UNO-3084

Core 2 Duo Embedded Automation Computer with One PCI Express and Three PCI Slot Extensions

User Manual

Acknowledgements

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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. We recommend the use of shielded cables. This kind of cable is available from Advantech.

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

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

Overview

This chapter provides an overview of UNO-3084 specifications.

Sections include:

- Introduction
- Hardware specification
- Safety precautions
- Chassis dimensions

Chapter 1 Overview

1.1 Introduction

Advantech's UNO-3082/3084 are high performance Core 2 Duo Fanless Box PCs with up to four expansion slots and PCI express or PCI support. The Gigabit LAN on the UNO-3082/3084 supports Teaming function with fault tolerance, link aggregation, and load balance features. It also equipped two IEEE 1394b bilingual interfaces which allow users to connect their own devices for machine vision or other digital video application. Critical data can be saved in UNO-3082/3084 on the battery backup SRAM. There are also two built in hard drive bays with RAID 0/1 support. It's an ideal platform for sophisticated control and logging in rugged environments.

1.2 Hardware Specifications

- **CPU:** Intel Core 2 Duo Processor L7500 (4M Cache, 1.60 GHz, 800 MHz FSB)
- **System Memory:** Built-in 2GB DDR2 RAM (2 x 200-pin SODIMM sockets, supports up to 4GB DDR RAM)
- **Battery Backup RAM:** 512 KB
- **Chipset:** Intel GME965 Express Chipset GMCH / Intel 82801HEM I/O Controller Hub (ICH8EM) 800 MHz FSB
- **BIOS:** Award 4 Mbit Flash BIOS, supports Boot-on-LAN function
- **Display:** Two DVI-I port, provide Dual DVI-D independent, or DVI-D + Dual VGA cloned displays
- **Audio:** AC 97, Line Out
- **Clock:** Battery-backup RTC for time and date
- **Serial Ports:** 2 x RS-232/422/485 with DB-9 connector and Automatic RS-485 data flow control
- **RS-232 Speed:** 300 bps ~ 115.2 kbps
- **RS-422/485 Speed:** 300 bps ~ 921.6 kbps (Optional cable Serial Ports: 2xRS-232, 50~115.2kbps)
- **LAN:** Two Intel 82574L 10/100/1000 Base-T RJ-45 ports with wake on LAN and teaming function support

- **USB Interface:**
  External:Four USB ports, USB EHCI, Rev. 2.0 compliant
  Internal: One USB port, USB EHCI, Rev. 2.0 compliant
  (Optional cable wiring: 2 x USB ports, USB EHCI, Rev 2.0 compliant)
- **IEEE 1394 Interface:** 2 x IEEE 1394 type B with Bilingual connectors
- **Compact Flash Slots:** Two type I/II CompactFlash Slots, One internal and one external
- **HDD:** SATA HDD extension kit for two standard 2.5" HDDs
  RAID 0/1 function support
  One external eSATA device (Does not support hot swap)
- **LEDs:** Power, Standby, HDD, Alarm for battery backup,
  4 COM ports Tx /Rx, LAN (Active, Status)
  (**Optional:** 4x Programmable LED while COM ports Tx/Rx disable)
- **PCI Express & PCI-bus Slot Power:** 12 V @ 3 A
  -12 V @ 0.8 A
  5 V @ 6 A
  3.3 V @ 6 A
  3.3 VSB @ 1.5A

  Note: Total power total combined power consumption on the PCIe/PCI slots should be less than 40W
- **4-ch Isolated Digital Input (Wet Contact, DI0~DI3)**
  1,500 VDC isolation
  1,500 VDC ESD protections
  50~70 VDC over-voltage protection
  50 VDC input range and 3 kHz speed

  Input Voltage Range:
  Dry Contact: Logic level 0: open
  Logic level 1: close to GND
  Wet Contact: Logic level 0: -3V ~ +3V
  Logic level 1: +10 ~ 50 V, -10 ~ -50V
- **4-ch Isolated Digital Output (DO0~DO3)**
  - 1,500 VDC isolation and 200 mA max / channel sink current
  - 2 options after hot reset: Reset all digital output or keep last status
  - 5~ 40 VDC output range to open collector and 3 kHz speed

- **Two 16-bit Counters/Timers:**
  Counter source: DI1 & DI3, Pulse output: DO2 & DO3
  Can be cascaded as one 32-bit counter/timer
  Down counting, preset counting value
  Interrupt handling, speed: 40 kHz
  Internal timer time base: 100 kHz, 10 kHz, 1 kHz, 100 Hz
- **Anti-Shock:**
  20 G @ Wall mounting, IEC 68 section 2-27, half sine, 11 ms w/HDD
  50 G @ Wall mounting, IEC 68 section 2-27, half sine, 11 ms w/CF
- **Anti-Vibration:**
  2 Grms w/CF@IEC 68 sec. 2-64, random, 5~500Hz, 1 Oct./min,1hr axis
  1 Grms w/HDD@IEC 68 sec. 2-64, random, 5~500Hz, 1 Oct./min, 1hr axis
- **Power Supply:** 9 ~ 36 VDC
- **Operating Temperature:** -10 ~ 55° C (14 ~ 131° F)
  Note: The temperature inside the chassis may be 5 to 10° C higher than the ambient temperature. To ensure stable performance, please make sure the operating temperature of the installed PCI add-on card is higher than 60° C.
- **Relative Humidity:** 5~95% @ 40° C (non-condensing)
- **Power Consumption:** 40 W (Typical)
- **Power Requirement:** Min 96 W, (9~36 VDC) (e.g. +24 V @ 4A)
- **Chassis Size (WxHxD):** 180 x 177 x 237 mm (7.1" x 7.0" x 9.3")
- **Mounting:** Wall/Panel/Stand mounting
- **Weight:** 5.0 kg
- **Software OS:** WinXP Embedded/CE 6.0/2000/XP, Windows 7, Linux
- **Watchdog Timer :** Programmable 256 levels timer interval, from 1 to 255 sec, with Fintek F75111
- **Keyboard & Mouse:** Optional cable wiring PS/2 connector

1.3 Safety Precautions

The following messages inform how to make each connection. In most cases, you will simply need to connect a standard cable.

Note: *Always disconnect the power cord from your chassis whenever 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.*

Note: *Always ground yourself to remove any static electric charge before touching UNO-3084. 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.*

Note: *If DC voltage is supplied by an external circuit, please put a protection device in the power supply input port.*

1.4 Chassis Dimensions

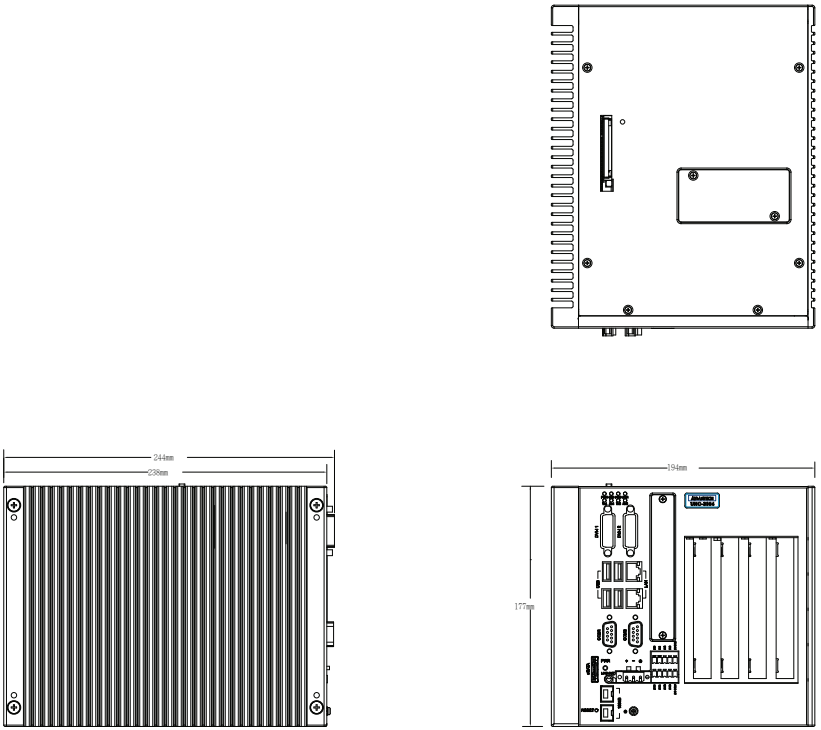


Figure 1.1: Chassis Dimensions

1.5 Packing List

The accessory package of UNO-3084 contains the following items:

(A) SATA signal cable and power cable

(B) Keyboard/ Mouse PS/2 cable

(C) Warranty card

(D) Driver and Utility CD-ROM

(E) 4 x nti-vibration rubber

(F) DVI-I convertion cable to DVI-D and VGA

(G) Mini Jumper

(H) Paper menu

(I) Power connector

(J) Digital Input and Digital Output Phoenix Connector

(K) Key Pro Bracket

CHAPTER 2

Hardware Functionality

This chapter shows how to setup the UNO-3084 hardware functions, including connecting peripherals, and setting switches and indicators.

Sections include:

- Introduction
- RS-232 Interface
- RS-232/422/485 Interface
- LAN / Ethernet Connector
- DI/O and Counter
- Power Connector
- LED and Buzzer
- PS/2 Mouse and Keyboard Connector
- USB Connector
- PCMCIA: PC Card Slot
- VGA Display Connector
- Battery Backup SRAM
- Reset Button

Chapter 2 Hardware Functionality

2.1 Introduction

The two figures below show the connectors on UNO-3084, and following sections give you detailed information about function of each peripheral.

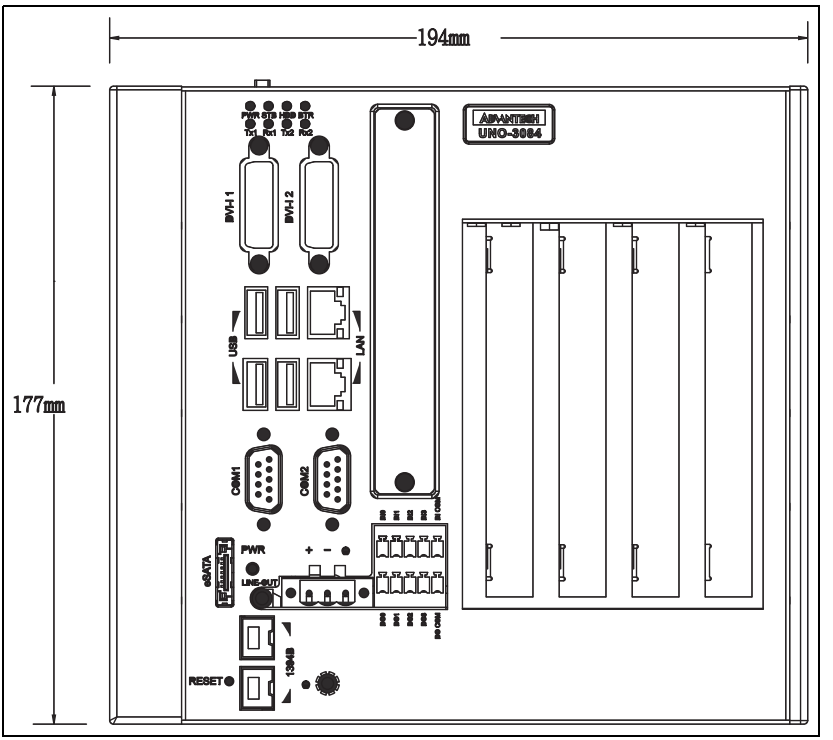


Figure 2.1: Front Panel of UNO-3084

2.2 RS-232/422/485 Interface (COM1~COM2)

The UNO-3084 offers two industrial RS-232/422/485 serial communication interface ports: COM1 and COM2. Please refer to Appendix A.5 for their pin assignments. The default setting of COM1 and COM2 are RS-422/485. (Please refer to section 2.2.4 for how to determine RS-232 or RS-422/485)

2.2.1 16C950 UARTs with 16-byte FIFO Standard

Advantech UNO-3084 comes standard with Oxford 16PCI952 UART (two OX16C950 UARTs, fully software compatible with 16C550) which containing 128 bytes FIFOs. These upgraded FIFOs greatly reduce CPU overhead and are an ideal choice for heavy multitasking environments.

