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UNO-2182

Core 2 Duo
Universal Network Controller
with PCI-104 Expansion

User Manual

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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. Please contact your local supplier for ordering information.

FCC Class A

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

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.

Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

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CHAPTER 1

Overview

This chapter provides an overview of UNO-2182's specifications.

Sections include:

- Introduction
- Hardware specification
- Safety precautions
- Chassis dimensions

Chapter 1 Overview

1.1 Introduction

UNO-2182 is an embedded Application Ready Platform (ARP) that can shorten your development time and offers rich networking interfaces to fulfill extensive needs in different projects. Advantech's Universal Network Controller is designed to be a total solution for network enabled Application Ready Platforms.

Leveraging field-approved and worldwide approved real-time OS technology, Advantech's UNO-2000 series provides a Windows CE .NET and Windows XP Embedded ready solution, and supports several standard networking interfaces, such as Ethernet, Wireless LAN, RS-232/422/485 and so on. Because of its openness, great expansion capability and reliable design (fanless and diskless), the UNO-2000 series are ideal embedded platforms for implementing custom applications for diversified applications.

1.2 Hardware Specifications

- **CPU:** Core 2 Duo
- **Memory:** 1GB on board
- **Battery-backup RAM:** 512 KB Battery-backup RAM
- **Keyboard/Mouse:** PS/2 keyboard & mouse
- **Display:** DVI-I, support dual display
- **Serial Ports:** 2 × RS-232 and 2 x RS-232/422/485 with DB-9 connectors. Automatic RS-485 data flow control
- **Serial Speeds:** RS-232: 50~115.2 kbps, RS-422/485: 50~921.6 kbps
- **LAN:** Two 10/100/1000 Base-T RJ-45 Ports
- **USB Interface:** Two USB ports, USB EHCI, Rev. 2.0 compliant
- **Audio:** Mic in, Line in, Line out
- **PC Card:** One PC Card slot. Supports CardBus (Card-32) Card and 16-bit (PCMCIA 2.1/JEIDA4.2) Card. Supports +5 V, +3.3 V working power
- **SSD:** One internal Type I / Type II CompactFlash card slot
- **LEDs:** Power (Power Standby: Orange, Power on : Green), IDE, Alarm for RAM Backup Battery
- **PCI-104**: PCI-104 slot, Supports +3.3V/5V Power
- **HDD:** One standard 2.5" SATA or PATA HDD
- **Watch Dog Timer:** Programmable
- **Anti-Shock:** 20 G @ Wall mounting, IEC 68 2-27, half sine, 11 ms w/ HDD50 G @ Wall mounting, IEC 68 2-27, half sine, 11 ms w/CF
- **Anti-Vibration:** 2 Grms w/CF @IEC 68 section 2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis. 1 Grms w/ HDD @ IEC 68 section 2-64, random, 5 ~ 500 Hz, 1 Oct./min, 1 hr/axis
- **Power Requirement:** Min. 48 W (9 ~ 36 VDC) (5A, MAX) (ATX)
- **Power Consumption:** 24W (Typical)
- **Operating Temperature:** -20 ~ 55° C (-4~135° F)
- **Storage Temperature**: -20~80° C (-4~176° F)
- **Relative Humidity:** 95% @ 40°C
- **Weight:** 2.8 kg

- **Chassis Size (W × L × H):** 255 x 152 x 69 mm (10”× 6.0”× 2.7”)
- **Software options:** Windows XP Embedded, Win/2000/XP
- **Certification**: CE, FCC Class A, UL

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.

Warning!



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.

Caution! *Always ground yourself to remove any static electric charge before touching UNO-2182. 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 Chassis Dimensions

