ARS-1000

USER Manual

Intel® Atom™ D525 Fanless and Compact Embedded Controller

Vecow

Worldwide Technical Support and Product Information
www.vecow.com
Vecow Corporate Headquarters
7F No 105 Zhongcheng Rd Tucheng Dist New Taipei City 23674 Taiwan R.O.C.
Tel: 886 2 2268 5658
Fax: 886 2 2268 1658
For further support information, refer to the Technical Support and Professional Services appendix. To comment on Vecow Co., Ltd. documentation, refer to the Vecow Co., Ltd. web site at www.vecow.com.

Record of Revision

Version	Date	Page	Description	Remark
V1.0.0	April 12 2012	All	Preliminary Release	
V1.0.1	June 22 2012			

Declaimer

This manual is intended to be used as a practical and informative guide only and is subject to change without prior notice. It does not represent commitment from Vecow Co., Ltd. Vecow shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of the product or documentation, nor for any infringements upon the rights of third parties, which may result from such use.

Declaration of Conformity

FCC 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.

CE The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

Copyright and Trademarks

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. Company/product names mentioned herein are used for identification

Packing List

Item	Description	Qty
1	ARS-1000 Series fanless controller (According to the configuration you order, the ARS-1000 series may contain HDD and DDR3 SO-DIMM. Please verify these items if necessary.)	1
2	Accessory box, which contains	
	• Vecow Drivers & Utilities DVD	1
	• Wall-mounting bracket	2
	• M4 screws for wall-mounting bracket	4
	• 2-pin pluggable terminal block	1
	• 3-pin pluggable terminal block	1
	• SATA HDD and power cable	1

Order Information

Part Number	Description
ARS-1000	Fanless Embedded Controller, 2 LAN, Isolated GPIO (8DI/8DO), 4 COM, 5 USB, Mini PCIe, PCI-104, One YCB-D15D9 included
ARS-1100	Fanless Embedded Controller, 2 LAN, Isolated GPIO (8DI/8DO), 4 COM, 5 USB, Mini PCIe, 1394a, PC/104+, One YCB-D15D9 included
ARS-1200	Fanless Embedded controller, 2 LANs, Isolated GPIO (8DI/8DO), 4 COMs, 5 USBs, Mini PCIe, 1394a, CAN, PC/104+, One YCB-D15D9 included
ARS-1500	Fanless Embedded controller, 2 LANs, Isolated GPIO (8DI/8DO), 8 COMs, 5 USBs, Mini PCIe, PC/104+, 4 YCB-D15D9 included
ARS-1600	Fanless Embedded controller, 2 LANs, Isolated GPIO (8DI/8DO), 8 COMs, 5 USBs, Mini PCIe, PC/104+, 4 YCB-D15D9 included

Optional Accessories

Part Number	Description
VMX-200-4	4-CH, D1, Real-time, Mini-PCI Express, 120 fps, Video Capture Card, include cables and SDK
VMX-200-8	8-CH, D1, Real-time, Mini-PCI Express, 240 fps, Video Capture Card, include cables and SDK
PWA-60WP3	60W, 24V, 100V_{AC} to 240V_{AC} Power Adapter
DIN ARS	Din-Rail Kit for ARS-1000 series
SCSI-20P-100	20-pin GPIO 8DI / 8DO Cable, 1M
TMB-SCSI-20P	Terminal Board with One 20-pin Connector and DIN-Rail Mounting
YCB-D15D9	Y Cable from DB15 to Two DB9

Table of Contents

1

General Introduction

1.1 Overview

ARS-1000 series is fanless embedded automation controller equipped with Intel ® Atom™ D525 1M cache, 1.8GHz processor, 2 Gigabit Ethernet ports, 3 RS-232 and 1 RS-232/422/485, external accessible CFast, 5 USB, Isolated DIO, Mini PCIe socket, and supports wide range DC-IN 16 to 28 V.

With fanless thermal, compact size, small footprint, and wide operating temperatures -20 ~ 70°C (-4 ~ 157°F), ARS-1000 series provides high performance, high versatility, and easy to install in field cabinets.

For further expansion, ARS-1000 model supports PCI-104, ARS-1100 supports 1394a and PC/104+. In addition, ARS-1000 series supports programmable GPIO 16-step rotary switch and 4 mode/status LED displays, in order to provide more adaptability for various environment requests.

With rich OS and driver supports, such as Windows XP Embedded, Windows XP Pro, and even Linux, ARS-1000 Series are application-ready platforms that provide multipurpose applications.

ARS-1000 series is value computing platforms for manufacturing executing systems, factory automation, and industrial applications.

1.2 Product Specification

1.2.1 Specification of Vecow ARS-1000

System Hardware	
CPU	Intel Atom D525, 1M Cache, 1.8GHz Processor
Chipset	ICH8M
Memory	Single Channel Supports 2 DDR3 SO-DIMM, up to 4GB
Storage	Internal Two 2.5" SATA/SATA II for HDD/SSD Outside Accessible CFast Slot
Mini PCIe	1
Display	Front DB 15 VGA Internal LVDS 24-bit
Audio	Internal Stereo Headphone, Internal Microphone
I/O Interface	
Serial Ports	3 RS-232, 1 RS-232/422/485 wtih Automatic Data Flow Control
LAN	2 Intel® GbE WG82583V
USB 2.0	Front: 2 Internal: 2 Mini PCIe: 1
Programmable GPIO	Isolation Protection on GPIO-16 (8DI/8DO) Sink/Wet Contact Source GPIO-4 (Programmable Status/Modes LED Display) 16-step Rotary Switch (States/Modes Select)
PCI-104	PCI-104 Slot, Supports 3.3V & +5V
General	
Certifications	CF, FCC Class A
Dimensions(W x H x D)	186mm x 147mm x 79mm (7.3" x 5.8" x 3.1")
Enclosure	Aluminum Heat-sink and Sheet Metal Chassis with Iron-gray Color
Mounting	Wall-mounting for DIN-rail
Power Requirements	ATX : 2-pin Remote Power On/Off Switch AT : Optional by Jumper Setting On-board DC-to-DC Power Support from 16 ~ 28 V DC
Weight	2.1 Kg (4.5 lb)
OS Support	Windows XP Embedded / Windows XP Pro and Above Linux Fedora 11 / Ubuntu 10.04 / Cent OS 5.3 / Kernel
System Design	Top Cover Heat-sink with Internal Heat Spreader for Fanless Design
Environmental	
Operating Temperature	-20°C to 70°C (-4°F to 157°F) Ambient Temperature with Air Flow
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	0% to 95% Humidity, Non-condensing
Shock Protection	IEC 68 2-27 CFast: 50G @ Wall-mount, Half Sine, 11ms HDD: 20G @ Wall-mount, Half Sine, 11ms
Vibration Protection	IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.) CFast: 5 Grms @ 5~500Hz, HDD: 1 Grms @ 5~500Hz

1.2.2 Specification of Vecow ARS-1100

System Hardware	
CPU	Intel Atom D525, 1M Cache, 1.8GHz Processor
Chipset	ICH8M
Memory	Single Channel Supports 2 DDR3 SO-DIMM, up to 4GB
Storage	Internal Two 2.5" SATA/SATA II for HDD/SSD Outside Accessible CFast Slot
Mini PCIe	1
Display	Front DB 15 VGA Internal LVDS 24-bit
Audio	Internal Stereo Headphone, Internal Microphone
I/O Interface	
Serial Ports	3 RS-232, 1 RS-232/422/485 wtih Automatic Data Flow Control
LAN	2 Intel® GbE WG82583V
USB 2.0	Front: 2 Internal: 2 Mini PCIe: 1
Programmable GPIO	Isolation Protection on GPIO-16 (8DI/8DO) Sink/Wet Contact Source GPIO-4 (Programmable Status/Modes LED Display) 16-step Rotary Switch (States/Modes Select)
PC/104+	PCI-104 Slot, Supports 3.3V & +5V
1394a	3 ports
General	
Certifications	CF, FCC Class A
Dimensions(W x H x D)	186mm x 147mm x 79mm (7.3" x 5.8" x 3.1")
Enclosure	Aluminum Heat-sink and Sheet Metal Chassis with Iron-gray Color
Mounting	Wall-mounting for DIN-rail
Power Requirements	ATX : 2-pin Remote Power On/Off Switch AT : Optional by Jumper Setting On-board DC-to-DC Power Support from 16 ~ 28 V DC
Weight	2.1 Kg (4.5 lb)
OS Support	Windows XP Embedded / Windows XP Pro and Above
System Design	Top Cover Heat-sink with Internal Heat Spreader for Fanless Design
Environmental	
Operating Temperature	-20°C to 70°C (-4°F to 157°F) Ambient Temperature with Air Flow
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	0% to 95% Humidity, Non-condensing
Shock Protection	IEC 68 2-27 CFast: 50G @ Wall-mount, Half Sine, 11ms HDD: 20G @ Wall-mount, Half Sine, 11ms
Vibration Protection	IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.) CFast: 5 Grms @ 5~500Hz, HDD: 1 Grms @ 5~500Hz

1.2.3 Specification of Vecow ARS-1200

System Hardware	
CPU	Intel Atom D525, 1M Cache, 1.8GHz Processor
Chipset	ICH8M
Memory	Single Channel Supports 2 DDR3 SO-DIMM, up to 4GB
Storage	Internal Two 2.5" SATA/SATA II for HDD/SSD Outside Accessible CFast Slot
Mini PCIe	1
PC/104 Slot	PC/104+ Slot, Support 3.3V and +5V
Display	Front DB 15 VGA Internal LVDS 24-bit
Audio	Internal Stereo Headphone, Internal Microphone
I/O Interface	
Serial Ports	3 RS-232, 1 RS-232/422/485 wtih Automatic Data Flow Control
LAN	2 Intel® GbE WG82583V
USB 2.0	Front: 2 Internal: 2 Mini PCIe: 1
Programmable GPIO	Isolation Protection on GPIO-16 (8DI/8DO) Sink/Wet Contact Source GPIO-4 (Programmable Status/Modes LED Display) 16-step Rotary Switch (States/Modes Select)
1394a	3 Ports
CAN	2 Ports
General	
Certifications	CF, FCC Class A
Dimensions(W x H x D)	186mm x 147mm x 79mm (7.3" x 5.8" x 3.1")
Enclosure	Aluminum Heat-sink and Sheet Metal Chassis with Iron-gray Color
Mounting	Wall-mounting for DIN-rail
Power Requirements	ATX : 2-pin Remote Power On/Off Switch AT : Optional by Jumper Setting On-board DC-to-DC Power Support from 16 ~ 28 V DC
Weight	2.1 Kg (4.5 lb)
OS Support	Windows XP Embedded / Windows XP Pro and Above
System Design	Top Cover Heat-sink with Internal Heat Spreader for Fanless Design
Environmental	
Operating Temperature	-20°C to 70°C (-4°F to 157°F) Ambient Temperature with Air Flow
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	0% to 95% Humidity, Non-condensing
Shock Protection	IEC 68 2-27 CFast: 50G @ Wall-mount, Half Sine, 11ms HDD: 20G @ Wall-mount, Half Sine, 11ms
Vibration Protection	IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.) CFast: 5 Grms @ 5~500Hz, HDD: 1 Grms @ 5~500Hz

1.2.4 Specification of Vecow ARS-1500

System Hardware	
CPU	Intel Atom D525, 1M Cache, 1.8GHz Processor
Chipset	ICH8M
Memory	Single Channel Supports 2 DDR3 SO-DIMM, up to 4GB
Storage	Internal Two 2.5" SATA/SATA II for HDD/SSD Outside Accessible CFast Slot
Mini PCIe	1
PC/104 Slot	PC/104+ Slot, Support 3.3V and +5V
Display	Front DB 15 VGA Internal LVDS 24-bit
Audio	Internal Stereo Headphone, Internal Microphone
I/O Interface	
Serial Ports	3 RS-232, 1 RS-232/422/485 wtih Automatic Data Flow Control Additional 4 RS-232
LAN	2 Intel® GbE WG82583V
USB 2.0	Front: 2 Internal: 2 Mini PCIe: 1
Programmable GPIO	Isolation Protection on GPIO-16 (8DI/8DO) Sink/Wet Contact Source GPIO-4 (Programmable Status/Modes LED Display) 16-step Rotary Switch (States/Modes Select)
General	
Certifications	CF, FCC Class A
Dimensions(W x H x D)	186mm x 147mm x 79mm (7.3" x 5.8" x 3.1")
Enclosure	Aluminum Heat-sink and Sheet Metal Chassis with Iron-gray Color
Mounting	Wall-mounting for DIN-rail
Power Requirements	ATX : 2-pin Remote Power On/Off Switch AT : Optional by Jumper Setting On-board DC-to-DC Power Support from 16 to 28 V DC
Weight	2.1 Kg (4.5 lb)
OS Support	Windows XP Embedded / Windows XP Pro and Above
System Design	Top Cover Heat-sink with Internal Heat Spreader for Fanless Design
Environmental	
Operating Temperature	-20°C to 70°C (-4°F to 157°F) Ambient Temperature with Air Flow
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	0% to 95% Humidity, Non-condensing
Shock Protection	IEC 68 2-27 CFast: 50G @ Wall-mount, Half Sine, 11ms HDD: 20G @ Wall-mount, Half Sine, 11ms
Vibration Protection	IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.) CFast: 5 Grms @ 5~500Hz, HDD: 1 Grms @ 5~500Hz

1.2.5 Specification of Vecow ARS-1600

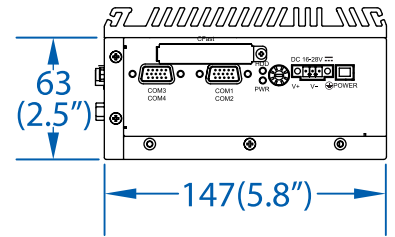| System Hardware	
CPU	Intel Atom D525, 1M Cache, 1.8GHz Processor
Chipset	ICH8M
Memory	Single Channel Supports 2 DDR3 SO-DIMM, up to 4GB
Storage	Internal Two 2.5" SATA/SATA II for HDD/SSD Outside Accessible CFast Slot
Mini PCIe	1
PC/104 Slot	PC/104+ Slot, Support 3.3V and +5V
Display	Front DB 15 VGA Internal LVDS 24-bit
Audio	Internal Stereo Headphone, Internal Microphone
I/O Interface	
Serial Ports	3 RS-232, 1 RS-232/422/485 wtih Automatic Data Flow Control additional 4 RS-232
LAN	2 Intel® GbE WG82583V
USB 2.0	Front: 2 Internal: 2 Mini PCIe: 1
Programmable GPIO	Isolation Protection on GPIO-16 (8DI/8DO) Sink/Wet Contact Source GPIO-4 (Programmable Status/Modes LED Display) 16-step Rotary Switch (States/Modes Select)
CAN	2 Ports
General	
Certifications	CF, FCC Class A
Dimensions(W x H x D)	186mm x 147mm x 79mm (7.3" x 5.8" x 3.1")
Enclosure	Aluminum Heat-sink and Sheet Metal Chassis with Iron-gray Color
Mounting	Wall-mounting for DIN-rail
Power Requirements	ATX : 2-pin Remote Power On/Off Switch AT : Optional by Jumper Setting On-board DC-to-DC Power Support from 16 ~ 28 V DC
Weight	2.1 Kg (4.5 lb)
OS Support	Windows XP Embedded / Windows XP Pro and Above
System Design	Top Cover Heat-sink with Internal Heat Spreader for Fanless Design
Environmental	
Operating Temperature	-20℃ to 70℃ (-4°F to 157°F) Ambient Temperature with Air Flow
Storage Temperature	-40℃ to 85℃ (-40°F to 185°F)
Humidity	0% to 95% Humidity, Non-condensing
Shock Protection	IEC 68 2-27 CFast: 50G @ Wall-mount, Half Sine, 11ms HDD: 20G @ Wall-mount, Half Sine, 11ms
Vibration Protection	IEC 68 2-64 (Random 1 Oct./min, 1hr/axis.) CFast: 5 Grms @ 5~500Hz, HDD: 1 Grms @ 5~500Hz

