

UNO-1172A/AE/AH/AHE

Intel Atom D510 Fanless, DIN-rail Embedded Automation Computer with 3 x LAN, 2 x COM, 4 x USB, 5.1 Channel HD Audio & PC/104+

User Manual

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5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring.

FCC Class A

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 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.

CID2 (Only for UNO-1172AH/AHE)

Hazardous locations are areas where fire or explosions may occur in normal or abnormal conditions because of the presence of flammable substances (e.g. gas, vapors, liquids, dust, fibers). Ignition sources, oxidizers and flammable substance are three basic and essential elements of an explosion. Any electrical apparatus installed in such location must be designed and tested to ensure that it can't initiate a fire or an explosion due to its hot surface, failure, arcs or impact sparks. Advantech's UNO-1100 H series are certified to be used on the Class I Division 2 Groups A, B, C and D Hazardous Locations. This series provides safe and reliable controllers to be operated in hazardous locations. The proof of the certification extends UNO-1100H series to many Oil and Gas applications including: Liquefied Natural Gas, Onshore/Offshore Drilling Production, Pipelines, and Refining. With enhanced design and reliability for hazards, UNO-1100H series not only reduces the disaster cost, but also ensures the constant operation and safety in hazardous locations.

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- Step 1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
- Step 2. Contact your distributor or Advantech's customer service center if you need additional assistance. Have the following info ready:
 - Product name and serial number
 - Description of your software (OS, version, software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Packing List

Before setting up the system, check that the items listed below are included. If any item is not, please contact your dealer immediately.

- Software Supporting CD-ROM
- 6P-6P-6P 20cm PS/2 Mouse/Keyboard Y cable (P/N: 1700060202)
- Phoenix power connector (P/N: 1652003206)
- DIN-rail & wall mount accessories
- USB holder accessories (Only for UNO-1172AH/AHE)
- HDD bracket
- Flat cable for reserved RS-232 pin-header (P/N: 1700008871) (optional)
- SATA cable (P/N: 1700006812)
- SATA power cable (P/N: 1700006492)
- Spacer for PC/104+ expansion (UNO-1172AE/AHE only)

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User's Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. 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 and damaged.
 - f. The equipment has obvious signs of breakage.
15. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO BELOW -10° C (14° F) OR ABOVE 65° C (149° F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
16. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER, DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

1. To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
2. Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Contents

Chapter	1	UNO-1172A/AE/AH/AHE Overview.....	2
	1.1	Introduction	2
	1.2	Hardware Specifications	2
	1.3	Safety Precautions	5
	1.4	UNO-1172A Series	5
	1.5	Chassis Dimensions.....	6
Chapter	2	Hardware Functionality	10
	2.1	UNO-1172A Peripherals	10
	2.2	RS-232 Interfaces	12
	2.3	COM1~2: RS-232/422/485 Interfaces	12
	2.3.1	SMSC SCH3114 UARTs with 16-byte Standard	12
	2.3.2	Jumperless RS-422/485	12
	2.3.3	Automatic Data Flow Control Function for RS-485 ..	12
	2.3.4	RS-232/422/485 Selection	13
	2.3.5	Terminal Resistor Setup for RS-422/485	14
	2.4	LAN: Ethernet Connector	15
	2.5	Power Connector	15
	2.6	LED Indicators	16
	2.7	PS/2 Keyboard and Mouse Connector	16
	2.8	Universal Serial Bus Connectors.....	16
	2.9	VGA: VGA Display Connector	16
	2.10	RESET: Reset Button.....	17
	2.11	Audio.....	17
	2.12	Battery Backup SRAM.....	17
	2.13	LED and Buzzer for System Diagnosis.....	18
	2.13.1	LED Settings	18
	2.14	PC/104+ Connectors (UNO-1172AE/AHE only)	20
	2.15	Onboard Digital Input	21
	2.15.1	PIN Assignments	22
	2.15.2	Interrupt Function of the DI Signals	23
	2.15.3	Interrupt Control Register	23
	2.15.4	Wet/Dry Contact Settings	24
	2.16	Onboard Digital Output.....	25
	2.16.1	PIN Assignments	25
	2.17	Remote Monitoring and Control Functions	26
	2.18	Advanced Watchdog Timer	29
Chapter	3	Initial Setup.....	32
	3.1	CompactFlash Card Installation	32
	3.2	Chassis Grounding	35
	3.3	Power Connection	35
	3.4	PC/104+ Card Installation (UNO-1172AE/AHE)	36
	3.5	Hard Drive installation (UNO-1172AE/AHE).....	39
	3.6	BIOS Setup and System Assignments	41

3.7	DIN-rail Mounting Setup	41
3.8	Wallmounting Setup.....	42
Appendix A	System Settings and Pin Assignments	44
A.2	Board Connectors and Jumpers.....	47
A.3	RS-232 Serial Port (COM3~4).....	50
A.4	RS-232/422/485 Serial Port (COM1~2)	51
A.5	Ethernet RJ-45 Connector (LAN1~LAN3).....	51
A.6	Power Screw Terminal (CN1).....	52
A.7	PS/2 Keyboard and Mouse Connector (CN7).....	52
A.8	USB Connector (CN8)	53
A.9	VGA Display Connector (CN14).....	53
A.10	SATA Data Connector (CN20).....	54
Appendix B	Watchdog Timer Register	56
Appendix C	Digital Input Interrupt Control Register	66
Appendix D	USB Holder Installation	72

UNO-1172A Overview

Sections include:

- Introduction
- Hardware Specifications
- Safety Precautions
- UNO-1172A Series
- Chassis Dimensions

Chapter 1 UNO-1172A/AE/AH/AHE Overview

1.1 Introduction

UNO-1172A/AE/AH/AHE is an DIN-rail mounted Embedded Automation Computer, which provides several serial communication ports and Ethernet interfaces. UNO-1172A/AE/AH/AHE is designed with a compact size, small footprint, and help to save space with its front accessible and DIN-rail design. With rich OS and driver support, such as Windows XP embedded, WinCE 6.0, and even embedded Linux. You can integrate your applications easily with an application ready platform that can provide a versatile function to fulfill diverse requirements.

1.2 Hardware Specifications

- **CPU:** Atom D510 1.66 GHz
- **Memory:** 2 GB DDR2 SDRAM on board
- **Battery-backup RAM:** 1 MB Battery-backup SRAM
- **VGA/Keyboard/Mouse:** DB-15 VGA Connector, Mini-DIN connector for PS/2 keyboard & mouse
- **Serial Ports:** 2 x RS-232/422/485 with DB-9 connectors. Automatic RS-485 data flow control
- **Serial Speeds:** RS-232: 50~115.2 kbps, RS-422/485: 50~115.2 kbps
- **LAN:** Three 10/100/1000 Base-T RJ-45 Ports
- **USB interface:** Four USB ports, USB EHCI, Rev. 2.0 compliant.
- **Audio:** Mic in, Line in, Line out
- **Storage:** SSD: 1 x internal type I/II CompactFlash slot
HDD: one 2.5" SATA HDD bracket (Only for UNO-1172AE/AHE)
- **LEDs:** Power (Power Standby: Orange, Power On: Green), 2 pairs of serial flow indicators (Tx, Rx), CF/HDD, Alarm for SRAM Backup Battery, RTC clock, over-temperature and over-voltage

- **PC/104+:** 2 x PC/104+, supports +3, +5 V Power (UNO-1172AE/ AHE only)
- **Mini PCI:** 1x MiniPCI (Only UNO-1172AE/AHE)
- **Digital I/O**

Digital In 2 Digital Input

Dry Contact

Logic level 0: Open

Logic level 1: Close

Wet Contact

Logic level 0: +3V max

Logic level 1: +10V_{DC} to 30V_{DC}

Digital Out 6 Digital Output

Open Collector to 40V

200mA max Load

Power Dissipation 450mW

- **Shock Protection:** IEC 60068-2-27, CompactFlash: 50G @ Wall mount, half sine, 11ms, HDD: 20G @ wall mount, half sine, 11ms
- **Vibration Protection:** IEC 60068-2-64 (Random 1 Oct./min, 1hr/ axis), CompactFlash: 2Grms@ 5~500Hz, HDD: 1 Grms @ 5~500Hz
- **Power Supply Voltage:** 10-36 V_{DC}, reversed wiring protection 9 (Min.) ~ 36 V_{DC} (Max.) (UNO-1172AH/ AHE only)
- **Power Requirement:** Min. 48 W (10 ~ 36 V_{DC}) (e.g +24 V @ 2 A)
- **Power Consumption:** 24W (Typical)
- **Operating Temperature:** -10~65°C (14~149°F)
- **Safety Cert. Temperature:** -10~50°C (14~122°F)
- **Storage Temperature:** -20~80°C (-4~176°F)
- **Relative humidity:** 95% @ 40°C
- **Weight:** 1.6KG (UNO-1172A/AH)
2.0KG (UNO-1172AE/AHE)

- **Chassis size (W × D × H):** 85.5x139x152 mm (3.4"x 5.5"x 6")
(UNO-1172A/AH)
111 x 139 x 152 mm (4.4" x 5.5" x 6")
(UNO-1172AE/AHE)
- **Software options:** WES7, WinXP Embedded, WinXP/7, WinCE 5.0/6.0, Linux, QNX WinXP Embedded, WinCE, Linux
- **Certification:** CE, FCC Class A, UL, CCC
- **CID2 (UNO-1172AH/AHE only):**
US: ANSI/ISA 12.12.01-2007, Non-incident Electrical Equipment for use in Class I, Division 2 Hazardous Locations
Canada: CSA C22.2 No. 213-M1987, Non-incident Control Equipment for use in Class I, Division 2 Hazardous Locations

1.3 Safety Precautions

The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix A.

