



NEXCOM International Co., Ltd.

Intelligent Platform & Services Business Unit
Embedded Computing (Industrial Motherboard)
X103

User Manual

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PREFACE

Copyright

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Disclaimer

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Acknowledgements

X103 is a trademark of Nexcobot 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



NexCOBOT RoHS Environmental Policy and Status Update

NexCOBOT 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, NexCOBOT 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 NexCOBOT development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NexCOBOT 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 NexCOBOT 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 NexCOBOT naming convention.

Warranty and RMA

NexCOBOT Warranty Period

NexCOBOT manufactures products that are new or equivalent to new in accordance with industry standard. NexCOBOT warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NexCOBOT.

NexCOBOT Return Merchandise Authorization (RMA)

- Customers shall enclose the “NexCOBOT 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 “NexCOBOT 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, NexCOBOT 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 NexCOBOT 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

NexCOBOT 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: NexCOBOT 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 NexCOBOT 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, NexCOBOT will return it to the customer without any charge.

Board Level

- Component fee: NexCOBOT 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, NexCOBOT 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 the equipment from any AC outlet before cleaning or installing a component inside the chassis. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
6. Keep the board away from humidity.
7. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
8. Wear anti-static wrist strap.
9. Do all preparation work on a static-free surface.
10. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
11. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
12. All cautions and warnings on the board should be noted.
13. Use the correct mounting screws and do not over tighten the screws.
14. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

Technical Support and Assistance

1. For the most updated information of NexCOBOT products, visit NexCOBOT's website at www.nexcobot.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.

Global Service Contact Information

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Package Contents

Before continuing, verify that the X103 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	X103 mainboard	1



Heat Spreader:

The heatspreader acts as a thermal coupling device to the module and is thermally coupled to the CPU via a thermal gap filler. On some modules, it may also be thermally coupled to other heat generating components with the use of additional thermal gap fillers. Although the heatspreader is the thermal interface where most of the heat generated by the module is dissipated, it is not to be considered as a heatsink. It has been designed as a thermal interface between the module and the application specific thermal solution.

Ordering Information

The following information below provides ordering information for X103.

X103-x6211E (P/N: 10W10X10300X0)

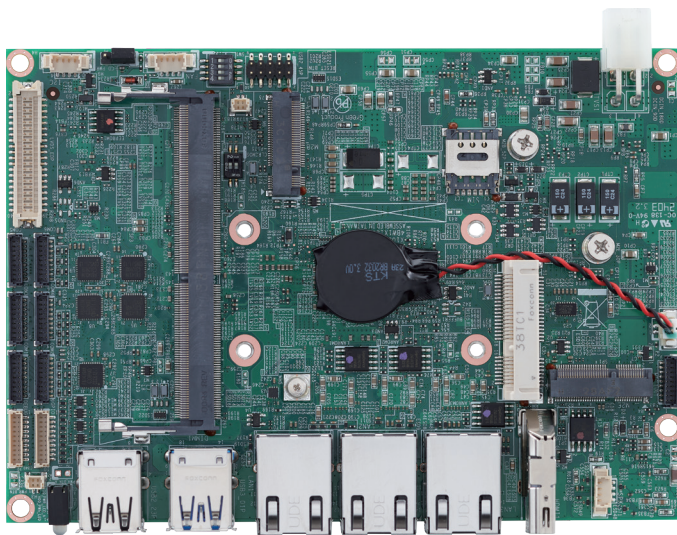
Embedded computing board with Intel Atom® x 6211E processor, with 1 x HDMI, 1 x LVDS, 3 x LAN, 6 x COM ports

X103-x6413E (P/N: 10W10X10301X0)

Embedded computing board with Intel Atom® x 6413E processor, with 1 x HDMI, 1 x LVDS, 3 x LAN, 6 x COM ports

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- Intel Atom® x6000E series processors
- TPM2.0 on board
- 1 x DDR4 SO-DIMM socket, up to 32GB
- 3 x 2.5GbE LAN
- 1 x HDMI 1.4, 4K30Hz and a dual channel 18/24-bits
- 1 x LVDS connector, up to 1920 x 1080 @60Hz
- 1 x M.2 Key B
- 1 x M.2 Key E
- 4 x USB port
- 6 x COM
- 1 x mini-PCIe slot
- Support dual power input, 12V/24V

Hardware Specifications

CPU Support

- Intel Atom® x6000E Series SoC processors
 - x6211E, dual-core, 1.3GHz, 6W
 - x6413E, qual-core, 1.5GHz, 9W (default)

Main Memory

- 1 x 260-pin DDR4 SO-DIMM socket, support 3200MHz, up to 32GB, with non ECC, Un-buffered memory
- Un-buffered memory

BIOS

- AMI Flash ROM BIOS

Graphic & Display

- Intel® Gen11 UHD graphics engines
- 1 x HDMI 1.4, resolution up to 3840 x 2160 @30Hz
- 1 x Dual channel 18/24-bit LVDS connector, up to 1920x 1080@60Hz (optional: eDP selects by jumper setting)

Onboard LAN

- 3 x RJ45 connector with Intel® i226-IT, 2.5GbE LAN controller

Expansion Slots

- 1 x M.2 Key B, support 3052 (Signal SATA, USB2.0, USB3.0)
- 1 x M.2 2230 Key E for Wi-Fi+BT module
- 1 x mini-PCIe slot (PCIe, USB 2.0, SATA signal)
- 1 x SIM socket onboard, support Key B+M, 5G/LTE module

Edge I/O Interface

- 3 x RJ45 connector with LEDs
- 1 x HDMI 1.4 output
- 2 x USB 3.2 (Gen2)
- 2 x USB 2.0

Onboard Internal I/O

- COM1~2: RS232/422/485, 9-pin header
- COM3~6: RS232 only, 9-pin header
- 1x 10-pin header for GPIO, 4 x GPI, 4 x GPO
- 1x 4-pin Smart Fan connector
- 1x 10pin header for 2 x USB 2.0 port
- 1x 9-pin header for MIC in/Line out
- 1 x Speaker out (6W)