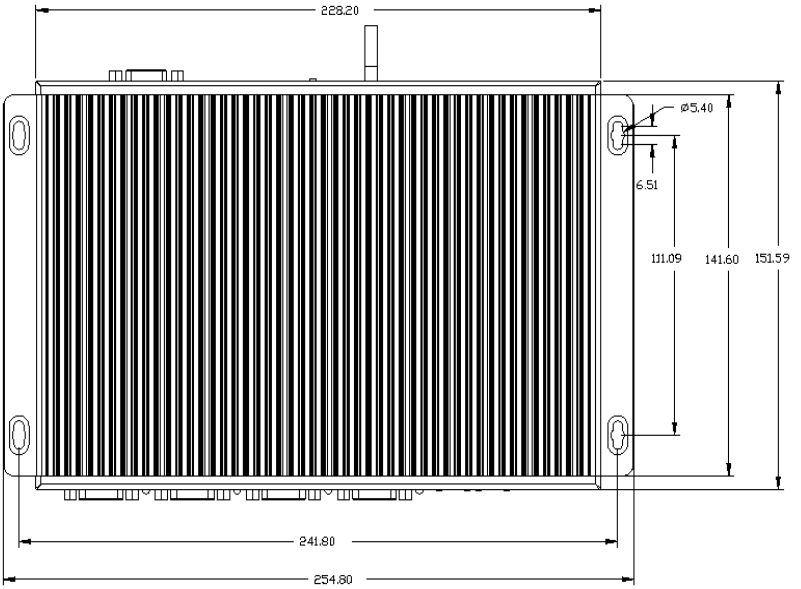


Figure 1.1: Chassis Dimensions 1

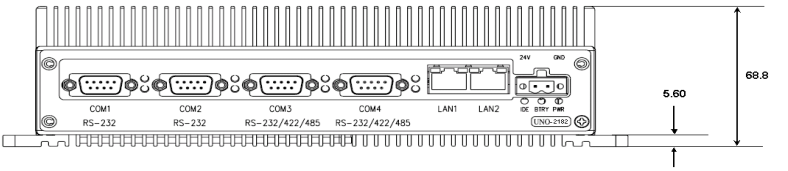


Figure 1.2: Chassis Dimensions 2

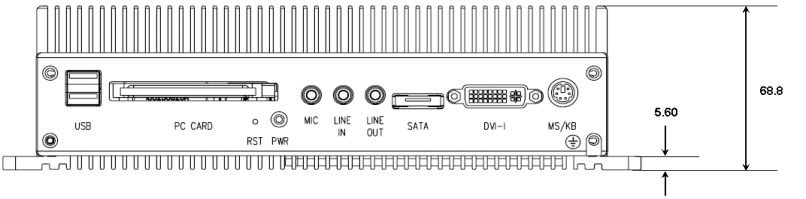


Figure 1.3: Chassis Dimensions 3

1.5 Accessories

Please refer below for the accessory list:

- 2-pin connector for power wiring (Advantech P/N : 1652002205)
- DVI-I to DVI and VGA cable (Advantech P/N : 1700004713)
- SATA signal cable (Advantech P/N : 1700004711)
- SATA power cable (Advantech P/N : 1700004712)
- 10 PCS jumper for PATA HDD (Advantech P/N : 1653302122)
- 1 PATA IDE HDD cable 15cm (Advantech P/N : 1701440151)
- Keyboard/Mouse Y cable (Advantech P/N : 1700060202)
- Driver CD
- PCI-104 bracket (Advantech P/N : 1960008884)
- 2 Standard posts for install PCI-104 card (Advantech P/N : 193A231540)
- 2 screws (M3*15L) for install PCI-104 bracket on UNO (Advantech P/N : 1935131510)
- Warranty card

If anything is missing or damaged, contact your distributor or sales representative immediately.

CHAPTER 2

Hardware Functionality

This chapter shows how to setup the UNO-2182's hardware functions, including connecting peripherals, setting switches and indicators.

Sections include:

- Peripherals
- RS-232 Interface
- RS-232/422/485 Interface
- LAN / Ethernet Connector
- Power Connector
- PS/2 Mouse and Keyboard Connector
- USB Connector
- PCMCIA: PC Card Slot
- VGA Display Connector
- Battery Backup SRAM
- Reset Button
- Power Button
- Audio
- PCI-104

Chapter 2 Hardware Functionality

2.1 Introduction

The following two figures show the connectors on UNO-2182. The following sections give you detailed information about function of each peripheral.

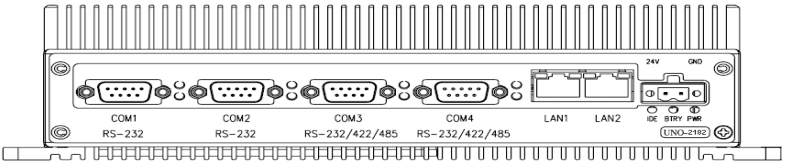


Figure 2.1: UNO-2182 Front Panel

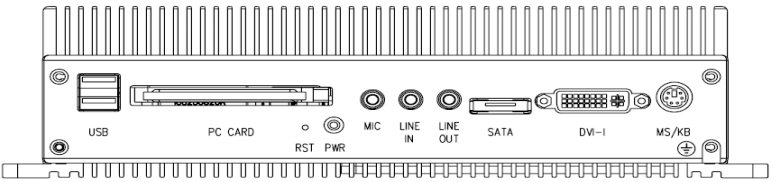


Figure 2.2: UNO-2182 Rear Panel

2.2 RS-232 Interface (COM1~COM2)

The UNO-2182 offers two standard RS-232 serial communication interface ports: COM1 and COM2. Please refer to A.3 for their pin assignments.

IRQ and Address Setting

The IRQ and I/O address range of COM1 and COM2 are listed below:

COM1: 3F8H, IRQ4

COM2: 2F8H, IRQ3

2.3 RS-232/422/485 Interface (COM3~COM4)

The UNO-2182 offers two RS-232/422/485 serial communication interface ports: COM3 and COM4. Please refer to Appendix A.4 for their pin assignments. The default setting of COM3 and COM4 are RS-422/485.

