# UNO-1170A/AE

**Atom N270 Fanless, DIN-rail Mounted Embedded Automation Computer with 2 x LAN, 3 x COM, 4 x USB, Audio & PC/104+**

# User Manual

**Acknowledgements**

IBM, PC/AT, PS/2 and VGA are trademarks of International Business Machines Corporation.

Intel® and Atom® are trademarks of Intel Corporation.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

C&T is a trademark of Chips and Technologies, Inc.

All other product names or trademarks are properties of their respective owners.

**Support**

For more information on this and other Advantech products, please visit our websites at: http://www.advantech.com

For technical support and service, please visit our support website at: http://www.advantech.com/support/

Part No. 2003117040 1st Edition

Printed in Taiwan May 2011

**Product Warranty (2 years)**

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandize authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
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.

**Technical Support and Assistance**

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

**Caution**

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type battery as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

**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
- Key pro bracket
- Bracket-keypro Assy for UNO-1170 A/AE
- Spacer for PCI/104+ expansion (UNO-1170AE 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 60° C (140° 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-1170A/AE Overview

Sections include:

- Introduction
- Hardware Specifications
- Safety Precautions
- UNO-1170A/AE Series
- Chassis Dimensions

# Chapter 1 UNO-1170A/AE Overview

## 1.1 Introduction

UNO-1170A/AE is an DIN-rail mounted Embedded Automation Computer, which provides several serial communication ports and Ethernet interfaces. UNO-1170A/AE is designed with a compact size, small footprint, and help to saves space with its front accessible and DIN-rail design. With rich OS and driver support, such as Windows XP embedded, WES-2009, WES7P, 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:** Intel Atom N270 1.67GHz
- **Memory:** 1GB
- **Battery-backup RAM:** 512 KB Battery-backup RAM
- **VGA/Keyboard/Mouse:** DB-15 VGA Connector, Mini-DIN connector for PS/2 keyboard & mouse
- **Serial Ports:** 2 × RS-232 and 1 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: 50~921.6 kbps
- **LAN:** Two 10/100 Base-T RJ-45 Ports
- **USB interface:** Four USB ports, USB EHCI, Rev. 2.0 compliant. (Including 3 external connectors and 1 internal connector for USB dongle)
- **Audio:** Line in, Line out
- **Storage:** SSD: 1 x internal type I/II CompactFlash slot
  HDD: one 2.5" SATA HDD bracket
- **LEDs:** Power (Power Standby: Orange, Power on: Green), 3 pairs of serial flow indicators (Tx, Rx), -IDE, Alarm for RAM Backup Battery & system Diagnostics
- **PC/104+:** PC/104+ slot, Supports +5V Power (UNO-1170AE only)
- **Mini PCI:** 1x Mini-PCI slot (UNO-1170AE only)
- **Watchdog Timer**: Advantech [W83627] WDT

- **Shock Protection:** IEC 68002-27, CompactFlash: 50G @ Wall mount, half sine, 11ms (Optional, for UNO-1170AE: 20G @ wall mount, half sine, 11ms)
- **Vibration Protection:** IEC 68002-64 (Random 1 Oct./min, 1hr/axis), CompactFlash: 2Grms@ 5~500Hz, (Optional, UNO-1170A/AE only) HDD: 0.5 Grms @ 5~500Hz
- **Power Supply Voltage:** 10-36 VDC, reversed wiring protection
- **Power Requirement:** Min. 36W (10-36VDC) (e.g +24 V @ 1.5A) (ATX)
- **Power Consumption:** 14W (Typical)
- **Operating Temperature:** -10~60°C (-4~149°F)
- **Storage Temperature**: -20~80°C (-4~176°F)
- **Relative humidity:** 95% @ 40°C
- **Weight:** 1.6KG (for UNO-1170A) 2.0KG (for UNO-1170AE)
- **Chassis size (W × L × H):**85x155x140mm (3.4"x 6.1"x 5.6")(UNO-1170A)
  110x155x140 mm (4.4"x 6.1"x 5.6") (UNO-1170AE)
- **Software options:** WinXP Embedded, WES-2009, WES7P, Win CE, Linux
- **Certification**: CE, FCC Class A, UL. CCC, CB

## 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-1170A/AE. 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-1170A/AE Series

There are four products in UNO-1170A/AE series, as listed below:

| | |
|---|---|
| **UNO-1170A-A12E** | UNO-1170AE with Intel Atom N270 CPU and 1G DDR2 RAM |
| **UNO-1170AE-A12E** | UNO-1170A with Atom N270 CPU and 1G DDR2 RAM and PC/104+ expansion |

