ARES-1970-E

Fan-Less Embedded Controller with 6th Generation Intel® Core™ Processors

User's Manual

Version 1.0

P/N: 4017197001100P

2017.07

Revision History

Version	Date	Description
1.0	2017.07	Initial release

Copyright Notice

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.

Declaration of Conformity

CE

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

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

Warning

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

FCC Class A

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

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

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

NOTE:

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

RoHS

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

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

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

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

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

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.

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.

Lithium Battery Replacement

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:
http://www.arbor.com.tw

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

http://www.arbor-technology.com

E-mail:info@arbor.com.tw

Warranty

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

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

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

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

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Chapter 1

Introduction

1.1. The Computer

Product Highlights

- 6th generation Intel® SkyLake-U platform
- Compact & fan-less design
- 4 x USB3.0 combo ports
- Dual Gbe Ethernet LANs connectivity
- Multi COMs
- 4 x PoE Gbe Ethernet w/ 802.3af compliant designed for GigE camera
- Raid 0/1 support

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 in this manual, 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 Intel® Core™ i5-6300U , 2.4GHz 3M L2 Cache, 15W TDP Soldered onboard Intel® Core™ i7-6600U , 2.6GHz 4M L2 Cache, 15W TDP Soldered onboard Intel® Core™ i3-6100U , 2.3GHz 3M L2 Cache, 15W TDP
Memory	1 x 260-pin DDR4 SO-DIMM socket, supporting 2133MHz SDRAM up to 8GB, 1 x 4GB DDR4 SO-DIMM Pre-installed
Chipset	Intel® SoC
Graphics	Integrated Intel® HD Graphics 520
LAN Chipset	1 x Intel® i219LM PCIe controller w/ iAMT 11.0 (except i3-6100U)
	1 x Intel® i210IT PCIe controller
	4 x Intel® i210IT PCIe controller for PoE
Watchdog Timer	1~255 levels reset
I/O	
Serial Port	4 x RS-232/422/485 ports
USB Port	4 x USB3.0/2.0 ports
	2 x USB2.0 Ports
Video Port	1 x HDMI 1 x VGA
Audio	Mic-in / Line-out
D-IO	16 x DI, 16 x DO
Expansion Bus	1 x mSATA (SATA, Full Size) 1 x mPCIE (PCIex1+USB2.0, Full Size) 1 x mPCIE (PCIex1+USB2.0, Half Size)
Environmental	
Operating Temp.	-20 ~ 55°C(-4 ~ 131°F)
Storage Temp.	-40 ~ 80°C (-40 ~ 176°F)
Operating Humidity	10 ~ 95% @ 55°C (non-condensing)
Vibration	5~500Hz 3G rms X,Y,Z axis w/SSD, according to IEC 68-2-64
Shock & Crash	10G peak acceleration (11 m sec. duration), operation
	30G peak acceleration (11 m sec. duration), non operation
	According to IEC 68-2-27
Qualification	
Certification	CE, FCC Class A

Power Requirement	
Power Input	DC 19~36 Input (3-PIN Terminal Block)
Power Consumption	80W (w/o I/O card)
Storage	
Type	1 x mSATA
	2 x 2.5” removable drive bays for SATA SSD, support RAID 0/1 (except i3-6100U)
Mechanical	
Construction	Aluminum alloy
Mounting	Wall-Mount and DIN-Rail
Weight	3.73kg (8.22lb)
Dimensions (W x D x H)	141 x 112 x 272 mm (5.55” x 4.41” x 10.71”)
OS Support	
Windows 7* / Windows 8.1 / Windows 10, Linux: Ubuntu (Kernel: 3.1X)	

*For Windows 7, only system image is available.

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:

1 x ARES-1970-E

1 x **Accessory Box** that contains the following items:

- Driver DVD
- User’s manual
- Screws/cable
- 3-pin plug for terminal block

1.5. Ordering Information

ARES-1970-E-6300U (STD)	ARES-1970-E w/6th Intel® Core i5-6300U and 4GB memory, w/o storage
ARES-1970-E-6600U (BTO)	ARES-1970-E w/6th Intel® Core i7-6600U and 4GB memory, w/o storage
ARES-1970-E-6100U (BTO)	ARES-1970-E w/6th Intel® Core i3-6100U and 4GB memory, w/o storage

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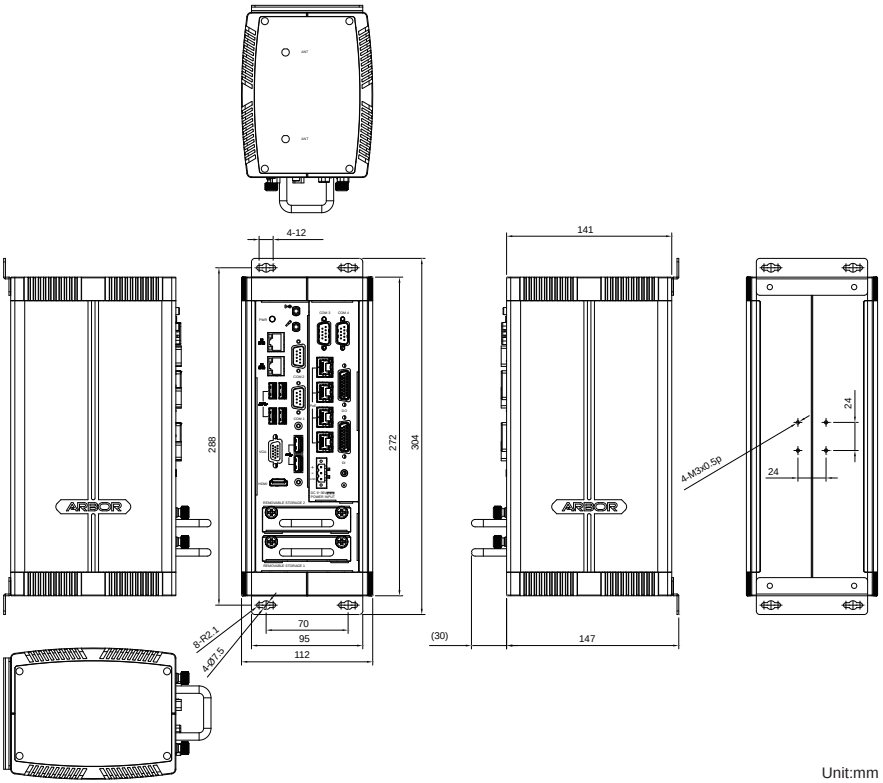
Chapter 2

Getting Started

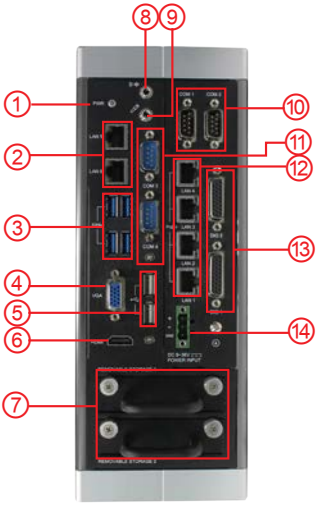
2.1. Dimensions



Unit:mm

2.2. Tour the Computer

Take a look around the computer and find the external controls and connectors.



No.	Description
①	Power button
②	2 x RJ-45 GbE ports
③	4 x Type-A USB 3.0/2.0 ports
④	VGA port
⑤	2 x Type-A USB 2.0 ports
⑥	HDMI port
⑦	2 x 2.5” removable drive bay for SATA SSD
⑧	Mic-in
⑨	Line-out
⑩	COM3, COM4, RS-232/422/485 selectable serial port
⑪	COM1, COM2, RS-232/422/485 selectable serial port
⑫	4x RJ-45 GbE connectors w/ PoE
⑬	DI, DO
⑭	DC 19~36 Input (3-PIN Terminal Block)

2.3. Driver Installation Note

The computer supports the operating systems Windows 8.1 and Windows10. Find the necessary device drivers on the CD that comes with your purchase. Always follow the sequence below to install all drivers to prevent errors:

Chipset → Serial I/O → Audio → Ethernet → Graphics → ME → RAID → PCIe Bridge Chipset

Windows 8.1

Device	Driver Path
Chipset	\Chipset_INF\Chipset_10.1.1.14_Public\SetupChipset.exe
Serial I/O	\Serial IO\Setup_x64.exe
Audio	\Audio\64bit\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
Ethernet	\Ethernet\Win8.1\PROWin64.exe
Graphics	\Graphic\64bit\win64_154025.4463.exe
ME	\ME_11.0_Corporate_11.0.0.1177\SetupME.exe
RAID	\Intel Rapid Storage Technology Driver (for RAID)\Intel Rapid Storage Technology Driver 14.8.0.1042\SetupRST.exe
PCIe Bridge chipset	\PCIe 8609 Switch driver

Windows 10

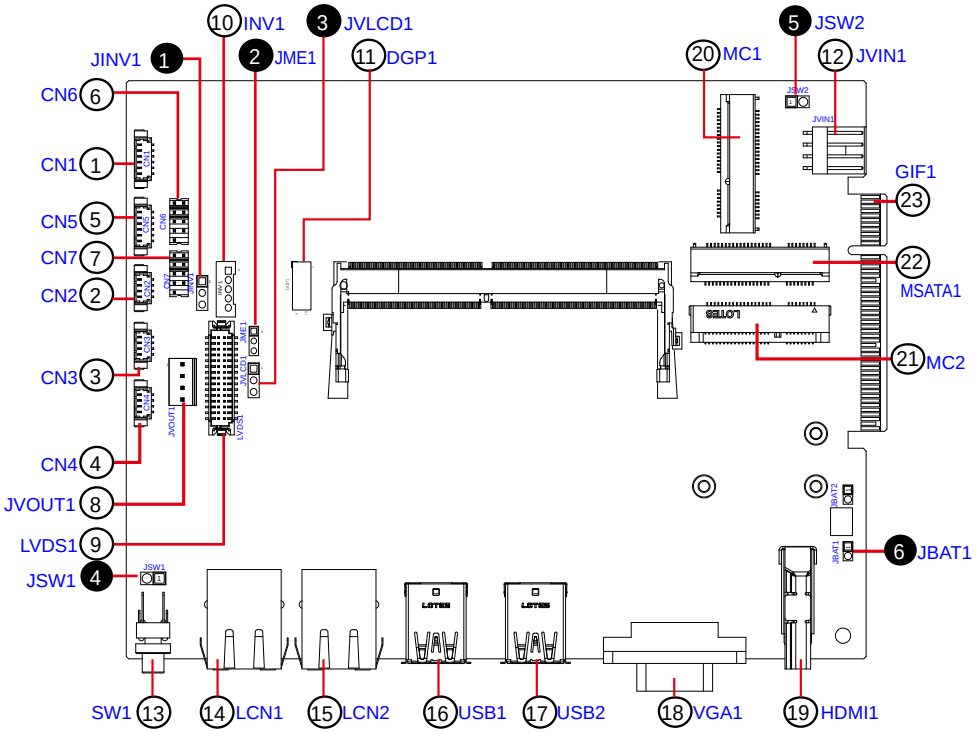
Device	Driver Path
Chipset	\Chipset_INF\Chipset_10.1.1.14_Public\SetupChipset.exe
Serial I/O	\Serial IO\Setup_x64.exe
Audio	\Audio\64bit\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
Ethernet	\Ethernet\Win10\PROWin64.exe
Graphics	\Graphic\64bit\win64_154025.4463.exe
ME	\ME_11.0_Corporate_11.0.0.1177\SetupME.exe
RAID	\Intel Rapid Storage Technology Driver (for RAID)\Intel Rapid Storage Technology Driver 14.8.0.1042\SetupRST.exe
PCIe Bridge chipset	\PCIe 8609 Switch driver

Chapter 3

Engine of the Computer

3.1. Board Layout

Main Board (FMB-i89U1)



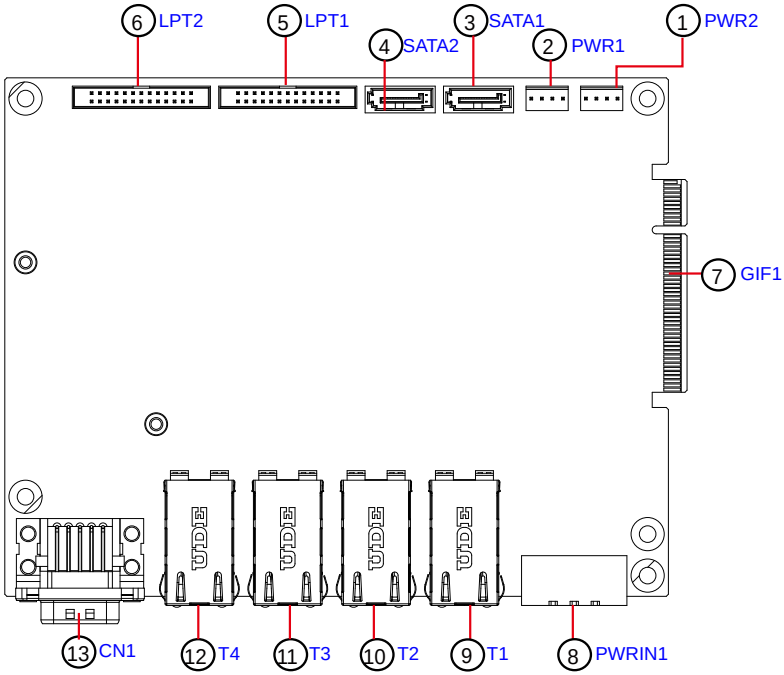
Jumpers

Label	Description
❶JINV1	LVDS Inverter Voltage Select Jumper
❷JME1	ME FLASH Select Jumper
❸JVLCD1	LVDS VDD Voltage Select Jumper
❹JSW1	Power Button
❺JSW2	Reset Button
❻JBAT1	CMOS Settings

Connectors

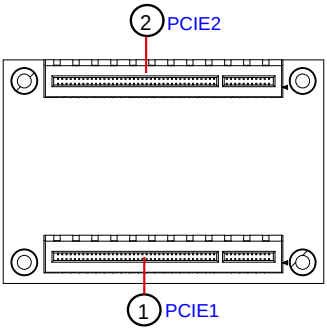
Label	Description
①CN1	Audio Connector
②③④CN2, 3, 4	USB 2.0 Connector
⑤CN5	PS2 Connector
⑥⑦CN6, 7	COM1, 2 (RS-232/422-485 Selectable)
⑧JVOUT1	Power Output
⑨LVDS1	LVDS Connector
⑩INV1	LVDS BL Connector
⑪DGP1	Debug Port
⑫JVIN1	Power Input
⑬SW1	Power Button
⑭⑮LCN1, 2	RJ-45 Ethernet Connectors
⑯⑰USB1, 2	USB 3.0/2.0 Connectors
⑱VGA1	VGA Connector
⑲HDMI1	HDMI Connector
⑳㉑MC1, 2	PCI Express Mini-card Full/Half Size Socket
㉒MSATA1	mSATA Socket
㉓GIF1	PCIe Gold Finger Connector

Daughter Board - SCDB-348a



Label	Description
①②PWR2, 1	SATA Power Output
③④SATA1, 2	SATA HDD Connector
⑤LPT1	Digital Input
⑥LPT2	Digital Output
⑦GIF1	PCIe Gold Finger Connector
⑧PWRIN1	DC Adapter Power Input
⑨⑩⑪⑫T1, 2, 3, 4	RJ-45 Ethernet Connectors
⑬CN1	RS-232/422-485 Selectable Serial Port

Daughter Board - SCDB-549x



Label	Description
①PCIE1	PCIe Slot
②PCIE2	PCIe Slot

3.2. Jumpers and Connectors

3.2.1. Main Board - FMB-i89U1

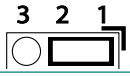
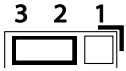
3.2.1.1. Jumpers

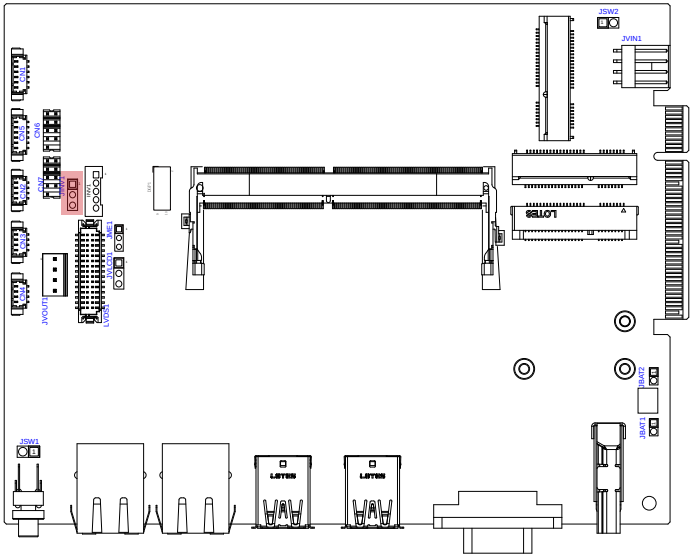
❶JINV1

Function: Sets LVDS inverter voltage. (This jumper sets the voltage of LVDS connector INV1, which means this jumper decides the pin 1 of the LVDS connector INV1.)