2.3.1 16C550 UARTs with 16-byte standard

Advantech UNO-2182 comes with TI16C550 UARTs containing 16 bytes FIFOs.

2.3.2 RS-422/485 detection

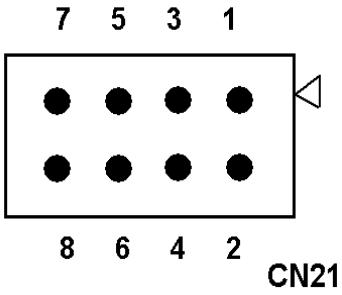
In RS-422/485 mode, UNO-2182 automatically detects signals to match RS-422 or RS-485 networks. (No jumper change required)

2.3.3 Automatic Data Flow Control Function for RS-485

In RS-485 mode, UNO-2182 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 conveniently 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 modification.

2.3.4 Termination Resistor (CN21)

The onboard termination resistor (120 ohm) for COM3/COM4 can be used for long distance transmission or device matching. (Default Open.)



Pin	Description
1-2	TX+/TX- for COM3 Data+/Data- for COM3
3-4	RX+/RX- for COM3
5-6	TX+/TX- for COM4 Data+/Data- for COM4
7-8	RX+/RX- for COM4

2.3.5 RS-232/422/485 Selection

COM3 and COM4 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 mode.

To select between RS-422/485 and RS-232 for COM3, adjust CN24.

To select between RS-422/485 and RS-232 for COM4, adjust CN25.

Jumper setting for RS-422/485 interface: (Default setting). (CN24/CN25)

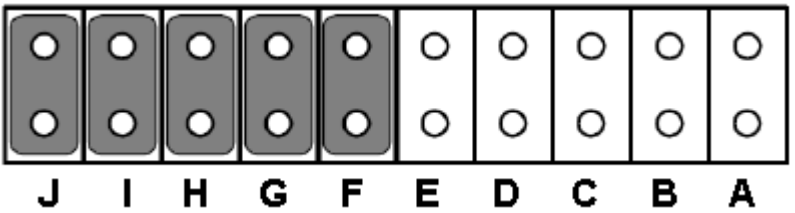


Figure 2.3: RS-422/485 Jumper Setting

Jumper setting for RS-232 interface: (CN24 and CN25)

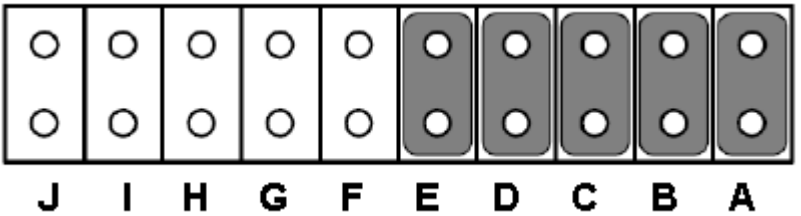


Figure 2.4: RS-232 Jumper Setting

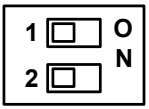
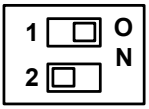
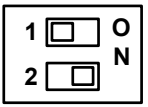
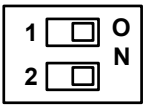
2.3.6 RS-485 Auto Flow & RS-422 Master/Slave Mode

You can set the "Auto Flow Control" mode of RS-485 or "Master/Slave" mode of RS-422 by using the SW4 DIP switch for each RS-422/485 port.

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

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

Table 2.1: Auto Flow & Slave/Master Selection

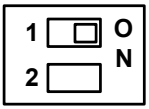
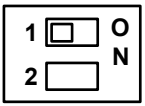
SW4 DIP Switch Setting	COM Port	Mode Selections
 (Default)	COM3	RS-422: Slave mode
		RS-485: Auto flow control
	COM4	RS-422: Slave mode
		RS-485: Auto flow control
	COM3	RS-422: Master mode
		RS-485: N/A
	COM4	RS-422: Slave mode
		RS-485: Auto flow control
	COM3	RS-422: Slave mode
		RS-485: Auto flow control
	COM4	RS-422: Master mode
		RS-485: N/A
	COM3	RS-422: Master mode
		RS-485: N/A
	COM4	RS-422: Master mode
		RS-485: N/A

2.3.7 IRQ and Address Setting

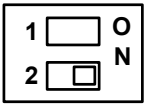
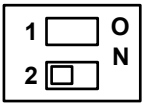
The IRQ and I/O address range of COM3 and COM4 are listed below:

- **COM3:** $3E8_H$, IRQ10 (Independent IRQ), IRQ10 (Share IRQ)
- **COM4:** $2E8_H$, IRQ5 (Independent IRQ), IRQ10 (Share IRQ)
- **Vector address for share IRQ:** $1D0_H$

You can set "Share IRQ" or "Independent IRQ" by the first switch of SW5.