## 1.5 Chassis Dimensions

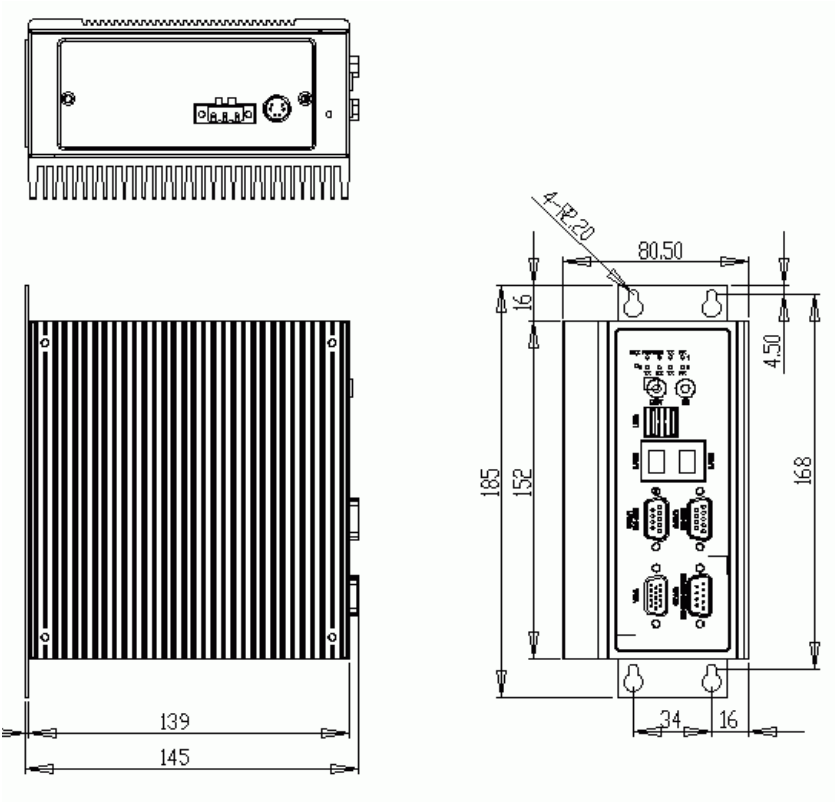



*Figure 1.1: UNO-1170A Chassis Dimensions*

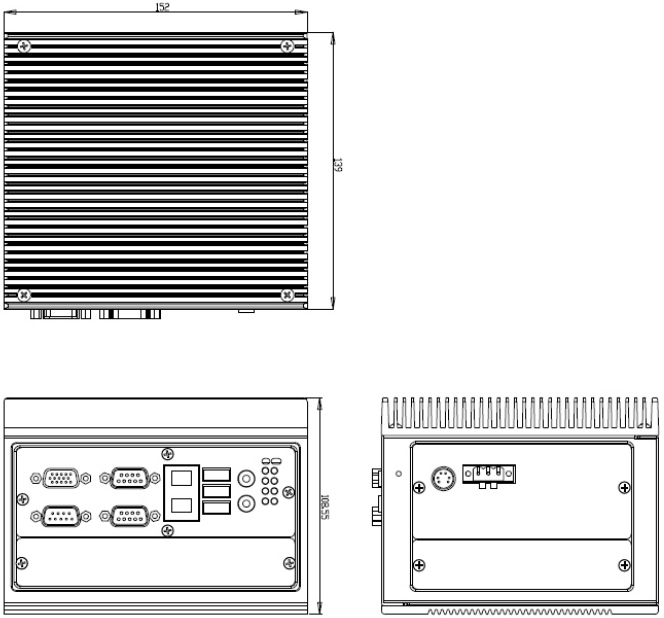



*Figure 1.2: UNO-1170AE Chassis Dimensions*

CHAPTER 2

# Hardware Functionality

Sections include:

- UNO-1170A/AE Peripherals
- COM1~2: RS-232 Interfaces
- COM 3: 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-1170A/AE Peripherals

The following figures show the connectors on UNO-1170A and UNO-1170AE. The following sections give you detailed information about function of each peripheral.

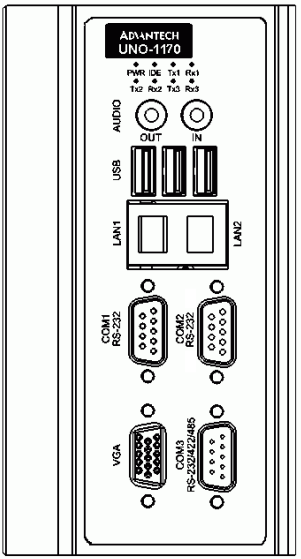



*Figure 2.1: UNO-1170A Front View*

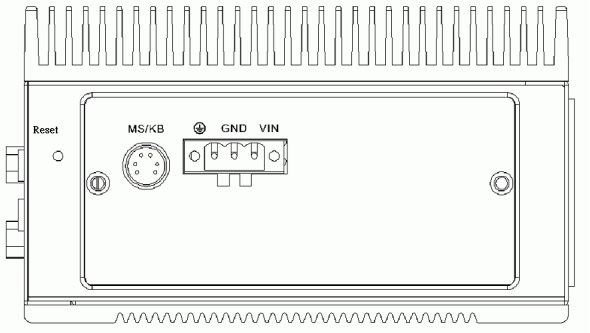



*Figure 2.2: UNO-1170A Top View*

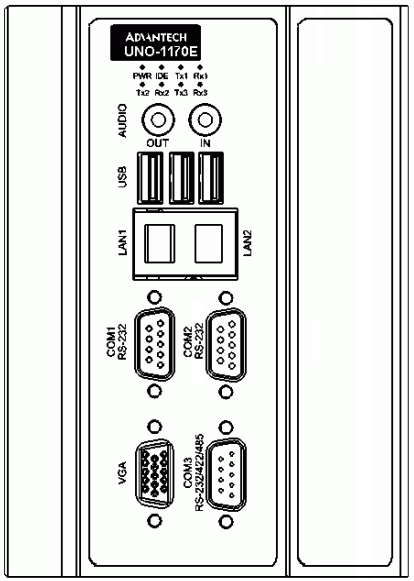



*Figure 2.3: UNO-1170AE Front View*

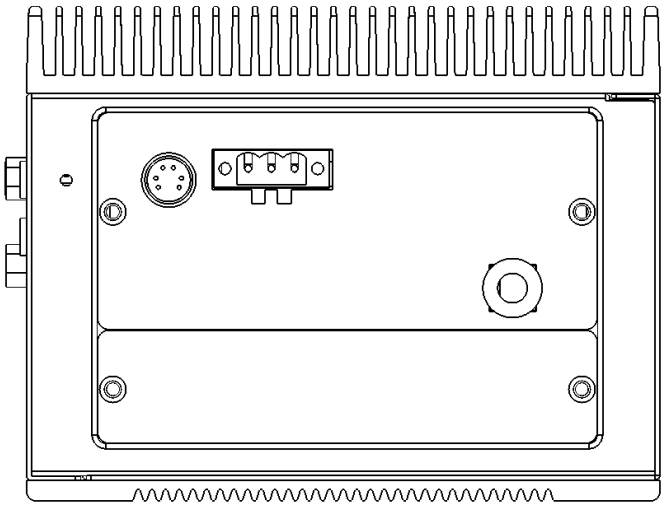


*Figure 2.4: UNO-1170AE Top View*

## 2.2 COM1~COM2: RS-232 Interfaces

The UNO-1170A/AE offers two standard RS-232 serial communication interface port on COM1 and COM2. Please refer to A.2 for pin assignments.