Warning! *Always disconnect the power cord from your chassis when you are working on it. Do not connect while the power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis.*

Caution! *Always ground yourself to remove any static electric charge before touching UNO-1172A/AE/AH/AHE. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag.*

1.4 UNO-1172A Series

There are four products in the UNO-1172A series, as listed below:

UNO-1172A-A33E	UNO-1172A with Intel Atom 1.66GHz CPU and 2GB RAM
UNO-1172AE-A33E	UNO-1172AE with Intel Atom 1.66GHz CPU, 2GB RAM and PC/104+
UNO-1172AH-A33E	CID2 certified UNO-1172AH with Intel Atom 1.66GHz CPU and 2GB RAM
UNO-1172AHE-A33E	CID2 certified UNO-1172AHE with Intel Atom 1.66GHz CPU, 2GB RAM and PC/104+

1.5 Chassis Dimensions

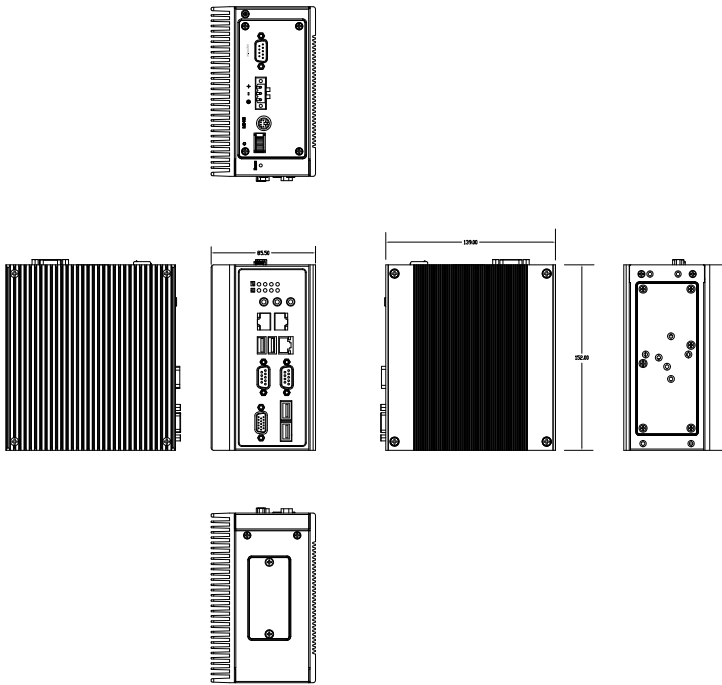


Figure 1.1: UNO-1172A/AH Chassis Dimensions

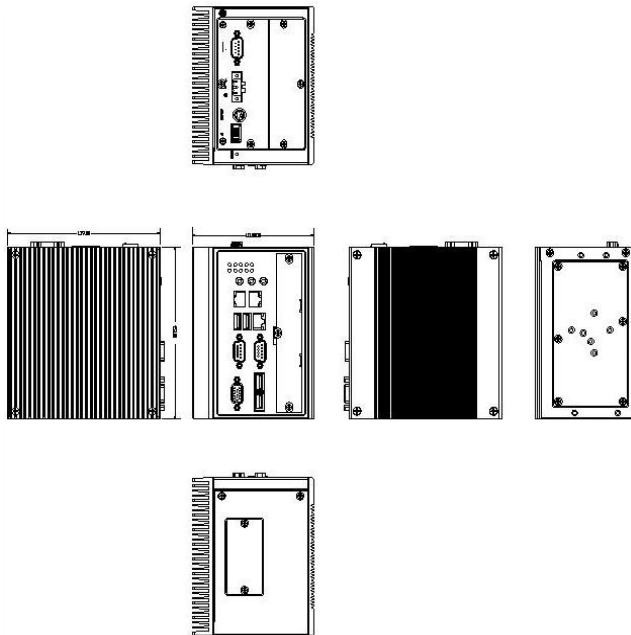


Figure 1.2: UNO-1172AE/AHE Chassis Dimensions

Hardware Functionality

Sections include:

- UNO-1172A Peripherals
- RS-232 Interfaces
- COM1~2: RS-232/422/485 Interfaces
- LAN: Ethernet Connector
- Power Connector
- LED Indicators
- PS/2 Keyboard and Mouse Connector
- Universal Serial Bus Connectors
- VGA: VGA Display Connector
- RESET: Reset Button
- Audio
- PC/104+ Voltage Selection

Chapter 2 Hardware Functionality

2.1 UNO-1172A Peripherals

The following figures show the connectors on UNO-1172A/AH, and UNO-1172AE/AHE. Information in this chapter applies to UNO-1172A, UNO-1172AE, UNO-1172AH and UNO-1172AHE. Therefore, in this chapter, we just mention UNO-1172A to represent the series product. The following sections give you detailed information about function of each peripheral.

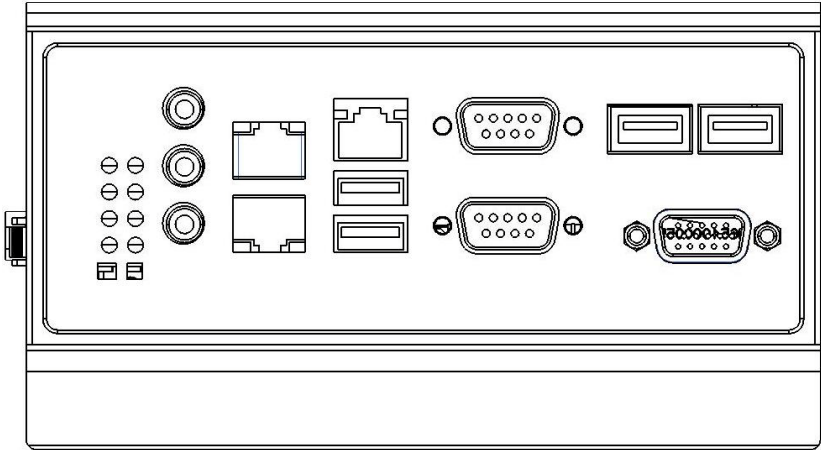


Figure 2.1: UNO-1172A/AH Front View

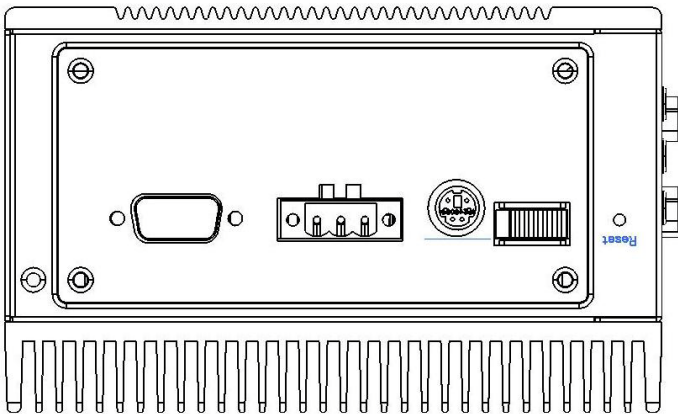


Figure 2.2: UNO-1172A/AH Top View

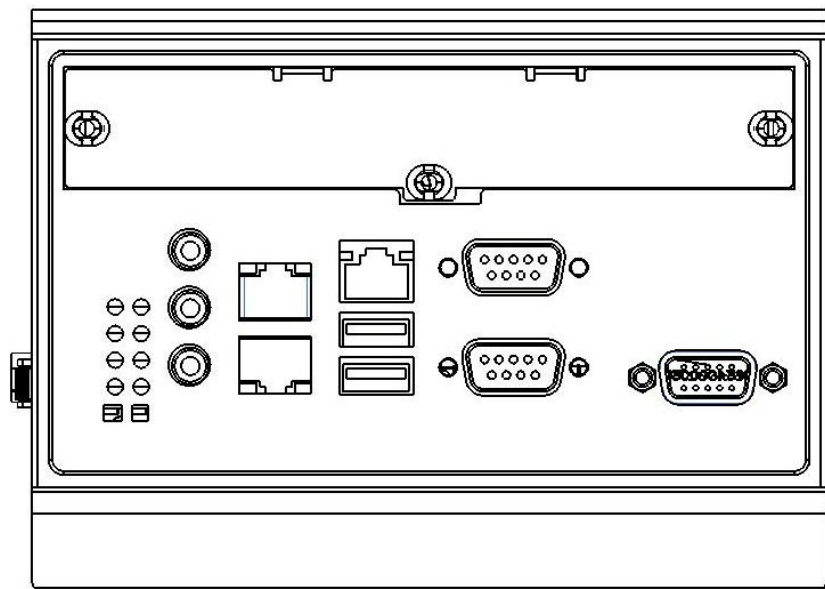


Figure 2.3: UNO-1172AE/AHE Front View

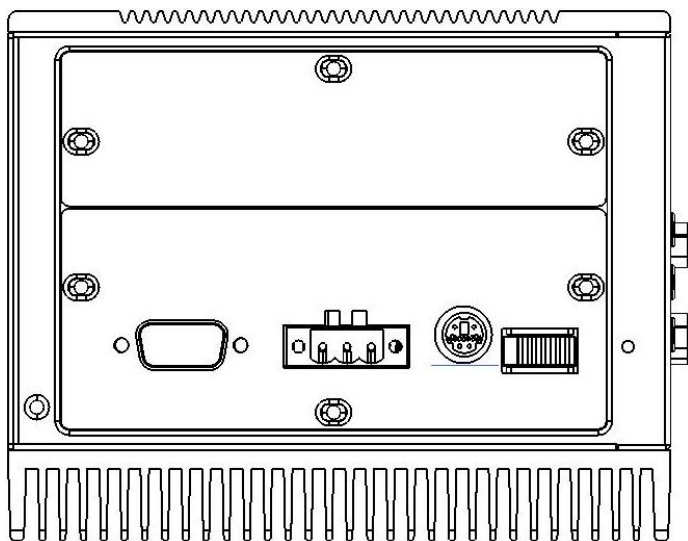


Figure 2.4: UNO-1172AE/AHE Top View

2.2 RS-232 Interfaces

The UNO-1172A reserves two standard RS-232 serial communication pin headers on mother board (CN27 and CN28). Please refer to A.3 for pin assignments.

2.3 COM1~2: RS-232/422/485 Interfaces

The UNO-1172A offers two RS-232/422/485 serial communication interface ports. The serial communication can be configured to either RS-232, RS422/485 by using on-board jumper. Please refer to A.4 for pin assignments and Table 2.1 lists the default setting of each port.

Table 2.1: COM1~2 Default Settings

COM Port	Default Setting
COM1	RS-422/485
COM2	RS-422/485

2.3.1 SMSC SCH3114 UARTs with 16-byte Standard

Advantech UNO-1172A comes standard with SMSC SCH3114 UARTs containing 16 bytes FIFOs. These upgraded FIFOs greatly reduce CPU overhead and are an ideal choice for heavy multitasking environments.

2.3.2 Jumperless RS-422/485

In RS-422/485 mode, UNO-1172A automatically sense signals to match RS-422 or RS-485 network. No need to change jumpers.

2.3.3 Automatic Data Flow Control Function for RS-485

In RS-485 mode, UNO-1172A automatically senses the direction of incoming data and switches its transmission direction accordingly. Therefore no handshaking signal (e.g. RTS signal) is necessary. This feature lets you simply and quickly build an RS-485 network with just two wires. More importantly, application software previously written for half duplex RS-232 environments can be reused without modification.