2.2.2 RS-422/485 Jumperless Detection

In RS-422/485 mode, UNO-3084 automatically detects signals to match RS-422 or RS-485 networks. (Refer to section 2.2.5)

2.2.3 Automatic Data Flow Control Function for RS-485

In RS-485 mode, UNO-3084 automatically detects the direction of incoming data and switches its transmission direction accordingly. So no handshaking signal (e.g. RTS signal) is necessary. This lets you easily build an RS-485 network with Data+, Data- and Ground. More importantly, application software previously written for full-duplex RS-232 environments can be maintained without modification.

2.2.4 RS-232/422/485 Selection

COM1 and COM2 support 9-wire RS-232, RS-422 and RS-485 interfaces. The system detects RS-422 or RS-485 signals automatically in RS-422/485 modes. To select between RS-422/485 and RS-232 for COM1, adjust CN28. To select between RS-422/485 and RS-232 for COM2, adjust CN29.

You can refer to figures below to set the CN28 and CN29.

Note: Please refer to Appendix A.2 Figure A.3 for location of CN28 and CN29 location.

Jumper setting for RS-422/485 interface: (Default setting).

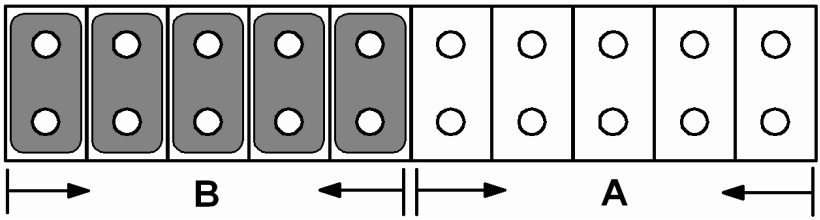


Figure 2.2: RS-422/485 Jumper Setting

Jumper setting for RS-232 interface:

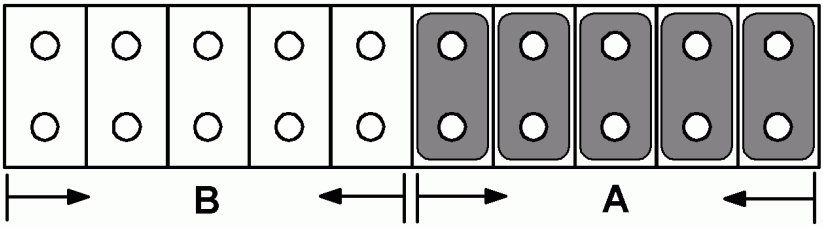


Figure 2.3: RS-232 Jumper Setting

2.2.5 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 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.

Table 2.1: Terminal Resistor Settings

COM Port	Switch No.	Pin	Setting	Description
COM1	SW4	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 Rx+/Rx- (RS-422)
			OFF	Open (Default)
COM2	SW5	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 Rx+/Rx- (RS-422)
			OFF	Open (Default)

2.2.6 RS-485 Auto Flow/RS-422 Master/Slave Selection

UNO-3084 support "Auto Flow Control" mode of RS-485 in default without any setting or jumper required. In RS-485, the driver automatically senses the direction of the data flow and switches the direction of transmission. Then no handshaking is necessary.

UNO-3084 can also allow user to adjust "Master/Slave" mode of RS-422 by changing setting in BIOS for each RS-422/485 port COM1 & COM2.

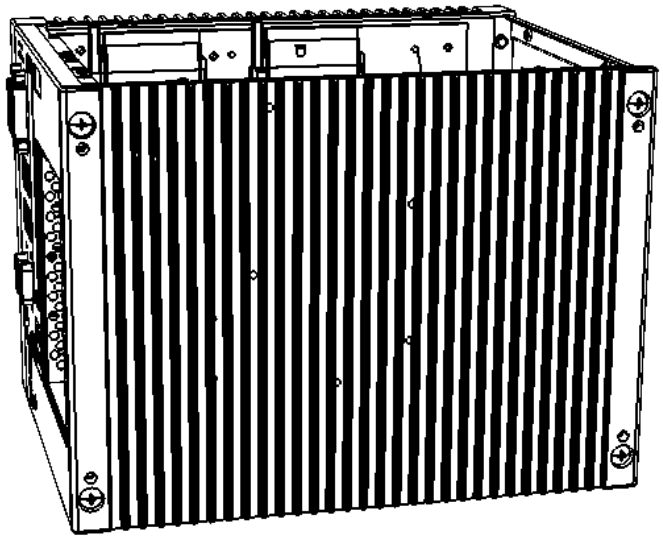
1. Boot up the system or reset the system, while boot up, press "Del" to enter into BIOS.
2. Select "Integrated Peripherals ' Onboard Device ' COM1 RS-422 or COM2 RS-422
3. The default of RS-422 is "Slave". User can change to "Master" for RS-422 Master Device requirement.
4. Press F10 or Back to "Save and Exit Setup" to finish setup change.

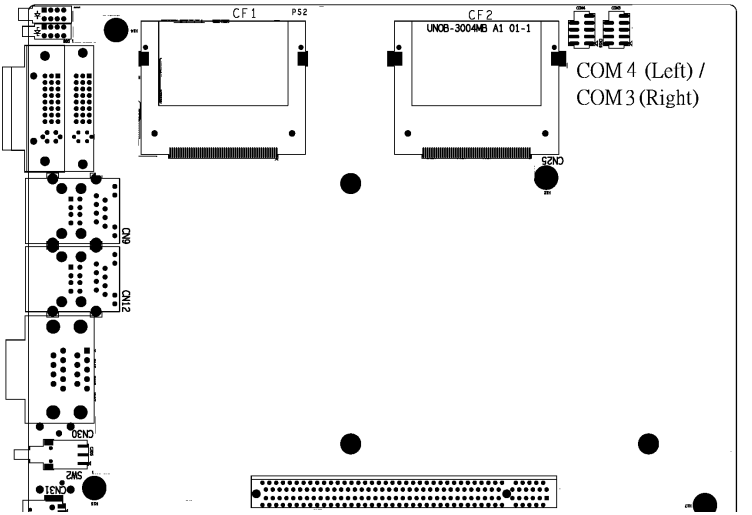
In RS-422, if the device mode was set to "Master", the driver is always enabled, and always in high or low status.

2.3 Optional RS-232 Interfaces (COM3~COM4)

UNO-3084 offers two optional RS-232 serial communication interfaces: COM3 and COM4. Please refer to Appendix A.4 for their pin assignments. The default of these two COM ports is "Disabled". In order to use these two COM ports, follow these steps:

1. Take the DB-9 RS-232 cable (with brackets) from accessory box.
2. Connect the end of the cable on CN17 and CN18 of the main board.

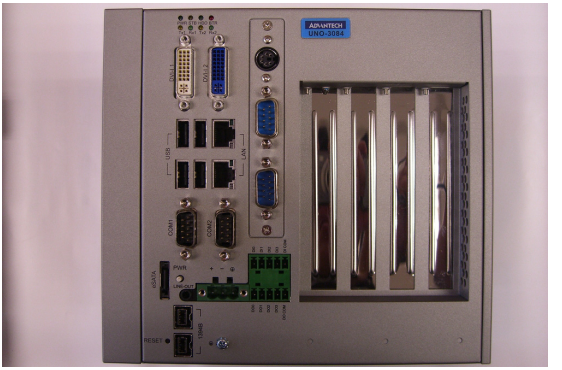




3. Boot up or reset the system, press Del to enter into BIOS
4. Select Integrated Peripherals → Super I/O device → Onboard Serial Port 1 and Onboard Serial Port 2,
5. Change the IRQ and IO address from Disablde to the above setting.
6. Press F10 or Back to "Save and Exit Setup" to finish setup change.
7. Fasten the COM port bracket on the UNO-3084 system like below.

The IRQ and I/O address range of COM3 and COM4 are listed below:

COM3: 2E8H, IRQ4 COM4: 2F8H, IRQ3



2.4 LAN: Ethernet Connector

The UNO-3084 is equipped with a Realtek RTL8139C Ethernet LAN controller that is fully compliant with IEEE 802.3u 10/100Base-T CSMA/CD standards. The Ethernet port provides a standard RJ-45 jack on board, and LED indicators on the front side to show its Link (Green LED) and Active (Yellow LED) status.

2.5 Onboard Isolated Digital Input

The UNO-3084 has 4 isolated DI channels designated DI0~DI3.

2.5.1 Pin Assignments

The connector type of UNO-3084 is plug-in screw terminal block that enables you to connect to field I/O devices directly without additional accessories. Figure 2.4 and Table 2.4 shows its pin assignment as well as signal description.

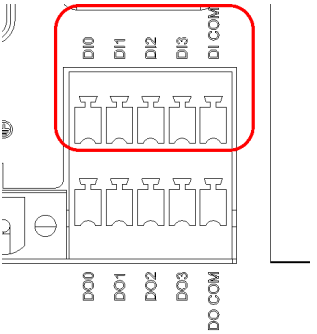


Figure 2.4: Digital Input Connector Pin Assignments

2.5.2 Isolated Inputs

Each of isolated digital input channels accepts 0 ~ 50 VDC voltage inputs, and accepts bi-directional input. The voltage range is -3 ~ 3 VDC for logic 0 (low), -50 ~ -10 VDC and 10 ~ 50 VDC for logic 1 (high). It means that you can apply positive or negative voltage to an isolated input pin (Vin). All channels share two common pins (I.GND). Figure 2.8 shows how to connect an external input source to an UNO-3084 isolated input channel.

Please note that DI0 and DI2 may be configured as gate control pins of Counter 0 and Counter 1; While DI1 and DI3 may be configured as input pins of Counter 0 and Counter 1.

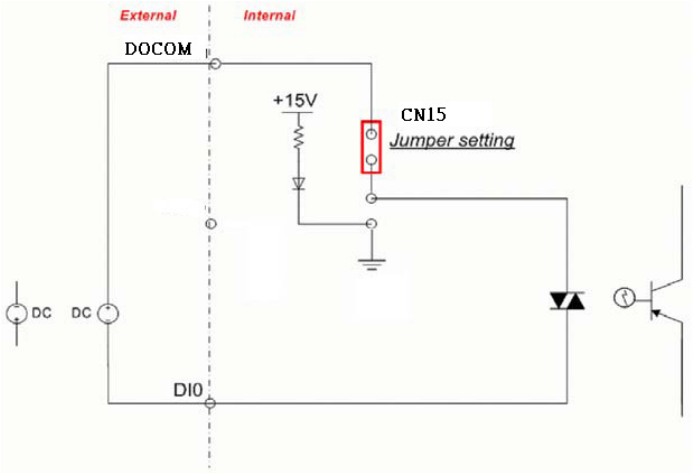


Figure 2.5: Digital Input Wet Contact Diagram

2.5.3 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-3084. 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.

2.5.4 IRQ Level

The IRQ level is by default set by the system BIOS. IRQ 7 is reserved for DI interrupt and counter interrupt.

