NEXCOM International Co., Ltd.

Multi-Media Solutions
Digital Signage Platform
NDiS 163/163F
User Manual

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PREFACE

Copyright

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Acknowledgements

NDiS 163 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of 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 instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

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

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

✠ Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.

✠ Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.

✠ Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.

✠ Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."

✠ Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

✠ Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.

✠ Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.

✠ Replace with 3rd party products if needed.

✠ If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

✠ Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.

✠ If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a 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.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User 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 stable surface during installation. Dropping it or letting it fall may cause damage.

7. Do not leave this equipment in either an unconditioned environment or in a above 40°C storage temperature as this may damage the equipment.

8. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

10. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

11. All cautions and warnings on the equipment should be noted.

12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

13. Never pour any liquid into an opening. This may cause fire or electrical shock.

14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

15. 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.

16. Do not place heavy objects on the equipment.

17. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

18. 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.

19. The computer is provided with CD drives that comply with the appropriate safety standards including IEC 60825.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEX-COM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:

   – Product name and serial number
   – Detailed information of the peripheral devices
   – Detailed information of the installed software (operating system, version, application software, etc.)
   – A complete description of the problem
   – The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

Conventions Used in this Manual

Warning: Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution: Information to avoid damaging components or losing data.

Note: Provides additional information to complete a task easily.

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9F, Tamachi Hara Bldg.,
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Japan 108-0014
Tel: +81-3-5419-7830
Fax: +81-3-5419-7832
http://www.nexcom-jp.com

PACKAGE CONTENTS

Before continuing, verify that the NDiS 163 package that you received is complete. Your NDiS 163 package should have all the items listed in the following table.

Item	P/N	Name	Specification	Qty
1	5044440080X00	GASKET FOR INTEL CPU KGS:C-4505(35x35x1)+G4000	35x35x 1.1mm	1
2	7400096003X00	(N)POWER ADAPTER FSP:FSP096-AHA	96W 12V/ 8A MINI DIN 4P	1
3	50311F0100X00	ROUND HEAD SCREW W/SPRING+FLAT WASHER LONG x4	P3x6 iso/SW6x0.5 NI	1
4	602DCD0172X00	(N)NDiS163 CD Driver		1

ORDERING INFORMATION

The following provides ordering information for NDiS 163/163F.

- **NDiS 163 (P/N:10W00016300X0)**
  - Intel® Core™ 2 Duo, Celeron® family processors
  - Intel® GM45 / Intel® ICH9-M

- **NDiS 163F (P/N:10W00016301X0)**
  - Intel® Core™ 2 Duo, Celeron® family processors
  - Intel® GM45 / Intel® ICH9-M

CHAPTER 1: PRODUCT INTRODUCTION

Overview

The NDiS 163/163F features Intel® Core™ 2 Duo, Celeron® family processors with 1066/667MHz as T9400, P8600, and Celeron® M 575 based on GM45 integrated graphics solution. Furthermore, NDiS 163 supports dual display via DVI, HDMI, and CRT with dual independent audio output.

Key Features

- Intel® Core™ 2 Duo processor T9400 2.53GHz (system with cooler) / Core™ 2 Duo mobile processor P8600 2.40GHz, Celeron® M 575 processor 2.0 GHz (fan-less system)
- Up to 8GB with unbuffered and non-ECC DDR3 800/1066MHz SDRAM
- Intel® GMA 4500MHD Integrated Graphics Engine
- Dual independent display supported
- One Intel® 82567 Gigabit Ethernet controller
- Two Mini-PCIe

Physical Features

Front panel

Side panel

USB

GPIO Terminal Port (4 in, 4 out)

COM

COM
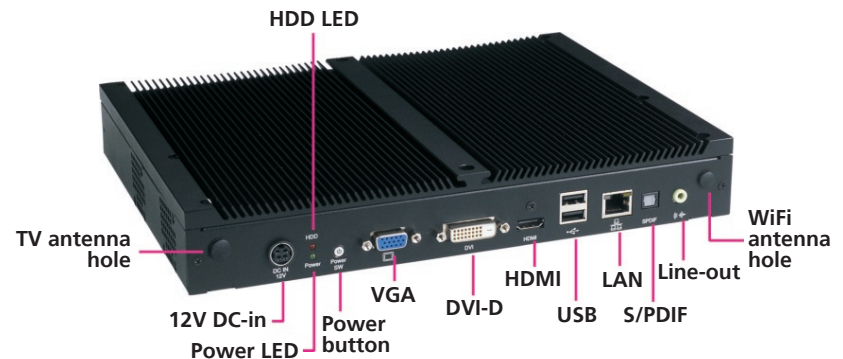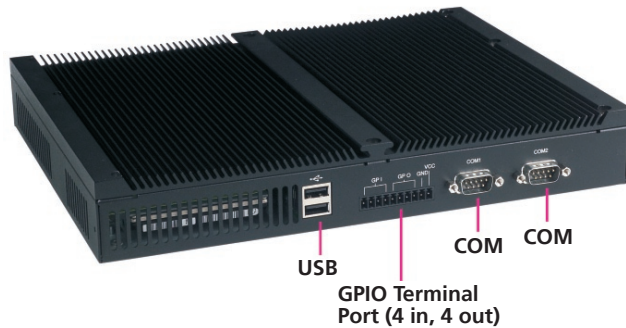
Hardware Specifications

System

Processor

- High-End: Intel® Core™2 Duo T9400, 2.53GHz, 35W (system with cooler)
- Mainstream: Intel® Core™2 Duo P8600, 2.4GHz, 25W (fanless)
- Entry: Intel® Celeron® M 575, 2GHz (fanless)
- FSB
  - 667/800/1066 MHz

Chipset

- Northbridge: Intel® GM45
- Southbridge: Intel® ICH9M

Main Memory

- Two 240-pin 25° angled DDR3 DIMM sockets
- Supports DDR3 800/1066MHz SDRAM with unbuffered and non-ECC memory module
- Supports up to 8GB memory

Graphics

- Graphics chip
  - Intel Gen 5.0 integrated graphics engine
  - Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0), shared system memory up to maximum of 352MB
  - Image Rotate via the supported driver
- Analog CRT
  - DB15 connector
  - Integrated 300MHz DAC
  - Analog monitor supports up to QXGA
  - Supports CRT Hot-Plug
- DVI
  - External DVI-D interface
  - TMDS transmitter via SDVO interface
- HDMI
  Integrated HDMI (iHDMI)
  - Video support for CEA modes 480i/p, 576i/p, 720p, 1080i/p and PC modes
  - Intel HD Audio
  - Integrated Intel HD Audio codec
  - Dolby* AC3 compress, Dolby* Digital, Dolby* DTS (full support)
  PCM audio supported
- Dual Display
  - Dual independent display: CRT+HDMI
  - Dual independent display: DVI+HDMI
  - Dual independent display: DVI+CRT

Network

- Intel 82574 Gigabit Ethernet controller
- PXE LAN boot ROM for Ethernet boot up
- Supports WOL
- One RJ45 connector with LEDs

Storage

- One JST 2.54mm 4-pin power connector for SATA power
- One 7-pin SATA connector
- One SATA+Power 90° connector
- One 2.5" HDD drive bay

Audio

- Audio 1
  - ALC888 HD Codec
  - Speaker-out with amplifying feature (1W, 8ohm)
  - SPDIF
- Audio 2
  - Combined with HDMI

I/O Interfaces

- Serial
  - DB9 COM 1 (RS232) connector at the front panel
  - DB9 COM 2 (RS232) connector at the front panel
- USB
  - USB 2.0 ports 1~2 at the rear panel
  - USB 2.0 ports 3~4 at the front panel
  - USB 2.0 port 5 - 2x5 pin header, 2.54mm supports uDOC
  - USB 2.0 port 6 supports mini-PCIe
  - USB 2.0 port 7 supports mini-PCIe

- GPIO
  - 8 GPIO lines via header (GPI 0~3 and GPO 0~3); TTL Level (0/5V)
  - 1x10-pin terminal port at the front panel
- Others
  - Onboard buzzer
  - CMOS status select: 1x3 pin header, 2.54mm
  - IR interface: 1x5 pin header, 2.54mm
  - Reset: 1x2 pin header, 2.54mm

Power Supply

- Onboard DC to DC
  - Power range design: +12V +/-10% DC input
  - 4-pin Mini-DIN power jack
  - ATX power mode
  - Supports wake up alarm
  - Supports WOL
- External adapter
  - +12V DC output 96W

RTC Battery

- On chip RTC with battery backup / One external Li-ion battery
- RTC tolerance less than 2 sec (24 hours) under 25°C environment

BIOS

- Award system BIOS
- SPI 8Mbit flash ROM

System Management

- Monitoring
  - Derived from Super IO to support system monitor
  - Monitors 4 voltages, 3 temperatures and 2 fan speeds
    4 voltages (+3.3V, +5V, +12V, Vcore)
    3 temperatures (CPU and two external temperature sensors)
    2 3-pin fan connectors
- Watchdog
  - Watchdog timeout is programmable by software from 1 second to 255 seconds and from 1 minute to 255 minutes
  - Tolerance: 15% under room temperature 25°C