Dimensions

- 146mm (L) x 102mm (W) (5.7" x 4.0")

Power Requirement

- Support 12V/24V DC power Input via 1 x 4-pin ATX connector

Environment

- Board level Operating temperature: -40°C ~ 85°C in chamber with airflow 0.7m/s
- Storage temperature: -40°C to 85°C
- Relative humidity : 95% (non-condensing)



Certifications

- CE (EN55035 + EN55032)
- FCC Class A (EMI part 15B)

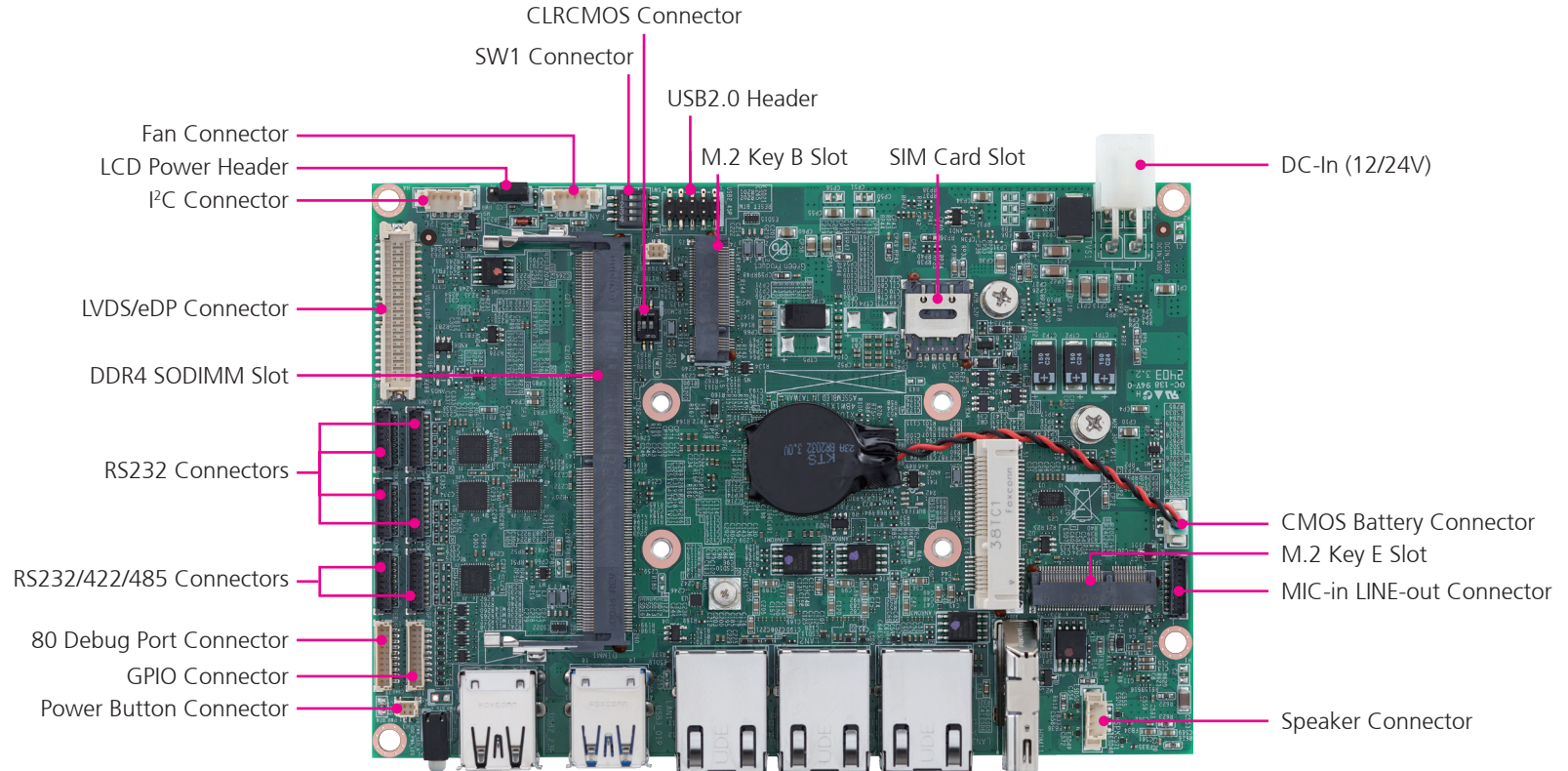
OS Support

- Windows®10 64-bit
- Linux™

Shipping Information

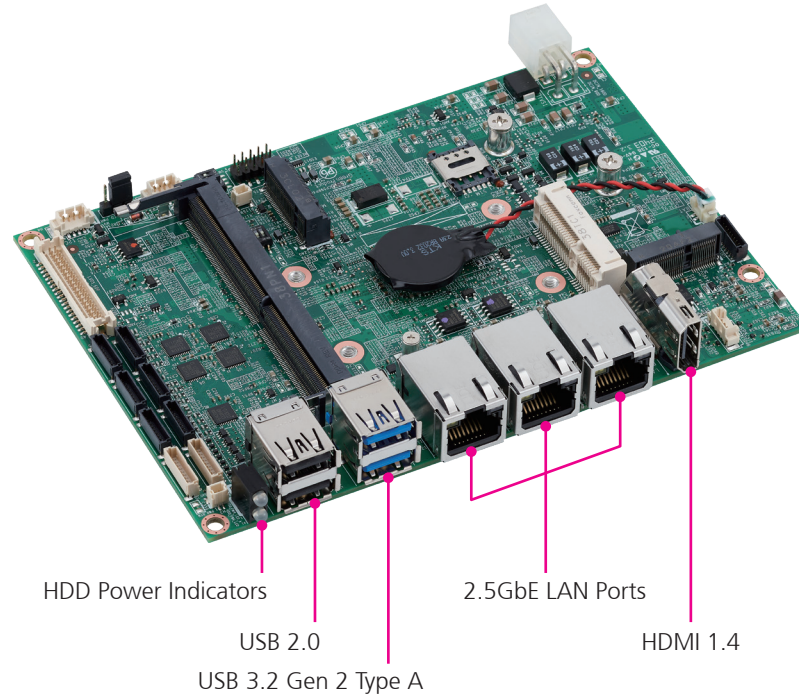
- Product weight (N.W): 1.6Kg
- Package weight (G.W): 2.8kg
- Carton dimension: 460mm x 373mm x 211mm

Knowing Your X103



The image shown above is part of the same product series, and it is for reference only. The actual product may vary depending on the shipment.