2.5.5 Interrupt Control Register

Table 2.2: Interrupt Control Register Bit Map

Base Address		7	6	5	4	3	2	1	0
202H	R/W	Interrupt Enable Control/Status Register							
								DI1EN	DI0EN
203H	R/W	Interrupt Triggering Edge Control/Status Register							
								DI1TE	DI0TE
207H	R/W	Interrupt Flag/Clear Register							
								DI1F	DI0F

The Interrupt Control Register controls the function and status of each interrupt signal source. Table 2.13 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.

DI0EN & DI1EN: DI0 & DI1 Interrupt disable/enable control bit

DI0TE & DI1TE: DI0 & DI1 Interrupt triggering edge control bit

DI0F & DI1F: DI0 & DI1 interrupt flag bit

2.5.6 Interrupt Enable Control Function

Table 2.3: Interrupt Disable/Enable Control

DI0EN & DI1EN	Interrupt Disable/Enable Control
0	Disable
1	Enable

The user can choose to enable or disable the interrupt function by writing its corresponding value to the interrupt disable/enable control bit in the interrupt control register, as shown in Table 2.14.

2.5.7 Interrupt Triggering Edge Control

The interrupt can be triggered by a rising edge or a falling edge of the interrupt signal, as determined by the value in the interrupt triggering edge control bit in the interrupt control register, as shown in Table 2.15.

Table 2.4: Interrupt Triggering Edge Control

DI0TE & DI1TE	Triggering edge of interrupt signal
0	Falling edge trigger
1	Rising edge trigger

2.5.8 Interrupt Flag Bit

The interrupt flag bit is a flag indicating the status of an interrupt. It is a readable/writable bit. To find the status of the interrupt, you have to read the bit value. To clear the interrupt, you have to write "1" to this bit. This bit must first be cleared to service the next coming interrupt.

Table 2.5: Interrupt Flag Bit Values

DI0F & DI1F		Interrupt Status
Read	0	No interrupt
	1	Interrupt occur
Write	0	Don't care
	1	Clear interrupt

Note: *UNO-3084 provides built-in examples to show how to deliver digital input functionality. 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)

2.6 Onboard Isolated Digital Output

The UNO-3084 has 4 isolated DO channels designated DO0~ DO4

2.6.1 Pin Assignments

The connector type of UNO-3084 is plug-in screw terminal block that enables you to connect to field I/O devices directly without additional accessories. Figure 2.9 and Table 2.17 show its pin assignment as well as signal description.

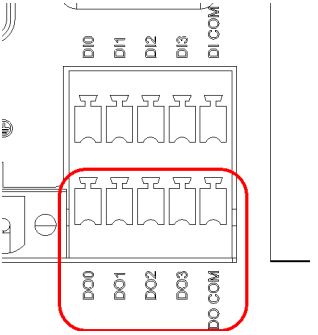


Figure 2.6: Digital Output Connector Pin Assignments

Table 2.6: Digital Output Connector Signals			
Signal Name	**Reference**	**Direction**	**Description**
DO<0...7>	GND	Output	Isolated DO signals
O.GND	-	-	DO isolated ground
COM	-	-	DO_COM as using inductance load

2.6.2 Power On Configuration

Default configuration after power on or hardware reset is to set all the isolated digital output channels to open status (the current of the load can't be sink) so that users need not worry about damaging external devices during system startup or reset. When the system is hot reset, then the status of isolated digital output channels are selected by jumper CN27. Table 2.18 shows the configuration of jumper CN27.

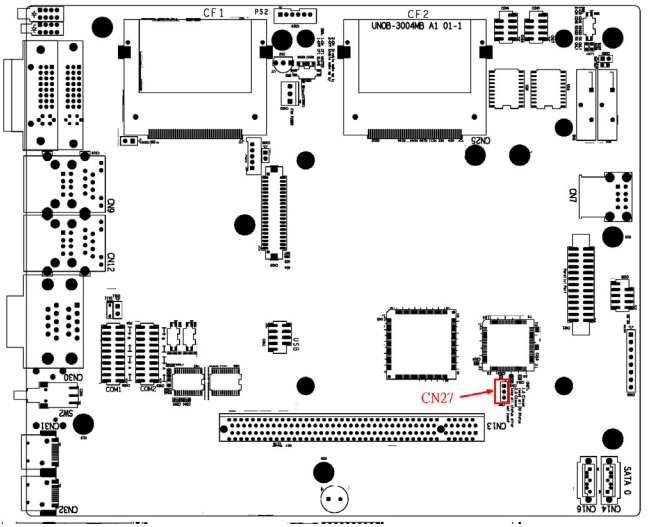
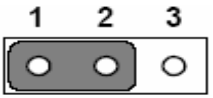
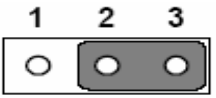


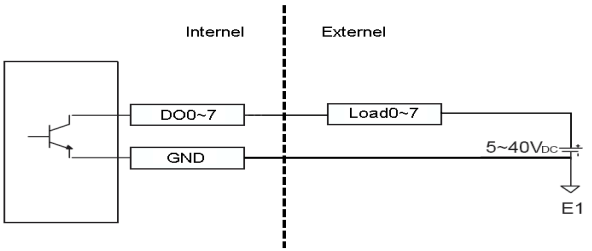
Figure 2.7: Location of CN27

Table 2.7: Digital Output Power On Configuration	
CN40	**Power on configuration after hot reset**
	**Reset all digital output** **Default setting**
	**Keep last status after hot reset**

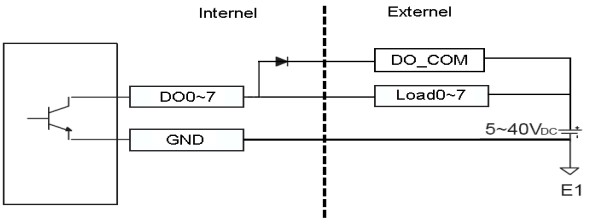
2.6.3 Isolated Outputs

Each of isolated output channels comes equipped with a Darlington transistor. All output channels share common emitters.

Please note that if an external voltage (5 ~ 40 VDC) is applied to an isolated output channel while it is being used as an output channel, the current will flow from the external voltage source to the UNO-3084. Please take care that the current through each DO pin not exceed 200 mA. Figure below shows how to connect an external output load to the UNO-3084 isolated outputs. Please note that DO2 and DO3 may be configured as output pins of Counter 0 and Counter 1.



When you use inductance load, please refer below figure



Note: UNO-3084 provides built-in examples to show how to deliver digital output functionality. 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)

2.7 Onboard Isolated Counter/Timer

The UNO-3084 uses one 82C54 programmable timer/counter chip that includes three independent 16-bit down counters: counter 0, counter 1 and counter 2. Counter 0 and counter 1 are for users, and counter 2 is specified for the system and can't be used by user. Each counter has clock input, gate input and pulse output. They can be programmed to count from 2 up to 65535 or cascaded into one 32-bit counter.

The UNO-3084 has two isolated counter input channels designated DI1 and DI3 with two isolated output channels designated DO2 and DO3. Therefore, you can set each counter of 82C54 as counter function or timer function.

2.7.1 Counter/Timer Control Register

The Counter/Timer Control Register controls the function and status of each counter/timer signal source. Table 2.19 shows the bit map of the Counter/Timer Control Register. The register is readable/writable register. While being written, it is used as a control register; and while being read, it is used as a status register.

Table 2.8: Counter/Timer Control Register Bit Map									
Base Address		**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
207H	R/W	Interrupt Flag/Clear Register							
						CTR1F	CTR0F		
208H	R/W	82C54 Chip Counter0 Register							
209H	R/W	82C54 Chip Counter1 Register							
20BH	R/W	82C54 Chip Control Register							
20CH	R/W	Counter0 Start Control / Output Status Register							
					CTR0 Out				CTR0 Gate
20DH	R/W	Counter1 Start Control / Output Status Register							
					CTR1 Out				CTR1 Gate
20EH	R/W	Counter0 Setting Register							
						CTR0 IntSet	CTR0 OutSet	CTR0 GateSet	CTR0 CLKSet
20FH	R/W	Counter1 Setting Register							
			CTR32 Set	S1	S0	CTR1 IntSet	CTR1 OutSet	CTR1 GateSet	CTR1 CLKSet

CTR0F/CTR1F: (Counter 0/1) interrupt flag bit

CTR0Gate/CTR1Gate: (Counter 0/1) gate control bit

CTR0Out /CTR1Out: (Counter 0/1) output status bit

CTR0CLKSet /CTR1CLKSet: (Counter 0/1) clock source control bit

CTR0GateSet/CTR1GateSet: (Counter 0/1) gate source control bit

CTR0OutSet/CTR1OutSet: (Counter 0 /1) output destination control bit

CTR0IntSet/CTR1IntSet: (Counter 0/1) interrupt control bit

S0/S1: (Counter 0/1) internal clock control bit

CTR32Set: Cascaded 32-bit counter control bit

2.7.2 Counter 0 Function Block

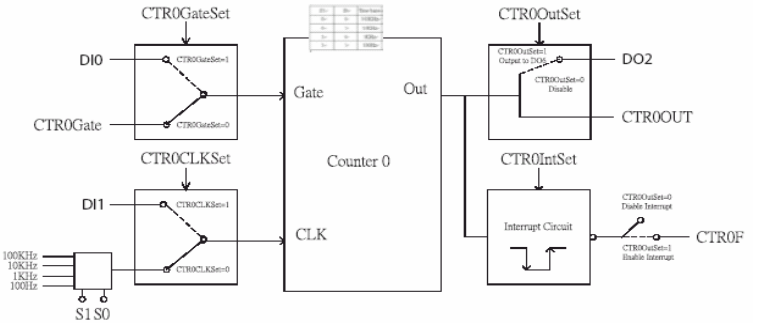


Figure 2.8: Counter 0 Function Block

2.7.3 Counter 1 Function Block

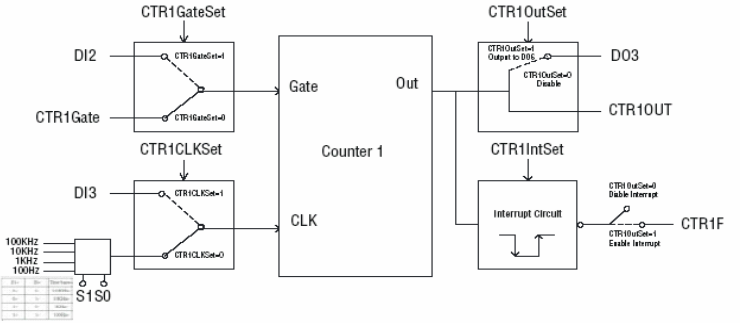


Figure 2.9: Counter 1 Function Block

2.7.4 32-bit Counter Function Block (CTR32Set=1)

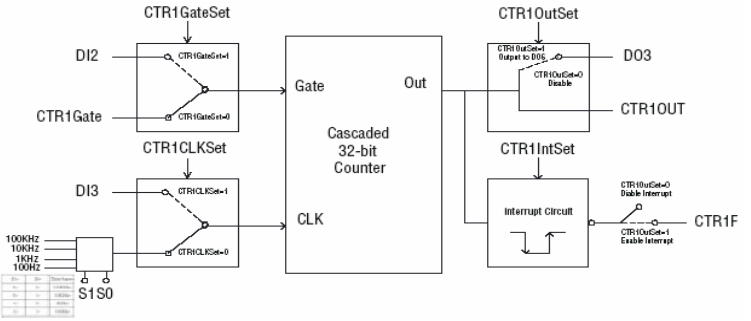


Figure 2.10: 32-bit Counter Function Block

2.7.5 Counter Clock Source

There are two clock sources available for the user counters by setting counter clock control bits - CTR0CLKSet and CTR1CLKSet.