2.3.4 RS-232/422/485 Selection

COM1~2 support 9-wire RS-232, RS-422 or RS-485 interfaces, and you can set corresponding jumpers to select serial ports as RS-232 or RS-422/485 interfaces shown in Table 2.2. Please note to reset the system to adapt this configuration change

The system detects RS-422 or RS-485 signals automatically in RS-422/485 mode.

Table 2.2: Selecting RS-232/422/485 (COM1&2)

Serial Port	Corresponding Jumper to Select RS-232/422/485
COM1	CN24
COM2	CN26

Jumper Setting for RS-422/485 Interface: (Default Setting)

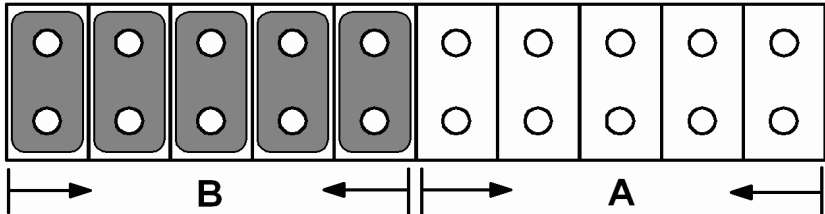


Figure 2.5: RS-422/485 Jumper Settings

Jumper Setting for RS-232 Interfaces:

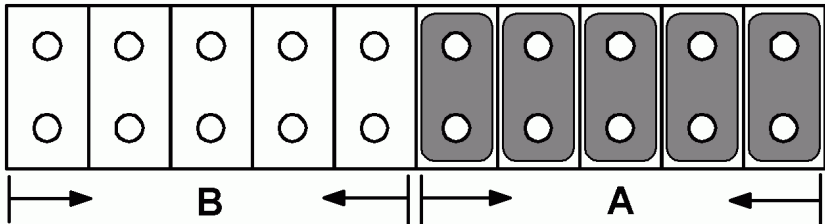


Figure 2.6: RS-232 Jumper Settings

2.3.5 Terminal Resistor Setup for RS-422/485

The onboard termination resistor (120 Ohm) for COM1/COM2 can be used for long distance transmission or device matching. (Default Off.) Each terminal resistor responds to different channels for RS-422/485.

Usually, these resistors are needed for both ends of the communication wires and the value of the resistors should match the characteristic impedance of the wires used.

Table 2.3: Terminal Resistor Settings

COM port	Switch No.	Pin	Setting	Description
COM1	SW3	3	ON	120 Ohm between Data+/Data- (RS-485) Or 120 Ohm between Tx+/Tx- (RS-422)
			OFF	Open (Default)
		4	ON	120 Ohm between Rx+/Rx- (RS-422)
			OFF	Open (Default)
COM2	SW3	1	ON	120 Ohm between Data+/Data- (RS-485) Or 120 Ohm between Tx+/Tx- (RS-422)
			OFF	Open (Default)
		2	ON	120 Ohm between Data+/Data- (RS-485) Or 120 Ohm between Tx+/Tx- (RS-422)
			OFF	Open (Default)

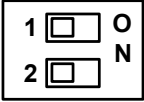
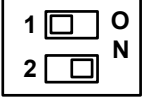
2.3.6 RS-485 Auto Flow & RS-422 Master/Slave Mode

You can set the “Auto Flow Control” mode of RS-485 or “Master/Slave” mode of RS-422 by using the SW5 DIP switch for each RS-422/485 port.

In RS-485, if the switch is set to “Auto”, the driver automatically senses the direction of the data flow and switches the direction of transmission. No handshaking is necessary.

In RS-422, if DIP switch is set to “On,” the driver is always enabled, and always in high or low status.

Table 2.4: Auto Flow & Slave/Master Selection

SW5 DIP Switch Setting	COM Port	Mode Selections
	COM1	RS-422: Slave mode RS-485: Auto flow control
	COM2	RS-422: Slave mode RS-485: Auto flow control
	COM1	RS-422: Master mode RS-485: N/A
	COM2	RS-422: Slave mode RS-485: Auto flow control
	COM1	RS-422: Slave mode RS-485: Auto flow control
	COM2	RS-422: Master mode RS-485: N/A
	COM1	RS-422: Master mode RS-485: N/A
	COM2	RS-422: Master mode RS-485: N/A

2.4 LAN: Ethernet Connector

The UNO-1172A is equipped with two RTL8111CL and one Intel 82574L Ethernet LAN controllers that are fully compliant with IEEE 802.3u 10/100/1000Base-T CSMA/CD standards. The Ethernet port provides a standard RJ-45 jack onboard, and LED indicators on the front side to show its Link (Yellow LED) and Active (Green LED) status. Please refer to A.5 for its pin assignments.

2.5 Power Connector

The UNO-1172A comes with a Phoenix connector that carries 10~36 V_{DC} external power input, and has reversed wiring protection. Therefore, it will not cause any damage to the system by reversed wiring of ground line and power line. Please refer to A.6 for its pin assignments.

2.6 LED Indicators

- There are five kinds of LEDs on the UNO-1172A front panel
- **PWR**: system power status
- **CF**: CF/HDD status
- **Txn, Rxn**: Serial communication status of COM Port n
- **B. BTR**: (status of **BB SRAM battery**): Replace battery when this LED is active
- **R. BTR**: status of battery for RTC clock
- **TEMP**: status of system temperature (active as over-temperature)
- **VOLT**: status of CPU voltage (active as over-voltage)

2.7 PS/2 Keyboard and Mouse Connector

The UNO-1172A provides a PS/2 keyboard and PS/2 mouse connector. A 6-pin mini-DIN connector is located on the top panel of the UNO-1172A. The UNO-1172A comes with an adapter to convert from the 6-pin mini-DIN connector to two 6-pin mini-DIN connectors for PS/2 keyboard and mouse connections. Please refer to Appendix A.7 for pin assignments.

2.8 Universal Serial Bus Connectors

The USB connector is used for connecting any device that conforms to the USB interface. Many recent digital devices conform to this standard. The USB interface supports Plug & Play, which enables you to connect or disconnect a device whenever you want without turning off the computer.

The UNO-1172A provides four connectors with USB interfaces, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB specification version 2.0 and EHCI, Rev. 2.0. The USB interface can be disabled in the system BIOS setup. Please refer to Appendix A.8 for its pin assignments.

2.9 VGA: VGA Display Connector

The UNO-1172A provides a VGA controller (Intel GMA 3150) for a high resolution VGA interface. It supports CRT Mode: up to 2048 x 1536 @ 60Hz.

2.10 RESET: Reset Button

UNO-1172A provides a reset button on the top of the device.

2.11 Audio

UNO-1172A supports audio function with:

- Line In
- Line Out
- Mic In

2.12 Battery Backup SRAM

UNO-1172A provides 1MB battery backup SRAM. This ensures that you have a safe place to store critical data. You can now write software applications without concern that system crashes will erase critical data from the memory.

There is a BTR LED in the front panel of the UNO-1172A, please replace the lithium battery with a new one if the BTR LED is activated.

2.12.1 Lithium Battery Specifications

- **Type:** BR2032 (Using CR2032 is NOT recommended)
- **Output voltage:** $3 V_{DC}$
- **Location:** the backside of UNO-1172A board.
(BH1 is for real time clock, BH2 is for SRAM)

2.13 LED and Buzzer for System Diagnosis

In a “headless application” (an application without a monitor display), it is always difficult to know the system status. Another PC may be needed to monitor a headless device's status via RS-232 or Ethernet. In order to solve this problem, UNO-1172A offers a programmable LED indicator i.e. R. BTR, B. BTR, TEMP. and VOLT. In the BIOS settings, they can be programmed to show systems status through LED indicators and buzzer alarms.

2.13.1 LED Settings

UNO-1172A series offer a set of LED indicators which have three modes to select for different purposes. You would need to enter BIOS to change the LED mode. Please refer to the following table 2.5 for details.

Table 2.5: LED Mode Settings

Mode	LED 1	LED 2	LED 3	LED 4
COM Port LED	TX1	RX1	TX2	RX2
Diagnostic LED	Programmable LED0	Programmable LED1	Programmable LED2	Programmable LED3
PCIe Mini Card LED	PCIe_LED_WLAN	PCIe_WWAN	PCIe_LED_WPAN	-

<1> In COM Port LED mode, LED1~4 indicate the simple TX/RX traffics.

<2> In diagnostic LED mode, you could program them as an indicator showing the situation of signal from DI/DO you may set and monitor their status.

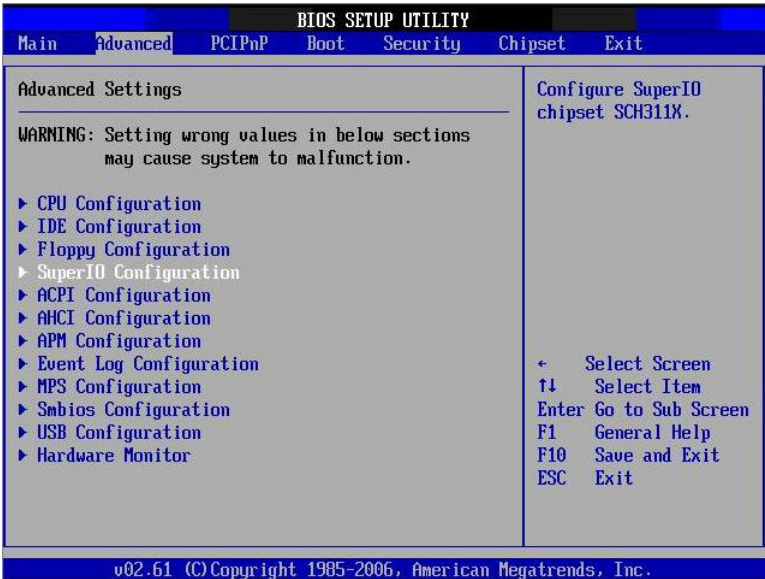
<3> In PCIe Mini Card LED mode, they show the status of PCIe mini card basically.