Edge I/O View



HDD Power Indicators

USB 2.0

USB 3.2 Gen 2 Type A

2.5GbE LAN Ports

HDMI 1.4

CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the X103 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:

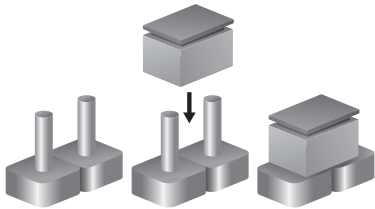
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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.

Jumper Settings

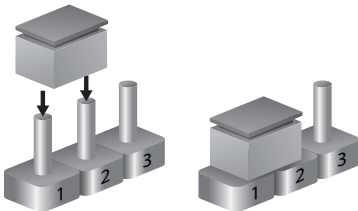
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

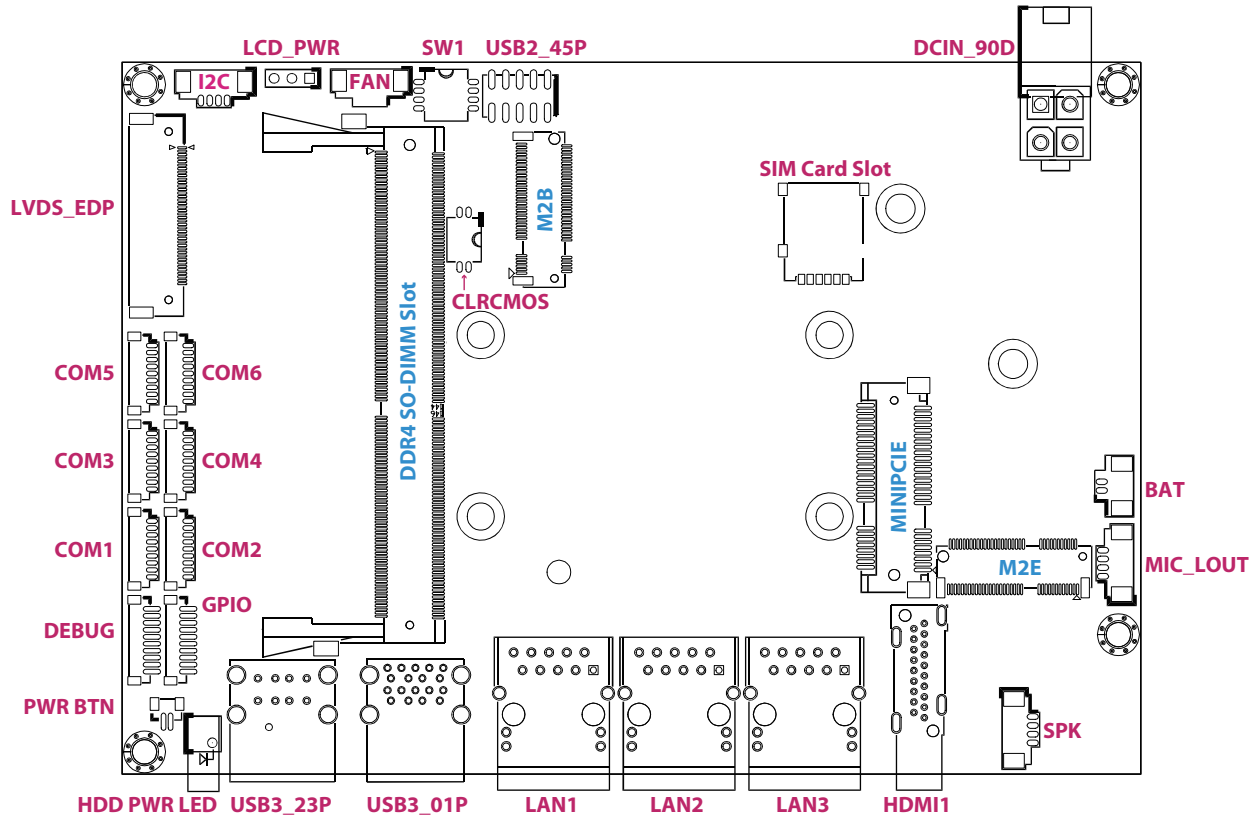


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

The following figure shows the motherboard of X103, and indicates the locations of jumpers and connectors. Refer to this chapter for detailed pin setting and definitions of connectors marked in pink on this figure.

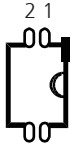


Jumpers

Clear CMOS

Connector type: DIP switch

Connector location: CLRCMOS



Pin	Settings
1-2 Off	Normal (default)
3-4 On	Clear CMOS

LCD Panel Voltage Selection

Connector type: 3-pin header

Connector location: LCD_PWR

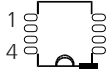


Pin	Settings
1-2 On	+3.3V (default)
2-3 On	+5V

LVDS/eDP Panel EDID Selection

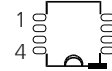
Connector type: DIP switch

Connector location: SW1



For eDP
(Resolution is determined by eDP panel.)

SW1 Position				eDP Panel
Pin4	Pin3	Pin2	Pin1	Max. Resolution
Others				Not Supported
OFF	OFF	OFF	OFF	Up to 1920x1080 (Default)



For LVDS
(Resolution is determined by SW1 setting.)

