intel PCH RC Version	1.1.4.1	Enable or disable PCIE Wake# to wake the system.
Intel PCH SKU Name	QM67	
Intel PCH Rev ID	05/B3	
PCIE Wake UP	[Enabled]	
<ul style="list-style-type: none"> <li>▶ USB Configuration</li> <li>▶ PCI Express Configuration</li> </ul>		
→←: Select Screen ↓↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save and Exit ESC: Exit		

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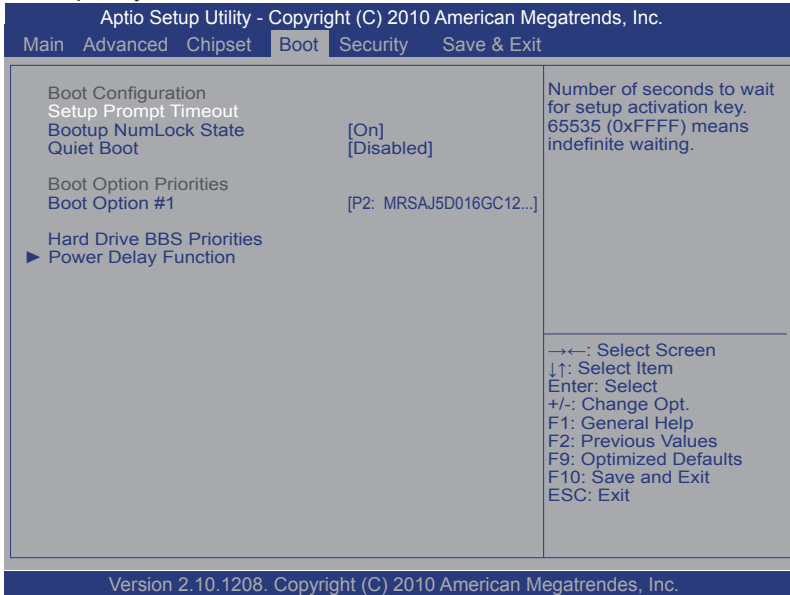
The featured settings are:

Setting / Submenu	Description
<b>PCIE Wake Up</b>	Enables/disables the "PCIE Wake#" to wake the system. ▶ <b>Enabled</b> is the default.

<b>USB Configuration</b>	Controls USB devices. The featured settings are:	
	Setting	Description
	<b>EHCI1</b>	Enables/disables the EHCI (USB2.0) USB controller 1. <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> <li>▶ One EHCI controller must always be enabled.</li> </ul>
<b>PCI Express Configuration</b>	Configures the computer's PCI Express root ports by the submenus <b>PCI Express Root Port #</b> , each of which features the following settings:	
	Setting	Description
	<b>PCI Express Root Port #</b>	Enables/disables the port. <ul style="list-style-type: none"> <li>▶ <b>Enabled</b> is the default.</li> </ul>
	<b>PEG - Gen X</b>	Controls PEG5 B0:D28:F4 Gen1-Gen2, or leaves it on BIOS auto-detection. <ul style="list-style-type: none"> <li>▶ Options are <b>Auto</b>, <b>Gen1</b> (default) and <b>Gen2</b>.</li> </ul>
<b>ASPM Support</b>	Configures ASPM (Active State Power Management) level, or leaves it on BIOS auto-configuration. <ul style="list-style-type: none"> <li>▶ Options are <b>Disabled</b>, <b>L0s</b>, <b>L1</b>, <b>L0sL1</b> and <b>Auto</b> (default).</li> </ul>	

### 5.2.4. Boot

Access this **Boot** menu to configure how to boot up the system such as boot device priority.



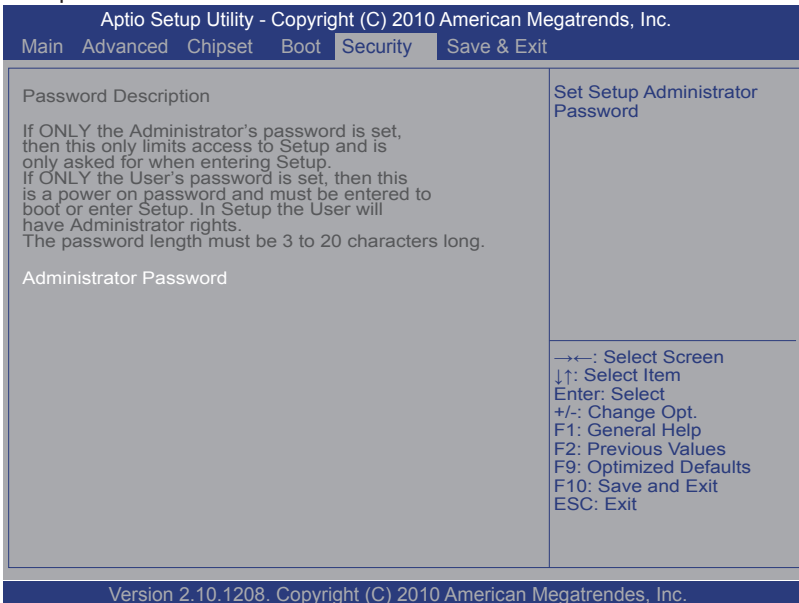
The featured settings and submenu are:

Group	Setting	Description
Boot Configuration	Setup Prompt Timeout	Sets how long to wait for the prompt to show for entering BIOS Setup. <ul style="list-style-type: none"> <li>▶ The default setting is 1 (sec).</li> <li>▶ Set it to <b>65535</b> to wait indefinitely.</li> </ul>
	Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. <ul style="list-style-type: none"> <li>▶ Options available are <b>On</b> (default) and <b>Off</b>.</li> </ul>
	Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. <ul style="list-style-type: none"> <li>▶ Leave it as <b>Disabled</b>, which is the default, to display the normal POST message.</li> </ul>
Boot Option Priorities	Boot Option #	Sets the boot priority among the available device types.

