NEXCOM International Co., Ltd.

IoT Automation Solutions Business Group
PC-based Factory Automation System
NIFE 105 Series
User Manual

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PREFACE

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Acknowledgements

NIFE 105 and NIFE 105W are trademarks 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 2011/65/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 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 2013 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.

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 needle-nose 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. The openings on the enclosure are for air convection to 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. 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.

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 place heavy objects on the equipment.

16. 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.

17. 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.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM'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.

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.

Safety Warning: This equipment is intended for installation in a Restricted Access Location only.

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Package Contents

Before continuing, verify that the NIFE 105 series package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Description	Qty
1	19J70010500X0	NIFE 105 ASSY	1
2	4NCPF00310X00	Terminal Blocks 3P Phoenix Contact:1803581	1
3	4NCPM00302X00	Terminal Blocks 3P Phoenix Contact:1777992	1
4	50311F0295X00	Flat Head Screw Long Fei:F2x4 Nylok NIGP	4
5	50311F0330X00	Round Head Screw Long Fei:P2x3 ISO+Nylon	4
6	5060900226X00	Mini PCIe Bracket CHYUAN-JYH	2
7	6012200052X00	PE Zipper Bag #8	1
8	6012200053X00	PE Zipper Bag #3	2
9	60177A0580X00	NIFE 105 Quick Reference Guide VER:A SIZE:A4	1
10	602DCD1428X00	NIFE 105 DVD Driver VER:1.0	1

Ordering Information

The following information below provides ordering information for the NIFE 105 series.

NIFE 105 System (P/N: 10J70010500X0)
Intel Atom® x5-E3930 Dual Core Factory Automation Fanless System with 4G memory and 16G eMMC onboard

NIFE 105W System (P/N: 10J70010501X0)
Intel Atom® x5-E3930 Dual Core Factory Automation Fanless System with 4G memory, 16G eMMC onboard and one FBI opening

- **24V, 60W AC/DC power adapter w/o power cord (P/N: 7400060033X00)**
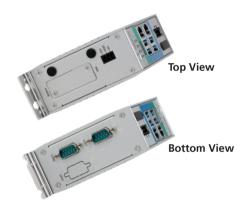
CHAPTER 1: PRODUCT INTRODUCTION

Overview

NIFE 105

Top View

Bottom View

NIFE 105W

Top View

Bottom View

Key Features

- Onboard Intel Atom® x5-E3930 processor dual core 1.8GHz

- 1 x HDMI display

- 2 x Intel® I210-IT GbE LAN ports; support WoL, teaming and PXE

- 4 x USB 3.0

- 2 x mini-PCIe sockets for optional Wi-Fi/3.5G/LTE modules

- 2 x RS232/422/485 with auto flow control

- 1 x External SD card slot and 1 x SIM card socket

- Support -5~55 degree C operating temperature

- Support typical +24VDC ±20%

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Hardware Specifications

CPU Support

▪ On-board Intel Atom® x5-E3930 processor dual core 1.8GHz

Main Memory

▪ On-board DDR3L 4GB

Display Output

▪ 1 x HDMI display

I/O Interface - Front

▪ 2 x Intel® I210-IT GbE LAN ports; support WoL, teaming and PXE
▪ 4 x USB 3.0 (900mA)
▪ 1 x External SD card slot (data storage only)
▪ 1 x FBI expansion slot (NIFE 105W only)
▪ 1 x Power/1 x HDD access LEDs
▪ 1 x Battery low/1 x GPO0 programming LED
▪ 2 x Tx/Rx LEDs
▪ 1 x ATX power on/off switch

I/O Interface - Top

▪ 1 x Remote switch
▪ 1 x SIM card slot
▪ 1 x RTC battery socket

I/O Interface - Bottom

▪ 2 x DB9, support RS232/422/485 with Auto Flow Control
▪ 1 x Optional DB9, support 4 x GPI and 4 x GPO

Internal I/O Interface

▪ 1 x USB 2.0, 500mA max.
▪ 1 x COM3/COM4 pin header, RS232 with Tx/Rx/RTS/CTS signal only
▪ 4 x GPI and 4 x GPO (General purpose I/O), TTL 5V

Storage Device

▪ On-board 16GB eMMC
▪ Optional mSATA module

Expansion

▪ 1 x Full size mini-PCIe socket (USB+PCIe signal) for optional Wi-Fi/LTE/ mSATA modules
▪ 1 x Full size mini-PCIe socket (USB+PCIe signal) for optional modules

Power Requirements

▪ Power input: typical +24VDC ±20%
▪ 1 x Optional 24V, 60W power adapter

Dimensions

▪ NIFE 105: 46.2mm (W) x 100mm (D) x 120mm (H)
▪ NIFE 105W: 78.2mm (W) x 100mm (D) x 120mm (H)

Construction

▪ Aluminum and metal chassis with front access design

Environment

- Operating temperature:
  Ambient: -20°C to 70°C
  (according to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -20°C to 80°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
  – mSATA/eMMC: 50G, half sine, 11ms, IEC60068-27
- Vibration protection w/ mSATA or eMMC condition:
  – Random: 2Grms @ 5~500 Hz, IEC60068-2-64
  – Sinusoidal: 2Grms @ 5~500 Hz, IEC60068-2-6
- Altitude: Up to 2000 m

Certifications

- CE approval
  – EN61000-6-2
  – EN61000-6-4
- FCC Class A
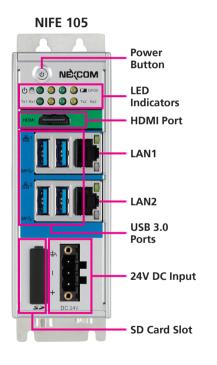
Support OS

- Windows 10 Enterprise (64-bit)

Knowing Your NIFE 105/NIFE 105W

Front View

NIFE 105

NIFE 105W

Power Button

LED Indicators

HDMI Port

LAN1

LAN2

USB 3.0 Ports

24V DC Input

SD Card Slot

FBI Module Expansion

Power Button

Press to power-on or power-off the system.

LED Indicators

Indicates the power, HDD access, battery, TX/RX, and GPO activity of the system.

HDMI Port

Used to connect a high-definition display.

LAN1 and LAN2 Ports

Two LAN ports used to connect the system to a local area network.

USB 3.0 Ports

USB 3.0 ports to connect the system with USB devices.

24V DC Input

Used to plug a DC power cord.

SD Card Slot

Used to expand data storage with SD card.
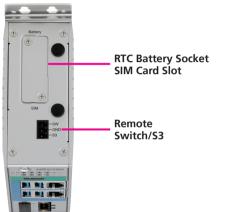
FBI Module Expansion

Expansion slot for add-on fieldbus modules.