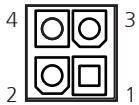
SW1 Position				LVDS Panel		
Pin4	Pin3	Pin2	Pin1	Resolution	Channel	Color Depth
ON	ON	ON	ON	800x600	Single	6 bit
ON	ON	ON	OFF	1024x768	Single	6 bit
ON	ON	OFF	ON	1024x768	Single	8 bit
ON	ON	OFF	OFF	1280x768	Single	6 bit
ON	OFF	ON	ON	1280x800	Single	6 bit
ON	OFF	ON	OFF	1280x800	Single	8 bit
ON	OFF	OFF	ON	1280x1024	Dual	8 bit
ON	OFF	OFF	OFF	1366x768	Single	6 bit
OFF	ON	ON	ON	1366x768	Single	8 bit
OFF	ON	ON	OFF	1440x900	Dual	8 bit
OFF	ON	OFF	ON	1400x1050	Dual	8 bit
OFF	ON	OFF	OFF	1600x900	Dual	8 bit
OFF	OFF	ON	ON	1680x1050	Dual	8 bit
OFF	OFF	ON	OFF	1600x1200	Dual	8 bit
OFF	OFF	OFF	ON	1920x1080	Dual	8 bit
OFF	OFF	OFF	OFF	1920x1200 (Default)	Dual	8 bit

Edge I/O Connector

DC Power Input Connector

Connector type: 4-pin block

Connector location: DCIN_90D



Pin	Definition
1	GND
2	GND
3	+VIN
4	+VIN

HDMI Connector

Connector type: HDMI Connector 19P

Connector location: HDMI1



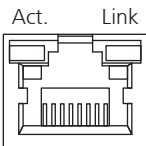
Pin	Definition	Pin	Definition
1	HDMI1_TX2P	2	GND
3	HDMI1_TX2N	4	HDMI1_TX1P
5	GND	6	HDMI1_TX1N
7	HDMI1_TX0P	8	GND
9	HDMI1_TX0N	10	HDMI1_CLK_P
11	GND	12	HDMI1_CLK_N
13	NC	14	NC
15	HDMI1_SCL	16	HDMI1_SDA
17	GND	18	HDMI1_P5V
19	HDMI1_HPD	MH1	CGND
MH2	CGND	MH3	CGND
MH4	CGND		

Edge I/O Connector

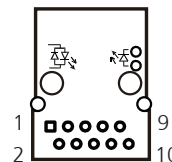
2.5GbE LAN Ports

Connector type: RJ-45

Connector location: LAN1, LAN2, LAN3



LAN Speed	Act.	Link
1G/2.5G	Blinking Yellow	Steady Green
100M	Blinking Yellow	Steady Yellow
10M	Blinking Yellow	Off
No Active	Off	Off

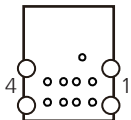


Pin	Definition	Pin	Definition
1	LAN1_MDI0P	2	LAN1_MDI0N
3	LAN1_MDI1P	4	LAN1_MDI1N
5	TCT	6	TCTG
7	LAN1_MDI2P	8	LAN1_MDI2N
9	LAN1_MDI3P	10	LAN1_MDI3N
11	LAN1_LED_ACT_POWER	12	LAN1_LED_ACT#
13	LAN1_LED_LINK2500#	14	LAN1_LED_LINK100#
MH1	CGND	MH2	CGND
MH3	NC	MH4	NC

USB 2.0 Connectors

Connector type: USB Connector Dual Port

Connector location: USB2_23P

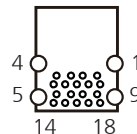


Pin	Definition
1	+5V
2	USB2_1N
3	USB2_1P
4	GND
5	+5V
6	USB2_2N
7	USB2_2P
8	GND
MH1	CGND
MH2	CGND
MH3	CGND
MH4	CGND

USB 3.2 Connectors

Connector type: USB3.0 Connector Dual Port

Connector location: USB3_01P



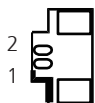
Pin	Definition	Pin	Definition
1	+5V	2	USB2_3N
3	USB2_3P	4	GND
5	USB3_RX3N	6	USB3_RX3P
7	GND	8	USB3_TX3N
9	USB3_TX3P	10	+5V
11	USB2_4N	12	USB2_4P
13	GND	14	USB3_RX4N
15	USB3_RX4P	16	GND
17	USB3_TX4N	18	USB3_TX4P
MH1	CGND	MH2	CGND
MH3	CGND	MH4	CGND

Internal Connector Pin Definitions

Coin-cell Battery Connector

Connector type: 2-pin header

Connector location: BAT



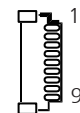
Pin	Definition
1	GND
2	BAT

COM1, COM2 (RS232/RS422/RS485)

COM3, COM4 COM5, COM6 (RS232)

Connector type: 9-pin header

Connector location: COM1, COM2, COM3, COM4, COM5, COM6



Pin	RS232	RS422 (If supported)	RS485 (If supported)
1	RI		
2	CTS		
3	RTS		
4	DSR		
5	GND		
6	DTR	RX-	
7	TXD	RX+	
8	RXD	TX+	D+
9	DCD	TX-	D-

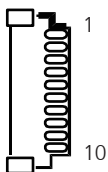


By default, COM1 and COM2 ports are RS485. You can change their function to RS232 or RS422 using a compatible COM cable and configure the [Serial I/O Configuration](#) setting in the BIOS.

80 Debug Port Connector

Connector type: 10-pin header

Connector location: DEBUG

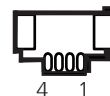


Pin	Definition	Pin	Definition
1	GND	2	PLTRST#
3	ESPI_CLK	4	ESPI_CS#
5	ESPI_IO3	6	ESPI_IO2
7	ESPI_IO1	8	ESPI_IO0
9	ESPI_RST#	10	3.3V

Fan Connector

Connector type: 4-pin header

Connector location: FAN

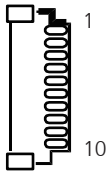


Pin	Definition
1	GND
2	+12V
3	FAN SPEED DETECT
4	FAN SPEED CONTROL

GPIO Connector

Connector type: 10-pin header

Connector location: GPIO

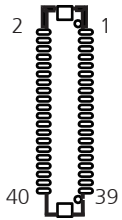


Pin	Definition	Pin	Definition
1	+5V	2	GND
3	GPO0	4	GPO1
5	GPO2	6	GPO3
7	GPI0	8	GPI1
9	GPI2	10	GPI3