<p><b>Hard Drive BBS Priorities</b></p>	<p>Sets the very 1st boot device among the available hard disk drives.</p> <ul style="list-style-type: none"> <li>▶ Option(s) available are the available storage device(s) and <b>Disabled</b>.</li> </ul>	
<p><b>Power Delay Function</b></p>	<p>Configures power delay function by the following settings:</p>	
	<p><b>Setting</b></p>	<p><b>Description</b></p>
	<p><b>Power Delay Function</b></p>	<p>Enables/disables power delay function:</p> <ul style="list-style-type: none"> <li>▶ <b>Enable</b> is the default.</li> <li>▶ Select <b>Disable</b> to manually power on/off..</li> </ul>
	<p><b>Power on delay</b></p>	<p>Configures how much time should be delayed for the system to power on.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Immediately</b>, <b>04 Seconds</b> (default), <b>08 Seconds</b> and <b>16 Seconds</b>.</li> </ul>
<p><b>Power off delay</b></p>	<p>Configures how much time should be delayed for the system to power off.</p> <ul style="list-style-type: none"> <li>▶ Options available are <b>Immediately</b> (default), <b>30 Seconds</b>, <b>60 Seconds</b> and <b>90 Seconds</b>.</li> </ul>	

### 5.2.5. 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.



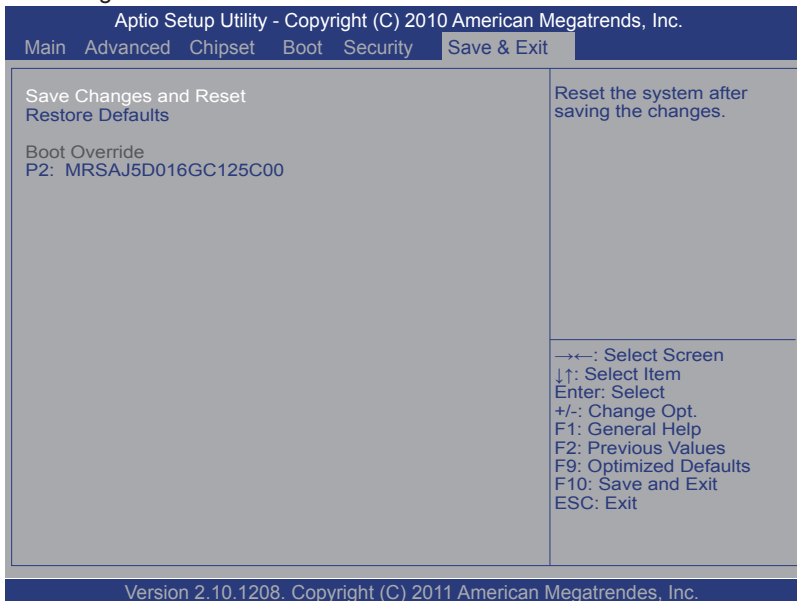
The featured setting is:

Setting	Description
<b>Administrator Password</b>	<p>To set up an administrator password:</p> <ol style="list-style-type: none"> <li>1. Select <b>Administrator Password</b>. An <b>Create New Password</b> dialog then pops up onscreen.</li> <li>2. Enter your desired password that is no less than 3 characters and no more than 20 characters.</li> <li>3. Hit [Enter] key to submit.</li> </ol>

# BIOS

## 5.2.6. 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 featured settings are:

Setting	Description
<b>Save Changes and Reset</b>	Saves the changes and restarts the system applying the changes. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.
<b>Restore Defaults</b>	Restores all settings to factory defaults. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.
<b>Boot Override</b>	Shows a list of the available boot devices in the system so users can boot up the system by any of the listed devices regardless of the currently configured boot priority. ▶ This is a command to launch action from the BIOS Setup utility rather than a setting.

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# Appendices

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

unsigned char Digital_Input(void);
void Digital_Output(unsigned char oData);

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

    Digital_Output(0xFF);
    delay(2000);

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

    Digital_Output(0x00);
    delay(2000);

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

unsigned char Digital_Input(void)
{
    unsigned char iData;

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

    outportb(SIO_INDEX, 0x07);          /* LDN - GPIO */
    outportb(SIO_DATA, 0x06);
}
```



```
    outportb(SIO_INDEX, 0x30);          /* GPIO - Enable */
    outportb(SIO_DATA, 0x01);

    outportb(SIO_INDEX, 0xC0);         /* GPIO3 - Input Mode */
    outportb(SIO_DATA, 0x00);

    outportb(SIO_INDEX, 0xC2);         /* GPIO3 - Status */
    iData = inportb(SIO_DATA) & 0x3F;

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

    return iData;
}

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

    outportb(SIO_INDEX, 0x07);         /* LDN - GPIO */
    outportb(SIO_DATA, 0x06);

    outportb(SIO_INDEX, 0x30);         /* GPIO - Enable */
    outportb(SIO_DATA, 0x01);

    outportb(SIO_INDEX, 0xA0);         /* GPIO5 - Output Mode */
    outportb(SIO_DATA, 0xFF);

    outportb(SIO_INDEX, 0xA1);         /* GPIO5 - Data */
    outportb(SIO_DATA, oData);