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

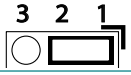
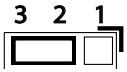
Setting:

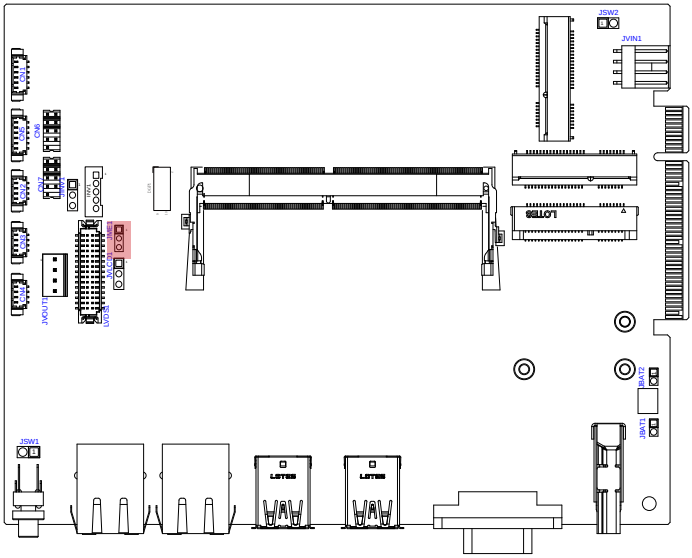
Pin	Description	
1-2	+12V (default)	
2-3	+5V	



❷ JME1

Function: ME Flash Select Jumper
Jumper Type: 2.00mm pitch, 1x3-pin header
Setting:

Pin	Description	
1-2	ME Flash disable (Default)	
2-3	ME Flash enable	

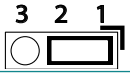
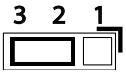


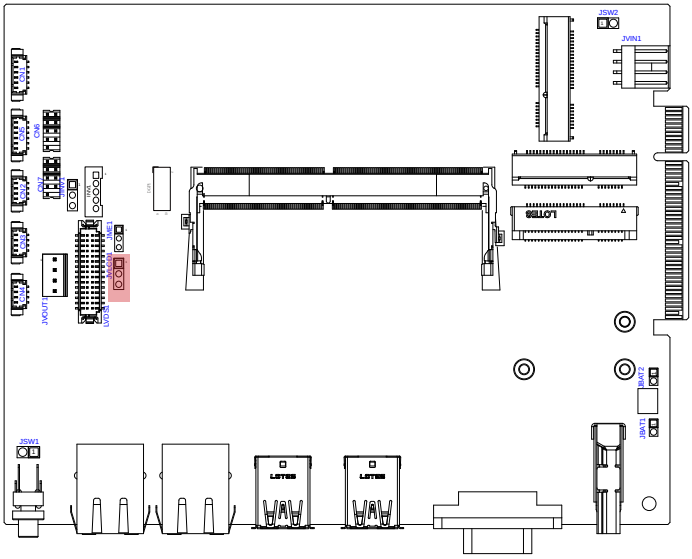
❸ JVLCD1

Function: LVDS VDD Voltage Select Jumper

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

Setting:

Pin	Description	
1-2	+3V (default)	
2-3	+5V	



❹ JSW1

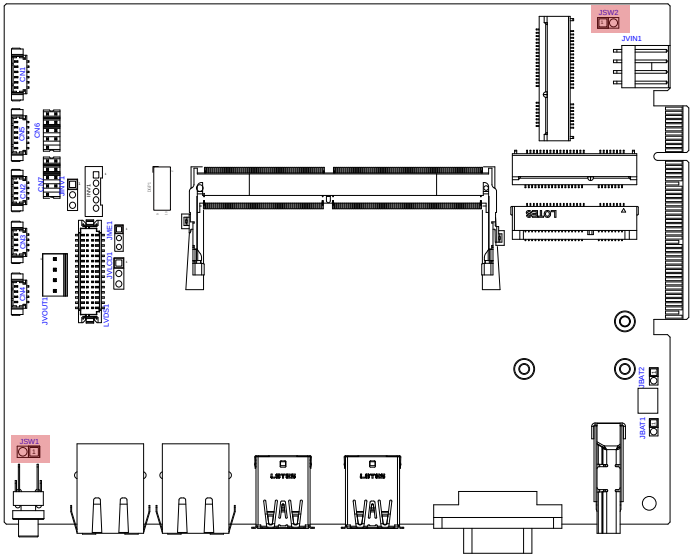
Function: DC Adapter Power Input
Connector Type: 2.54 mm pitch 1x2-pin header
Setting:

Pin	Desc.
1	PWR_IN_SW#
2	GND

❺ JSW2

Function: Reset Button
Connector Type: 2.54 mm pitch 1x2-pin header
Setting:

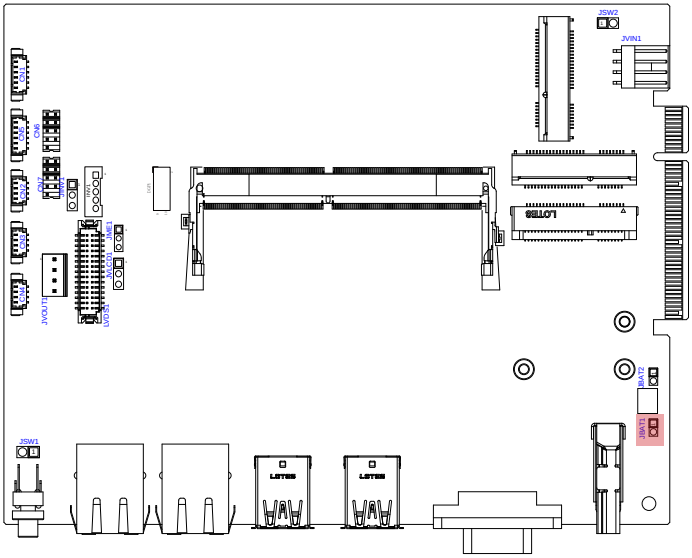
Pin	Desc.
1	RST_SW#
2	GND



❻ JBAT1

Function: Clears/keeps CMOS
Jumper Type: 2.00 mm pitch 1x2-pin header
Setting:

Pin	Description	
Short	Clears CMOS	1 2 
Open	Keeps CMOS (default)	1 2 



3.2.1.2. Connectors

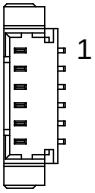
① CN1

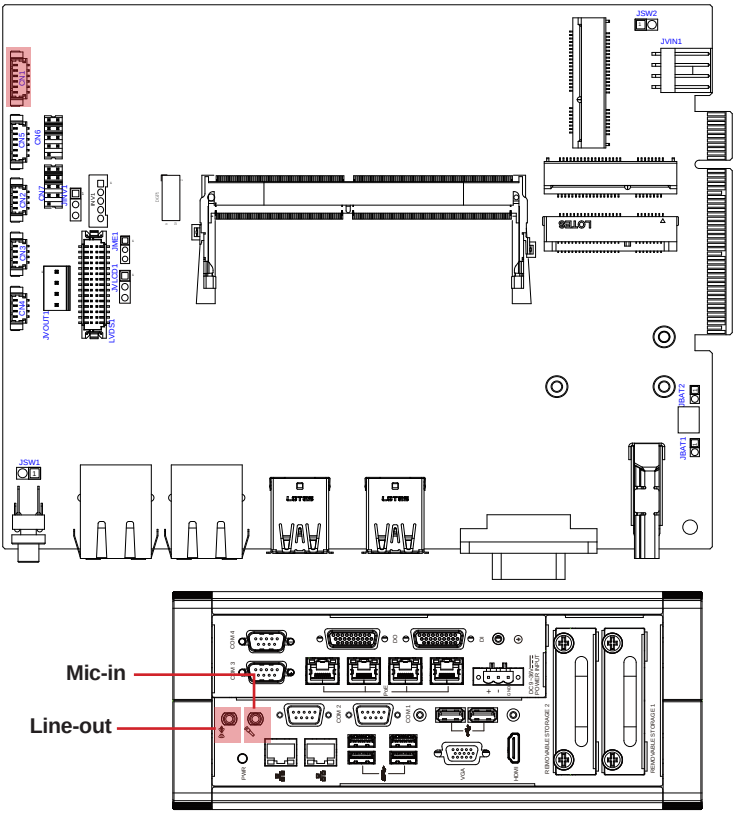
Function: Audio Connector

Connector Type: 1.25mm pitch 1x6 wire to board connector

Pin Assignment:

Pin	Desc.
1	MIC_L
2	MIC_R
3	GND
4	GND
5	Line Out_L
6	Line Out_R





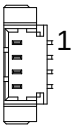
②③④ CN2, 3, 4

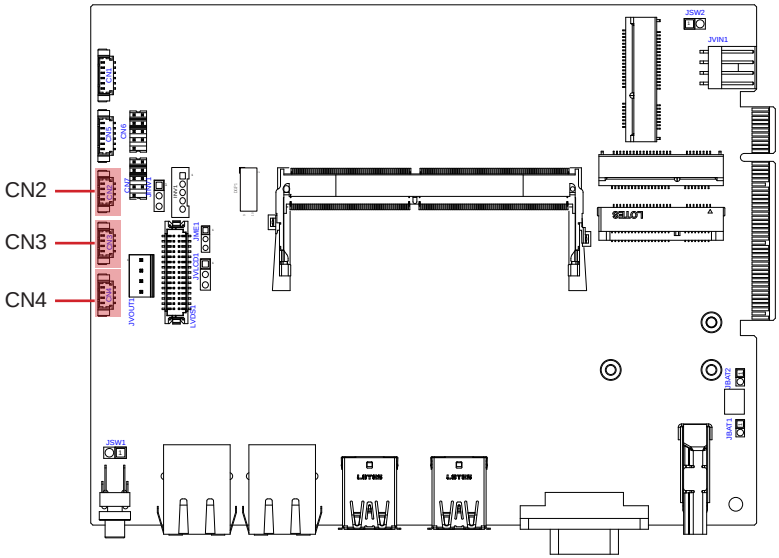
Function: USB 2.0 Connector

Connector Type: 1.25mm pitch 1x4 wire to board connector

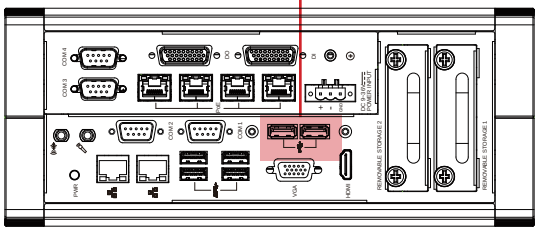
Pin Assignment:

Pin	Desc.
1	VCC5
2	DATA-
3	DATA+
4	GND





USB 2.0 (CN2, 3)



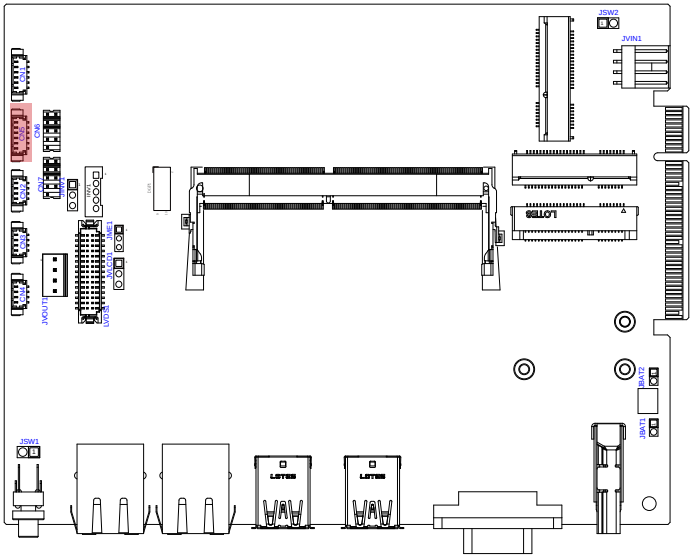
⑤ CN5

Function: PS2 Connector

Connector Type: 1.25mm pitch 1x6 wire to board connector

Pin Assignment:

Pin	Desc.
1	KDATA
2	GND
3	MDATA
4	KCLK
5	VCC5
6	MCLK

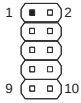


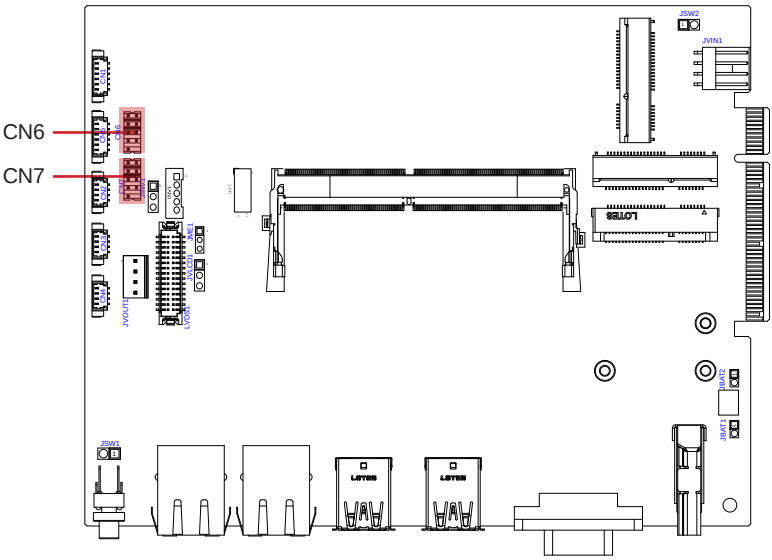
⑥⑦ CN6, CN7 (COM1, COM2)

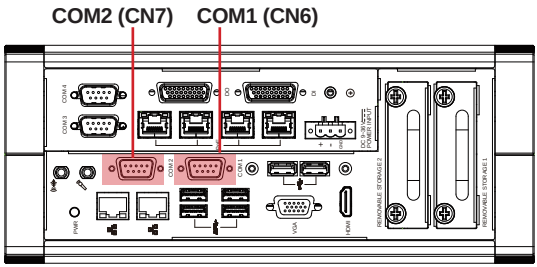
Function: RS-232/422/485 Selectable Serial Port
Connector Type: 2.54mm-pitch 2x5-pin header

Pin Assignment:

Pin	Desc.			Pin	Desc.		
1	DCD	RS-485(D-)	RS-422(TX-)	2	RXD	RS-485(D+)	RS-422(TX+)
3	TXD		RS-422(RX+)	4	DTR		RS-422(RX-)
5	GND			6	DSR		
7	RTS			8	CTS		
9	RI			10	N/C		







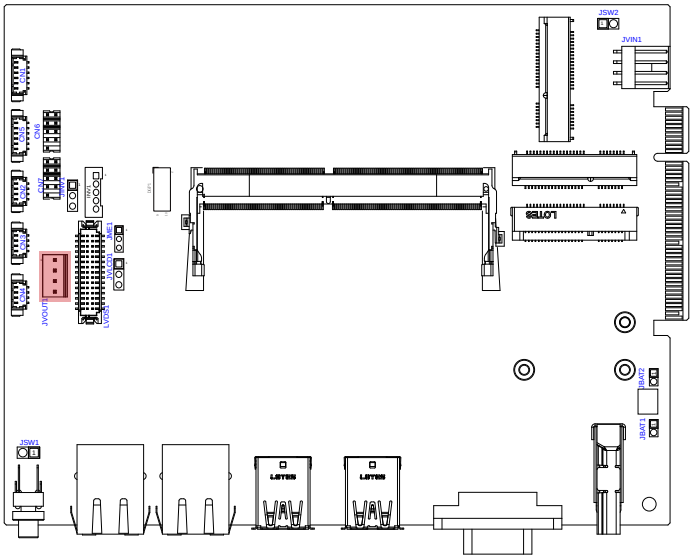
⑧ JVOUT1

Function: Power output

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

Pin Assignment:

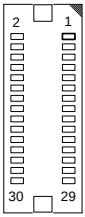
Pin	Desc.
1	VCC5
2	GND
3	GND
4	VCC12

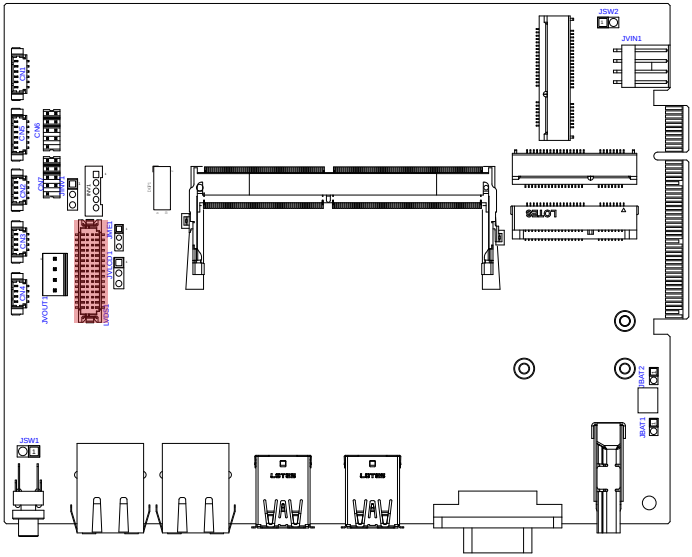


⑨ LVDS1

Function: LVDS Connector
Connector Type: Onboard 30-pin header
Pin Assignment:

Pin	Desc.	Pin	Desc.
2	VCC_LCD	1	VCC_LCD
4	LVDS_B_CLK+	3	LVDS_A_CLK+
6	LVDS_B_CLK-	5	LVDS_A_CLK-
8	GND	7	GND
10	LVDS_B0+	9	LVDS_A0+
12	LVDS_B0-	11	LVDS_A0-
14	GND	13	GND
16	LVDS_B1+	15	LVDS_A1+
18	LVDS_B1-	17	LVDS_A1-
20	GND	19	GND
22	LVDS_B2+	21	LVDS_A2+
24	LVDS_B2-	23	LVDS_A2-
26	GND	25	GND
28	LVDS_B3+	27	LVDS_A3+
30	LVDS_B3-	29	LVDS_A3-

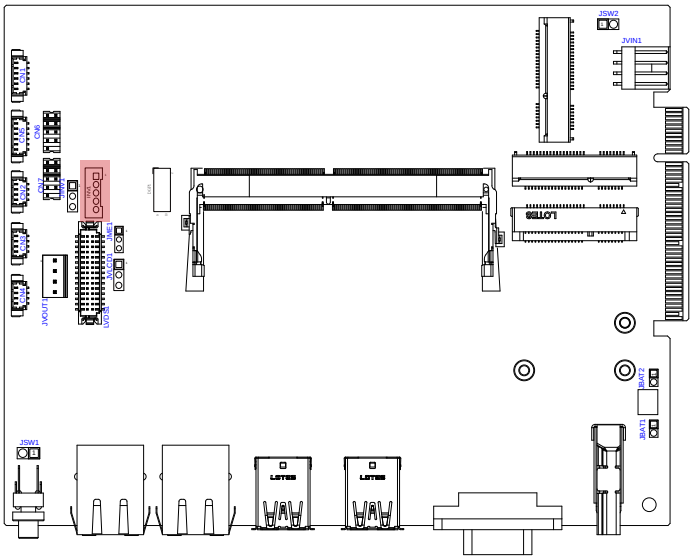




⑩ INV1

Function: LVDS BL Connector
Connector Type: 2.00mm pitch 1x5-pin one-wall connector
Pin Assignment:

Pin	Description
1	VCC_INV
2	GND
3	LVDS_BKLT_EN
4	LVDS_BKLTCTL
5	GND



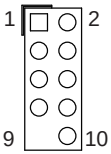
⑪ DGP1

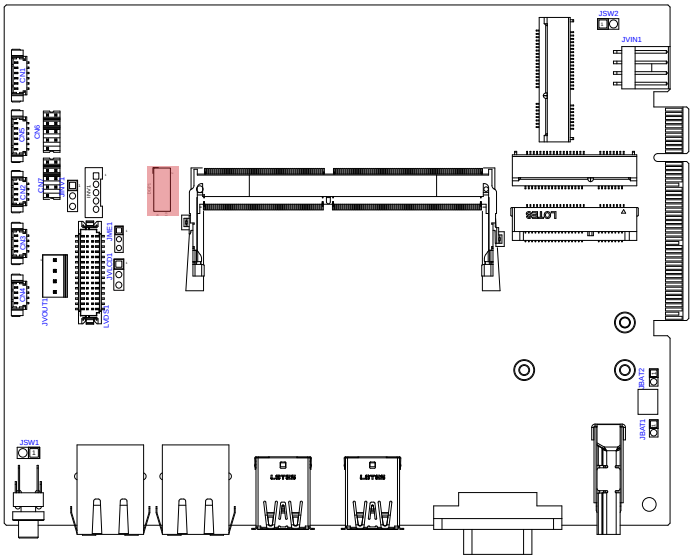
Function: Debug port

Connector Type: 2.00mm-pitch 2x5-pin header

Pin Assignment:

Pin	Description	Pin	Description
1	24MHz Clock	2	GND
3	LPC_FRAME#	4	LPC_LAD0
5	PLTRST#	6	N.C
7	LPC_LAD3	8	LPC_LAD2
9	VCC3	10	LPC_LAD1





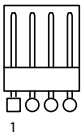
⑫ JVIN1

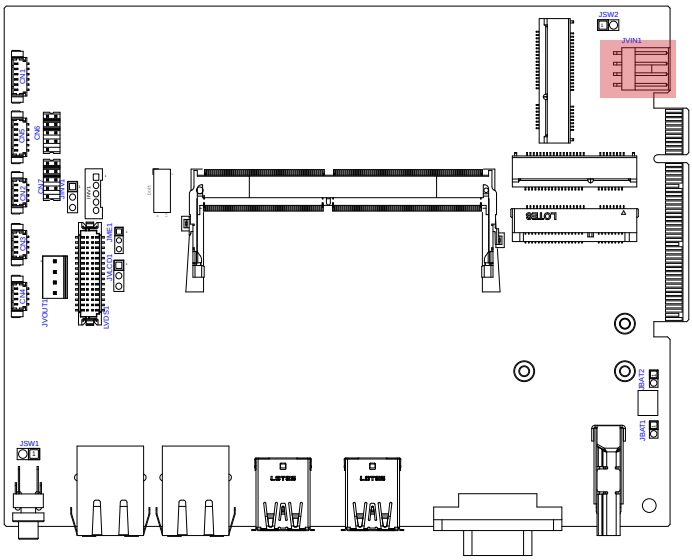
Function: Power Input Connector

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

Pin Assignment:

Pin	Desc.
1	VCC
2	VCC
3	GND
4	GND





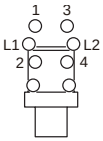
⑬ SW1

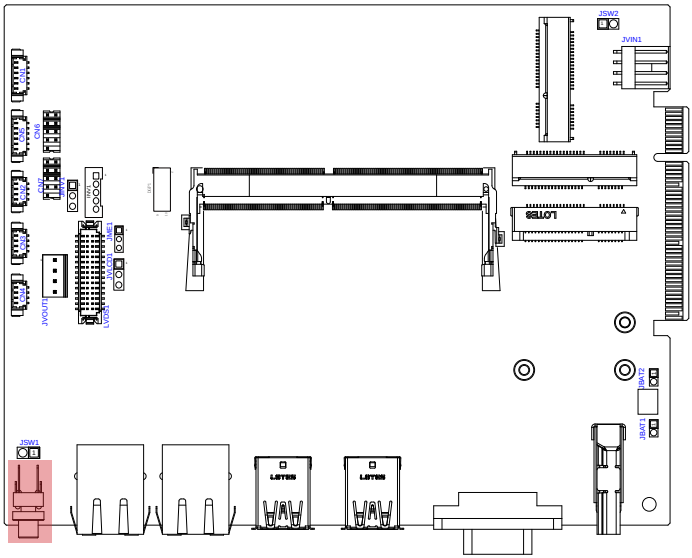
Function Power Button

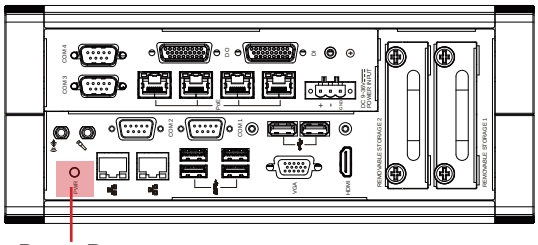
Connector Type: LED tact switch with green and red colors

Pin Assignment:

Pin	Description	Pin	Description
1	GND	2	N/A
3	BTN	4	N/A
L1	SW1_LED_N	L2	SW1_LED_P



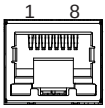


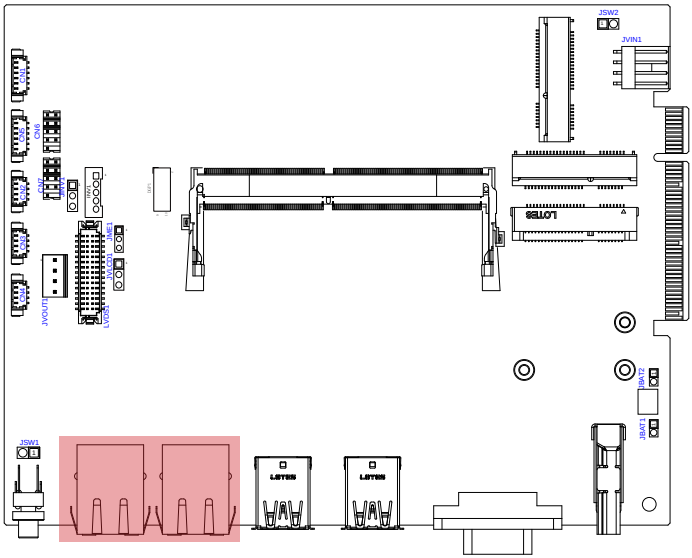


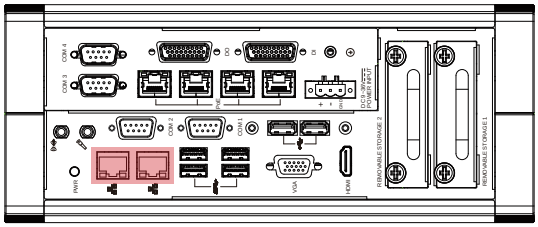
Power Button

⑭⑮ LCN1, 2

Function: RJ-45 Ethernet connectors
Connector Type: RJ-45 connector that supports 10/100/1000Mbps fast Ethernet
Pin Assignment: The pin assignments conform to the industry standard.





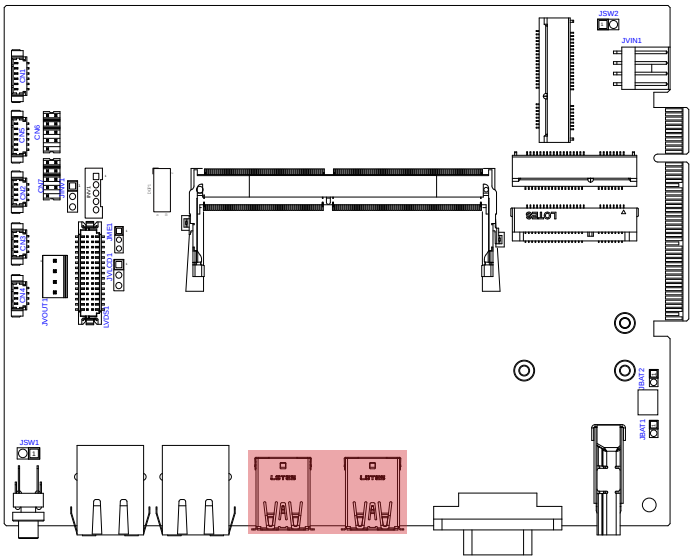


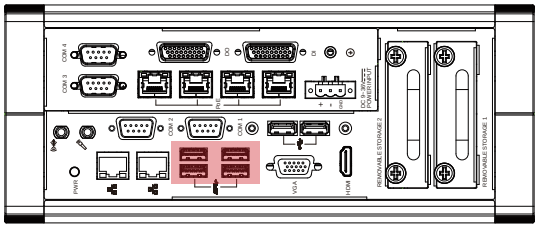
⑯⑰ USB1, 2

Function: USB 3.0/2.0 Connectors

Connector Type: Double-stacked Type-A USB connectors

Pin Assignment: The pin assignments conform to the industry standard.

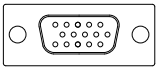


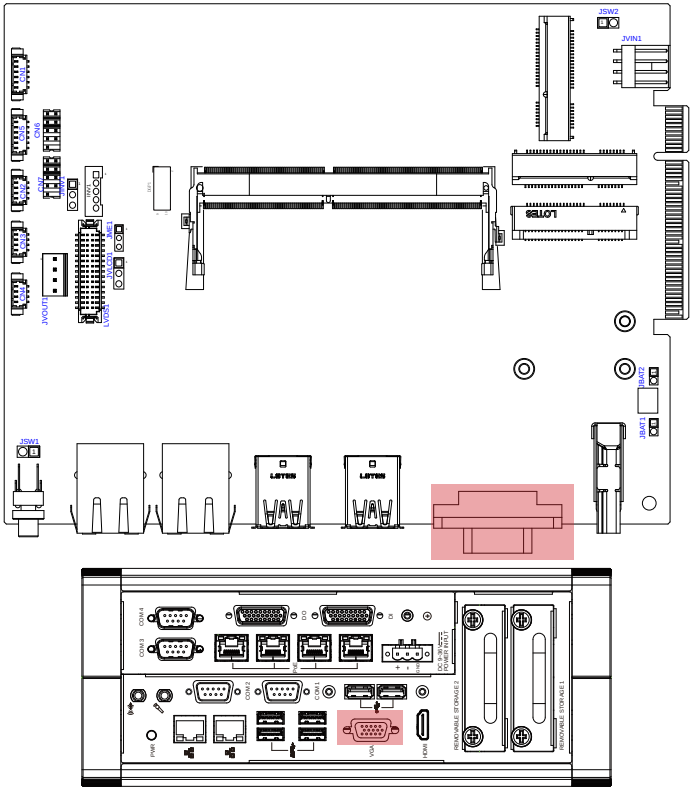


⑱ VGA1

Function: VGA Connector
Connector Type: D-Sub 15-pin female connector
Pin Assignment:

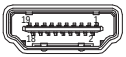
Pin	Description	Pin	Description
1	RED	9	5V
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	D-DATA
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	D-DCLK
8	GND		

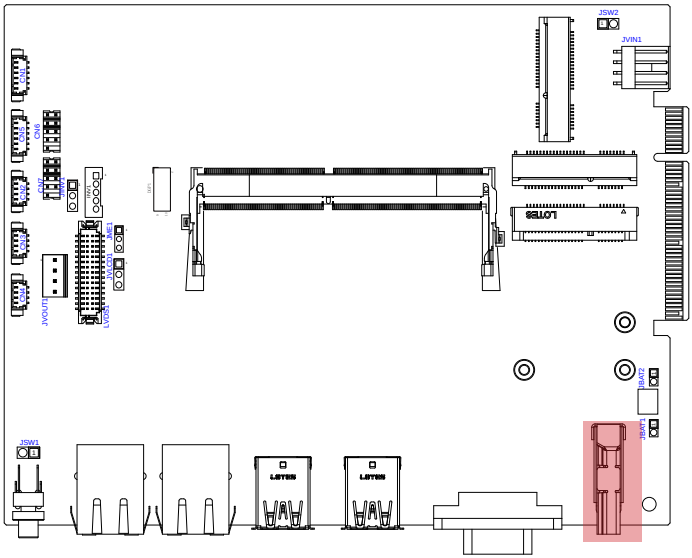


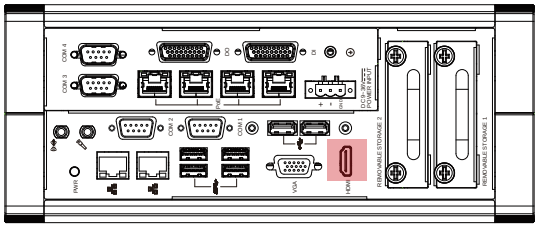


⑲ HDMI1

Function: HDMI connector
Connector Type: 19-pin HDMI connector with flange
Pin Assignment: The pin assignments conform to the industry standard.