Table 2.9: Counter Clock Source Control Bit		
CTR0CLKSet	0	Internal clock (default)
	1	External clock from digital input 1 (DI1) channel
CTR1CLKSet	0	Internal clock (default)
	1	External clock from digital input 3 (DI3) channel

2.7.6 Counter Internal Clock

There are four frequency options to choose according to applications, and it's set by internal clock control bits - S0 and S1.

Table 2.10: Counter Internal Clock Control Bit		
S1	**S0**	**Time base**
0	0	100 KHz (default)
0	1	10 KHz
1	0	1 KHz
1	1	100 Hz

2.7.7 Counter Gate Source

The gate sources you select determine what kind of gate input signal to enable your counter/timer when receiving clock input. There are two gate sources available for the user counters by setting gate source control bits - CTR0GateSet and CTR1GateSet.

Table 2.11: Counter Gate Source Control Bit		
CTR0GateSet	0	Gate source from "CTR0Gate" control bit (Default)
	1	Gate source from digital input 0 (DI0) channel
CTR1GateSet	0	Gate source from "CTR1Gate" control bit (Default)
	1	Gate source from digital input 2 (DI2) channel

2.7.8 Counter Output Destination

You can choose the output destination of counter 0 and counter 1 by setting "Output Destination control bits"- CTR0OutSet and CTR1OutSet.

Table 2.12: Counter Output Destination Control Bit		
CTR0OutSet	0	Output destination to "CTR0Out" status bit (Default)
	1	Output destination to "CTR0Out" status bit and digital output 2 (DO2) channel
CTR1OutSet	0	Output destination to "CTR1Out" status bit. (Default)
	1	Output destination to "CTR1Out" status bit and digital output 3 (DO3) channel

2.7.9 Counter Interrupt Flag

The interrupt flag bit is a flag indicating the status of an interrupt. It is a readable/writable bit. To find the status of the interrupt, you have to read the bit value; to clear the interrupt, you have to write "1" to this bit. This bit must first be cleared to service the next coming interrupt. Besides, you can choose if counter 0 or counter 1 generate interrupt signal by configuring "CTR0IntSet" and "CTR1IntSet" control bit.

Table 2.13: Counter Interrupt Flag Control Bit		
CTR0F, CTR1F		Counter Interrupt Status
Read	0	No interrupt
	1	Interrupt occur
Write	0	Don't care
	1	Clear interrupt
CTR0IntSet, CTR1IntSet		Counter Interrupt Control
0		Disable (Default)
1		Enable

2.7.10 Cascaded 32-bit Counter

You can also cascade counter 0 and counter 1 together as one 32-bit counter/timer, and it's configured by control bit - CTR32Set.

Table 2.14: 32-bit Counter Control Bit	
0	Disable (Default)
1	Cascade counter 0 and counter 1 into one 32-bit counter

Note: UNO-3084 provides built-in examples to show how to deliver counter functionality. 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)

2.8 Power Inputs

UNO-3084 comes with a Phoenix connector that carries 9~36 VDC external power input, and features 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 Figure 2.11 for location of power input).

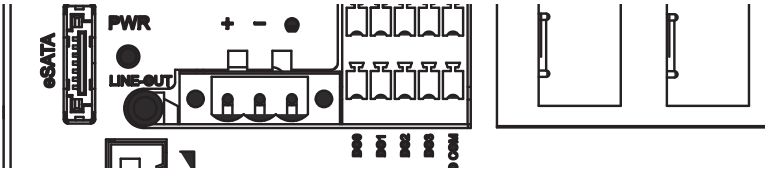


Figure 2.11: Figure Location of Power and grounding

2.8.1 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-3084 offers a solution which can turn the four LED originally used for COM port Tx & Rx to programmable LED indicators while. They can be programmed to show a systems status by LED indicator.

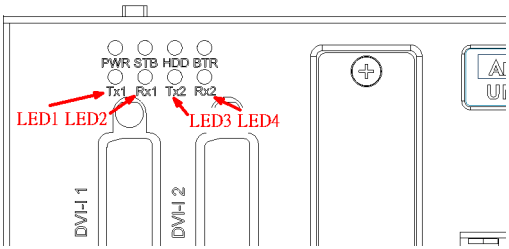


Figure 2.12: Programmable LED

In order to use programmable LED, user needs to change BIOS setting to switch the LED for COM port Tx & Rx to programmable LED function.

Please follow the steps below:

1. Boot up or reset the system, press Del to enter into BIOS
2. Select Integrated Peripherals → Onboard Device → LED Select, Default setting is "Comport TX-RX", change the setting to "Programmable LED".
3. Press F10 or Back to "Save and Exit Setup" to finish setup change.

Table 2.15: LED Control Register									
212H	R/W	Diagnostic / Programmable LED Register							
		x	x	x	x	P1	P2	P3	P4

Note: Px: = 0, DIAG LED disable
= 1, DIAG LED enable

Note: UNO-3084 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 example)

2.9 USB Connector

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 and Play, which enables you to connect or disconnect a device whenever you want, without turning off the computer.

The UNO-3084 provides four connectors of USB interfaces. The USB interface complies with USB UHCI, Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. Please refer to Appendix A.9 for its pin assignments.

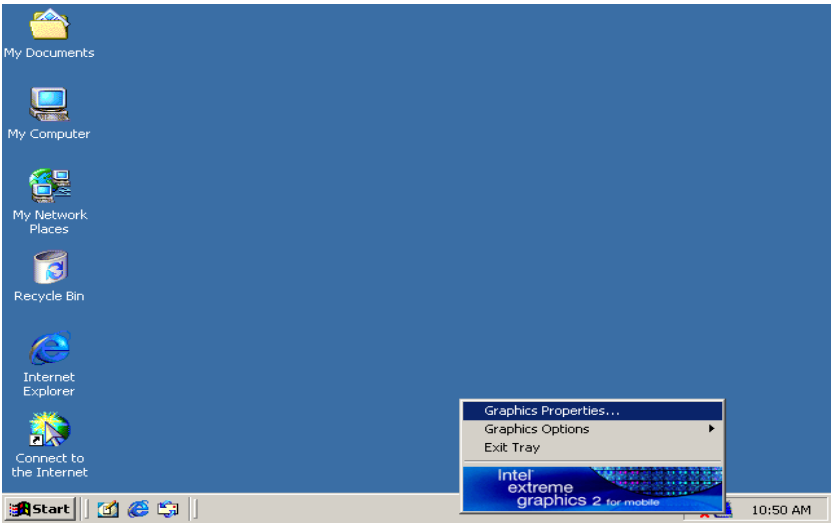
2.10 DVI-I Display Connector

The UNO-3084 provides two DVI-I interface, powered by Intel 965GME GMCH/ Intel GMA 3100 accelerator. It integrates both analog and digital video signal. This supports high-speed, high-resolution digital display and traditional analog display. You could link you DVI or VGA monitor through DVI-I to DVI and VGA cable (Advantech P/N: 1700004713). As for detail DVI-I pin assigmnet, please refer A.10.

2.10.1 VGA Support and Hotkey

UNO-3084 support VGA interface: CRT mode: 1280 x 1024 @ 32bpp (60Hz), 1024 x 768 @ 32bpp (85Hz) and supports 8 MB frame buffer with system memory.

You can set the hotkey and other configuration for the VGA Graphics (Please refer to the two images below)



Note: 1. UNO-3084 also support 16:9 widescreen.

2. While using Microsoft Windows, if plug-n-play didn't work properly and cause no image on the monitor, please try hot key "CTRL+ALT+F1" in order to manually switch video output.

2.10.2 Multiple Video Output Option

UNO-3084 provides two DVI-I connectors, which can let user have multiple video output configuration as follow:

Single Display:

Single DVI Monitor:Connect DVI cable to the DVI-I 1 or DVI-I 2 connector

Single VGA Monitor: Link the DVI-I to DVI and VGA Y-cable (Advantech P/N: 1700004713) or through DVI to VGA converter connector (Advantech P/N: 1654000446)

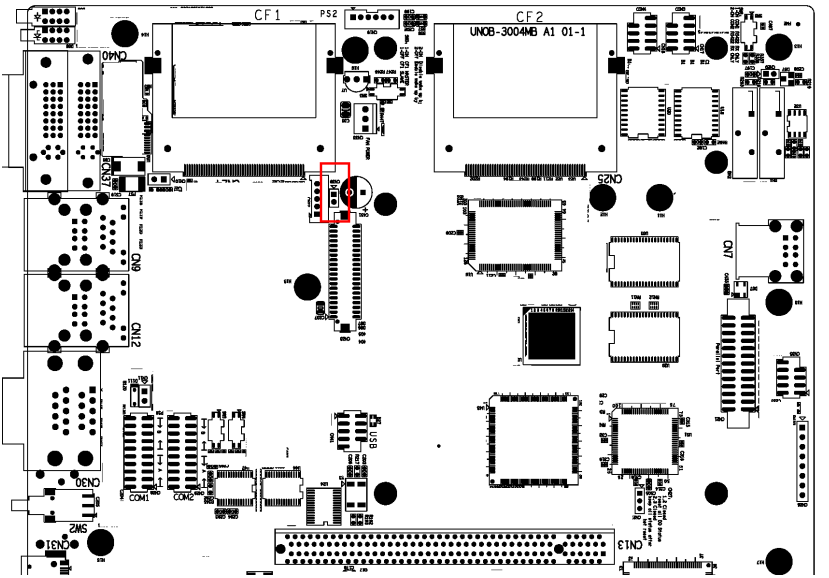
Dual Display:

DVI-I 1 + VGA (on 2nd DVI through converter), can be clone mode or extend mode (independent display)

DVI-I 2 + VGA (on 1st DVI through converter), can be clone mode or extend mode (independent display)

Two DVI, can be clone mode or extend mode (independent display)

Note: User will need to close jumper on CN39 in order to support



Two VGA, clone only through hardware

Triple Display:

Note: The 965 GME Video Cores in UNO-3084 only provide two video content source, while using triple display it will be two clone image with the third image independent.

1. VGA1 + VGA2 + DVI1 (Y-cable on DVI-I 2 connector)
2. VGA1 + VGA2 + DVI2 (Y-cable on DVI-I-1 connector)

2.11 Battery Backup SRAM

UNO-3084 provides 512 KB of battery backup 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 BTR LED in the front panel of the UNO-3084 (Figure 2.13). Please replace the lithium battery if the BTR LED is activated.

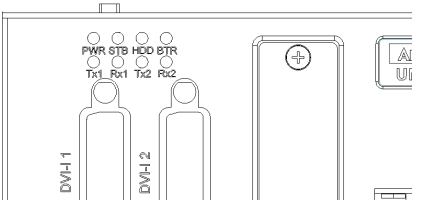


Figure 2.13: LED Location for Battery Backup

2.11.1 Lithium Battery Specification

Type: BR2032 (Using CR2032 is NOT recommended)

Output voltage: 3 VDC

Location: Mainboard of UNO-3084. (Figure 2.15)

When the voltage of battery < 2.5 VDC, BTRY LED will light up.

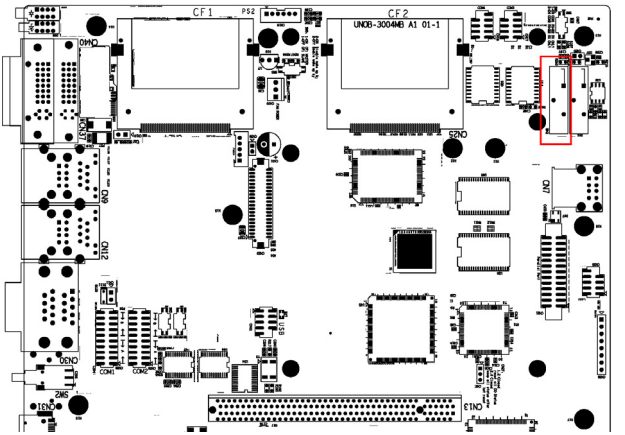


Figure 2.14: Lithium Battery for SRAM

2.12 Reset Button

Press the "Reset" button to activate the reset function. (SW1)

2.13 Power Button

UNO-3084 standard power is ATX type. Please press the "Power" button to power on or power off. The power switch bottom featured "safety switch" which user need to use finger tip to continue press 4 second to shut the system down. It protect the system won't be accidently shut down.