Top View

NIFE 105

RTC Battery Socket
SIM Card Slot

Remote
Switch/S3

NIFE 105W

Bottom View

COM
Ports

COM Port
(Optional)

COM Ports

DB9 ports used to connect RS232/422/485 compatible devices. The optional DB9 port supports 4 x GPI and 4 x GPO.
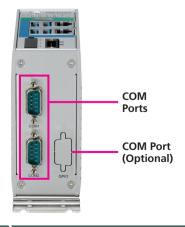
RTC Battery Socket and SIM Card Slot

Used to insert a RTC battery and SIM card.

Remote Switch/S3

Used to connect a remote to power on/off the system.
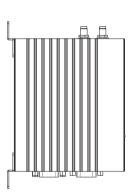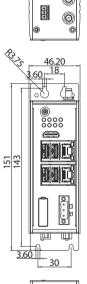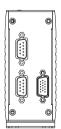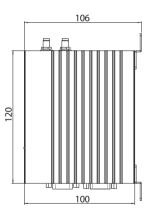
Mechanical Dimensions

NIFE 105
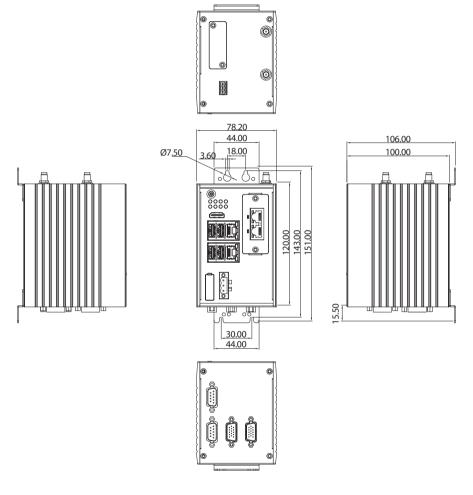
NIFE 105W

CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NIFE 105 series motherboard.

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 environments 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 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.

8 NIFE 105 Series User Manual
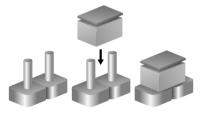
Jumper Settings
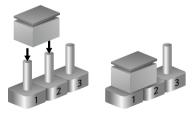
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just 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
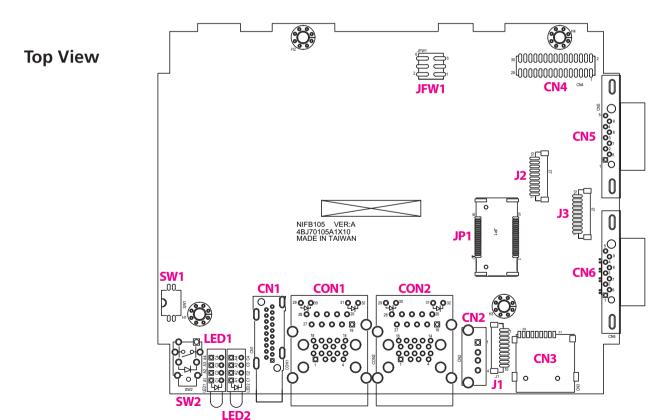
NIFE 105/105W System Components

The NIFE 105/105W systems are made up of a NIFB105 motherboard and a NISKIO7 power board. This chapter lists the location and pinout assignment of the jumpers and connectors on each component.
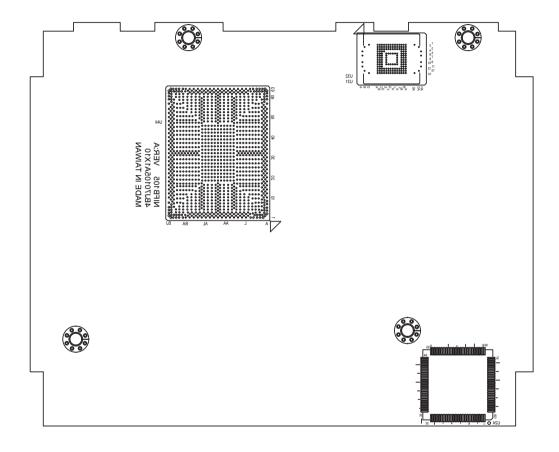
Locations of the DIP Switches and Connectors for NIFE 105/105W

Bottom View
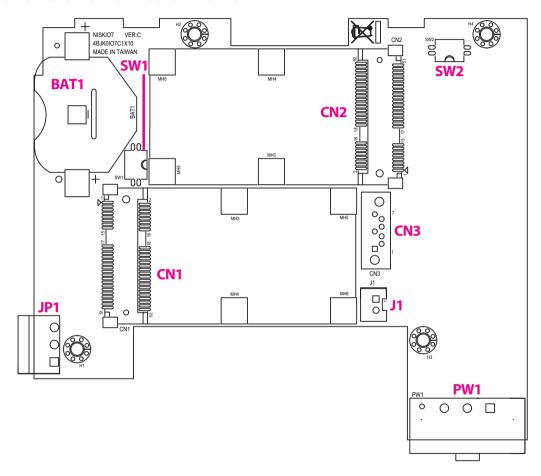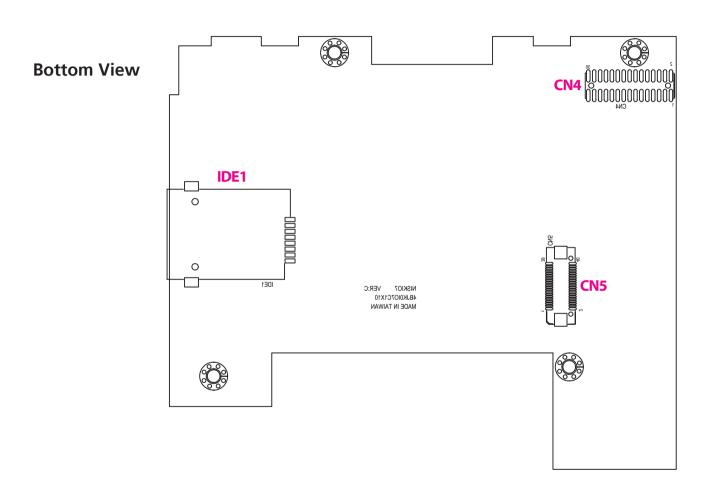
Connector Locations for the Power Board NISKIO7

Bottom View

CN4

IDE1

CN5

Connector Pin Definitions for NIFB105

DIP Switch

AT/ATX Switch

Connector type: 2-pin On/Off DIP switch
Connector location: SW1

Pin	Function
1 ON, 2 OFF	AT Mode
1 OFF, 2 ON	ATX Mode

Pin	Definition
1	AT_PWRBT#
2	PBT_TR1
3	PWRBTN#
4	PWRBTN#

External I/O Interfaces

Power Button

Connector location: SW2

Power/HDD/Battery Low/PG LED Indicators

Connector location: LED1

PWR	HDD	BATT	PG

Pin	Definition	Pin	Definition
1	GND	2	PBT_TR
3	PBT_TR	4	GND
A1	PWRLED_N	C1	PWRLED_P
MH1		MH2	