## 2.3 COM3: RS-232/422/485 Interfaces

The UNO-1170A/AE offers one 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.3 for pin assignments and Table 2.1 lists the default setting of each port.

*Table 2.1: COM3 Default Settings*

| COM Port | Default Setting |
|---|---|
| COM3 | RS-422/485 |

### 2.3.1 TI 16C550 UARTs with 16-byte Standard

Advantech UNO-1170A/AE comes standard with TI 16C550 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-1170A/AE 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-1170A/AE 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 maintained without need for modification.

### 2.3.4 RS-232/422/485 Selection

COM3 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 (COM2&3)*

| Serial Port | Corresponding Jumper to Select RS-232/422/485 |
|---|---|
| COM3 | CN12 |

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

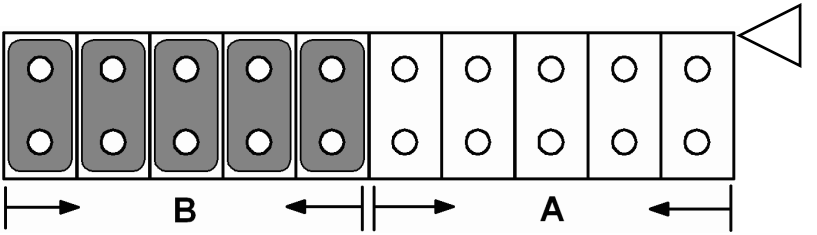



*Figure 2.5: RS-422/485 Jumper Settings*

**Jumper Setting for RS-232 Interfaces:**

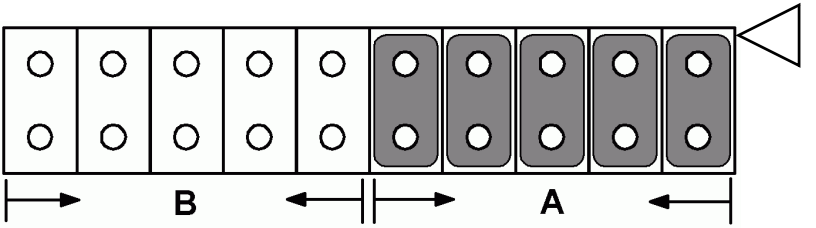



*Figure 2.6: RS-232 Jumper Settings*

### 2.3.5 Terminal Resistor Setup for RS-422/485 SW3

The onboard termination resistor (120 Ohm) for COM3 can be used for long distance transmission or device matching. (Default Open.) 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.

SW3 Pin 3,4 is reserved for on board COM port pin header use only.

*Table 2.3: Terminal Resistor Settings*

| COM port | Switch No. | Pin | Setting | Description |
|---|---|---|---|---|
| COM3 | SW3 | 1 | ON | 120 Ohm between Data+/ Data- (RS-485)<br>Or 120 Ohm between Tx+/Tx- (RS-422) |
| | | | OFF | Open (Default) |
| | | 2 | ON | 120 Ohm between Rx+/Rx- (RS-422) |
| | | | OFF | Open (Default) |

### 2.3.6 RS-485 Auto Flow & RS-422 Master/Slave Mode SW2

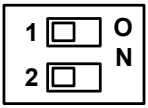
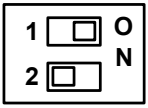
You can set the "Auto Flow Control" mode of RS-485 or "Master/Slave" mode of RS-422 by using the SW2 DIP switch for each RS-422/485 port.

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.

SW2 Pin 2 is reserved for on board COM port pin header use only.

*Table 2.4: Auto Flow & Slave/Master Selection*

| SW2 DIP Switch Setting | COM Port | Mode Selections |
|---|---|---|
|  | COM3 | RS-422: Slave mode |
| | | RS-485: Auto flow control |
|  | COM3 | RS-422: Master mode |
| | | RS-485: N/A |

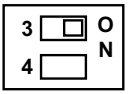
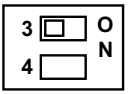
## 2.4 IRQ and Address Setting

The IRQ and I/O address range of COM3 are listed below:

• COM3: IRQ10 (Independent IRQ), IRQ5 (Share IRQ)

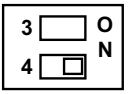
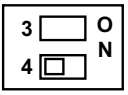
You can set “Share IRQ” or “Independent IRQ” by the first switch of SW2.

*Table 2.5: IRQ Setting via Switch 1 at SW2*

| Switch 1 at SW2 Setting | Function |
|---|---|
|  | Share IRQ (default) |
|  | Independent IRQ |

You can adjust the transmission rate by the second switch of SW2.

*Table 2.6: IRQ Setting via Switch 1 at SW2*

| Switch 1 at SW2 Setting | Function |
|---|---|
|  | Speed x 8* |
|  | Speed x 1 (default) |

* To increase the normal baud rates by eight times, (e.g. if 115.2K bps is set, the baud rate will be increased to 921.6K bps), set switch 2 of SW2 to “on”.

## 2.5 LAN: Ethernet Connector

The UNO-1170A/AE is equipped with two Realtek RTL8100CL Ethernet LAN controllers that are fully compliant with IEEE 802.3u 10/100Base-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.4 for its pin assignments.

## 2.6 Power Connector

The UNO-1170A/AE comes with a Phoenix connector that carries 10~36 VDC 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.5 for its pin assignments.

## 2.7 LED Indicators

There are five kinds of LEDs on the UNO-1170A/AE front panel:

- **PWR**: System power status
- **CF:** ID bus status
- **Txn, Rxn**: Serial communication status of COM Port n
- **DIAG**: A programmable LED indicator to show a systems status
- **BTR**: Replace battery when this LED is active

## 2.8 PS/2 Keyboard and Mouse Connector

The UNO-1170A/AE provides a PS/2 keyboard and PS/2 mouse connector. A 6-pin mini-DIN connector is located on the rear panel of the UNO-1170A/AE. The UNO-1170A/AE 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.6 for pin assignments.

## 2.9 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-1170A/AE provides two 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 compliant. OpenHCI, Rev. 1.0. The USB interface can be disabled in the system BIOS setup. Please refer to Appendix A.7 for its pin assignments.

