

SYS-ITX-N-6425E

Industrial NANO-ITX
Industrial Embedded Computer
with Intel® Atom™ x6425E Processor

Product Manual



Revision History

Document Version	Last Updated Date	Brief Description of Change
v1.0	2/14/24	Initial release
v1.1	8/11/26	Updated conformal coating, warranty and web links information

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1. Before You Begin

Review the warnings in this section and the best practice recommendations (see “Best Practices” on page 66) when using and handling the WINSYSTEMS SYS-ITX-N-6425E embedded computer. Adherence to these recommendations provides an optimal user experience and prevents damage. Read through this document and become familiar with the SYS-ITX-N-6425E before proceeding.



APPLYING CONFORMAL COATING AFTER PURCHASE WILL VOID YOUR WARRANTY. FAILING TO COMPLY WITH THESE BEST PRACTICES MAY DAMAGE THE PRODUCT AND VOID YOUR WARRANTY.

1.1 Warnings

Only qualified personnel should configure and install the SYS-ITX-N-6425E. While observing best practices, pay particular attention to the following:



WARNING!

ESD-Sensitive Electronic Equipment

Observe ESD-safe handling procedures when working with this product. Always use this product in a properly grounded work area and wear appropriate ESD-preventive clothing and/or accessories. Always store this product in ESD-protective packaging when not in use.



Warning

Do not reverse the positive and negative terminals when you connect power to the unit. This voids the warranty and damages the embedded computer.

2. Introduction

This manual provides configuration and usage information for the SYS-ITX-N-6425E. If you still have questions, contact Technical Support at (817) 274-7553, Monday through Friday, between 8 AM and 5 PM Central Standard Time (CST).

Refer to the WINSYSTEMS website at <https://www.winsystems.com/> for other accessories (including cable drawings and pinouts) that can be used with your SYS-ITX-N-6425E.

3. Functionality

The SYS-ITX-N-6425E is an industrial NANO-ITX embedded computer. Its compact design and low power dissipation board is ideal for digital signage, digital security surveillance (DSS), medical, and industrial IoT applications. The processor for the unit is an Intel Atom® Quad-core x6000E, integrated into the SYS-ITX-N-6425E. This low-profile system provides a rugged platform base that protects the PCB assembly and offers convenient mounting. Information to configure and operate the SYS-ITX-N-6425E for most applications is included in this Product Manual or on our website at <https://www.winsystems.com/>.

NOTE WINSYSTEMS can provide custom configurations for original equipment manufacturer (OEM) clients. For details, please contact an Application Engineer through Technical Support (see “Introduction” on page 5 for contact information).

4. Features

This section describes the features of the SYS-ITX-N-6425E embedded computer.

Package Contents

- One SYS-ITX-N-6425E NANO-ITX embedded computer
- One external AC/DC power supply

Embedded Computer

- x6000E series Intel Atom® processor
- Up to 3.0 GHz
- 4 cores
- 1.5 MB L2 cache

Operating Systems (compatibility)

The SYS-ITX-N-6425E uses the Intel Elkhart Lake system on a chip (SOC). This embedded computer supports Linux, Windows® 10/11 IoT, and other x86-compatible real-time operating systems.

Please contact a WINSYSTEMS Sales Engineer for OS BSP availability.

Memory

- Up to 32 GB in 1 slot 260-pin DDR4 SO-DIMM socket.
- Supports DDR43200MT/s

BIOS

- AMI uEFI BIOS (SPI ROM)

Video Interfaces

- Intel® Gen 11 Graphics
- Supports multiple displays
- HDMI: Up to resolution 4096 x 2160@60Hz
- DP: Up to resolution 4096 x 2160@60Hz
- VGA: Up to resolution 1920 x 1200

Ethernet

NOTE GPY215 port default supports 1000Mbps. On Elkhart Lake platform, GPY215 cannot automatically downgrade to 10/100/1000 Mbps while setting speed to 2500Mbps

- Supports one 10/100/1000 Mbps Ethernet port via PCI Express x1 (Controller: I210IT)
- Supports one 10/100/1000/2500 Mbps Ethernet port via SGMII (PHY: GPY215)

Storage (Bootable)

- One SATA port for 2.5-inch SATA HDD/SSD
- One mSATA socket (Switch mSATA or Mini-PCIe by BIOS)

Serial Interface

- One serial port (RS232/422/485, BIOS configurable)

USB

- Two USB 3.2 Gen 1 ports

SD Interface

- One micro SD socket

Expansion Interface

- One M.2 E key(2230) socket for wireless application (PCIe x1 / USD2.0)\
- One full-size mini-PCIe socket (Switch mSATA or Mini-PCIe by BIOS)

Audio

- Line out audio Jack on rear I/O

Power

- DC 12 V input (rear I/O)
- +12 V DC input (9 W typical)

Additional Features

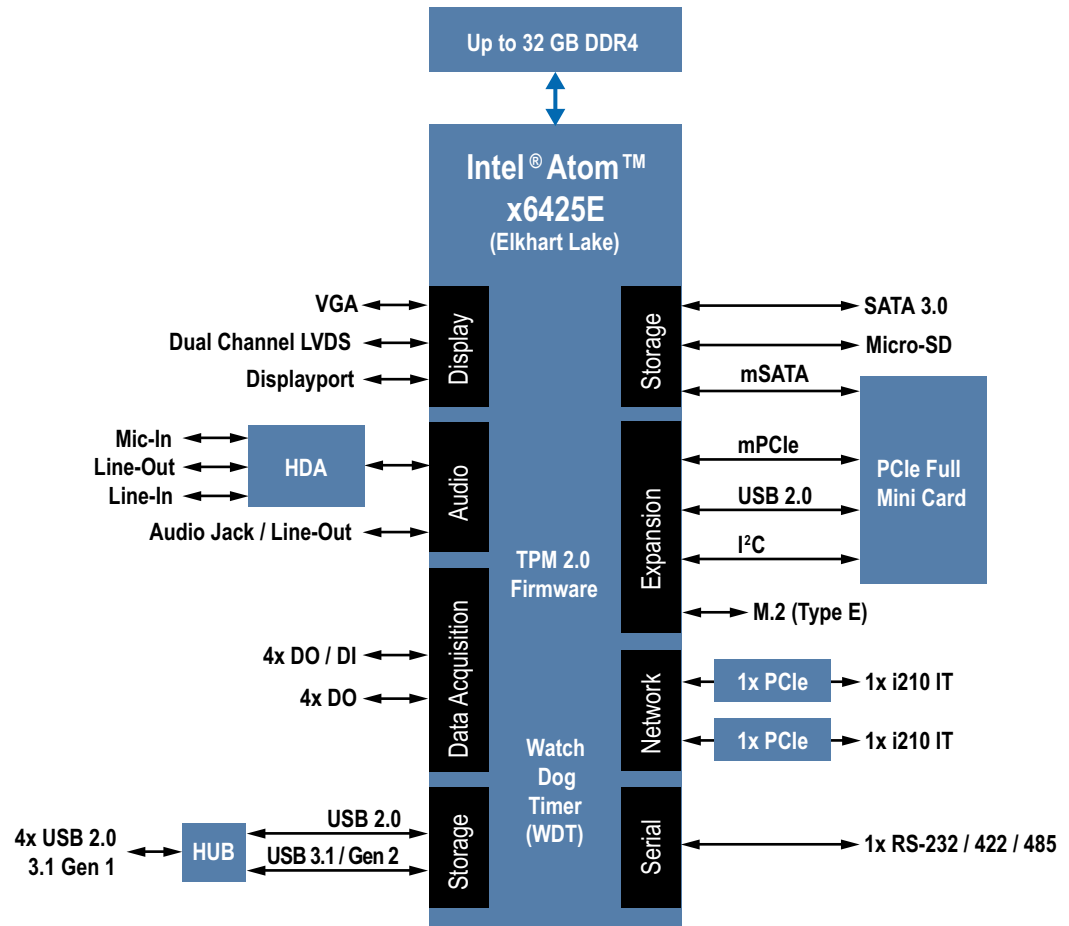
- Watchdog timer (WDT). Supports WDT function through software programming for enable/disable and interval setting, and a general system reset.

Temperature

- Operating temperature: -20 ~ 60° C (-4° ~ 140° F)
- Storage temperature: -40 ~ 85° C (-40° ~ 185° F)
- Humidity: 95% @ 40° C (104 °F) non-condensing

5. General Operation

5.1 System Block Diagram



6. Specifications

The SYS-ITX-N-6425E adheres to the following specifications and requirements.

Electrical	
V _{CC}	12 V DC ±5%, 40 watts (maximum)
MTBF	11 years
Mechanical	
Mechanical Dimensions	7 x 6 x 2.6 in. (179.7 x 151.6 x 67.7 mm)
Weight	3.1 lb. (1.4 kg)
Environmental	
Temperature	Operating temperature: -20 ~ 60° C (-4° ~ 140° F) Requires airflow and high temperature grade DRAM.
Humidity (RH)	Operating: 10% to 95% non-condensing
RoHS Compliant	Yes
Operating Systems	
This embedded computer supports Linux, Windows® 10/11 IoT, and other x86-compatible real-time operating systems.	

7. Setup

Use the information in this section to install the SYS-ITX-N-6425E. Refer to [“Configuration” on page 16](#) to locate and identify the connectors outlined in this section.

7.1 Installation and Connections

1. Connect a compatible monitor to either the VGA, HDMI, or DP connector.
2. Connect a USB keyboard to either of the two USB ports.
3. Plug in the boot media of your preference. The options are:
 - SATA data (J19), SATA power (J20)
 - mSATA (J17)
 - USB (J6)
4. If using a battery, connect the battery to J15.
5. Connect an Ethernet cable to a port at J4/J22 (as available).

7.2 Options Installation

These equipment options are available for the SYS-ITX-N-6425E:

- mSATA Device
- M.2 Key
- WiFi Antenna
- DIN Rail Mount

The following paragraphs provide instructions for installing these options.

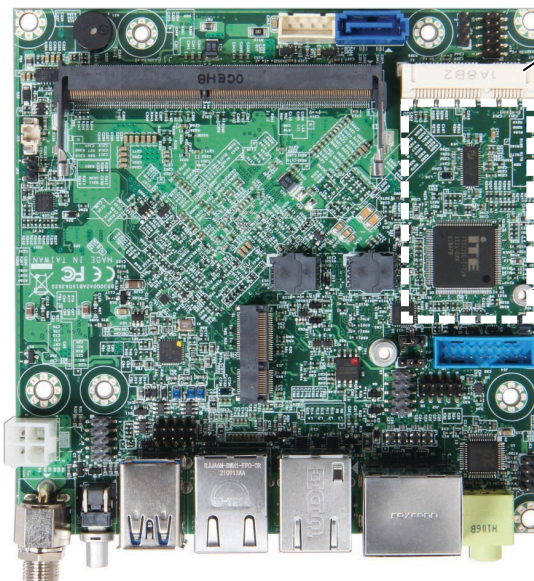
7.2.1 mSATA/Mini PCIe Device Installation

1. Remove four screws and remove top cover from case.
2. Insert the mSATA card into connector J17, ensuring that it is properly aligned.
3. Secure mSATA card in place using M3 x 6 screw.
4. Replace top cover and secure with four screws.

Remove
four screws



Remove
top cover



Insert mSATA
card into J17
connector

Secure mSATA card
in place with M3 x 6
screw

7.2.2 M.2 Key Installation

1. Remove four screws and remove top cover from case.
2. Insert the M.2 key into connector J13, ensuring that it is properly aligned.
3. Secure M.2 key in place using M3 x 6 screw.
4. Replace top cover and secure with four screws.

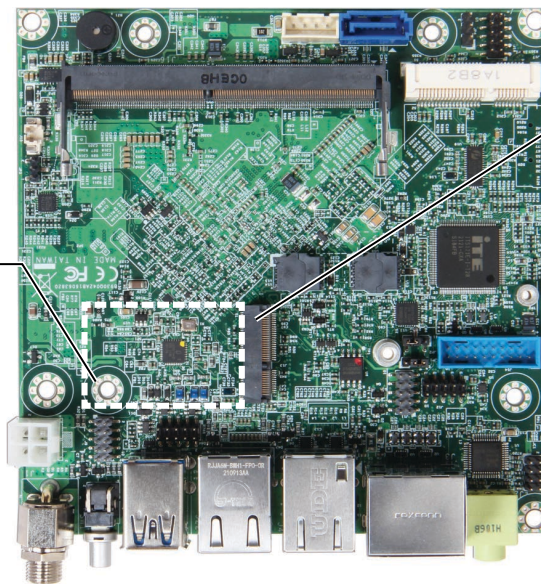
Remove
four screws



Remove
top cover



Secure M.2 key
in place with
M3 x 6 screw



Insert M.2
key into J13
connector

7.2.3 Antenna Installation

NOTE Procedure assumes that a WiFi card has been previously installed in the J13 connector.

1. Remove four screws and remove top cover from case.
2. Route the antenna cable through the rear panel hole.
3. Connect the antenna cable to the connector on the WiFi card.
4. Secure antenna cable to rear panel.
5. Replace top cover and secure with four screws.
6. Attach antenna to connector.

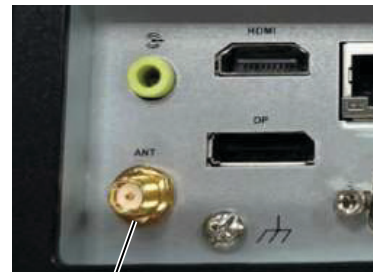
Remove
four screws



Remove
top cover



Connect antenna
cable to connector



Secure antenna
cable to rear panel

7.2.4 DIN Rail Mount Installation

1. Remove four screws and remove top cover from case.
2. Remove the front cover and replace with the DIN rail mounting panel.
3. Replace top cover and secure with four screws.
4. Attach DIN rail mount to unit with three screws.