Pin	Definition	Pin	Definition
A1	VCC3	C1	PWR_LED_N
A2	VCC3	C2	SATA_LED_N
A3	3VSB	C3	BATTERY_LED
A4	3VSB	C4	GPO_BUZZER

COM1 and COM2 TX/RX LED Indicators

Connector location: LED2

HDMI

Connector type: HDMI port
Connector location: CN1

Tx1   **Rx1**   **Tx2**   **Rx2**

Pin	Definition	Pin	Definition
A1	VCC5	C1	COM2_RXLEDN
A2	VCC5	C2	COM2_TXLEDN
A3	VCC5	C3	COM1_RXLEDN
A4	VCC5	C4	COM1_TXLEDN
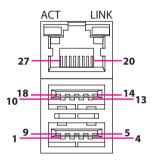
Pin	Definition	Pin	Definition
1	HDMI_DATA2_P_C	2	GND
3	HDMI_DATA2_N_C	4	HDMI_DATA1_P_C
5	GND	6	HDMI_DATA1_N_C
7	HDMI_DATA0_P_C	8	GND
9	HDMI_DATA0_N_C	10	HDMI_CLK_P_C
11	GND	12	HDMI_CLK_N_C
13	NA	14	NA
15	HDMI_CTRL_CLK	16	HDMI_CTRL_DAT
17	GND	18	VCC5
19	DDI0HPD0	MH1	CHASSIS_GND
MH2	CHASSIS_GND	MH3	CHASSIS_GND
MH4	CHASSIS_GND	NH1	NA
NH2	NA		

LAN1 and USB 3.0 Ports

Connector type: RJ45 port with LEDs and dual USB 3.0 ports, Type A
Connector location: CON1A (USB) and CON1B (LAN1)

USB

Pin	Definition	Pin	Definition
1	5VSB	2	USB2_N0
3	USB2_P0	4	GND
5	USB3_RX0N	6	USB3_RX0P
7	GND	8	USB3_TX0N
9	USB3_TX0P	10	5VSB
11	USB2_N1	12	USB2_P1
13	GND	14	USB3_RX1N
15	USB3_RX1P	16	GND
17	USB3_TX1N	18	USB3_TX1P
MH1	CHASSIS_GND	MH2	CHASSIS_GND
MH3	CHASSIS_GND	MH4	CHASSIS_GND

LAN1

Pin	Definition	Pin	Definition
19	V1P5_LAN	20	LAN_MDI0P_1
21	LAN_MDI0N_1	22	LAN_MDI1P_1
23	LAN_MDI1N_1	24	LAN_MDI2P_1
25	LAN_MDI2N_1	26	LAN_MDI3P_1
27	LAN_MDI3N_1	28	GND
29	LAN_ACTPW	30	LAN_LED_ACT#
31	LAN_LINK	32	LAN_LED_LINK1G#
MH5	CHASSIS_GND	MH6	CHASSIS_GND
MH7	CHASSIS_GND	MH8	CHASSIS_GND
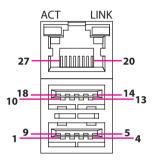
LAN2 and USB 3.0 Ports

Connector type: RJ45 port with LEDs and dual USB 3.0 ports, Type A
Connector location: CON2A (USB) and CON2B (LAN2)

USB

Pin	Definition	Pin	Definition
1	VCC5	2	USB2_N2
3	USB2_P2	4	GND
5	USB3_RX2N	6	USB3_RX2P
7	GND	8	USB3_TX2N
9	USB3_TX2P	10	VCC5
11	USB2_N3	12	USB2_P3
13	GND	14	USB3_RX3N
15	USB3_RX3P	16	GND
17	USB3_TX3N	18	USB3_TX3P
MH1	CHASSIS_GND	MH2	CHASSIS_GND
MH3	CHASSIS_GND	MH4	CHASSIS_GND

LAN2

Pin	Definition	Pin	Definition
19	V1P5_LAN2	20	LAN2_MDI0P
21	LAN2_MDI0N	22	LAN2_MDI1P
23	LAN2_MDI1N	24	LAN2_MDI2P
25	LAN2_MDI2N	26	LAN2_MDI3P
27	LAN2_MDI3N	28	GND
29	LAN2_ACTPW	30	LAN2_LED_ACT#
31	LAN2_LINK	32	LAN2_LED_LINK1G#
MH5	CHASSIS_GND	MH6	CHASSIS_GND
MH7	CHASSIS_GND	MH8	CHASSIS_GND

microSD Card Connector

Connector type: microSD
Connector location: CN3
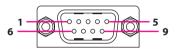
Pin	Definition	Pin	Definition
P1	SDCARD_D2	P2	SDCARD_D3
P3	SDCARD_CMD	P4	VCC3
P5	SDCARD_CLK	P6	GND
P7	SDCARD_D0	P8	SDCARD_D1
D1	SDCARD_CD#		
MH1	GND	MH2	GND
MH3	GND	MH4	GND
NH1	NA	NH2	NA

COM1 Connector

Connector type: DB-9 port, 9-pin D-Sub
Connector location: CN6
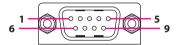
RS232		RS485		RS422	
Pin	Definition	Pin	Definition	Pin	Definition
1	SP1_DCD	1	SP1_DATA-	1	SP1_TX-
2	SP1_RXD	2	SP1_DATA+	2	SP1_TX+
3	SP1_TXD	3	NC	3	SP1_RX+
4	SP1_DTR	4	NC	4	SP1_RX-
5	GND	5	GND	5	GND
6	SP1_DSR	6	NC	6	SP1_RTS-
7	SP1_RTS	7	NC	7	SP1_RTS+
8	SP1_CTS	8	NC	8	SP1_CTS+
9	SP1_RI	9	NC	9	SP1_CTS-

COM2 Connector

Connector type: DB-9 port, 9-pin D-Sub
Connector location: CN5

RS232		RS485		RS422	
Pin	**Definition**	**Pin**	**Definition**	**Pin**	**Definition**
1	SP2_DCD	1	SP2_DATA-	1	SP2_TX-
2	SP2_RXD	2	SP2_DATA+	2	SP2_TX+
3	SP2_TXD	3	NC	3	SP2_RX+
4	SP2_DTR	4	NC	4	SP2_RX-
5	GND	5	GND	5	GND
6	SP2_DSR	6	NC	6	SP2_RTS-
7	SP2_RTS	7	NC	7	SP2_RTS+
8	SP2_CTS	8	NC	8	SP2_CTS+
9	SP2_RI	9	NC	9	SP2_CTS-