Table 2.2: IRQ Setting via switch 1 at SW5	
Switch 1 at SW5 setting	**Function**
	Share IRQ (default)
	Independent IRQ

You can adjust the transmission rate by the second switch of SW5.

Table 2.3: IRQ Setting via switch 1 at SW5	
Switch 1 at SW5 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 SW5 to "on".

2.4 LAN: Ethernet Connector

The UNO-2182 is equipped with a Realtek RTL8111B Ethernet LAN controller that is fully compliant with IEEE 802.3u 10/100Mbps Ethernet and also IEEE 802.3ab 1000Mbps Ethernet.. The Ethernet port provides a standard RJ-45 jack on board, and LED indicators on the front side to show its Link (Green : 1000 Mbps network, Orange : 100 Mbps network, Blank : 10Mbps network.) and Active (Yellow LED) status.

2.5 Power Connector

The UNO-2182 comes with a Phoenix connector that carries 9 ~ 36 VDC (ATX) 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 Appendix A.6

2.6 PS/2 Keyboard and Mouse Connector

The UNO-2182 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-2182. The UNO-2182 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 PS/2 mouse connection. Please refer to Appendix A.7 for its pin assignments.

2.7 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-2182 provides two connectors of USB interfaces, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB EHCI, Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. Please refer to Appendix A.8 for its pin assignments.

2.8 PCMCIA: PC Card Slot

The UNO-2182 provides one PC Card slot that supports CardBus (Card-32) cards and 16-bit (PCMCIA 2.1/JEIDA 4.2) card standards. It supports +3.3 V, +5 V. The PC Card is 85.6 mm long by 54 mm wide (3.37" x 2.126"), use a 68-pin connector and a removable module standardized by PCMCIA that is known as “PCMCIA card.”

PS: PCMCIA interrupt assignment is IRQ 7.

2.9 VGA Display Connector

UNO-2182 provides DVI-I interface, 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.

The UNO-2182 provides a VGA controller (Intel 945GM GMCH for a high resolution VGA interface. It supports CRT Mode: 1600 x 1200 @ 32bpp @ 85Hz, and up to 32 MB shared memory.

2.10 Battery Backup SRAM

UNO-2182 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-2182, please replace the lithium battery with a new one if the BTRY LED is activated.

2.10.1 Lithium Battery Specification

- **Type:** BR2032 (Using CR2032 is NOT recommended)
- **Output voltage:** 3 V_{DC}
- **Location:** the backside of UNO-2182 board.

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

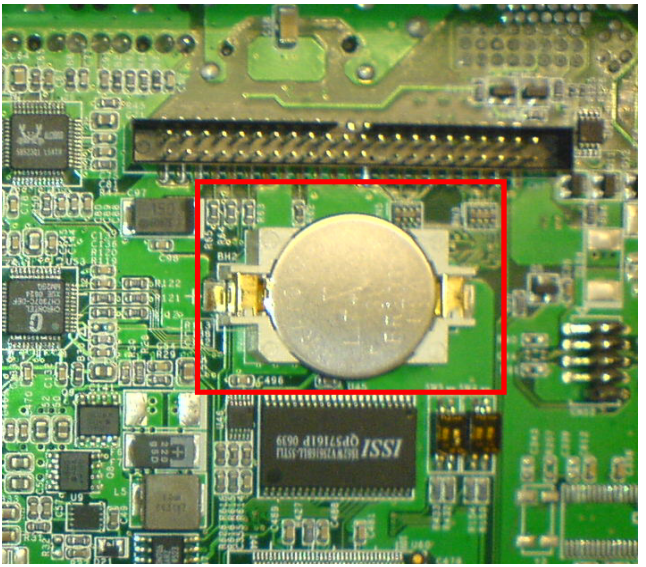


Figure 2.5: SRAM Lithium Battery Location

2.10.2 Jumper Setting for SRAM

You could set up SRAM enable or diable by jumper CN44.

SRAM Enable/Disable Jumper Setting (CN44)	
Status	**Function**
Open 	Enable SRAM function (Default)
Closed 	Disable SRAM function

2.11 Reset Button

Press the "Reset" button to activate the reset function. (SW2)

2.12 Power Button

Press the "Power" button to power on or power off UNO-2182. (ATX type) (SW3)

UNO-2182's power is also designed for power management only "S1" compliant.

2.13 Audio

UNO-2182 supports audio function with

- Microphone
- Line In
- Line Out.

2.14 PCI-104

UNO-2182 supports standard PCI-104 version 1.2, which supports up to 3 PCI masters (CN33). You also could install jumper (CN32) for choosing power of PCI-104 bus supplies (Jumper default setting is open).