## 2.10 VGA: VGA Display Connector

The UNO-1170A/AE provides a VGA controller for a high resolution VGA interface. It supports CRT Mode: 2048 x 1536.

## 2.11 RESET: Reset Button

UNO-1170A/AE provides a reset button on the top of the device.

## 2.12 Audio

UNO-1170A/AE supports audio function with:

- Line In
- Line Out

## 2.13 Battery Backup SRAM

UNO-1170A/AE provides 512 KB of battery backed SRAM. This ensures that you have a safe place to store critical data. You can now write software applications without being concerned that system crashes will erase critical data from the memory.

There is a BTRY LED in the front panel of the UNO-1170A/AE, please replace the lithium battery with a new one if the BTRY LED is activated.

### 2.13.1 Lithium Battery Specifications

- **Type:** BR2032 (Using CR2032 is NOT recommended)
- **Output voltage:** 3 $V_{DC}$
- **Location:** the backside of UNO-1170A/AE board.

(BH1 is for real time clock, BH2 is for SRAM)

## 2.14 LED and Buzzer for System Diagnosis (Diag LED)

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-1170A/AE offers a programmable LED indicator and buzzer. They can be programmed to show a systems status by LED indicator flickering and buzzer alarm.

***Table 2.7: LED & Buzzer Control Register***

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 210H | R/W | DIAG LED Register | | | | | | | |
| | | | | | | | LEDS1 | LEDS0 | LEDEn |
| 211H | R/W | Buzzer Register | | | | | | | |
| | | | | | | | SPKS1 | SPKS0 | SPKEn |

LEDEn: =0, DIAG LED disable

=1, DIAG LED enable

LEDS0 and LEDS1: LED flickering speed setting bit (refer to Table 2.8)

SPKEn: =0, Speaker disable

=1, Speaker enable

SPKS0 & SPKS1: Buzzer alarming setting bit (refer to Table 2.9)

*Note: UNO-1170A/AE provides built-in examples to show how to configure DIAG LED and Buzzer. Refer to console mode examples in C:\Program Files\Advantech\UNO\UNO_IsaDIO\Examples\Console.*

*(Please install DI/O driver from the UNO CD to use these examples)*

***Table 2.8: Programmable LED Control Bit***

| | **LEDS1** | **LEDS0** |
|---|---|---|
| Light on | 0 | 0 |
| Fast flicker | 0 | 1 |
| Normal flicker | 1 | 0 |
| Short flicker | 1 | 1 |

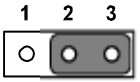
| *Table 2.9: Programmable Buzzer Control Bit* | | |
|---|---|---|
| | **SPKS1** | **SPKS0** |
| Beep on | 0 | 0 |
| Short beep | 0 | 1 |
| Normal beep | 1 | 0 |
| Long beep | 1 | 1 |

## 2.15 PCI/104+ Connectors (UNO-1170AE only)

UNO-1170AE supports up to two PCI/104+ cards. The cards will be installed on connector noted “CN18 and CN19”. If your PC/104+ card requires VIO voltage settings adjust the jumper on CN4 on the expansion board.

| *Table 2.10: PC/104+ VIO 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: RS-422/485 Jumper Settings***

CHAPTER 3

# Initial Setup

Sections include:

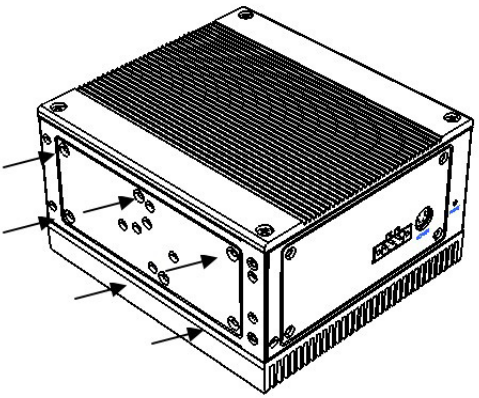
- CompactFlash Installation
- PC/104+ Card Installation (UNO-1170AE)
- Hard Drive Installation
- Chassis Grounding
- Power Connection
- BIOS Setup and System Assignments

# Chapter 3 Initial Setup

## 3.1 CompactFlash Card Installation

The procedure for installing a CompactFlash card into the UNO-1170A/AE is as follows, please follows these steps carefully. Although the outside appearance of the UNO-1170A/AE is different from the figures shown below, the procedure is the same.

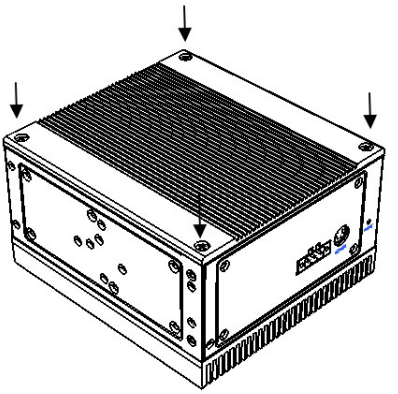
1. Remove the power.
2. Unscrew six screws from UNO-1170A/AE indicated below.

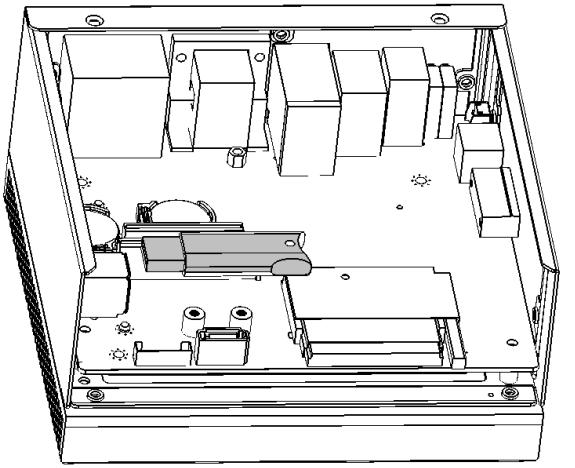


3. Remove the rear cover.
4. Plug a CompactFlash card with user's OS and application program into a CompactFlash card slot on board.
5. Screw back the rear cover and the four screws.