Internal Connectors

BIOS Flash Pin Header

Connector type: 2x3 6-pin header, 2.0mm pitch
Connector location: JFW1

Pin	Definition	Pin	Definition
1	VSPI	2	GND
3	BIOS_SPI_CS#0	4	BIOS_SPI_CLK
5	BIOS_SPI_SO	6	BIOS_SPI_SI

Internal USB 2.0 Connector

Connector location: CN2

Pin	Definition	Pin	Definition
1	5VSB	2	USB2_N6
3	USB2_P6	4	GND
MH1	GND	MH2	GND

Port 80 Pin Header

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J1

Pin	Definition	Pin	Definition
1	GND	2	PLTRST_N
3	LPC_CLK0_DEBUG	4	LPC_FRAME#
5	LPC_AD3	6	LPC_AD2
7	LPC_AD1	8	LPC_AD0
9	VCC3	10	VCC3
MH1	GND	MH2	GND

COM3/4 TX/RX/RTS/CTS Pin Header

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J3

Pin	Definition	Pin	Definition
1	SP3_RXD	2	SP3_TXD
3	SP3_RTS#	4	SP3_CTS#
5	SP4_RXD	6	SP4_TXD
7	SP4_RTS#	8	SP4_CTS#
9	GND	10	GND
MH1	GND	MH2	GND

GPIO Pin Header

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: J2

Pin	Definition	Pin	Definition
1	VCC5	2	GND
3	ICH_GPO0_OUT	4	ICH_GPI0_IN
5	ICH_GPO1_OUT	6	ICH_GPI1_IN
7	ICH_GPO2_OUT	8	ICH_GPI2_IN
9	ICH_GPO3_OUT	10	ICH_GPI3_IN

Power and Signal Pin Header
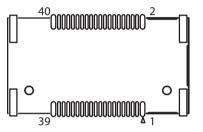
Connector type: 2x15 30-pin header, 1.27mm pitch
Connector location: CN4

Pin	Definition	Pin	Definition
1	GND	2	3VSB
3	GND	4	3VSB
5	GND	6	3VSB
7	GND	8	3P3_WAKE0#
9	GND	10	RTC
11	GND	12	12VSB_PG
13	GND	14	BATTERY_LED
15	GND	16	RTEST#
17	12VSB	18	SRTCRST#
19	12VSB	20	SOC_SLP_S3_N
21	12VSB	22	PBT_TR
23	12VSB	24	SMB_DATA_3P3
25	PLTRST_N	26	SMB_CLK_3P3
27	3G_GPIO1	28	VCC5
29	3G_GPIO2	30	VCC5

High Speed Signal Board to Board

Connector type: 2x20 40-pin header
Connector location: JP1

Pin	Definition	Pin	Definition
1	GND	2	GND
3	SATA_TXP0	4	SATA_TXP1
5	SATA_TXN0	6	SATA_TXN1
7	GND	8	GND
9	SATA_RXP0	10	SATA_RXP1
11	SATA_RXN0	12	SATA_RXN1
13	GND	14	GND
15	PCIE_TXP3	16	PCIE_TXP2
17	PCIE_TXN3	18	PCIE_TXN2
19	GND	20	GND

Pin	Definition	Pin	Definition
21	PCIE_RXP3	22	PCIE_RXP2
23	PCIE_RXN3	24	PCIE_RXN2
25	GND	26	GND
27	PCIE_CLKOUT3P	28	PCIE_CLKOUT2P
29	PCIE_CLKOUT3N	30	PCIE_CLKOUT2N
31	GND	32	GND
33	USB2_P5	34	USB2_P4
35	USB2_N5	36	USB2_N4
37	GND	38	GND
39	PCIE_CLKREQ3#	40	PCIE_CLKREQ2#

Connector Pin Definitions for NISKIO7

DIP Switch

Clear CMOS Switch

Connector type: 2-pin On/Off DIP switch
Connector location: SW2

Pin	Definition
1	RTEST#
2	SRTCRST#
3	GND
4	GND

3G SIM Card Power Select

Connector type: 2-pin On/Off DIP switch
Connector location: SW1
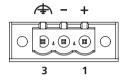
Pin	Definition
1	UIM_PWR1
2	UIM_PWR2
3	UIM_PWR
4	UIM_PWR

External Connectors

DC Power Input

Connector location: PW1

Pin	Definition	Pin	Definition
1	VIN_1	2	VIN_VSS
3	Chassis_GND	NH1	NA
NH2	NA		

Remote Button and Push Button Pin Header

Connector location: JP1
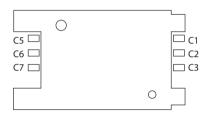
Pin	Definition
1	REMOTE_S3
2	GND
3	PBT_TR

SIM Card Slot
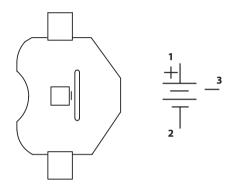
Connector location: IDE1

Battery Connector

Connector location: BAT1

Pin	Definition	Pin	Definition
C1	UIM_PWR	C2	UIM_RESET
C3	UIM_CLK	C5	GND
C6	UIM_VPP	C7	UIM_DATA
COM	GND	CD	GND
MH1	GND	MH2	GND
NH1	NA	NH2	NA

Pin	Definition
1	BATIN
2	GND
3	GND

Internal Connectors

SATA Signal Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: CN3

SATA Power Connector

Connector type: 1x2 2-pin header, JST 2.5mm pitch
Connector location: J1

Pin	Definition	Pin	Definition
1	GND	2	SATA_TXP1
3	SATA_TXN1	4	GND
5	SATA_RXN1	6	SATA_RXP1
7	GND		
MH1	GND	MH2	GND

Pin	Definition
1	VCC5
2	GND

Power and Signal Pin Header
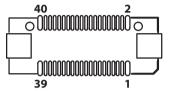
Connector type: 2x15 30-pin header, 1.27mm pitch
Connector location: CN4

Pin	Definition	Pin	Definition
1	GND	2	3VSB
3	GND	4	3VSB
5	GND	6	3VSB
7	GND	8	3P3_WAKE0#
9	GND	10	RTC
11	GND	12	12VSB_PG
13	GND	14	BATTERY_LED
15	GND	16	RTEST#
17	12VSB	18	SRTCRST#
19	12VSB	20	SOC_SLP_S3_N
21	12VSB	22	PBT_TR
23	12VSB	24	SMB_DATA_3P3
25	PLTRST_N	26	SMB_CLK_3P3
27	3G_GPIO1	28	VCC5
29	3G_GPIO2	30	VCC5
NH1	NA	NH2	NA