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

### Appendix B: 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 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, 0x07);

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

    outportb(sioIndex, 0xF0);        /* WDOUT_EN */
    outportb(sioData, 0x80);

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

    outportb(sioIndex, 0xF5);        /* WDT - Configuration */
    outportb(sioData, 0x72);

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

```

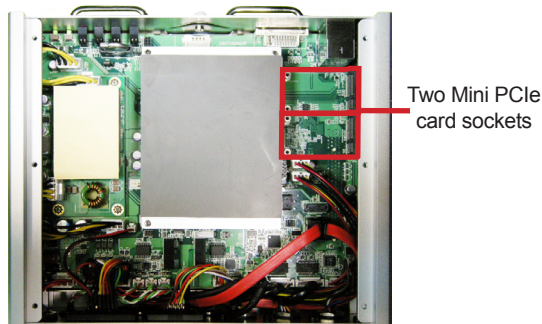
## Appendix C: HSPA-SI1400 Hardware/Software Installation

To be able to network with 3G, hardware-wise the computer needs a 3G module installed and a SIM card inserted (as described in [4.1.2. Install/uninstall SIM Card](#) on page 60) and software-wise the computer needs the device driver and an application program. This appendix will guide you to install the 3G module **HSPA-SI1400** and the device driver. (To have a copy of the device driver, please contact ARBOR customer service as described in [Technical Support](#) on page viii.)

### C.1. Install HSPA-SI1400

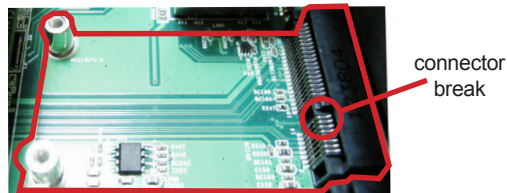
1. Remove the computer's top cover as described in [4.1.1. Open the Computer](#) on page 58.

The inside of the computer comes to view.



2. Find the two **PCI Express Mini-card** sockets for a 3G module or a WiFi module as the illustration above shows.

The socket has a break among the connector .

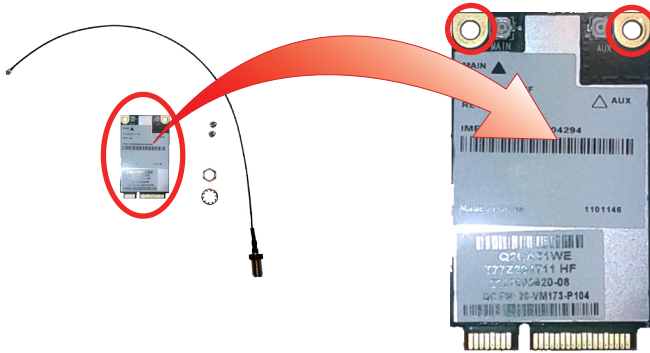


**Mini-card socket**

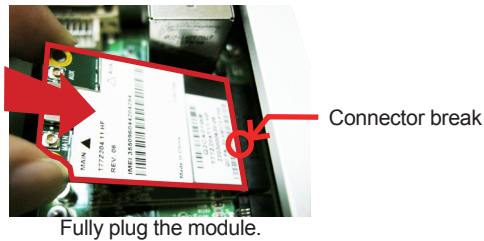
## Appendices

3. Have the **HSPA-SI1400** 3G module kit. The 3G module is a full-size module of **PCI Express Mini-card** form factor, with two U.FL connectors, one is "MAIN", and the other is "AUX".

Two U.F.L connectors, one is "MAIN", the other is "AUX".



4. Plug the 3G module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the wireless module should meet the break of the connector.



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



- Remove one plastic plug from the computer's front panel to make an antenna hole. Keep the plastic plug for any possible restoration in the future.

Antenna holes stopped up by plugs



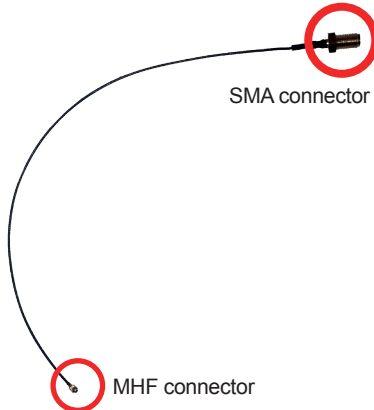
a view from the inside of the computer

an antenna hole w/o the plug



a view outside the computer

- Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.



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

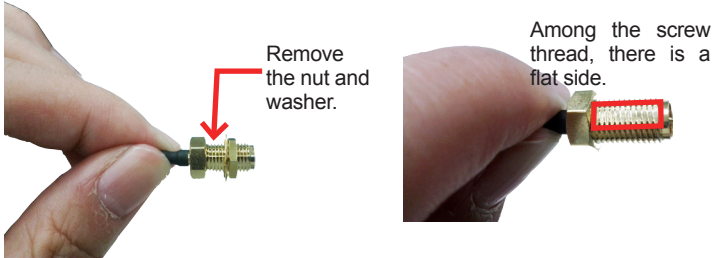