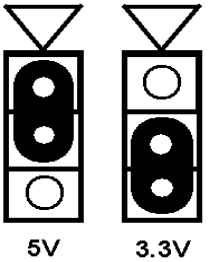


Figure 2.6: PCI-104 Power Selection

CHAPTER 3

Initial Setup

This chapter introduces how to initialize the UNO-2182.

Sections include:

- Chassis Grounding
- Inserting a CompactFlash Card
- Installing a Hard Disk
- Connecting Power
- BIOS Setup and System Assignments
- Installing PCI-104 Modules

Chapter 3 Initial Setup

3.1 Chassis Grounding

The aluminum made UNO-2182 provides good EMI protection and a stable grounding base. There is an easy-to-connect chassis grounding point for you to use.

Please connect chassis ground of UNO-2182 with "EARTH" as ground.

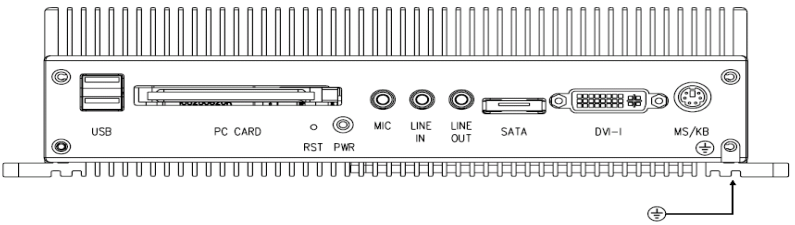


Figure 3.1: Chassis Grounding Connection

Note: UNO-2182 is design as system power ground and chassis ground is separated.

3.2 Inserting a CompactFlash Card

The procedure for installing a CompactFlash card into the UNO-2182 is detailed below, please follow these steps carefully.

1. Remove the power cord.
2. Unscrew the four screws from the rear panel.
3. Remove the storage panel.
4. Plug a CompactFlash card with your OS and application program into a CompactFlash card slot on board. (CN8)
5. Screw back the rear panel with four screws

Note CN8 is primary's master

CN7 is Primary

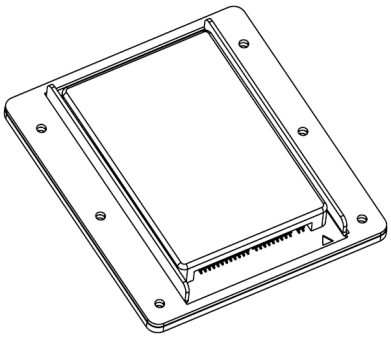
Please do not use CN8 and CN7 at same time.

If your OS is build in CF card and program,application and data are save in HDD, please install CF in CN8 and connect SATA HDD in CN40 (SATA signal) and CN41 (SATA power), please also refer CN40 and CN41 pin assignment in A.11.

3.3 Installing a Hard Disk

The procedure for installing a hard disk into the UNO-2182 is below. Please follow these steps carefully.

1. Remove the power cord.
2. Unscrew six screws from the down storage panel of the UNO-2182.
3. Remove the storage panel.
4. Install 2.5" HDD on storage panel and please notice the cable connector on HDD for IDE should be near bottom triangle sign of storage panel, and screw 4 screws on the back side of storage panel connector IDE cable with Standard PATA and CN7 or SATA HDD with CN40 (SATA signal) and CN41 (SATA power), , please also refer CN40 and CN41 pin assginment in A.11



5. Screw back the down storage panel with 6 screws

Note: *CN8 is Primary's master*

CN7 is Primary

Please do not use CN8 and CN7 at same time.

If your OS is build in CF card and program,application and data are save in HDD, please install CF in CN8 and connect SATA HDD in CN40 (SATA signal) and CN41 (SATA power), please also refer CN40 and CN41 pin assignment in A.10

Also you could apply external SATA connector to link with your storage device for data storage, this connector only provides signal, but not power. As for external SATA connector pin definitions, please refer to A.11.

3.4 Connecting Power

Connect the UNO-2182 to a 9 ~ 36 VDC power source. The power source can either be from a power adapter or an in-house power source.