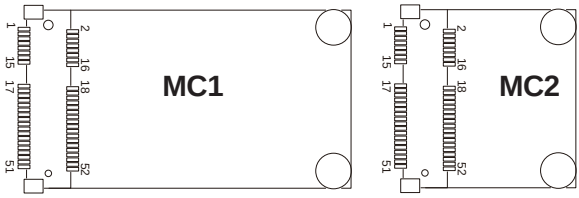


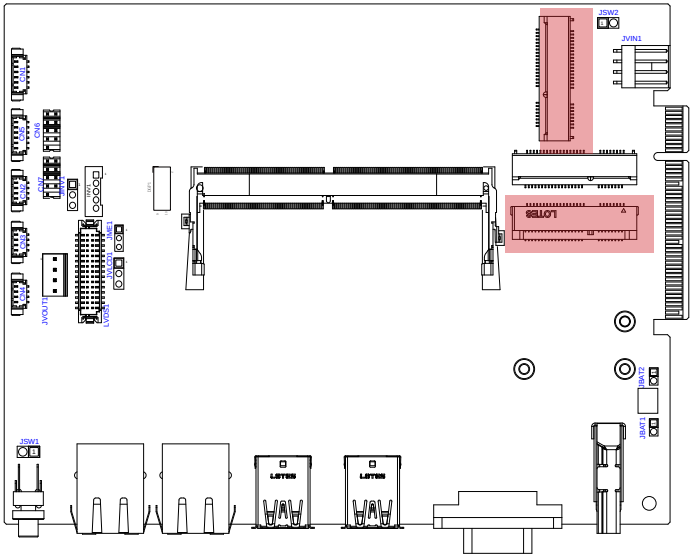




⑳㉑ MC1, 2

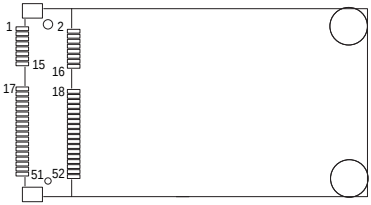
Function: MC1: PCI Express Mini-card Full Size socket
MC2: PCI Express Mini-card Half Size socket
Connector Type: Onboard 0.8mm pitch 52-pin edge card connector
Pin Assignment: The pin assignments conform to the industry standard.

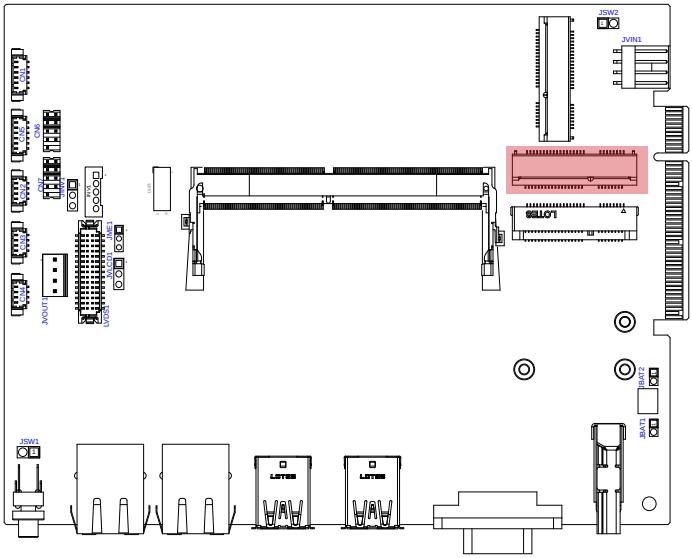




㉒ MSATA1

Function: mSATA socket
Connector Type: Onboard 0.8mm pitch 52-pin edge card connector
Pin Assignment: The pin assignments conform to the industry standard.





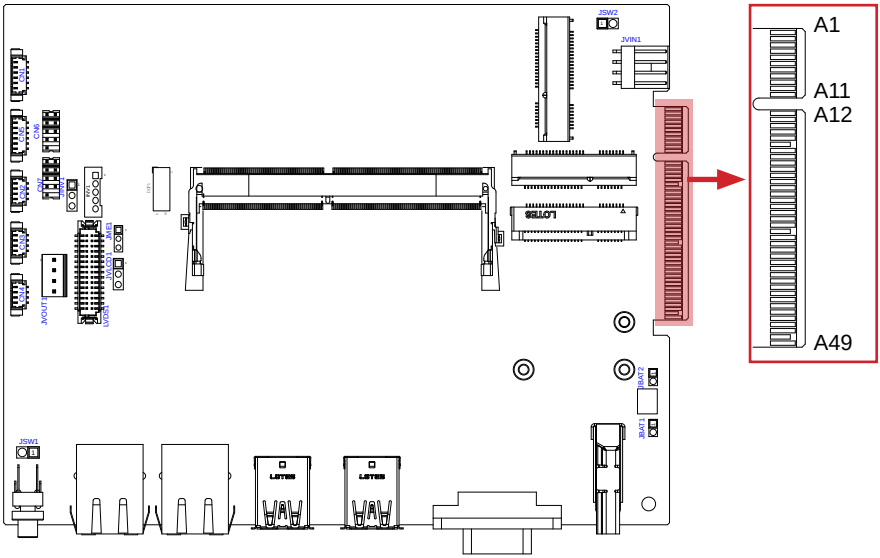
㉓ GIF1

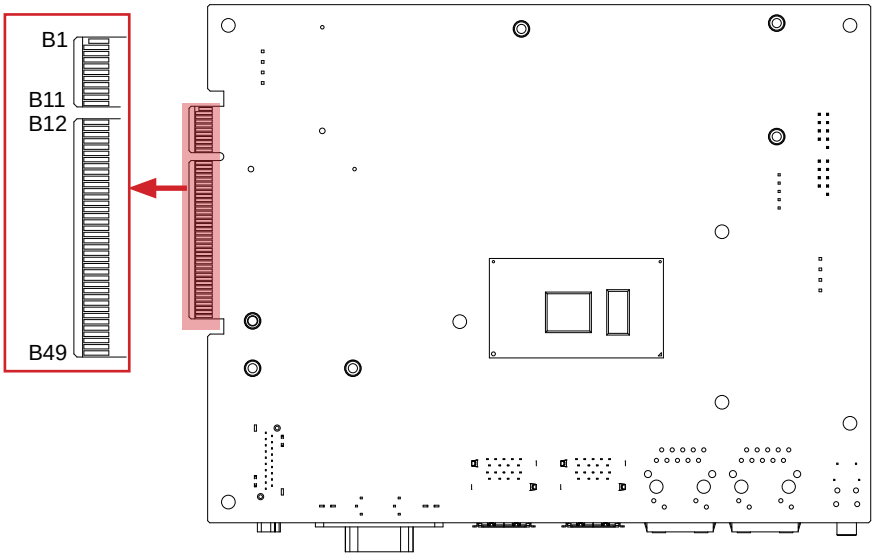
Function: PCIe Gold Finger Connector

Connector Type: Onboard 49-pin PCI Express edge connector

Pin Assignment:

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
A1	NC	A26	NC	B1	+12VAUX	B26	GND
A2	+12VAUX	A27	GND	B2	+12VAUX	B27	NC
A3	+12VAUX	A28	GND	B3	+12VAUX	B28	NC
A4	GND	A29	NC	B4	GND	B29	GND
A5	LPC_LAD0	A30	NC	B5	SMBCLK_PCIE	B30	NC
A6	LPC_LAD1	A31	GND	B6	SMBDATA_PCIE	B31	NC
A7	LPC_LAD2	A32	NC	B7	GND	B32	GND
A8	LPC_LAD3	A33	NC	B8	NC	B33	NC
A9	NC	A34	GND	B9	LPC_FRAME#	B34	NC
A10	NC	A35	NC	B10	NC	B35	GND
A11	BUF_PLTRST#	A36	NC	B11	PCIE_WAKE#	B36	GND
A12	GND	A37	GND	B12	LPC_SERIRQ	B37	SATA0_TX+
A13	NC	A38	GND	B13	GND	B38	SATA0_TX-
A14	NC	A39	SATA1_TX+	B14	NC	B39	GND
A15	GND	A40	SATA1_TX-	B15	NC	B40	GND
A16	NC	A41	GND	B16	GND	B41	SATA0_RX+
A17	NC	A42	GND	B17	NC	B42	SATA0_RX-
A18	GND	A43	SATA1_RX+	B18	GND	B43	GND
A19	CLK_24M_GF	A44	SATA1_RX-	B19	NC	B44	GND
A20	GND	A45	GND	B20	NC	B45	USB2_1+
A21	NC	A46	GND	B21	GND	B46	USB2_1-
A22	NC	A47	NC	B22	GND	B47	GND
A23	GND	A48	NC	B23	NC	B48	PS_ON#
A24	GND	A49	GND	B24	NC	B49	GND
A25	NC			B25	GND		


A1
A11
A12
A49
JSW2
JVIN1
JSW1
JBAT2
JBAT1

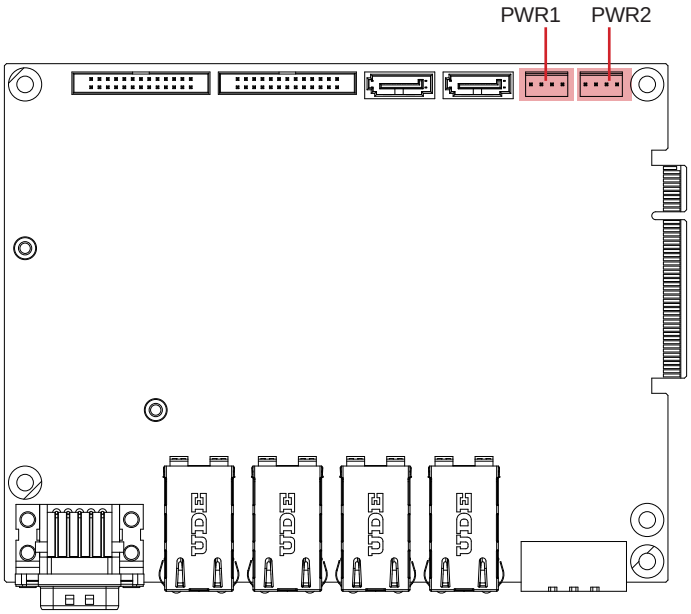

B1
B11
B12
B49

3.2.2 Daughter Board - SCB-348a

①② PWR2, 1

Function: SATA Power Input
Connector Type: 2.54mm pitch 1x4-pin one-wall connector
Pin Assignment:

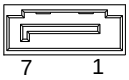
Pin	Desc.
1	VCC5
2	GND
3	GND
4	+12V

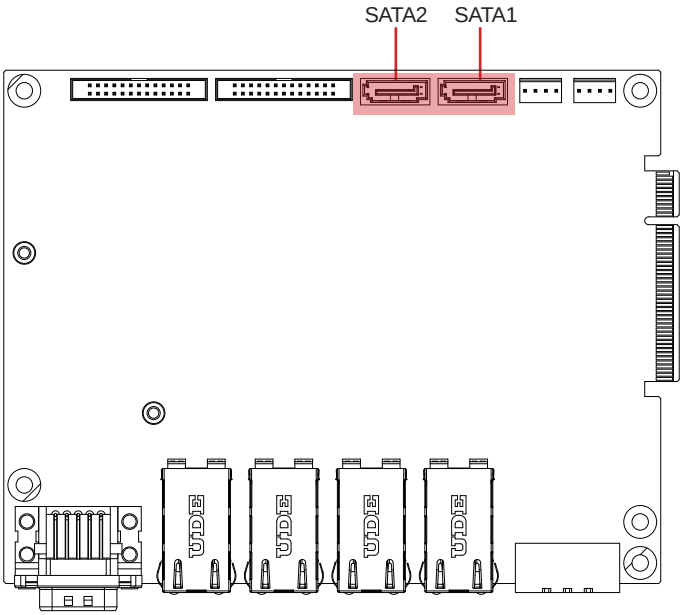


③④ SATA1, 2

Function: SATA Connector
Connector Type: On-board Serial ATA Connector
Pin Assignment:

Pin	Desc.
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND





⑤⑥ LPT1, 2

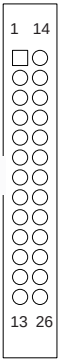
Function: Digital I/O Connector

Connector Type: On-board 2.00mm pitch 2 x13-pin box header

Pin Assignment:

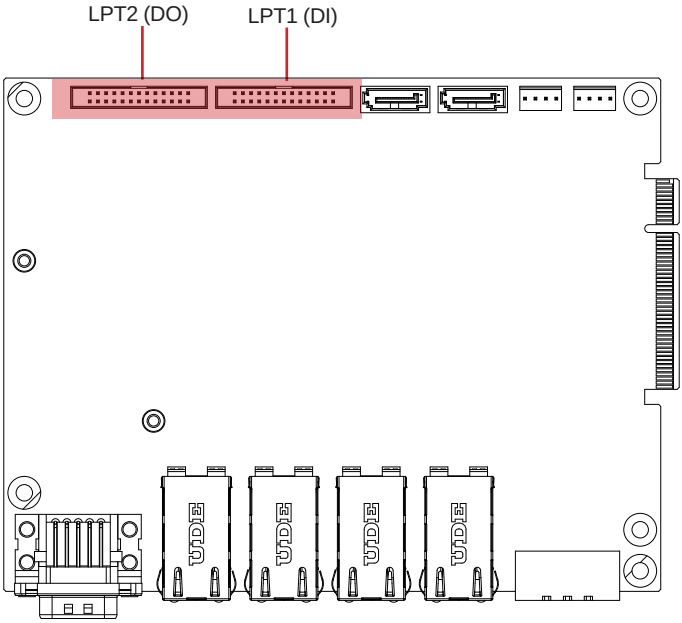
LPT1 (DI)

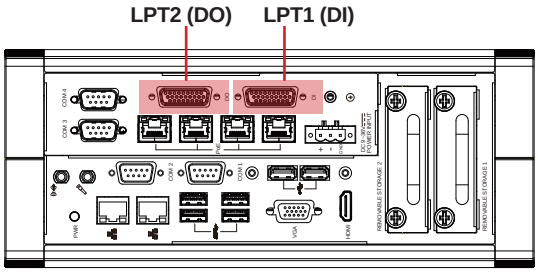
Pin	Desc.	Pin	Desc.
1	SIO_DI0	14	SIO_DI8
2	SIO_DI1	15	SIO_DI9
3	SIO_DI2	16	SIO_DI10
4	SIO_DI3	17	SIO_DI11
5	SIO_DI4	18	SIO_DI12
6	SIO_DI5	19	SIO_DI13
7	SIO_DI6	20	SIO_DI14
8	SIO_DI7	21	SIO_DI15
9	+V24A	22	GND
10	+V24A	23	GND
11	NC	24	NC
12	NC	25	NC
13	NC	26	NC



LPT2 (DO)

Pin	Desc.	Pin	Desc.
1	SIO_DO0	14	SIO_DO8
2	SIO_DO1	15	SIO_DO9
3	SIO_DO2	16	SIO_DO10
4	SIO_DO3	17	SIO_DO11
5	SIO_DO4	18	SIO_DO12
6	SIO_DO5	19	SIO_DO13
7	SIO_DO6	20	SIO_DO14
8	SIO_DO7	21	SIO_DO15
9	+V24A	22	GND
10	+V24A	23	GND
11	NC	24	NC
12	NC	25	NC
13	NC	26	NC


LPT2 (DO)
LPT1 (DI)


LPT2 (DO)
LPT1 (DI)

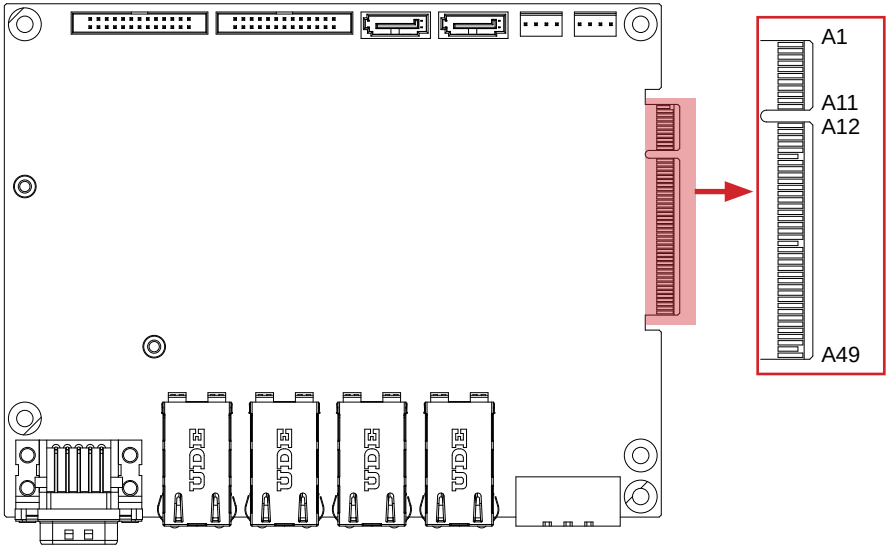
⑦ GIF1

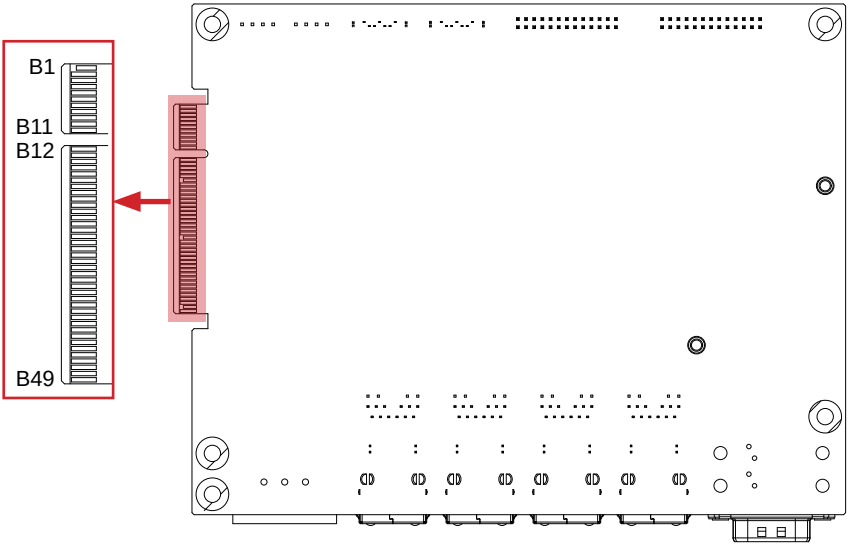
Function: PCIe Gold Finger Connector

Connector Type: Onboard 49-pin PCI Express edge connector

Pin Assignment:

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
A1	NC	A26	NC	B1	+12VAUX	B26	GND
A2	+12VAUX	A27	GND	B2	+12VAUX	B27	NC
A3	+12VAUX	A28	GND	B3	+12VAUX	B28	NC
A4	GND	A29	NC	B4	GND	B29	GND
A5	LPC_LAD0	A30	NC	B5	SMBCLK_PCIE	B30	NC
A6	LPC_LAD1	A31	GND	B6	SMBDATA_PCIE	B31	NC
A7	LPC_LAD2	A32	NC	B7	GND	B32	GND
A8	LPC_LAD3	A33	NC	B8	NC	B33	NC
A9	NC	A34	GND	B9	LPC_FRAME#	B34	NC
A10	NC	A35	NC	B10	NC	B35	GND
A11	BUF_PLTRST#	A36	NC	B11	PCIE_WAKE#	B36	GND
A12	GND	A37	GND	B12	LPC_SERIRQ	B37	SATA0_TX+
A13	NC	A38	GND	B13	GND	B38	SATA0_TX-
A14	NC	A39	SATA1_TX+	B14	NC	B39	GND
A15	GND	A40	SATA1_TX-	B15	NC	B40	GND
A16	NC	A41	GND	B16	GND	B41	SATA0_RX+
A17	NC	A42	GND	B17	NC	B42	SATA0_RX-
A18	GND	A43	SATA1_RX+	B18	GND	B43	GND
A19	CLK_24M_GF	A44	SATA1_RX-	B19	NC	B44	GND
A20	GND	A45	GND	B20	NC	B45	USB2_1+
A21	NC	A46	GND	B21	GND	B46	USB2_1-
A22	NC	A47	NC	B22	GND	B47	GND
A23	GND	A48	NC	B23	NC	B48	PS_ON#
A24	GND	A49	GND	B24	NC	B49	GND
A25	NC			B25	GND		

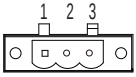

A1
A11
A12
A49

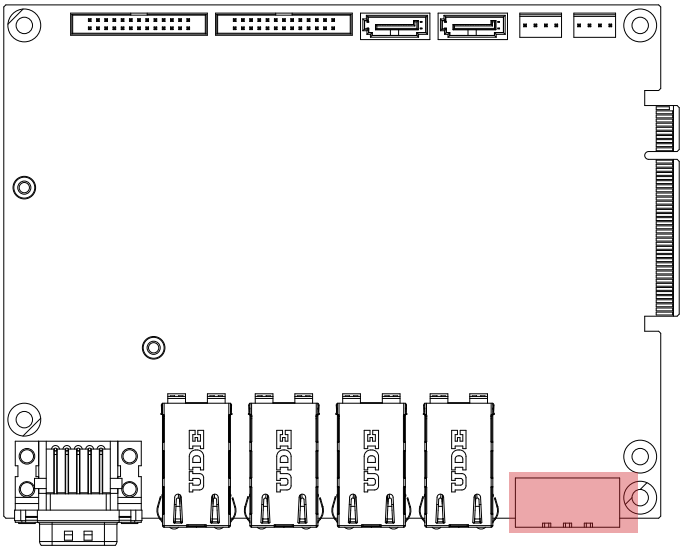

B1
B11
B12
B49

⑧ PWRIN1

Function: DC Adapter Power Input
Connector Type: 1x3-pin Terminal block
Pin Assignment:

Pin	Desc.
1	VCC+
2	VCC-
3	GND

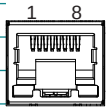


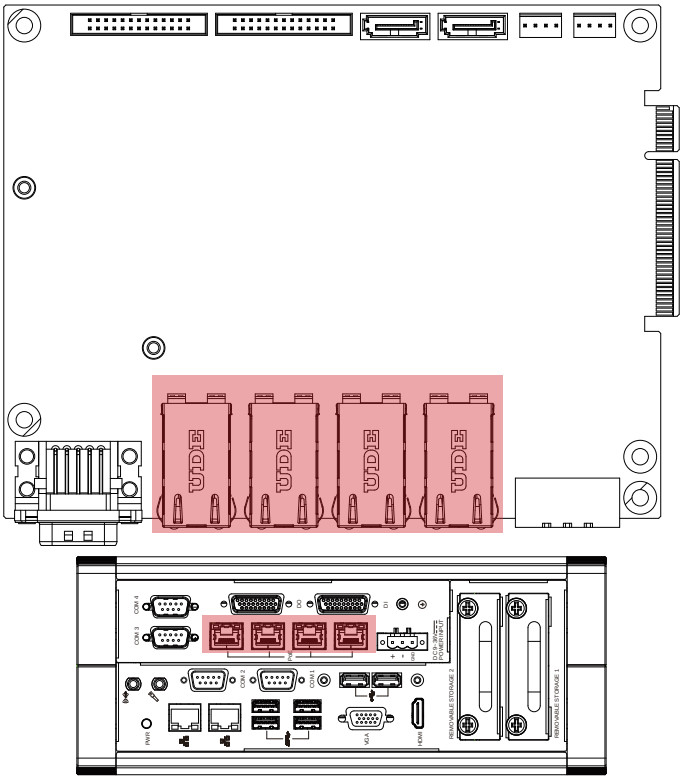


⑨⑩⑪⑫ T1, 2, 3, 4

Function: RJ-45 Ethernet connectors w/ PoE
Connector Type: RJ-45 connector that supports 10/100/1000Mbps fast Ethernet
Pin Assignment:

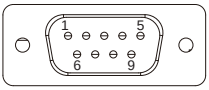
Pin	Desc.	Pin	Desc.
1	MDI0+	5	MDI2+
2	MDI0-	6	MDI2-
3	MDI1+	7	MDI3+
4	MDI1-	8	MDI3-





⑬ CN1 (CN1A, 1B)

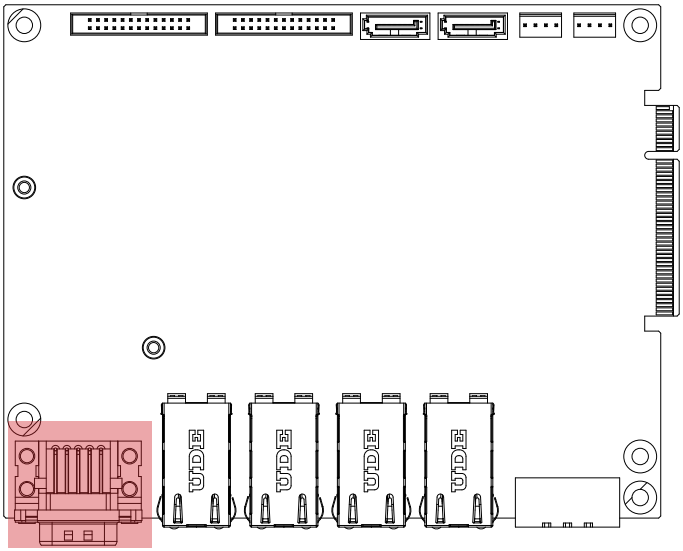
Function: RS-232/422/485 Selectable Serial Port
Connector Type: External 9-pin D-sub male connector
Pin Assignment:

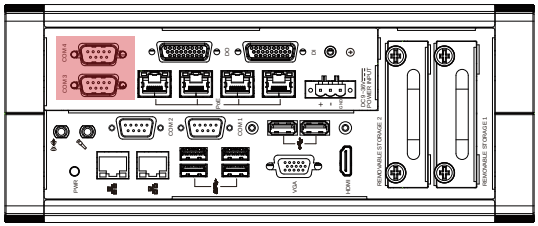


	Pin	Desc.	Pin	Desc
RS232	1	DCD	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	RI
	5	GND		

	Pin	Description
RS422	1	COM_422 TX-
	2	COM_422 TX+
	3	COM_422 RX+
	4	COM_422 RX-
	5	GND

	Pin	Description
RS485	1	COM_485 D-
	2	COM_485 D+
	5	GND





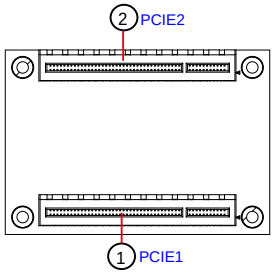
3.2.3 Daughter Board - SCB-549x

①② PCIE1, 2

Function: PCIE1: PCI Express slot for main board
PCIE2: PCI Express slot for dauther board - SCB-348a

Connector Type: Onboard 49-pin Golden Finger

Pin	Desc.	Pin	Desc.	Pin	Desc.	Pin	Desc.
A1	NC	A26	NC	B1	+12VAUX	B26	GND
A2	+12VAUX	A27	GND	B2	+12VAUX	B27	NC
A3	+12VAUX	A28	GND	B3	+12VAUX	B28	NC
A4	GND	A29	NC	B4	GND	B29	GND
A5	LPC_LAD0	A30	NC	B5	SMBCLK_PCIE	B30	NC
A6	LPC_LAD1	A31	GND	B6	SMBDATA_PCIE	B31	NC
A7	LPC_LAD2	A32	NC	B7	GND	B32	GND
A8	LPC_LAD3	A33	NC	B8	NC	B33	NC
A9	NC	A34	GND	B9	LPC_FRAME#	B34	NC
A10	NC	A35	NC	B10	NC	B35	GND
A11	BUF_PLTRST#	A36	NC	B11	PCIE_WAKE#	B36	GND
A12	GND	A37	GND	B12	LPC_SERIRQ	B37	SATA0_TX+
A13	NC	A38	GND	B13	GND	B38	SATA0_TX-
A14	NC	A39	SATA1_TX+	B14	NC	B39	GND
A15	GND	A40	SATA1_TX-	B15	NC	B40	GND
A16	NC	A41	GND	B16	GND	B41	SATA0_RX+
A17	NC	A42	GND	B17	NC	B42	SATA0_RX-
A18	GND	A43	SATA1_RX+	B18	GND	B43	GND
A19	CLK_24M_GF	A44	SATA1_RX-	B19	NC	B44	GND
A20	GND	A45	GND	B20	NC	B45	USB2_1+
A21	NC	A46	GND	B21	GND	B46	USB2_1-
A22	NC	A47	NC	B22	GND	B47	GND
A23	GND	A48	NC	B23	NC	B48	PS_ON#
A24	GND	A49	GND	B24	NC	B49	GND
A25	NC			B25	GND		



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Chapter 4

Installation & Maintenance

4.1. Disassembly the Computer

To use onboard jumpers/connectors or to install/remove internal components, you will need to open the computer to access the inside of the computer. Follow through the guide below to disassembly the computer.

1. Position the computer upright with the top side facing up and remove the 2 screws on the top panel as shown below. (You don't need to remove the top panel).

2. Turn the computer over with the bottom side facing up. Remove the 4 screws on the bottom panel and remove the bottom panel from the assembly.

3. Remove the 2 screws as shown below.

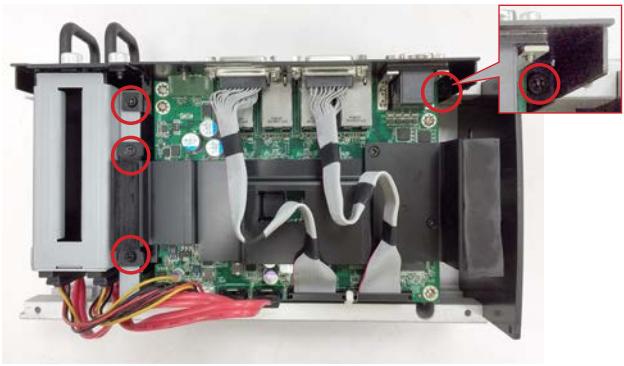
4. Lift the chassis away from the assembly as shown below

Keep the top panel.

View from the I/O panel side

View from the other side

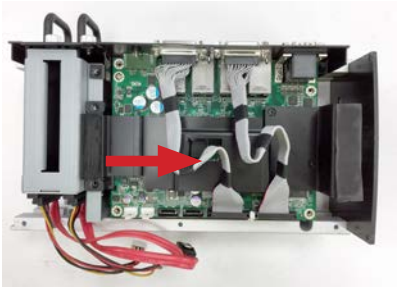
5. Remove the 4 screws securing the bracket as shown below.



6. Remove the 4 screws securing the daughter board as shown below.

7. Disconnec the two USB and two SATA power cables from the daughter board.

8. Remove the daughter board from the PCIe socket and lift the board away from computer.



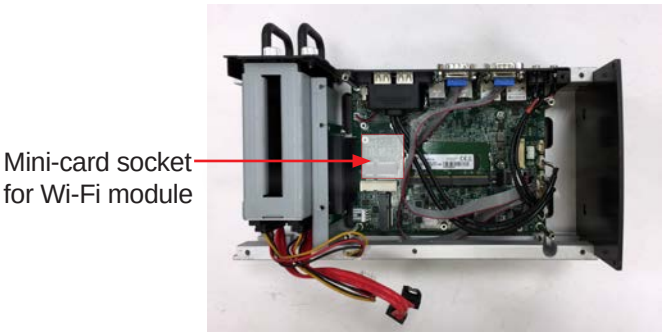
9. Then you are ready to access the components of the main board.

4.2. Install Hardware

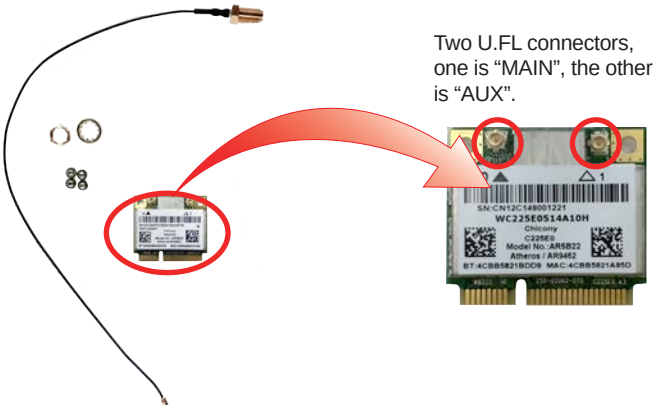
4.2.1. Install Wi-Fi Module

The computer comes with one Mini-card socket to load the computer with a wireless module of PCI Express Mini-card form factor. This section will guide you to install the Wi-Fi module.

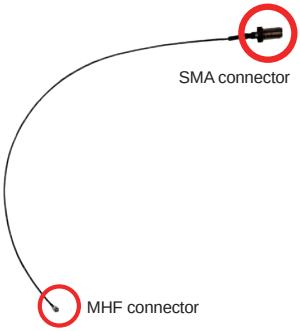
1. Locate the **PCI Express Mini-card** socket for wireless modules.



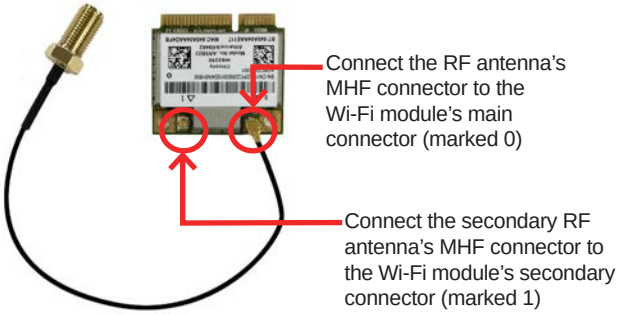
2. Prepare the Wi-Fi module kit. The module is a half-size module of **PCI Express Mini-card** form factor, with two U.FL connectors, one is “MAIN“, and the other is “AUX“.



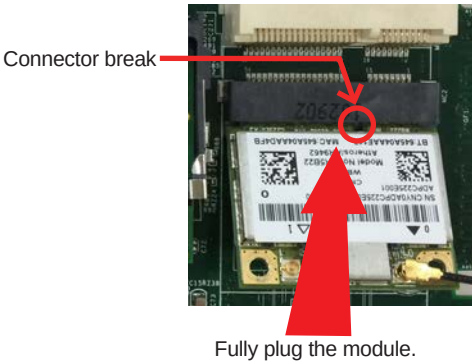
3. Have the RF antenna. The antenna has an SMA connector on one end and an MHF connector on the other.