1.2.6 Specification of Optional Video Capture Card-VMX-200-4

General	
Bus Type / Form Factor	Mini PCI Express
Dimensions (L x H)	51mm x 30mm (2.0" x 1.2")
I/O connector	1x 16 pin headers to D-Sub 15 cables 1x D-Sub 15 to BNC cable
Environment Certification	FCC, CE, RoHS Compliance
Storage Temperature	-40°C to 85°C
Operate Temperature	0°C to 60°C
Video	
Maximum Channel Number	4
Input Connector	4 input BNC to D-Sub 15
Resolution	D1 (NTSC: 720 x 480 / PAL: 720 x 576) CIF (NTSC: 360 x 240 / PAL: 360 x 288) 4CIF (NTSC: 704 x 480 / PAL: 704 x 576) DCIF (NTSC: 528 x 320 / PAL: 528 x 384) QCIF (NTSC: 180 x 120 / PAL: 180 x 144)
Recording Rate	4CH with full D1 resolution 120 fps on NTSC system, 100 fps on PAL system
Video Compression Format	H.264 / MJPEG
Audio	
Maximum Channel Number	4 mono or 2 stereo
Audio Input Connector	4 input RCA to D-Sub 15
Software	
OS Support	WindowsXP/VISTA/Windows7 (32 Bits or 64 Bits) Standard Linux kernel 2.6.32 and all above
SDK	VC++ / .NET
Recommend System	
CPU	Intel Core 2 Duo E4500 2.2GHz
Memory	1GB
Graphics Unit	DirectX 9.0c compatible display card
Storage Size	500GB

1.2.7 Specification of Optional Video Capture Card-VMX-200-8

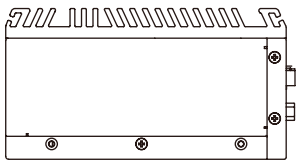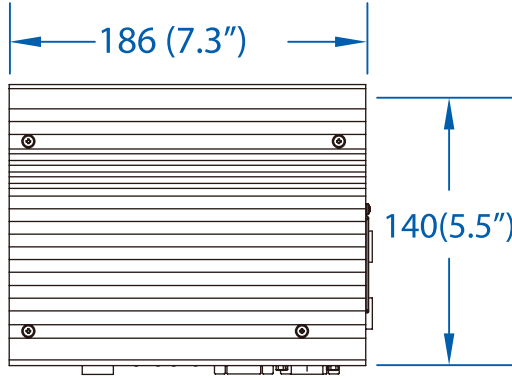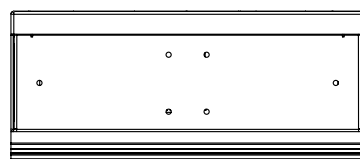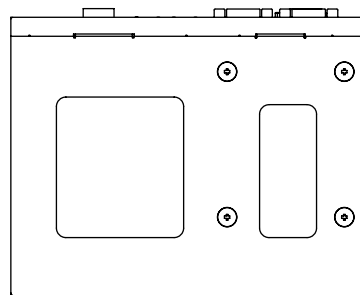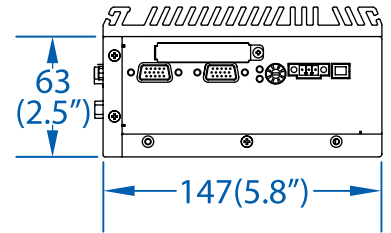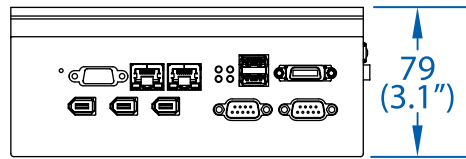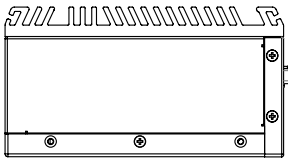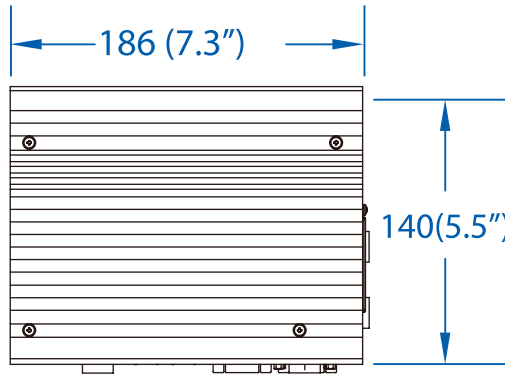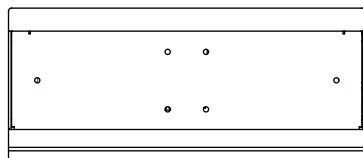| General	
Bus Type / Form Factor	Mini PCI Express
Dimensions (L x H)	51mm x 30mm (2.0" x 1.2")
I/O connector	2x 16 pin headers to D-Sub 15 cables 2x D-Sub 15 to BNC cable
Environment Certification	FCC, CE, RoHS Compliance
Storage Temperature	-40°C to 85°C
Operate Temperature	0°C to 60°C
Video	
Maximum Channel Number	8
Input Connector	2x 4 input BNC to D-Sub 15
Resolution	D1 (NTSC: 720 x 480 / PAL: 720 x 576) CIF (NTSC: 360 x 240 / PAL: 360 x 288) 4CIF (NTSC: 704 x 480 / PAL: 704 x 576) DCIF (NTSC: 528 x 320 / PAL: 528 x 384) QCIF (NTSC: 180 x 120 / PAL: 180 x 144)
Recording Rate	8CH with full D1 resolution 240 fps on NTSC system, 100 fps on PAL system
Video Compression Format	H.264 / MJPEG
Audio	
Maximum Channel Number	8 mono or 2 stereo
Audio Input Connector	2x 4 input RCA to D-Sub 15
Software	
OS Support	WindowsXP/VISTA/Windows7 (32 Bits or 64 Bits) Standard Linux kernel 2.6.32 and all above
SDK	VC++ / .NET
Recommend System	
CPU	Intel Core 2 Quad Q8400 2.66GHz
Memory	1GB
Graphics Unit	DirectX 9.0c compatible display card
Storage Size	750GB

1.3 Mechanical Dimension

ARS-1000 Model Dimension
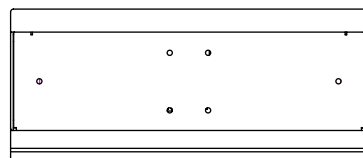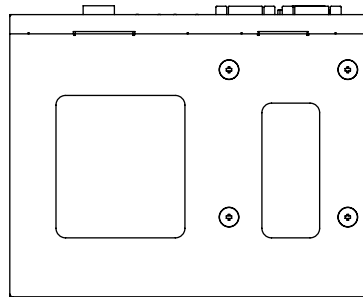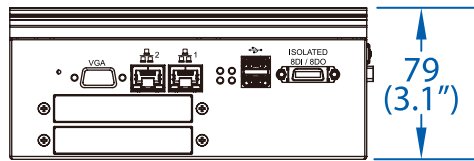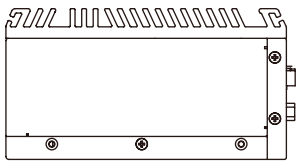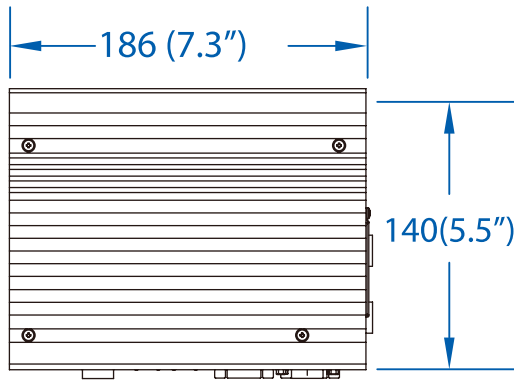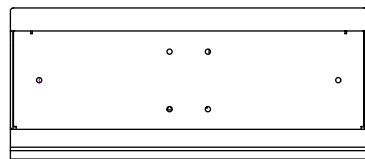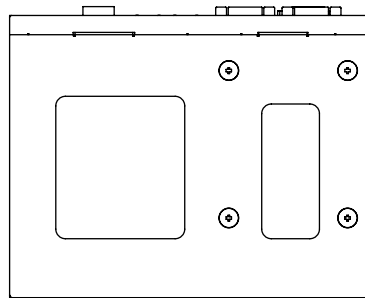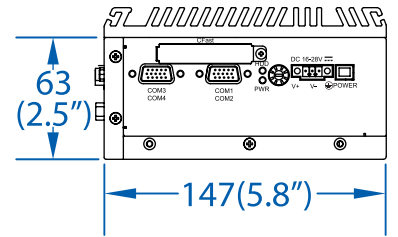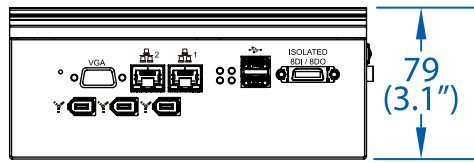
Unit : mm (inch)

186 (7.3")

140(5.5")

VGA   2   1   ISOLATED
              8DI / 8DO

79
(3.1")

63
(2.5")

COM3   COM1   PWR   V+ V-   POWER
COM4   COM2

147(5.8")

ARS-1100 Model Dimension

Unit : mm (inch)

186 (7.3")

140(5.5")

79 (3.1")

63 (2.5")

147(5.8")

VGA

ISOLATED
8DI / 8DO

CFast

COM3
COM4

COM1
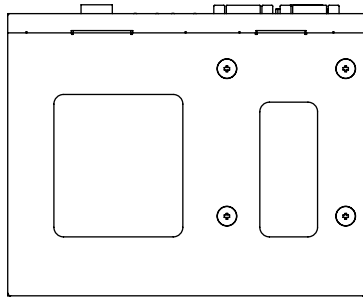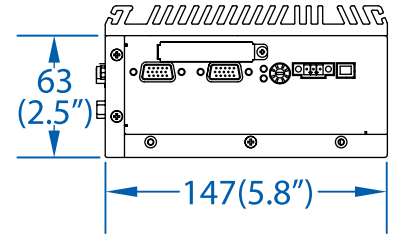COM2

PWR

V+   V-   POWER

DC 16-28V

ARS-1200 Model Dimension

Unit : mm (inch)

186 (7.3")

140(5.5")

79 (3.1")

63 (2.5")

147(5.8")

ARS-1500 Model Dimension

Unit : mm (inch)
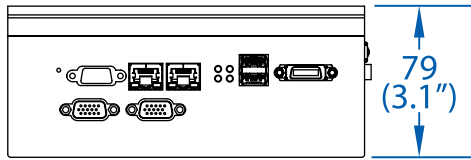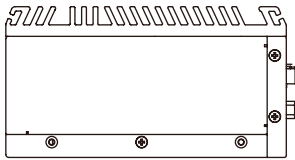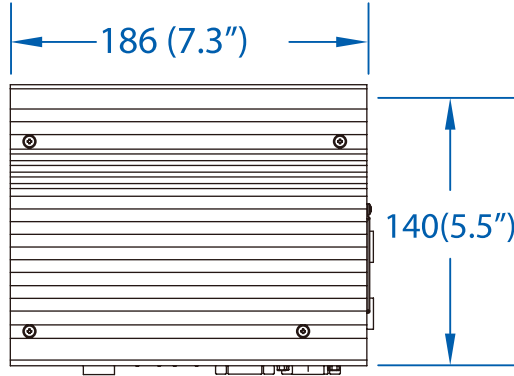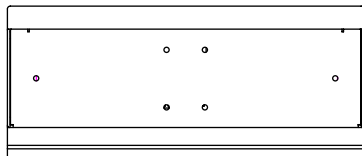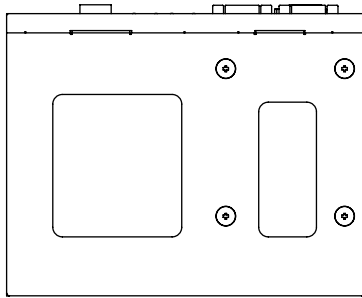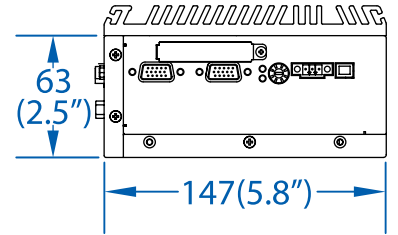
186 (7.3")

140(5.5")

79 (3.1")

63 (2.5")

147(5.8")

ARS-1600 Model Dimension

Unit : mm (inch)

186 (7.3")

140(5.5")

79 (3.1")

63 (2.5")

147(5.8")
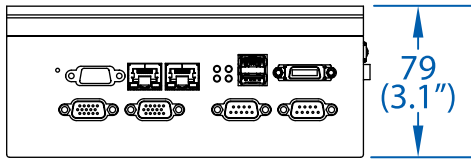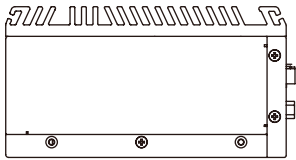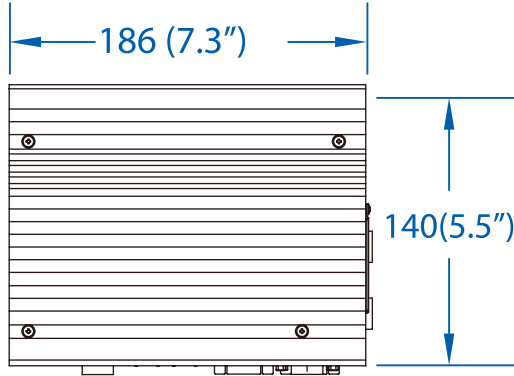
2

Hardware Installation

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

2.1 Front Side External I/O Connectors
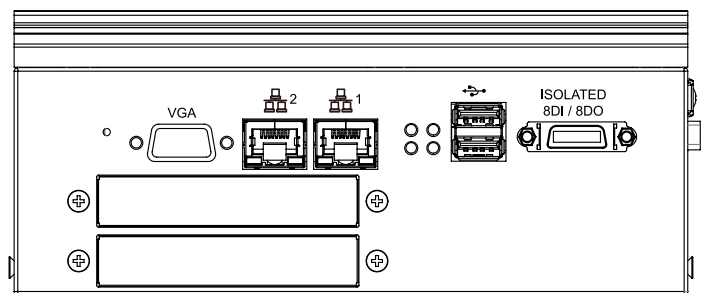
ARS-1000
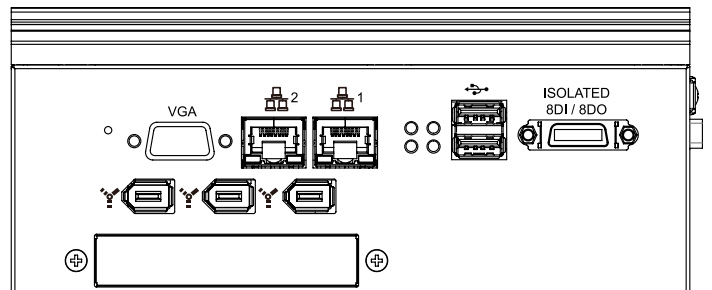
ARS-1100

2.1.1 VGA Connector
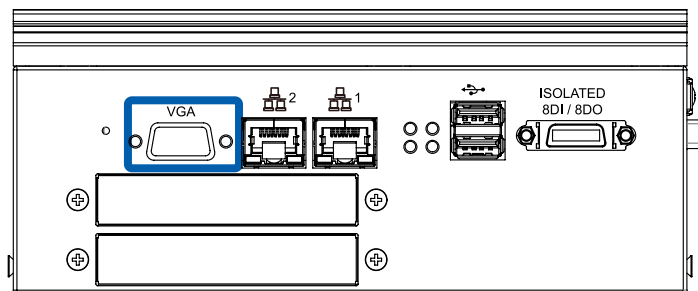
The ARS-1000 comes with a DB15 female connector on the front panel to connect a VGA monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the ARS-1000. The pin assignments of the VGA connector are shown below.
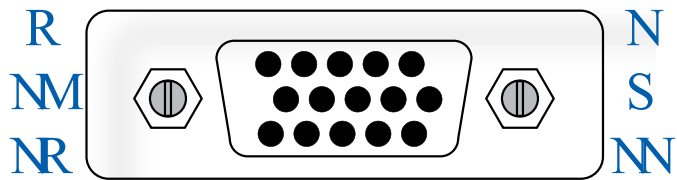
VGAA1

Pin No.	Description
1	Red Color Signal
2	Green Color Signal
3	Blue Color Signal
4	NC
5	Ground
6	VGA Detect
7	Ground
8	Ground
9	VCC
10	Ground
11	NC
12	DDC-DATA
13	H-Sync.
14	V-Sync.
15	DDC-CLK

2.1.2 10/100/1000 Mbps Ethernet Port
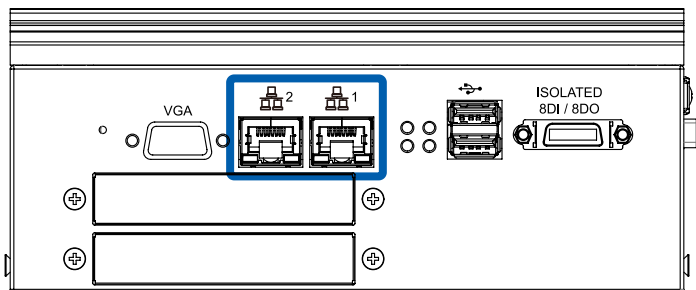
The 10/100/1000 Mbps Ethernet LAN ports 1 and 2 use 8-pin RJ-45 connector. LAN1 and LAN2 are equipped with Intel 82583V. Using suitable RJ-45 cable, you can connect ARS-1000 system to a computer, or to any other piece of equipment that has an Ethernet connection, for example, a hub or a switch. Moreover, both of them have Wake-on-LAN and Preboot Execution Environment capabilities. The following diagram shows the pinouts for LAN1 and LAN2 port.