Remove
four screws



Remove
top cover



Replace front
cover with
DIN rail mounting
panel



Secure DIN rail
mount with
three screws



7.3 Power Up

Plug in a compatible +12 V DC power source at J1. Press the power button to turn the SYS-ITX-N-6425E on and off or press and hold it to reset.

7.4 Driver Installation

The information in this section helps you to configure an operating system's driver for use with the on-board PCI devices of the SYS-ITX-N-6425E. Drivers and documentation are available on the WINSYSTEMS website at <https://www.winsystems.com/> or by contacting a Application Engineer at +1-817-274-7553.

7.4.1 Chipset Component Driver

The SYS-ITX-N-6425E uses the Intel Apollo Lake-I SOC. Older operating systems might not be able to recognize this chip. For compatibility issues with older Windows Operating Systems such as Windows 8, make sure to install the Apollo Lake-I SOC chipset component driver (INF) before any other driver.

7.5 Watchdog Timer (WDT)

The SYS-ITX-N-6425E features an advanced watchdog timer (WDT) that can be used to guard against software lockups. The timer is programmable from 1 second to 255 minutes (15,300 seconds).

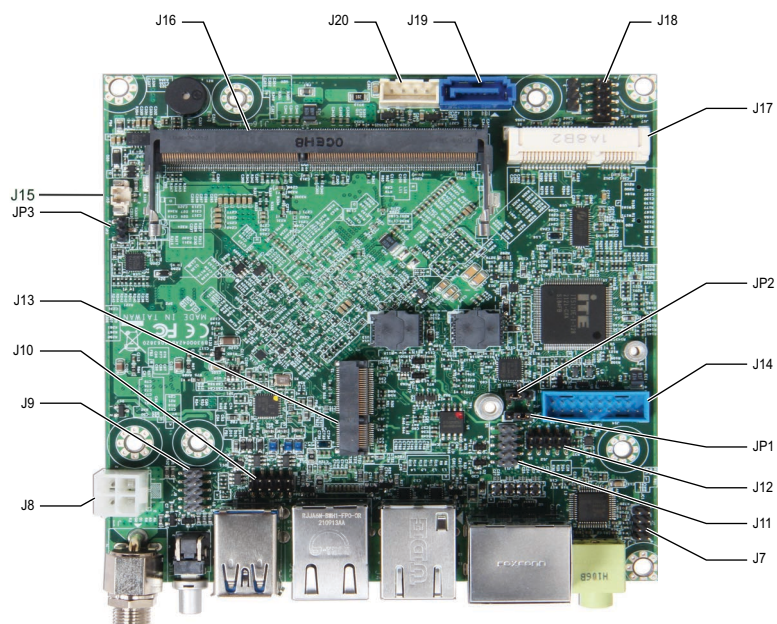
NOTE Use a long timeout if the watchdog timer is enabled and booting to an operating system.

Use the following example as a guide to programming the WDT.

8. Configuration

This section describes the SYS-ITX-N-6425E components and configuration.

8.1 Main Board Connectors



The following table provides connector descriptions and references for the main board, illustrated in the figure above.

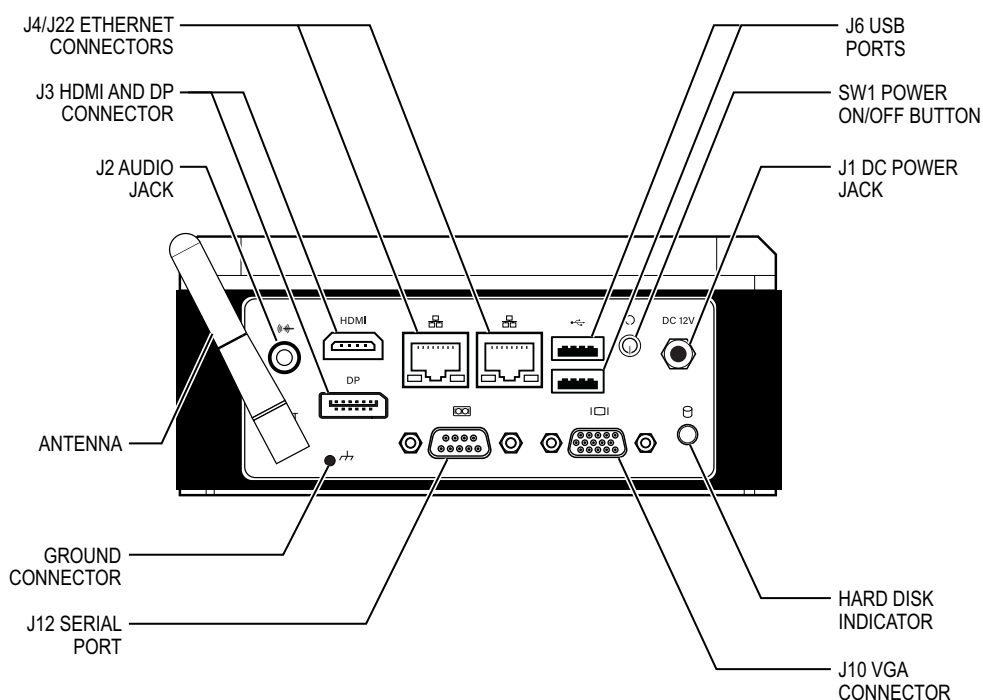
Item	Type	Description	Reference
J7	Header	External Audio Connector	page 28
J9	Header	Front Panel Pin HDR	page 29
J10	Header	VGA Pin HDR	page 29
J11	Header	General Purpose I/O Pin HDR	page 30
J12	Header	RS232/422/485 Pin HDR	page 30
J13	Connector	M.2 key E Socket	page 23
J14	Connector	External USB3 connector	page 25
J15	Connector	Battery connector	page 31
J16	Connector	DDR3 SODIMM Socket	page 27
J17	Connector	mSATA/Mini PCIe Socket	page 26
J18	Connector	80 Port connector	page 31
J19	Connector	SATA Gen3 connector	page 27
J20	Connector	SATA Power Header	page 28

Item	Type	Description	Reference
JP1	Jumper	Power on mode select	page 32
JP2	Jumper	Voltage output level select	page 32
JP3	Jumper	CMOS Clear	page 32

9. Component Layout

9.0.1 Rear Panel Connectors

Rear panel connectors provide common external connections.



The following table provides connector descriptions and references for the rear panel, illustrated in the figure above.

Item	Type	Description	Reference
J4/J22	Connector	RJ45 Connector	page 19
J3	Connector	HDMI/DisplayPort Connector	page 18
J2	Connector	Audio Jack (combo Line out/Mic in)	page 18
J6	Connector	USB 3.2 Connectors	page 20
J1	Connector	DC Jack	page 18
	Indicator	SSD Indicator LED	page 22
J10	Connector	VGA Connector	page 29
J12	Connector	RS232/422/485 Connector	page 30

Item	Type	Description	Reference
SW1	Switch	Power Button	page 21
	Connector	Ground connector	n/a
	Antenna	WiFi Antenna	page 13

9.0.2 DC Jack (J1)

This connector provides for a +12 V DC input from a power adapter.

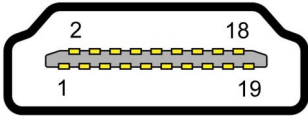
9.0.3 Audio Jack (combo Line Out/Mic In) (J2)

This connector provides an audio line out (Line_out) signal.

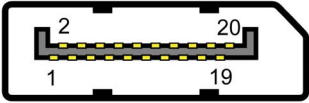
9.0.4 HDMI and DisplayPort (J3)

The J3 connector provides both an HDMI port and a DisplayPort™. These connectors supply both video and high-definition (HD) audio.

HDMI Layout and Pin Reference

			
Pin	Name	Pin	Name
1	D2+	2	D1_Shield
3	D2-	4	D1+
5	D1_Shield	6	D1-
7	D0+	8	D0_Shield
9	D0-	10	CK+
11	-	12	CK-
13	CK_Shield	14	HEC
15	I ₂ C_CLK	16	I ₂ C_DAT
17	GND	18	+5V
19	HOT_PLUG_DET		

DisplayPort Layout and Pin Reference

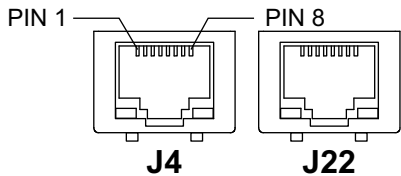
					
Pin	Name	Description	Pin	Name	Description
1	ML_Lane 0 (p)	Lane 0 (positive)	2	GND	Ground
3	ML_Lane 0 (n)	Lane 0 (negative)	4	ML_Lane 1 (p)	Lane 1 (positive)
5	GND	Ground	6	ML_Lane 1 (n)	Lane 1 (negative)
7	ML_Lane 2 (p)	Lane 2 (positive)	8	GND	Ground
9	ML_Lane 2 (n)	Lane 2 (negative)	10	ML_Lane 3 (p)	Lane 3 (positive)
11	GND	Ground	12	ML_Lane 3 (n)	Lane 3 (negative)
13	CONFIG1	CONFIG1	14	CONFIG2	CONFIG2
15	AUX_CH (p)	Auxiliary Channel (positive)	16	GND	Ground
17	AUX_CH (n)	Auxiliary Channel (negative)	18	Hot Plug	Hot Plug Detect
19	RETURN	Return for Power	20	DP_PWR	Power for connector (3.3 V 500 mA)

9.0.5 Ethernet Connector (J4/J22)

Two RJ45 connectors and two Intel I210-IT Gigabit Ethernet controllers provide standard IEEE 1588 and 802.1AS protocol time-stamping. Each Ethernet interface includes 10/100/1000 MP/s multispeed, full, and half-duplex operation.

The pinout below describes the standard RJ45 Ethernet connectors.

Layout and Pin Reference

		
Pin	Function	Description
1	TX_D1+	Transceive Data+
2	TX_D1-	Transceive Data-
3	RX_D2+	Receive Data+
4	BI_D3+	Bi-Directional Data+
5	BI_D3-	Bi-Directional Data-
6	RX_D2-	Receive Data-
7	BI_D4+	Bi-Directional Data+
8	BI_D4-	Bi-Directional Data-

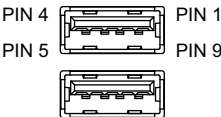
On-board Ethernet activity LEDs are built into the connectors at J4 and J22. There is one green LED (left) and one bi-color green/yellow LED (right).

LED	Activity	Ethernet Status
Left	Off	No Link
	Flashing (green)	Linked
Right	Off	No Link
	Off	Linked at 10 MB
	On (yellow)	Linked at 100 MB
	On (green)	Linked at 1 GB

9.0.6 USB Ports (J6)

J6 provides two USB 3.2 Type A connectors.

Layout and Pin Reference

			
Pin	Description	Pin	Description
1	USBVCC	6	RX+
2	D-	7	GND
3	D+	8	TX-
4	GND	9	TX+
5	RX-		

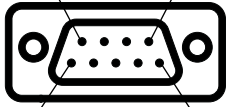
9.0.7 VGA Connector (J9)

Standard full size 15-pin VGA connector.

9.0.8 RS232/422/485 Connector (J10)

This DB9 connector provides access to the SYS-ITX-N-6425E serial port (RS232/422/485) at J10. This DB9 connector provides a serial port connection and is switched by BIOS.

Layout and Pin Reference

			
Pin	RS232	RS422	RS485
1	DCD#	T-	RX/TX-
2	RXD#	T+	RX/TX+
3	TXD#	R+	N/A
4	DTR#	R-	N/A
5	GND	GND	GND
6	DSR#	N/A	N/A
7	RTS#	N/A	N/A
8	CTS#	N/A	N/A
9	RI#	N/A	N/A

9.1 Power

The main power supply to the embedded computer is +12 V DC. The SYS-ITX-N-6425E draws power through the J1 connector. See “The following table provides connector descriptions and references for the rear panel, illustrated in [“Configuration” on page 16](#).

9.2 Controls and Indicators

9.2.1 Power Button (SW1)

The power button (SW1), located next to J1, controls power to the SYS-ITX-N-6425E. The first time you connect power to J1, the power button is bypassed and the embedded computer powers up automatically. See [“Rear Panel Connectors” on page 17](#) for switch location.

After the initial power up, press **SW1** briefly to power the unit on or off, depending on the present state.

If the unit accidentally locks up and is unresponsive, press and hold **SW1** for four (4) seconds to perform a hard restart.

9.2.2 SDD Indicator LED

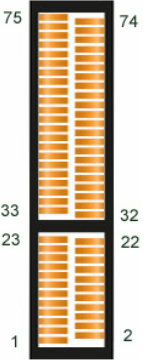
LED illuminates to show real-time read and write activity of your SSD.

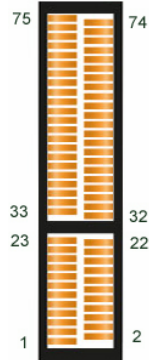
9.3 Connectors

9.3.1 M.2 key E Socket (J13)

The SYS-ITX-N-6425E provides a 2230 M.2 key E Socket to support a variety of peripherals as available in this format.