Media Format

- Macromedia Director® MX & Shockwave® 8.5, Flash® Power Point® 2003
- Video: MPEG player 1, 2, 4, Windows® Media HD, Div x, QuickTime® 7 HD
- Streaming: MMS, ASF
- Sound: Wave, WMA, MP3
- Images: BMP, GIF, JPEG
- HTML and all inferred functionalities
- DVD-video playback, TV tuner and DirectX based input feeds

Operating Systems

- Microsoft
  - XP, Vista; Embedded XP
- Linux
  - Fedora 7/8/9

Main Board

External I/O

- Front I/O
  - Two USB 2.0 ports
  - Two RS232 COM ports
  - One GPIO port
- Rear I/O
  - One audio-out port
  - One SPDIF port
  - Two USB 2.0 ports
  - One GbE RJ45 port
  - One HDMI port
  - One DVI-D port
  - One VGA port
  - On/Off switch
  - One power LED (green)
  - One HDD LED (red)
  - +12V DC-in jack

Physical Characteristics

- Dimensions (W x D x H)
  - 280mm x 210mm x 40.4mm (without bracket)
- Color
  - Black
- Mounting
  - Wall mount bracket
- Cooling system
  - NDiS 163: without CPU fan
  - NDiS 163F: with CPU fan

Expansion

- Two Mini-PCIe slots
- Supports Wireless LAN module & DVB-T TV-tuner module

Environment

- Operating temperature: 100% CPU loading and component thermal profile: 0 ~ 40 °C
- Storage temperature: -40°C ~ 80°C
- Relative humidity (non-condensing): 95%

Vibration

Non-operating (X-Y-Z): Sine vibration (HDD/CF)
- Sine wave vibration test - Acceleration: 1g rms
  - Frequency: 5 – 500 Hz
  - Test axis: X,Y,Z axis
  - Test time: 10 minutes per axis
  - Total test time: 30 minutes

Operating (X-Y-Z): Random vibration (CF)
- Random vibration test (operating) - Acceleration: 2g rms
  - Frequency: 5 – 500 Hz
  - Test axis: X,Y,Z axis
  - Test time: 1 hour per axis
  - Total test time: 3 hours

Operating (X-Y-Z): Random vibration (HDD)
- Random vibration test (operating) - Acceleration: 0.3 g rms
  - Frequency: 5 – 500 Hz
  - Test axis: X,Y,Z axis
  - Test time: 1 hour per axis
  - Total test time: 3 hours

Shock

- 50g peak acceleration (11 msec. duration) - CF
- 20g peak acceleration (11 msec. duration) - HDD

Certificate

- CE
- FCC Class A

Mechanical Dimensions
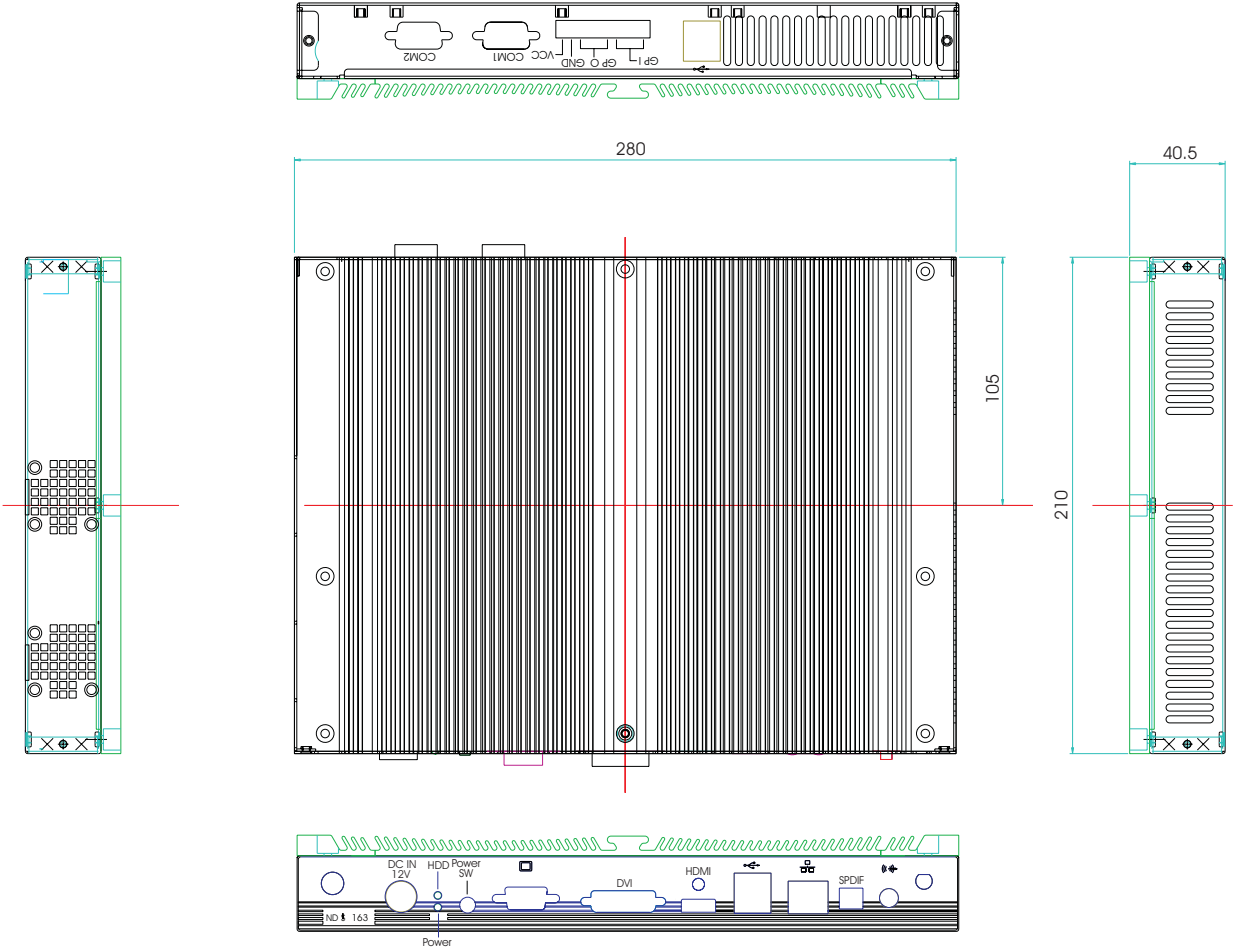
CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers on the motherboard. Note that the following procedures are generic for all NDiS 163 series.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers Screwdrivers
  - A grounding strap
  - An anti-static pad

- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.

- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.

- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.

- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.

- Use correct screws and do not over tighten screws.

Jumper Settings

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **open**.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)
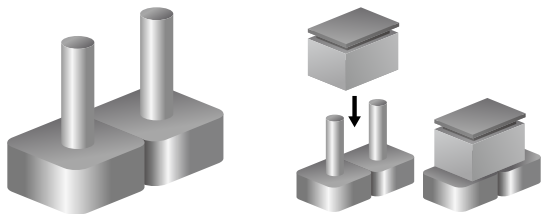
Three-Pin Jumpers: Pins 1 and 2 Are Short
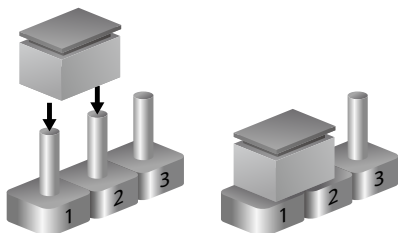
Locations of the Jumpers and Connectors