UNO-3084 had also offers "AT power mode" available. Please close the jumper on CN5 in order to use AT mde

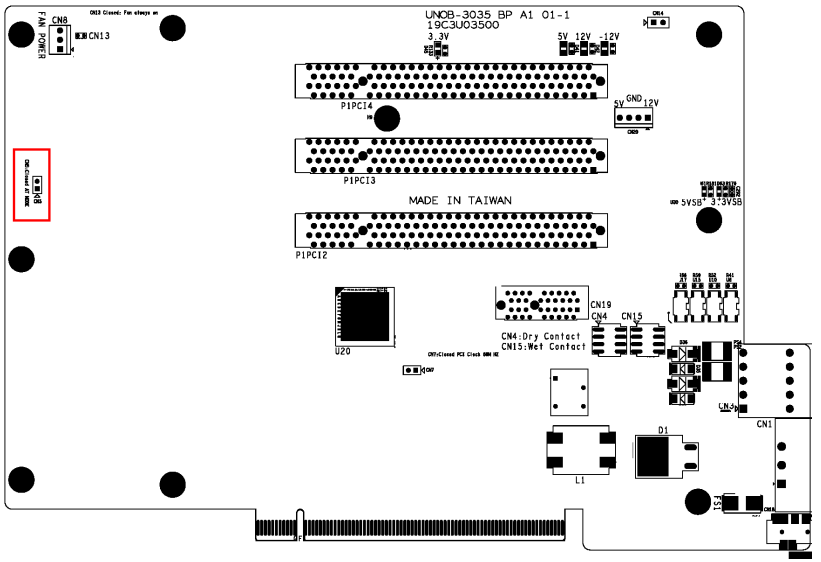


Figure 2.15: Hardware AT mode Jumper Location

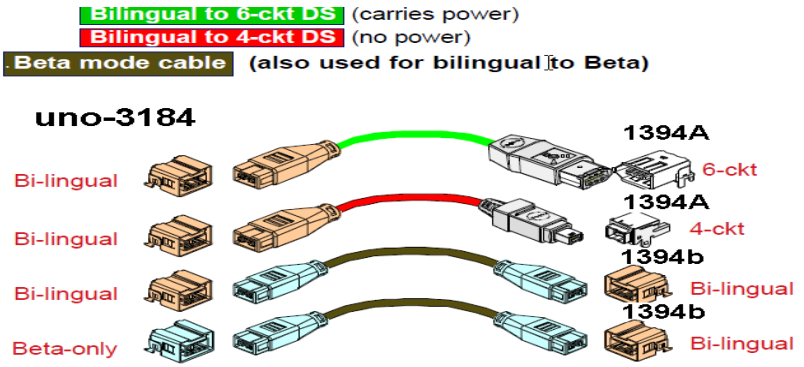
2.14 Audio

UNO-3084 supports audio Line out function.

2.15 IEEE1394

UNO-3084 equipped Dual IEEE 1394b (also known as "FireWire") connector interfaces supports transfer rates up to 800Mb/s. IEEE 1394 is the one of the most popular interface for PC peripherals and customer electronics including digital video, CD-RW, DVD, music synthesizers. This interface is also very popular in Camera for Machine Vision application in industrial automation.

The interface on UNO-3084 is type B interfaces. If the current IEEE-1394 equipment is with type A, user need to buy extra converter cable from IEEE-1394 equipment vendor.



2.16 SATA Hard Drive RAID Support

In order to install an operating system onto a RAID volume, the RAID option must be enabled in the system BIOS, a RAID volume must be created, and the F6 installation method must be used to load the Intel Rapid Storage Technology driver during operating system setup.

Before you start, please make sure that two SATA hard drives have been mounted in system. A USB floppy will be also required for some additional files.

Enable RAID in System BIOS

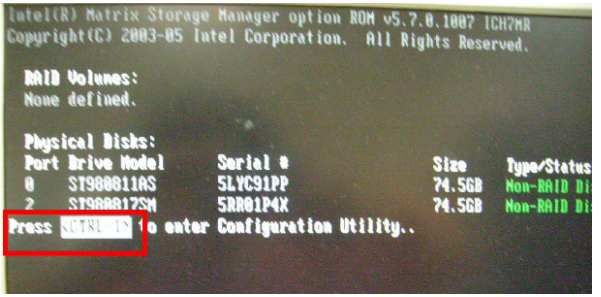
Use the instructions included with your motherboard to enable RAID in the system BIOS.

1. Click Del to enter the BIOS Setup program after the Power-On-Self-Test (POST) memory test begins.
2. Click the Integrated Peripherals menu.
3. Click the OnChip IED Device menu.
4. Switch the SATA Mode option to RAID to enable Intel? RAID Technology.
5. Click F10 to save the BIOS settings and exit the BIOS Setup program.

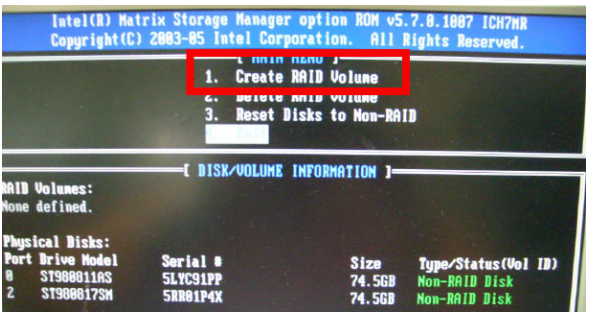
Create a RAID Volume

Use the following steps to create a RAID volume.

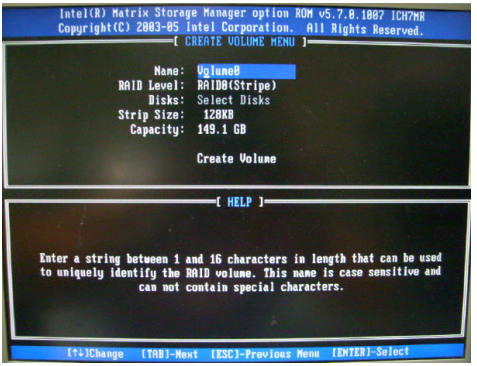
1. When the Intel Rapid Storage Technology option ROM status screen appears during POST, press Ctrl and i at the same time to enter the option ROM user interface.



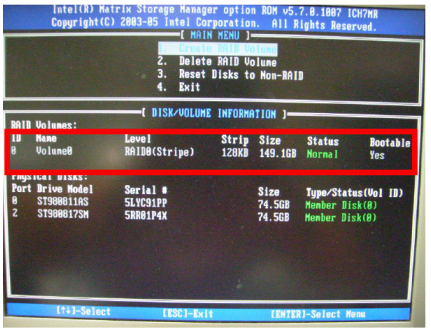
2. Select 1: Create RAID Volume and press Enter.



3. Use the up or down arrow keys to select the RAID level and press Enter.



4. Unless you have selected RAID 1, use the up or down arrow keys to select the strip size and press Enter.
5. Press Enter to select the physical disks.
6. Select the appropriate number of hard drives by using the up or down arrow keys to scroll through the list of hard drives and press Space to select the drive. When finished press Enter.

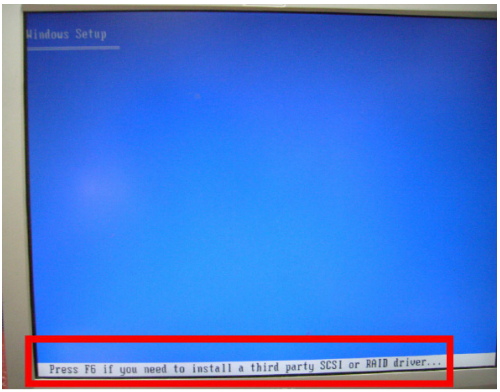


7. Select the volume size and press Enter.
8. Press Enter to create the volume.
9. At the prompt press Y to confirm volume creation.
10. Select 4: Exit and press Enter.
11. Press Y to confirm your exit.

Install the RAID Driver Using the F6 Installation Method

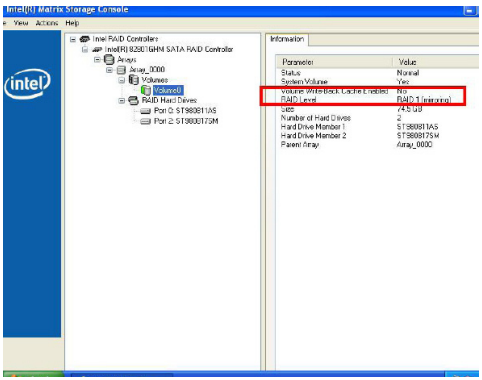
Perform the following steps to install the Intel Rapid Storage Technology driver during operating system setup:

1. Press F6 when you see a message in the status line that says, Press F6 if you need to install a third party SCSI or RAID driver. This message appears at the beginning of Windows XP* setup (during text-mode phase).



Note: Nothing will happen immediately after pressing F6. Setup will temporarily continue loading drivers. You will then be prompted with a screen asking you to load support for mass storage device(s).

2. Press S to Specify Additional Device.

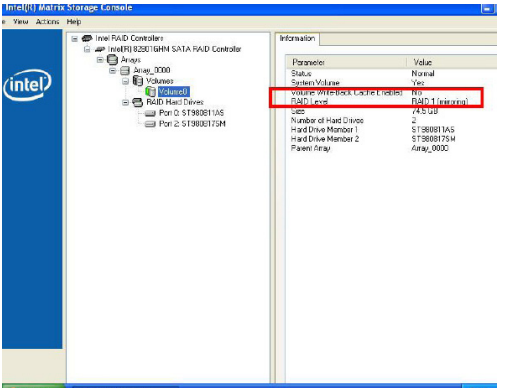


3. When you see a prompt that says, Please insert the disk labeled Manufacturer-supplied hardware support disk into Drive A:, insert ;a floppy disk containing the following files: IAAHCI.INF, IAAHCI.CAT, IASTOR.INF, IASTOR.CAT, IASTOR.SYS, and TXTSETUP.OEM.

   Note: Use the Floppy Configuration Utility to create a floppy disk with the necessary files or copy required file from driver folder.

4. Press Enter.
5. Select your controller from the list of available SCSI adapters. Use the up and down arrow keys to scroll through the list as all controllers may not be visible.
   Note: For UNO-3084, pick Intel ICH8M-E; for UNO-3272/3282, pick Intel ICH7MDH.
6. Press Enter to confirm your controller and continue. At this point, you have successfully installed the driver and Windows setup should continue. Leave the floppy disk in the floppy drive until the system reboots. Windows setup will need to copy the files again from the floppy to the Windows installation folders. Once Windows setup has copied these files again, remove the floppy disk so that Windows setup can reboot as needed.
7. During Windows setup, create a partition and file system on the RAID volume as you would on any physical disk.

   Note: If you wish to use the Intel Rapid Storage Technology user interface in Windows, you will need to install Intel Rapid Storage Technology by running the Setup.exe process after these steps have been completed and the operating system has been successfully installed.