Layout and Pin Reference

			
Pin	Description	Pin	Description
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	LED1#
7	GND	8	PCN_CLK/I2S SCK
9	SDIO CLK/SYSCLK	10	PCM SYNC/I2S WS
11	SDIO CMD	12	PCM_IN/I2S_IN
13	SDIO DATA0	14	PCM_OUT/I2S SD_OUT
15	SDIO DATA1	16	LED2#
17	SDIO DATA2	18	GND
19	SDIO DATA3	20	UART WAKE#
21	SDIO WAKE#	22	UART Rx/D
23	SDIO RESET#/TX_BLANKING		
E KEY			
		32	UART Tx/D
33	GND	34	UART CTS
35	PETp0	36	UART RTS
37	PETn0	38	Vendor defined
39	GND	40	Vendor defined
41	PERp0	42	Vendor defined
43	PERn0	44	COEX3
45	GND	46	COEX_RxD
47	PEFCLKP0	48	COEX_TxD
49	PEFCLKN0	50	SUSCLK
51	GND	52	PERST0#

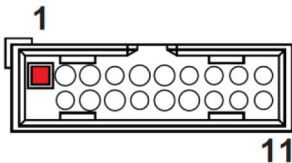


Pin	Description	Pin	Description
53	CLKREQ0#	54	W_DISABLE2#
55	PEWake0#	56	W_DISABLE1#
57	GND	58	I2C_DATA
59	Reserved/PETp1	60	I2c_CLK
61	Reserved/PETn1	62	ALERT#
63	GND	64	Reserved
65	Reserved/PERp1	66	UIM_SWP/PERST1#
67	Reserved/PERn1	68	UIM_POWER_SNK/CLKREQ1#
69	GND	70	UIM_POWER_SRC/PEWAKE1#
71	Reserved/REFCLKp1	72	+3.3V
73	Reserved/REFCLKn1	74	+3.3V
75	GND		

9.3.2 External USB3 Connector(J14)

Voltage (5 V DC) through pin 1 and pin 19 is always available. It is supplied by the 5 V VCC power source (in normal operation mode) or by the 5 V standby power source (in standby mode)

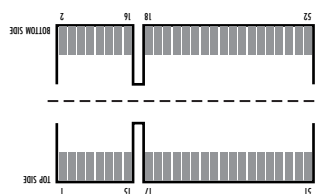
Layout and Pin Reference

			
Pin	Description	Pin	Description
1	5 V	11	USB2_DP_#3
2	USB3_RXM_#1	12	USB_DM_#3
3	USB3_RXP_#1	13	Ground
4	Ground	14	USB3_TXP_#3
5	USB3_TXM_#1	15	USB3_TXM_#3
6	USB3_TXP_#1	16	Ground
7	Ground	17	USB3_RXP_#3
8	USB2_DM_#1	18	USB3_RXM_#3
9	USB2_DP_#1	19	5 V
10	Ground	20	Key (no pin)

9.3.3 mSATA/Mini PCIe Socket (J17)

The SYS-ITX-N-6425E provides a Mini-PCIe socket to support a variety of peripherals as available in this format. The socket alternatively supports a mSATA device in this socket. Select mSATA, or Mini-PCIe in the BIOS to support your specific expansion device.

Layout and Pin Reference



Pin	Description	Pin	Description
1	GND	2	+3.3V
3	GND	4	+3.3V
5	NC	6	NC
1	NC	2	VCC_3V3
3	NC	4	GND
5	NC	6	NC
7	NC	8	USIM_VDD
9	GND	10	USIM_DATA
11	NC	12	USIM_CLK
13	NC	14	USIM_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	W_DISABLE
21	GND	22	NC
23	NC	24	VCC_3V3

Pin	Description	Pin	Description
25	NC	26	GND
27	GND	28	NC
29	GND	30	NC
31	NC	32	NC
33	NC	34	GND
35	GND	36	USB_DM
37	GND	38	USB_DP
39	VCC_3V3	40	GND
41	VCC_3V3	42	LED_WWAN

Pin	Description	Pin	Description
43	NC	44	NC
45	NC	46	NC
47	NC	48	NC
49	NC	50	NC
51	NC	52	VCC_3V3

9.3.4 DDR4 SODIMM Socket (J16)

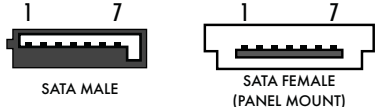
Connector J16 is a DDR4SO-DIMM socket. Supports DDR43200MT/s. Main Memory: NANO-6063 provides 1 x 260-pin SO-DIMM sockets which supports DDR4 non-ECC memory.

The maximum memory can be up to 32GB. Memory clock and related settings can be detected by BIOS via SPD interface.

9.3.5 2.5-inch SATA HDD/SSD Connector (J19)

The bootable SATA III (SATA 6 Gb/s) interface is located at J19. WINSYSTEMS offers CBL-SATA-701-20 for this connector.

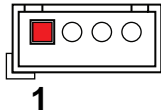
Layout and Pin Reference

	
Pin	Name
1	GND
2	TXP / A+
3	TXN / A-
4	GND
5	RXN / B-
6	RXN / B+
7	GND

9.3.6 SATA Power Header (J20)

Power is supplied to the SATA device via the connector at J20.

Layout and Pin Reference

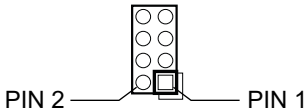
	
Pin	Name
1	+12 V
2	Ground
3	Ground
4	+5 V

9.3.7 MicroSD Card Socket (J21)

The SYS-ITX-N-6425E provides a MicroSD card socket for storage only.

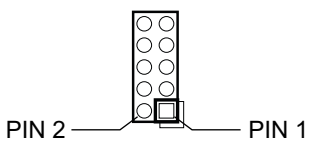
9.3.8 External Audio Connector (J7)

Layout and Pin Reference

	
Pin	Name
1	MIC_L
2	LINE_IN_L
3	GROUND
4	LINE_IN_R
5	LINE_OUT_L
6	GROUND
7	LIN_OUT_R
8	MIC_R

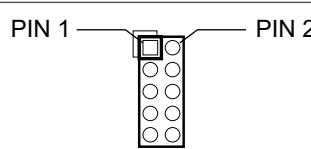
9.3.9 Front Panel Pin HDR (J9)

Layout and Pin Reference

	
Pin	Name
1	Ground
2	BIOS_RECOVERY
3	External Power LED (+)
4	External Power LED (-)
5	HDD LED (+)
6	HDD LED (-)
7	Reset (+)
8	Power On (-)
9	Reset (-)
10	Power On (+)

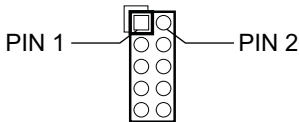
9.3.10 VGA Connector (J10)

Layout and Pin Reference

	
Pin	Name
1	RED
2	SCL
3	GREEN
4	GND
5	BLUE
6	SDA
7	VSYNC
8	GND
9	HSYNC
10	+5 V

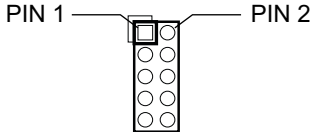
9.3.11 General Purpose I/O Connector (J11)

Layout and Pin Reference

	
Pin	Name
1	GPIO0
2	GPIO4 (Output only)
3	GPIO1
4	GPIO5 (Output only)
5	GPIO2
6	GPIO6 (Output only)
7	GPIO3
8	GPIO7 (Output only)
9	Ground
10	+5 V

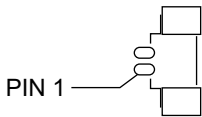
9.3.12 RS-232/422/485I/O Connector (J12)

Layout and Pin Reference

	
Pin	Name
1	DCD#/485D-/422T-
2	RXD#/485D+/422T+
3	TXD#/422R+
4	DTR#/422R-
5	Ground
6	DSR#
7	RTS#
8	CTS#
9	RI#
10	N/C

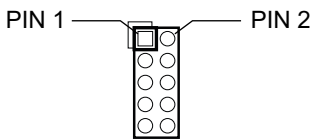
9.3.13 Battery Connector (J15)

Layout and Pin Reference

	
Pin	Name
1	Battery Voltage
2	Ground

9.3.14 80 Port Connector (J18)

Layout and Pin Reference

	
Pin	Name
1	EC_LEDA
2	3.3 V
3	EC_LEDB
4	EC_LEDE
5	EC_LEDC
6	EC_LEDF
7	EC_LEDD
8	EC_LEDG
9	EC_DGL#
10	GND

9.4 Jumper Settings

9.4.1 Power On Mode Select (JP1)

Set a jumper on JP1 to select the power mode for the board..

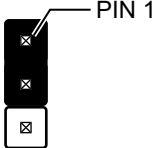


The diagram shows a 3-pin header labeled JP1. Pin 1 is the rightmost pin. A jumper is shown connecting Pin 1 to Pin 2.

Pin No.	Function
1-2 Short	AT
2-3 Short	ATX (Default)

9.4.2 GPIO4~7 Voltage Output Level Selection (JP2)

Set a jumper on JP2 to select the voltage output of GPIO4 through GPIO7.

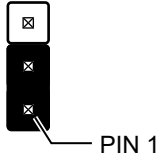


The diagram shows a 3-pin header labeled JP2. Pin 1 is the top pin. A jumper is shown connecting Pin 1 to Pin 2.

Pin No.	Function
1-2 Short	5 V
2-3 Short	3.3 V (Default)

9.4.3 CMOS Clear (JP3)

Clear the CMOS using jumper (JP3) below. Refer to [“Reset CMOS BIOS Configuration” on page 65](#) for more detail on using this jumper.



The diagram shows a 3-pin header labeled JP3. Pin 1 is the bottom pin. A jumper is shown connecting Pin 1 to Pin 2.

Pin No.	Function
1-2 Short	Normal Operation (Default)
2-3 Short	Clear CMOS Contents

10. BIOS Settings

10.1 General Information

The SYS-ITX-N-6425E includes a BIOS from AMI stored in Flash ROM. Access setup information through the BIOS setup utility to modify basic system configuration. The configuration is stored in CMOS RAM (it is retained during power-off). When power is applied to the system, the SYS-ITX-N-6425E communicates with peripheral devices and checks hardware resources against the configuration information stored in the CMOS memory. If during startup an error is detected or the CMOS parameters need to be initially defined, the diagnostic program prompts the user to enter the SETUP program. Some errors are significant enough to cause the startup to fail.

10.2 Entering Setup

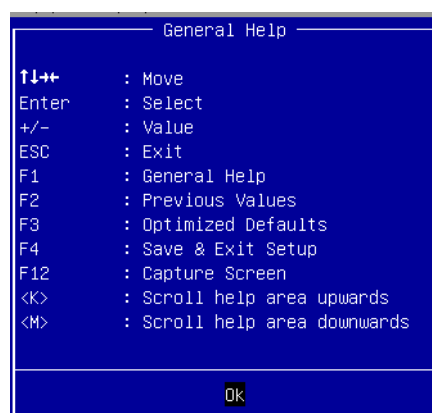
To enter setup, apply power to the computer and then press the **Delete** key or the **ESC** key. Either of these keys must be pressed when either the splash screen is displayed (during the system power-on self test, POST) or when the following prompt message is displayed. It may take a few seconds before the main setup menu screen is displayed.

Prompt message: Press <Delete> or <ESC> to enter SETUP

If the above message disappears before you respond and you can still to enter Setup by pressing the **RESET** button to restart the system. Alternatively, you can restart the system by simultaneously pressing the **CTRL**, **ALT**, and **DELETE** keys on the keyboard.

Prompt message: Press <F1> to Run General Help or Resume

At the above prompt, the BIOS setup program can provide a General Help screen. The menu can be easily called up from any menu by pressing **F1**. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press **ESC** to exit the Help screen.



10.3 Navigating the Menus

Use the up and down arrow keys to move among the selections and press **Enter** when a selection is highlighted to enter a sub-menu or to see a list of choices. See below for available options.

10.4 BIOS Screens

The following BIOS screens contain the options and sample settings for the SYS-ITX-N-6425E. Your actual configuration may differ from the screens shown here.



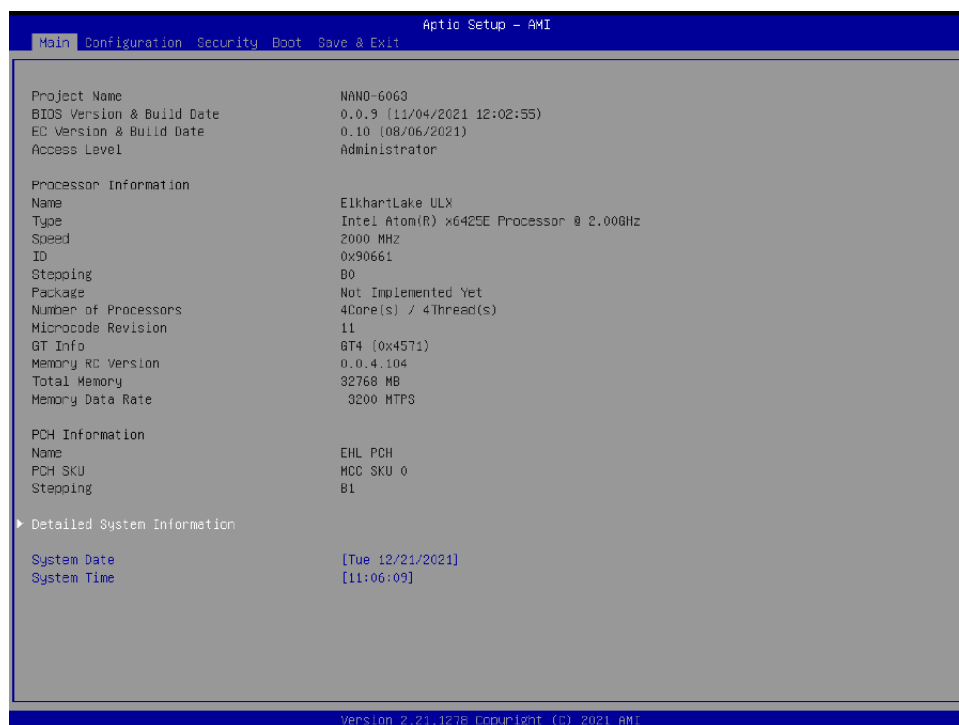
Warning

Assigning incorrect values to items on the following screen menus may cause system malfunction.