Connect the RF antenna's MHF connector to the 3G module's "MAIN" connector.



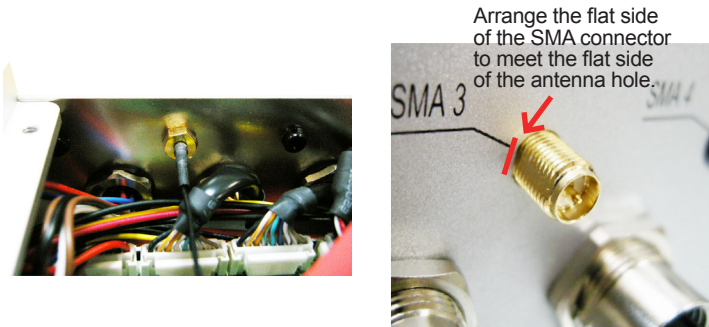
## Appendices

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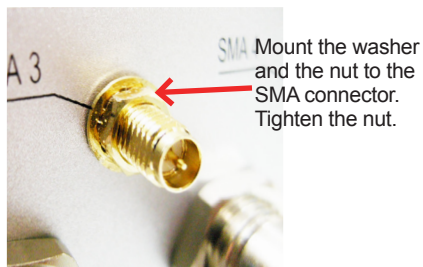
- From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flattened side.



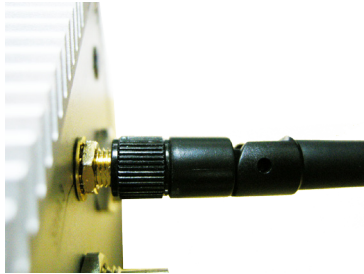
- Pull the SMA connector through the above mentioned antenna hole. Note to meet the aforesaid flattened side with the antenna hole's flat side.



- Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.



12. Restore the computer's top cover.
13. Have an external antenna. Screw and tightly fasten the antenna to the SMA connector.



14. Swivel the antenna to an angle of best signals.



## C.2. Install Device Driver

As described in [2.3. Driver Installation Notes](#) on page 14, after the drivers for the chipset, .NET Framework, audio and Ethernet are installed, you can proceed to install the driver for the wireless modules such as 3G module or Wi-Fi module.

To install the driver for the 3G module **HSPA-SI1400**:

1. Request a copy of the device driver from ARBOR customer service by the contact info as described in [Technical Support](#) on page viii.
2. Run the executable file **SWIQMISetup.exe**.

The installer then opens.





3. Click the **Next** button to proceed.

The driver installation then starts, progresses and finishes.

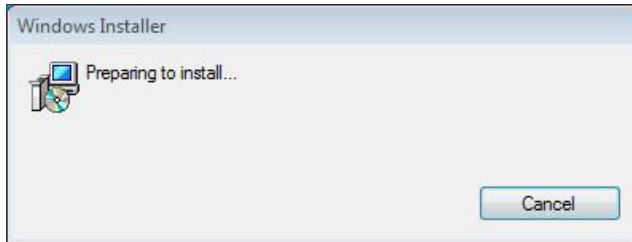


4. Click the **Finish** button to quit the driver installation

### C.3. Install Application Program

1. Request a copy of the application program from ARBOR customer service by the contact info as described in [Technical Support](#) on page [viii](#).
2. Run the Windows Installer file **Watcher\_Generic.msi**.

The installer opens and prepares to install.



Once the preparation finishes, the installer prompts to install **Sierra Wireless AirCard Watcher** on the computer.



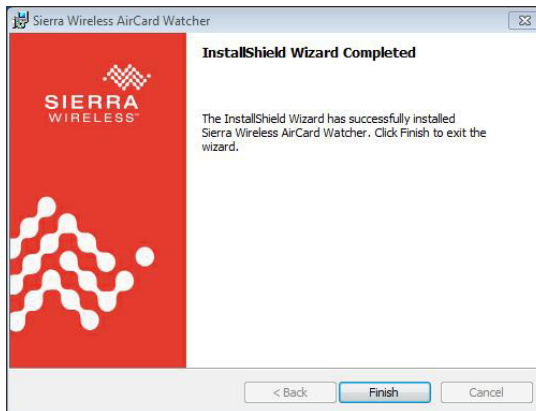
3. Click the **Next** button to proceed.

The installer then prompts the license agreement.



4. Select **I accept the terms in the license agreement**. Click the **Change...** button to browse for an alternate folder to install the application program to, or simply click the **Next** button to install the application program to the suggested folder.

The installation then starts, progresses and finishes.



## Appendices

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5. Click the **Finish** button to quit the installation.

An **AirCard Watcher** icon  then shows up on the desktop.