- WLAN: Wireless LAN such as 802.11b/g/a (2.4GHz and 5.2GHz)
- WWAN: Wireless WAN (e.g. GSM/GPRS/UMTS/CDMA2000)
- WPAN: Wireless Personal Area Network (e.g. Bluetooth)

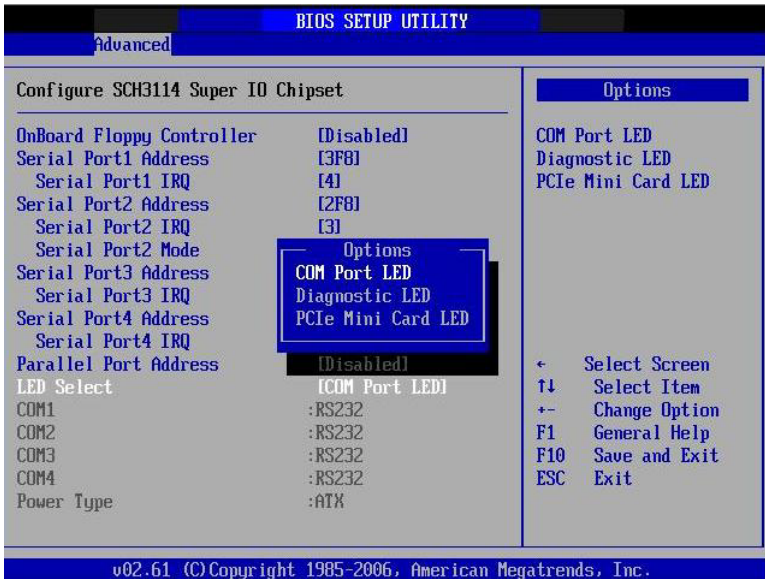
Here are the steps for showing how to set the LED configuration in BIOS.

1. Enter BIOS mode and select "**Advanced**".

2. Select **"SuperIO Configuration"** in Advanced page and press **Enter** key.



3. Select **"LED Select"**. Then choose the LED mode you need.



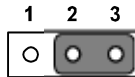
2.14 PC/104+ Connectors (UNO-1172AE/AHE only)

UNO-1172AE/AHE supports up to two PC/104+ cards. The cards can be installed on connector CN3. Please check your PC/104+ cards supported voltage to adjust the jumper on CN4.

Table 2.6: PC/104+ Voltage Jumper Settings

Voltage	Jumper close position setting
+5V	1-2
+3.3V	2-3

Jumper Setting for +3.3V example:



closed 2-3

Figure 2.7: PC/104+ Jumper Settings

2.15 Onboard Digital Input

On top side of UNO-1172A series, there is a DB9 connector (CN36) whose pins could be set as DI/O or other alternatives (Pls. refer to Table 2.7) by DIP2 of SW4. The default setting is OFF (i.e. DI/O mode) and you could check the alternatives in 2.17 for more details.

Table 2.7: DI/O & Remote Mode Selection

Mode	Pin								
	1	2	3	4	5	6	7	8	9
DI/O	DI0	DI1	DO0	DO1	GND	DO2	DO3	DO4	DO5
Remote	PWR_CTRL	SYS_RST	PWR_Status	Program_LED0	GND	Program_LED1	BAT_FAIL	OVER_TEMP	OVER_VOL

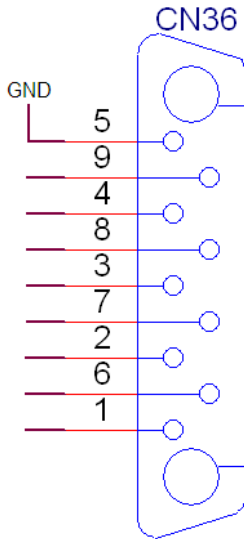


Figure 2.8: Connector CN36

2.15.1 PIN Assignments

The UNO-1172A series have 2 DI channels designated DI0~DI1. The connector type is a plug-in screw terminal block that enables you to connect to field I/O devices directly without additional accessories. Figure 2.9 and shows its pin assignment as well as signal description.

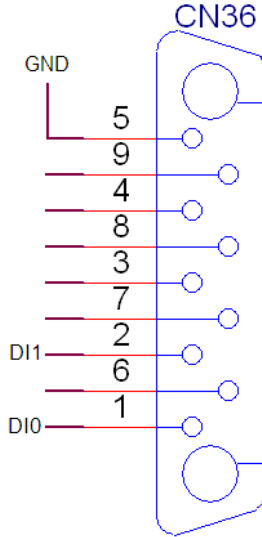


Figure 2.9: Digital In

Each of digital input channels accepts $0 \sim 50 V_{DC}$ voltage inputs, and accepts bi-directional input. The voltage range is $-3 \sim 3 V_{DC}$ for logic 0 (low), $-50 \sim -10 V_{DC}$ and $10 \sim 50 V_{DC}$ for logic 1 (high). It means that you can apply positive or negative voltage to an isolated input pin (V_{in}).

2.15.2 Interrupt Function of the DI Signals

DI0 and DI1 can be used to generate hardware interrupts. Users can setup the configuration of them by programming the interrupt control register.

The channels are connected to the interrupt circuitry. Users can disable/enable interrupt function, select trigger type or latch the port data by setting the Interrupt Control Register of the UNO-1172A (refer to section 2.15.3 below). When the interrupt request signals occur, then the software will service these interrupt requests by ISR (Interrupt Service Routine). The multiple interrupt sources provide the card with more capability and flexibility.

2.15.3 Interrupt Control Register

The Interrupt Control Register controls the function and status of each interrupt signal source. Appendix C shows the bit map of the Interrupt Control Register. The register is readable/writeable register. While being written, it is used as a control register; and while being read, it is used as a status register.

2.15.4 Wet/Dry Contact Settings

UNO-1172A series offer a simple switch to select dry/wet contact for digital inputs. Please refer to Table 2.8 for detailed specifications.

<i>Table 2.8: SW11 Settings</i>	
SW11 Settings	DI0/DI1
ON	Wet contact: Logic level 1: 10~50V Logic level 0: 3Vmax
OFF	Dry contact: Logic level 1: close to GND Logic level 0: open

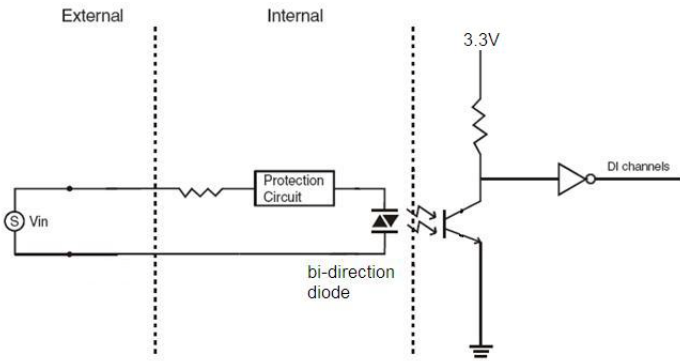


Figure 2.10: Wet Contact Wiring

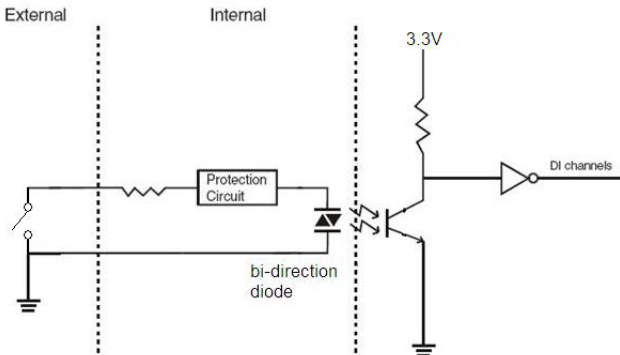


Figure 2.11: Dry Contact Wiring

2.16 Onboard Digital Output

The UNO-1172A has 6 DO channels designated DO0 ~ DO5

2.16.1 PIN Assignments

The connector type of UNO-1172A is plug-in screw terminal block that enables you to connect to field I/O devices directly without additional accessories. Figure 2.12 and Table 2.9 show its pin assignment as well as signal description.

NOTE: If an external voltage (5 ~ 40 V_{DC}) is applied to an output channel while it is being used as an output channel, the current will flow from the external voltage source to the UNO-1172A. Take care that the current through each DO pin does not exceed 200 mA. The Figure below shows how to connect an external output load to the UNO-1172A outputs

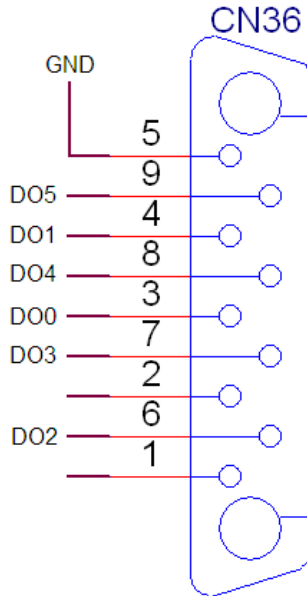


Figure 2.12: Digital Out

Table 2.9: Digital Output Connector Signals

Signal name	Direction	Description
DO<0-5>	Output	DO signals

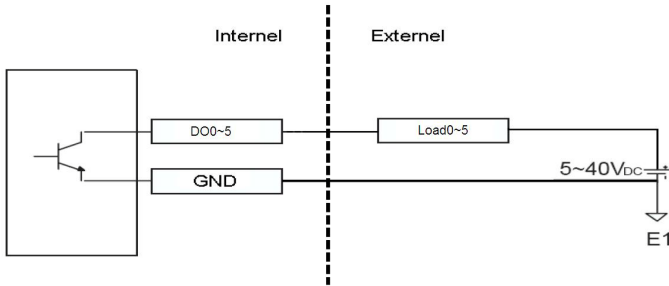


Figure 2.13: DO Wiring

2.17 Remote Monitoring and Control Functions

UNO-1172A series provides a lot of remote diagnosis to monitor controller's health for enhancing the system reliability. Through this unique function provided, the centre control room could easily know the current status of UNO-1172A remotely.

Setting DIP2 of SW4 as "ON" could turn on the remote mode on each pin of connector-CN36-on the top of UNO-1172A. You could refer to the table 2.10 for more detail information.