3.5 BIOS Setup and System Assignments

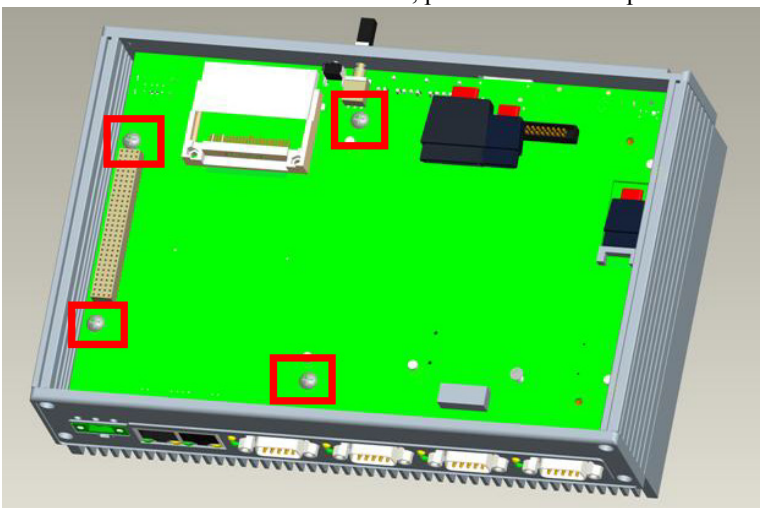
UNO-2182 adopts Advantech's SOM-5782 CPU module. Further information about the SOM-5782 CPU module, can be found in SOM-5782 user's manual. You can find this manual on the UNO-2182's driver and utility CD-ROM.

Please note that you can try to "LOAD BIOS DEFAULTS" from the BIOS Setup manual if the UNO-2182 does not work properly.

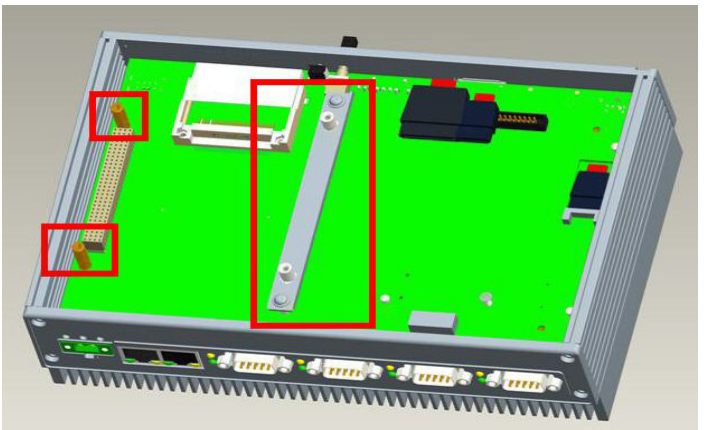
3.6 Installing PCI-104 Modules

If you need install PCI-104 module on UNO-2182, please refer below procedure.

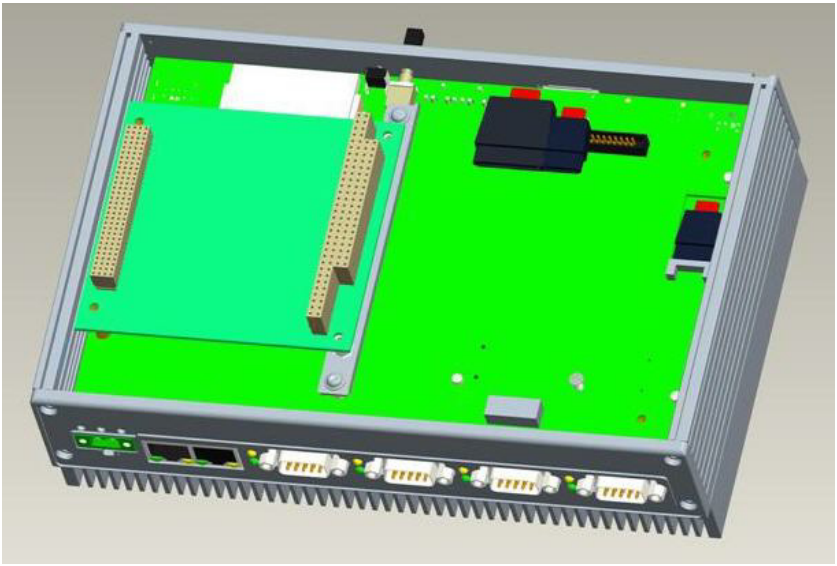
1. Make sure power core is not connected with UNO-2182.
2. Unscrew the four screws from the rear panel.
3. Slide off down cover of UNO-2182.
4. Unscrew four screws from PCB, please refer below picture.



5. Screw up 2 post and PCI-104 bracket in accessory, please refer below picture.



6. Install PCI-104 card and screw up 4 screws which removed from UNO-2182 PCB, please refer below picture.



7. Installation complete.

Note: If only function test, UNO-2182 could integrate PCI-104 card without UNO-PCM22, if you need a whole set chassis, you have to assembly with UNO-PCM22 for whole UNO set.