LVDS Connector

Connector type: 40-pin header

Connector location: LVDS_EDP



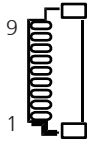
Pin	Definition	Pin	Definition
1	+V_INV	2	+V_INV
3	+V_INV	4	+V_INV
5	+V_INV	6	GND
7	+V_PANEL	8	GND
9	+V_PANEL	10	+V_PANEL
11	N.C	12	N.C
13	INV_BKLTCTRL	14	Hot-Plug Detect
15	INV_BKLTEN	16	GND
17	LVDS_DAT0N	18	LVDS_DAT0P
19	LVDS_DAT1N	20	LVDS_DAT1P

Pin	Definition	Pin	Definition
21	LVDS_DAT2N	22	LVDS_DAT2P
23	LVDS_CLK1N	24	LVDS_CLK1P
25	LVDS_DAT3N	26	LVDS_DAT3P
27	GND	28	GND
29	LVDS_DAT4N	30	LVDS_DAT4P
31	LVDS_DAT5N	32	LVDS_DAT5P
33	LVDS_DAT6N	34	LVDS_DAT6P
35	LVDS_CLK2N	36	LVDS_CLK2P
37	LVDS_DAT7N	38	LVDS_DAT7P
39	GND	40	GND

Pin	Definition	Pin	Definition
61	NC	62	NC

MIC-in LINE-out Connector

Connector type: 9-pin header
Connector location: MIC_LOUT



Pin	Definition
1	LINE_OUT-R
2	LINE_JD
3	AUDGND
4	LINE_OUT-L
5	AUDGND
6	MIC_OUT-R
7	MIC_JD
8	MIC_OUT-L
9	AUDGND

System Power Button

Connector type: 2-pin header
Connector location: PWR_BTN

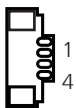


Pin	Definition
1	GND
2	PWRBTN#

Speaker Out Connector with Audio Amplifier

Connector type: 4-pin header

Connector location: SPK

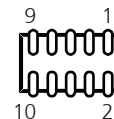


Pin	Definition
1	L+
2	L-
3	R+
4	R-

USB 2.0 Ports

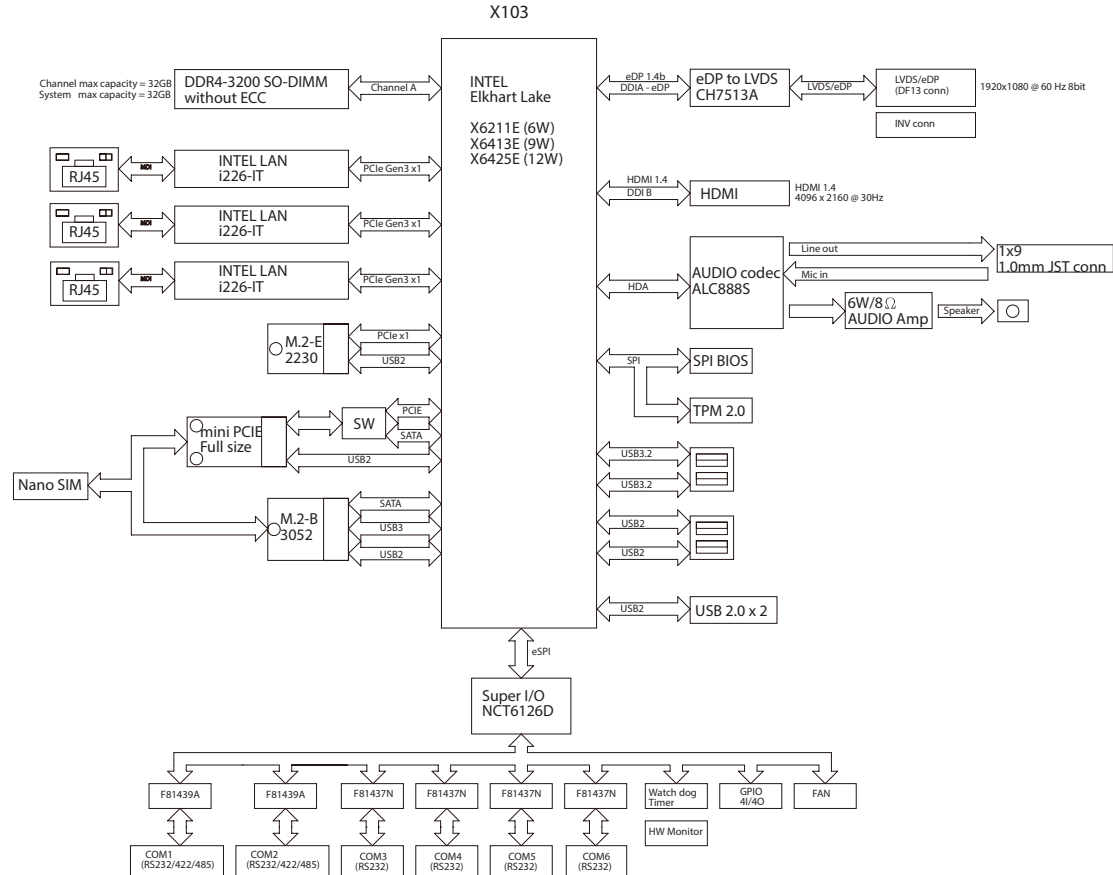
Connector type: 10-pin header

Connector location: USB2_45P



Pin	Definition	Pin	Definition
1	+5V	2	GND
3	USB2_1N	4	GND
5	USB2_1P	6	USB2_2P
7	GND	8	USB2_2N
9	GND	10	+5V

Block Diagram



CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for X103. 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 NexCOBOT website at www.nexcobot.com.

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











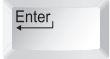
When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- 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 allows you to enter Setup.

Press the  key 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.
	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.
	Selects a field.
	Displays General Help.
	Load previous values.
	Load optimized default values.
	Saves and exits the Setup program.
	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  .