NOTE Use care when modifying BIOS settings.

Main

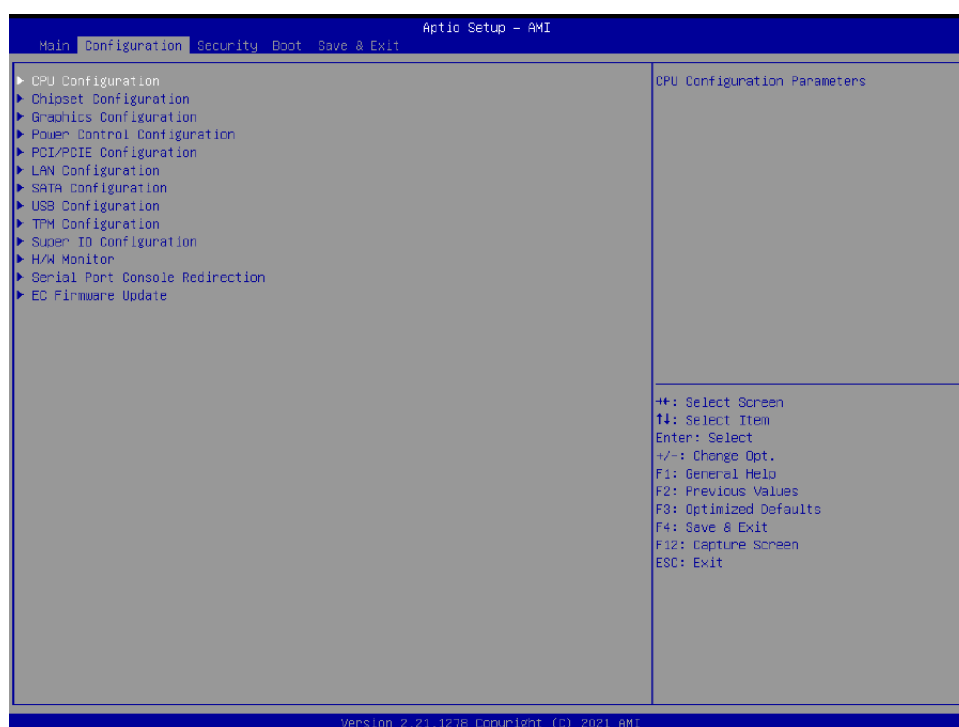
Use this screen to review basic system information and adjust system date and time.



Menu item	Description
System Information	System information parameters provide information and vary with BIOS version and the specific modules used.
System Date	Displays the current date in MM/DD/YYYY format. To set or change the date, highlight the row using the up/down arrow keys, then highlight the month, day, or year by pressing Enter until the desired value is highlighted with a square block. Use the +/- keys to change the highlighted value, or enter the time using the number keys.
System Time	Displays the current time in HH/MM/SS format. To set or change the time, highlight the row using the up/down arrow keys, then highlight the hour, minute, or second by pressing Enter until the desired value is highlighted with a square block. Use the +/- keys to change the highlighted value.

Configuration

Use this screen to set enhanced configuration features (see the following sections for specifics): [“CPU Configuration” on page 36](#)



CPU Configuration

Use this screen to configure the specific active cores and advanced processor management technologies.

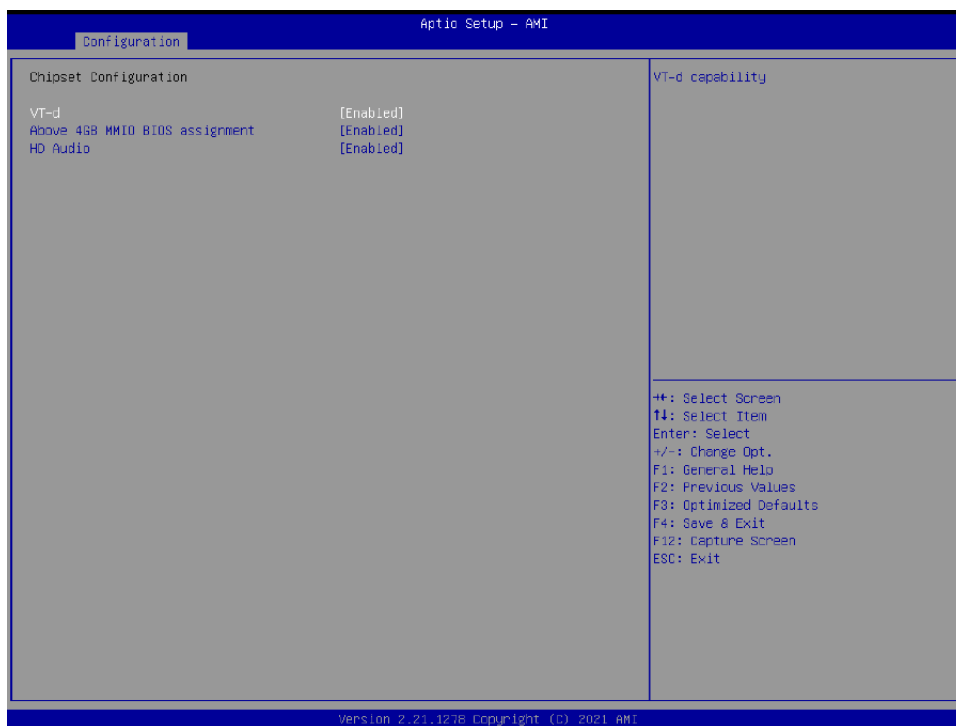


ABIOS Setup Information

Feature	Description	Options
CPU Flex Ratio Override	Enable/Disable CPU Flex Ratio Programming	Disabled (default) Enabled
CPU Flex Ratio Settings	This value must be between Max Efficiency Ratio (LFM) and Maximum non-turbo ratio set by hardware (HFM)	20 (default)
Intel (VMX) Virtualization Technology	When enabled, VMM can utilize the additional hardware capabilities provided by the Vander pool Technology	Enabled (default) Disabled
Active Processor Cores	Number of cores enabled in each processor package	ALL (default), 1, 2,3
Boot performance mode	Select the performance state that the BIOS will set starting from reset vector	Max Non-Turbo Performance (default), Max Battery, Turbo Performance
Intel® Speed Step™	Allows more than two frequency ranges to be supported	Enabled (default) Disabled
Intel® Speed Shift Technology	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.	Enabled (default) Disabled
Turbo Mode	Enable/Disable processor Turbo Mode (requires EMITM enabled too). AUTO means enabled.	Enabled (default) Disabled

Chipset Configuration

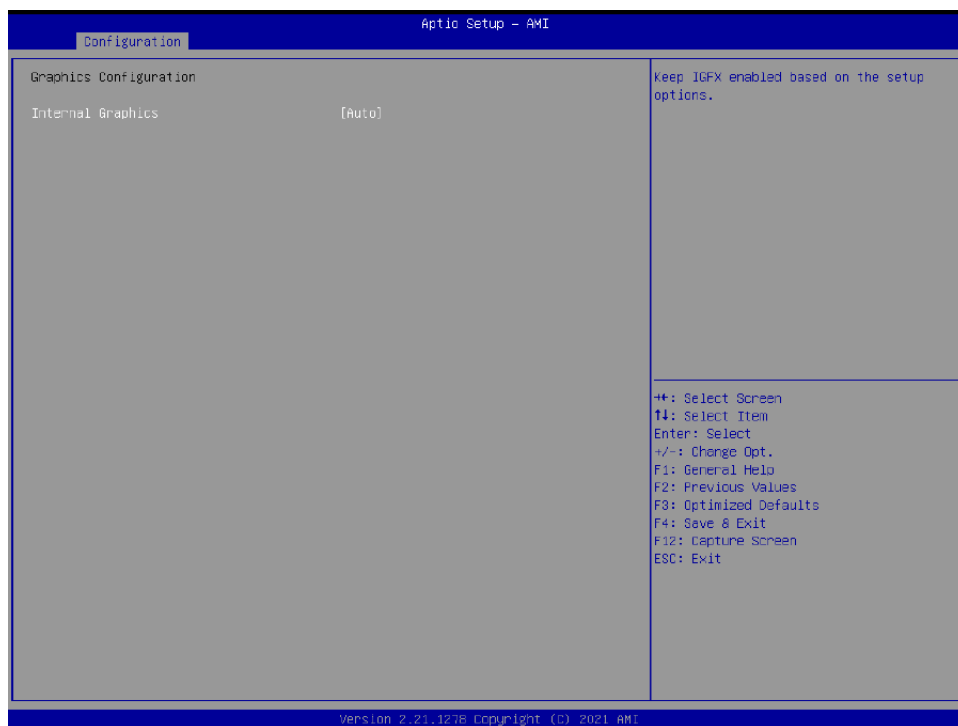
Use this screen to configure the timer and audio features.



Feature	Description	Options
VT-d	VT-d Capability	Enabled (default) Disabled
Above 4GB MMIO BIOS assignment	Enable/Disable above 4GB Memory Mapped IO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048 MB	Enabled (default) Disabled
HD Audio	Control Detection of the HD-Audio device. Disabled = HAD will be unconditionally disabled. Enabled = HAD will be unconditionally enabled.	Enabled (default) Disabled

Graphics Configuration

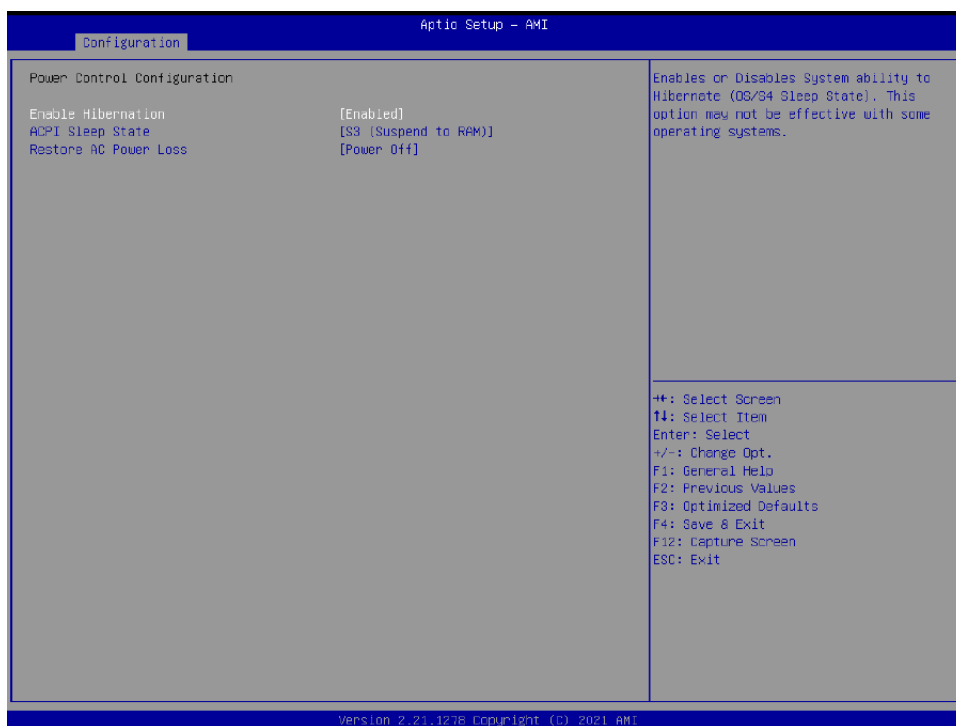
Use this screen to configure the onboard graphics features.



Feature	Description	Options
Internal Graphics	Keep IGFX enabled based on setup options	Auto (default) Disabled Enabled

Power Control Configuration

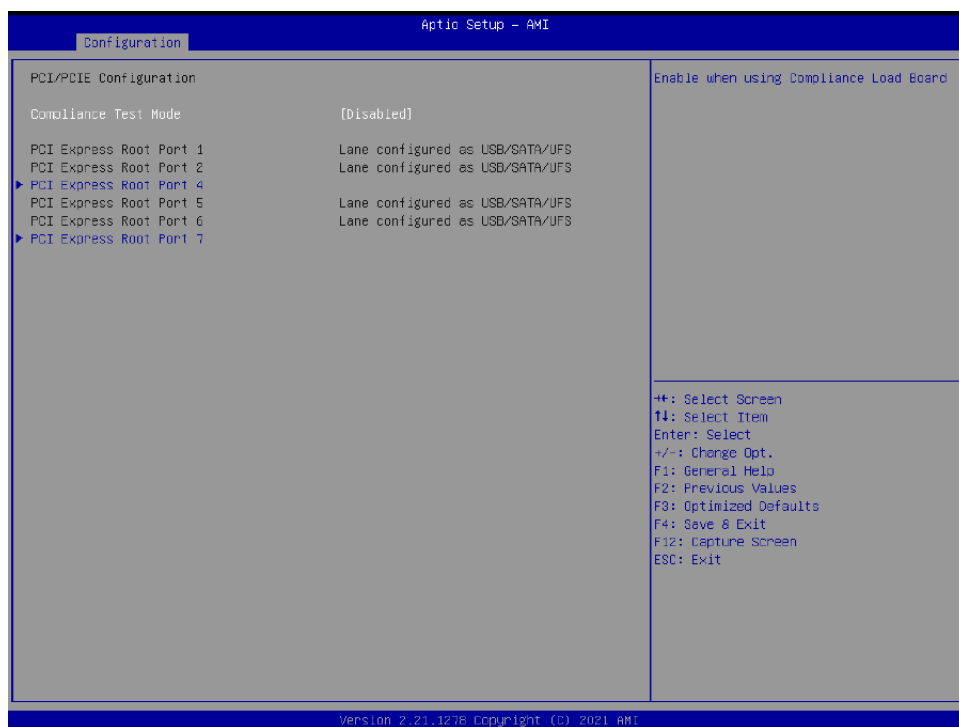
Use this screen to set the system power control configuration parameters.