High Speed Signal Board to Board
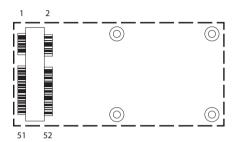
Connector type: 2x20 40-pin header
Connector location: CN5

Pin	Definition	Pin	Definition
1	GND	2	GND
3	SATA_TXP0	4	SATA_TXP1
5	SATA_TXN0	6	SATA_TXN1
7	GND	8	GND
9	SATA_RXP0	10	SATA_RXP1
11	SATA_RXN0	12	SATA_RXN1
13	GND	14	GND
15	PCIE_TXP3	16	PCIE_TXP2
17	PCIE_TXN3	18	PCIE_TXN2
19	GND	20	GND

Pin	Definition	Pin	Definition
21	PCIE_RXP3	22	PCIE_RXP2
23	PCIE_RXN3	24	PCIE_RXN2
25	GND	26	GND
27	PCIE_CLKOUT3P	28	PCIE_CLKOUT2P
29	PCIE_CLKOUT3N	30	PCIE_CLKOUT2N
31	GND	32	GND
33	USB2_P5	34	USB2_P4
35	USB2_N5	36	USB2_N4
37	GND	38	GND
39	PCIE_CLKREQ3#	40	PCIE_CLKREQ2#

Mini-PCIe Connector (Wi-Fi/mSATA/3G)

Connector location: CN2
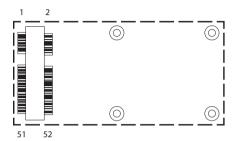
Pin	Definition	Pin	Definition
1	3P3_WAKE3#	2	3VSB_MINI2
3	N/A	4	GND
5	N/A	6	VCC1_5#2
7	PCIE_CLKREQ3#	8	UIM_PWR2
9	GND	10	UIM_DATA
11	PCIE_CLKOUT3N	12	UIM_CLK
13	PCIE_CLKOUT3P	14	UIM_RESET
15	GND	16	UIM_VPP
17	N/A	18	GND
19	N/A	20	MINICARD2DIS#
21	GND	22	PLTRST_N
23	PCIE_mSATA_RXP	24	3VSB_MINI2
25	PCIE_mSATA_RXN	26	GND

Pin	Definition	Pin	Definition
27	GND	28	VCC1_5#2
29	GND	30	SMB_CLK_3P3
31	PCIE_mSATA_TXN	32	SMB_DATA_3P3
33	PCIE_mSATA_TXP	34	GND
35	GND	36	USB2_N5C
37	GND	38	USB2_P5C
39	3VSB_MINI2	40	GND
41	3VSB_MINI2	42	N/A
43	N/A	44	N/A
45	N/A	46	N/A
47	N/A	48	VCC1_5#2
49	N/A	50	GND
51	3VSB_MINI2	52	3VSB_MINI2

Mini-PCIe Connector (Wi-Fi/3G)

Connector location: CN1

Pin	Definition	Pin	Definition
1	3P3_WAKE2#	2	3VSB_MINI1
3	N/A	4	GND
5	N/A	6	VCC1_5#1
7	PCIE_CLKREQ2#	8	UIM_PWR1
9	GND	10	UIM_DATA
11	PCIE_CLKOUT2N	12	UIM_CLK
13	PCIE_CLKOUT2P	14	UIM_RESET
15	GND	16	UIM_VPP
17	N/A	18	GND
19	N/A	20	MINICARD1DIS#
21	GND	22	PLTRST_N
23	PCIE_RXN2	24	3VSB_MINI1
25	PCIE_RXP2	26	GND

Pin	Definition	Pin	Definition
27	GND	28	VCC1_5#1
29	GND	30	SMB_CLK_3P3
31	PCIE_TXN2	32	SMB_DATA_3P3
33	PCIE_TXP2	34	GND
35	GND	36	USB2_N4C
37	GND	38	USB2_P4C
39	3VSB_MINI1	40	GND
41	3VSB_MINI1	42	N/A
43	GND	44	N/A
45	N/A	46	N/A
47	N/A	48	VCC1_5#1
49	N/A	50	GND
51	N/A	52	3VSB_MINI1

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 sources to prevent electric shock or system damage.

1. Remove the screws on the top chassis.

2. Remove the screws on the bottom chassis.

3. Remove the screws on the rear chassis.
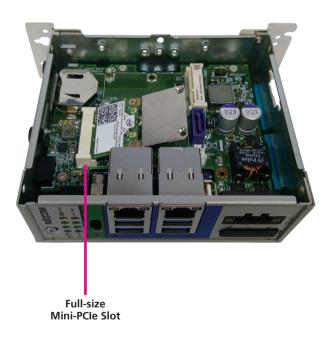
4. Gently lift up the cover.

Installing a Wi-Fi/3G/LTE Module

1. Locate the full-size mini-PCIe slot on the board for the Wi-Fi module. Insert the Wi-Fi module into the slot at 45 degree angle until the gold-plated connector on the edge of the module completely disappears into the slot.

2. Push the module down and secure it with screws. Ensure the screws are fixed tightly to the slot.

**Full-size
Mini-PCIe Slot**

Installing an Antenna

Before installing an antenna, make sure that the Wi-Fi/3G/LTE module is installed into the slot first.

1. Prepare the antenna cables for the Wi-Fi/3G/LTE module.

2. Locate the antenna holes on the top panel and insert the antenna jacks through the antenna holes. Fix the antenna jacks with ring 1 then ring 2.

Ring 1   Ring 2
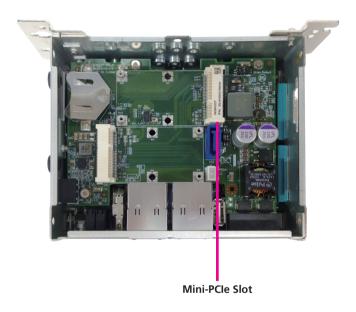
3. Connect external antennas to the antenna jacks.

Installing an mSATA or 3G Module

1. Locate the mini-PCIe slot for 3G or mSATA modules. The SIM card is located in the middle of the mini-PCIe slot.
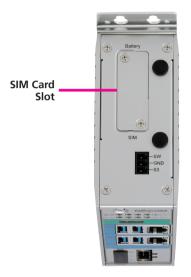
2. Insert the mSATA module into the mini-PCIe slot at 45 degree angle until the gold-plated connector on the edge of the module completely disappears into the slot.