Intel(R) Matrix Storage Console
View Actions Help
Intel RAID Controllers
Intel(R) 82801GHM SATA RAID Controller
Arrays
Array_0000
Volumes
Volume1
RAID Hard Drives
Port 0: ST980811AS
Port 2: ST980817SM
Information
Parameter
Value
Status
Normal
System Volume
Yes
Volume Write-Back Cache Enabled
No
RAID Level
RAID 1 (mirroring)
Size
74.5 GB
Number of Hard Drives
2
Hard Drive Member 1
ST980811AS
Hard Drive Member 2
ST980817SM
Parent Array
Array_0000

CHAPTER 3

Initial Setup

This chapter introduces how to initialize the UNO-3084.
Sections include:

- Introduction
- Inserting a CompactFlash Card
- Chassis Grounding
- Connecting Power
- Connecting a Hard Disk
- BIOS Setup and System Assignments

Chapter 3 Initial Setup

3.1 Inserting a CompactFlash Card

UNO-3084 provides two CompactFlash slots. One slot (CF2) on the daughterboard is accessible from the top of the system, where you can insert your CompactFlash card directly. The other slot (CF1) is inside UNO-3084 on its motherboard. You can set SW3-1 to decide which one is the master.

SW3-1 on motherboard (refer to Figure A.4)

OFF: External CF master (CF1 Slave, default)

ON: External CF master (CF1 Slave)

Note: Only one CompactFlash can be set as master

Internal & external CompactFlash doesn't support Hot Swap

Needs to use " Fixed Disk Mode" CompactFlash to install OS

Following is the procedure for the installing a CompactFlash card in the internal slot (CN3) of your UNO-3084. Please follow these steps carefully:

1. Remove the power cord.
2. Unscrew the four screws from the top cover of UNO-3084.
3. Remove the top cover.
4. Plug a CompactFlash card with your OS and application program into a CompactFlash card slot on mainboard.
5. Screw back the top cover with four screws.

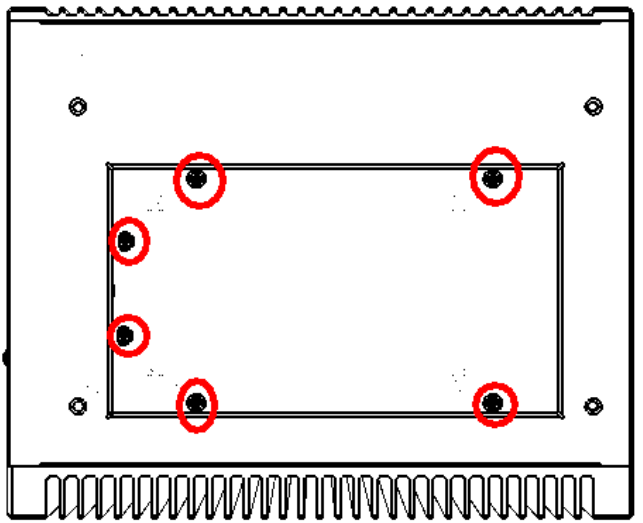
3.2 Connecting Power

Connect the UNO-3084 to a 9 ~ 36 VDC power source. The power source can either be from a power adapter or an in-house power source.

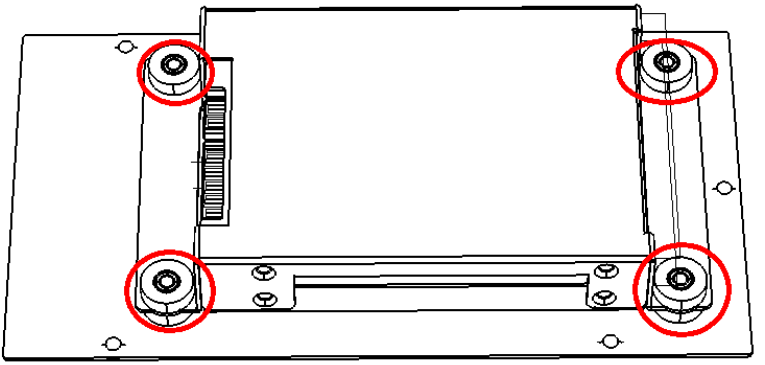
3.3 Installing a Hard Disk

The procedure for installing a hard disk is listed below. Please follow these steps carefully.

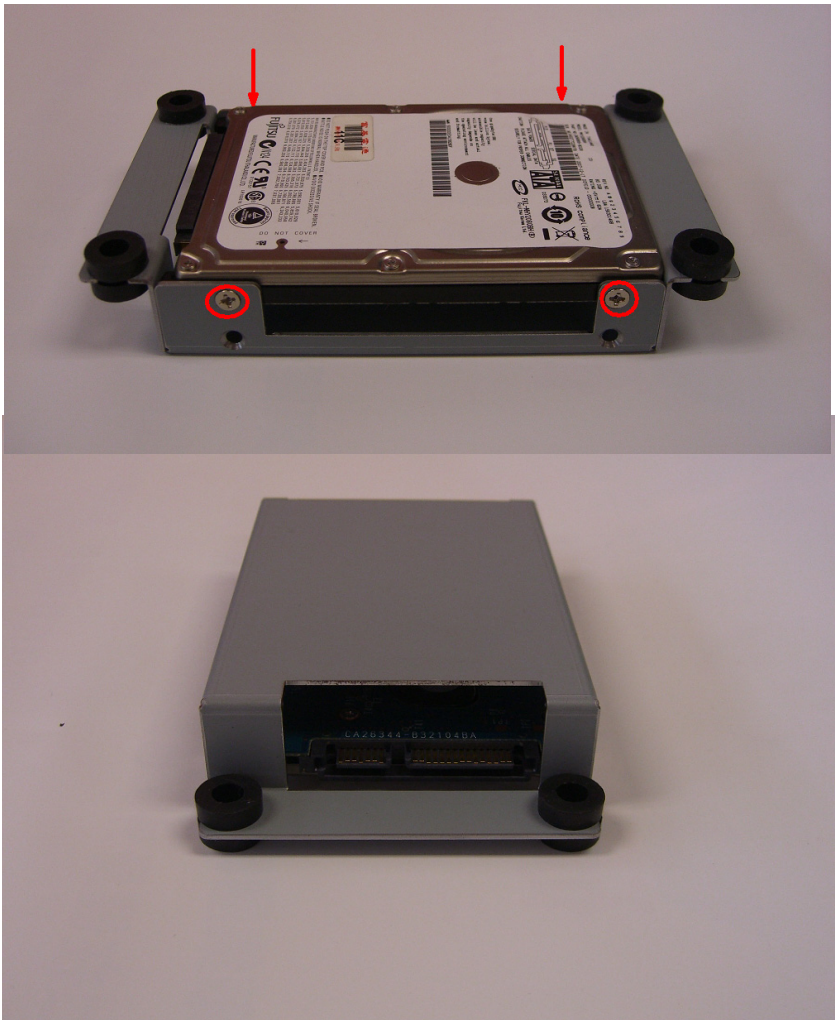
1. Remove the power cord.
2. Unscrew the six screws from the bottom cover (as shown below)



3. Unscrew the HDD bracket from the upper cover.

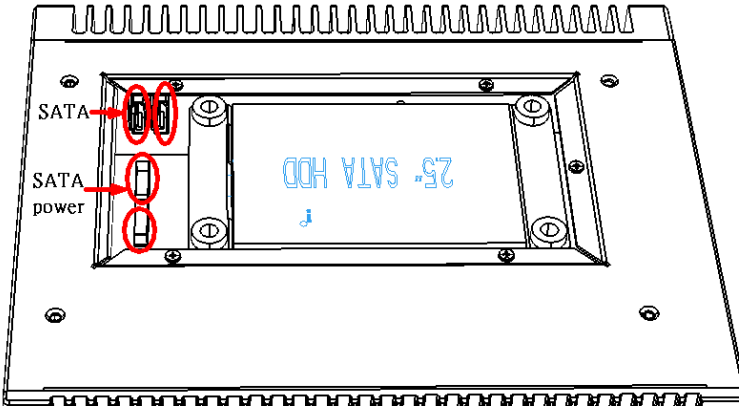


4. Install the HDD in HDD bracket and secure with the four screws. Please refer to pictures below. Please mind the direction of the SATA hard drive connector like below.

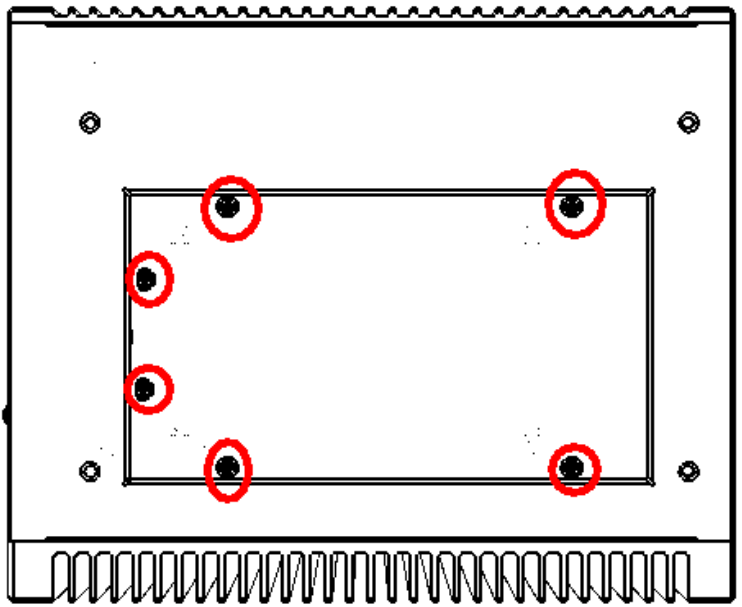


5. SATA HDD Installation
   Install HDD into HDD bracket and fix with screw

6. Connect SATA cable and SATA power cable on HDD side and motherboard side. The correct connection way is shown below.



7. Re-fasten the upper cover with the six screws.



3.4 Installing a PCI-bus Card

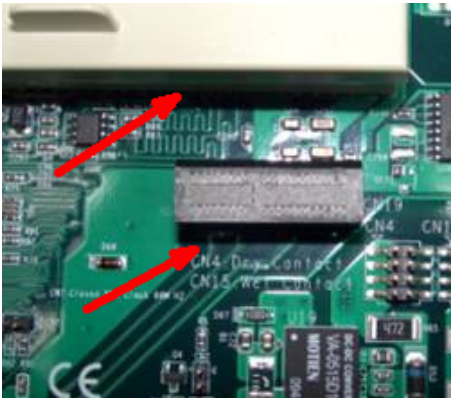
The procedure for installing a PCI-bus card into the UNO-3084 is listed below. Please follow these steps carefully.

1. Remove the power cord.

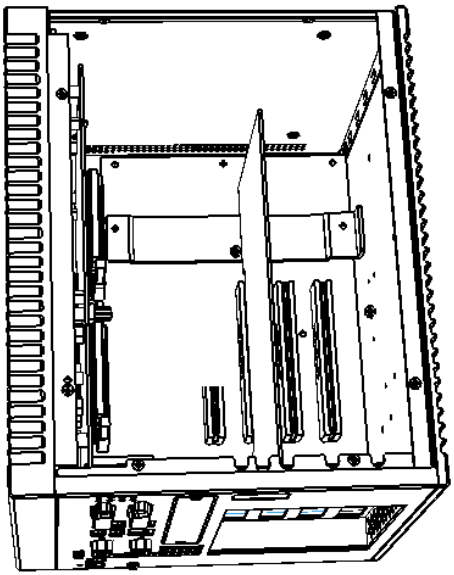
2. Remove the upper cover of UNO-3084.