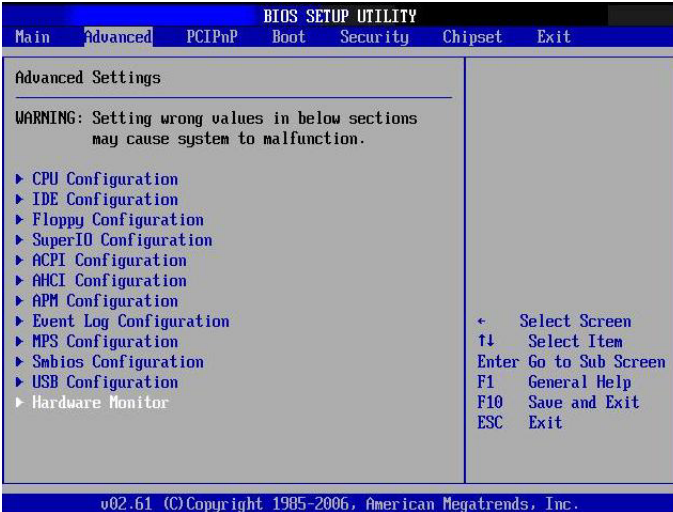
Table 2.10: Remote Diagnosis Functions

#Pin	Pin Assignment	Definition
1	PWR_CTRL	Power control functioning like SW2. Please refer to A.2
2	SYS_RST	Reset the system
3	PWR_Status	Power status showing whether a power supply is connected
4	Programmable LED0	Same function as diagnostic LED mode. Please refer to 2.13.1
5	GND	Ground
6	Programmable LED1	Same function as diagnostic LED mode. Please refer to 2.13.1
7	BAT_FAIL	Battery fail detection for RTC & SRAM batteries
8	OVER_TEMP	Over temperature detection (in BIOS)
9	OVER_VOL	Over voltage detection (in BIOS)

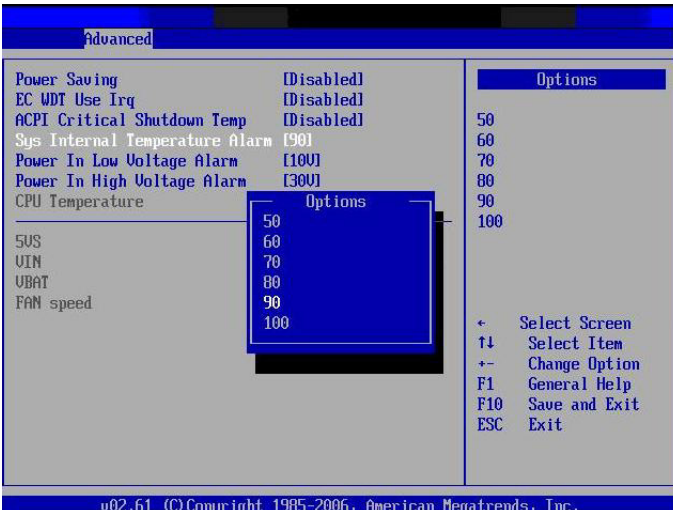
Regarding to setting OVER_TEMP and OVER_VOL, you would need to enter BIOS mode first and follow the steps below to complete it.

OVER_TEMP Settings:

1. Enter BIOS mode and select "**Hardware Monitor**" in **Advanced**.

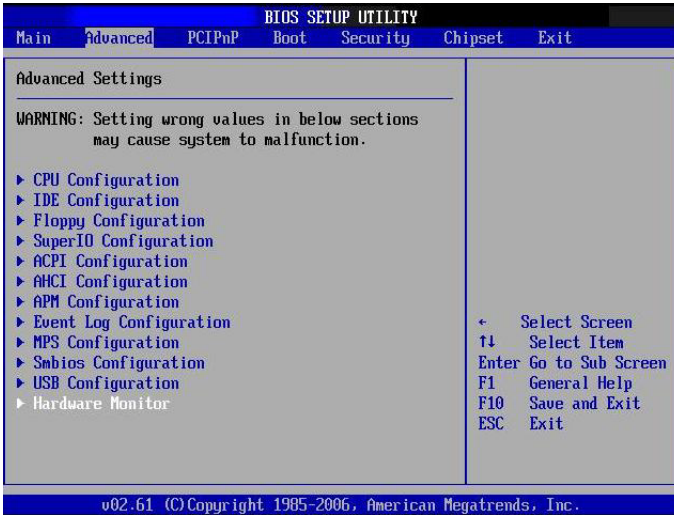


2. Select "**Sys Internal Temperature Alarm**" to set the target temperature. (default setting: 90°C)



OVER_VOL Settings:

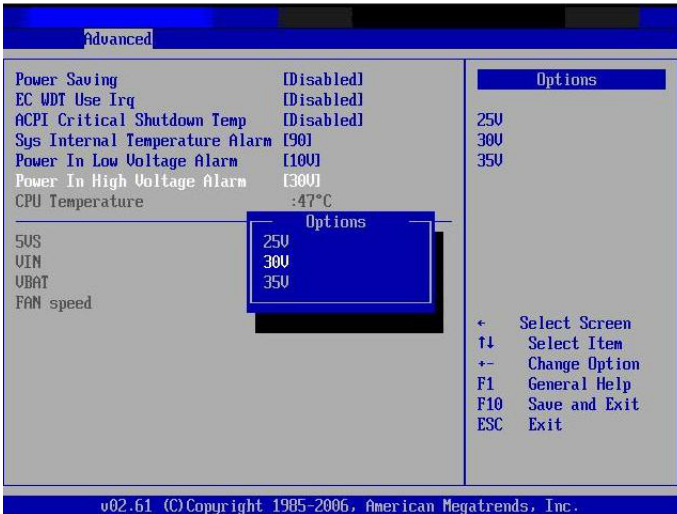
1. Enter BIOS mode and select "**Hardware Monitor**" in **Advanced**.



2. Select "**Power In Low Voltage Alarm**" to set the minimum input voltage. (default setting: 10V)



3. Select "Power In High Voltage Alarm" to set the maximum input voltage. (default setting: 35V)



2.18 Advanced Watchdog Timer

The UNO-1172A provides a 7-tier Watchdog Timer for users to have a chance to escalate system status before the forced system reset. Each tier has the same time interval from 1~255 seconds and users can have an event handling after the time-out of each tier. Install the driver from companion disc and refer to the software manual for details.

Initial Setup

Sections include:

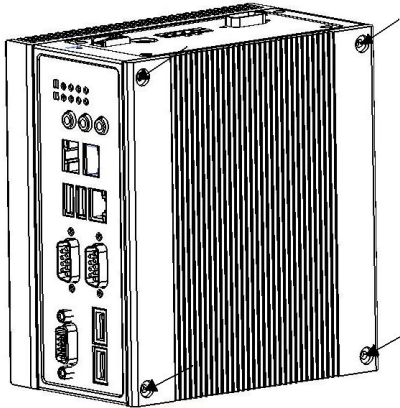
- CompactFlash Installation
- PC/104+ Card Installation
(UNO-1172AE/AHE)
- Hard Drive Installation (UNO-1172AE/
AHE)
- Chassis Grounding
- Power Connection
- BIOS Setup and System Assignments

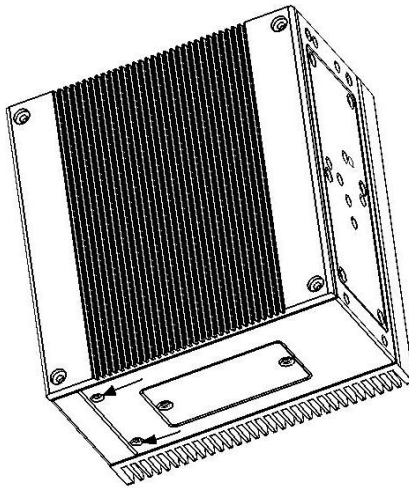
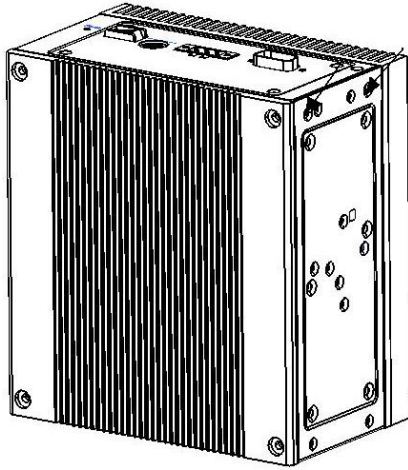
Chapter 3 Initial Setup

3.1 CompactFlash Card Installation

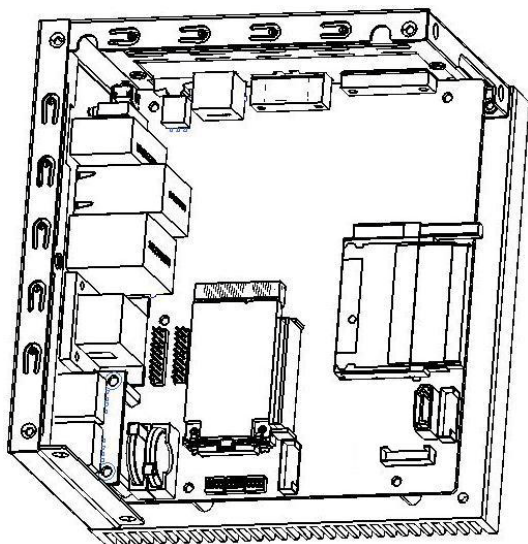
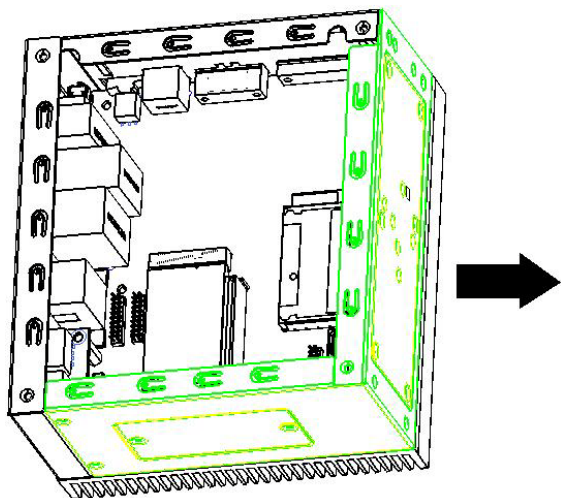
The procedure for installing a CompactFlash card into the UNO-1172A/1172AE/1172AH/1172AHE is as follows, please follows these steps carefully. Although the outside appearance of the UNO-1172A/AH and UNO-1172AE/AHE is different from the figures shown below, the procedure is the same.

1. Remove the power.
2. Unscrew the screws from the UNO-1172A/AH as indicated below.





3. Remove the L-shaped cover.



4. Plug a CompactFlash card with user's OS and application program into a CompactFlash card slot on board.
5. Screw back the rear cover and the screws.

3.2 Chassis Grounding

Please connect the chassis ground of UNO-1172A/AH with “EARTH”.

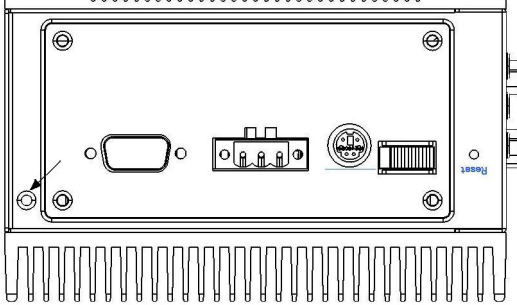


Figure 3.1: Chassis Grounding Connection

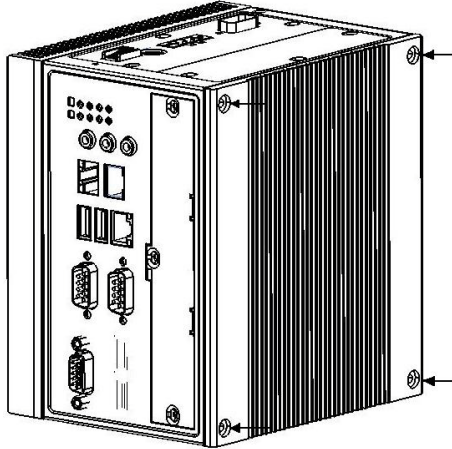
3.3 Power Connection

Connect the UNO-1172A/AE to a 10 ~ 36 V_{DC} or the UNO-1172AH/AHE to a 9(Min.)~36(Max.)V_{DC} power source. The power source can either be from a power adapter or an in-house power source.