Pin No.	10 / 100 Mbps	1000 Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	------	MDI2_P
5	------	MDI2_N
6	E_RX-	MDI1_N
7	------	MDI3_P
8	------	MDI3_N

The Ethernet ports use standard RJ-45 jack connectors with LED indicators on the front side to show Active/Link status and Speed status.

The LED indicators on the right bottom corners glow a solid green color when the cable is properly connected to a 100 Mbps Ethernet network. The LED indicator on the left bottom corner will flash on and off when Ethernet packets are being transmitted or received.

The LED indicators on the right bottom corners glow a solid orange color when the cable is properly connected to a 1000 Mbps Ethernet network. The LED indicator on the left bottom corner will flash on and off when Ethernet packets are being transmitted or received.
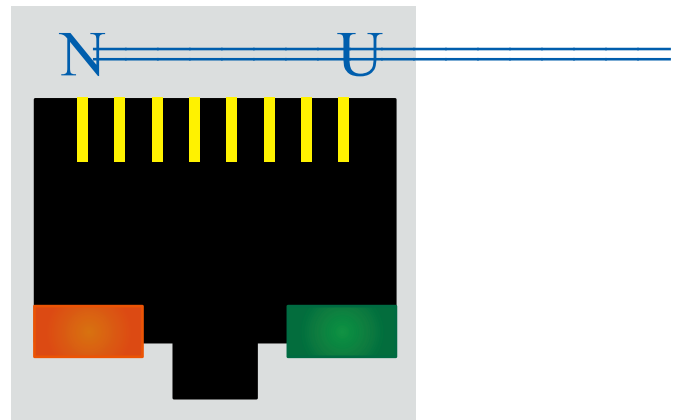
LED	10 Mbps	100 Mbps	1000 Mbps
Right bottom LED	Off	Solid Green	Solid Orange
Left bottom LED	Flash Yellow	Flash Yellow	Flash Yellow

2.1.3 GPIO LED Indicator
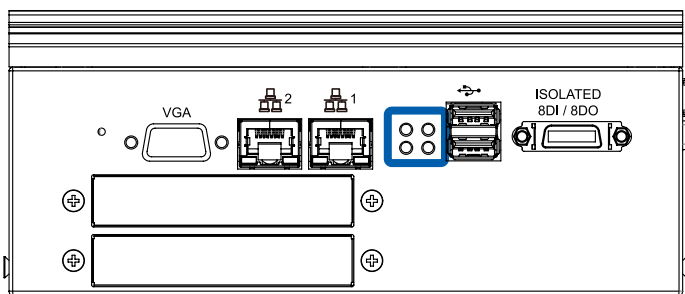
The ARS-1000 offers 4 programmable LEDs on front panel. If the LED is on, it indicates that the mapping SIO GPIO pin is logic high level. If the LED is off, it indicates that the mapping SIO GPIO pin is logic low level.

Definition	Mapping to SIO GPIO Function
Programmable LDE1	SIO_GP64
Programmable LDE2	SIO_GP65
Programmable LDE3	SIO_GP66
Programmable LDE4	SIO_GP67

2.1.4 USB Dual Port
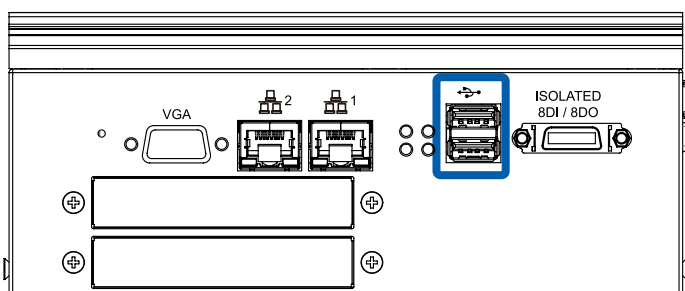
The ARS-1000 comes with 2 USB 2.0 hosts on the front panel. The USB interface supports Plug and Play, which enables you to connect or disconnect a device whenever you want, without turning off the system. The hosts can be used for an external flash disk or hard drive for storing large amounts of data. You can also use these USB hosts to connect to a keyboard or a mouse. The following diagram shows the pinouts for USB1 and USB2 port.
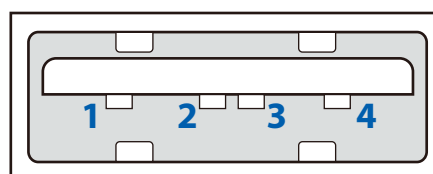
Pin No.	USB1	USB2
1	+5V	+5V
2	USB1-	USB2-
3	USB1+	USB2+
4	GND	GND

2.1.5 Isolated 8-DI / 8-DO
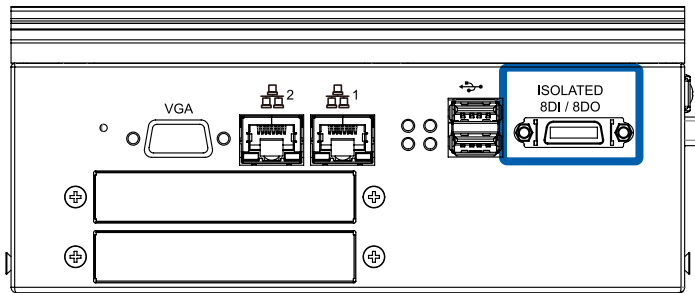
The ARS-1000 offers a 16-bit DIO (8-DI / 8-DO) connector. Each bit of DI and DO equipped with a photo-coupler for isolated protection. A power buffer device TPD2007F integrated in 8-DO circuit for motors, solenoids, and lamp driver applications.

Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT0	SIO_GPI50
2	INPUT 1	SIO_GPI51
3	INPUT 2	SIO_GPI52
4	INPUT 3	SIO_GPI53
5	INPUT 4	SIO_GPI54
6	INPUT 5	SIO_GPI55
7	INPUT 6	SIO_GPI56
8	INPUT 7	SIO_GPI57
9	DI_COM	
10	GND	
11	OUTPUT0	SIO_GPO20
12	OUTPUT 1	SIO_GPO21
13	OUTPUT 2	SIO_GPO22
14	OUTPUT 3	SIO_GPO23
15	OUTPUT 4	SIO_GPO24
16	OUTPUT 5	SIO_GPO25
17	OUTPUT 6	SIO_GPO26
18	OUTPUT 7	SIO_GPO27
19	N.C.	
20	External 24V$_{DC}$ Input	

GPI SINK Mode

Isolated GPI input circuit in SINK mode (NPN) is illustrated as follows.
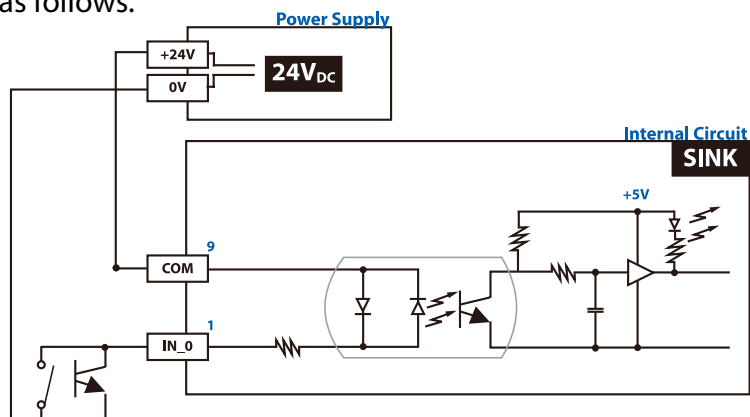
GPI SOURCE Mode

Digital GPI input signal circuit in SOURCE mode (PNP) is illustrated as follow:
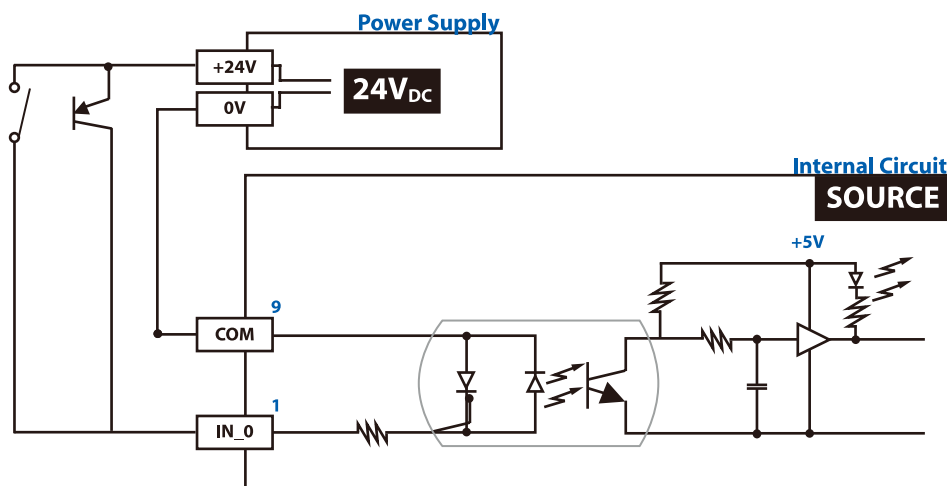
GPO SINK Mode:

Digital GPO output circuit in SINK mode (NPN) is illustrated below.
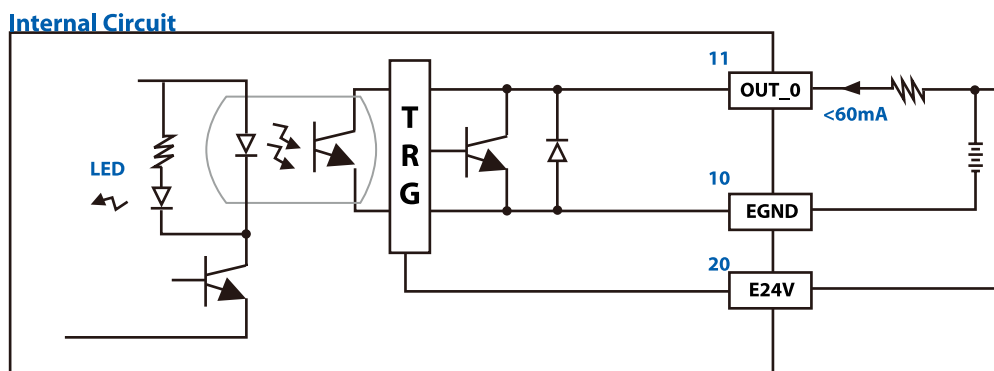
2.1.6 Reset Tact Switch
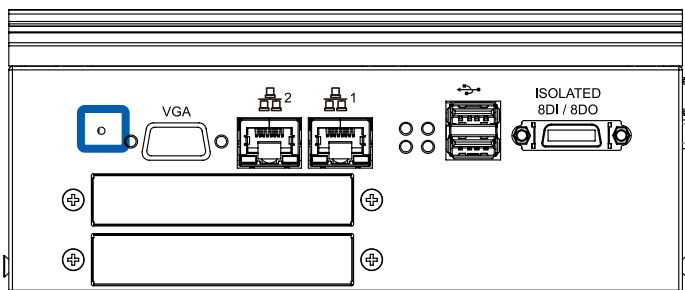
Use this switch to reset the system without turning off the power. Momentarily pressing the switch will activate a reset.

2.2 Top Side External I/O Connectors
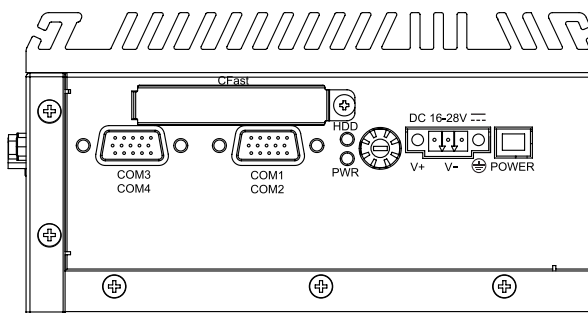
2.2.1 Remote Power ON / OFF Switch
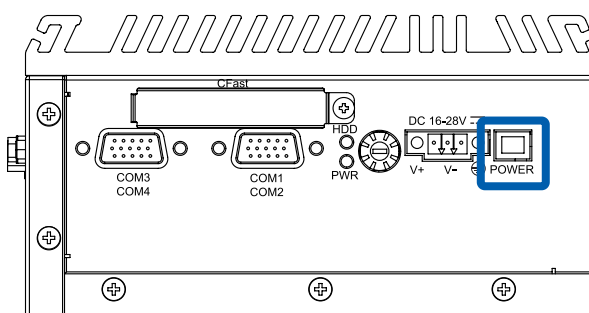
It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block support dual function of soft power-on / power-off (instant off or delay 4 second), and suspend mode.

2.2.2 DC-IN 16~28V Power Terminal Block with Screw Lock
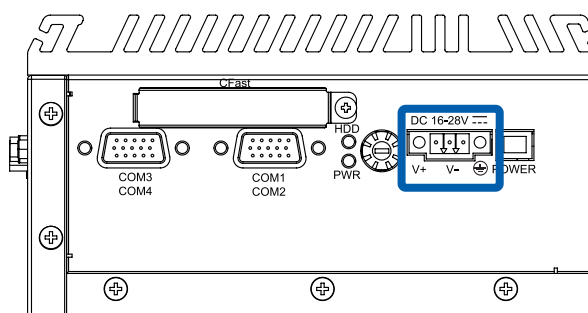
The ARS-1000 offers 16 to 28 VDC power input with the terminal block. If the power is supplied properly, the Power LED will light up a solid green.

Grounding and write routing help limit the effects of noise due to EMI. Run the ground connection from the ground screw to the grounding surface prior to connecting the power.

See the figure shown below for the location of the earth ground on the terminal block power connector. Connect the earth ground wire to an appropriate grounded metal surface.