6. Double-click the **AirCard Watcher** icon  to launch the application program.

The **AirCard Watcher** opens.



7. See the document of the **AirCard Watcher** to know how to use the application program.

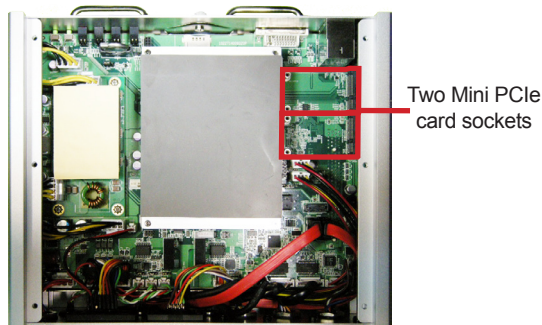
## Appendix D: WIFI-IN1350 Hardware/Software Installation

To use Wi-Fi, hardware-wise the computer needs a Wi-Fi module installed, and software-wise the computer needs the device driver and an application program. This appendix will guide you to install the Wi-Fi module **WIFI-IN1350** and the device driver. (To have a copy of the device driver, please contact ARBOR customer service by the contact info described in [Technical Support](#) on page [viii](#).)

### D.1. Install WIFI-IN1350

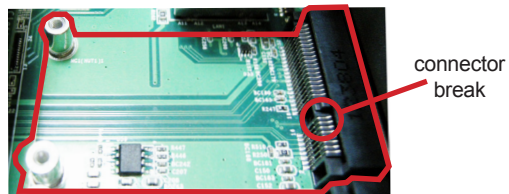
1. Remove the computer's top cover as described in [4.1.1. Open the Computer](#) on page [58](#).

The inside of the computer comes to view.



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

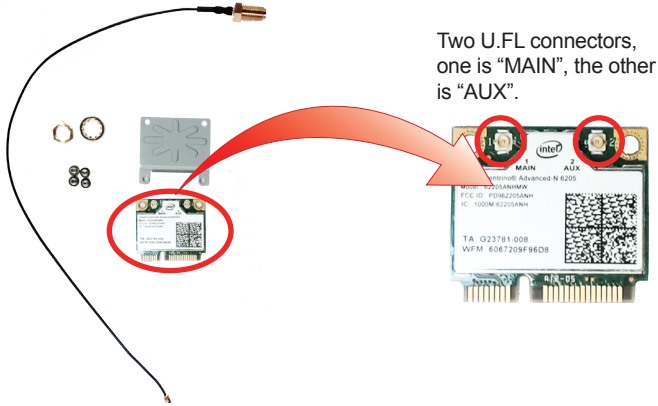
The socket has a break among the connector .



**Mini-card socket**

## Appendices

3. Prepare the **WiFi-IN1350** Wi-Fi module kit. The module is a half-size module of **PCI Express Mini-card** form factor, with two U.FL connectors, one is "MAIN", and the other is "AUX".



4. In order to make the half-size Wi-Fi module compatible with the **Mini-card** socket, extend the WiFi module with a "mini half bracket". Join them together by using two screws.

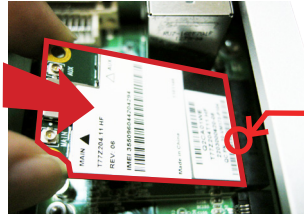


Position the WiFi module and the "mini half bracket" exactly as shown.



Join the WiFi module and the "mini half bracket" by using two screws.

5. Plug the Wi-Fi module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the wireless module should meet the break of the connector.



Connector break

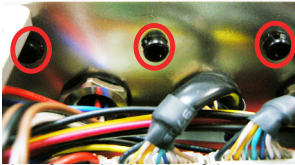
Fully plug the module.

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



7. Remove one plastic plug from the computer's front panel to make an antenna hole. Keep the plastic plug for any possible restoration in the future.

Antenna holes stopped up by plugs



a view from the inside of the computer

an antenna hole w/o the plug

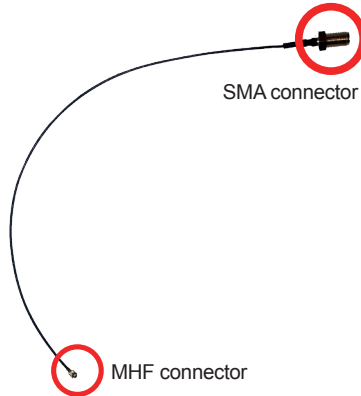


a view outside the computer

## Appendices

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8. Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.

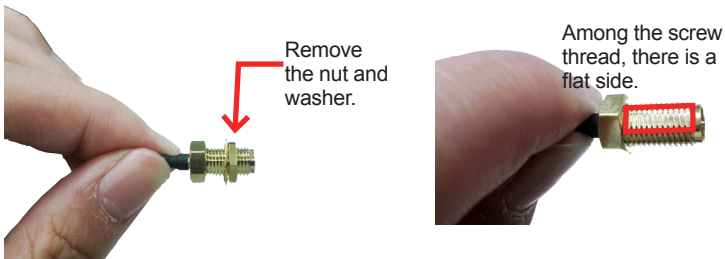


9. Connect the RF antenna's MHF connector to the Wi-Fi module's "MAIN" connector.

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