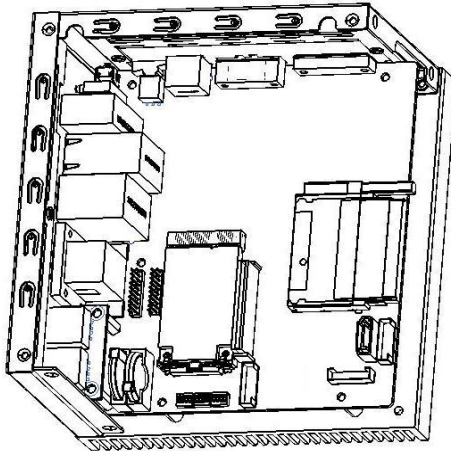
3.4 PC/104+ Card Installation (UNO-1172AE/AHE)

The procedure for installing a PC/104+ card into is as follows.

1. Remove the power.
2. Unscrew the screws from UNO-1172AE/AHE indicated below.

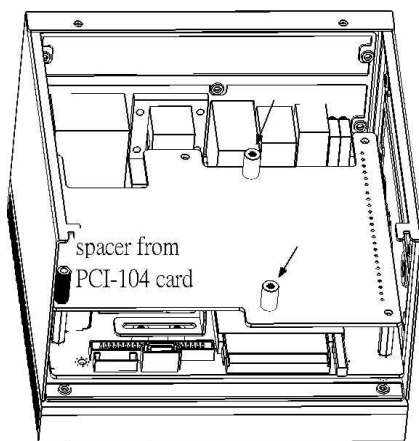


3. Remove the rear cover.

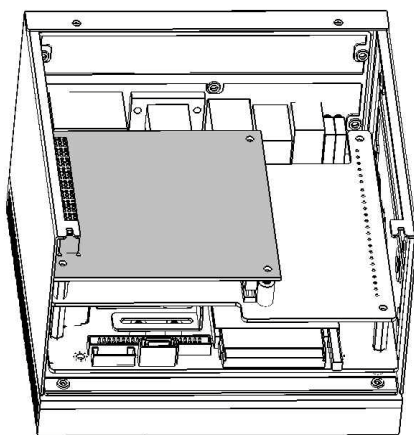


4. Find 2 metal spacer from accessory bag, and screw tight on the location indicated arrow in the below picture. (Note: There were spacers soldered on the daughter board already). Normally you will also get some hexagon spacer from your PC/104+ card packing.

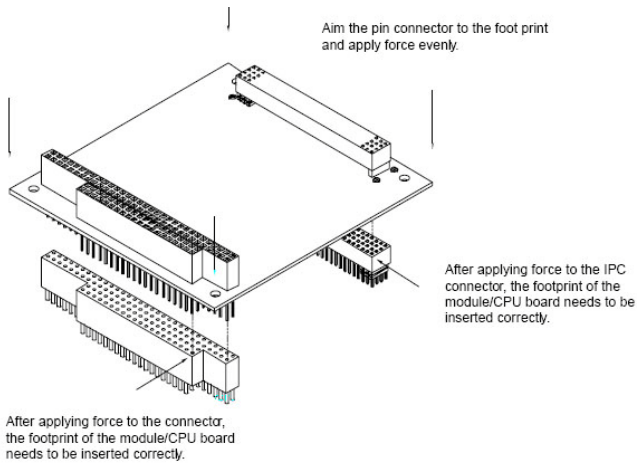
Use and screw those spacers on the location indicated black shown in below picture.



5. Please refer to section 2.14 for PC/104+ card voltage setting before install the PC/104+ card.
6. Stack the PC/104+ card and related cables.



7. Screw the rear cover and the six screws. Now you are done with the PC/104+ card installation.



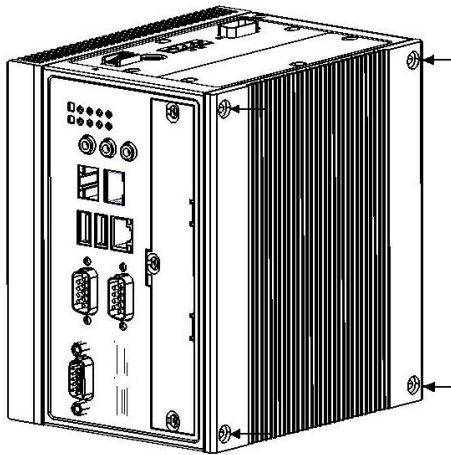
Note: You can use two PC/104+ cards at the same time while you don't use a hard drive. Using a hard drive will limit the number of PC/104+ you used to one

Note: There are four set of INT# in PCI-104 standard--INTA~D--and we don't support INTA and INTC.

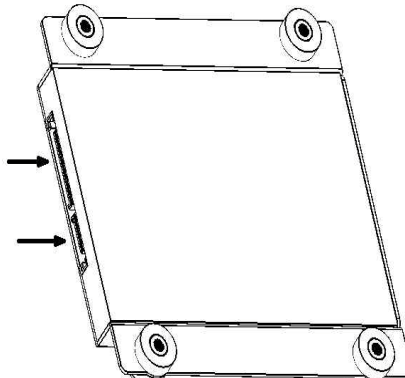
3.5 Hard Drive installation (UNO-1172AE/AHE)

The procedure for installing a hard drive into the UNO-1172AE/AHE is shown as following step.

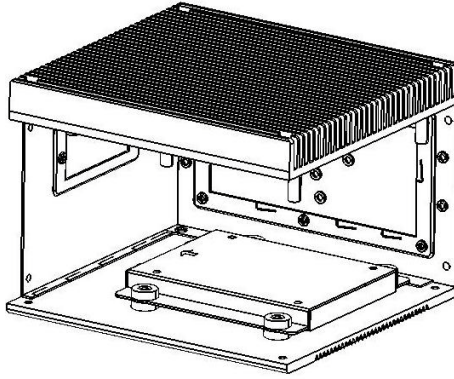
1. Remove the power.
2. Unscrew the screws from UNO-1172AE/AHE indicated below.
3. Remove the rear cover. Please refer to Section 3.1 for the instruction to open the cover.
4. Take four screws from the rear cover to lose the hard drive bracket.



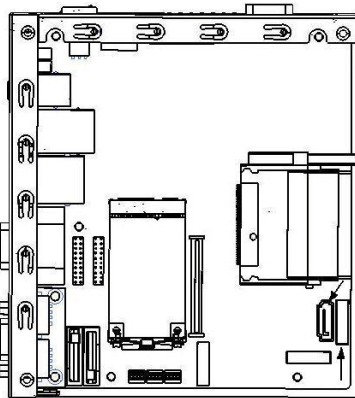
5. Connect the SATA cable and SATA power cable. Make sure the cable will not lose. Use the screws in accessory to mount the hard drive on the hard drive bracket.



6. Turn the hard drive bracket and align with the screw hole on the rear cover. Use the four screws taken from step 4 and screw the bracket and the rear cover tight.



7. Connect the other end of SATA cable on the board which the arrow indicated in below picture.



8. Screw the rear cover and the screws.
9. For user who tried to plug other SATA device, please note the UNO-1172AE/AHE SATA power connector doesn't support 12V power.

Note: There are switch setting about SATA hard drive below, please refer to the section A.10 for detail. The hard drive might not work correctly if the switch setting is incorrect

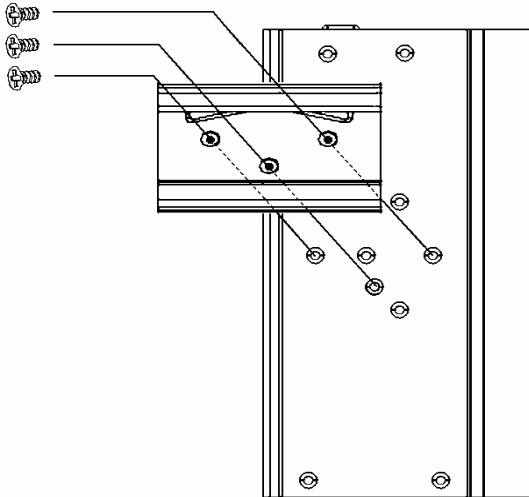
3.6 BIOS Setup and System Assignments

UNO-1172A uses the Advantech SOM-6763 CPU module. For UNO-1172A BIOS setup and system assignments, you can refer to Chapter 4 and Appendix A. Please note that you can try to “LOAD BIOS DEFAULTS” from the BIOS Setup manual if UNO-1172A does not work properly.

3.7 DIN-rail Mounting Setup

Please follow the below steps to mount the UNO-1172A on the DIN-Rail.

1. Screw the provided DIN-Rail Kit on the rear side of UNO-1172A as the diagram shown below.



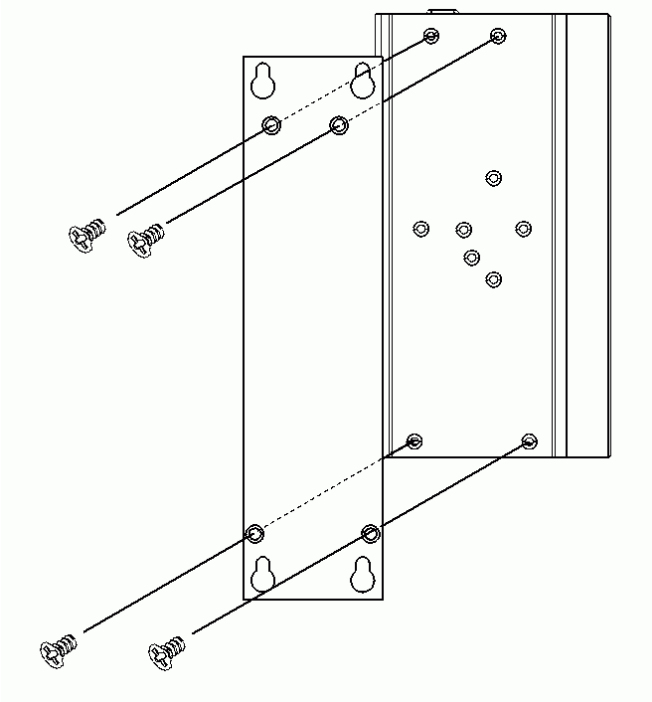
2. Hang the UNO-1172A to the DIN-Rail with angle of inclination about 30 degrees.
3. Let UNO-1172A down straight to slide over the Rail smoothly.