4. Connect the RF antenna's MHF connector to the Wi-Fi module's main connector marked 0. If you are going to connect a secondary antenna, connect it to the connector marked 1.

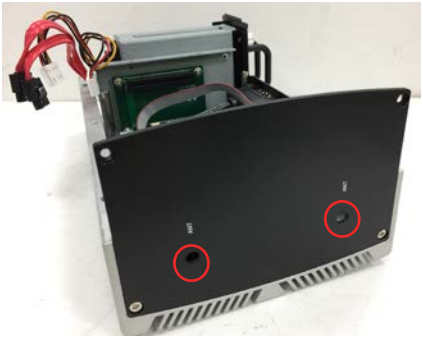


5. Plug the Wi-Fi module to the socket's connector by a slanted angle. Fully plug the module, and note the notch on the wireless module should meet the break of the connector.

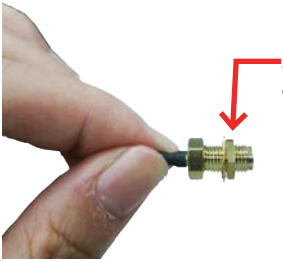


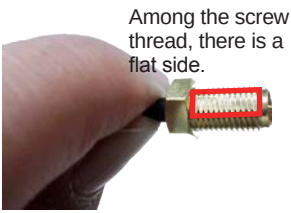
6. Press the module down and fix the module in place using two screws.

7. Remove the plastic plug(s) from the computer's top panel side to make antenna hole(s). Keep the plastic plug for any possible restoration in the future.

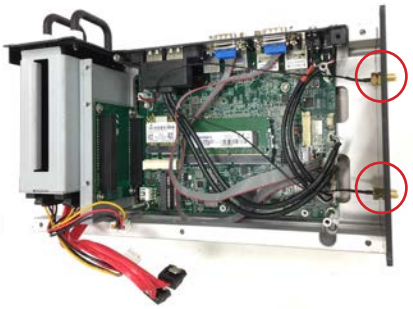


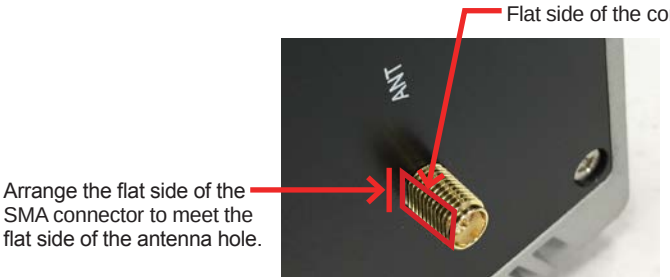
8. From the other end of the RF antenna, which is an SMA connector, remove the washer and the nut. Save the washer and nut for later use. Note the SMA connector has the form of a threaded bolt, with one flat side.





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





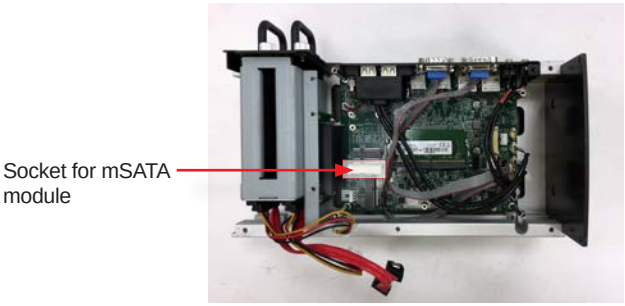
10. Mount the washer first and then the nut to the SMA connector. Make sure the nut is tightened.

11. Have the external antenna(s). Screw and tightly fasten the antenna(s) to the SMA connector.

4.2.1. Install mSATA Module

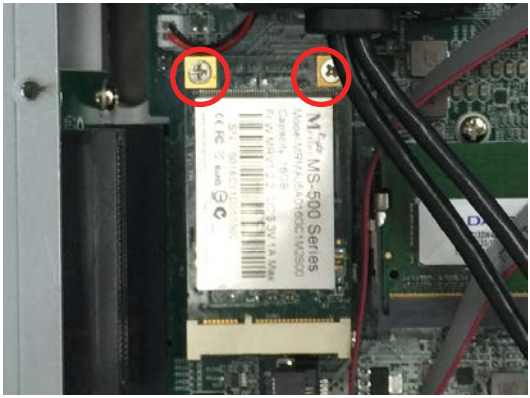
To install an mSATA storage module to the computer:

1. Locate the socket for mSATA modules.



2. Confront the mSATA module's edge connector with the socket's connector. Align the module's key notch the connector's break.

3. Fully plug the module until it cannot be plugged any more. Press the module down and fix the module in place using two screws.



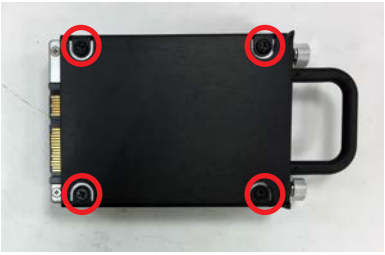
4.2.1. Install SSD or HDD

The computer comes with two 2.5" drive bays for 2.5” HDD or SSD storage device. To install 2.5” HDD or SSD to the computer,

1. For the drive bay you want to use, loosen the 2 screws that securing the drive bay.

2. Slide the 2.5” HDD or SSD storage device into the drive bay you just removed.

3. Using 4 screws coming with the storage device kit, fix the storage device in place.



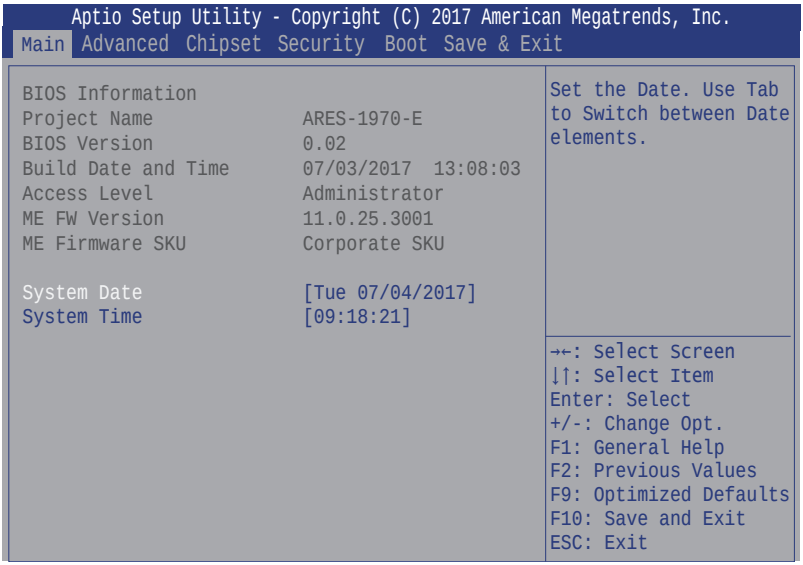
4. Slide the drive bay into the SATA connector. Then fasten the 2 screws that securing the drive bay.

Chapter 5

BIOS

The BIOS Setup utility 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.



Menu	Description
Main	See 5.1. Main on page 66
Advanced	See 5.2. Advanced on page 67
Chipset	See 5.3. Chipset on page 81
Security	See 5.4 Security on page 86
Boot	See 5.5. Boot on page 87
Save & Exit	See 5.6. Save & Exit on page 88

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 use the utility.

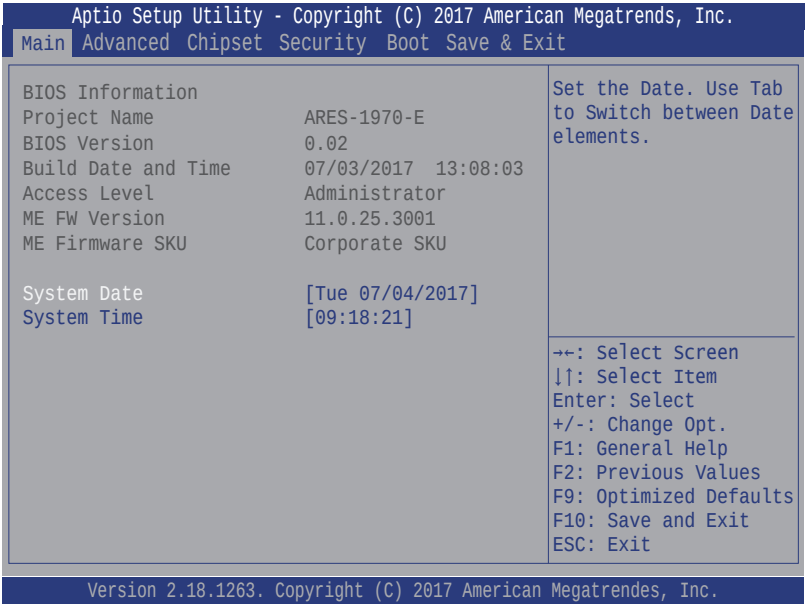
Keystroke	Function
← →	Moves left/right between the top menus.
↓ ↑	Moves up/down between highlight items.
Enter	Selects an highlighted item/field.
Esc	► On the top menus: Use **Esc** to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select **OK** or **Cancel**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

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

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

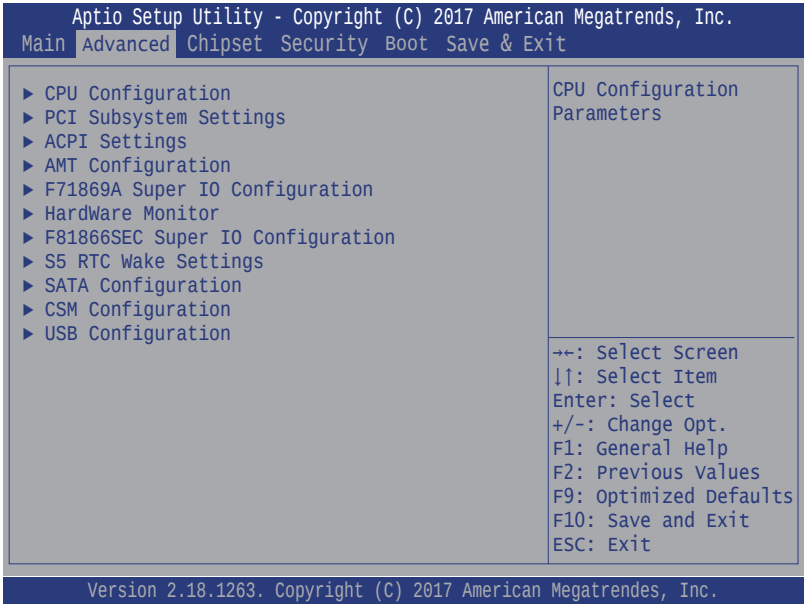
5.1. Main

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



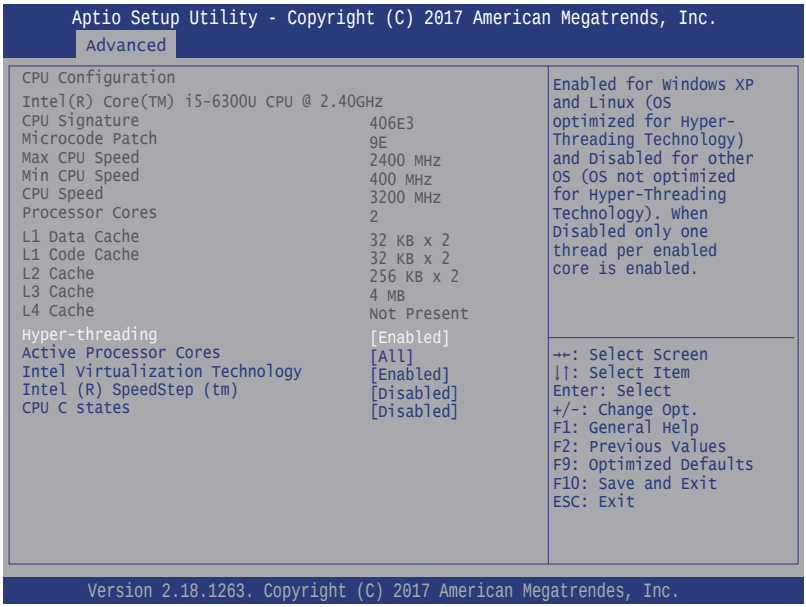
Setting	Description
Project Name	Delivers the model name of the computer.
BIOS Version	Delivers the computer's BIOS version.
Build Date and Time	Delivers the date and time when the BIOS Setup utility was made/ updated.
Access Level	Delivers the level that the BIOS is being accessed at the moment.
System Date	Sets system date.
System Time	Sets system time.

5.2. Advanced



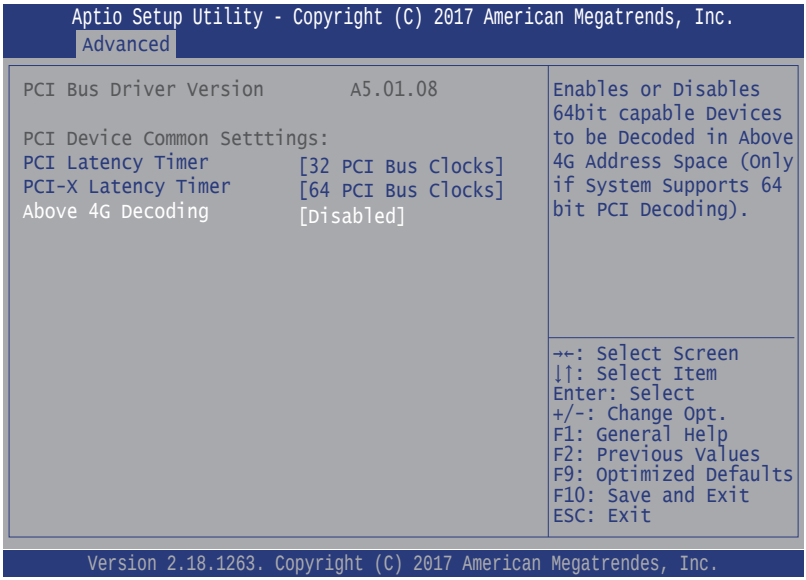
Setting	Description
CPU Configuration	See 5.2.1. CPU Configuration on page 68
PCI Subsystem Settings	See 5.2.2. PCI Sybsystem Settings on page 69
ACPI Settings	See 5.2.3. ACPI Settings on page 70
AMT Configuration	See 5.2.4. AMT Configuration on page 71
F71869A Super IO Configuration	See 5.2.5. F71869A Super IO Configuration on page 72
Hardware Monitor	See 5.2.6. Hardware Monitor on page 74
F81866SEC Super IO Configuration	See 5.2.7. F81866SEC Super IO Configuration on page 75
S5 RTC Wake Settings	See 5.2.8. S5 RTC Wake Settings on page 76
SATA Configuration	See 5.2.9 SATA Configuration on page 77
CSM Configuration	See 5.2.10. CSM Configuration on page 78
USB Configuration	See 5.2.11. USB Configuration on page 79

5.2.1. CPU Configuration



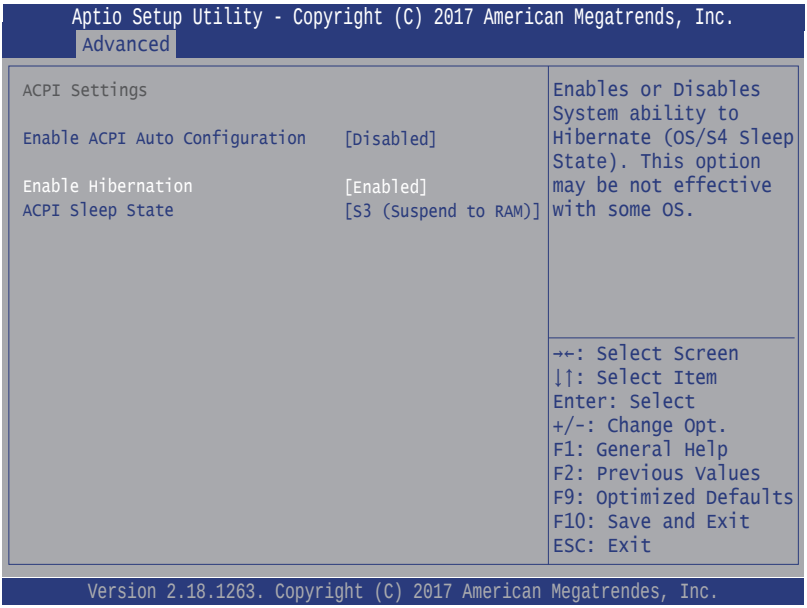
Setting	Description
Hyper-threading	**Enabled** (default) for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and **Disabled** for other OS (OS not optimized or Hyper-Threading Technology). When disabled only one thread per enabled core is enabled.
Active Processor Cores	Number of cores to enable in each processor package. ► Options: **All** (default) and **1**
Intel Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology ► Options: **Enabled** (default) or **Disabled**
Intel (R) Speed Step (tm)	**Enable** / **Disable** (default) Intel SpeedStep
Turbo Mode	Only available when Intel Speed Step is **Enabled**. **Enable** (default) / **Disable** Turbo Mode
CPU C States	**Enable** / **Disable** (default) CPU C States

5.2.2. PCI Sybsystem Settings



Setting	Description
PCI Latency Timer	Value to be programmed into PCI Latency Timer Register. ► **Options: 32** (default), **64**, **96**, **128**, **160**, **192**, **224** and **248 PCI Bus Clocks**.
PCI-X Latency Timer	Value to be programmed into PCI-X Latency Timer Register. ► **Options: 32**, **64** (default), **96**, **128**, **160**, **192**, **224** and **248 PCI Bus Clocks**.
Above 4G Decoding	**Enable/Disable** (default) 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).