NDiB 163

The figure on the right is the NDiB 163 motherboard which is the motherboard used in the NDiS 163 system. It shows the locations of the jumpers and connectors.
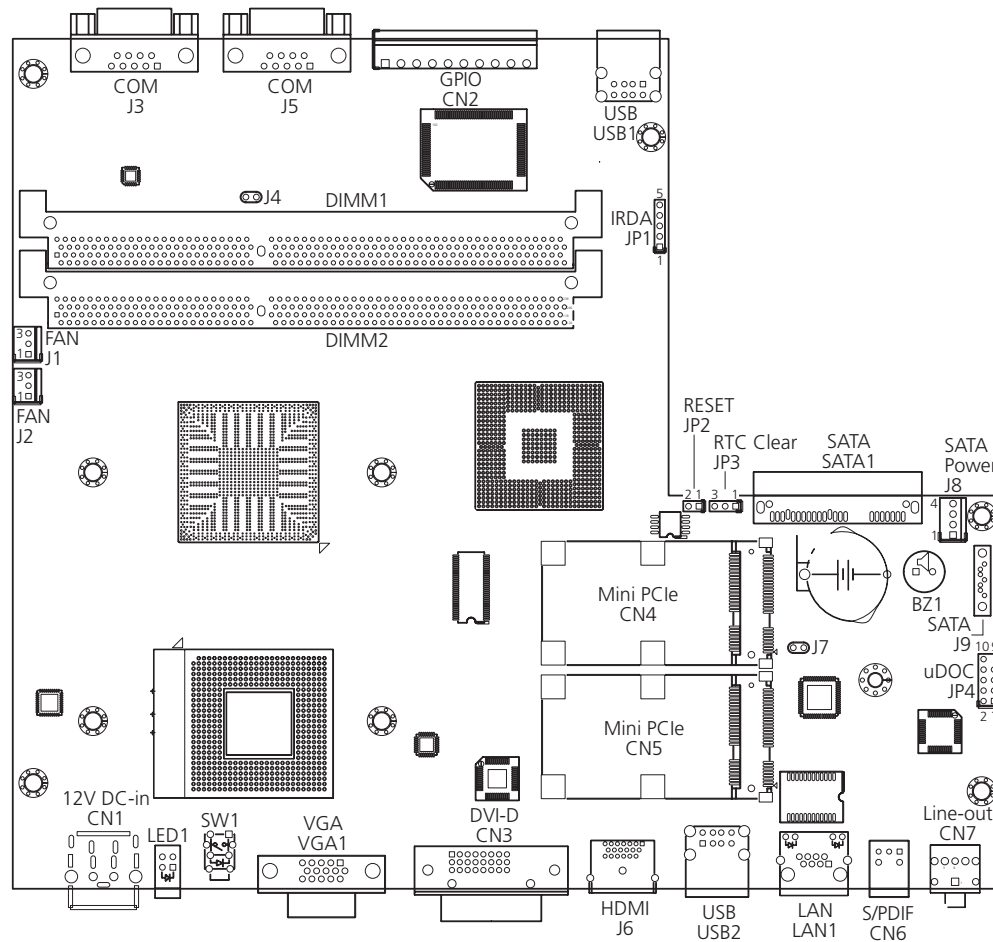
External Connectors Pin Definitions

This section provides descriptions, illustrations and pin definitions of the external connectors.

Power Input Connector

CN1 (4-pin power jack with lock)
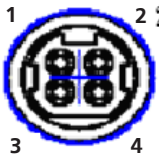
Pin	Definition
1	DC-IN (+12V)
2	DC-IN (+12V)
3	GND
4	GND

ATX Power Switch

SW1 (push button with LED and without lock)

Status	LED Color
Standby	Red
Operation	Blue

HDMI Type A Connector

J6
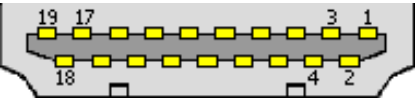
Pin	Definition	Pin	Definition
1	HDMI D2P	2	HDMI_GND
3	HDMI D2N	4	HDMI D1P
5	HDMI_GND	6	HDMI D1N
7	HDMI D0P	8	HDMI_GND
9	HDMI D0N	10	HDMI LKP
11	HDMI_GND	12	HDMI LKN
13	NC	14	NC
15	HDMI_CTL_CLK	16	HDMI_CTL_SDA
17	HDMI_GND	18	+5V
19	HDMI_HDP		

VGA Connector

VGA1
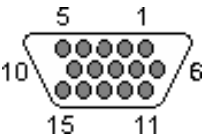
Pin	Definition	Pin	Definition
1	RED_VGA	9	+5V
2	GREEN_VGA	10	GND
3	BLUE_VGA	11	GND
4	GND	12	DATA_V
5	GND	13	HS_VGA
6	GND	14	VS_VGA
7	GND	15	CLK_V
8	GND		

DVI-D Connector
CN3
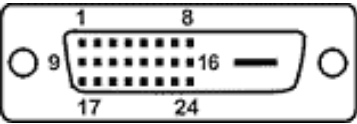
Pin	Definition	Pin	Definition
1	DVI_DATA2_N	13	NC
2	DVI_DATA2_P	14	+5V
3	GND	15	GND
4	NC	16	HPDET
5	NC	17	DVI_DATA0_N
6	DDC_CLK	18	DVI_DATA0_P
7	DDC_DATA	19	GND
8	NC	20	NC
9	DVI_DATA1_N	21	NC
10	DVI_DATA1_P	22	NC
11	GND	23	TLC_P
12	NC	24	TLC_N

S/PDIF Connector
CN6
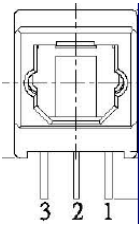
Pin	Definition	Pin	Definition
1	GND	3	S/PDIF OUT
2	+3.3V		+5V

Speaker-out Connector

CN7

Pin	Definition	Pin	Definition
1	GND	4	NC
2	Front out L	5	Front out R
3	NC		

LAN Connector

LAN1

Pin	Definition	Pin	Definition
1	LAN_TXD0P	7	LAN_TXD3P
2	LAN_TXD0N	8	LAN_TXD3N
3	LAN_TXD1P	9	LAN_LINK#
4	LAN_TXD2P	10	3VSB PWR
5	LAN_TXD2N	11	LAN_ACT#
6	LAN_TXD1N	12	3VSB PWR

13

USB Port
USB1 / USB2 (Standard USB connector, right-angle type)

USB1

Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USB2_N	6	USB1_N
3	USB2_P	7	USB1_P
4	GND	8	GND

USB2

Pin	Definition	Pin	Definition
1	+5V	5	+5V
2	USB3_N	6	USB6_N
3	USB3_P	7	USB6_P
4	GND	8	GND

GPIO Connector
CN2 (Phoenix type 1x10 connector)

Pin	Definition	Pin	Definition
1	+5V	2	GND
3	GPO_0	4	GPO_1
5	GPO_2	6	GPO_3
7	GPI_0	8	GPI_1
9	GPI_2	10	GPI_3

RS232 Port
COM1 (J5) / COM2 (J3)
Standard DB9 Connector

```
1          5
  ooooo
   oooo
6          9
```
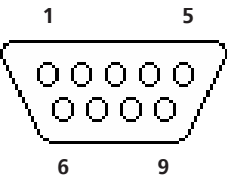
Pin	Definition (COM1)	Pin	Definition (COM2)
1	DCD1	1	DCD2
2	RX1	2	RX2
3	TX1	3	TX2
4	DTR#1	4	DTR#2
5	GND	5	GND
6	DSR#1	6	DSR#2
7	RTS#1	7	RTS#2
8	CTS#1	8	CTS#2
9	RI#1	9	RI#2
10	NC	10	NC

PWR LED
LED1

HDD

PWR

Status	LED Color
HDD	RED / Upper
PWR	Green / Lower

Internal Connectors Pin Definitions

This section provides descriptions, illustrations and pin definitions of the internal connectors.

SATAII Connector

J9 (Standard Serial ATAII 1.27mm connector)

Pin	Definition	Pin	Definition
1	GND	2	TXP1
3	TXN1	4	GND
5	RXN1	6	RXP1
7	GND		

SATA Power Connector

J8 (JST 2.0mm vertical type with lock)
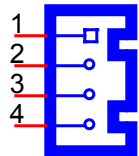
Pin	Definition	Pin	Definition
1	+12V	2	GND
3	GND	4	+5V

SATAII Connector

SATA1 (Right-angle Serial ATAII connector with power)
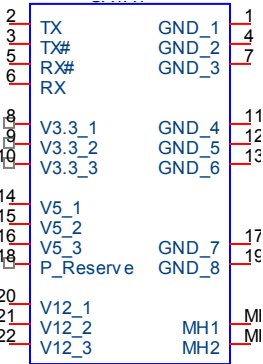
Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP0
3	SATA_TXN0	4	GND
5	SATA_RXN0	6	SATA_RXP0
7	GND	8	NC
9	NC	10	NC
11	GND	12	GND
13	GND	14	+5V
15	+5V	16	+5V
17	GND	18	NC
19	GND	20	NC
21	NC	22	NC

uDOC Connector

JP4 (Right-angle 2.54mm pitch)
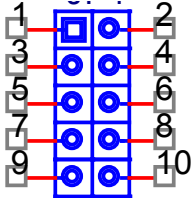
Pin	Definition	Pin	Definition
1	+5V	2	+5V
3	USB4_N	4	NC
5	USB4_P	6	NC
7	GND	8	GND
9	NC	10	NC

Mini PCIe Connector
CN4
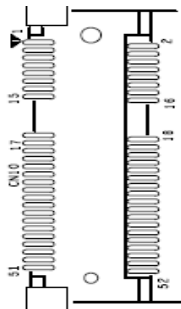
Pin	Definition	Pin	Definition
1	WAKE#	2	+V3.3_MINI
3	NC	4	GND
5	NC	6	+1.5S_MINI
7	MINICARD1_CLKREQ#	8	NC
9	GND	10	NC
11	GPP_CLK0_N	12	NC
13	GPP_CLK0_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD1_DIS#
21	GND	22	PCIE_RST#