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  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.

```

Aptio Setup - AMI
Main Advanced Security Boot Save & Exit
-----
BIOS Information
BIOS Vendor      American Megatrends  *|
Product Name     X103                 *|
Project Version  X103-016 x64        *|
Build Date and Time 04/16/2024 13:49:27 *|
Lan1 MAC Address  00-10-F3-BA-C5-24   *|
Lan2 MAC Address  00-10-F3-BA-C5-25   *|
Lan3 MAC Address  00-10-F3-BA-C5-26   *|
Name
Intel Atom(R) x6425E Processor @ 2.00GHz *|<: Select Screen
Stepping         B0                 *|^v: Select Item
Microcode Revision 17                +|Enter: Select
+|+/-: Change Opt.
IGFX GOP Version  18.0.1044         +|F1: General Help
ME FW Version     15.40.30.2879      +|F2: Previous Values
Total Memory      4096 MB            +|F3: Optimized Defaults
Memory Data Rate  3200 MTPS          v|F4: Save & Exit
                  |ESC: Exit
-----
Version 2.22.1282 Copyright (C) 2024 AMI
  
```

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.

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 - AMI
Main  Advanced  Security  Boot  Save & Exit

-----
ATX mode
Power State After G3  [S0 State]
WAKE on LAN/COM      [Enabled]
USB Power State in S5 [OFF]
eDP/LVDS Support     [OFF]
> CPU Configuration
> SATA Configuration
> Trusted Computing
> ACPI Settings
> NCT6126D Super IO Configuration
> Hardware Monitor
> S5 RTC Wake Settings
> Serial Port Console Redirection
> USB Configuration
> Network Stack Configuration

Specify what state to
go to when power is
re-applied after a
power failure (G3
state).

-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

-----
Version 2.22.1282 Copyright (C) 2024 AMI

```

Power State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state).

WAKE on LAN/COM

Enable or Disable the integrate LAN & COM port RI to wake the system.

eDP/LVDS Support

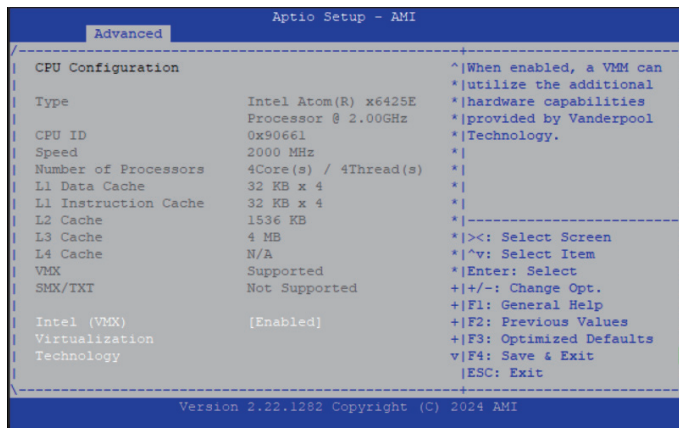
Enable or disable eDP/LVDS support.

LVDS Panel Type

Configure a resolution for the LVDS panel.

CPU Configuration

This section is used to display the current CPU information and configure the installed CPU.



Intel (VMX) Virtualization Technology

When Enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

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

Intel(R) Speedstep(tm)

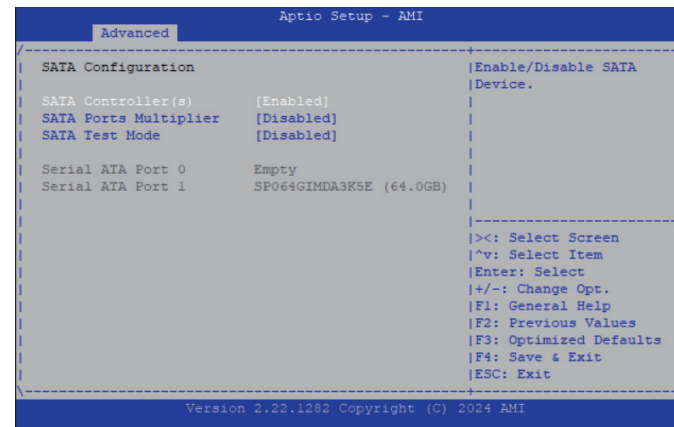
Enable or disable Intel Speedstep technology.

Turbo Mode

Enable or disable turbo mode.

SATA Configuration

This section is used to display and configure the SATA connection of the device.



SATA Controller(s)

Enable or disable the SATA controller. The options below will be available when enabling this item.

SATA Ports Multiplier

Enable or disable ports multiplier.

SATA Test Mode

Enable or Disable SATA Test mode.

Trusted Computing

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