Mini-PCIe Slot

3. When installing a 3G module, make sure to install the SIM card first.

SIM Card Slot ——————

4. Push the module down and secure it with screws. Ensure both screws are fixed tightly to the slot.

39
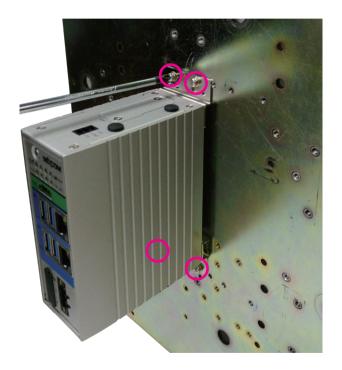
How to Wall Mount the System

1. Install the wall mount bracket to the rear chassis and make sure the wall mount bracket screws are fasten tightly.

2. On a flat surface where the NIFE 105 will be installed, align the mounting holes on the wall mount bracket to the holes on the surface and tighten screws into the mounting holes to secure the system.

Screw Specifications:
4 x round head screws, P3x6.
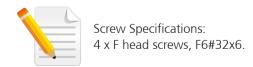
How to Install a DIN Rail Kit (Optional)

1. Unscrew and remove the wall mount bracket on the rear chassis.

2. Install the DIN rail bracket on the rear of NIFE 105 with the screws properly tighten.

Screw Specifications:
4 x F head screws, F6#32x6.

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3. Install NIFE 105 on the DIN rail from top of the bracket and make sure the hook is properly connected with the DIN rail.

4. Push NIFE 105 back to connect the bracket with the DIN rail and complete installation.

CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for the NIFE 105 series. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM website at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:
▪ Hard drives, diskette drives, and peripherals

▪ Video display type and display options

▪ Password protection from unauthorized use

▪ Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

▪ This program should be executed under the following conditions:

▪ When changing the system configuration

▪ When a configuration error is detected by the system and you are prompted to make changes to the setup program

▪ When resetting the system clock

▪ When redefining the communication ports to prevent any conflicts

▪ When making changes to the Power Management configuration

▪ When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.

- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing Del allows you to enter Setup.

Legends

Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menu or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
−	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter	Press <Enter> to enter the highlighted sub-menu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press Enter.
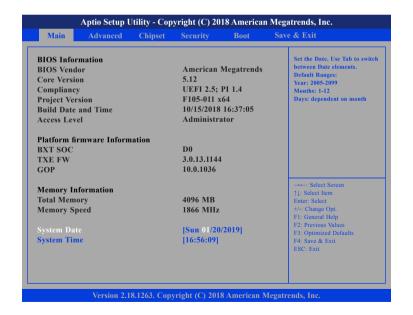
BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter, to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 2005 to 2099.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
   Main      Advanced    Chipset    Security    Boot     Save & Exit

  BIOS Information                                        Set the Date. Use Tab to switch
  BIOS Vendor            American Megatrends             between Date elements.
  Core Version           5.12                            Default Ranges:
  Compliancy             UEFI 2.5; PI 1.4                Year: 2005-2099
  Project Version        F105-011 x64                    Months: 1-12
  Build Date and Time    10/15/2018 16:37:05             Days: dependent on month
  Access Level           Administrator

  Platform firmware Information
  BXT SOC                D0
  TXE FW                 3.0.13.1144
  GOP                    10.0.1036

  Memory Information                                      →←: Select Screen
  Total Memory           4096 MB                          ↑↓: Select Item
  Memory Speed           1866 MHz                         Enter: Select
                                                          +/-: Change Opt.
  System Date            [Sun 01/20/2019]                 F1: General Help
  System Time            [16:56:09]                       F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit

          Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

⚠️ Setting incorrect field values may cause the system to malfunction.

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.

| Main | Advanced | Chipset | Security | Boot | Save & Exit |

▶ ACPI Settings
▶ ITE8786E Super IO Configuration
▶ Hardware Monitor
▶ CPU Configuration
▶ Network Stack Configuration
▶ Trusted Computing
▶ USB Configuration

System ACPI Parameters.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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ACPI Settings

This section is used to configure ACPI Settings.

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| Advanced |

ACPI Settings

| Enable Hibernation | [Enabled] |
| ACPI Sleep State | [S3 (Suspend to RAM)] |

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Enable Hibernation
Enables or disables system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some OS.
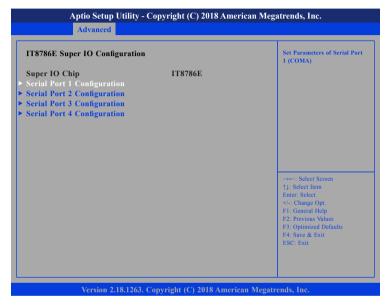
ACPI Sleep State
Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

IT8786E Super IO Configuration

This section is used to configure the serial ports.

```
                Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
         Advanced

      IT8786E Super IO Configuration                              Set Parameters of Serial Port
                                                                 1 (COMA)
      Super IO Chip                   IT8786E
    ▶ Serial Port 1 Configuration
    ▶ Serial Port 2 Configuration
    ▶ Serial Port 3 Configuration
    ▶ Serial Port 4 Configuration




                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



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```

Super IO Chip
Displays the Super I/O chip used on the board.

Serial Port 1 to Serial Port 4 Configuration
Configuration settings for serial port 1 to port 4.

Serial Port 1 Configuration

This section is used to configure serial port 1.

```
                Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
          Advanced

      Serial Port 1 Configuration                                Enable or Disable Serial Port
                                                                 (COM)
      Serial Port                     [Enabled]
      Device Settings                 IO=3F8h; IRQ=4;
      Onboard Serial Port Mode        [RS232]
      Terminal resistor               [Auto]




                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



                Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```

Serial Port
Enables or disables the serial port.

Onboard Serial Port Mode
Configures the serial port mode to RS232, RS422, RS485 or RS485 Auto.

Terminal resistor
Enables or disables the terminal resistor.

Serial Port 2 Configuration

This section is used to configure serial port 2.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    Serial Port 2 Configuration                              Enable or Disable Serial Port
                                                             (COM)
    Serial Port                      [Enabled]
    Device Settings                  IO=2F8h; IRQ=5;
    Onboard Serial Port Mode         [RS232]
    Terminal resistor                [Enabled]




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



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```

Serial Port
Enables or disables the serial port.

Onboard Serial Port Mode
Configures the serial port mode to RS232, RS422, RS485 or RS485 Auto.

Terminal resistor
Enables or disables the terminal resistor.

Serial Port 3 Configuration

This section is used to configure serial port 3.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

    Serial Port 3 Configuration                              Enable or Disable Serial Port
                                                             (COM)
    Serial Port                      [Enabled]
    Device Settings                  IO=3E8h; IRQ=11;




                                                             →←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



            Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```
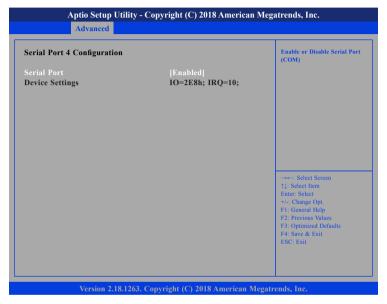
Serial Port
Enables or disables the serial port.