Note: To get the UNO-1172A down from the Rail, push the device top to down then pull the bottom of the device to let it off the Rail smoothly.

3.8 Wallmounting Setup

Please follow the below steps to mount the UNO-1172A on the wall.

1. Screw the provided Wall Mounting Kit on the rear side of UNO-1172A as the diagram shown below.



2. Mount the device on the wall by the 2 pairs hooking hole provided by the Wallmounting Kit.

System Settings and Pin Assignments

- Board Connectors and Jumpers
- RS-232 Serial Port (COM3&4)
- RS-232/422/485 Serial Port (COM1~2)
- Ethernet RJ-45 Connector
- Power Screw Terminal
- PS/2 Keyboard and Mouse Connector
- USB Connector
- VGA Display Connector
- CompactFlash Master/Slave Jumper Setting
- SATA DATA Connector

Appendix A System Settings and Pin Assignments

A.1 System I/O Address & Interrupt Assignments

Table A.1: UNO-1172A System I/O Ports

Address Range	Device
0000-000F	DMA controller (slave)
0000 - 0CF7	PCI bus
0020 - 0021	Programmable interrupt controller
0040 - 0043	System timer
0060 - 0060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0061 - 0061	System speaker
0062 - 0062	Microsoft ACPI-Compliant Embedded Controller
0064 - 0064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0066 - 0066	Microsoft ACPI-Compliant Embedded Controller
0070 - 0071	System CMOS/real time clock
00A0 - 00A1	Programmable interrupt controller
00F0 - 00FF	Numeric data processor
01F0 - 01F7	Primary IDE Channel
0274 - 0277	ISAPNP Read Data Port
0279 - 0279	ISAPNP Read Data Port
02F8 - 02FF	Communications Port (COM2)
0378 - 037F	Printer Port (LPT1)
03B0 - 03BB	Intel(R) Graphic Media Accelerator 3150
03C0 - 03DF	Intel(R) Graphic Media Accelerator 3150
03F8 - 03FF	Communications Port (COM1)
0400 - 041F	Intel(R) ICH8 Family SMBus Controller - 283E
D400 - D41F	Intel 82567V-3 Gigabit Network Connection
D480 - D49F	Standard Universal PCI to USB Host Controller
D800 - D81F	Intel ICH8 Family USB Universal Host Controller - 2832
D880 - D89F	Intel ICH8 Family USB Universal Host Controller - 2831

Table A.1: UNO-1172A System I/O Ports

Address Range	Device
DC00 - DC1F	Intel ICH8 Family USB Universal Host Controller - 2830
E080 - E08F	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
E400 - E40F	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
E480 - E483	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
E800 - E807	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
E880 - E883	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
EC00 - EC07	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
FFA0 - FFAF	Intel ICH8M Ultra ATA Storage Controller - 2850

Table A.2: UNO-1172A Interrupt Assignment

Interrupt No.	Interrupt Source
NMI	Parity error detected
IRQ 0	System timer
IRQ 1	Keyboard
IRQ 2	Available
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Available
IRQ 6	Available
IRQ 7	Available
IRQ 8	System CMOS/real time clock
IRQ 10	Intel ICH8 Family SMBus Controller - 283E
IRQ 11	Available
IRQ 12	PS/2 mouse
IRQ 13	Numerical data processor
IRQ 14	Primary IDE
IRQ 15	Available

A.2 Board Connectors and Jumpers

There are connectors and jumpers on the UNO-1172A board. The following sections tell you how to configure the UNO-1172A hardware setting. Figure A-1 and figure A-2 show the locations of UNO-1172A connectors and jumpers.

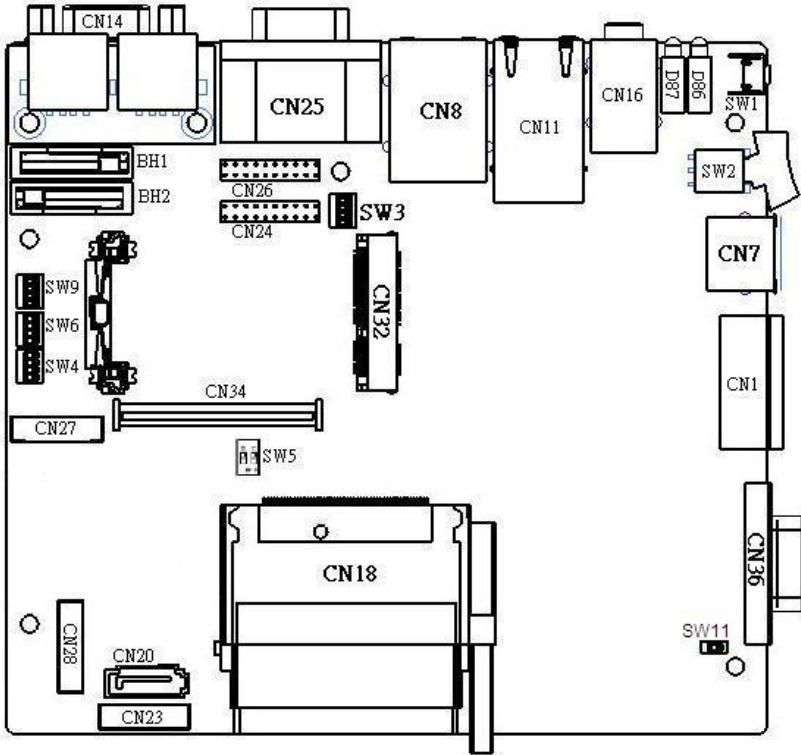


Figure A.1: Connector & Jumper Locations (Top)

Table A.3: Connectors & Jumpers

BH1	Lithium battery for BIOS
BH2	Lithium battery for Backup SRAM
CN1	Power Screw Terminal
CN7	PS/2 keyboard and mouse connector
CN8	USB and LAN connectors
CN11	LAN connector
CN14	VGA DB15 display
CN16	Audio line in/out and Mic in
CN18	CompactFlash card connector
CN20	SATA connector (data)
CN23	SATA connector (power)
CN24	Jumper for RS-232/422/485 selection
CN25	COM1~2 RS-232/422/485 serial port
CN26	Jumper for RS-232/422/485 selection
CN27	COM3 RS-232 serial port (reserved pin header)
CN28	COM4 RS-232 serial port (reserved pin header)
CN32	Mini PCIe card connector
CN34	Board to board connector (PCI)
CN36	DB9 connector (for DI/O)
SW1	Reset switch
SW2	Power control
SW3	Terminal resistor for COM 1~2
SW4	DIP1: AT/ATX mode selection
	DIP2: DI/O & Alternatives selection
	DIP3: COM port RI wake (ON: Enable; OFF: Disable)
	DIP4: reserved
SW5	RS-422/485 Master/Slave Selector
SW9	DIP1: WDT initial protection (255 sec)
	DIP2: reserved
	DIP3: default: OFF
	DIP4: default: OFF
SW11	ON: DI wet contact
	OFF: DI dry contact

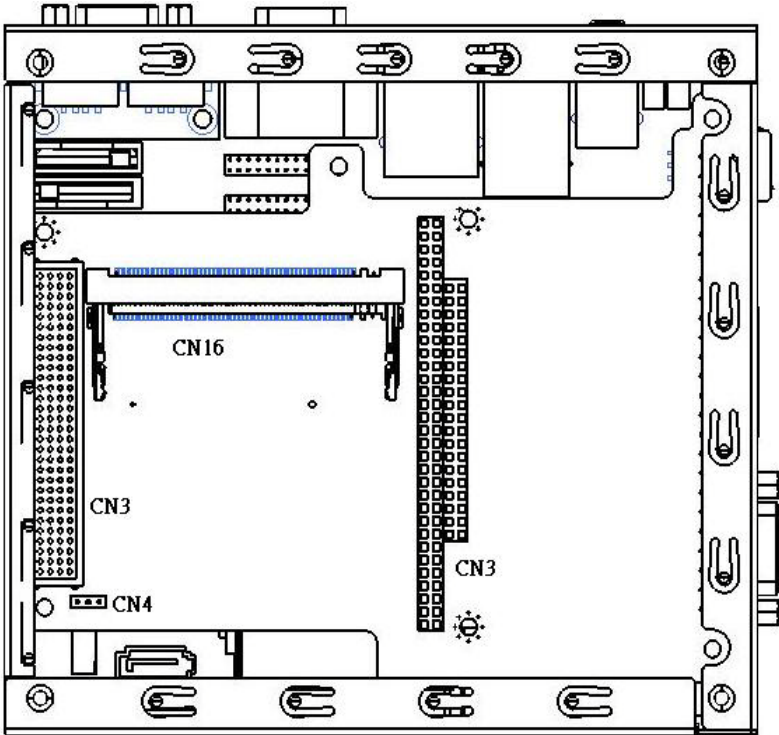


Figure A.2: Connector & Jumpers (UNO-1172AE)

Table A.4: Connectors & Jumpers (UNO-1172AE)	
CN3-B,CN3-C	PC/104 card connector
CN3-A	PC/104+ card connector
CN16	Mini PCI card connector
CN4	Jumper of PC/104+ card voltage selection (+3.3V or +5V)

A.3 RS-232 Serial Port (COM3~4)

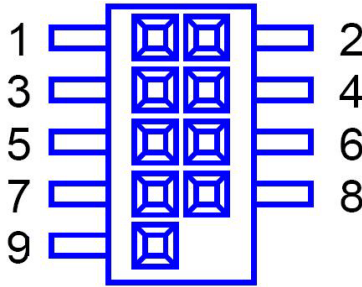


Table A.5: RS-232 Serial Port Pin Assignments

Pin	Signal Name
1	DCD
2	DSR
3	RxD
4	RTS
5	TxD
6	CTS
7	DTR
8	RI
9	GND

A.4 RS-232/422/485 Serial Port (COM1~2)

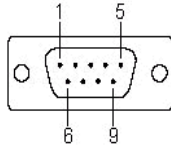


Table A.6: RS-232/422/485 Serial Ports

Pin	RS-232	RS-422	RS-485
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

A.5 Ethernet RJ-45 Connector (LAN1~LAN3)