Pin	Definition	Pin	Definition
23	PCIE_RX0N	24	+V3.3A_MINI
25	PCIE_RX0P	26	GND
27	GND	28	+V1.5S_MINI
29	GND	30	SMB_CLK
31	PCIE_TX0N	32	SMB_DAT
33	PCIE_TX0P	34	GND
35	GND	36	USB_0N
37	GND	38	USB_0P
39	+V3.3A_MINI	40	GND
41	+V3.3A_MINI	42	NC
43	GND	44	LED_WLAN#
45	NC	46	NC
47	NC	48	+V1.5S_MINI
49	NC	50	GND
51	NC	52	+V3.3A_MINI

Mini PCIe Connector
CN5
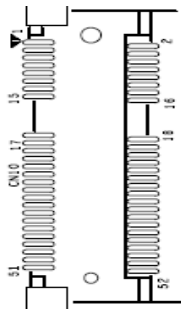
Pin	Definition	Pin	Definition
1	WAKE#	2	+V3.3_MINI
3	NC	4	GND
5	NC	6	+1.5S_MINI
7	MINICARD2_CLKREQ#	8	NC
9	GND	10	NC
11	GPP_CLK1_N	12	NC
13	GPP_CLK1_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD2_DIS#
21	GND	22	PCIE_RST#

Pin	Definition	Pin	Definition
23	PCIE_RX1N	24	+V3.3A_MINI
25	PCIE_RX1P	26	GND
27	GND	28	+V1.5S_MINI
29	GND	30	SMB_CLK
31	PCIE_TX1N	32	SMB_DAT
33	PCIE_TX1P	34	GND
35	GND	36	USB_5N
37	GND	38	USB_5P
39	+V3.3A_MINI	40	GND
41	+V3.3A_MINI	42	NC
43	GND	44	LED_WLAN#
45	NC	46	NC
47	NC	48	+V1.5S_MINI
49	NC	50	GND
51	NC	52	+V3.3A_MINI

H/W Reset

JP2 (Pin header 1x2 2.54 Pitch)
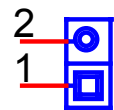
Pin	Definition
1	RESET
2	GND

RTC Clear

JP3 (1x3 Pin header 2.54 Pitch)
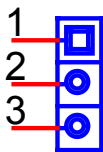
Pin	Definition
1	NC
2	RTC_RESET#
3	GND

1-2 Short: Normal (default*)
2-3 Short: Clear CMOS

IRDA Connector

JP1 (1x5 2.54mm Pitch Pin Header)
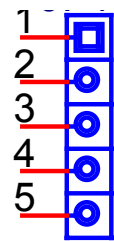
Pin	Definition
1	+5V
2	CIRRX
3	IRRX
4	GND
5	IRTX

CPU Fan Connector

J1 / J2 (Wafer-2.54mm Male 180)
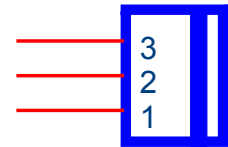
Pin	Definition
1	GND
2	12V
3	SENSE

CHAPTER 3: SYSTEM SETUP

Removing the Chassis Cover

> **CAUTION!** Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power source to prevent electric shock or system damage.

1. The screws on the cover are used to secure the cover to the chassis. Remove these screws and put them in a safe place for later use.
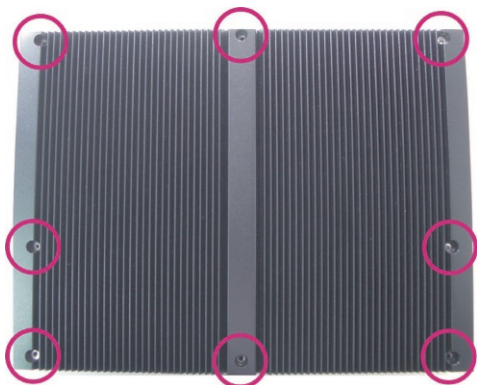
Installing a DIMM

1. Locate for the DIMM socket on the board.

DIMM sockets

2. Push the ejector tabs which are at the ends of the socket outward. This indicates that the socket is unlocked.

Ejector tab
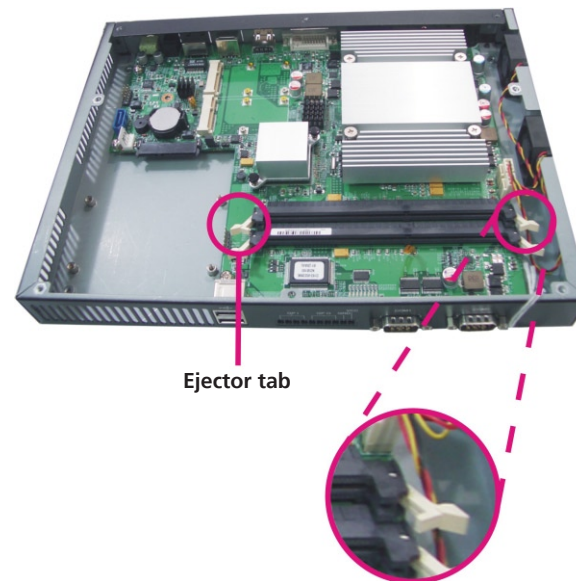
3. Note how the module is keyed to the socket. Grasping the module by its edges, align the module with the socket so that the "notch" on the module is aligned with the "key" on the socket. The key ensures the module can be plugged into the socket in only one direction.

Key

Notch
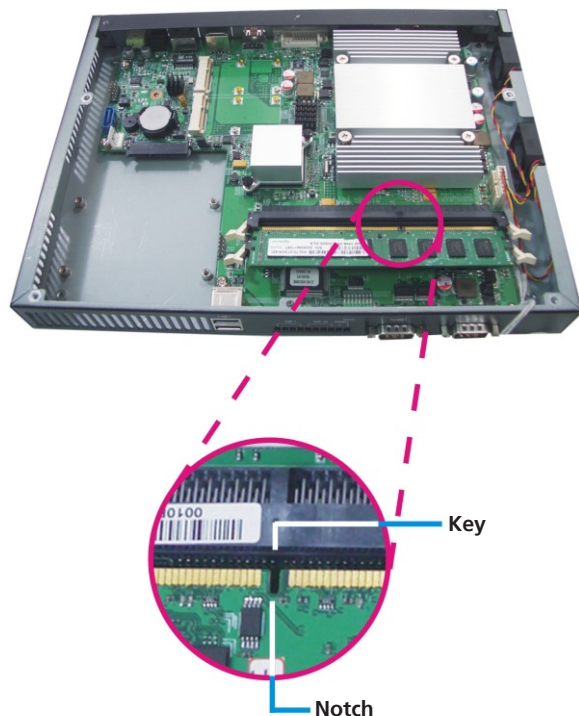
4. Insert the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.

    The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.
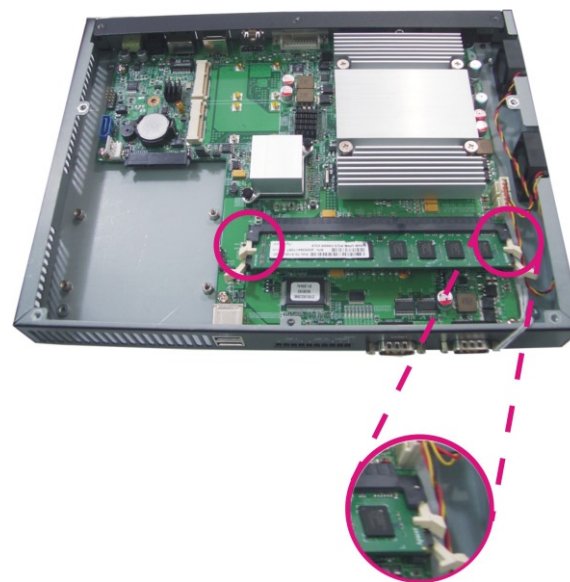
Installing the CPU

1. Loosen the mounting screws that secure the heat sink to the chassis.

Mounting screw

> **CAUTION!**
> - Make sure all power cables are unplugged before you install the CPU.
> - The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure.
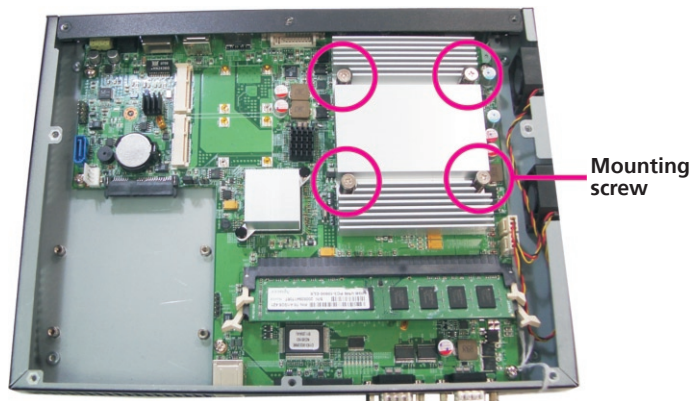
2. Now remove the heat sink to access the CPU socket.