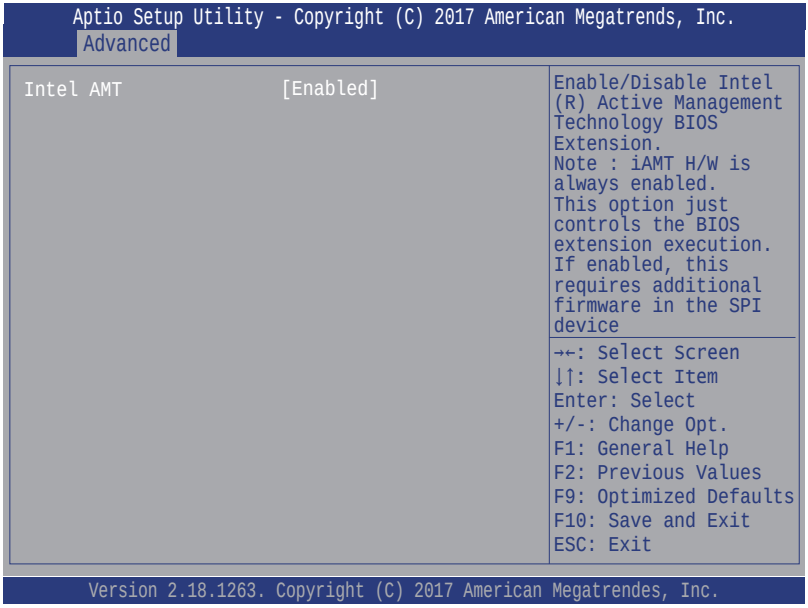
5.2.3. ACPI Settings



Setting	Description
Enable ACPI Auto Configuration	**Enables** or **Disables** (default) BIOS ACPI Auto Configuration
Enable Hibernation	Only available when BIOS ACPI Auto Configuration is enabled. **Enables** (default) or **Disables** System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
ACPI Sleep State	Only available when BIOS ACPI Auto Configuration is enabled. Select ACPI sleep state the system will enter when the SUSPEND button is pressed. ► **Options: Suspend Disabled** and **S3 (Suspend to RAM)** (default)

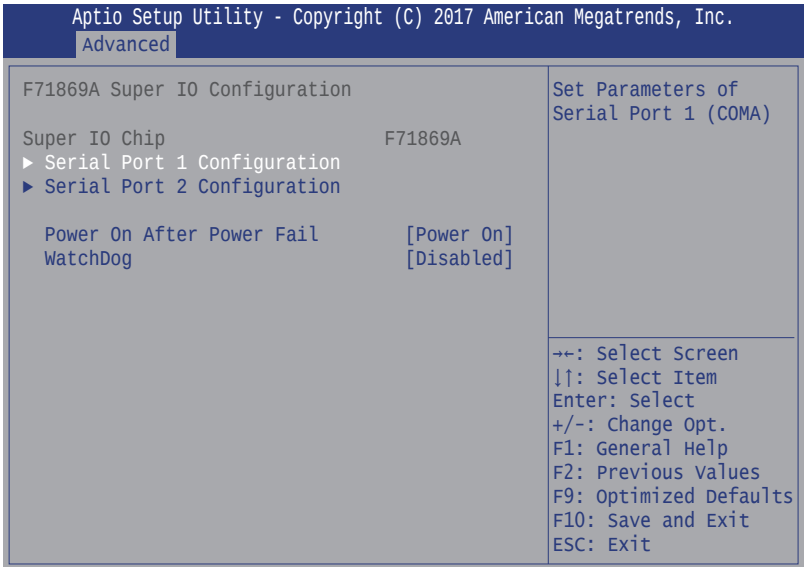
5.2.4. AMT Configuration

Intel® Active Management Technology (Intel® AMT) is a hardware-based solution that uses out-of-band communication for system administrators to monitor and manage the computers and other network equipment by remote control even if the hard drive is crashed, the system is turned off or the operating system is locked. This submenu features the settings of iAMT's BIOS extension, which are required to make use of iAMT.



Setting	Description
Intel AMT	**Enables** (default) /**disables** Intel® Active Management Technology BIOS extensions. ► Note iAMT hardware is always enabled. ► This setting only controls the execution of BIOS extension execution. ► When enabled, additional firmware is required in the SPI device.

5.2.5. F71869A Super IO Configuration



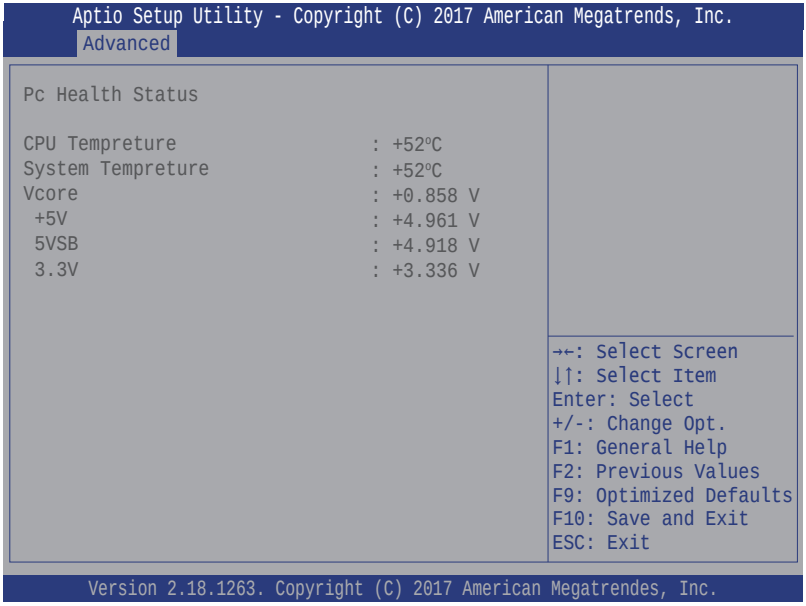
Setting	Description
Serial Port 1/2 Configuration	See next page.
Power On After Power Fail	Sets whether the system should power on or power off when the power supply resumes after an power failure. ► Options are **Power off** and **Power on** (default) .
WatchDog	**Enables/disables** (default) watchdog timer.

Serial Port 1/2 Configuration

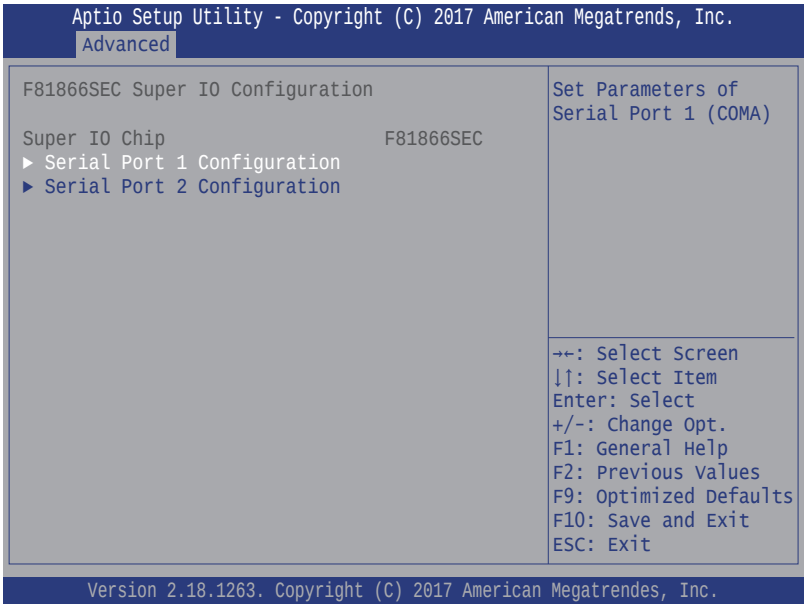
Setting	Description
Serial Port	**Enable** (default) or **Disable** Serial Port (COM).
Change Settings	Select an optimal setting for Super IO device. ▶ Options for Serial Port 1: **Auto**; **IO=3F8h; IRQ=4** (default) ; **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; ▶ Options for Serial Port 2: **Auto** **IO=2F8h; IRQ=3** (default) **IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**; **IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12**
Mode Select	Select **RS-232** (default), **RS-422** or **RS-485**.

5.2.6. Hardware Monitor

Select this submenu to view the main board's hardware status. Select it to run a report of various info as depicted below:

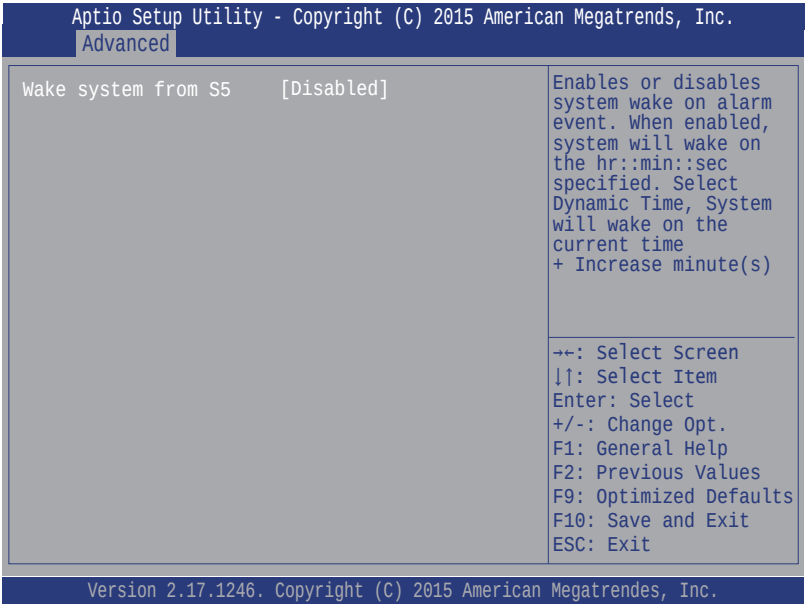


5.2.7. F81866SEC Super IO Configuration



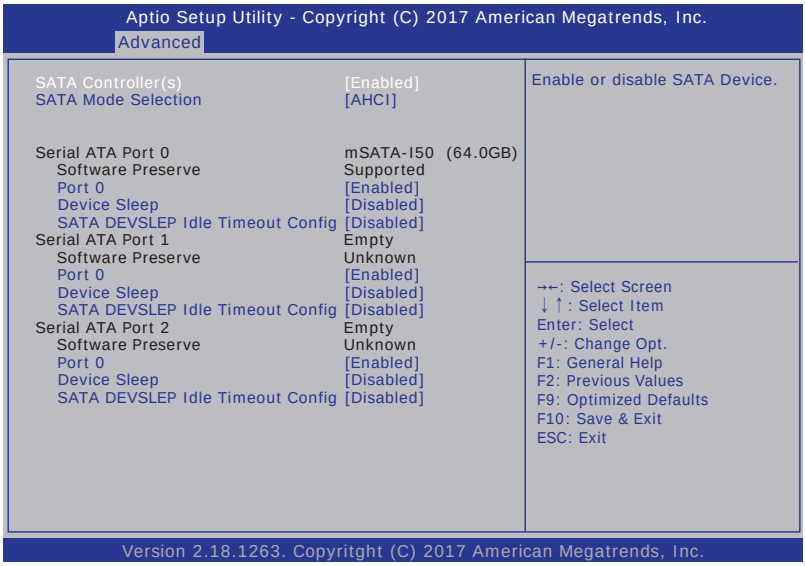
Setting	Description
Serial Port	**Enable** (default) or **Disable** Serial Port (COM).
Mode Select	Select **RS-232** (default), **RS-422** or **RS-485**.

5.2.8. S5 RTC Wake Settings



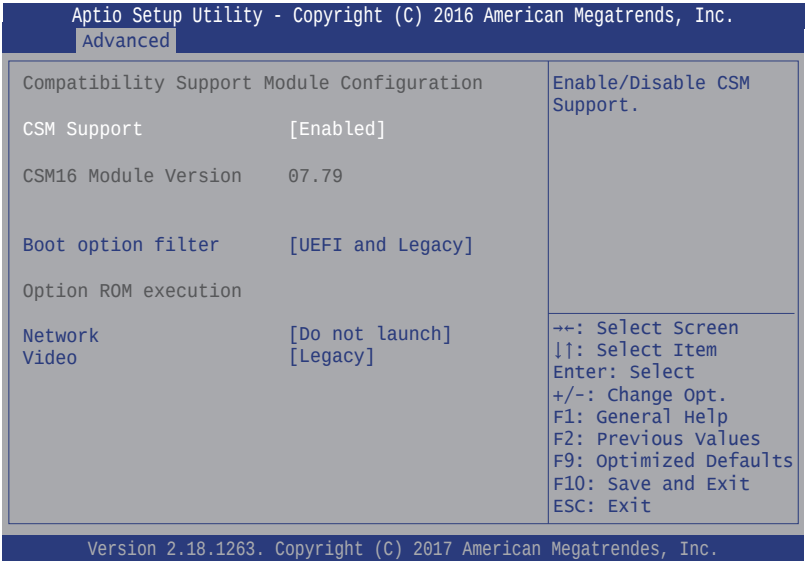
Setting	Description
Wake System from S5	**Enable** or **Disable** (default) system wake on alarm event. ► Options available are: **Disabled** (default): **Fixed Time:** System will wake on the hr::min::sec specifiedc. **DynamicTime:** If selected, you need to set **Wake up minute increase** from 1 - 5. System will wake on the current time + increase minute(s).

5.2.9 SATA Configuration



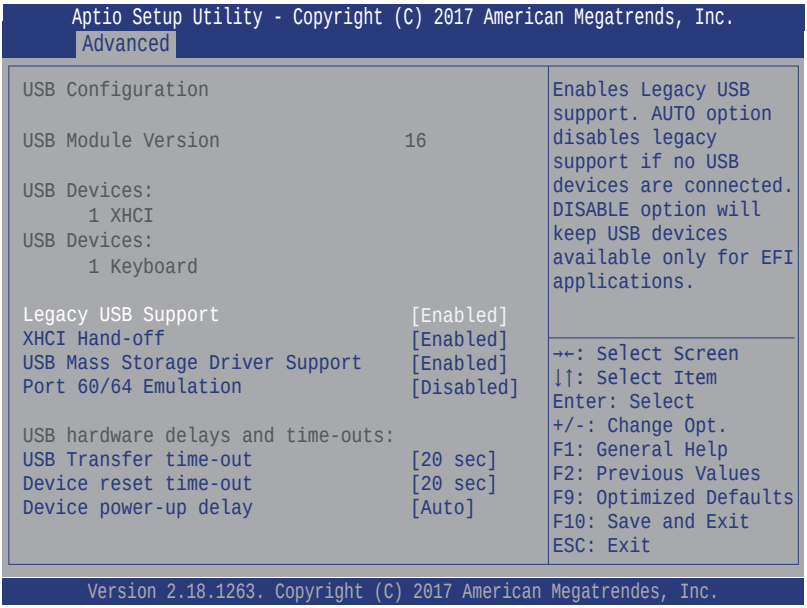
Setting	Description
SATA Controller(s)	**Enables** (default) / **disables** SATA device(s).
SATA Mode Selection	Configures how SATA controller(s) operate. ► Options: **AHCI** (default) and **RAID**.
Serial ATA Port 0 ,1 ,2	SATA device information
Port 0, 1, 2	**Enables** (default) / **disables** the SATA port 0, 1, 2.
Device Sleep	**Enables** / **disables** (default) the mSATA for RTD3.
SATA DEVSLEP Idle Timeout Config	**Enables** / **disables** (default) SATA DTIO config.