DC 16-28V

V+   V-   ⏚
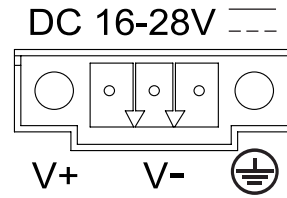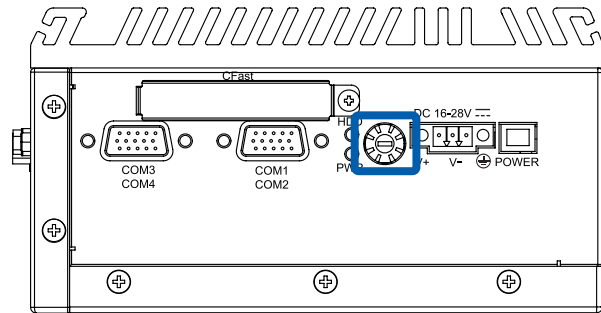
2.2.3 Rotary Switch

The rotary switch is for board number switch. If there are more than on ARS-1000 install in the group, it is necessary to specify the ID for each board respectively by configuring the rotary switch.

Mapping to SIO GPIO Function					
Item	SIO_GP60	SIO_GP61	SIO_GP62	SIO_GP63	GND
Rotary Switch Position	1	2	4	8	C
0					●
1	●				●
2		●			●
3	●	●			●
4			●		●
5	●		●		●
6		●	●		●
7	●	●	●		●
8				●	●
9	●			●	●
A		●		●	●
B	●	●		●	●
C			●	●	●
D	●		●	●	●
E		●	●	●	●
F	●	●	●	●	●

Note: "●"connecting to common mode connection (GND)

2.2.4 Power and HDD LED Indicators
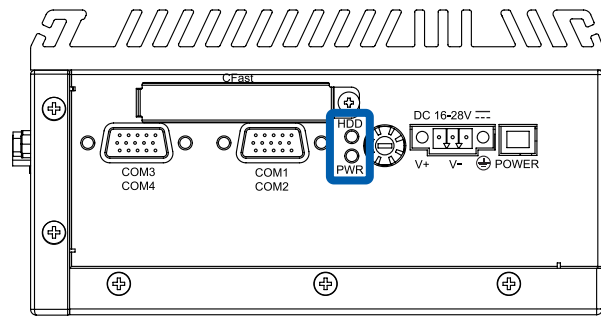
Yellow-HDD LED : A hard disk / CFast LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

Green-Power LED : If the LED is solid green, it indicates that the system is powered on.

2.2.5 Serial Port COM1 / COM2
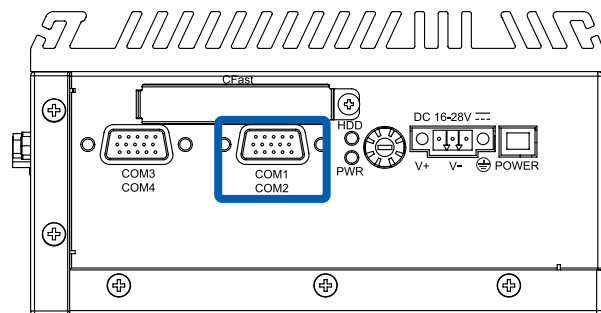
Serial ports 1 and 2 have combined in a male DB15 connector and port 2 can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. Serial Port 2 default setting is RS-232, if you want to use RS-422 or RS-485, you can find the setting in BIOS . You can use the Y-type cable to convert the 15-pin D-Sub connector into two 9-pin D-Sub connectors to connect both COM1 and COM2 at the same time. The pin assignments are shown in the following table:

Serial Port	Pin No.	RS-232	RS-422 (4-Wire)	RS-485 (2-Wire)
1	1	DCD	-----	-----
	2	RXD	-----	-----
	3	TXD	-----	-----
	4	DTR	-----	-----
	5	GND	-----	-----
	6	DSR	-----	-----
	7	RTS	-----	-----
	8	CTS	-----	-----
	9	RI	-----	-----
	10	-----	-----	-----
2	11	RXD	RXD+	-----
	12	TXD	422-RXD-	-----
	13	RTS	422-TXD+	DATA+
	14	CTS	422-TXD-	DATA-
	15	GND	GND	GND

2.2.6 Serial Port COM3 / COM4
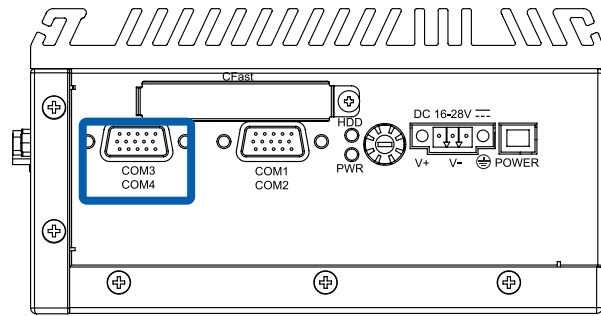
Serial ports 3 and 4 have combined in a male DB15 connector. You can use the Y-type cable to convert the 15-pin D-Sub connector into two 9-pin D-Sub connectors to connect both COM3 and COM4 at the same time. The pin assignments are shown in the following table:

Serial Port	Pin No.	Definition
3	1	DCD
	2	RXD
	3	TXD
	4	DTR
	5	GND
	6	DSR
	7	RTS
	8	CTS
	9	RI
	10	-----
4	11	RXD
	12	TXD
	13	RTS
	14	CTS
	15	GND

2.2.6 CFast
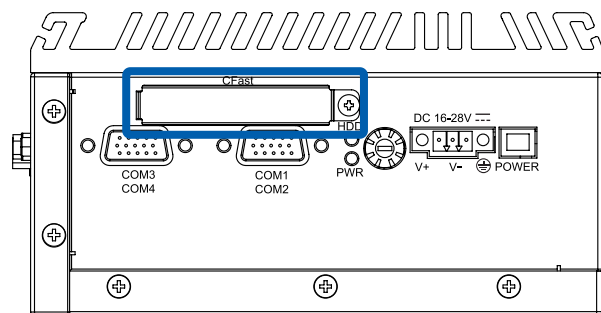
The ARS-1000 system comes with a CFast socket. Be sure to disconnect the power source and unscrew the CFast socket cover before installing a CFast card. The ARS-1000 does not support the CFast hot swap and PnP (Plug and Play) functions. It is necessary to remove power source first before inserting or removing the CFast card. The following table shows the pinouts for CFast port:

Pin No.	Definition
S1	GND
S2	SATA_TX_P2
S3	SATA_TX_N2
S4	GND
S5	SATA_RX_N2
S6	SATA_RX_P2
S7	GND
PC1	NC
PC2	GND
PC3	NC
PC4	NC
PC5	NC
PC6	NC
PC7	GND
PC8	NC
PC9	CFAST_LED_N
PC10	NC
PC11	NC
PC12	NC
PC13	+3.3V
PC14	+3.3V
PC15	GND
PC16	GND
PC17	NC

2.3 Main Board Expansion Connectors

Block Diagram

The block diagram depicts the relationships among the interfaces or modules on the main board. Please refer to the following figure for the main board's layout design.
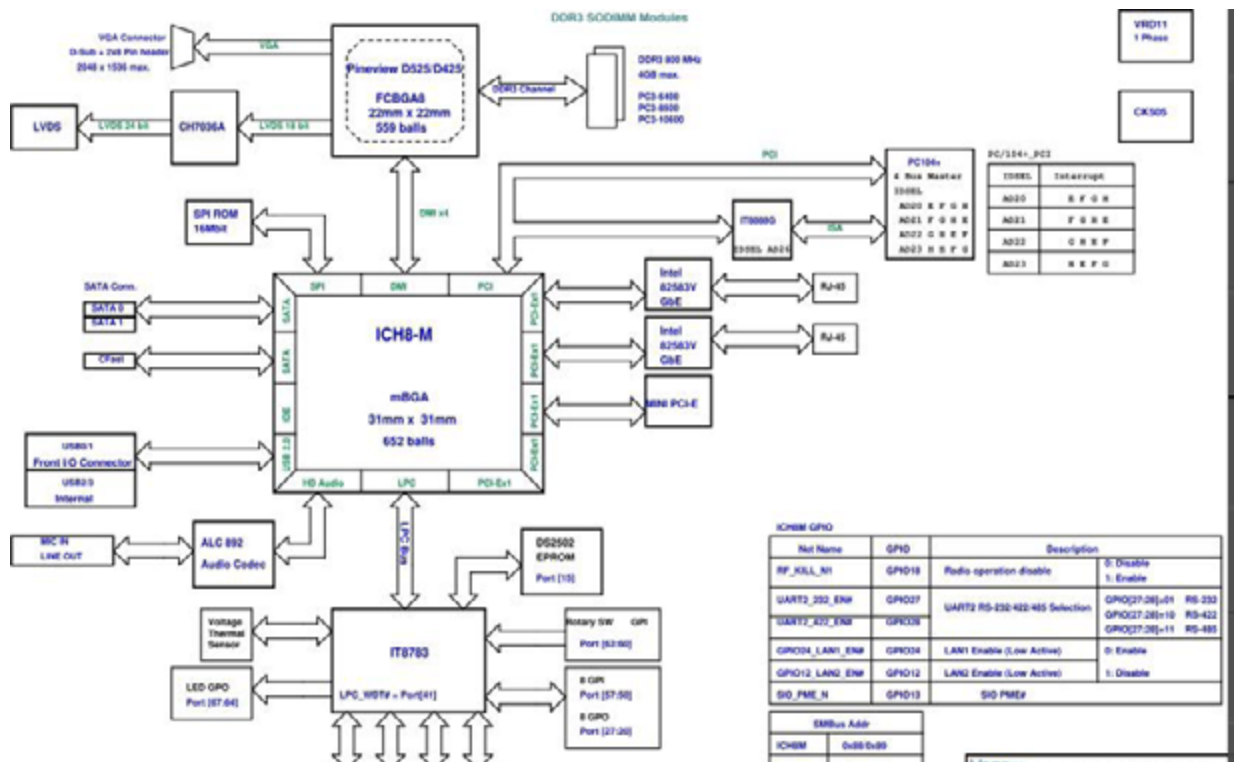
The figure below is the top view of the ARS-1000 main board which is the main board used in the ARS-1000 Series system. It shows the location of the connectors.
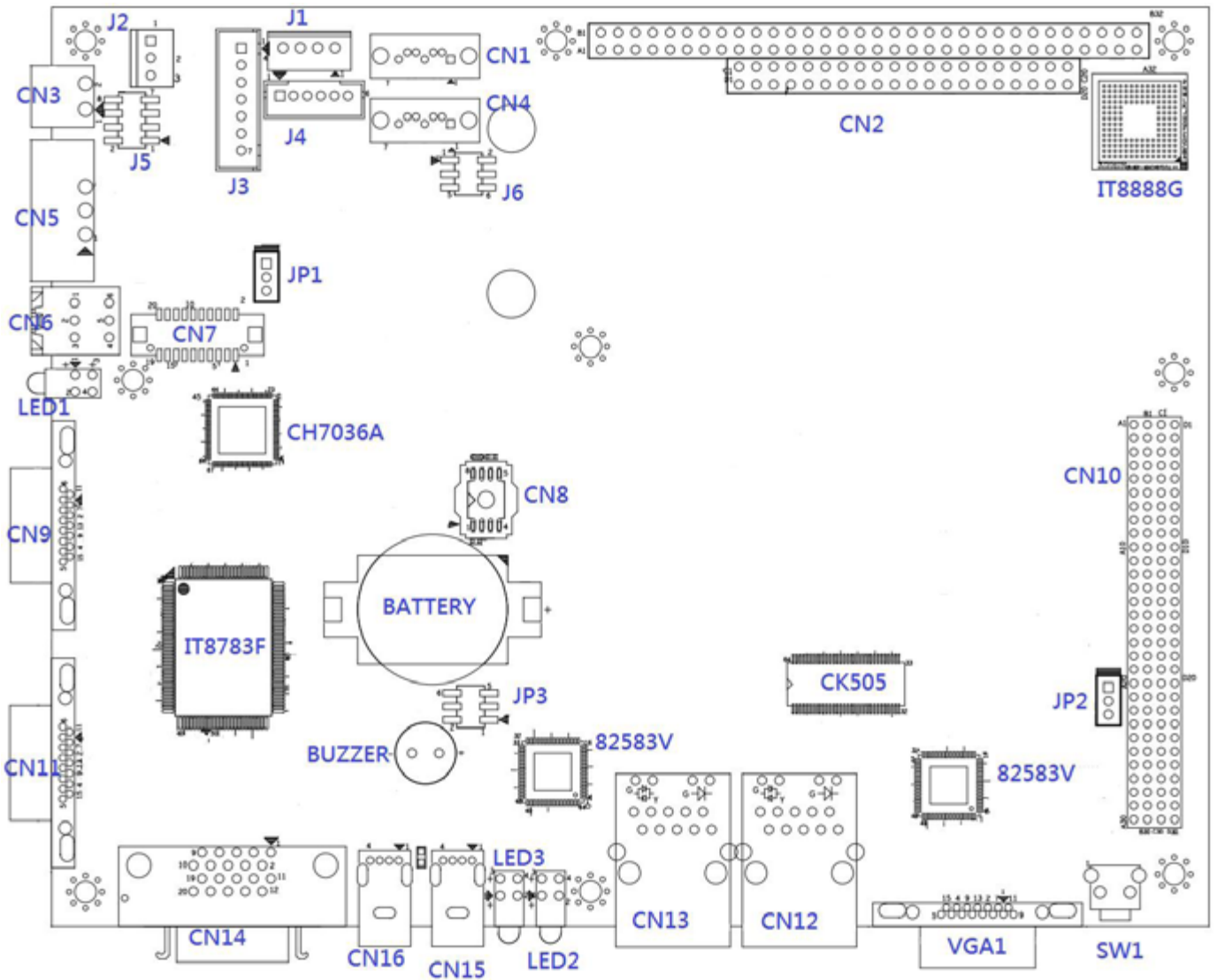
The figure below is the bottom view of the ARS-1000 main board.
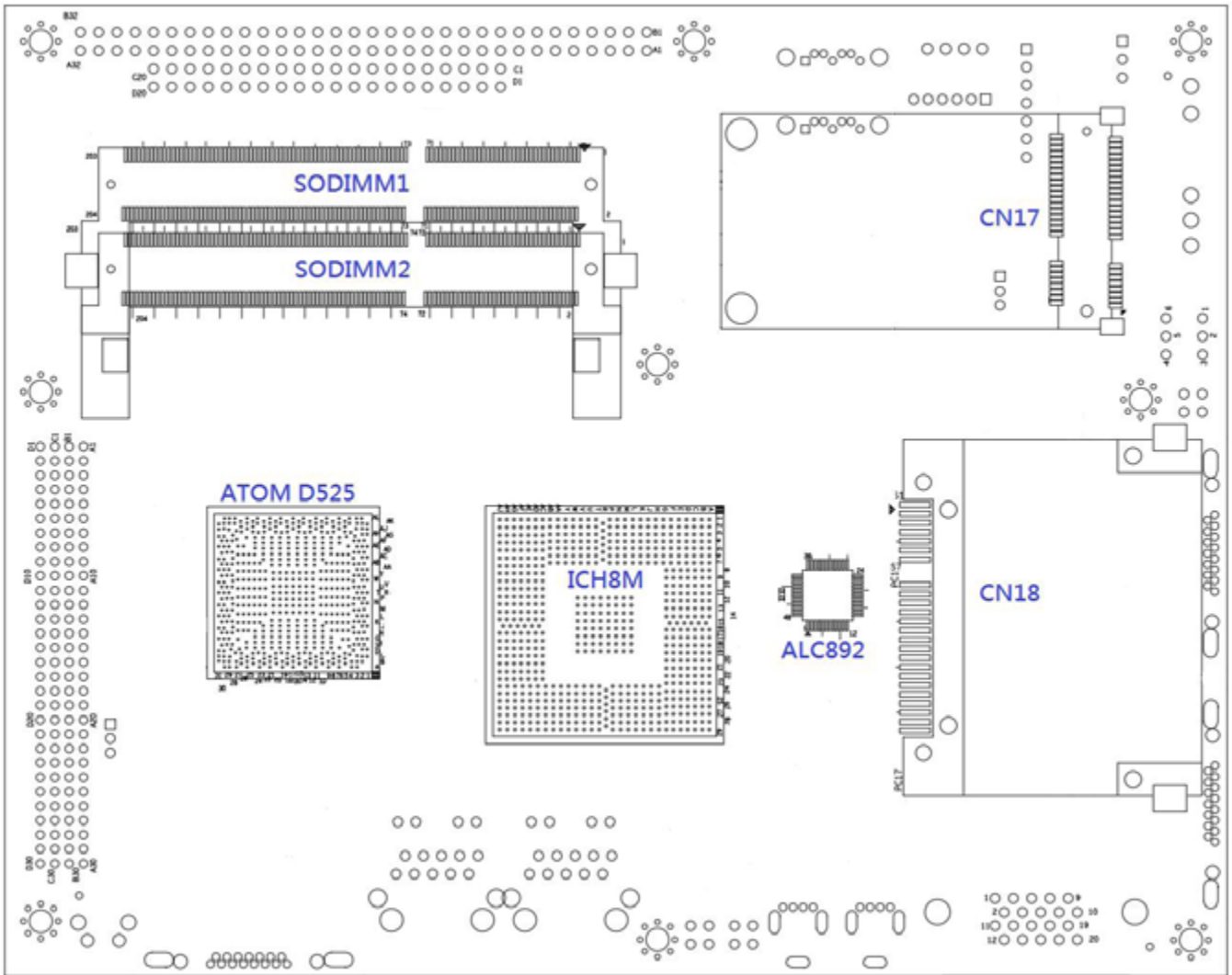
2.3.1 J2 Additional Power Supply for L2 Board
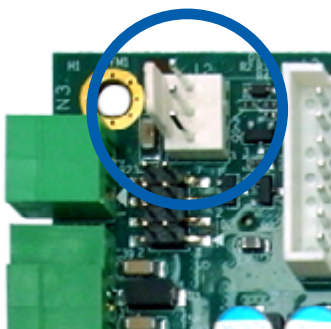
This 3-pin wafer is not a FAN using connector. J2 is identical to power DC input connector J5, and reserved for applying more power rail option in ARS-1100 Layer 2 board application.