Bottom Side of the Heat Sink

3. The CPU socket is readily accessible after you have removed the heat sink.

CPU socket

4. Use a screwdriver to turn the screw to its unlocked position.

Locked

Unocked
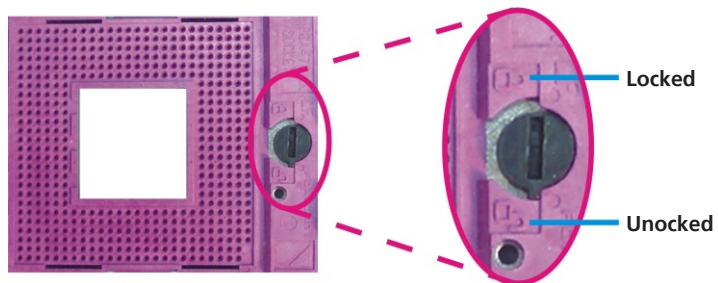
5. Position the CPU above the socket. The gold triangular mark on the CPU must align with pin 1 of the CPU socket.

Gold triangular mark

Pin 1
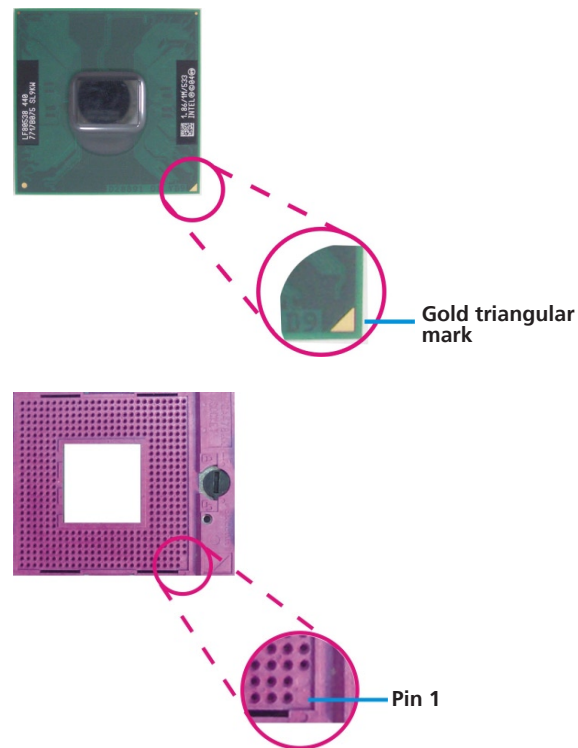
Handle the CPU by its edges and avoid touching the pins.

6. Insert the CPU into the socket until it is seated in place. The CPU will fit in only one orientation and can easily be inserted without exerting any force. Use a screwdriver to turn the screw to its locked position.

CAUTION! Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.

7. Attach the square cushion pad and the thermal pad onto the CPU.

Square cushion pad **Thermal pad**

8. Align the mounting screws of the heat sink with the mounting holes
   on the board then tighten the screws to secure the heat sink in place.

**Mounting
hole**
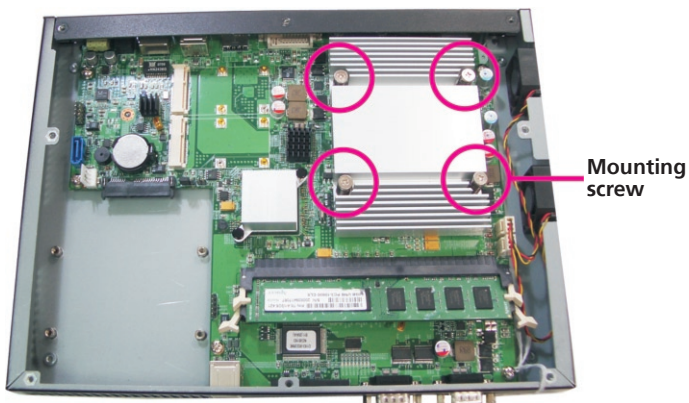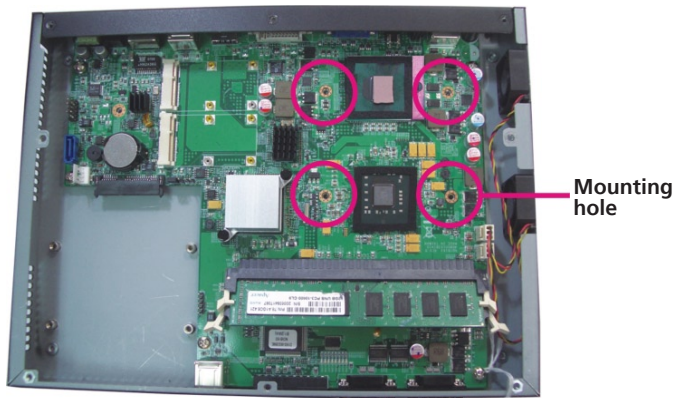
**Mounting
screw**

Installing the uDOC Module

1. Locate for the uDOC connector on the board.
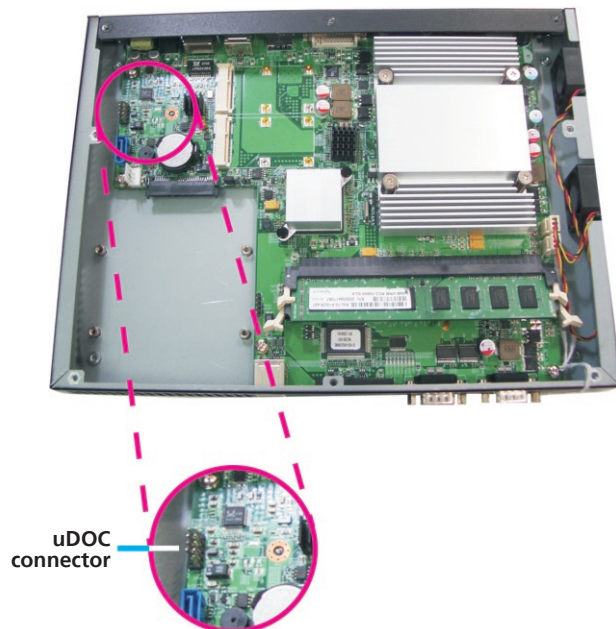
uDOC connector

2. Install the provided mounting stud as shown in the illustration below.
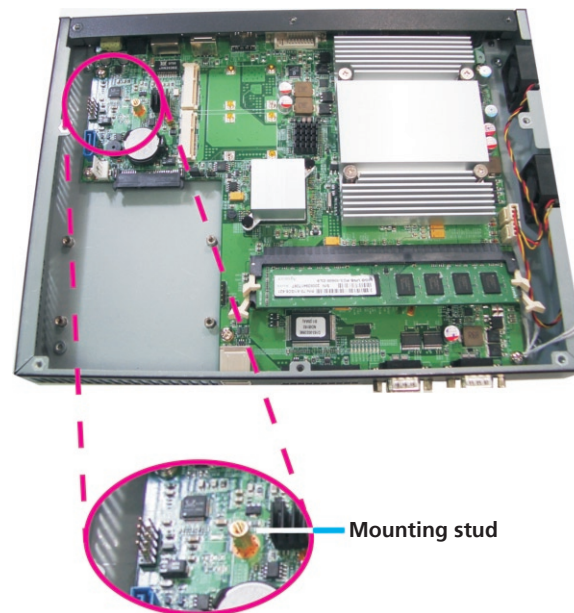
Mounting stud

3. Align the connector located on the solder side of the uDOC module to the uDOC connector that is on the board then press it down firmly.
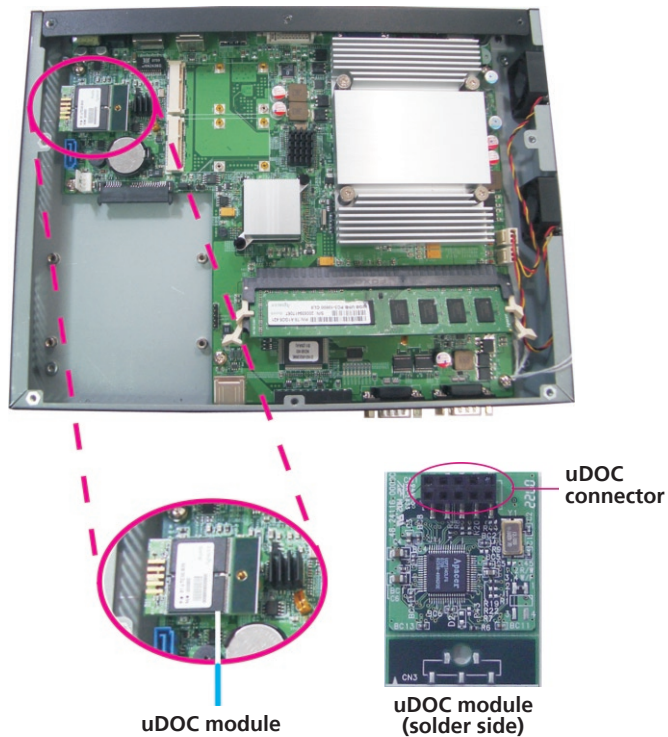
4. Secure the uDOC module with the provided mounting screw.