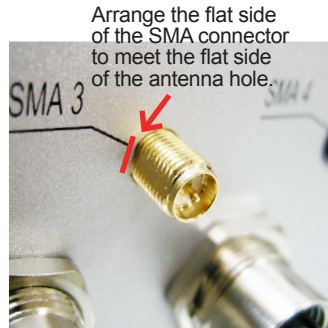
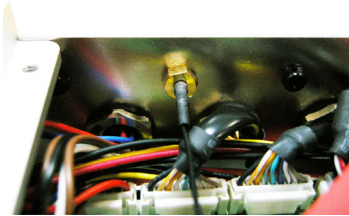


10. From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flat side.

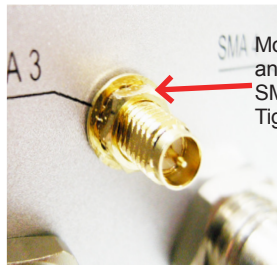




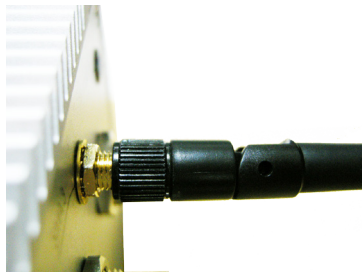
11. Pull the SMA connector through the above mentioned antenna hole. Note to meet the aforesaid flattened side with the antenna hole's flat side.



12. Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.



13. Restore the computer's top cover.
14. Have an external antenna. Screw and tightly fasten the antenna to the SMA connector.



## Appendices

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15. Swivel the antenna to an angle of best signals.



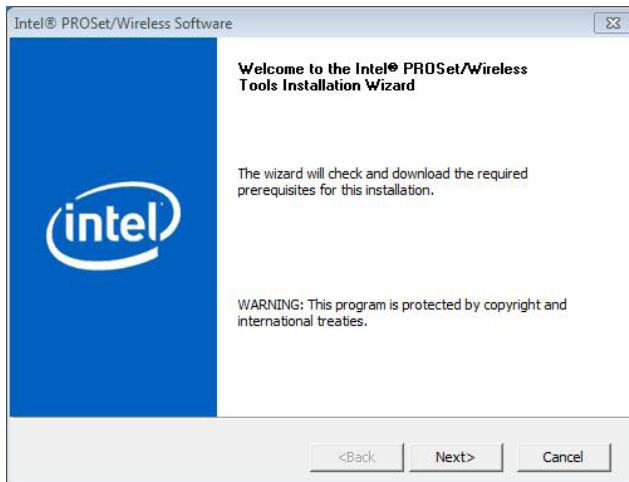
## D.2. Install Device Driver & Application Program

As described in [2.3. Driver Installation Notes](#) on page 14, after the drivers for the chipset, .NET Framework, audio and Ethernet are installed, you can proceed to install the driver for the wireless modules such as 3G module or Wi-Fi module.

The device driver of **WIFI-IN1350** will install the application program (the utility) as well. Follow the guide below to install **WIFI-IN1300** driver (and the application program):

1. Request a copy of the device driver from ARBOR customer service by the contact info as described in [Technical Support](#) on page viii.
2. Run the executable file of the device driver, for example **Advanced-N 6205 WinXP\_14.2.0.10\_x32.exe**.

The installer then opens.

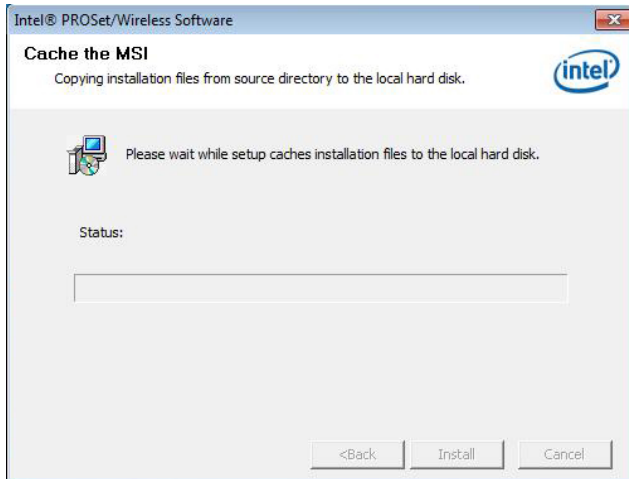


## Appendices

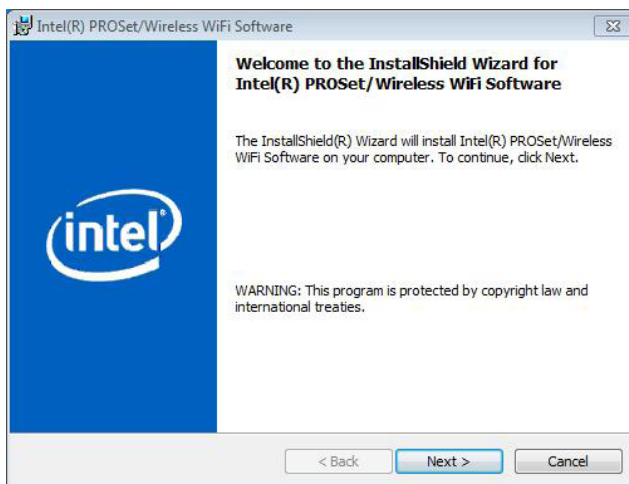
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3. Click the **Next** button to proceed.

The installer then starts to prepare for the setup.



When the preparation finishes, the installer prompts to install **Intel(R) PROSet/Wireless WiFi Software** on the computer.



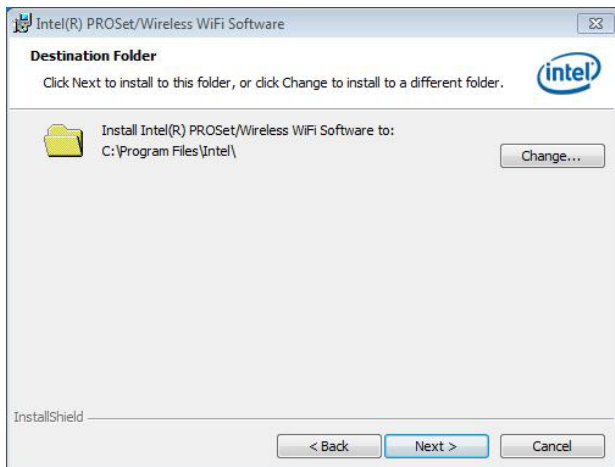
4. Click the **Next** button to proceed.

The installer then prompts the license agreement.



5. Select **I accept the terms in the license agreement** and click the **Next** button to proceed.

The installer then asks where to install the software.

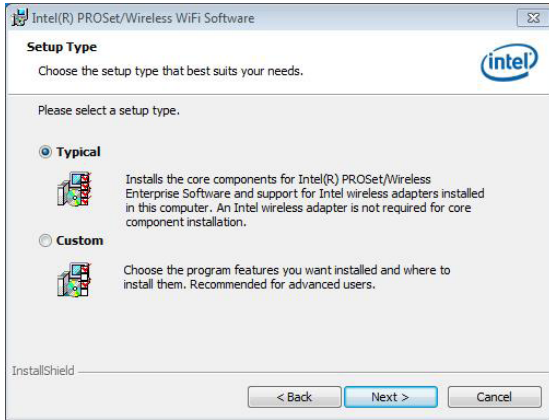


## Appendices

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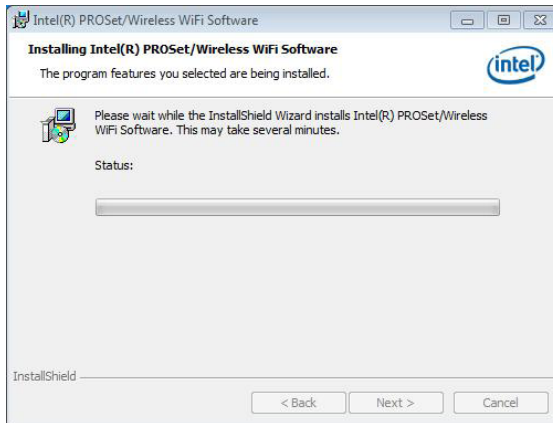
6. Click the **Change...** button to browse for an alternate folder to install the software to, or simply click the **Next** button to install the software to the suggested folder.

The installer then opens a **Setup Type** selection.