Feature	Description	Options
Enable Hibernation	Enables/Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems	Enabled (default) Disabled
ACPI Sleep State	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed	S3 - suspend to RAM (default) Suspend disabled
Restore AC Power Loss	Specify what state to go to when power is re-applied after a power failure (G3 state)	Power Off (default) Power On

PCI/PCIE Configuration

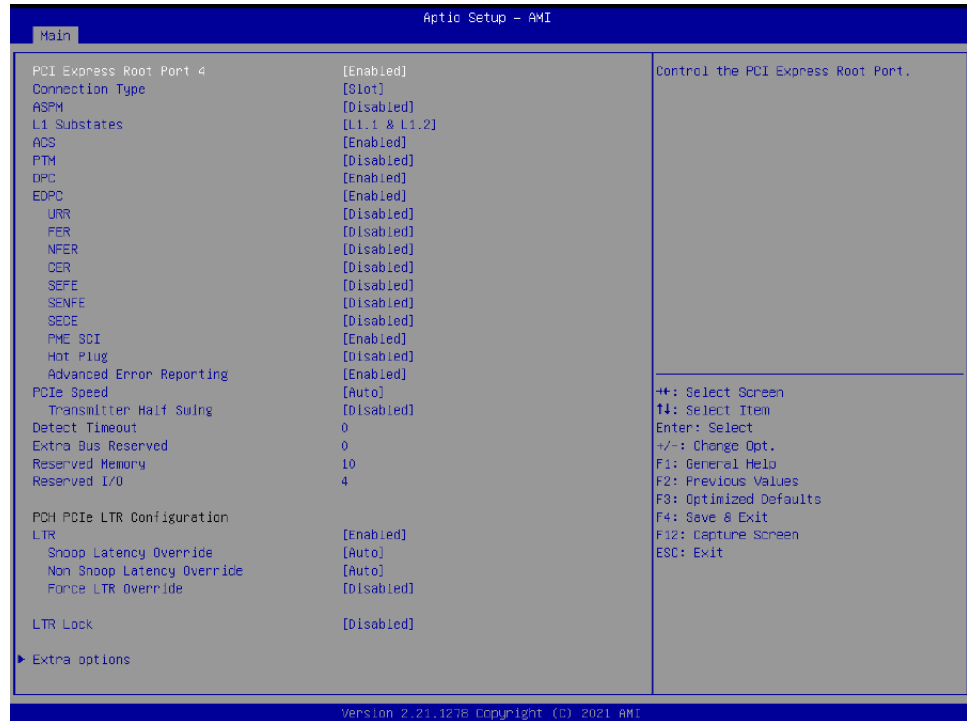
Use this screen to select mSATA or Mini-PCle.



Feature	Description	Options
Mini-PCle	Mini-PCle & mSATA Switch	mSATA (Default)

PCI Express Root Port 4

Use this screen to enable and configure the PCIe Port 4 assigned to M.2 parameters.



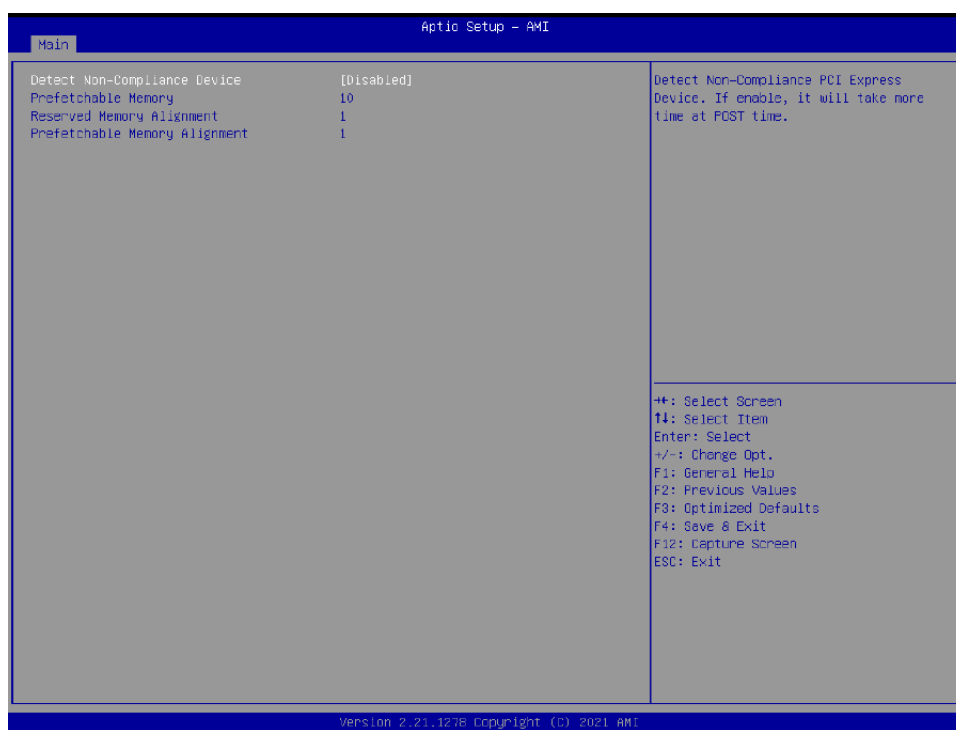
Feature	Description	Options
COMe PCIe Port	Control the PCI Express Root Port.	Enabled (default) Disabled
Connection Type	Built-In: a built-in device is connected to this root port. Slot Implemented bit will be clear. Slot: this root port connects to user-accessible slot. Slot Implemented bit will be set.	Slot (default), Built-in
ASPM	Set the ASPM Level: - Force L0s – Force all links to L0s State - AUTO - BIOS auto configure - DISABLE – Disables ASPM	Disabled (default) L0s, L1, L0sL1, Auto
L1 Substates	PCI Express L1 Substates settings.	L1.1 & L1.2 (default), L1.1, Disabled
ACS	Enable/Disable Access Control Services Extended Capability	Enabled (default), Disabled

Feature	Description	Options
PTM	Enable/Disable Precision Time Measurement	Disabled (default), Enabled
DPC	Enable/Disable Downstream Port Containment	Enabled (default), Disabled
EDPC	Enable/Disable Root port extensions for Downstream Port Containment	Enabled (default), Disabled
URR	PCI Express Unsupported Request Reporting Enable/Disable.	Disabled (default), Enabled
FER	PCI Express Device Fatal Error Reporting Enable/Disable	Disabled (default), Enabled
NFER	PCI Express Device Non-Fatal Error Reporting Enable/Disable	Disabled (default), Enabled
CER	PCI Express Device Correctable Error Reporting Enable/Disable.	Disabled (default), Enabled
SEFE	Root PCI Express System Error on Fatal Error Enable/Disable.	Disabled (default), Enabled
SENF	Root PCI Express System Error on Non-Fatal Error Enable/Disable.	Disabled (default), Enabled
SECE	Root PCI Express System Error on Correctable Error Enable/Disable.	Disabled (default), Enabled
PME SCI	PCI Express PME SCI Enable/Disable.	Enabled (default), Disabled
Hot Plug	PCI Express Hot Plug Enable/Disable.	Disabled (default), Enabled
Advanced Error Reporting	Advanced Error Reporting Enable/Disable.	Enabled (default), Disabled
PCIe Speed	Configure PCIe Speed	Auto (default), Gen1, Gen2, Gen3
Transmitter Half Swing	Transmitter Half Swing Enable/Disable.	Disabled (default), Enabled
Detect Timeout	The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.	0 (default)
Extra Bus Reserved	Extra Bus Reserved (0-7) for bridges behind this Root Bridge.	0 (default)

Feature	Description	Options
Reserved Memory	Reserved Memory for this Root Bridge (1-20) MB	10 (default)
Reserved I/O	Reserved I/O (4K/8K/12K/16K/20K) Range for this Root Bridge.	4 (default)
LTR	PCH PCIE Latency Reporting Enable/Disable	Enabled (default), Disabled
Snoop Latency Override	Snoop Latency Override for PCH PCIE. Disabled: Disable override. - Manual: Manually enter override values. - Auto (default): Maintain default BIOS flow.	Auto (default), Manual, Disabled
Snoop Latency Value	LTR Snoop Latency value of PCH PCIE	60 (default)
Multiplier	LTR Snoop Latency Multiplier of PCH PCIE	1024ns (default), 1ns, 32ns, 32768ns, 1048576ns, 33554432ns
Non Snoop Latency Override	Non Snoop Latency Override for PCH PCIE. - Disabled: Disable override. - Manual: Manually enter override values. - Auto (default): Maintain default BIOS flow.	Auto (default), Manual, Disabled
Non Snoop Latency Value	LTR Non Snoop Latency value of PCH PCIE	60 (default)
Non Snoop Latency Multiplier	LTR Non Snoop Latency Multiplier of PCH PCIE.	1024ns (default), 1ns, 32ns, 32768ns, 1048576ns, 33554432ns
Force LTR Override	Force LTR Override for PCH PCIE. - Disabled: LTR override values will not be forced. - Enable: LTR override values will be forced and LTR messages from the device will be ignored.	Disabled (default), Enabled
LTR Lock	PCIE LTR Configuration Lock	Disabled (default), Enabled
Extra options	PCI Express Root Port extra options.	

Extra Options

Use this screen to configure additional options for PCI express root port 4.



Feature	Description	Options
Detect Non-Compliance Device	Detect Non-Compliance PCI Express Device. If enable, it will take more time at POST time.	Disabled (default), Enabled
Prefetchable Memory	Prefetchable Memory Range for this Root Bridge.	10 (default)
Reserved Memory Alignment	Reserved Memory Alignment (0 – 31 bits)	1 (default)
Prefetchable Memory Alignment	Prefetchable Memory Alignment (0 – 31 bits)	1 (default)

LAN Configuration

Use this screen to configure the onboard LAN.

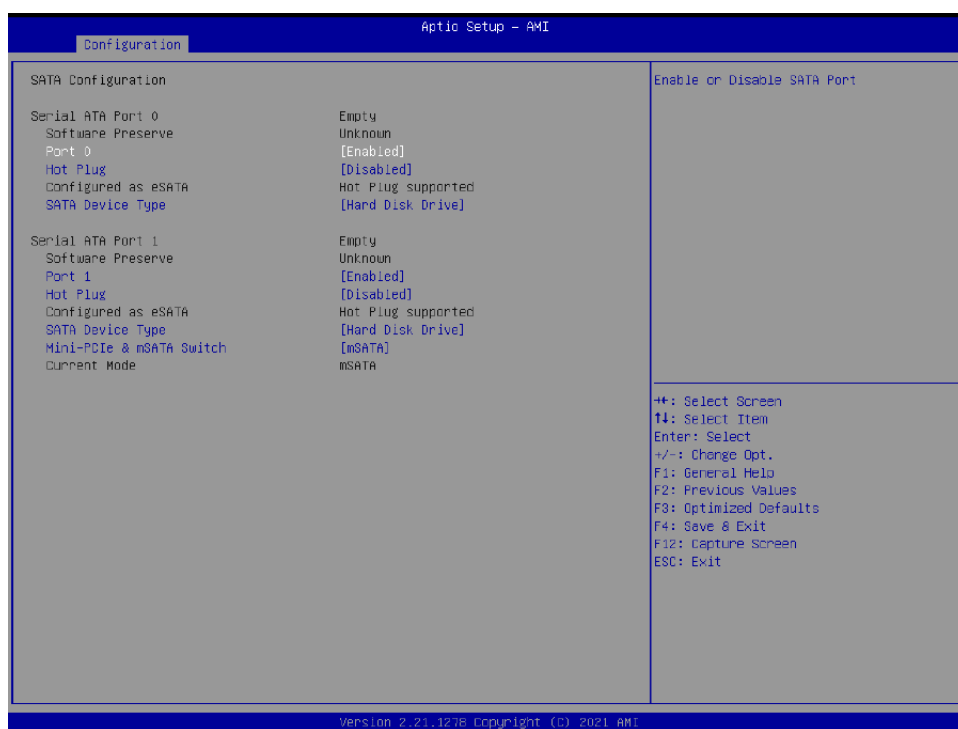


Feature	Description	Options
Intel PSE TSN GbE #0 (SGMII Mode)		
PSE TSN GBE 0	Select ownership for GBE	Host owned with pin muxed (default), SPE owned with pin
PSE TSN GBE 0 LinkSpeed	PSE TSN GBE 0 Link Speed configuration.	SGMII 1 Gbps (default), SGMII 2.5 Gbps
Intel Ethernet Controller WGI210AT		
On Board LAN	Controller On Board LAN Enabled or Disabled	Enabled (default), Disabled
On Board USB Power		
USB Port 0/1 Power	Controller USB Port Power Enabled or Disabled	Enabled (default), Disabled
USB Port 2/3 Power	Controller USB Port Power Enabled or Disabled	Enabled (default), Disabled
Network stack (Enable)		

Feature	Description	Options
Ipv4 PXE Support	Enable /Disable IPv4 PXE Support. If disable, IPv4 PXE boot support will not be available.	Enabled (default), Disabled
Ipv4 HTTP Support	Enable /Disable Ipv4 HTTP Support. If disable, IPv4 HTTP boot support will not be available.	Enabled (default), Disabled
Ipv6 PXE Support	Enable /Disable Ipv6 PXE Support. If disable, IPv6 PXE boot support will not be available.	Enabled (default), Disabled
Ipv6 HTTP Support	Enable /Disable Ipv6 HTTP Support. If disable, IPv6 HTTP boot support will not be available.	Enabled (default), Disabled
PXE boot wait time	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set value.	0 (default)
Media detect count	Number of times the presence of media will be checked. Use either +/- or numeric keys to set value.	1 (default)