uDOC connector

uDOC module

uDOC module (solder side)

Mounting screw
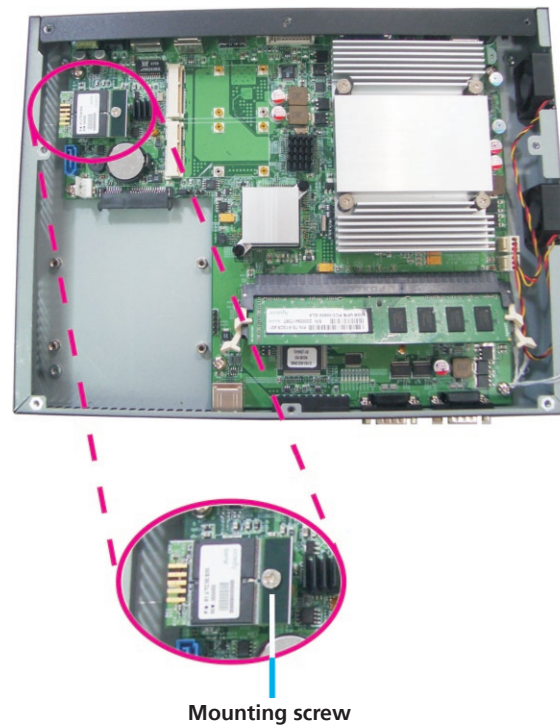
Installing a Wireless LAN Module

1. Locate for the Mini PCI Express slot on the board.

Mini PCI Express slot
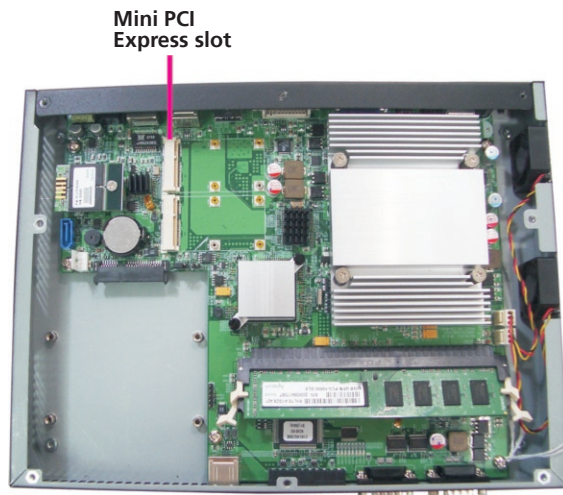
2. Insert the wireless LAN module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot.

Mini PCI Express slot

Wireless LAN module

3. Push the module down then secure it with mounting screws.
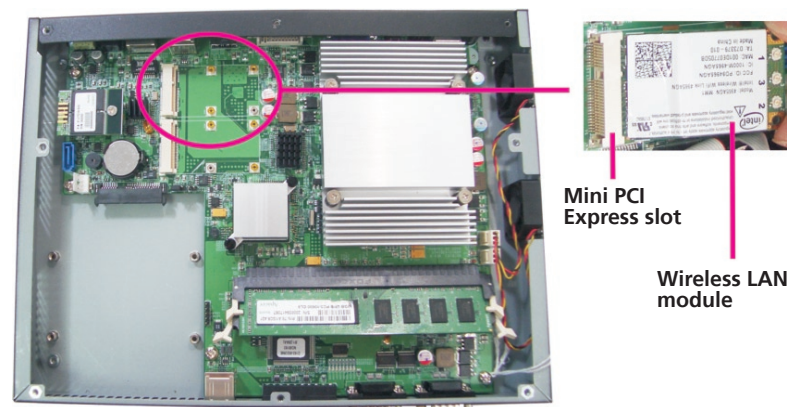
Mounting screw

Mounting screw
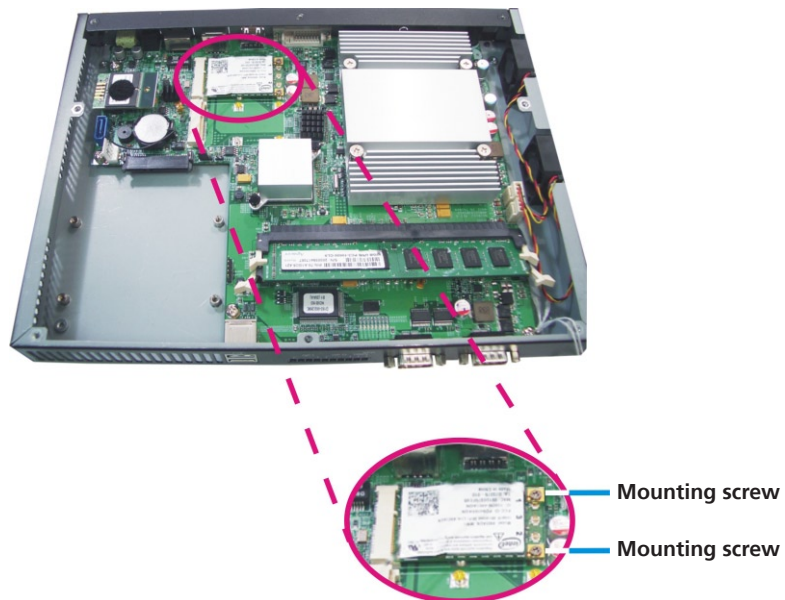
4. Attach one end of the RF cable onto the WiFi module.

RF cable attached to the module

RF cable

RF cable attached to the module

WiFi antenna jack

Mount to the antenna mounting hole
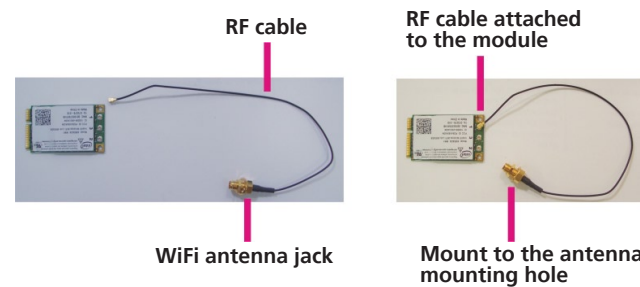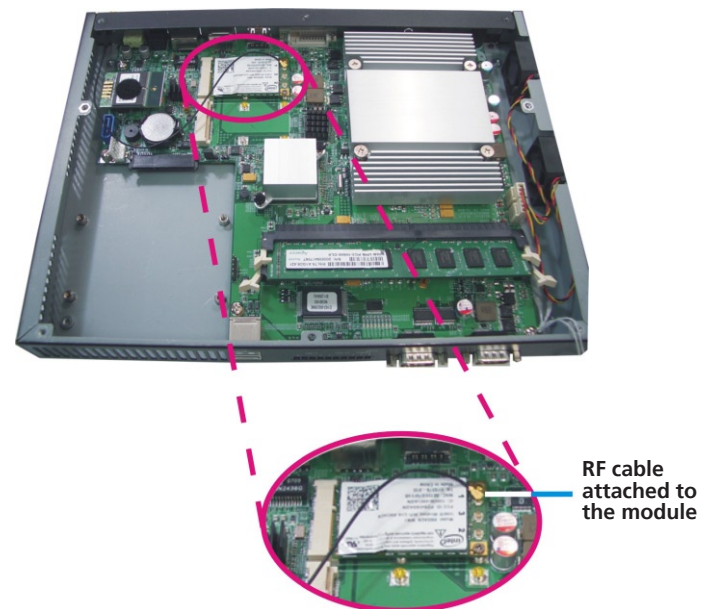
5. Insert the 2 rings (ring 1 then ring 2) into the WiFi antenna jack.