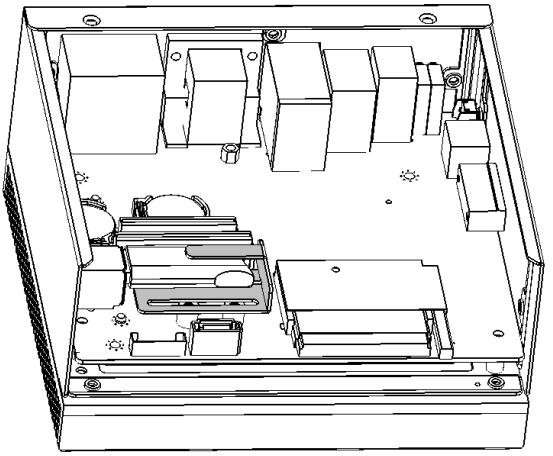
## 3.2 USB Keypro and Keypro Bracket Installation

1. Keep the side cover removed and have the USB keypro dongle ready. (Note: Only the upper internal USB connector will work. The lower is a dummy connector and won't have any function)

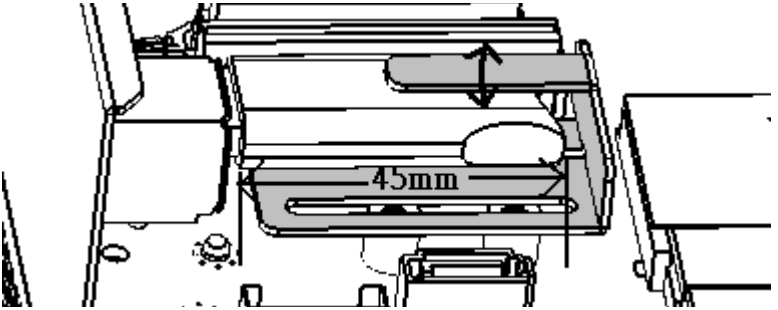




2. Insert the USB keypro/dongle into the internal USB connector and place the keypro bracket as shown in the picture. Then, screw the keypro bracket.



3. Manually adjust the bracket to perfectly fit the USB keypro/dongle.




(Note: Due to the extremely compact space in the chassis, the length for USB keypro has to be limited to 45mm)

## 3.3 Chassis Grounding

Please connect the chassis ground of UNO-1170A/AE with "EARTH".

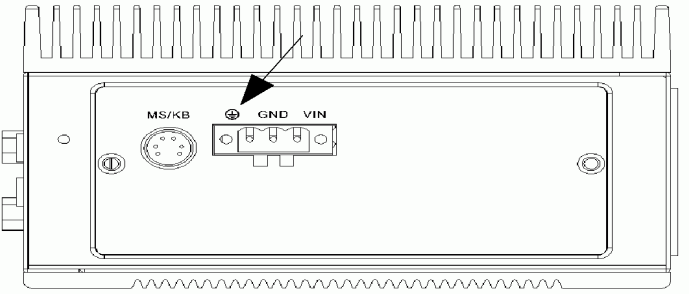



***Figure 3.1: Chassis Grounding Connection***

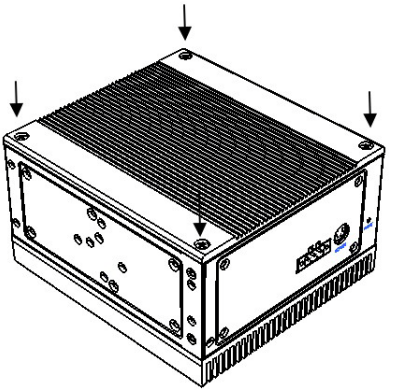
## 3.4 Power Connection

Connect the UNO-1170A/AE to a 10 ~ 36 $V_{DC}$ power source. The power source can either be from a power adapter or an in-house power source.

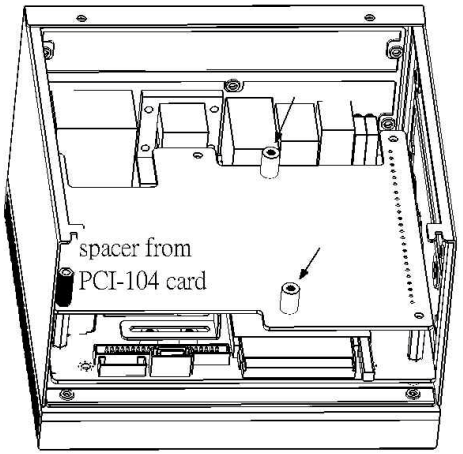
## 3.5 PC/104+ Card Installation (UNO-1170AE)

The procedure for installing a PC/104+ card into the UNO-1170AE is shown as following step.

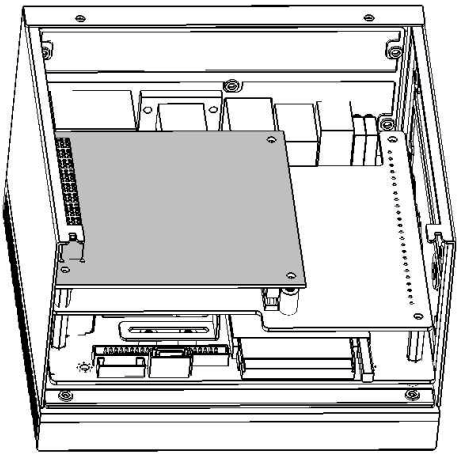
1. Remove the power.
2. Unscrew four screws from UNO-1170AE indicated below.

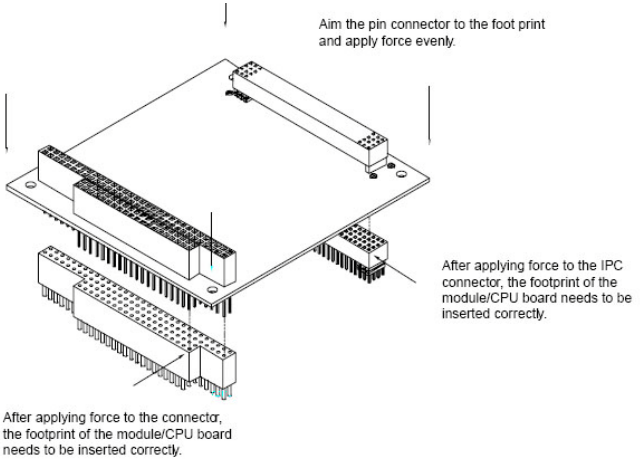


3. Find 2 metal spacer from accessory bag, and screw tight on the location indicated arrow in the below picture. (Note: There were spacers soldered on the daughter board already). Normally you will also get some hexagon spacer from your PC/104+ card packing. Use and screw those spacers on the location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




4. Please refer to section 2.12 for PC/104+ card voltage setting before install the PC/104+ card.
5. Stack the PC/104+ card and related cables.