```

Advanced
-----
TPM 2.0 Device Found          Enables or Disables
Firmware Version: 73.64      BIOS support for
Vendor: STM                   security device. O.S.
                               will not show Security
Security Device [Enable]     Device. TCG EFI
Support                       protocol and INT1A
Active PCR banks SHA256      interface will not be
Available PCR banks SHA256  available.
-----
SHA256 PCR Bank [Enabled]
-----
Pending operation [None]
Platform Hierarchy [Enabled]
Storage Hierarchy [Enabled]
Endorsement Hierarchy [Enabled]
-----
><: Select Screen
^v: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
-----
Version 2.22.1282 Copyright (C) 2024 AMI

```

Security Device Support

Enable or disable BIOS support for security device. Note that the O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available. More options will be available if the option is configured to Enabled.

SHA256 PCR Bank

Enable or disable SHA256 PCR Bank.

Pending operation

Schedule an operation for the security device. Note that your computer will reboot during restart in order to change state of security device.

Platform Hierarchy

Enable or disable Platform Hierarchy.

Storage Hierarchy

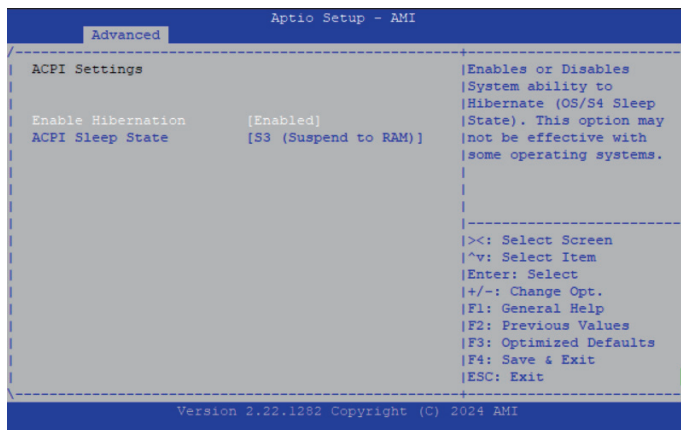
Enable or disable Storage Hierarchy.

Endorsement Hierarchy

Enable or disable Endorsement Hierarchy.

ACPI Settings

This section is used for the configuration of the ACPI (Advanced Configuration and Power Interface) settings.



Enable Hibernation

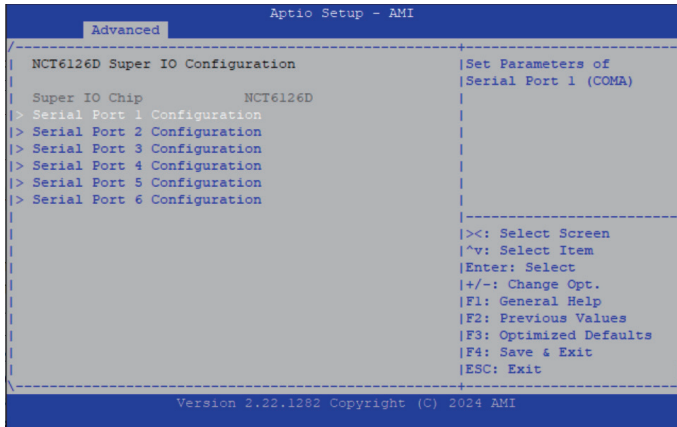
Enable or disable system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

ACPI Sleep State

Select ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

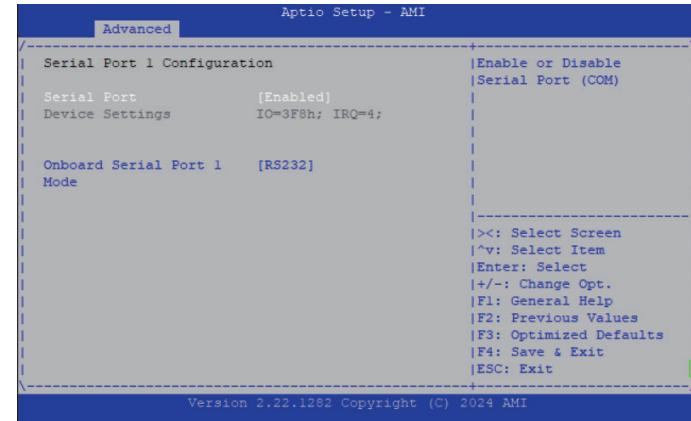
NCT6126D Super I/O Configuration

This section is used to configure the input/output of the serial ports.



Serial Port 1/2/3/4/5/6 Configuration

This section is used to enable and configure the input/output of the serial ports.



Serial Port 1/2/3/4/5/6 Configuration

Press Enter to configure the parameters of Serial Port 1/2/3/4/5/6.

Serial Port

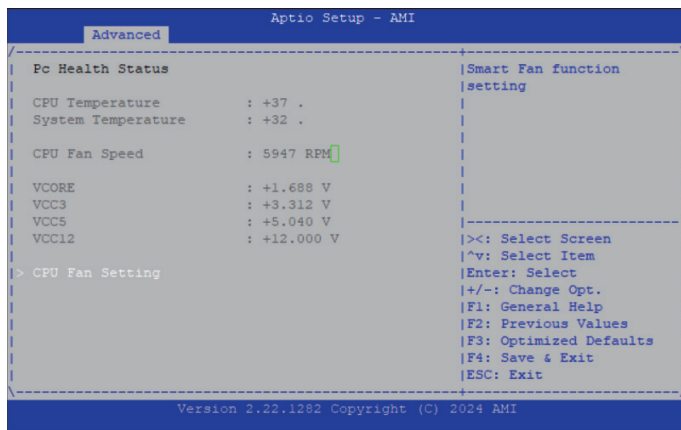
Enable or disable this serial port (COM).

Onboard Serial Port 1~6 Mode

Specify a mode for the serial port, COM1/2 can be configured as RS232/RS422/RS485, while COM3/4/5/6 can be configured as RS232.

Hardware Monitor

This section is used to monitor the hardware status such as temperature or fan speed.