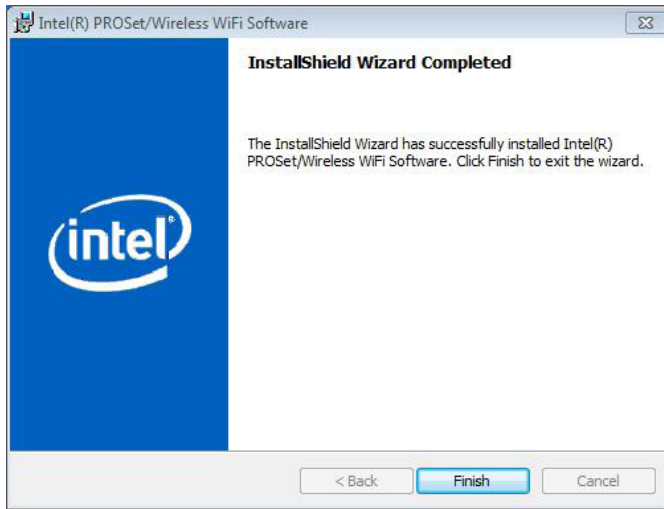


7. Select **Typical** to install both the driver and the application program (recommended) or select **Custom** to choose the features to install. Then click the **Next** button to proceed.

The software installation then starts, progresses and finishes.



8. Click the **Finish** button to quit the software installation.



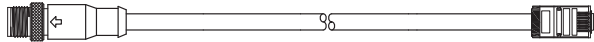
9. The computer's Wi-Fi feature is ready-to-use, see the document of the application program to know how to connect the computer to a Wi-Fi hotspot.

## **Appendix D: WIFI-IN1350 Hardware/Software Installation**

## Appendix E: External and Internal Cables

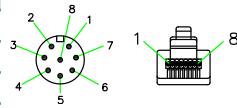
In this session you will find the following information about the external and internal cables:

<b>RJ-45 LAN cable</b>	<b>Description</b>	External LAN cable for ARTS-3X50
	<b>Connector</b>	1x RJ-45 Male connector 1x M12 A-code Male 8 Pin



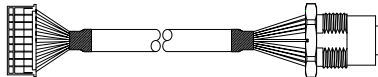
### Pin assignments

Pin	Description
Pin 1	MDI0+
Pin 2	MDI0-
Pin 3	MDI1+
Pin 4	MDI2+
Pin 5	MDI2-
Pin 6	MDI1-
Pin 7	MDI3+
Pin 8	MDI3-



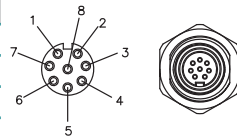
### Internal RJ-45 cable

<b>Description</b>	Internal RJ-45 cable for ARTS-3X50
<b>Connector</b>	1x M12 A-code Female 8 Pin connector



### Pin assignments

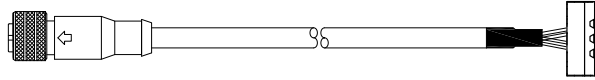
Pin	Description
Pin 1	MDI0+
Pin 2	MDI0-
Pin 3	MDI1+
Pin 4	MDI2+
Pin 5	MDI2-
Pin 6	MDI1-
Pin 7	MDI3+
Pin 8	MDI3-





**Power cable**

<b>Description</b>	External Power cable for ARTS-3X50
<b>Connector</b>	1x power terminal connector 1x M12 Female 5 Pin

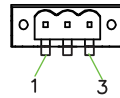


**Pin assignments**

Pin	Description
Pin 1	Vin+
Pin 2	Vin+
Pin 3	Chassis GND
Pin 4	Vin-

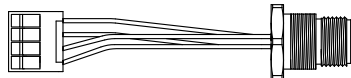
  

Pin	Description
Pin 1	DC Input +
Pin 2	DC Input -
Pin 3	Chassis GND



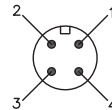
**Power Input cable**

<b>Description</b>	Internal power input cable for ARTS-3X50
<b>Connector</b>	1x power terminal connector



**Pin assignments**

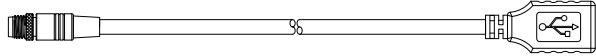
Pin	Description
Pin 1	Vin+
Pin 2	Vin+
Pin 3	Chassis GND
Pin 4	Vin-



## Appendices

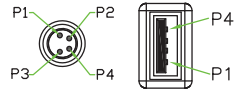
### USB cable

<b>Description</b>	External USB cable for ARTS-3X50
<b>Connector</b>	1x USB A type female connector 1x M8 male 4 Pin



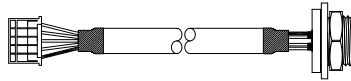
### Pin assignments

Pin	Description
Pin 1	USB 5V
Pin 2	USB_N
Pin 3	GND
Pin 4	USB_P



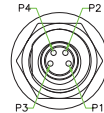
### Internal USB cable

<b>Description</b>	Internal USB cable for ARTS-3X50