Ring 2   **Ring 1**
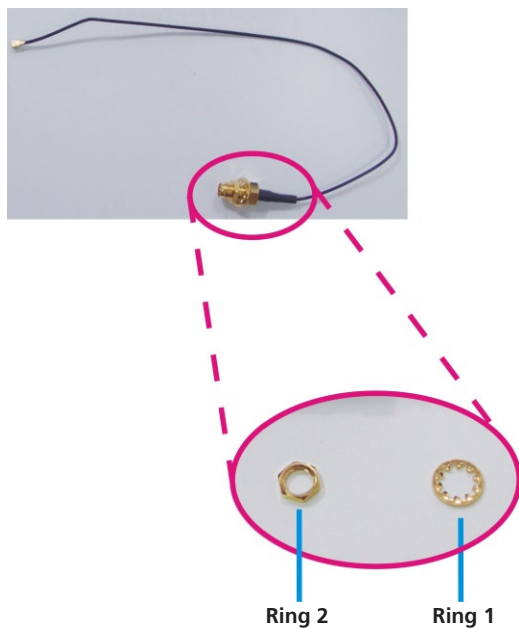
6. Now mount the WiFi antenna jack to the WiFi antenna hole located at the front panel of the chassis then tighten the rings.

RF cable

Internal View of the Front Panel
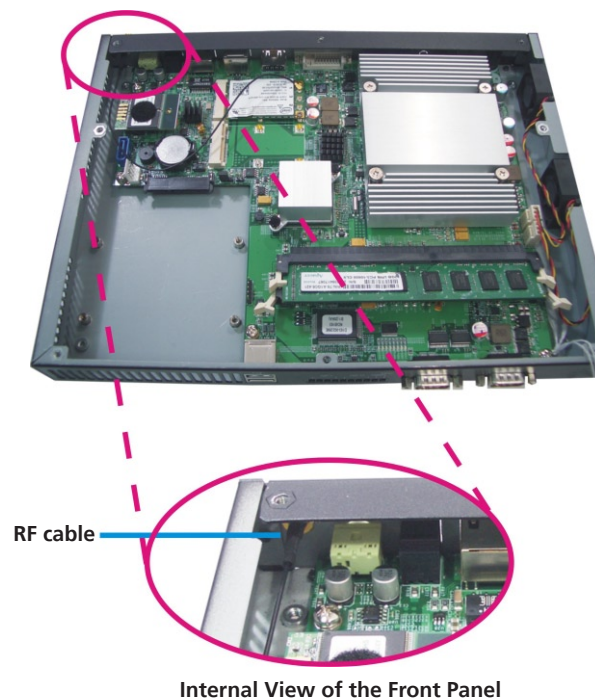
7. The photo below shows the WiFi antenna jack attached at the front panel of the chassis.

8. Now connect an external antenna to the WiFi antenna jack.
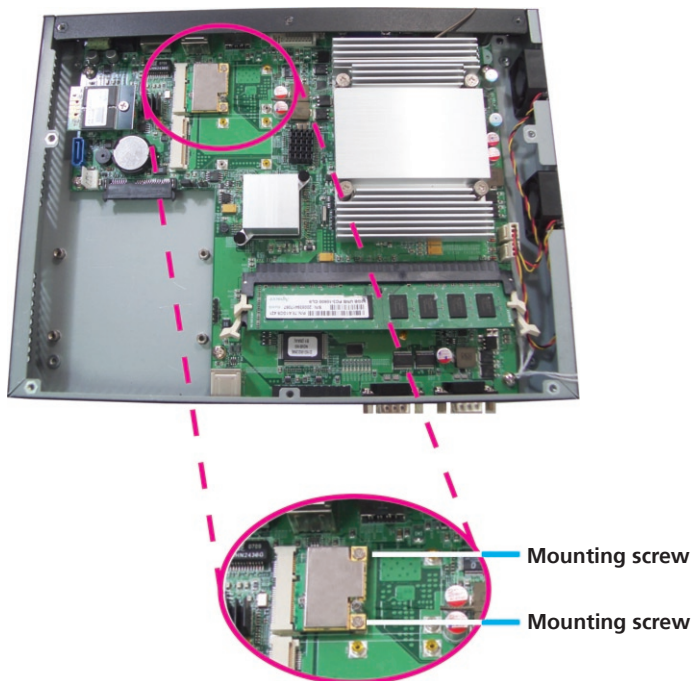

Antenna

Installing a TV Tuner Module

1. Locate for the Mini PCI Express slot on the board.

Mini PCI Express slot
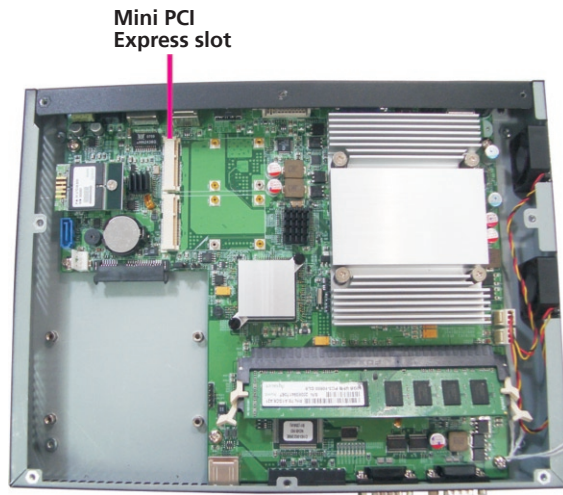
2. Insert the TV Tuner module into the Mini PCI Express slot at a 45 degrees angle until the gold-plated connector on the edge of the module completely disappears inside the slot.
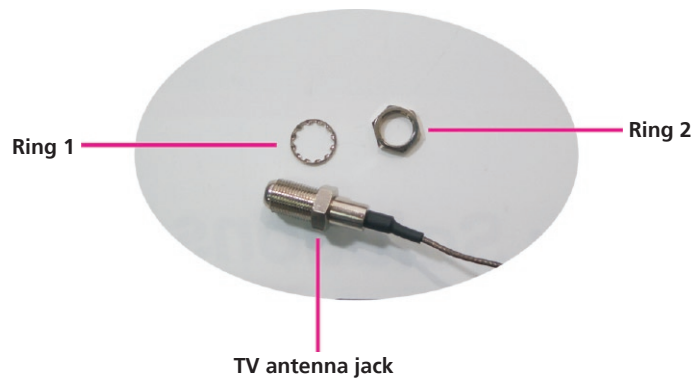

Mini PCI Express slot   **TV Tuner module**

3. Push the module down then secure it with mounting screws.
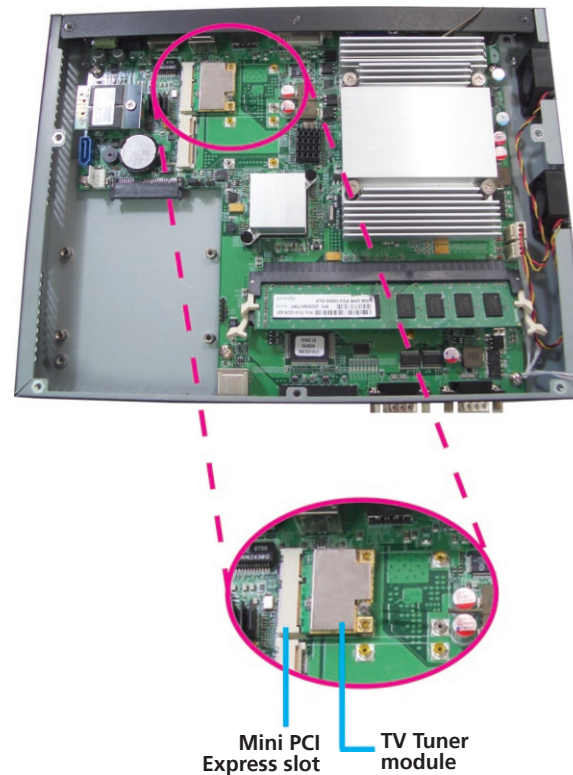
Mounting screw

Mounting screw

4. Attach one end of the RF cable onto the module.

RF cable attached to the module
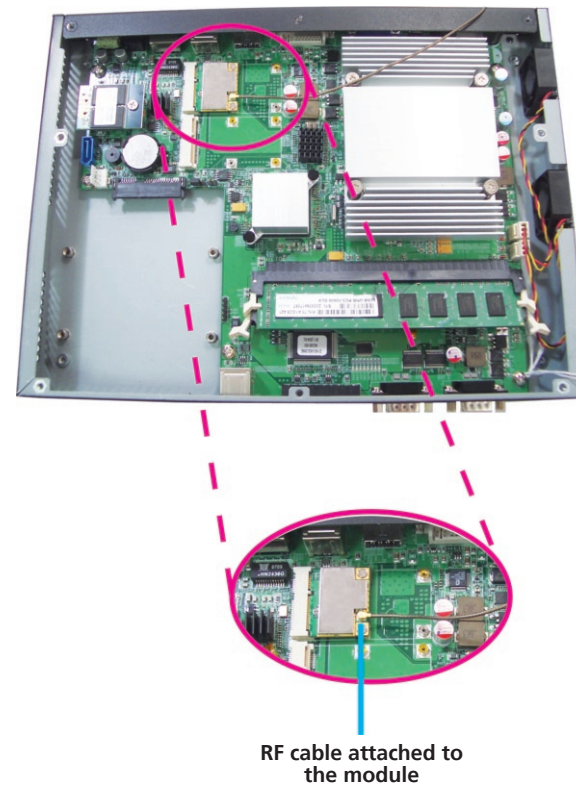
5. Insert the 2 rings (ring 1 then ring 2) into the TV antenna jack.