Serial Port 4 Configuration

This section is used to configure serial port 4.

```
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

  Serial Port 4 Configuration                              Enable or Disable Serial Port
                                                           (COM)
  Serial Port                         [Enabled]
  Device Settings                     IO=2E8h; IRQ=10;



                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


       Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```

Serial Port
Enables or disables the serial port.

Hardware Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.

```
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     Advanced

  Pc Health Status

  CPU temperature(DTS)           : +34 °c
  System temperature            : +34 °c
  VCore                         : +0.828 V
  VDDQ                          : +1.356 V
  VCC5                          : +5.010 V
  VCC3                          : +3.326 V



                                                           →←: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


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```

CPU temperature(DTS)
Detects and displays the current CPU temperature.

System temperature
Detects and displays the current system temperature.

VCore to VCC3
Detects and displays the output voltages.

CPU Configuration

This section is used to configure the CPU.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

  CPU Configuration                                      Socket specific CPU Information

► Socket 0 CPU Information

  Speed                         1300 MHz
  64-bit                        Supported

► CPU Power Management
  Active Processor Core         [Disabled]
  Intel Virtualization Technology   [Disabled]
  VT-d                          [Disabled]

                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

Active Processor Core

Select the number of cores to enable in each processor package.

Intel® Virtualization Technology
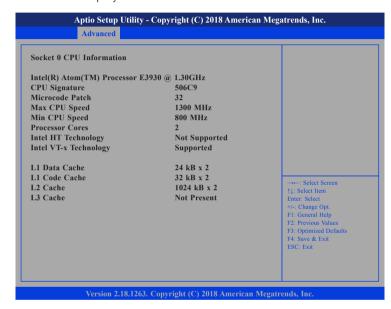
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

VT-d

Enables or disables Intel® VT-d technology.

Socket 0 CPU Information
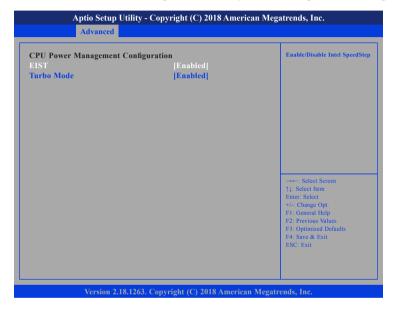
This section displays the information of the CPU installed in Socket 0.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

  Socket 0 CPU Information

  Intel(R) Atom(TM) Processor E3930 @ 1.30GHz
  CPU Signature                 506C9
  Microcode Patch               32
  Max CPU Speed                 1300 MHz
  Min CPU Speed                 800 MHz
  Processor Cores               2
  Intel HT Technology           Not Supported
  Intel VT-x Technology         Supported

  L1 Data Cache                 24 kB x 2
  L1 Code Cache                 32 kB x 2
  L2 Cache                      1024 kB x 2
  L3 Cache                      Not Present
                                                       →←: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

CPU Power Management

This section is used to configure the CPU power management settings.

```
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  Advanced

  CPU Power Management Configuration          Enable/Disable Intel SpeedStep
  EIST                        [Enabled]
  Turbo Mode                  [Enabled]




                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit

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```

EIST
Enables or disables Intel® SpeedStep.

Turbo Mode
Enables or disables turbo mode.

Network Stack Configuration

This section is used to configure the network stack.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

  Network Stack               [Disabled]      Enable/Disable UEFI Network
                                              Stack




                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit

            Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
```

Network Stack
Enables or disables UEFI network stack.

Trusted Computing

This section is used to configure Trusted Platform Module (TPM) settings.

```
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced

Configuration                                         Enables or Disables BIOS
   Security Device Support        [Enable]            support for security device.
   NO Security Device Found                           O.S. will not show Security
                                                      Device. TCG EFI protocol and
                                                      INT1A interface will not be
                                                      available.




                                                      →←: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


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```

Security Device Support

Enables or disables BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

USB Configuration

This section is used to configure the USB.

```
Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
   Advanced

  USB Configuration                                   Enables Legacy USB support.
                                                      AUTO option disables legacy
  USB Module Version          17                      Support if no USB devices are
                                                      connected. DISABLE option will
  USB Controllers:                                    keep USB devices available
       1 XHCI                                         only for EFI applications.
  USB Devices:
       1 Keyboard, 1 Mouse

  Legacy USB Support          [Disabled]
  XHCI Hand-off               [Enabled]
  USB Mass Storage Driver     [Enabled]

  USB hardware delays and time-outs:
  USB transfer time-out       [20 sec]                →←: Select Screen
  Device reset time-out       [20 sec]                ↑↓: Select Item
  Device power-up delay       [Auto]                  Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


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```

Legacy USB Support

Enable   Enables Legacy USB.

Auto   Disables support for Legacy when no USB devices are connected.

Disable Keeps USB devices available only for EFI applications.

XHCI Hand-Off

This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver.

USB Mass Storage Driver
Enables or disables USB mass storage driver support.

USB Transfer Time-out
The time-out value for control, bulk, and Interrupt transfers.

Device Reset Time-out
Selects the USB mass storage device's start unit command timeout.

Device Power-up Delay
Maximum time the value will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.