SATA Configuration

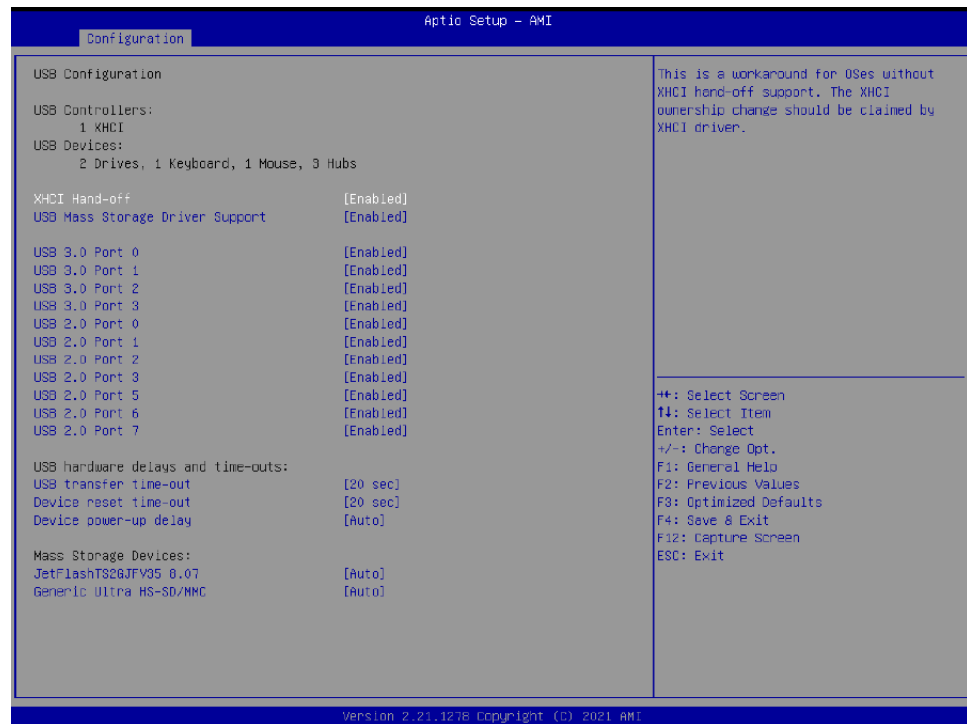
Use this screen to configure the SATA device options settings.



Feature	Description	Options
Serial ATA Port 0		
Port 0	Enable or Disable SATA Port	Enabled (default), Disabled
Hot Plug	Designates this port as Hot Pluggable	Disabled (default), Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive	Hard Disk Drive (default), Solid State Drive
Serial ATA Port 1		
Port 1	Enable or Disable SATA Port	Enabled (default), Disabled
Hot Plug	Designates this port as Hot Pluggable	Disabled (default), Enabled
SATA Device Type	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive	Hard Disk Drive (default), Solid State Drive
Mini-PCIe & mSATA Switch	Select Slot (J17) to be mSATA or Mini PCIe. [Auto] will use Pin7 to detect device type.	mSATA (default), Mini PCIe, Auto

USB Configuration

Use this screen to set the USB configuration parameters.

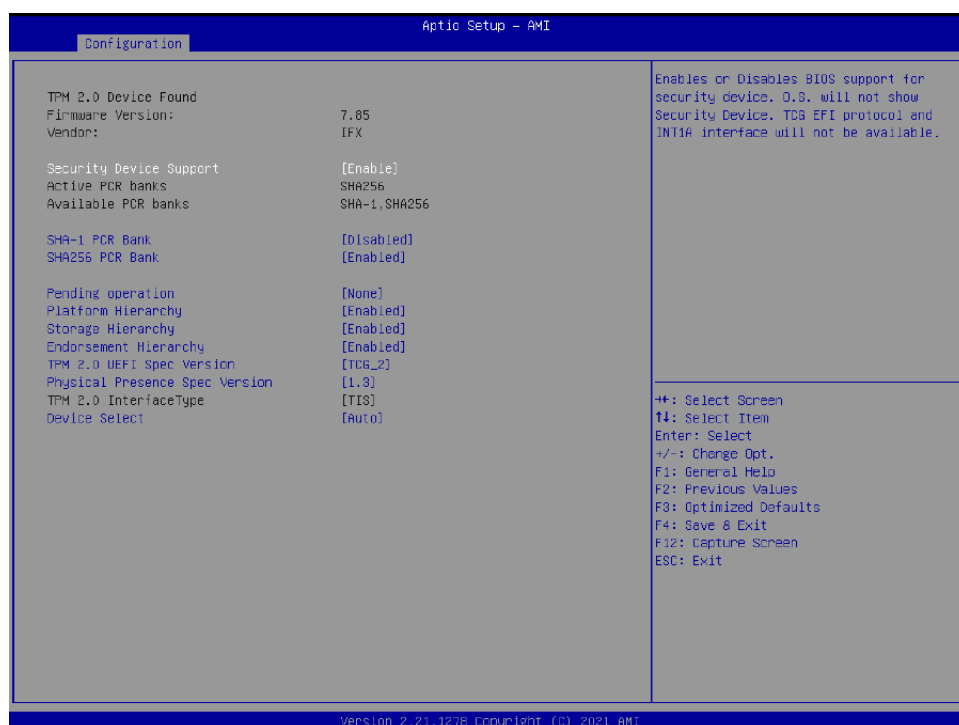


Feature	Description	Options
XHCI Hand- off	This is a workaround for OSeS without XHCI hand- off support. The XHCI ownership change should be claimed by XHCI driver	Enabled (default), Disabled
USB Mass Storage Driver Support	Enable/Disable USB Mass Storage Driver Support	Enabled (default), Disabled
COMe USB 3.0 Port 0 ~ 3	Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB device plug into the connector will not be detected by BIOS or OS.	Enabled (default), Disabled
COMe USB 2.0 Port 0 ~ 7	Enable/Disable this USB Physical Connector (physical port). Once disabled, any USB device plug into the connector will not be detected by BIOS or OS.	Enabled (default), Disabled

Feature	Description	Options
USB transfer time-out	The time-out value for Control, Bulk, and Interrupt transfers.	20 sec (default), 1, 5, 10
Device reset time-out	USB mass storage device Start Unit command time-out.	20 (default), 10, 30, 40 sec
Device power-up delay	Maximum time the device 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.	Auto (default), Manual
Device power-up delay -- Manual (default)		
Device power- up delay in seconds	Delay range is 1..40 seconds, in one second increments	5 (default)
Generic Ultra HS-SD/MMC	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM'; drives with no media will be emulated according to a drive type.	Auto (default), Floppy, Forced FDD, Hard Disk, CD-ROM

TPM 2.0 Configuration

Use this screen to set the trusted computing setting parameter.



Feature	Description	Options
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.	Enabled (default), Disabled
SHA-1 PCR Bank	Enables or Disables SHA-1 PCR Bank	Disabled (default), Enabled
SHA256 PCR Bank	Enables or Disables SHA256 PCR Bank	Enabled (default), Disabled
Pending operation	Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device	None (default), TPM Clear
Platform Hierarchy	Enables or Disables Platform Hierarchy	Enabled (default), Disabled
Storage Hierarchy	Enables or Disables Storage Hierarchy	Enabled (default), Disabled

Feature	Description	Options
Endorsement Hierarchy	Enables or Disables Endorsement Hierarchy	Enabled (default), Disabled
TPM2.0 UEFI Spec Version	Select the TCG2 Spec Version Support TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later	TCG_2 (default), TCG_1_2
Physical Presence Spec Version	Select to Tell O.S. to Support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3	1.3 (default), 1.2
Device Select	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.	Auto (default), TPM 1.2, TPM 2.0

Super IO Configuration

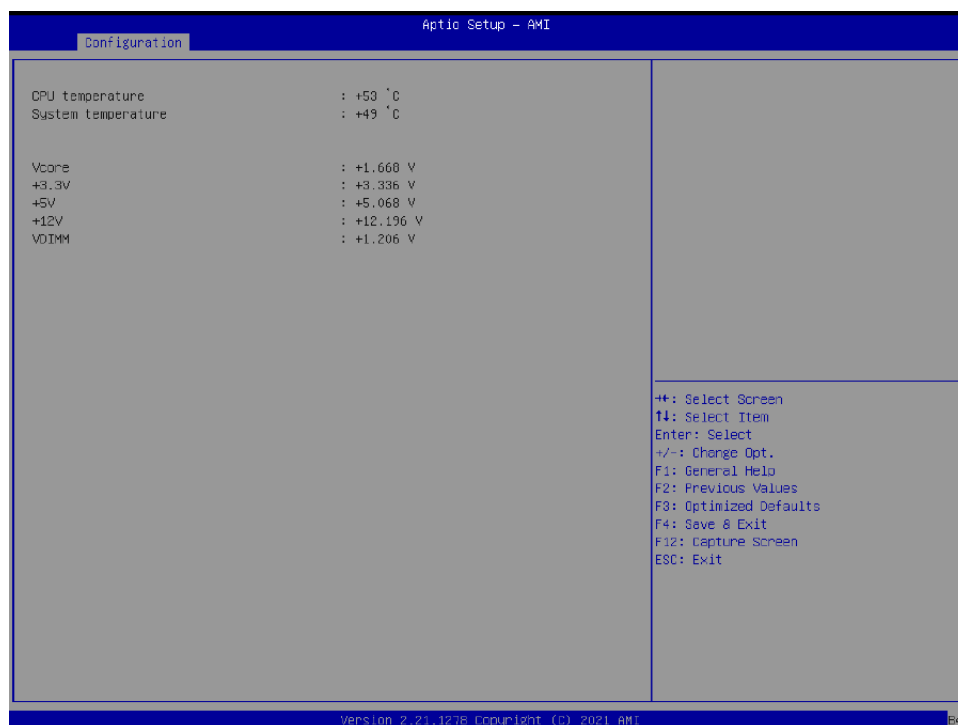
Use this screen to set the system super I/O chip parameters.



Feature	Description	Options
Module Serial Port 1	Enable or Disable Serial Port (COM)	Enabled (default), Disabled
RS-232/422/485 Control Option	Serial Port 3 RS-232/422/485 Control Option	RS-232 (default), RS-484 HALF DUPLEX, RS-422 FULL DUPLEX,
Watch Dog Timer	Enable/Disable Watch Dog Timer	Disabled (default), Enabled
Watch Dog Timer [Enabled]		
Timer Unit	Select Timer count unit of WDT [Watch Dog Timer [Enabled]]	Second (default), Minute
Timer value	Set WDT Timer value [Watch Dog Timer [Enabled]]	20 (default)

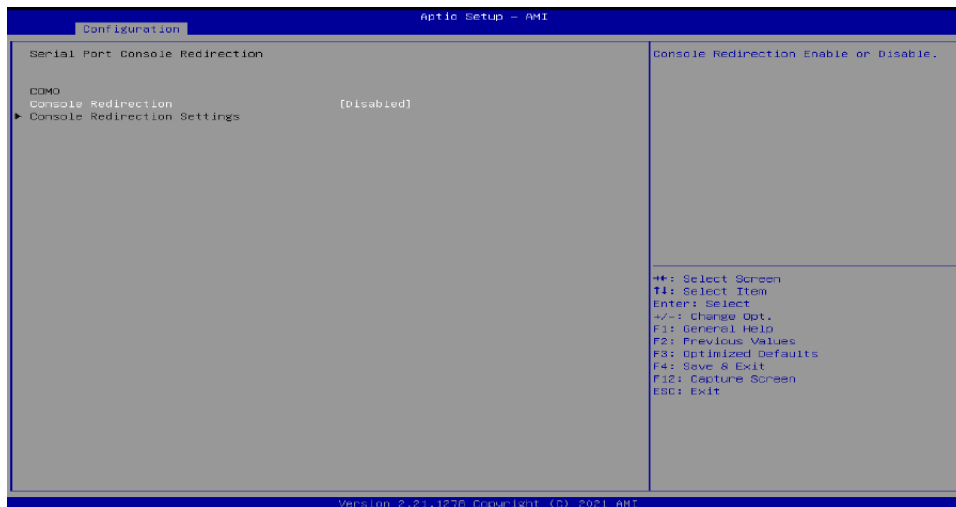
H/W Monitor Configuration

Use this screen to display the hardware status. There are no editable settings on this screen.



Serial Port Console Redirection

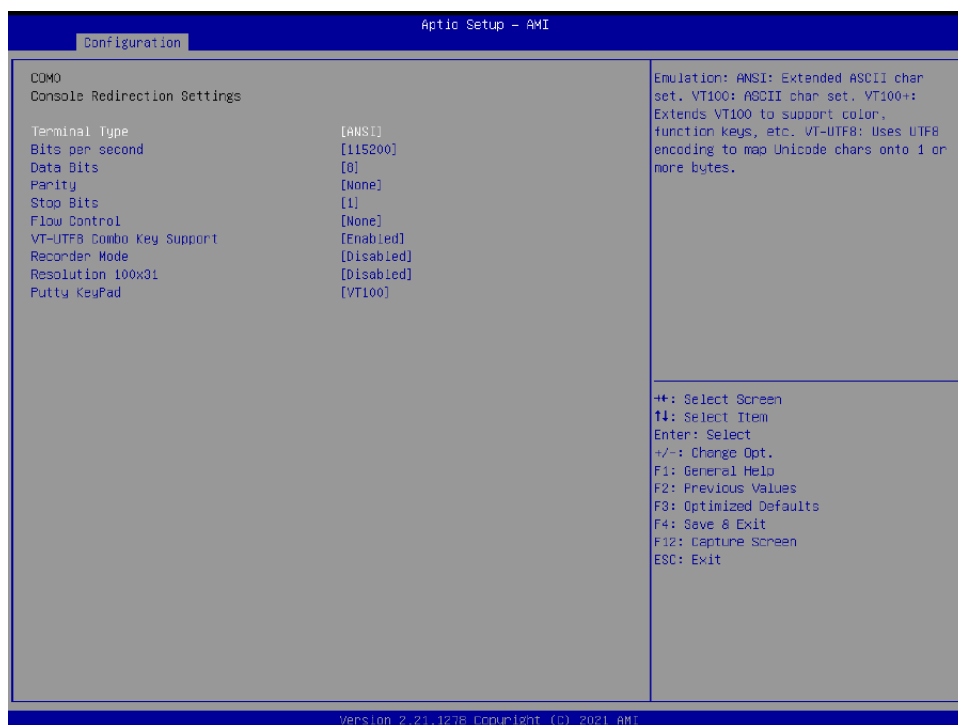
Use this screen to access and to enable/disable serial port console redirection settings.