3. Unscrew the screw of a PCI bracket, and remove it.

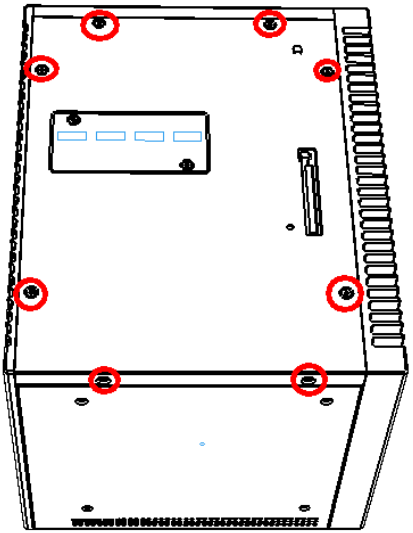
4. Remove the Slot Cover on PCI/PCIe slot



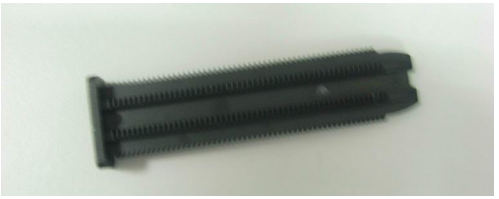
5. Plug-in PCI-bus card in a PCI-slot of UNO-3084.

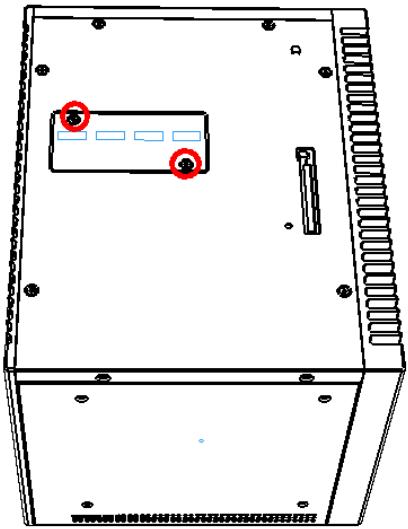


6. Screw back the upper cover with the eight screws.

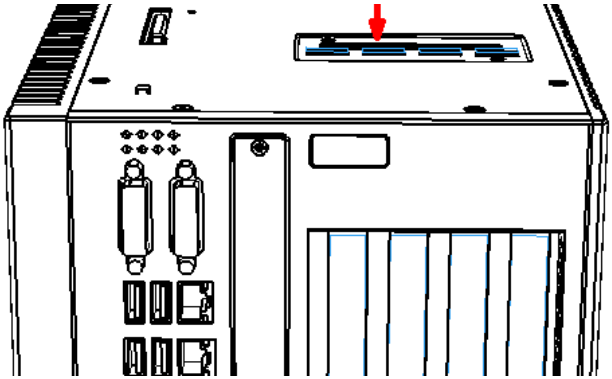


7. Unscrew the two screws and take the PCI Anti-vibration support ki from accessory box





8. Insert the PCI Anti-Vibration support kit through the hole shown till it insert tight. Cut the overhang part and fasten screws.



3.5 Mounting UNO-3084

There are 3 types of mounting kits for UNO-3000 series:

- Panel mount
- Stand mount
- Wallmount

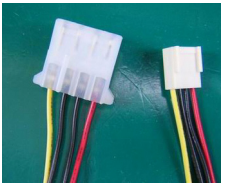
Pls refer to ***UNO-3000 Series Accessories Manual***

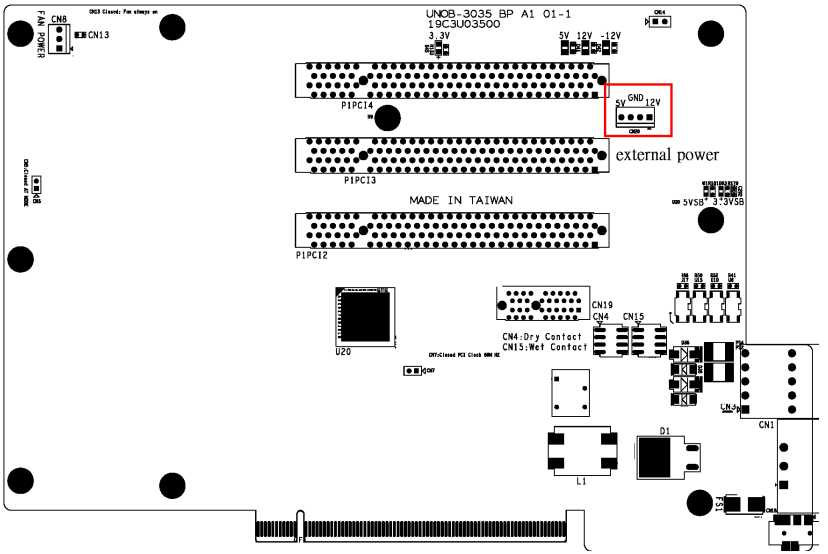
Note: Due to thermal performance issues, Wallmount will only support specific models

3.6 Installing Power Cable

UNO-3084 provides an internal backup power source so that it can provide power for a PCI Blower, external video card that required additional power or other external devices. You can use the power cable from accessory package (see section 1.5).

Yellow	+12V
Black	GND
Black	GND
Red	+5V





3.7 BIOS Setup and System Assignments

UNO-3084 adapts Advantech's SOM-5786 CPU module. Further information about the SOM-5786CPU module can be found in user manual of SOM-5786. You can find this manual on the driver and utility CD of UNO-3084 in the accessory package.

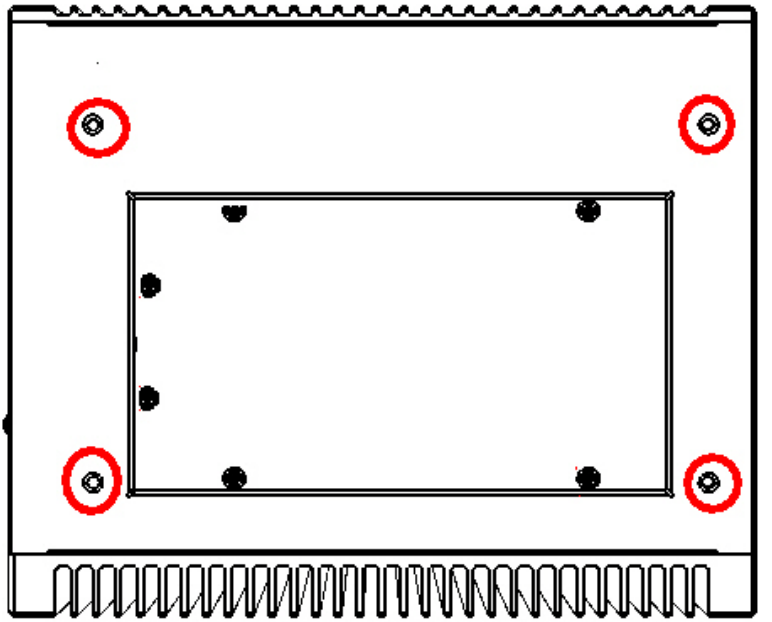
Please note that you can try to "LOAD BIOS DEFAULTS" from the BIOS Setup manual if the UNO-3084 does not work properly.

3.8 Rubber Foot Installation

UNO-3084 provides Rubber Foot for two purpose: <1> Anti-Shock/ Vibration purpose and <2> protect the surface of Chassis from scratch.

Please find the rubber foot in accessory box shown below.

Please peel the non-stick paper and put the rubber foot on the location that has been circled in red.



APPENDIX A

System Settings and Pin Assignments

Appendix A System Settings and Pin Assignments

A.1 System I/O Address and Interrupt Assignments

Table A.1: UNO-3084 System I/O Port

Address Range Device	Device
0000 - 0CF7	PCI bus
0000 - 000F	Direct memory access controller
0010 - 001F	Motherboard resources
0020 - 0021	Programmable interrupt controller
0022 - 003F	Motherboard resources
0040 - 0043	System timer
0044 - 005F	Motherboard resources
0060 - 0060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0061 - 0061	System speaker
0062 - 0063	Motherboard resources
0064 - 0064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0065 - 006F	Motherboard resources
0070 - 0073	System CMOS/real time clock
0074 - 007F	Motherboard resources
0080 - 0090	Direct memory access controller
0091 - 0093	Motherboard resources
0094 - 009F	Direct memory access controller
00A0 - 00A1	Programmable interrupt controller
00A2 - 00BF	Motherboard resources
00C0 - 00DF	Direct memory access controller
00E0 - 00EF	Motherboard resources
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)
02E8-02EF	Communications Port (COM4)
0378 - 037F	Printer Port (LPT1)
03B0 - 03BB	Mobile Intel 965 Express Chipset Family
03C0 - 03DF	Mobile Intel 965 Express Chipset Family
03F6 - 03F6 I	Primary IDE Channe
03E8-03EF	Communications Port (COM3)
03F8 - 03FF	Communications Port (COM1)
0500 - 051F	Intel ICH8 Family SMBus Controller - 283E
0778 - 077B	Printer Port (LPT1)
0D00 - FFFF	PCI bus
F200 - F20F	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F300 - F30F	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F400 - F403	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F500 - F507	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F600 - F603	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F700 - F707	Intel ICH8M 3 port Serial ATA Storage Controller - 2828
F800 - F80F	Intel ICH8M Ultra ATA Storage Controllers - 2850
F900 - F91F	Intel ICH8 Family USB Universal Host Controller - 2832
FA00 - FA1F	Intel ICH8 Family USB Universal Host Controller - 2831
FB00 - FB1F	Intel ICH8 Family USB Universal Host Controller - 2830
FC00 - FC1F	Intel ICH8 Family USB Universal Host Controller - 2835
FD00 - FD1F	Intel ICH8 Family USB Universal Host Controller - 2834
FF00 - FF07	Mobile Intel 965 Express Chipset Family
443	Watchdog timer
DC000-DFFFF	Battery backup resource

Table A.2: UNO-3084 Interrupt Assignments	
Interrupt Number	**Interrupt source**
NMI	Parity error detected
IRQ 0	System timer
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	Communications Port (COM4)
IRQ 6	Standard floppy disk controller
IRQ 7	DIO
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	Communications Port (COM3)
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Numeric data processor
IRQ 14	Primary IDE Channel
IRQ 15	Intel ICH8 Family SMBus Controller - 283E
IRQ 16	Mobile Intel 965 Express Chipset Family

A.2 Board Connectors and Jumpers

There are several connectors and jumpers on the UNO-3084 board. The following sections tell you how to configure the UNO-3084 hardware setting. Figures A.1 to A.5 show the location of the connectors and jumpers.