6. Screw the side 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 use to one*

Notes:

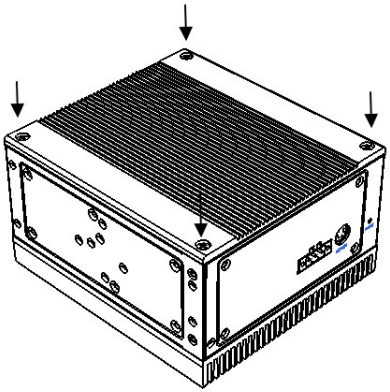
- When use PC/104+ card, please note the system does not support S3, S4 sleep mode and DMA mode.
- Maximum number of modules supported of PC/104+ cards are 2.
- The expansion board support up to 4 ID selects for PC/104+.
- When on board mini-PCI slot is used, it shares IDSEL0 with PC/104+.

| Module Slot | ID Select | Clock Select | Interrupt Select |
|---|---|---|---|
| 1(shared with mini-PCI slot) | IDSEL0 | CLK0 | INTA |
| 2 | IDSEL1 | CLK1 | INTB |
| 3 | IDSEL2 | CLK2 | INTC |
| 4 | IDSEL3 | CLK3 | INTD |

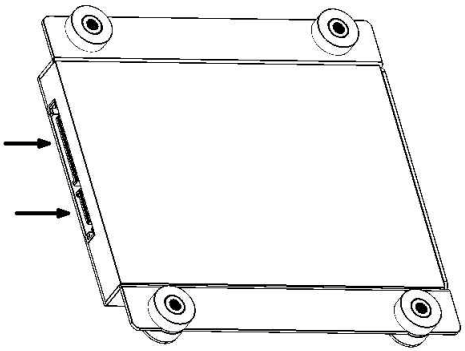
## 3.6 Hard Drive installation

The procedure for installing a hard drive into the UNO-1170A/AE is shown as following step.

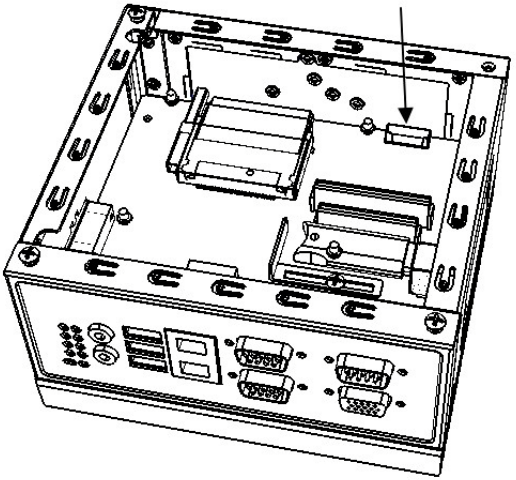
1. Remove the power.
2. Unscrew four screws from UNO-1170A/AE indicated below.



3. Remove the side cover. Please refer to Section 3.1 & 3.2 for the instruction to open the cover.
4. 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. (Note: SATA cable is already installed in the device)
   SATA Power Cable PN: 1700006492
   SATA Cable PN: 1700017959



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



6. Screw the side cover and the four screws.
7. For user who tried to plug other SATA device, please note the UNO-1170A/AE SATA power connector doesn't support 12V power.

*Note: There are switch setting about SATA hard drive below, please refer to the section A.9 for detail. The hard drive might not work correctly if the switch setting is incorrect*

## 3.7 BIOS Setup and System Assignments

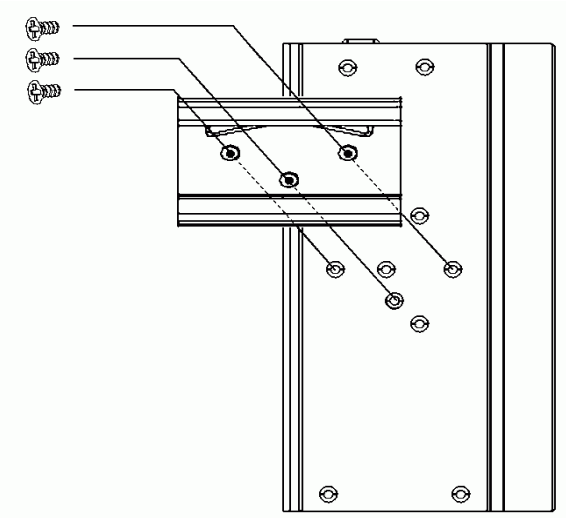
UNO-1170A/AE uses the Advantech SOM-4461 module. For UNO-1170A/AE BIOS setup and system assignments, you can refer to SOM-4481 and SOM-4486 “Award BIOS Setup” and Appendix A “System Assignments”. The SOM-4461's user’s manual is in the “Manual” folder on the CD-ROM.

Please note that you can try to “LOAD BIOS DEFAULTS” from the BIOS Setup manual if UNO-1170A/AE does not work properly.

## 3.8 DIN-rail Mounting Setup

Please follow the below steps to mount the UNO-1170A/AE on the DIN-Rail.