<b>Connector</b>	1x M8 female connector



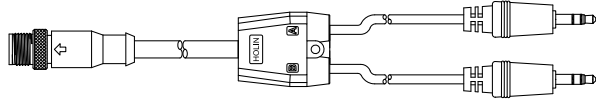
### Pin assignments

Pin	Description
Pin 1	USB 5V
Pin 2	USB_N
Pin 3	GND
Pin 4	USB_P



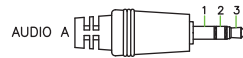
**Audio cable**

<b>Description</b>	External audio cable for ARTS-3X50
<b>Connector</b>	1x 3.5mm Stereo plug 1x M12 A-code Male 8 Pin



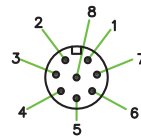
**Pin assignments**

Jack	Pin	Description
Audio A	1	Audio GND
	2	Line out-R
	3	Line out-L
Audio B	4	Audio GND
	5	MIC-R
	6	MIC-L



**Pin assignments**

Pin	Description
Pin 1	Line out-L
Pin 2	Line out-R
Pin 3	Audio GND
Pin 4	N.C
Pin 5	N.C
Pin 6	Audio GND
Pin 7	MIC-L
Pin 8	MIC-R



## Appendices

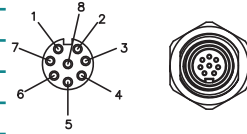
### Internal Audio cable

<b>Description</b>	Internal audio cable for ARTS-3X50
<b>Connector</b>	1x M12 A-code Female 8 Pin



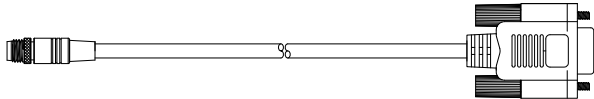
### Pin assignments

Pin	Description
Pin 1	Line out-L
Pin 2	Line out-R
Pin 3	Audio GND
Pin 4	N.C
Pin 5	N.C
Pin 6	Audio GND
Pin 7	MIC-L
Pin 8	MIC-R



### RS-485 cable

<b>Description</b>	External RS-485 cable for ARTS-3X50
<b>Connector</b>	1x D-SUB 9 Pin male connector 1x M8 male 3 Pin



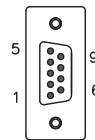
### Pin assignments

Pin	Description
Pin 1	485_GND
Pin 3	485+
Pin 4	485-



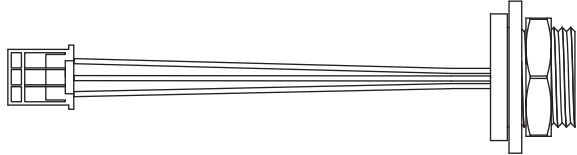
### Pin assignments

Pin	Description
Pin 1	485-
Pin 2	485+
Pin 5	485_GND



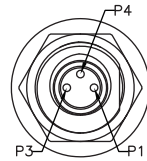
**Internal RS-485 cable**

<b>Description</b>	Internal RS-485 cable for ARTS-3X50
<b>Connector</b>	1x M8 Female 3 Pin



**Pin assignments**

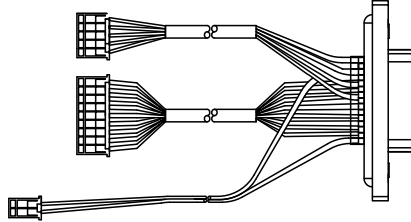
Pin	Description
Pin 1	485_GND
Pin 3	485+
Pin 4	485-



## Appendices

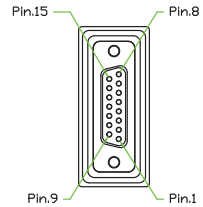
### DIO Internal cable

<b>Description</b>	Internal DIO cable for ARTS-3X50
<b>Connector</b>	1x D-Sub female 15 Pin

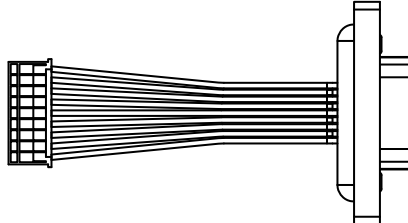


### Pin assignments

Pin	Description
Pin 1	Digital output_GND
Pin 2	Digital output 4
Pin 3	Digital output 3
Pin 4	Digital output 2
Pin 5	Digital output 1
Pin 6	N.C
Pin 7	Voltage +
Pin 8	Voltage -
Pin 9	Digital input 6
Pin 10	Digital input 5
Pin 11	Digital input 4
Pin 12	Digital input 3
Pin 13	Digital input 2
Pin 14	Digital input 1
Pin 15	N.C



<b>RS-232 Internal cable</b>	<b>Description</b>	Internal RS-232 cable for ARTS-3X50
	<b>Connector</b>	1x D-Sub male 9 Pin



**Pin assignments**

Pin	Description
Pin 1	DCD#
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR#
Pin 5	232_GND
Pin 6	DSR#
Pin 7	RTS#
Pin 8	CTS#
Pin 9	RI#