Pin No.	Definition
1	FRAME GND
2	GND
3	VIN (DC 16V ~ 28V)

2.3.2 J5 Miscellaneous Pin Header
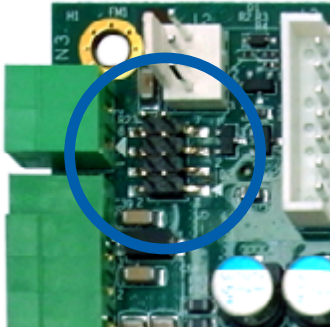
These pin headers can be used as a backup for the following functions: hard drive LED indicator, reset button, power LED indicator, and power-on/off button. The front and top panel already provides access to these functions. The following table shows the pinouts for Miscellaneous port

Group	Pin No.	Definition
HDD LED	1	HDLED
	3	HD_LED_N
Reset Button	5	FP_RST_BTN_N
	7	GND
Power LED	2	PWRLED
	4	PWROK_100MS_N
Power Button	6	FP_PWR_BTN_N
	8	GND

2.3.3 CN7, J3 LVDS

CN7
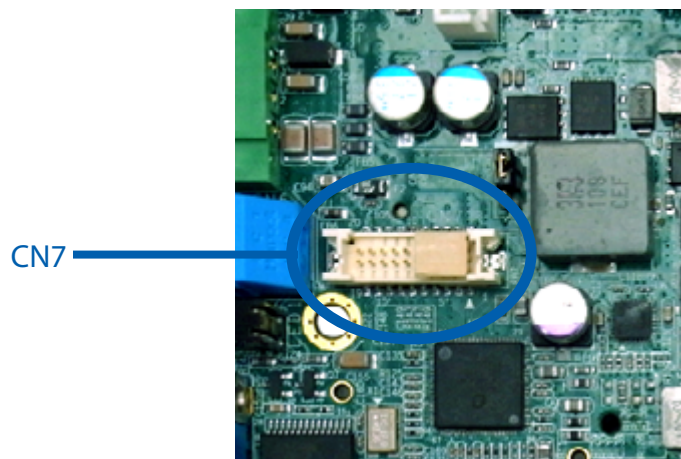
The ARS-1000 supports single-channel 24-bit LVDS Panel up to 1366x768 pixels panel resolution.

Pin No.	Definition
1	LDDC_CLK
2	LDDC_DATA
3	PANEL1_VDD
4	LA_CN_DATA0_P
5	LA_CN_DATA3_P
6	LA_CN_DATA0_N
7	LA_CN_DATA3_N
8	PANEL1_VDD
9	GND
10	LA_CN_DATA1_P
11	LA_CN_CLKP
12	LA_CN_DATA1_N

13	LA_CN_CLKN
14	GND
15	GND
16	PANEL1_BACKLIGHT
17	LA_CN_DATA2_P
18	PANEL1_BACKLIGHT
19	LA_CN_DATA2_N
20	GND
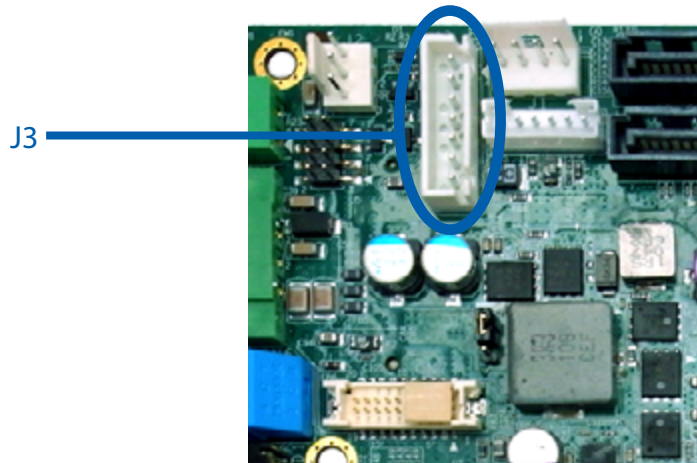
The LCD inverter is connected to J3 via a JST 7-pin, 2.5mm connector to provide +5V/+12V power to the LCD display.

Pin No.	Definition
1	+5V
2	+12V
3	+12V
4	LBKLT_CTL
5	GND
6	GND
7	LBKLT_EN

2.3.4 CN1, CN4 SATA Connector J1 SATA Power Connector
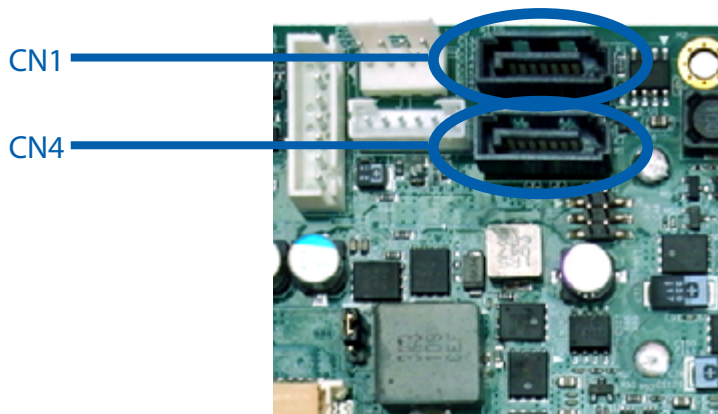
The ARS-1000 features two high performance Serial ATA interfaces that eases cabling to hard drives or SSD with thin and short cables while application need larger storage capacity.

Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

J1 ──────
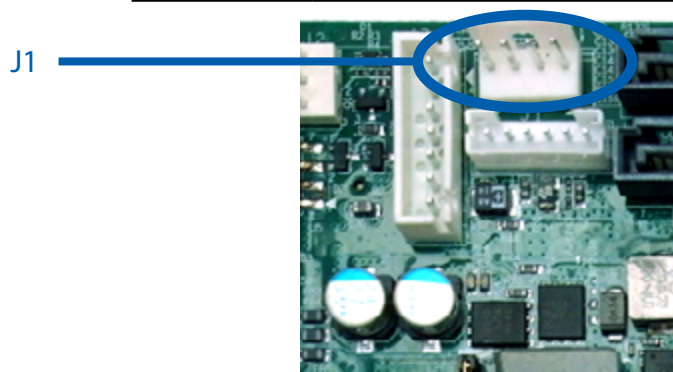
The ARS-1000 also equipped one SATA power connector. It supply 5V (2A max.) and 12V (1A max) current to the hard drive or SSD.

Pin No.	Definition
1	+12V
2	GND
3	GND
4	+5V

2.3.5 J4 Internal 2 USB Ports

The ARS-1000 main board provides up to two expansion USB ports using Plug and Play for Dongle Key or LCD touch Panel. The USB interface supports 480 Mbps transfer rate which comply with high speed USB specification Rev. 2.0, and are fuse protected.

The USB interface is accessed through one 1x6-pin JST 2.0mm connector. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 1x6-pin connector on one end and a USB connector on the other.

Pin No.	Description	Pin No.	Description
1	USB_VCC	2	USBD2-
3	USBD2+	4	USBD3-
5	USBD3+	6	GND

2.3.6 J6 Audio Connector

J6
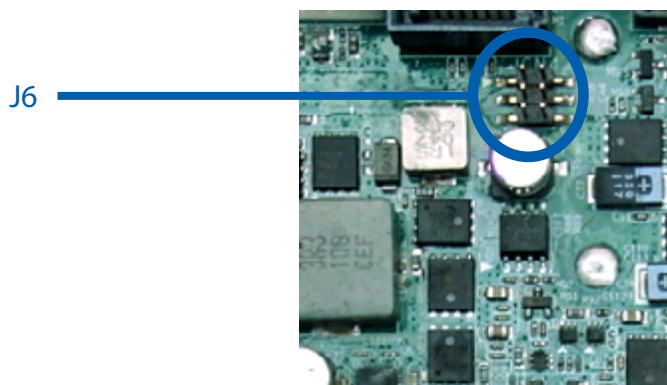
The ARS-1000 offers stereo audio ports by a 2x3 2.0mm pin header of MIC and Line_Out. The audio chip controller is by ALC892 which is compliant with the Intel Azalia standard. To utilize the audio function in Windows, you need to install corresponding drivers for both Intel ICH8M chipset and Realtek ALC892 codec. Please refer to Section 4 for information of driver installation.

Pin No.	Description	Pin No.	Description
1	MIC_OUT_L	2	FRONT_OUT_L
3	MIC_OUT_R	4	FRONT_OUT_R
5	GND	6	GND

2.3.7 CN10 PC/104 plus (PCI)

CN10
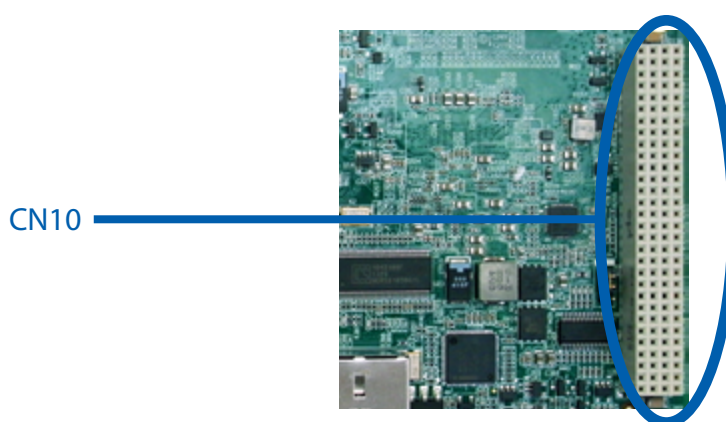
This PCI bus connector is a 4x30 (120-pin) 2mm pitch stackthrough connector as opposed to the 123-pin edge connector on standard 32-bit PCI Local Bus. This 120-pin PCI does not support 64-bit extensions, JTAG, PRSNT, or CLKRUN signals.

The ARS-1000 stackthrough PCI connector supports 4 arbitration (bus master) and 4 request interrupts.

J3/P3				
Pin No.	A	B	C	D
1	GND	+5V_SB	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06

5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/B#1#	AD15	+3.3V
9	SERR#	GND	PSON#	PAR
10	GND	PERR#	+3.3V	PME#
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSELI	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND

2.3.8 CN2 PC/104 (ISA)
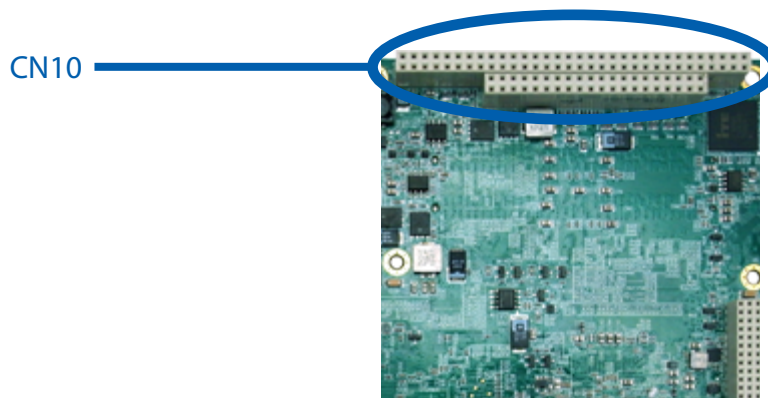
The ARS-1000 equipped with IT8888G for ISA 8-bit / 16-bit application in board layer 2.

J1/P1		
Pin No.	Row A	Row B
1	IOCHK3	GND
2	SD7	RESET
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	SRDY
9	SD0	+12V
10	IOCHRDY	KEY
11	AEN	SMEMW
12	SA19	SMEMR
13	SA18	IOW
14	SA17	IOr
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1
18	SA13	DRQ1
19	SA12	REFRESH
20	SA11	BCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	GND
32	GND	GND

J2/P2		
Pin No.	Row D	Row C
0	GND	GND
1	MEMCS16	SBHE
2	IOCS16	LA23
3	IRQ10	LA22
4	IRQ11	LA21
5	IRQ12	LA20
6	IRQ15	LA19
7	IRQ14	LA18
8	DACK0	LA17
9	DRQ0	MEMR
10	DACK5	MEMW
11	DRQ5	SD8
12	DACK6	SD9
13	DRQ6	SD10
14	DACK7	SD11
15	DRQ7	SD12
16	+5V	SD13
17	MASTER16	SD14
18	GND	SD15
19	GND	KEY

2.3.9 CN17 Mini-PCIe Connector

CN17
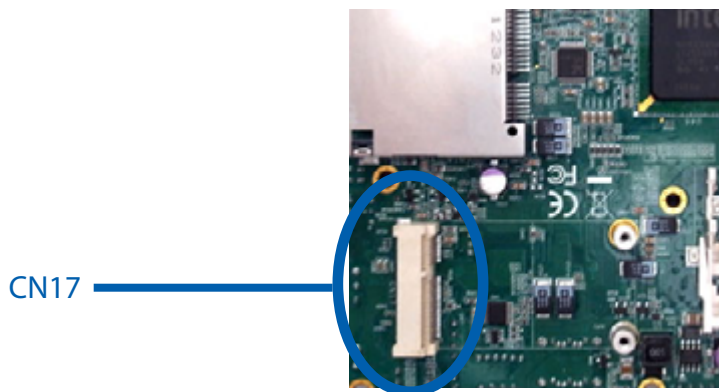
It is for connecting any Mini-PCIe adapter such as a Wi-Fi module.

| Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3V
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Reserved	44	Reserved
41	Reserved	42	Reserved
39	Reserved	40	GND
37	Reserved	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved (UIM_C4)	20	ENABLE
17	Reserved (UIM_C8)	18	GND
Mechanical Key			
15	GND	16	Reserved
13	REFCLK+	14	Reserved
11	REFCLK-	12	Reserved
9	GND	10	Reserved
7	CLKREQ#	8	Reserved
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3V