1. Screw the provided DIN-Rail Kit on the rear side of UNO-1170A/AE as the diagram shown below.



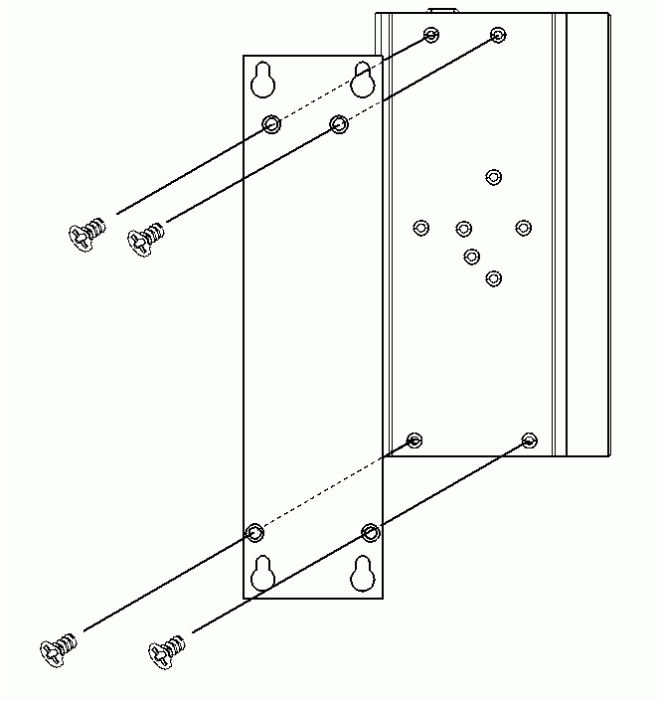
2. Hang the UNO-1170A/AE to the DIN-Rail with angle of inclination about 30 degree.
3. Let UNO-1170A/AE down straight to slide over the Rail smoothly.

*Note: To get the UNO-1170A/AE down from the Rail, push the device top to down then pull the bottom of the device to let it off the Rail smoothly.*

## 3.9 Wallmounting Setup

Please follow the below steps to mount the UNO-1170A/AE on the wall.

1. Screw the provided Wall Mounting Kit on the rear side of UNO-1170A/AE as the diagram shown below.



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

APPENDIX A

# System Settings and Pin Assignments

- Board Connectors and Jumpers
- RS-232 Serial Port (COM1~2)
- RS-232/422/485 Serial Port (COM3)
- 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 Interrupt Assignments

*Table A.1: UNO-1170A/AE Interrupt Table*

| Interrupt No. | Interrupt Source |
|---|---|
| IRQ 0 | Interval timer |
| IRQ 1 | Keyboard |
| IRQ 2 | Interrupt from controller 2 (cascade) |
| IRQ 3 | COM 2 |
| IRQ 4 | COM 1 |
| IRQ 5 | COM 4 |
| IRQ 6 | Diskette controller (FDC) |
| IRQ 8 | Real-time clock |
| IRQ 10 | COM 3 |
| IRQ 12 | PS/2 mouse/Realtek NIC#2 |
| IRQ 13 | Numeric Data Processor |
| IRQ 14 | Primary IDE |
| IRQ 16 | Realtek NIC#2 |

## A.2 Board Connectors and Jumpers

There are connectors and jumpers on the UNO-1170A/AE board. The following sections tell you how to configure the UNO-1170A/AE hardware setting. Figure A-1 and figure A-2 show the locations of UNO-1170A/AE connectors and jumpers.

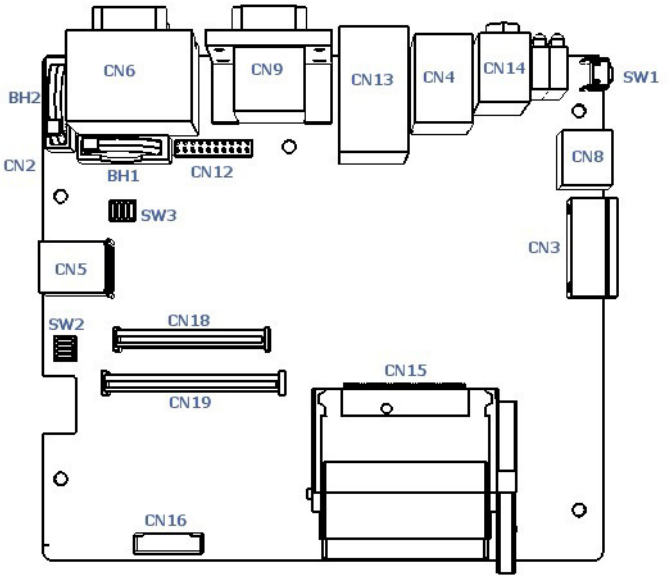



*Figure A.1: Connector & Jumper Locations (Top)*

| *Table A.2: Connectors* | |
|---|---|
| **BH1** | Lithium battery for BIOS |
| **BH2** | Lithium battery for Backup SRAM |
| **CN2** | Clear COMS Jumper |
| **CN3** | Power Screw Terminal |
| **CN4** | USB connector |
| **CN5** | Internal USB dongle connector |
| **CN6** | VGA DB15 display connector/ COM3 RS-232/422/485 serial port |
| **CN8** | PS/2 keyboard and mouse connector |

| | |
|---|---|
| **CN9** | COM1 RS-232 serial port / COM2 RS-232 serial port |
| **CN12** | COM2 RS-232/422/485 selection |
| **CN13** | Ethernet port 1 / Ethernet port 2 |
| **CN14** | Audio line in / Audio line out |
| **CN15** | Internal CompactFlash card slot |
| **CN16** | SATA connector (power) |
| **CN18/CN19** | Board to Board connector, PC/104+ |
| **SW1** | Reset switch |
| **SW2** | RS-485 auto-flow and RS-422 Master/Slave mode for OM3 |
| **SW3** | Terminal resistor for COM3 |