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Main	Advanced	**Chipset**	Security	Boot	Save & Exit

```
► South Bridge                                          South Bridge Parameters
► South Cluster Configuration




                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit


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```

South Bridge
Enters the South Bridge submenu.

South Cluster Configuration
Enters the South Cluster Configuration submenu.

South Bridge

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.	
Chipset	
SMBus Support [Enabled]	Enable/Disable SMBus Support
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.	

SMBus Support

Enables or disables SMBus support.

South Cluster Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.	
Chipset	
► SATA Drives ► SCC Configuration ► USB Configuration ► Miscellaneous Configuration	Press <Enter> to select the SATA Device Configuration Setup options.
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.	

SATA Drives

Enters the SATA Drives submenu.

SCC Configuration

Enters the SCC Configuration submenu.

USB Configuration

Enters the USB Configuration submenu.
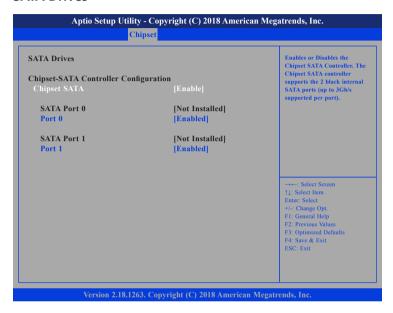
Miscellaneous Configuration

Enters the Miscellaneous Configuration submenu.

SATA Drives

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Chipset	

SATA Drives

Chipset-SATA Controller Configuration
Chipset SATA   [Enable]

    SATA Port 0   [Not Installed]
    Port 0   **[Enabled]**

    SATA Port 1   [Not Installed]
    Port 1   **[Enabled]**

Enables or Disables the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Chipset SATA
Enables or disables the chipset SATA controller.

Port 0 and Port 1
Enables or disables SATA port 0 and SATA port 1.

SCC Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.	
Chipset	

SCC SD Card Support (D27:F0)   [Enable]
SCC eMMC Support (D28:F0)   [Enable]
eMMC Max Speed   [DDR50]
SCC SDIO Support (D30:F0)   [Enable]

Enable/Disable SCC SD Card Support

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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SCC SD Card Support (D27:F0)
Enables or disables SCC SD card support.

SCC eMMC Support (D28:F0)
Enables or disables SCC eMMC support.

eMMC Max Speed
Configures the eMMC maximum allowed speed.

SCC SDIO Support (D30:F0)
Enables or disables SCC SDIO support.

USB Configuration

Chipset

xHCI Mode	[Enable]	Once enabled, XHCI controller would be function disabled, none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debug purpose.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

xHCI Mode
Enables or disables XHCI mode. When enabled, XHCI controller would be disabled and none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debugging purposes.

Miscellaneous Configuration

Chipset

Miscellaneous Configuration		
High Precision Timer	[Enable]	Enable or Disable the High Precision Event Timer
State After G3	[S0 State]	
USB Power State in S5	[ON]	

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

High Precision Timer
Enables or disables high precision event timer.

State After G3
Configures the power state when power is re-applied after a power failure (G3 state).

S0 State   System will boot directly as soon as power is applied.
S5 State   System stays in power-off state until power button is pressed.

USB Power State in S5
Configures the USB power state in S5.

Security

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.					
Main	**Advanced**	**Chipset**	**Security**	**Boot**	**Save & Exit**

```
Password Description                              Set Setup Administrator
                                                 Password
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length              3
Maximum length              20

                                                 →←: Select Screen
                                                 ↑↓: Select Item
Setup Administrator Password                     Enter: Select
User Password                                    +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit



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```

Setup Administrator Password
Select this to reconfigure the administrator's password.

User Password
Select this to reconfigure the user's password.

Boot

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.					
Main	**Advanced**	**Chipset**	**Security**	**Boot**	**Save & Exit**

```
Boot Configuration                               Select the keyboard NumLock
Bootup NumLock State          [On]               state
Quiet Boot                    [Disabled]

Boot Option Priorities
Boot Option #1                [Windows Boot Manager]
Boot Option #2                [UEFI: Built-in EFI . . .]
Fast Boot                     [Disable]



                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


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```

Bootup NumLock State
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot
Enabled   Displays OEM logo instead of the POST messages.
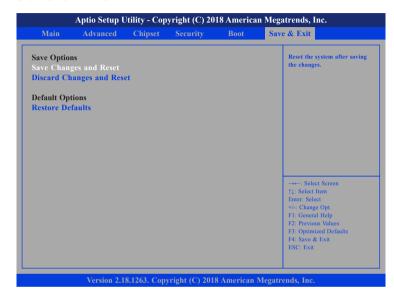Disabled   Displays normal POST messages.

Boot Option Priorities
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

Fast Boot
When enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Save & Exit

Save Changes and Reset
To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Reset
To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Restore Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

CHAPTER 5: POWER CONSUMPTION

Power Consumption Measurement Test

Purpose

The purpose of the power consumption test is to verify the power dissipation of system, and the loading of power supply.

Test Equipment/Software

1. DC power supply.
2. Room temperature.
3. Run BURN IN+KPOWER at DUT.

Test Result

Device	Test Case	Voltage/Watt
DUT	DC IN (Max Voltage)	28.8V/31.392W
	DC IN (Min Voltage)	9.6V/33.504W
	DC IN (General Voltage)	24V/32.16W 12V/32.88W

APPENDIX A: WATCHDOG PROGRAMMING GUIDE

ITE8786 WatchDog Programming Guide

```
#define SUPERIO_PORT      0x2E
#define WDT_SET           0x72
#define WDT_VALUE         0x73

void main(void)
{
    #Enter SuperIO Configuration
            outportb(SUPERIO_PORT, 0x87);
            outportb(SUPERIO_PORT, 0x01);
            outportb(SUPERIO_PORT, 0x55);
            outportb(SUPERIO_PORT, 0x55);

    # Set LDN
            outportb(SUPERIO_PORT, 0x07);
            outportb(SUPERIO_PORT+1 ,0x07);

    # Set WDT setting
            outportb(SUPERIO_PORT, WDT_SET);
            outportb(SUPERIO_PORT+1, 0x90); # Use the second
                                            # Use the minute, change value to 0x10
    # Set WDT sec/min
            outportb(SUPERIO_PORT, WDT_VALUE);
            outportb(SUPERIO_PORT+1, 0x05); #Set 5 seconds
}
```

APPENDIX B: GPI/O MODE CONFIGURATION

Pin	GPI/O Mode	Address	Pin	GPI/O Mode	Address
1	VCC	-	2	GND	-
3	GPO0	CEh (Bit3)	4	GPI0	CEh (Bit7)
5	GPO1	CEh (Bit2)	6	GPI1	CEh (Bit6)
7	GPO2	CEh (Bit1)	8	GPI2	CEh (Bit5)
9	GPO3	CEh (Bit0)	10	GPI3	CEh (Bit4)

Configuring the GPIO Input / Output mode
0: Input mode
1: Output mode

```
#define SUPERIO_PORT    0x2E
#define GPIO_MODE       0xCE

void main(void)
{
    #Enter SuperIO Configuration
        outportb(SUPERIO_PORT, 0x87);
        outportb(SUPERIO_PORT, 0x01);
        outportb(SUPERIO_PORT, 0x55);
        outportb(SUPERIO_PORT, 0x55);

    # Set LDN
        outportb(SUPERIO_PORT, 0x07);
        outportb(SUPERIO_PORT+1 ,0x07);

    # Set GPIO mode
        outportb(SUPERIO_PORT, GPIO_MODE);
        outportb(SUPERIO_PORT+1, 0x0F); # GPIO pin 3/5/7/9 : Output
                                        # GPIO pin 4/6/8/10 : Input
}
```

APPENDIX C: SELV STATEMENT

If the power supply is used it will be in accordance with IEC/EN61010-1 IEC/, EN61010-2-201 and output meet SELV. All circuits are SELV for system.