2.3.10 Battery
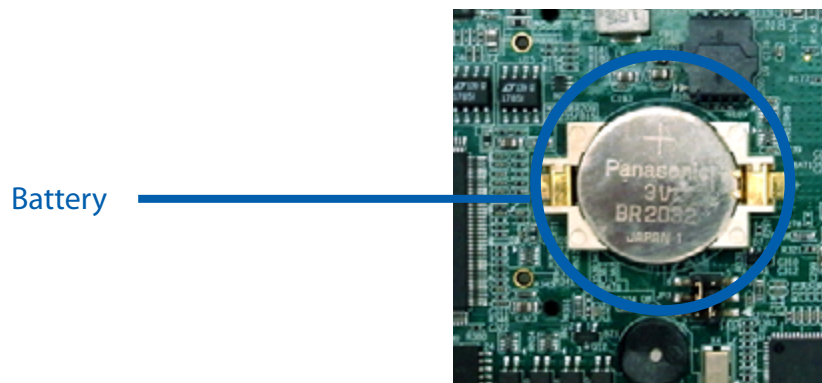
Battery

The ARS-1000's real-time clock is powered by a lithium battery. It is equipped with Panasonic BR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

2.4 Main Board Jumper Setting

The figure below is the top view of the ARS-1000 main board which is the main board used in the ARS-1000 Series system. It shows the location of the jumpers.
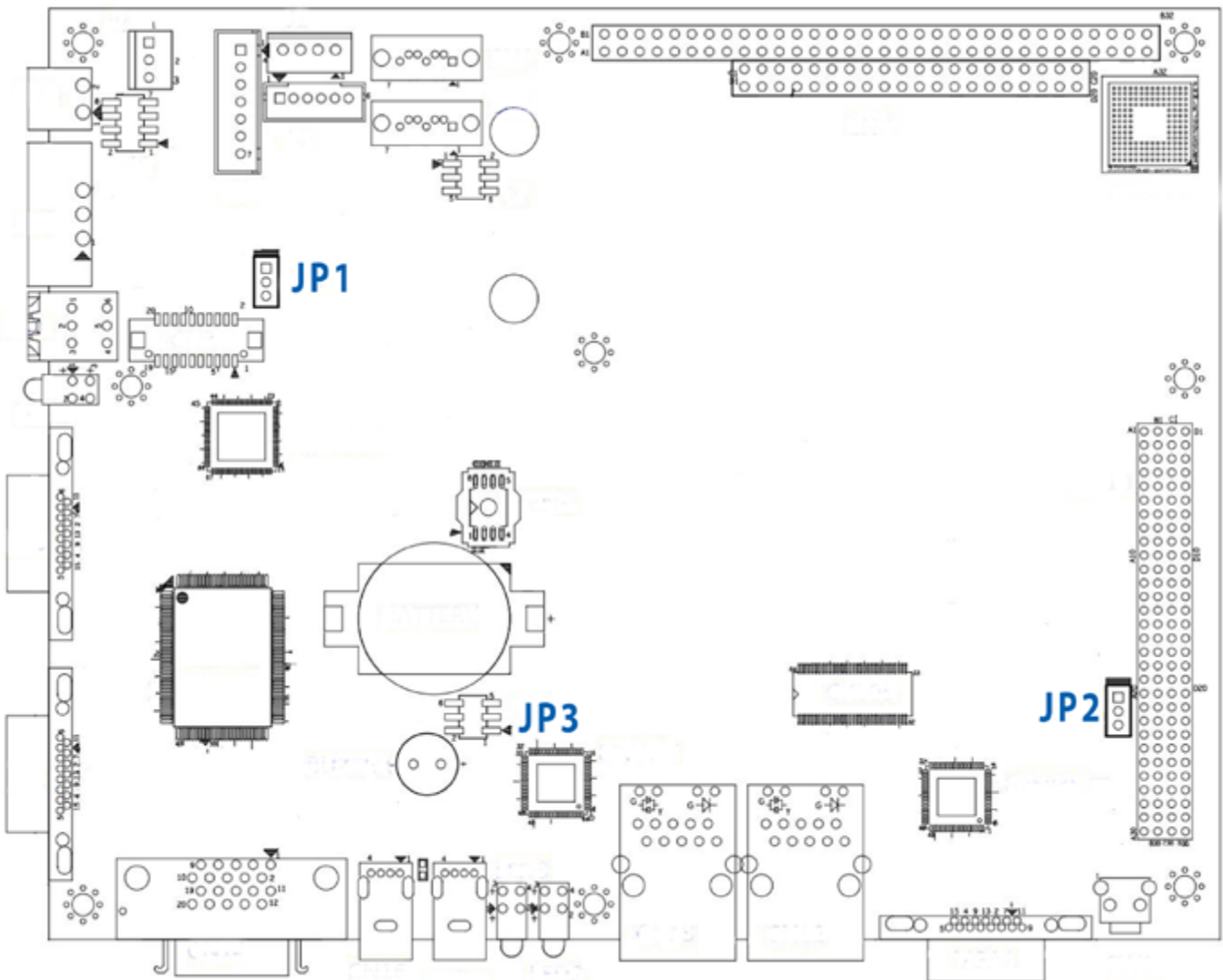
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.

open   closed   closed 2-3
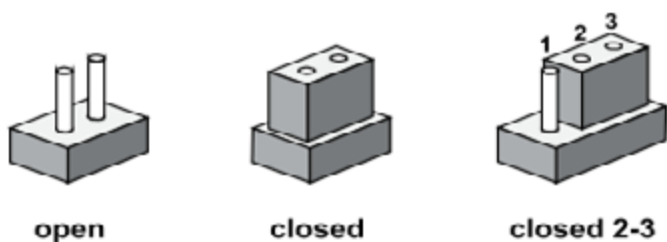
2.4.1 JP1 LVDS Backlight Power Selection
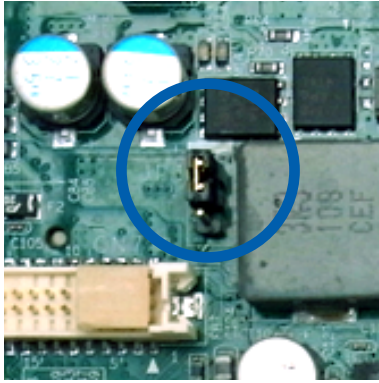
JP1 provides LVDS voltage selection function, closing Pin 1, 2 is for 3.3V LVDS power input; closing Pin 2, 3 is for 5V LVDS power input.

Setting	Description
1-2	+3.3V (Default)
2-3	+5V

2.4.2 JP2 PCI I/O Voltage Selection

The PCI host board will always determine the PCI signaling level on the bus by setting all VIO pins to either 3.3V or 5V. If VIO is set to 3.3V, the system will use 3.3V I/O signaling, likewise, if VIO is set to 5V, the system will use 5V I/O signaling. Some PCI host modules may only allow one of the options, while others may provide a jumper to allow the user to select the signaling level. Once the signaling level is selected, the remaining boards in the system must use that signaling level.

Setting	Description
1-2	+3.3V (Default)
2-3	+5V

2.4.3 JP3(A) CMOS Clear Jumper Setting

Setting	Description
1-3	Normal (Default)
3-5	Clear CMOS

2.4.4 JP3(B) AT/ATX Power mode Jumper Setting
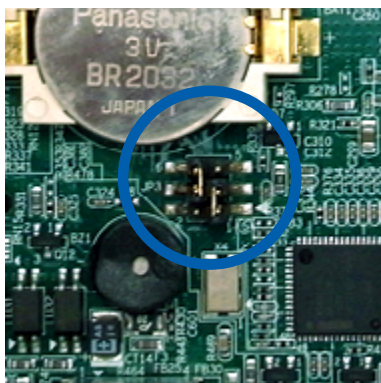
The ARS-1000 main board contains a jumper that can switch the AT/ATX Power Setting. Normally this jumper should be set with Pin 4 and Pin 6 in ATX power mode. And power on the system by the 2-pin terminal block at the top panel.

If you set it with Pin 2 and Pin 4 in AT power mode. It will send the power button signal to power on the system automatically.

Setting	Description
2-4	AT Mode
4-6	ATX Mode (Default)