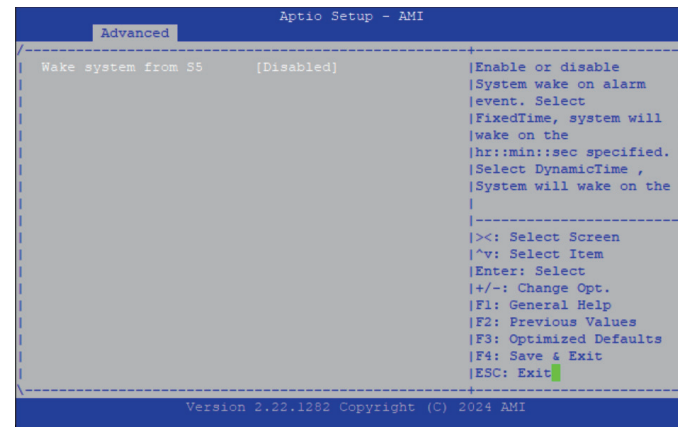


CPU Fan Setting

Press Enter to configure the smart fan function setting.

S5 RTC Wake Settings

This section is used to configure S5 RTC Wake Settings



Wake system from S5

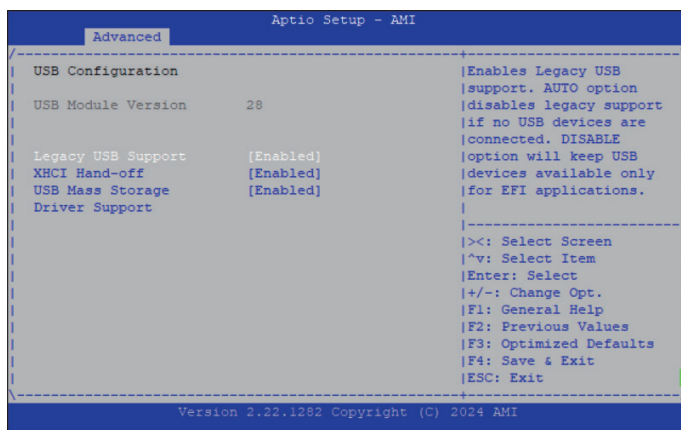
Disabled: Disable the system wake from S5.

Fixed Time: Set the system wake-up time in hours, minutes, or seconds.

Dynamic Time: System will wake on the current time + increase minute(s)

USB Configuration

This section is used to configure the USB functionality and related settings.



Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

XHCI Hand-off

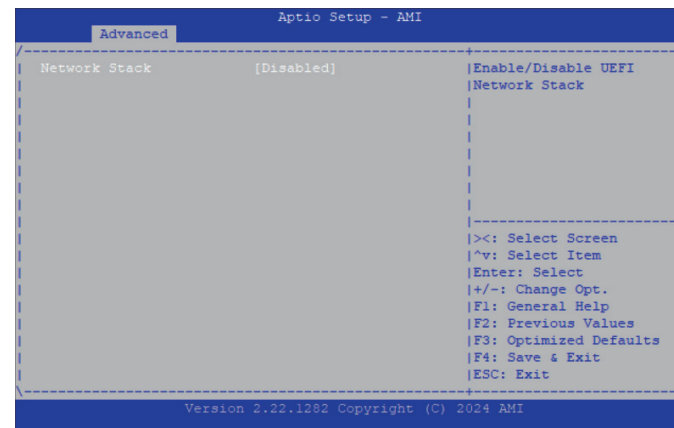
This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver.

USB Mass Storage Driver Support

Enable or disable USB mass storage driver support.

Network Stack Configuration

This section is used to configure the network stack.



Network Stack

Enable or disable UEFI network stack. Once enabled, PXE function will be available for configuration.

Ipv4 PXE Support

Enable or disable Ipv4 PXE Boot Support.

Ipv6 PXE Support

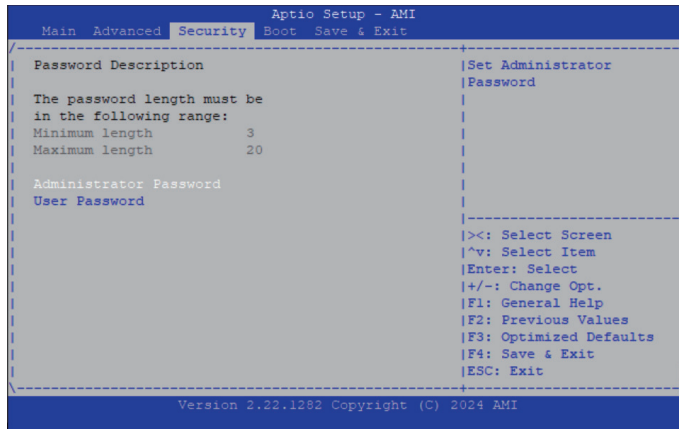
Enable or disable Ipv6 PXE Boot Support.

PXE boot wait time

Configure the wait time in second to press the ESC key to abort the PXE boot.

Security

This section is used to configure the security related options for BIOS protection.



Administrator Password

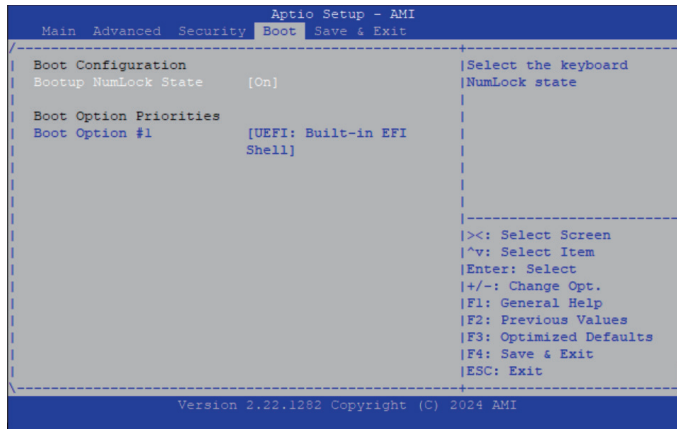
Select this to configure the administrator's password.

User Password

Select this to configure the user's password.

Boot

This section is used to configure the boot features.



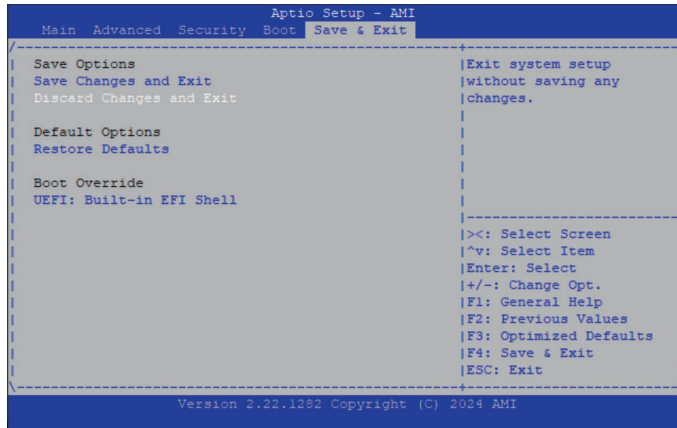
Bootup NumLock State

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.

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 Boot Option #2 and so forth.

Save & Exit



Save Changes and Exit

After save all the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting “Yes” and then exit the system setup.

Discard Changes and Exit

Press Enter to exit the BIOS without saving the changes. You may be prompted to confirm again before exiting.

Restore Defaults

Press Enter to restore the BIOS to the default settings. Confirm by selecting Yes when a dialogue box appears.

Boot Override

Select the desired device and press <Enter> to bypass the boot sequence from the boot option list and boot from a specific device.