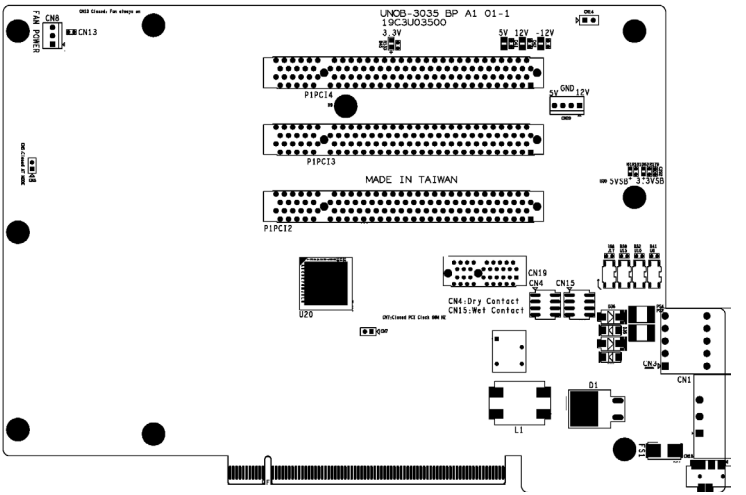


Figure A.1: Backplane Connector & Jumpers

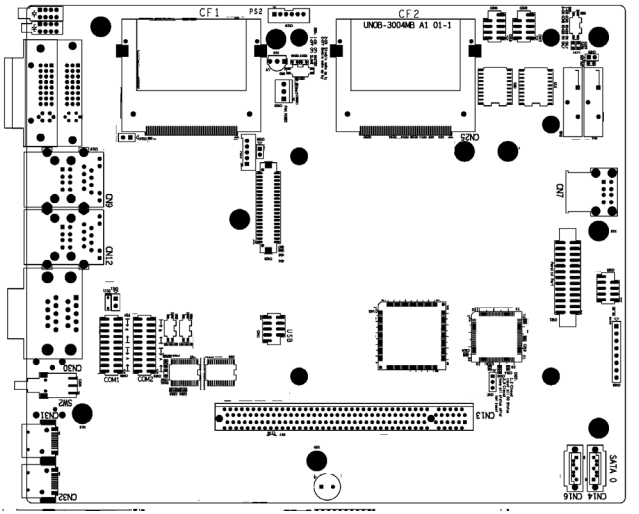


Figure A.2: Mainboard Connector & Jumpers (Front)

Table A.3: Connector and Jumper Descriptions		
Location	**Label**	**Function**
Backplane	FS1, FS2	Fuse for input DC power
	CN4	Dry Contact Selection Jumper
	CN15	Wet Contact Selection Jumper
	CN5	Hardware AT selection Jumper
	CN7	PCI frequency Selection (closed: 66MHz)
	CN8	3P Fan Power connector
	CN13	3P Fan Power On (Closed: Always On)
	CN11, CN12	SATA power connector
	CN18	Audio Out Connector
	CN20	4P External Power connector
	CN19	PCI Express x 1
	P1PCI 2	PCI slot 2
	P1PCI 3	PCI slot 3
	P1PCI 4	PCI slot 4

Table A.4: Connector and Jumper Descriptions		
Location	**Label**	**Function**
Main-board	CN7	Internal USB
	CN9/CN12	Gigabit LAN/USB Connector
	CN14, CN16	SATA Connector
	CN17, CN18	Optional Cable Wired COM3/COM4 pin header
	CN19	Optional Cable Wired PS/2 pin header
	CN20	Clear CMOS
	CN21	Print Port Pin header
	CN22, CN23	LVDS /LVDS power (Reserved)
	CN24, CN25	CF1/ CF2
	CN27	DO status after reset Jumper
	CN28, CN29	COM port RS-232/RS-422&485 selection
	CN30	COM1/COM2 DB-9 connector
	CN33	3P Fan power connector
	CN39	Video detect Jumper for Dual DVI-D selection (Close:Disable VGA)
	CN41	Optional Cable Wired USB pin header
	SW3	CF1/CF2 Master selection
	SW6	(Reserved)

A.3 UNO-3084 Control Register

Table A.5: UNO-3084 Control Register									
Base Address		7	6	5	4	3	2	1	0
200H	R	Isolated Digital Input Status Register							
		DI7	DI6	DI5	DI4	DI3	DI2	DI1	DI0
201H	R/W	Isolated Digital Output Control/Status Register							
		DO7	DO6	DO5	DO4	DO3	DO2	DO1	DO0
202H	R/W	Interrupt Enable Control/Status Register							
								DI1EN	DI0EN
203H	R/W	Interrupt Triggering Edge Control/Status Register							
								DI1TE	DI0TE
207H	R/W	Interrupt Flag/Clear Register							
						CTR1F	CTR0F	DI1F	DI0F
208H	R/W	82C54 Chip Counter0 Register*							
209H	R/W	82C54 Chip Counter1 Register*							
20BH	R/W	82C54 Chip Control Register*							
20CH	R/W	Counter0 Start Control / Output Status Register							
					CTR0 Out				CTR0 Gate
20DH	R/W	Counter1 Start Control / Output Status Register							
					CTR1 Out				CTR1 Gate
20EH	R/W	Counter0 Setting Register							
						CTR0 IntSet	CTR0 OutSet	CTR0 GateSet	CTR0 CLKSet
20FH	R/W	Counter1 Setting Register							
			CTR 32Set	S1	S0	CTR1 IntSet	CTR1 OutSet	CTR1 GateSet	CTR1 CLKSet
210H	R/W	DIAG LED Control Register							
							LEDS1	LEDS0	LEDEn
211H	R/W	Buzzer Control Register							
							SPKS1	SPKS0	SPKEn
218H	R	Power Register							
							PWR	P2	P1

** Refer to 82c54 manual*

A.4 RS-232 Standard Serial Port (COM3~COM4)

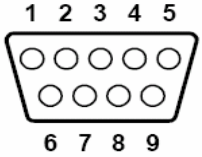


Table A.6: RS-232 Serial Port Pin Assigns	
Pin	**RS-232 Signal Name**
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.5 RS-232/422/485 Serial Port (COM1~COM2)

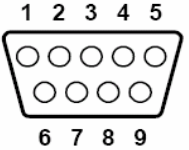


Table A.7: RS-232/422/485 Serial Port Pin Assigns			
Pin	**RS-232**	**RS-422**	**RS-485**
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

A.6 Ethernet RJ-45 Connector (LAN1~LAN2)

Table A.8: 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.7 Power Connector (PWR)

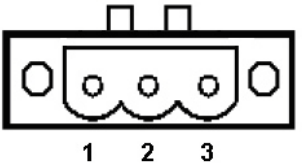


Table A.9: Power connector pin assignments	
Pin	
1	V+ (9~36V_{DC})
2	V-
3	Field Ground

A.8 PS/2 Keyboard and Mouse Connector

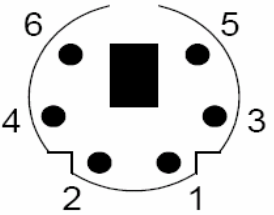


Table A.10: Keyboard & Mouse Connector Pins	
Pin	**Signal Name**
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB Clock
6	MS Clock

A.9 USB Connector (USB1~USB4 & CN7)

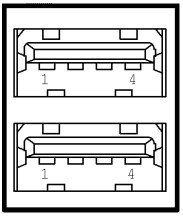


Table A.11: USB Connector Pin Assignments		
Pin	**Signal Name**	**Cable Color**
1	VCC	Red
2	DATA-	White
3	DATA+	Green
4	GND	Black

A.10 VGA Display Connector

DVI-I to DVI & VGA Cable or Converter

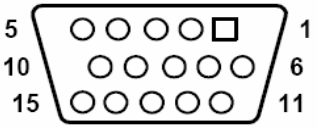


Table A.12: VGA Adaptor Cable Pin Assignmen	
Pin	**Signal Name**
1	Red
2	Green
3	Blue
4	NC
5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	NC
13	H-SYNC
14	V-SYNC
15	NC

A.11 DVI-I Connector

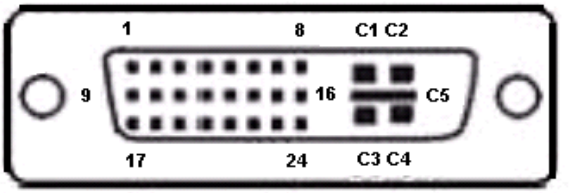


Table A.13: DVI-I connector pin assignment

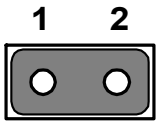
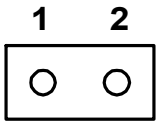
Pin	Signal Name
1	TMDS_C2#
2	TMDS_C2
3	GND
4	CRT_DDC_CLK
5	CRT_DDC_DATA
6	MDVI_CLK
7	MDVI_DATA
8	VGAVSY
9	TMDS_C1#
10	TMDS_C1
11	GND
12	-
13	-
14	VCC_DVI
15	VGA Detect
16	HP_DET
17	TMDS_C0#
18	TMDS_C0
19	GND
20	-
21	-
22	GND
23	TMDS_CK#
24	TMDS_CK
C1	VGAR
C2	VGAG
C3	VGAB
C4	VGAHSY
C5	GND

A.12 Clear CMOS (CN3)

This jumper is used to erase CMOS data and reset system BIOS information. Follow the procedures below to clear the CMOS.

1. Turn off the system.
2. Close jumper CN3 (1-2) to clear CMOS .
3, Remove jumper CN3(1-2)
3. Turn on the system. The CMOS is now cleared.
4. Turn on the system. The BIOS is reset to its default setting.

Table A.14: CN3 Clear CMOS

Configuration	Function
	Clear CMOS
	Normal (Default)

A.13 External & Internal SATA Connectors

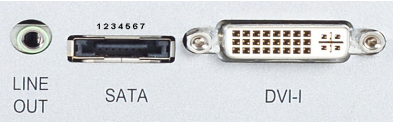


Table A.15: External SATA connector pin assignment	
Pin	**Signal name**
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

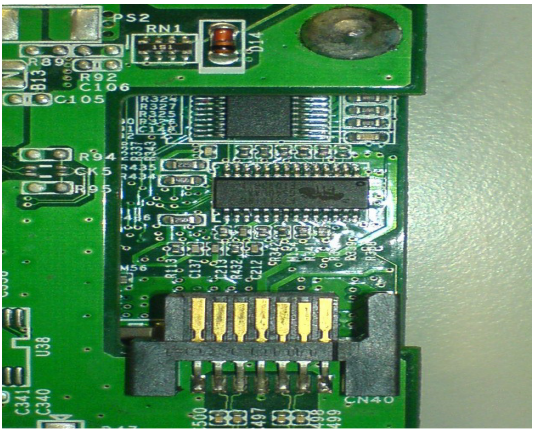
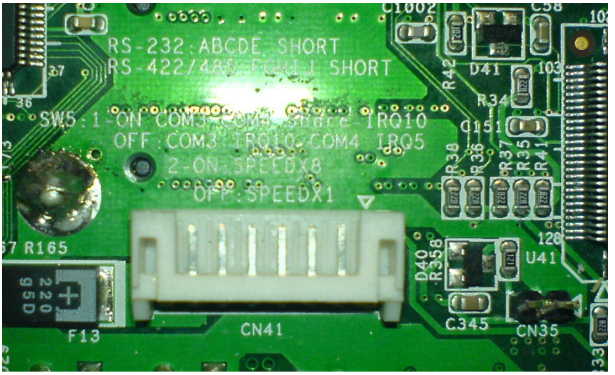


Table A.16: Internal SATA DATA Connectors (CN40)	
Pin	**Signal name**
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



8 7 6 5 4 3 2 1

Table A.17: Internal SATA Power Connectors (CN41)	
Pin	**Signal name**
1	GND
2	GND
3	+12V
4	+12V
5	+5V
6	+5V
7	+3V
8	+3V

APPENDIX B

Programming the Watchdog Timer

Appendix B Programming the Watchdog Timer

To program the watchdog timer, you must write a program which writes I/O port address 443 (hex). The output data is a value of time interval. The value range is from 01 (hex) to 3E (hex), and the related time interval is 1 sec. to 62 sec.

Data	Time Interval
01	1 sec.
02	2 sec.
03	3 sec.
04	4 sec.
..	
..	
..	
3E	62 sec.

After data entry, your program must refresh the watchdog timer by rewriting the I/O port 443 (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read I/O port 443 (hex).

The following example shows how you might program the watchdog timer in BASIC:

```
10   REM Watchdog timer example program
20   OUT &H443, data REM Start and restart the watchdog
30   GOSUB 1000 REM Your application task #1,
40   OUT &H443, data REM Reset the timer
50   GOSUB 2000 REM Your application task #2,
60   OUT &H443, data REM Reset the timer
70   X=INP (&H443) REM, Disable the watchdog timer
80   END
1000  REM Subroutine #1, your application task
..
..
..
1070   RETURN
2000   REM Subroutine #2, your application task
..
..
..
2090   RETURN
```