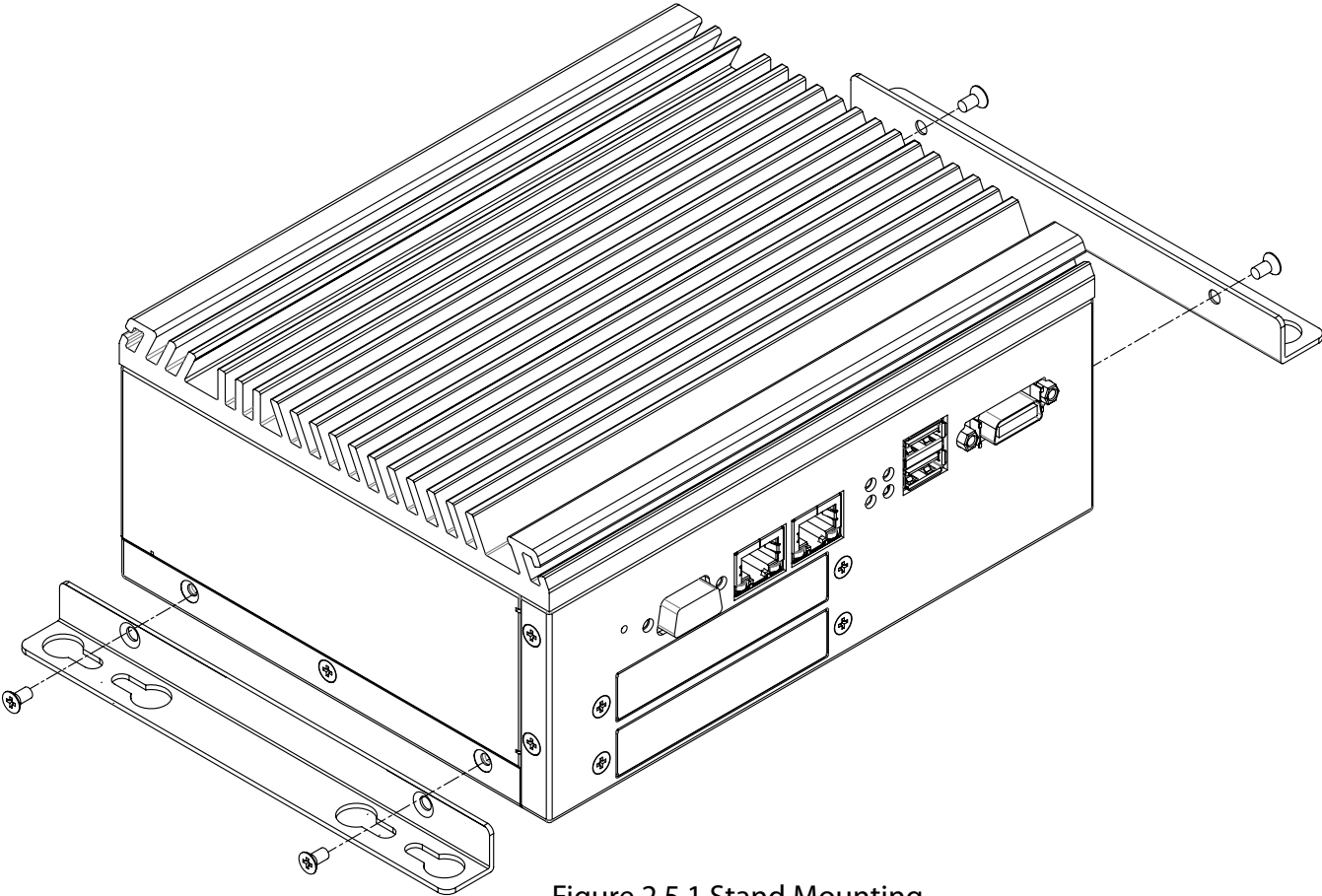# 2.5 Mounting Options

2.5.1 Stand Mounting
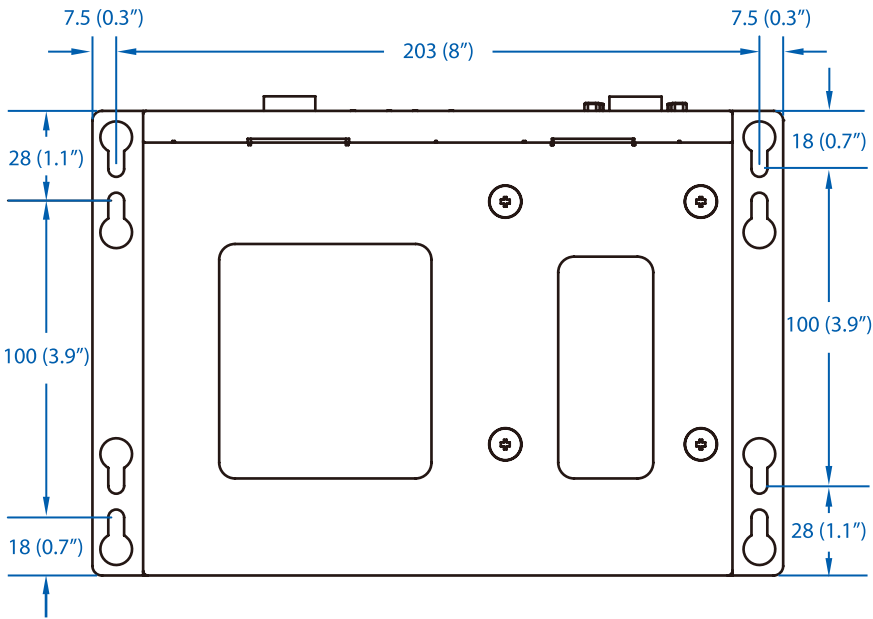

Figure 2.5.1 Stand Mounting

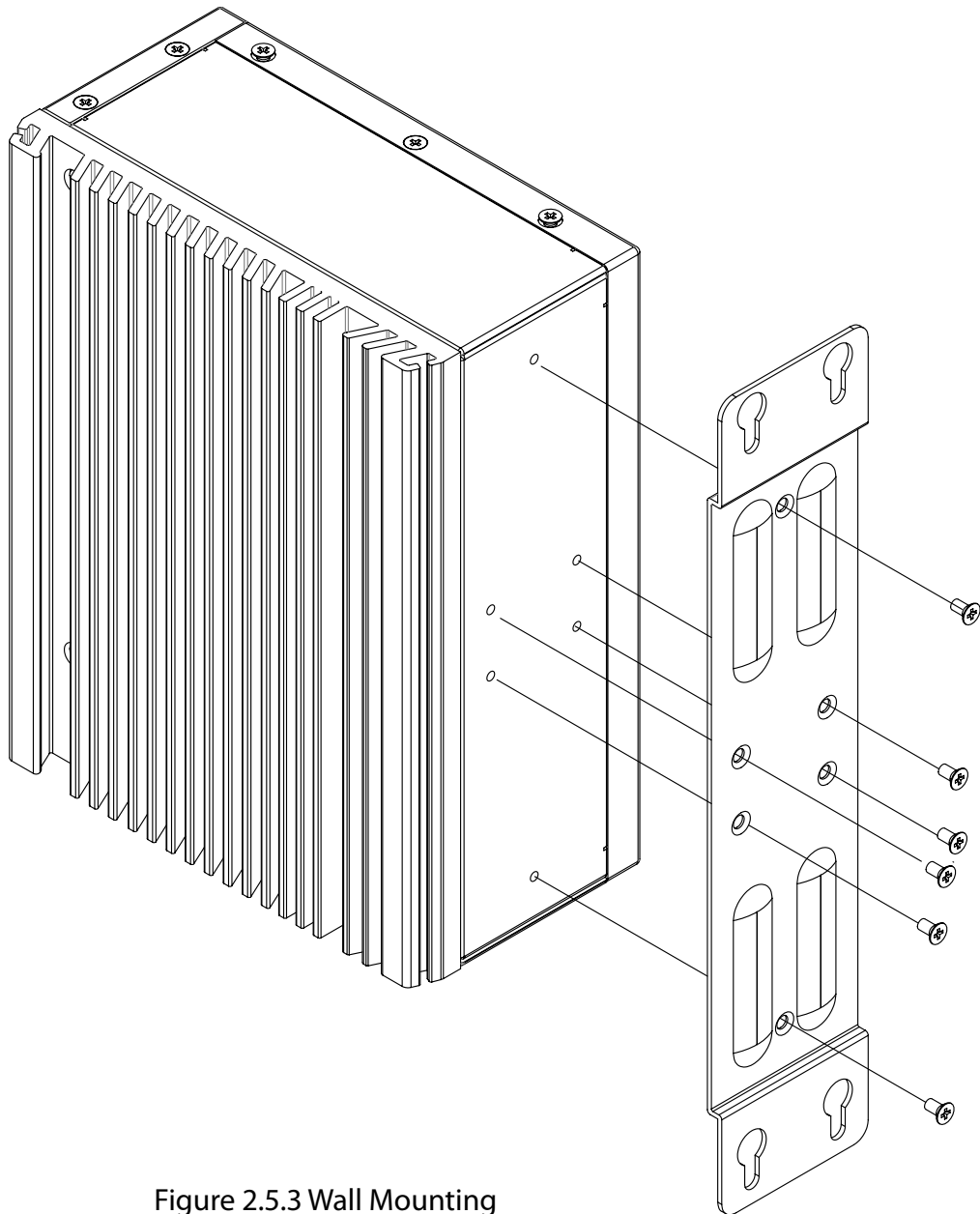Figure 2.5.2 Stand Mounting Dimension

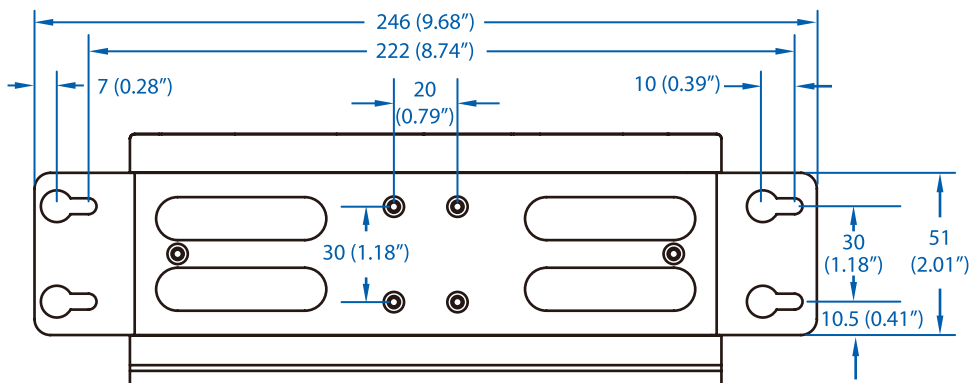## 2.5.2 Wall Mounting

Figure 2.5.3 Wall Mounting

Figure 2.5.4 Wall Mounting Dimension

2.5.3 DIN-rail Mounting
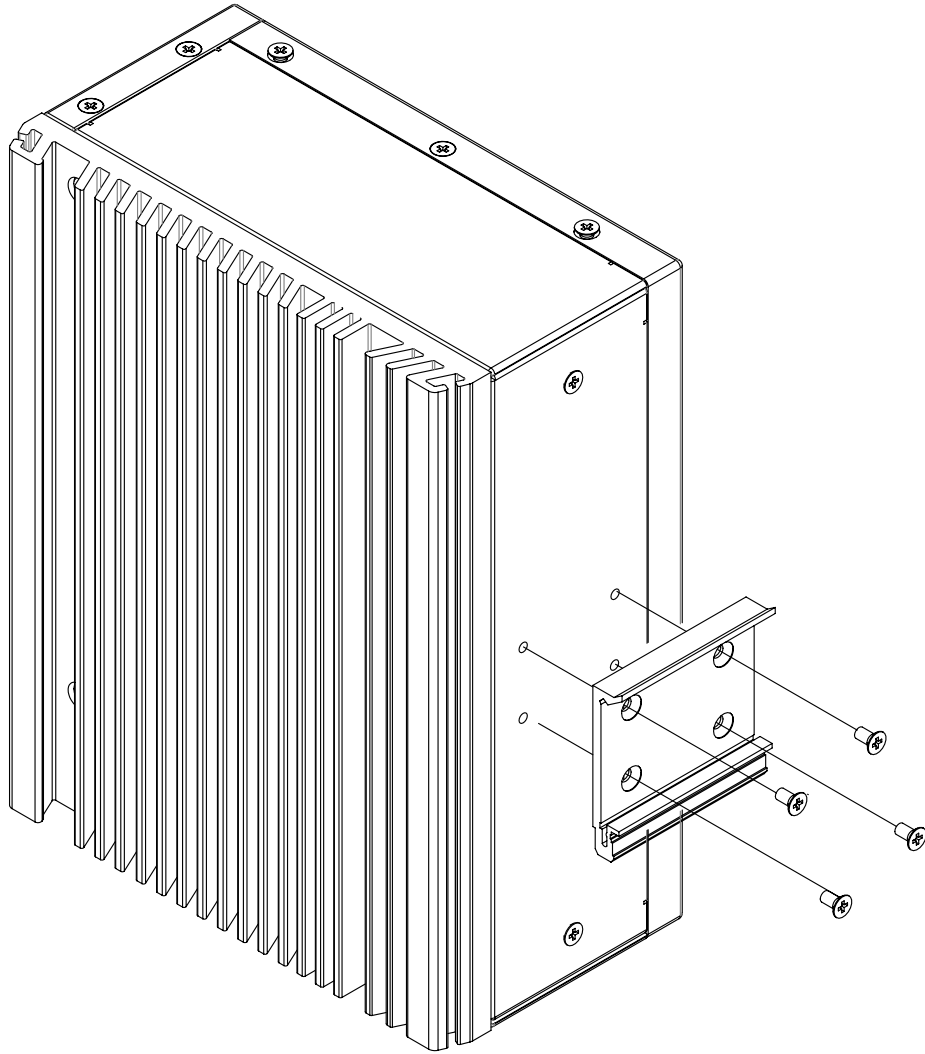
Figure 2.5.5 DIN-rail Mounting
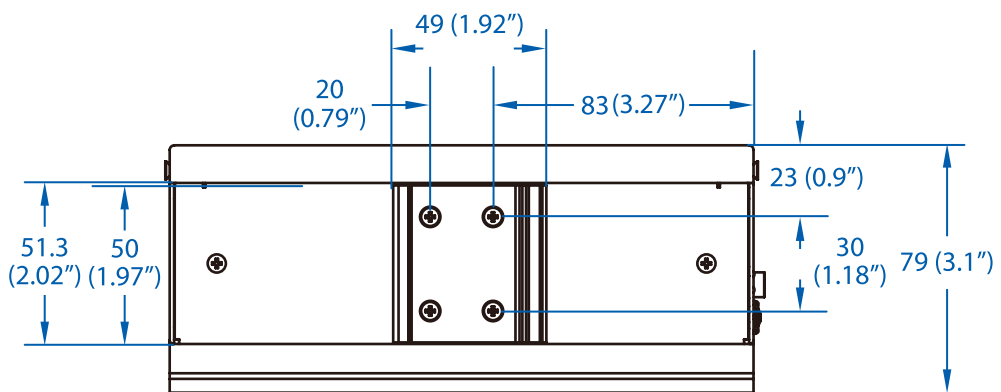
Figure 2.5.6 DIN-rail Mounting Dimension

3

BIOS Settings

The board uses UEFI BIOS that is use Serial Peripheral Interface (SPI) Flash. The SPI Flash contains the BIOS Setup program, POST, the PCI auto-configuration utility, LAN, EEPROM information, and Serial port support. The BIOS Setup program is accessed by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.
The menu bar is shown below.

| Main | Advanced | Intel | Security | Power | Boot | Exit |

3.1 Main Menu

```
System Time:              [17:12:15]
System Date:              [03/26/2012]


▶ SATA Port 1            [None]
▶ SATA Port 2            [30017MB SATA2]
▶ SATA Port 3            [None]


▶ Memory Cache
▶ Boot Features


Installed memory         4096 MB
Available to OS           4085 MB
Used by devices           11 MB
```
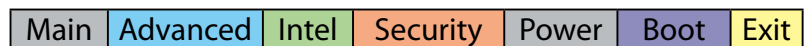
System Time / Date : Press "TAB" key to switch sub-items of value .Then press " +" key or "-" key number key for modify value.

SATA Port 1 / 2 / 3 : Show Current Storage on SATA port.

3.2 Advanced BIOS Features
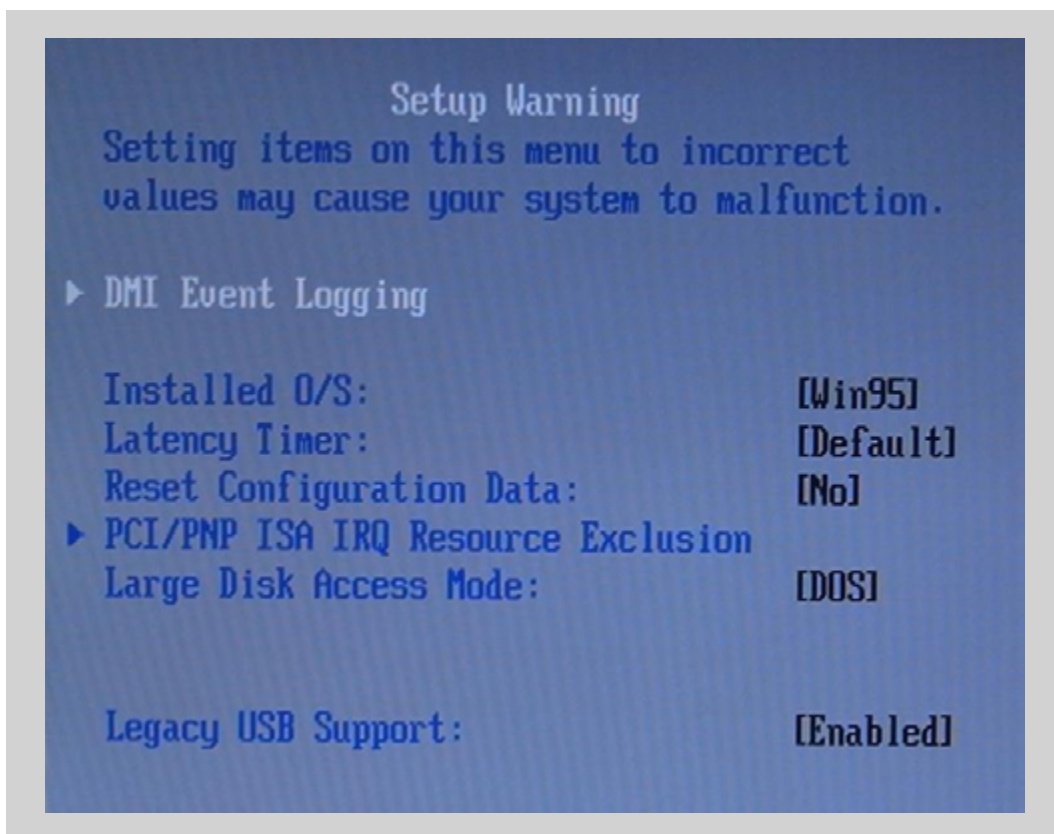
Legacy USB Support : Some USB device need active this function.

3.2.1 IRQ Resource Exclusion
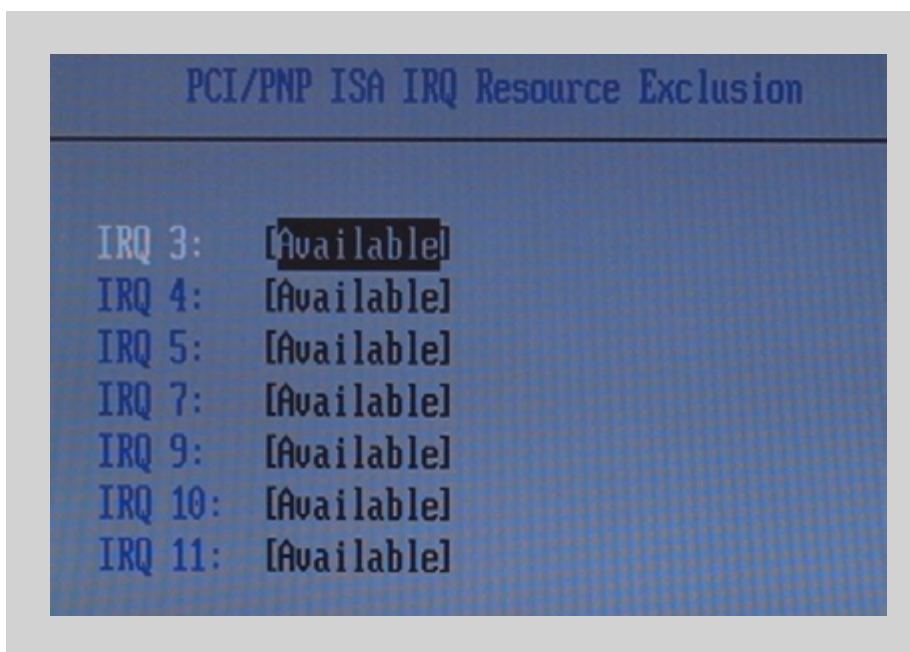
For IRQ 3,4,5,7,9,10,11 , you can select "Reverse" or "Available" for you PCI/ISA device

3.3 CPU Menu

```
▶ CPU Control Sub-Menu
▶ Video (Intel IGD) Control Sub-Menu
▶ ICH Control Sub-Menu
▶ LPC Control Sub-Menu

  CK-xxx Clock Chip:              [Program]
    Spread Spectrum Mode:          [Off]
```
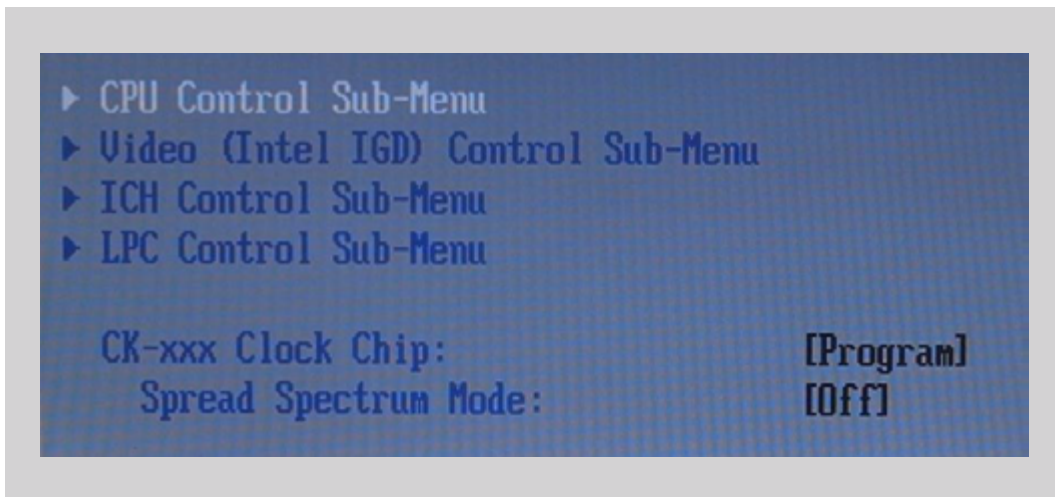
This page is contol all CPU and ICH chipset function , before you set it , please check you suppiler or contact us for technical server.