5.2.10. CSM Configuration



Setting	Description
CSM Support	**Enable** (default) or **Disable** CSM Support.
Boot option filter	Control the Legacy/UEFI ROMs priority. ► Options: **UEFI and Legacy** (default), **Legacy only**, **UEFI only**
Network	Control the execution of UEFI and Legacy PXE OpROM ► Options: **Do not launch** (default) and **Legacy**
Video	Control the execution of UEFI and Legacy Video OpROM ► Options: **UEFI** and **Legacy** (default)

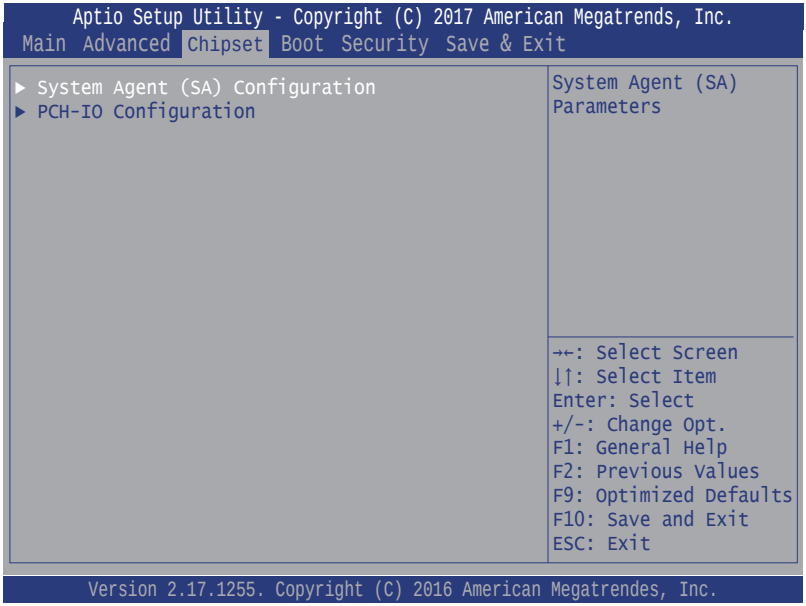
5.2.11. USB Configuration



Setting	Description
Legacy USB Support	Enables/disables legacy USB support. ► Options available are **Enabled** (default), **Disabled** and **Auto**. ► Select **Auto** to disable legacy support if no USB device are connected. ► Select **Disabled** to keep USB devices available only for EFI applications.
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. ► The optional settings are: **Enabled** (default) **/ Disabled**.
USB Mass Storage Driver Support	Enables/disables USB Mass Storage Driver Support. ► The optional settings are: **Enabled** (default) **/ Disabled**.
USB hardware delay and time-out	
Port 60/64 Emulation	**Enables** / **Disables** (default) I/O port 60/64h emulation support.
USB transfer time-out	Use this item to set the time-out value for control, bulk, and interrupt transfers. ► Options: **1 sec, 5 sec, 10 sec, 20 sec** (default)

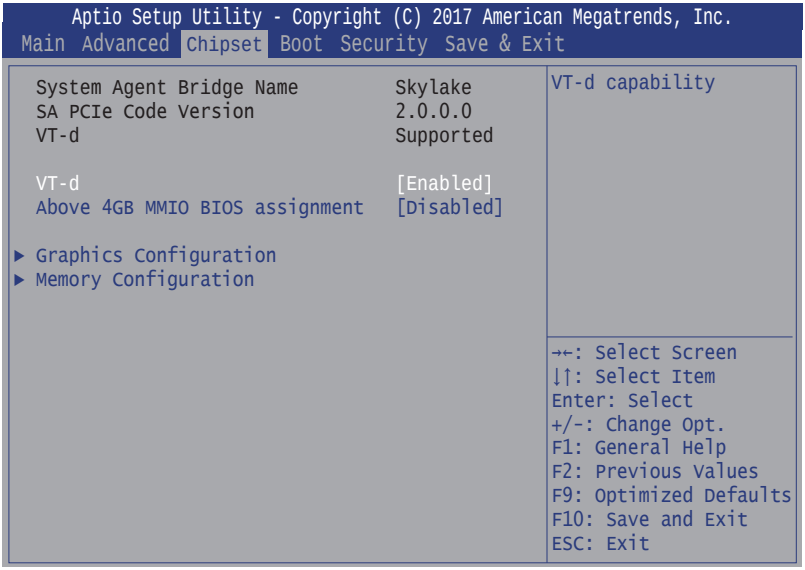
Device reset time-out	Use this item to set USB mass storage device start unit command time-out. ► Options available are: **10 sec, 20 sec** (default)., **30 sec, 40 sec**
Device power-up delay	Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor. ► Options available are: **Auto**: Default **Manual**: Select **Manual** you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.

5.3. Chipset



Submenu	Description
System Agent (SA) Configuration	See 5.3.1. System Agent (SA) Configuration on page 82
PCH-IO Configuration	See 5.3.2. PCH-IO Configuration on page 84

5.3.1. System Agent (SA) Configuration



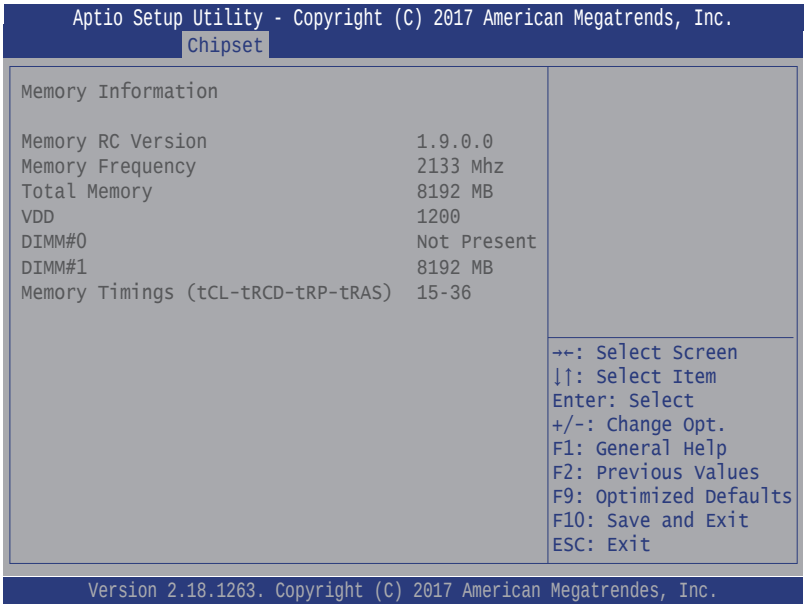
Submenu	Description
VT-d	**Enable** (default) or **Disable** VT-d function
Above 4GB MMIO BIOS assignment	**Enable** or **Disable** (default) Above 4GB MMIO BIOS assignment
System Agent (SA) Configuration	
Graphics Configuration	See 5.3.1.1. Graphics Configuration on page 83
Memory Configuration	See 5.3.1.2. Memory Configuration on page 83

5.3.1.1. Graphics Configuration

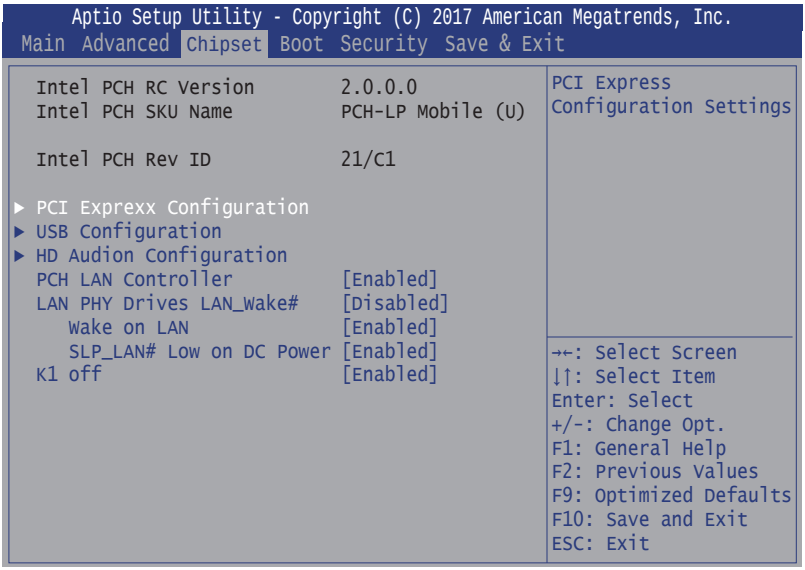
Setting	Description
IGFX VBIOS Version	Display the IGFX(internal VGA) VBIOS version.
Graphics Turbo IMON Current	Sets the graphics turbo IMON current values. ► Options available are **14** to **31**. **31** is the default.
DVMT Pre-Allocated	Select the DVMT 5.0 Pre-allocated (Fixed) Graphic Memory size used by the Internal Graphic Device. ► 32M is the default.
DVMT Total Gfx Mem	Select the DVMT 5.0 Total Graphic Memory size used by the Internal Graphic Device. ► Options: **128MB, 256MB** (default) and **Max.**

5.3.1.2. Memory Configuration

Access this submenu to view the memory configuration.



5.3.2. PCH-IO Configuration



Setting	Description
PCI Express Configuration	See 5.3.2.1. PCI Express Configuration on page 85
USB Configuration	See 5.3.2.2. USB Configuration on page 85
HD Audio Configuration	► Control Detection of the HD-Audio device. Options available are: **Disabled**: HDA will be unconditionally disabled **Enabled**: HDA will be unconditionally Enabled **Auto** (default) = HDA will be enabled if present, disabled otherwise.
PCH LAN Controller	**Enabled** (default) / **disabled** onboard NIC. If enabled, “Wake on LAN” option will be available to enable (default) / disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

LAN PHY Drives LAN-WAKE#	**Enable** or **disable** (default) LAN Phy driving LAN-WAKE# else platform drives LAN_WAKE#. ► Wake on LAN **Enable** (default) or **disable** integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state)/ ► SLP_LAN# Low on DC Power **Enable** (default) or **disable** SLP_LAN# Low on DC Power
K1 Off	**Enable** (default) or **disable** K1 off feature (CLKREQ).

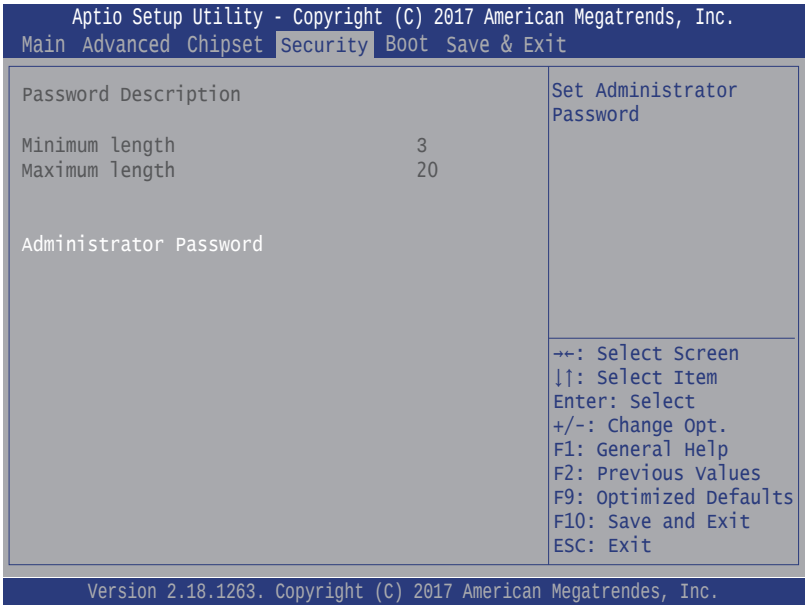
5.3.2.1. PCI Express Configuration

Setting	Description
PCI Express Root Port 1/5/6/10	**Enable** (default) or disable PCI Express Port.
ASPM Support	Disable or set the ASPM level. Force L0s will force all inks to L0s state. “Auto” will allow BIOS to auto configure.”Disable” will disable ASPM. ► Options: **Disabled** (default), **L0s**, **L1**, **L0sL1** and **Auto**.
L1 Substates	PCI Express L1 Substates settings. ► Options: **Disabled**, **L1.1**, **L1.2** and **L1.1 & L1.2** (default).
PCIe Speed	Select PCI Express port speed. ► Options: **Auto** (default), **Gen1**, **Gen2** and **Gen3**

5.3.2.2. USB Configuration

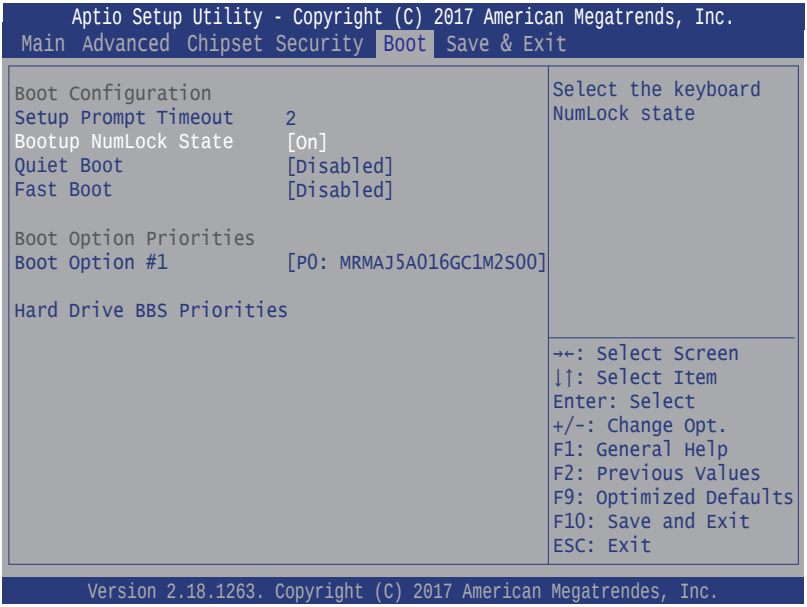
Setting	Description
USB Precondition	Precondition work on USB host controller and root ports for faster enumeration. ► Options: **Enable**/**Disable** (default).
XHCI Disable Compliance Mode	Options to disable Compliance Mode. Default is **FALSE** (default) to not disable Compliance Mode. Set **TRUE** to disable Compliance Mode.
xDCI Support	**Enable**/**disable** (default) xDCI (USB OTG Device).
USB Port Disable Override	Selectively **enable**/**disable** (default) the corresponding USB port from reporting a Device Connection to the controller.

5.4 Security



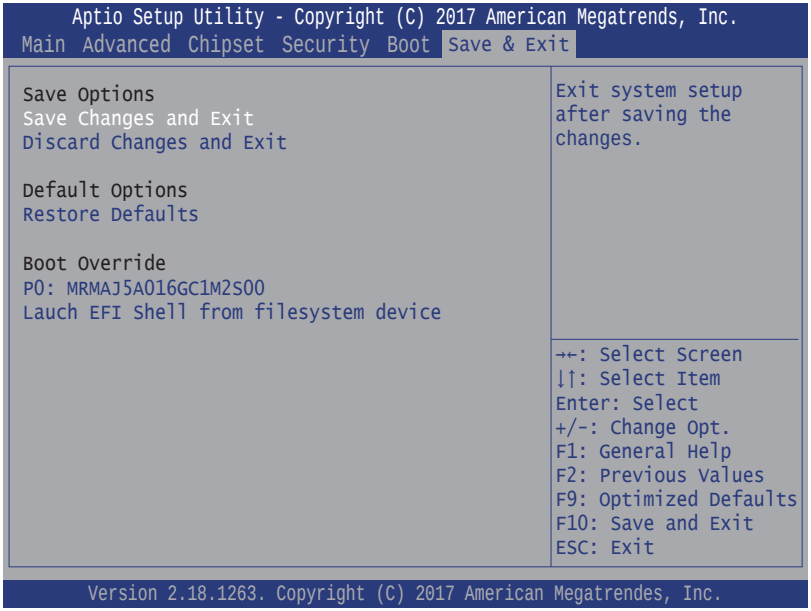
Setting	Description
Administrator Password	To set up an administrator password: 1. Select **Administrator Password**. 2. An **Create New Password** dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Hit [Enter] key to submit.

5.5. Boot



Setting	Description
Setup Prompt Timeout	Set how long to wait for the prompt to show for entering BIOS Setup. ► The default setting is **2** (sec). ► Set it to **65535** to wait indefinitely.
Bootup NumLock State	Sets whether to enable or disable the keyboard's NumLock state when the system starts up. ► Options available are **On** (default) and **Off**.
Quiet Boot	Sets whether to display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. ► Select **Disabled** to display the normal POST message, which is the default.
Fast Boot	Enables or disables (default) boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Boot Option Priority	Set the system boot priorities.
Hard Drive BBS Priorities	Sets the order of the legacy devices in this group. BBS means "BIOS Boot Specification".

5.6. Save & Exit



Setting	Description
Save Changes and Reset	Saves the changes and quits the BIOS Setup utility.
Discard Changes and Exit	Quits the BIOS Setup utility without saving the change(s).
Restore Defaults	Restores all settings to defaults. ► This is a command to launch an action from the BIOS Setup utility.
Boot Override	**Boot Override** presents a list in context with the boot devices in the system. ► **P0:** Select the device to boot up the system regardless of the currently configured boot priority. ► **Launch EFI Shell from filesystem device:** Attempts to launch EFI Shell Application (Shell.efi) from one of the available filesystem devices.