Feature	Description	Options
COM0 Console Redirection	Console Redirection Enable or Disable	Disabled (default), Enabled

Console Redirection Settings (COM0)

Use this screen to specify how the host computer and the remote computer (which the user is using) exchange data. Both computers should have the same or compatible settings.

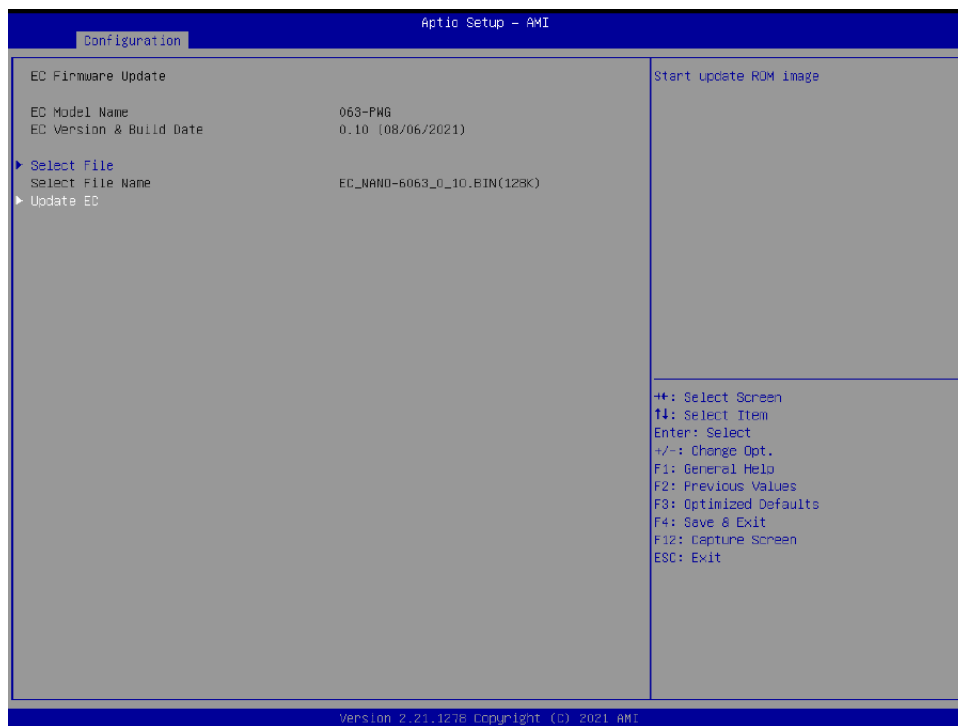


Feature	Description	Options
Terminal Type	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.	ANSI (default), VT100, VT100+, VT- UTF8
Bits per second	Select Serial port transmission speed. The speed must be matched on other side. Long or noisy lines may require lower speeds.	115200 (default), 9600, 19200, 38400, 57600
Data bits	Data bits	8 (default), 7

Feature	Description	Options
Parity	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.	None (default), Even, Odd, Mark, Space
Stop Bits	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.	1 (default), 2
Flow Control	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re- start the flow. Hardware flow control uses two wires to send start/stop signal.	None (default), Hardware RTS/CTS
VT-UTFB Combo Key Support	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals	Enabled (default), Disabled
Recorder Mode	With this mode enabled only text will be sent. This is to capture Terminal data.	Disabled (default), Enabled
Resolution 100x31	Enables or disables extended terminal resolution	Disabled (default), Enabled
Putty KeyPad	Select Function Key and KeyPad on Putty	VT100 (default), LINUX, XTERMR6, SCO, ESCN, VT400

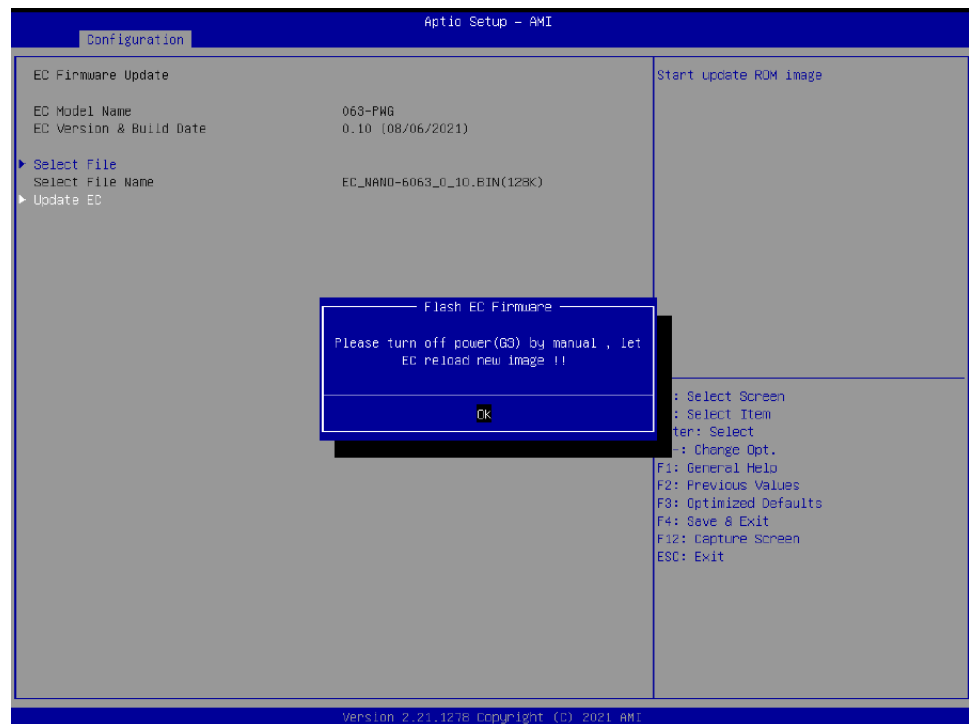
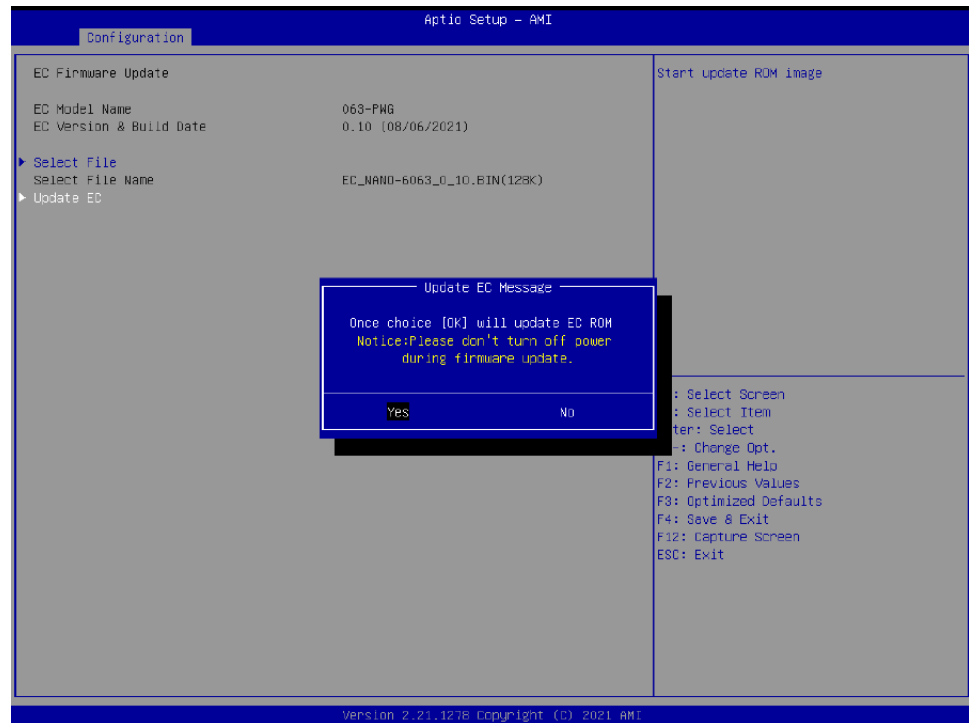
EC Firmware Update

Use this screen to update the firmware.



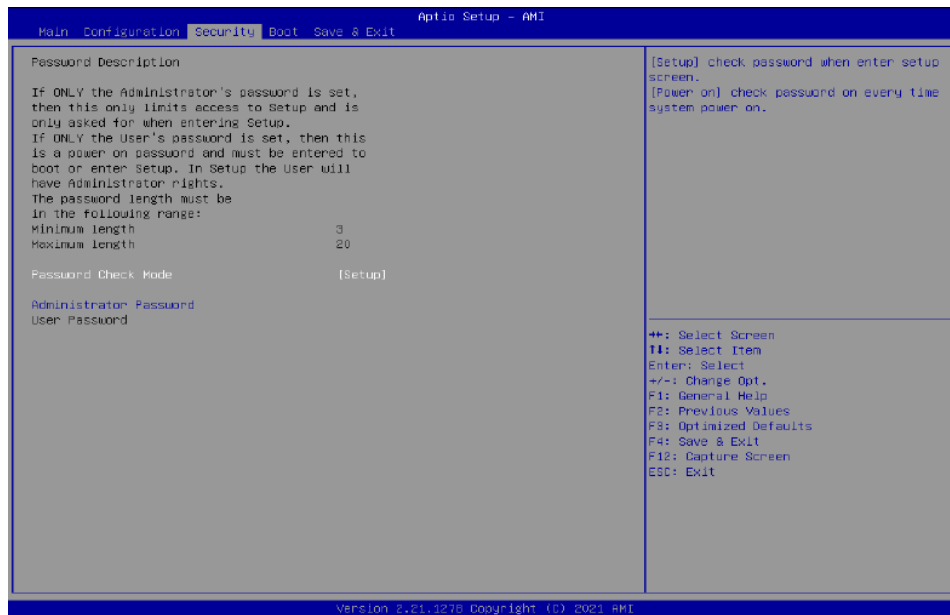
Feature	Description	Options
Select File	Select ROM Image	Bin file to the USB DOK

Update EC



Security

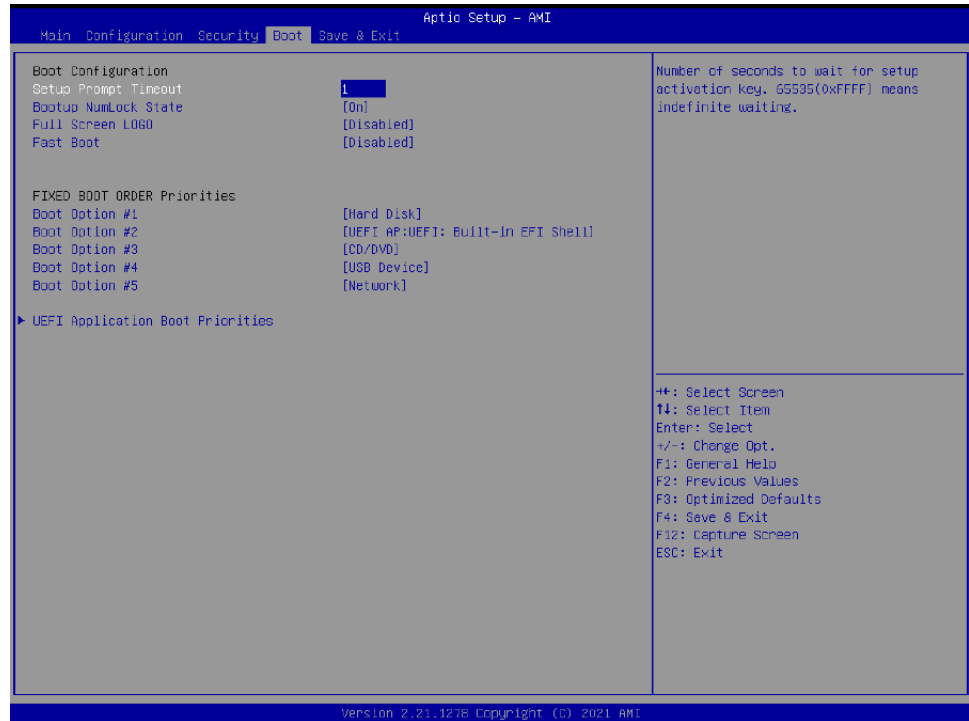
Use this screen to set security passwords to control system access at boot time or when entering the BIOS setup program.



Feature	Description	Options
Password Check Mode	[Setup] check password when enter setup screen. [Power on] check password on every time system power on.	Setup (default), Power on
Administrator Password	Set Administrator Password	

Boot

Use this screen to specify the priority of boot devices and to set other boot options.