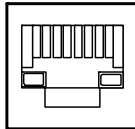


Table A.7: Ethernet RJ-45 Connector Pin Assigns

Pin	10/100/1000Base-T Signal Name
1	XMT+
2	XMT-
3	RCV+
4	NC
5	NC
6	RCV-
7	NC
8	NC

A.6 Power Screw Terminal (CN1)

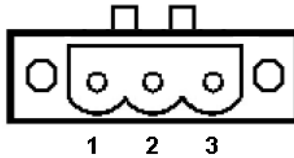


Table A.8: Phoenix Power Connector Pin Assigns

Pin	Signal Name
1	VIN (10 ~ 36 V _{DC})
2	GND
3	Field Ground

A.7 PS/2 Keyboard and Mouse Connector (CN7)

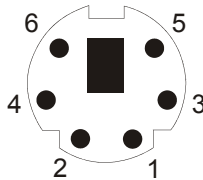


Table A.10: Keyboard & Mouse Connector Pin Assigns

Pin	Signal Name
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

A.8 USB Connector (CN8)

Table A.11: USB Connector Pin Assignments

Pin	Signal Name	Cable Color
1	VCC	Red
2	DATA-	White
3	DATA+	Green
4	GND	Black

A.9 VGA Display Connector (CN14)

Table A.12: VGA Adaptor Cable Pin Assignments

Pin	Signal Name	Pin	Signal Name
1	RED	9	EDID Power
2	GREEN	10	GND
3	BLUE	11	NC
4	NC	12	EDID Data
5	GND	13	H-SYNC
6	VGA Detect	14	V-SYNC
7	GND	15	EDID Clock
8	GND		

VGA Controller

The Intel GMA 3150 VGA controller can drive CRT displays or color panel displays with resolutions up to 2048 x 1536 at 60 Hz.

A.10 SATA Data Connector (CN20)

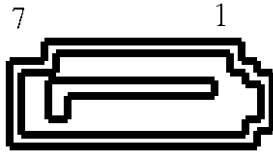


Table A.13: SATA DATA Connectors (CN20)

Pin	Signal Name
1	GND
2	A+
3	A-
4	GND
5	B-
6	B+
7	GND

Watchdog Timer Register

Appendix B Watchdog Timer Register

Register 1: WatchDogTimer Load (WDTLOAD)

OFFSET = 0x000

WDTLOAD serves as a countdown timer. Once an 8-bit width value is loaded into the register, it starts to count down to zero automatically.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

	Reserved	WDTLOAD
--	----------	---------

Table B.1: WDTLOAD Bits Definitions

Bits	Access	Name	Description
31:8	-	-	Reserved 0x00 = reset
7:0	R/W	WDTLOAD	Load time into the register 0xFF = reset

Register 2: WatchDogTimer Value (WDTVALUE)

OFFSET = 0x004

WDTVALUE saves the current watchdog timer value.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

	Reserved	WDTLOAD
--	----------	---------

Bits	Access	Name	Description
31:8	RO	-	Reserved 0x00 = reset
7:0	RO	WDTLOAD	Current watchdog timer value 0xFF = reset

Register 3: WatchDogTimer Control (WDTCTL)

OFFSET = 0x008

WDTCTL selects the corresponding event as time out. It could be configured to choose reset, interrupt or digital output signal when time out.

Bit	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	9	8	7	6	5	4	3	2	1	0
User Settings																											

Reserved	INTEN	RESEN	WDT_DO_EN
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Bits	Access	Name	Description
31:3	RO	-	Reserved 0x00 = reset
2	R/W	WDT_DO_EN	Digital Output Enable for Watchdog Timer time out 0 = Disable digital output 1 = Enable digital output
1	R/W	RESEN	Reset Enable for Watchdog Timer time out 0 = Disable reset 1 = Enable reset
0	R/W	INTEN	Interrupt Enable for Watchdog Timer time out 0 = Disable Interrupt 1 = Enable Interrupt

Register 4: WatchDogTimer Counter Clear (WDTCR)

OFFSET = 0x00C

WDTCR clears the watchdog timer. Any value written into WDTCR would set zero and reload the value stored in WDTLOAD register to watchdog timer. Read/reset WDTCR is undefined.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

	WDTCR
--	-------

Bits	Access	Name	Description
31:0	WO	WDTCR	Watchdog Timer Clear any value = clear watchdog timer

Register 5: WatchDogTimer Time-Out Trigger Status (WDTTR)

OFFSET = 0x010

WDTTR saves the occurrence times of watchdog timer time-out. The corresponding operation differs from the access type which is taken on WDTTR. A read-out from WDTTR would clear the watchdog interrupt while a write-in clear WDTTR.

Bit	3	3	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	9	8	7	6	5	4	3	2	1	0	
User Settings																												

	Reserved	WDTTR
--	----------	-------

Bits	Access	Name	Description
31:8	RO	-	Reserved 0x00 = reset
7:0	R/W	WDTTR	Watchdog Timer time-out counter: The correlative operation is upon the access type. 0xFF = reset Read-out = clear the watchdog interrupt Write-in = clear WDTTR

Register 6: WatchDogTimer Interrupt Control Register (WDTINTCTR)

OFFSET = 0x014

Based on the watchdog timer time-out frequency which is stored in WDTR, WDTINTCTR sets the period of interrupt. WDTR plus one as watchdog timer time out occurred. While the number of occurrences exceeds the value saved in WDTINTCTR, an interrupt would be issued.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

	Reserved	WDTINTCTR
--	----------	-----------

Bits	Access	Name	Description
31:8	RO	-	Reserved 0x00 = reset
7:0	R/W	WDTINTCTR	Interrupt Occurrence Frequency Setup: An interrupt issued when the number of times of watchdog timer time-out is greater than the value store in WDTINTCTR. 0x00 = reset

Register 7: WatchDogTimer Reset Control Register (WDTRSTCTR)

OFFSET = 0x018

Based on the watchdog timer time-out frequency which is stored in WDTR, WDTINTCTR sets the period of reset. WDTR plus one as watchdog timer time out occurred. While the number of occurrences exceeds the value saved in WDTINTCTR, a reset signal would be issued.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

	Reserved	WDTRSTCTR
--	----------	-----------

Bits	Access	Name	Description
31:8	RO	-	Reserved 0x00 = reset
7:0	R/W	WDTRST-CTR	Reset Occurrence Frequency Setup: A reset issued when the number of times of watchdog timer time-out is greater than the value store in WDTRSTCTR. 0x00 = reset

Register 8: WatchDogTimer Alarm Digital Output (WDTALAR-MDO)

OFFSET = 0x01C

WDTALARMDO is an alarm which indicates whether watchdog timer time-out occurs. As soon as watchdog timer time-out takes place, WDTALARMDO would be set to one till be cleared.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
User Settings																																

	Reserved	WDTALARMDO
--	----------	------------

Bits	Access	Name	Description
31:1	-	-	Reserved 0x00 = reset
0	-	WDTALAR-MDO	Watchdog Timer Timer-out Alarm 0 = reset 1 = watchdog time out takes place

Register 9: WatchDogTimer Interrupt (WDTINT)

OFFSET = 0x020

WDTINT is a register indicating whether interrupt is triggered. Once read out the value in WDTINT, it'll be cleared immediately to avoid looping.

Bit	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
User Settings																																	

Reserved	INT
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Bits	Access	Name	Description
31:1	-	-	Reserved 0x00 = reset
0	-	WDTALAR-MDO	Watchdog Timer Interrupt Indicator 0 = no interrupt triggered 1 = an interrupt triggered

Digital Input Interrupt Control Register

Appendix C Digital Input Interrupt Control Register

Register 1: Interrupt Enable Status (Base Address 1 + 02H)

Bit	7	6	5	4	3	2	1	0
User Settings								

	Reserved	D11EN	D10EN
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Bits	Access	Name	Description
7:2	-	-	-
1	R	D11EN	D11 Interrupt enable status 0 = Off 1 = On
0	R	D10EN	D10 Interrupt enable/disable control 0 = Off 1 = On

Register 2: Interrupt Enable Register (Base Address 1 + 02H)

Bit	7	6	5	4	3	2	1	0
User Settings								

	Reserved	D11EN	D10EN
--	----------	-------	-------

Bits	Access	Name	Description
7:2	-	-	-
1	W	D11EN	D11 Interrupt enable/disable control 0 = Disable 1 = Enable
0	W	D10EN	D10 Interrupt enable/disable control 0 = Disable 1 = Enable

Register 3: Interrupt Triggering Status (Base Address 1 + 03H)

Bit	7	6	5	4	3	2	1	0
User Settings								
	Reserved					DI1RF	DI0RF	

Bits	Access	Name	Description
7:2	-	-	-
1	R	DI1RF	DI1 Interrupt triggering status 0 = Off 1 = On
0	R	DI0RF	DI0 Interrupt triggering status 0 = Off 1 = On

Register 4: Interrupt Triggering Register (Base Address 1 + 03H)

Bit	7	6	5	4	3	2	1	0
User Settings								
	Reserved						DI1RF	DI0RF

Bits	Access	Name	Description
7:2	-	-	-
1	W	DI1RF	DI1 Interrupt triggering edge control 0 = Falling edge trigger 1 = Rising edge trigger
0	W	DI0RF	DI0 Interrupt triggering edge control 0 = Falling edge trigger 1 = Rising edge trigger

Register 5: Interrupt Flag (Base Address 1 + 07H)

Bit	7	6	5	4	3	2	1	0
User Settings								
	Reserved						DI1IF	DI0IF

Bits	Access	Name	Description
7:2	-	-	-
1	R	DI1IF	DI1 Interrupt flag 0 = No interrupt 1 = Interrupt occur
0	R	DI0IF	DI0 Interrupt flag 0 = No interrupt 1 = Interrupt occur

Register 6: Interrupt Clear Register (Base Address 1 + 07H)

Bit	7	6	5	4	3	2	1	0
User Settings								

	Reserved	DI1IFCLR	DI0IFCLR
--	----------	----------	----------

Bits	Access	Name	Description
7:2	-	-	-
1	W	DI1IFCLR	DI1 Interrupt flag clear control 0 = Don't care 1 = Clear
0	W	DI0IFCLR	DI0 Interrupt flag clear control 0 = Don't care 1 = Clear

**USB Holder Installation
(ONLY FOR UNO-1172AH/AHE)**

Appendix D USB Holder Installation

In hazardous locations, sparks caused by the movement from a USB connector which is even slightly loose could lead to a disaster. To prevent this, we provide a set of accessories to secure the USB connectors. Follow the below instructions to complete the installation. (The contents may vary but the installation procedure is the same.)

1. Find the USB holders (5pcs in total) in the accessory bag.
2. Refer to the following figures and attach the holders to the UNO-1172AH/AHE for securing the USB connector.