Ring 1

Ring 2

TV antenna jack

6. Now mount the TV antenna jack to the TV antenna hole located at the front panel of the chassis then tighten the rings.
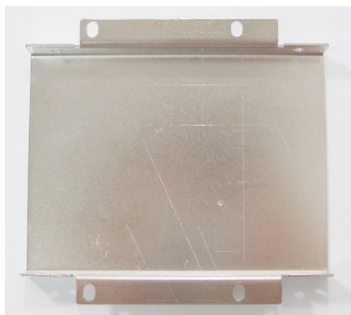
TV antenna jack

7. Connect an external TV antenna to the TV antenna jack.

TV antenna
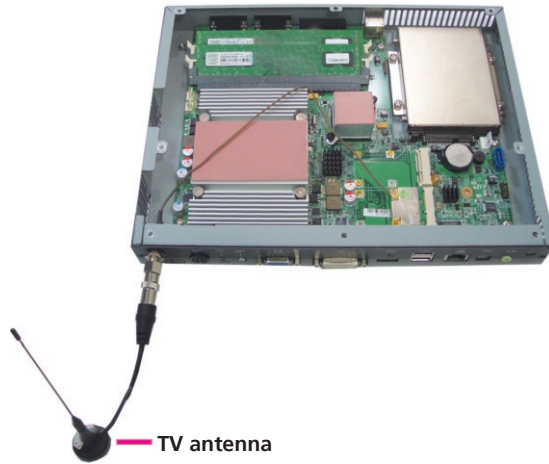
Installing a SATA Hard Drive

1. The drive bay included in the package is used to hold a SATA hard drive.
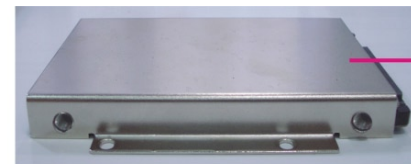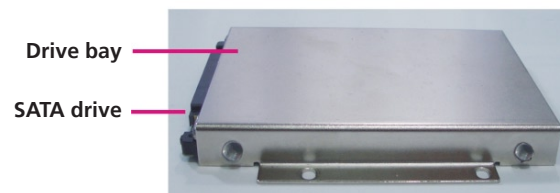

Bottom View

Top View

2. Place the SATA hard drive onto the drive bay. Align the mounting holes that are on the sides of the SATA drive with the mounting holes on the drive bay.
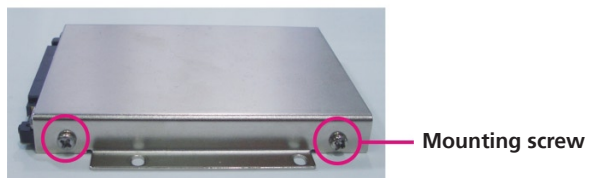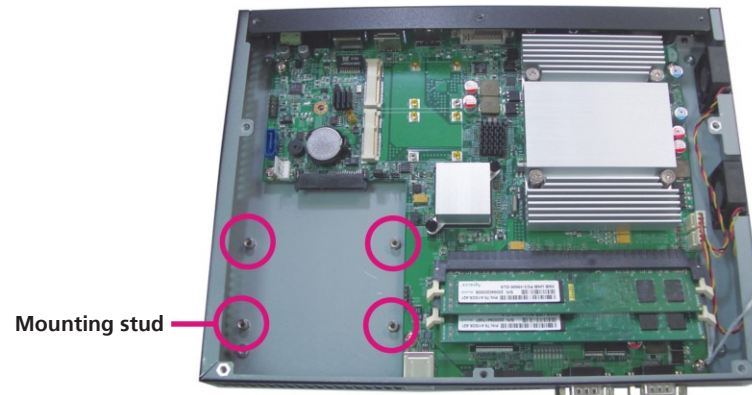

Drive bay
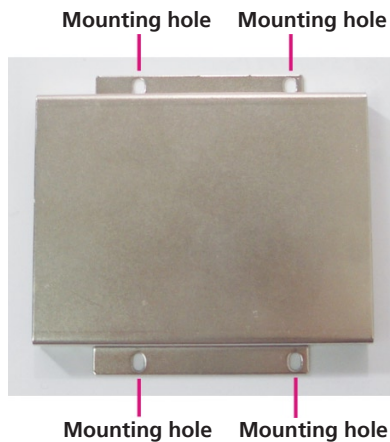
SATA drive

Drive bay

SATA drive

3. Use the provided screws to secure the SATA drive in place.

Mounting screw

Mounting screw

4. Locate for the mounting studs on the board.

Mounting stud

5. The mounting holes on the drive bay are used to secure the bay to the chassis.

Mounting hole   Mounting hole

Mounting hole   Mounting hole

6. Locate for the SATA connector and the SATA power connector on the SATA drive.

SATA power connector

SATA connector
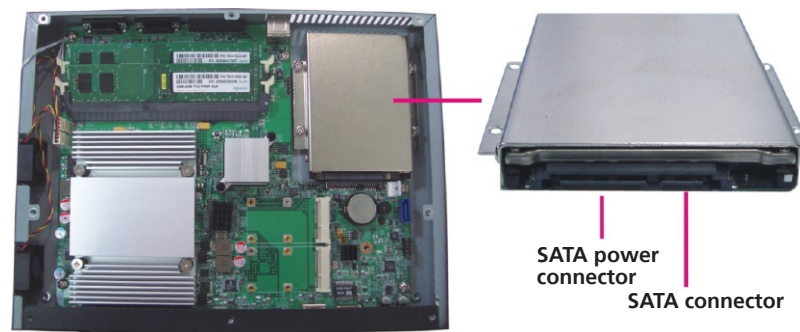
7. Align the mounting holes of the drive bay with the mounting studs on the board then use the provided mounting screws to secure the drive bay in place.

Mounting screw
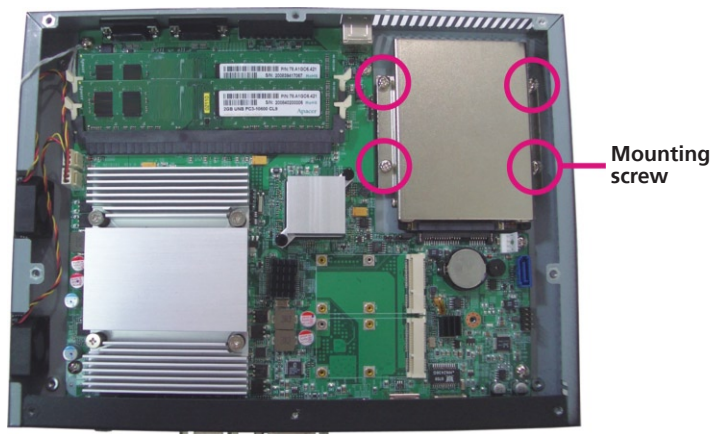
APPENDIX A: WATCHDOG TIMER

NDiS 163 features a watchdog timer that resets the CPU or generates an interrupt if the processor stops operating for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Watchdog Timer Control Register
(Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt.
6	WDT is reset upon a KBC (mouse) interrupt.
5	WDT is reset upon a KBC (keyboard) interrupt.
4	WDT is reset upon a read or a write to the Game Port base address.
3-2	Reserved
1	Force Time-out. This bit is self-clearing.
	WDT Status
0	1: WDT value reaches 0.
	0: WDT value is not 0.

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Watchdog Timer Configuration Register
(Index=72h, Default=00h)

Bit	Description
	WDT Time-out value select.
7	1: Second
	0:Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level for WDT.

APPENDIX B: GPI/O PROGRAMMING GUIDE

This appendix provides definitions for the GPI/O pins in NDiS 163. GPI/O (General Purpose Input/Output) pins are provided for custom system design. The pin programmed as input mode (GPI) or output mode (GPO) depends on the configuration.

Command Format Define

Command	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
GPIO mapping	GPI 3	GPI 2	GPI 1	GPI 0	GPO 3	GPO 2	GPO 1	GPO 0

Connector Pin Define

1	2	3	4	5	6	7	8	9	10
		GPO 0	GPO 1	GPO 2	GPO 3	GPI 0	GPI 1	GPI 2	GPI 3
5V	GND	O 0	O 1	O 2	O 3	I 0	I 1	I 2	I 3
		OUTPUT				INPUT			

Test Method

The steps below will guide you in verifying the GPIO port.

Step 1
Short pins 3-7, 4-8, 5-9 and 6-10 of the CN2 connector.

Step 2
Boot the system in DOS operating environment.
Run the debug utility in C:\ then enter
-o 801 F3
-i 801
-33