Appendix A

System Settings and Pin Assignments

Appendix A System Settings & Pin Assignments

A.1 System I/O Address & Interrupt Assignments

Table A.1: UNO-2182 System I/O Ports

Address Range	Device
000-00F	DMA controller
020-03F	Interrupt controller 1, (master)
040-05F	Timer/counter
060-06F	(keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI)
	Mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2 (slave)
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F7	Primary IDE channel
200-207	Game I/O
274-279	ISAPNP Read Data Port
2E8-2EF	Serial port 4
2F8-2FF	Serial port 2
3B0-3DF	Intel 915GM Express Chipset Family
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1
500-51E	Intel 82801 SMbus Controller– 266A
DC000-DFFFF	Battery back-up RAM
E000-E01F	Intel 82801 USB Host Controller - 2658
E100-E11F	Intel 82801 USB Host Controller - 2659
E200-E21F	Intel 82801 USB Host Controller - 265A
E300-E31F	Intel 82801 USB Host Controller - 265B
1D0	Vector address; for COM port share IRQ
1E0	Battery backup resource
11E	Battery backup resource

Table A.2: UNO-2182 Interrupt Assignment

Interrupt No.	Interrupt Source
NMI	Parity error detected
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	COM4 (Independent IRQ)
IRQ 6	Diskette controller (FDC)
IRQ 7	PCMCIA
IRQ 8	Real-time clock
IRQ 10	COM3 (Independent IRQ)/COM3&COM4 Share IRQ
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE

Note: USB and Ethernet IRQ is set automatically by system

A.2 Board Connectors and Jumpers

There are several connectors and jumpers on the UNO-2182 board. The following sections tell you how to configure the UNO-2182 hardware setting. Figure A-1 and Figure A-2 show the locations of UNO-2182's connectors and jumpers.

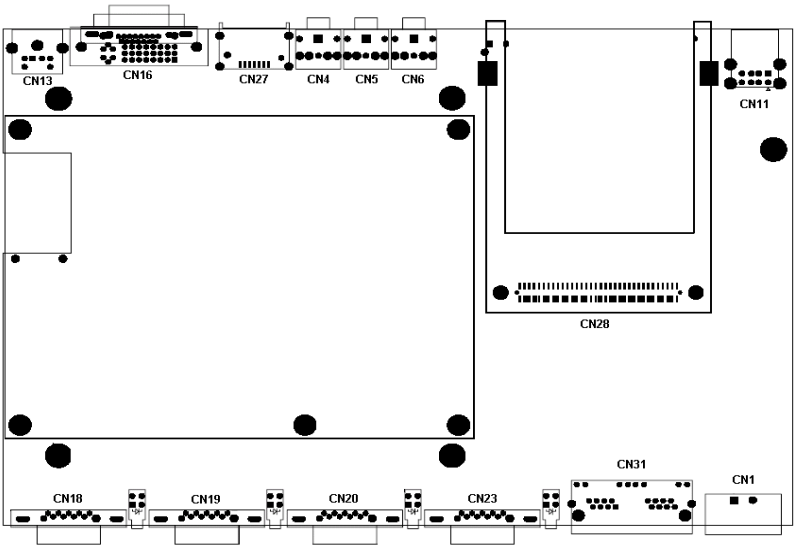


Figure A.1: Connectors & Jumpers (frontside)

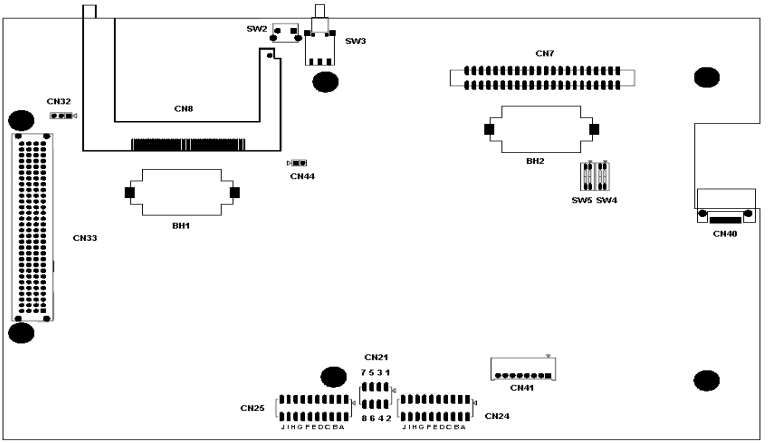


Figure A.2: Connectors & Jumpers (backside)

Table A.3: UNO-2182 Connectors and Jumpers

Label	Function
CN1	Phoenix power connector
CN31	Ethernet port 1 & 2
CN18	COM1 RS-232 serial port
CN19	COM2 RS-232 serial port
CN20	COM3 RS-232/422/485 serial port
CN23	COM4 RS-232/422/485 serial port
SW4	COM3/COM4 RS-422 master/slave selection
SW5	Share IRQ/Independent IRQ selection /Speed selection
CN24	COM3 RS-232/422/485 selection
CN25	COM4 RS-232/422/485 selection
CN21	Terminator resistor (120 ohm) for COM3/COM4 (RS-422/RS-485)
CN13	PS/2 keyboard and mouse connector
CN8	Primary's master CF card connector
CN7	Primary IDE connector
CN11	USB connector
CN40	Internel SATA signal connector
CN41	Internel SATA power connector
CN27	Externel SATA
CN33	PCI-104 slot
CN32	PCI-104 power selection
CN16	DVI-I display connector
CN28	PC card slot
SW3	Power button
SW2	Reset button
BH1	Battery for RTC
BH2	Battery for SRAM
CN44	Enable/disble battery back RAM jumper
CN4	Audio's Line-out
CN5	Audio's Line-in
CN6	Audio's MIC