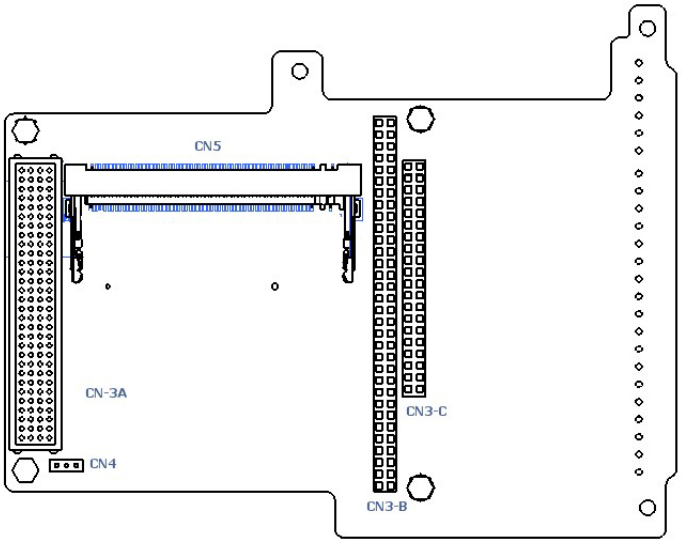
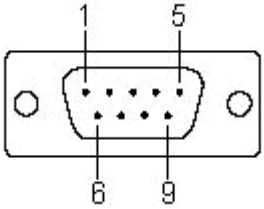



*Figure A.2: Connector & Jumpers (UNO-1170AE)*

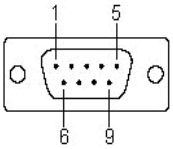
| *Table A.3: Connectors & Jumpers (UNO-1170AE)* | |
|---|---|
| CN3-B,CN3-C | PC/104 card connector |
| CN3-A | PCI-104 card connector |
| CN5 | Mini PCI card connector |
| CN4 | Jumper of PCI-104 card voltage selection (+3.3V or +5V) |

## A.3 RS-232 Serial Port (COM1~COM2)



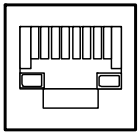

| *Table A.4: RS-232 Serial Port Pin Assignments* | |
|---|---|
| **Pin** | **Signal Name** |
| 1 | DCD |
| 2 | RxD |
| 3 | TxD |
| 4 | DTR |
| 5 | GND |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | RI |

## A.4 RS-232/422/485 Serial Port (COM3)



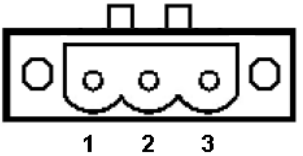

| *Table A.5: RS-232/422/485 Serial Ports* | | | |
|---|---|---|---|
| **Pin** | **RS-232** | **RS-422** | **RS-485** |
| 1 | DCD | Tx- | DATA- |
| 2 | RxD | Tx+ | DATA+ |
| 3 | TxD | Rx+ | NC |
| 4 | DTR | Rx- | NC |
| 5 | GND | GND | GND |
| 6 | DSR | NC | NC |
| 7 | RTS | NC | NC |
| 8 | CTS | NC | NC |
| 9 | RI | NC | NC |

## A.5 Ethernet RJ-45 Connector (LAN1~LAN2)



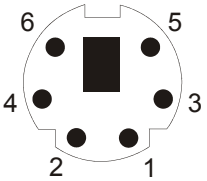
| *Table A.6: Ethernet RJ-45 Connector Pin Assigns* | |
|---|---|
| **Pin** | **10/100Base-T Signal Name** |
| 1 | XMT+ |
| 2 | XMT- |
| 3 | RCV+ |
| 4 | NC |
| 5 | NC |
| 6 | RCV- |
| 7 | NC |
| 8 | NC |

## A.6 Power Screw Terminal (CN3)




| *Table A.7: Phoenix Power Connector Pin Assigns* | |
|---|---|
| **Pin** | **Signal Name** |
| 1 | VIN ( 10 ~ 36 VDC ) |
| 2 | GND |
| 3 | Field Ground |

## A.7 PS/2 Keyboard and Mouse Connector (CN8)




| *Table A.9: 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 (CN4)

| *Table A.10: USB Connector Pin Assignments* | | |
|---|---|---|
| **Pin** | **Signal Name** | **Cable Color** |
| 1 | VCC | Red |
| 2 | DATA- | White |
| 3 | DATA+ | Green |
| 4 | GND | Black |

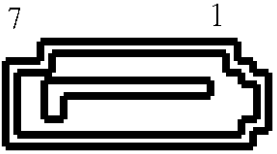
## A.9 VGA Display Connector (CN6)

| *Table A.11: 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 | NC |
| 5 | GND | 13 | H-SYNC |
| 6 | GND | 14 | V-SYNC |
| 7 | GND | 15 | NC |
| 8 | GND | | |

**Display Memory**

With 64MB share memory, the VGA controller can drive CRT displays or color panel displays with resolutions up to 1600 x 1200 at 85 Hz.

## A.10 SATA Data Connector




| *Table A.12: SATA DATA Connectors (CN17)* | |
|---|---|
| **Pin** | **Signal Name** |
| 1 | GND |
| 2 | A+ |
| 3 | A- |
| 4 | GND |
| 5 | B- |
| 6 | B+ |
| 7 | GND |

Appendix B

# Programming the Watchdog Timer

## Advantech [W83627] WDT

# Appendix B Programming the Watchdog Timer

Below are samples of code for controlling the Watchdog Timer function.

```
--------------------------------------------------------------------------------
Enter the extended function mode, interruptible double-write |
--------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,87H OUT DX,AL OUT DX,AL
--------------------------------------------------------------------------------
Configured logical device 8, configuration register CRF6 |
--------------------------------------------------------------------------------
MOV DX,2EH
MOV AL,2BH OUT DX,AL MOV DX,2FH IN AL,DX
AND AL.OEFH;Setbit 4=0 Pin 89=WDTO OUT DX,AL
MOV DX,2EH
MOV AL,07H; point to Logical Device Number Reg. OUT DX,AL
MOV DX,2FH
MOV AL,08H; select logical device 8
OUT DX,AL; MOV DX,2EH
MOV AL,30H;Set watch dog activate or inactivate
OUT DX,AL MOV DX,2FH
MOV AL,01H; 01:activate 00:inactivate
OUT DX,AL; MOV DX,2EH
MOV AL,F5H; Setting counter unit is second
OUT DX,AL MOV DX,2FH MOV AL,00H OUT DX,AL; MOV
DX,2EH MOV AL,F6H OUT DX,AL MOV DX,2FH
MOV AL,05H; Set 5 seconds
OUT DX,AL
;-----------------------------------------
; Exit extended function mode |
;-----------------------------------------
MOV DX,2EH
MOV AL,AAH OUT DX,AL
```