3.3.1 CPU Control

```
Hyperthreading:                [Enabled]
Processor Power Management:     [Disabled]

No Execute Mode Mem Protect
Set Max Ext CPUID = 3           Disabled
                                GV3 Only
                                C-States Only
                                Enabled
```
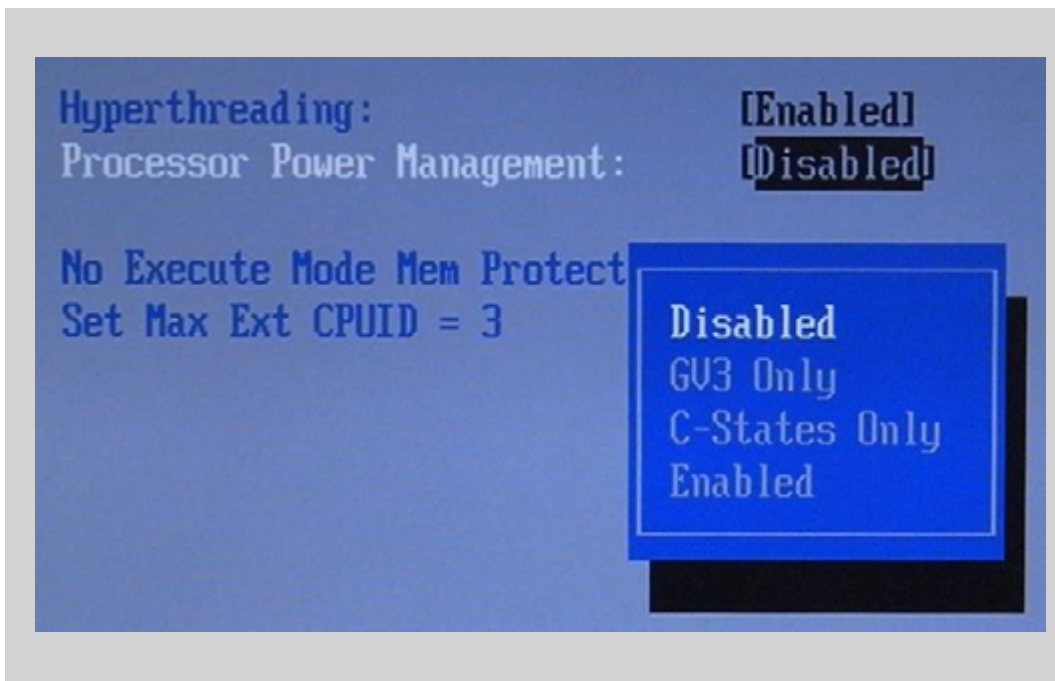
Processor Power Management: Select CPU power management method.

3.3.2 ICH Control
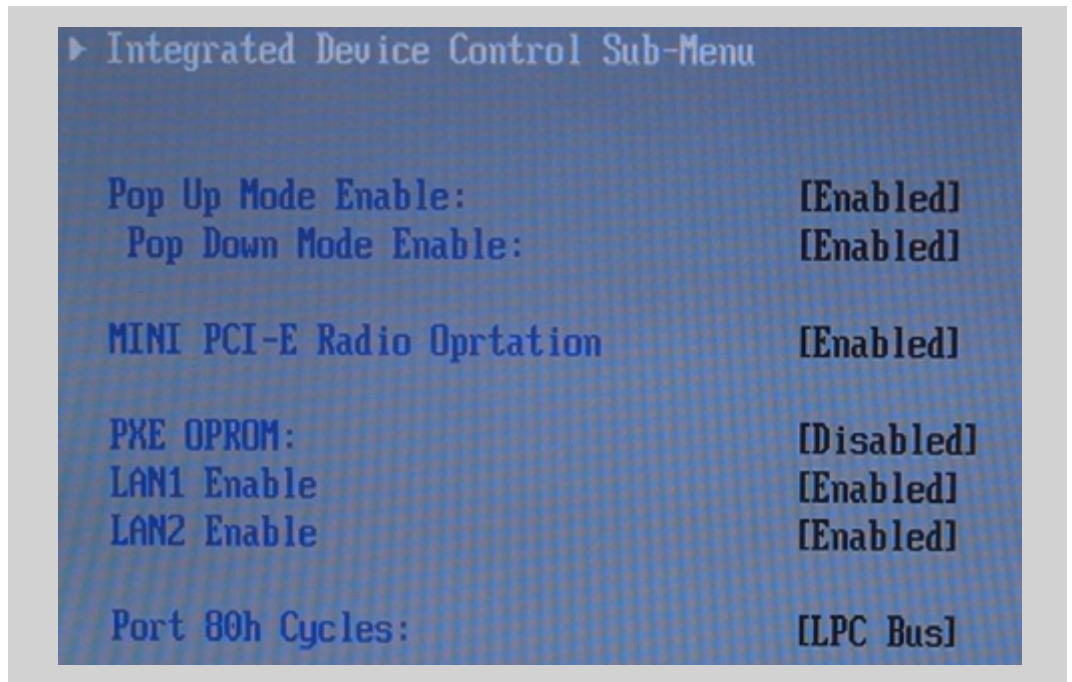
Legacy USB Support : Some USB device need active this function.
LAN 1 Enable : Switch ON / OFF network device 1 (82583V).
LAN 2 Enable : Switch ON / OFF network device 2 (82583V).

3.3.3 LPC Control Sub-Menu
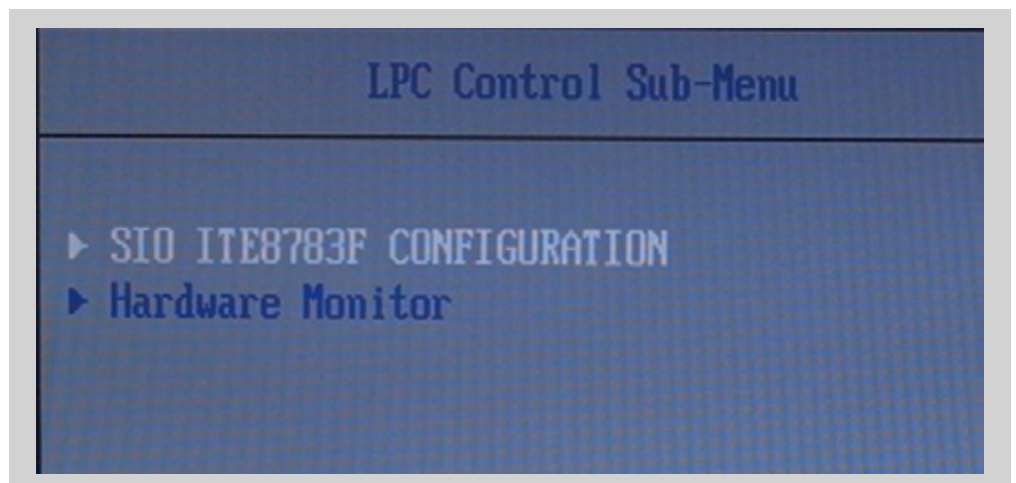
SIO ITE8783F CONFIGURATION : The function of super I/O chip control page.
Hardware Monitor : Display system status .

3.3.4 LPC Control -SIO ITE8783F Configuration

Serial port A: [Enabled]
  Base I/O address: [3F8]
                      [IRQ 4]

COMB Select   [RS-232]
Serial port B: [Enabled]
  Base I/O address: [2F8]
                      [IRQ 3]

Serial port C: [Enabled]
  Base I/O address: [3E8]
                      [IRQ 6]

Serial port D: [Enabled]
  Base I/O address: [2E8]

3F8
2F8
3E8
2E8
2F0
2E0

Base Address

IRQ 3
IRQ 4
IRQ 10
IRQ 6

Interrupt

Set Serial port A/B/C/D configuration : You should select Base I/O from table .

COMB Select : COMB support RS-232 / 422 / 485 multi functions.

3.4 Security Menu


```
Supervisor Password Is:    Clear
User Password Is:          Clear

Set Supervisor Password    [Enter]
Set User Password          [Enter]

Virus check reminder:      [Disabled]
Password on boot:          [Disabled]
```

3.5 Power Menu


```
Enable ACPI :              [Yes]
Enable Multimedia Timer    [No]
ACPI Suspend Type:         [S3]
Power off delay 4 sec:     [Disabled]

Power Type Select          [ATX Power]
After Power Failure:       [Stay Off]

Resume On Modem Ring:      [Off]
Resume On Time:            [Off]
Resume Time:               [00:00:00]
```

ACPI Suspend Type : If select S1 , suspend data will save to disk , S3 is save to RAM , when power loss , the resume data will loss.

Power Type Select : ATX is control by OS , AT mode will alwayse ON.

After Power Failure :

[Stay OFF]–When re-plug in power source , not power-on the system , and the system will keep on Standby mode

[Last State]–When re-plug in power source , the power will resume last state before remove the power source, and the system will keep on Standby mode,

[Power ON]–Auto Power ON while plug-in the power source.

3.6 Exit Menu
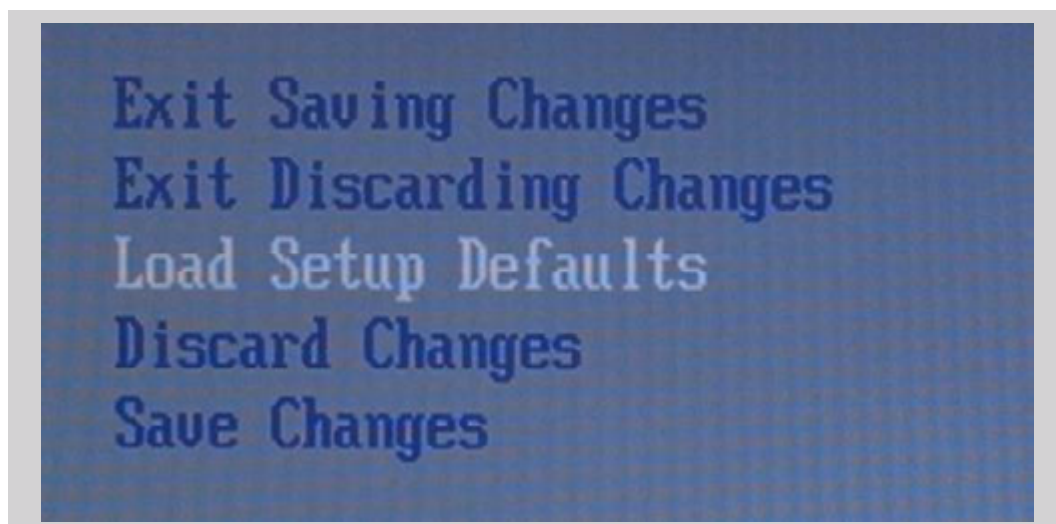
Exit Saving Changes : Save changes BIOS setting , and reboot system active changes.

Exit Discarding Changes : No any changes and reboot system.

Load Setup Defaults : Load default setting for all BIOS items.

Discard Changes : Change back all setting that you changes.

Save Changes : Only save current changes that you modify.

Before you load default value , you must confirm it again.

4

Software Installation

For The ARS-1000 series, we need install below driver for Windows system. Normally, most of devices have been detect and install by windows.

- Intel Chipset
- Intel VGA
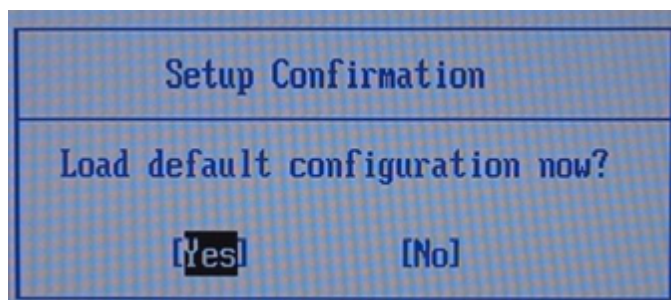- Network Device.
- Audio driver

4.1 Chipset Driver Installation

This driver will install following features or function properly:
- PCIe Support
- IDE/ATA33/ATA66/ATA100 Storage Support (IDE Mode)
- SATA Storage Support(AHCI Mode)
- USB 1.1/2.0 bus service
- SMBUS controller service
- Identification of Intel(R) Chipset Components in the Device Manager

Find the driver install file
Window 7 64bit version :
The Chipset driver location is : [CD]:\Win7\64bit\ ChipsetDriver

Window 7 32bit version :
The Chipset driver location is : [CD]:\Win7\32bit\ ChipsetDriver

Window XP :
The Chipset driver location is : [CD]:\WinXP\ChipsetDriver

Execute the install file and start to install it
On setup screen will prompt some instructions, please follow it and complete setup process.

Once you finish the Intel Chipset Driver setup , please reboot your system , all update function will be active on next time into Windows.

4.2 Graphic Driver Installation

This driver will install Intel GMA 3150 driver.

Find the driver install file
Window 7 64bit version :
The Chipset driver location is : [CD]:\Win7\64bit\VGA

Window 7 32bit version :
The Chipset driver location is : [CD]:\Win7\32bit\VGA

Window XP :
The Chipset driver location is : [CD]:\WinXP\VGA

Execute the install file and start to install it
On setup screen will prompt some instructions, please follow it and complete setup process.

Once you finish the Intel Chipset Driver setup , please reboot your system , all update function will be active on next time into Windows.

4.3 Network Device Driver Installation

This driver will install Intel 2 LANs of Intel 82583V network device driver.

Find the driver install file
Window 7 64bit version :
The Chipset driver location is : [CD]:\Win7\64bit\LAN

Window 7 32bit version :
The Chipset driver location is : [CD]:\Win7\32bit\LAN

Window XP :
The Chipset driver location is : [CD]:\WinXP\LAN

Execute the install file and start to install it
On setup screen will prompt some instructions, please follow it and complete setup process.

Once you finish the Intel Chipset Driver setup , please reboot your system , all update function will be active on next time into Windows.

4.4 Audio Device Driver Installation

This driver will install Ionboard Realtek Audio device driver.

Find the driver install file
Window 7 64bit version :
The Chipset driver location is : [CD]:\Win7\64bit\Audio

Window 7 32bit version :
The Chipset driver location is : [CD]:\Win7\32bit\Audio

Window XP :
The Chipset driver location is : [CD]:\WinXP\Audio

Execute the install file and start to install it
On setup screen will prompt some instructions, please follow it and complete setup process.

Once you finish the Intel Chipset Driver setup , please reboot your system , all update function will be active on next time into Windows.

4.5 Linux Driver Support

The Linux kernel 2.6.32 is intergrade all device driver that ARS-1000 have it. Easy to say , you should use Fedora 13 , Ubuntu 10.04 , CentOS 6.0.

4.6 Additional Drivers

If you need driver that for another OS . Such kind of Windows Embedded series , Windows Server series, etc., please contact us.

Appendix A GPIO & WDT Function Programming Guide

The GPIO& WDT are using internal Super IO function. However, you must entry super I/O configuration mode to set it.
The output port is set as GPIO 1 on CN13 , reg. index = **0x60**
The input port is set as GPIO 4 on CN12 , reg. index = **0x62**.
Super I/O special address port = 0x2E
Super I/O special data port = 0x2F
GPIO Logical device is 0x07

A. Entry MB PnP mode.
//write twice 0x87 value.
outportb(Super I/O special address port, 0x87);
outportb(Super I/O special address port, 0x01);
outportb(Super I/O special address port, 0x55);
outportb(Super I/O special address port, 0x55);

B. Located on Logical Device 7
//write 0x07 on Reg [0x07] , this setup must follow Step A. that can be workable.
outportb(Super I/O special address port, 0x07);
outportb(Super I/O special data port, 0x07);

C. Access the Super I/O register
Base control for write Super I/O register.
outportb(Super I/O special address port, Register Index.);
outportb(Super I/O special data port, update_value);

Base control for read Super I/O register
outportb(Super I/O special address port, Register Index.);
inportb(Super I/O special data port);   //It will return a BYTE value.

D. Start to Access the ARS-1000 GPIO port
Please refer to source code for set_data() and get_data() function.
Write data to GPO(output) port
        set_data(Register Index , update_value);

example :
unsigned char data = 0x82;
set_data(0xE5 , data);

//Set bit 7 & bit 1 of GPO output port as High level ,another bit is Low
Read data to GPI(input) port
get_data(Register Index) //It will return a BYTE value.
example :
unsigned char data
get_data(0xF1 , data);
//Get GPI(input) port status on input_data variable.

E. WDT ON/OFF and Timer-Counter setting
Refer to GPIO setting of Step A and B. , located Logical 0x08 for WDT function.

Reg [0x72] is WatchDog ON/OFF control.
WatchDog On : set_data(0x30 , 0x01);
WatchDog Off : set_data(0x30 , 0x00);

Reg [0x73] is WatchDog timer – For WDT Timer out value

WatchDog counter start : set_data(0xF0 , 0x02);
WatchDog counter start : set_data(0xF0 , 0x00);

Reg [0x72] is WatchDog time-out value, "Reading" this register returns the current value in the Watch Dog Counter, not the Watch Dog Timer Time-out value..

WatchDog time-out value : set_data(0xF1,);

Appendix B LED & Rotary Function Programming Guide

This two function use some address [0x905].

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
LED3	LED2	LED1	LED0	Rotary I/O Value			
R / W				**Read Only**			