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

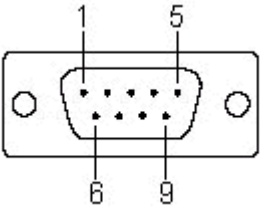


Table A.4: RS-232 standard serial port pin assignments

Pin	RS-232 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~COM4)

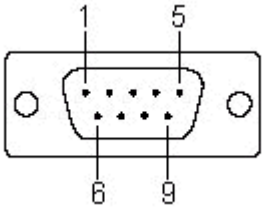


Table A.5: RS-232/422/485 serial port pin assignments

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 assignments

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

A.6 Phoenix Power Connector (PWR)

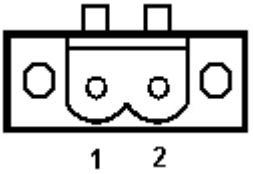


Table A.7: Power connector pin assignments

Pin	Signal Name
1	+9 ~36 VDC
2	GND

A.7 PS/2 Keyboard and Mouse Connector

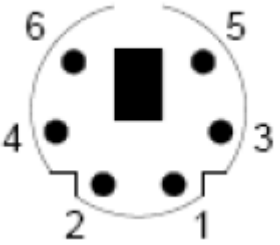


Table A.8: Keyboard and Mouse connector pin assignments

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

A.8 USB Connector (USB1~USB2)

Table A.9: 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 (DVI-I to DVI & VGA Cable)

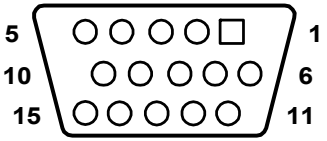


Table A.10: VGA adaptor cable pin assignment

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.10 DVI-I Connector

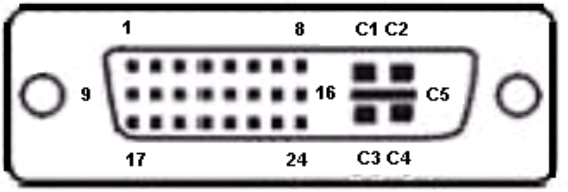


Table A.11: DVI-I connector pin assignment

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.11 External & Internal SATA Connectors

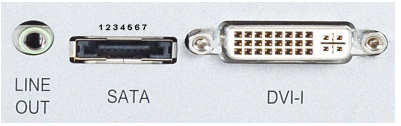
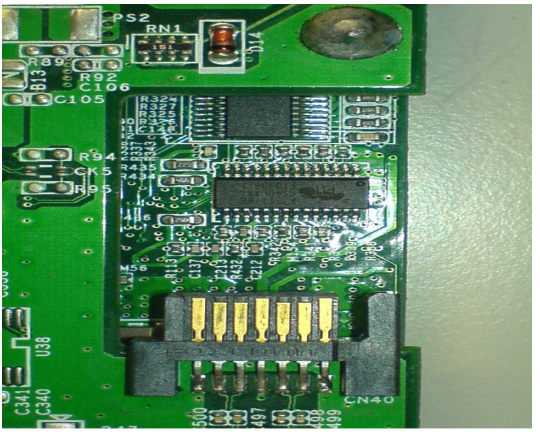
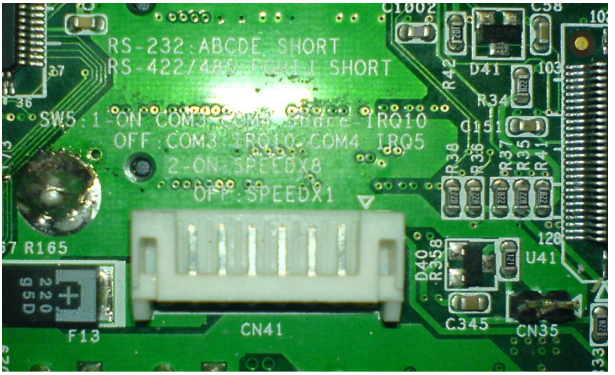


Table A.12: External SATA connector pin assignment	
Pin	**Signal name**
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



7 6 5 4 3 2 1

Table A.13: 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.14: Internal SATA Power Connectors (CN41)	
Pin	**Signal name**
1	GND
2	GND
3	+12V
4	+12V
5	+5V
6	+5V
7	+3V
8	+3V

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