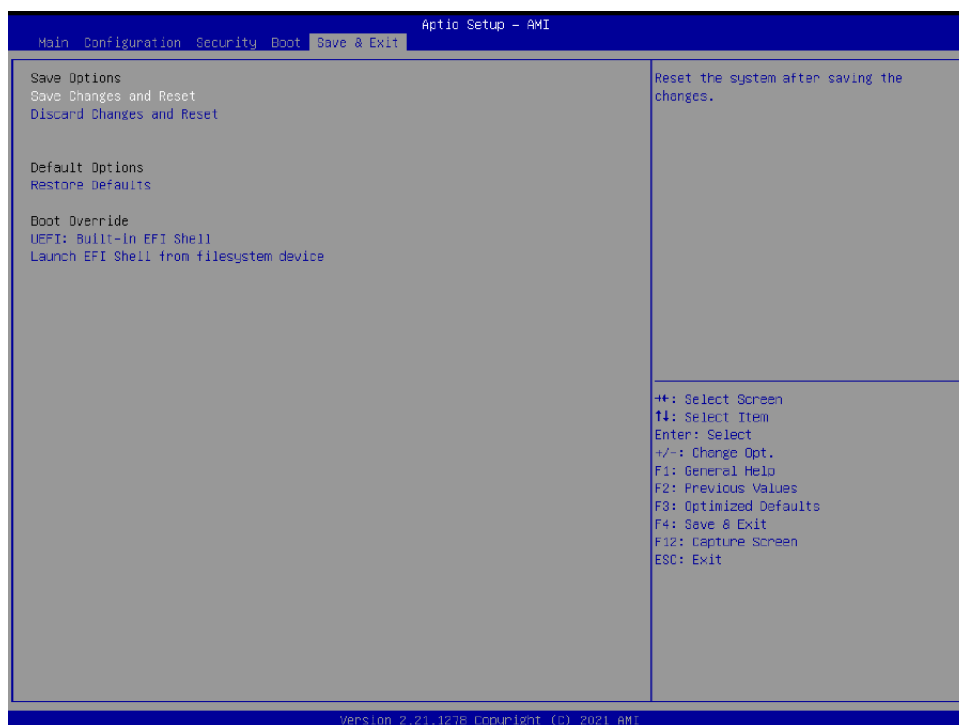




Feature	Description	Options
Setup Prompt Timeout	Set the default timeout before system boot. A value of 65535 will disable the timeout completely.	1 (default)
Bootup NumLock State	Select the keyboard NumLock state	On (default), Off
Full Screen LOGO	Enables or disables Quiet Boot option and Full screen Logo.	Disabled (default), Enabled
Fast Boot	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.	Disabled, Enabled
Boot Option #1 ~ #5	Sets the system boot order	Hard Disk (default),, NVME, UEFI AP, CD/DVD, SD, USB Device, Network, Disabled
UEFI Application Boot Priorities	Specifies the Boot Device Priority sequence from available UEFI Application	

Save & Exit

Use this screen to save or discard changes made to BIOS settings, or to restore the system to the default BIOS settings.

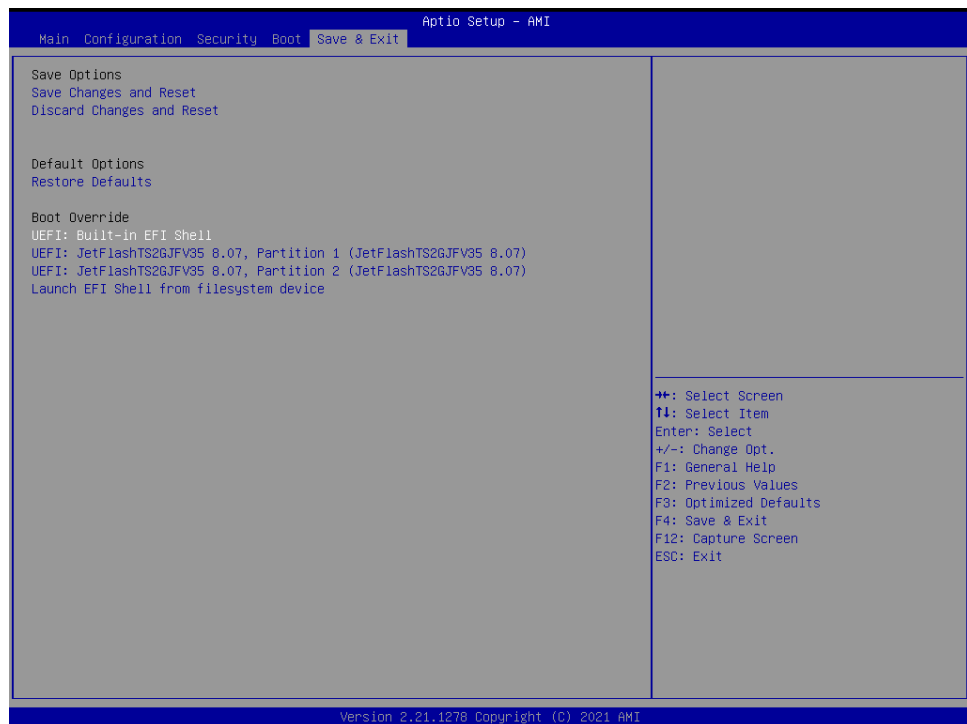
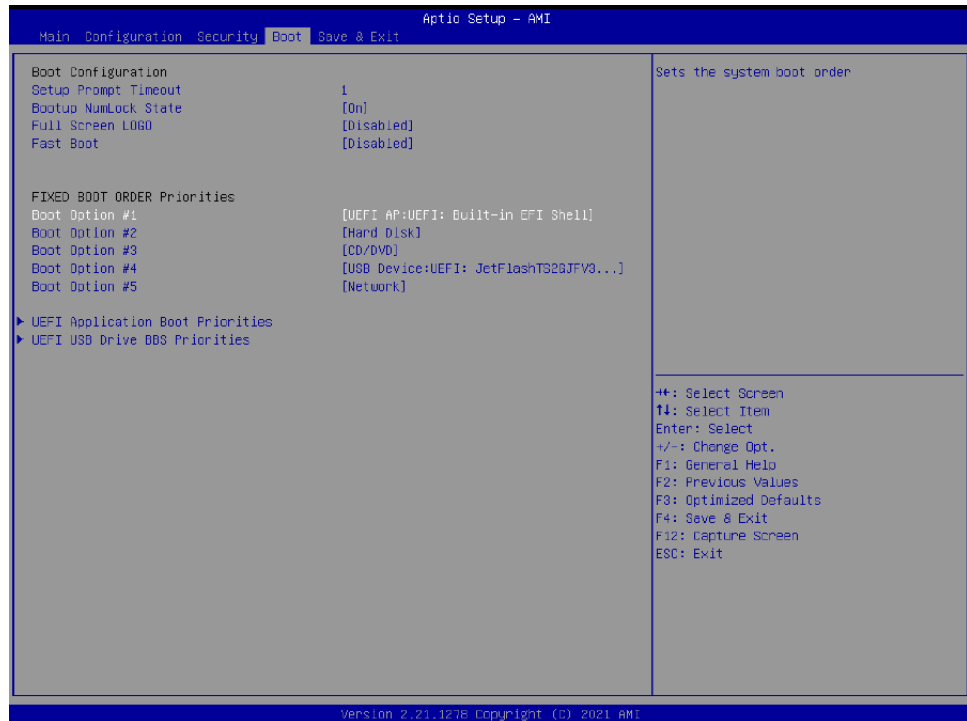


Feature	Description	Options
Save Changes and Reset	Reset the system after saving the changes.	
Discard Changes and Reset	Reset system setup without saving any changes.	

NANO-6063 BIOS / UC EFI Update SOP Process

1. Prepare a USB DOK.
2. Unzip update file to the USB DOK.
3. Select UEFI: Built-in EFI Shell in the BIOS boot menu and save then restarts the system.
4. Plug the USB DOK into the target system and boot from UEFI Shell.
5. Under the UEFI shell, navigate to your USB DOK. Below is an example using fs0. Then direct to the folder with updated file and type command: `update` and press **Enter**.

6. The updating process will start. Once the process has completed, power off and restart the system.



```

COM8:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
Current running mode 1.1.2
Device mapping table
fs0      :Removable HardDisk - Alias hd12b0b blk0
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x1,0x0)/HD(1,GPT,22C5C695-BC77-43E0-9
          727-1BD0FB0E64B3,0x800,0x18801)
fs1      :Removable HardDisk - Alias hd12b0c blk1
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x1,0x0)/HD(2,GPT,4D6420CF-C077-45FD-9
          0F4-D4D32EF9168A,0x19800,0x317DF)
blk0     :Removable HardDisk - Alias hd12b0b fs0
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x1,0x0)/HD(1,GPT,22C5C695-BC77-43E0-9
          727-1BD0FB0E64B3,0x800,0x18801)
blk1     :Removable HardDisk - Alias hd12b0c fs1
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x1,0x0)/HD(2,GPT,4D6420CF-C077-45FD-9
          0F4-D4D32EF9168A,0x19800,0x317DF)
blk2     :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x1,0x0)
blk3     :Removable BlockDevice - Alias (null)
          PciRoot(0x0)/Pci(0x14,0x0)/USB(0x7,0x0)/USB(0x0,0x0)

Press ESC in 1 seconds to skip startup.nsh, any other key to continue.
Shell> FS0:

fs0:Y> CD BIOS_Update
fs0:¥BIOS_Update> Update.efi

```

```

COM8:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help
        UPDATING...
        >>DO NOT TURN OFF POWER<<
        PLEASE RESET SYSTEM
        AFTER UPDATING COMPLETE!
        ~~~~~
        64 Bit
Intel (R) Flash Programming Tool Version: 15.40.0.1017
Copyright (C) 2005 - 2020, Intel Corporation. All rights reserved.
Reading HSFSTS register... Flash Descriptor: Valid

--- Flash Devices Found ---
ID:0xC22019   Size: 32768KB (262144Kb)

GbE Region does not exist.
- Erasing Flash Block [0x20000000] - 100 percent complete.
- Programming Flash [0x20000000] 32768KB of 32768KB - 100 percent complete.
RESULT: The data is identical.32768KB of 32768KB - 100 percent complete.
FPT Operation Successful.

fs0:¥BIOS_Update>

```

```

COM8:115200baud - Tera Term VT
File Edit Setup Control Window KanjiCode Help

~~~~~#
UPDATING...
>>DO NOT TURN OFF POWER<<
PLEASE RESET SYSTEM
AFTER UPDATING COMPLETE!
~~~~~#
64 Bit
Current shell version is v1.x
ITE EC Flash Utility for UEFI Shell, Version : 1.3.0 (64)
<Re-Write by FoxYang .. 2020/07/21 >

[/NOKBC] support
Please don't use ERASE during updating !!!
Device ID      : EF 40 14 0
SPI Vendor     : Winbond
Erasing...     :  ~~~~~ -- Erase OK.
                :  ~~~~~ -- Erase Verify OK.
Erase Verify... :  ~~~~~ -- Programing OK.
Programing...   :  ~~~~~ -- Verify OK.
Verify...      :  ~~~~~
Please turn off power(G3) by manual , let EC reload new image !!
fs0:YEC_Update>

```

11. Troubleshooting

This section provides useful tips to get the SYS-ITX-N-6425E operating. For basic hardware installation and configuration, refer to [“Installation and Connections” on page 10](#). This section addresses system integration issues in terms of BIOS setting and OS diagnostics.

11.1 BIOS settings

This section assumes that you have correctly selected and connected all devices with the required cables before applying power. If this is in question, inspect the connection and application of each of the following components: 260-pin DDR4 memory, keyboard, mouse, SATA hard disk, VGA connector, power cable of the device, and all ATX accessories. Failure of any of these components can cause a system failure.

It is recommended that you press the **DELETE** or **ESC** key and enter the BIOS setup menu during the initial boot-up sequence to configure a stable BIOS configuration that can be woken.

11.1.1 Loading the Default Optimal Setting

NOTE If the system appears to be unstable during startup, you can try loading the default BIOS configuration to see if this solves the issue.

When prompted in the main setup menu, load setup defaults:

1. Apply power to an installed SYS-ITX-N-6425E and press **DELETE** or **ESC** to enter the BIOS setup menu.

2. Select the **Save & Exit** menu and then scroll to **Restore Defaults**.
3. Press **Enter**.
4. To load the default optimal BIOS setup, select **Yes**. This forces the BIOS settings back to the initial factory configuration.

11.1.2 Reset CMOS BIOS Configuration

You can use jumper JP3 to reset the BIOS CMOS settings to the factory default and reset the BIOS password. See “[CMOS Clear \(JP3\)](#)” on page 32.

To reset the BIOS CMOS configuration to the factory default settings:

1. Switch off power supply.
2. Locate jumper JP3 on main board and move the jumper from pins 2-3 to short pins 1-2.
3. Wait for 5 seconds to clear the password.
4. Move the jumper back to short pins 2-3 short.
5. Switch on your power supply.

11.1.3 Update BIOS

1. Obtain the ROM file and flash utility. See “[Cables and Software Drivers](#)” on page 65.
2. Extract the files from the zip archive to the root directory of a bootable USB flash drive. The three required files are Shell Flash 32.efi, temp.bin, and Update.nsh.
3. Insert the USB flash drive in a USB port on the SYS-ITX-N-6425E and apply power to the embedded computer.
4. Boot to EFI-Shell mode.
5. At the prompt, enter the command `fs0:` to change to the root directory of the USB drive.
6. At the root directory of the USB drive, enter the command `update` to start the updating the BIOS.
7. When the update has completed, there is a 5-second pause and then the computer automatically restarts.
8. Press **DELETE** or **ESC** to open the **BIOS** setup menu and select Restore Defaults.
9. To finish the update, select **Save & Exit**.

12. Cables and Software Drivers

Go to <https://www.winsystems.com/> for cable information and software drivers.

Appendix A. Best Practices

This section outlines the best practices for operating the SYS-ITX-N-6425E in a safe and effective manner that does not damage the board. Read this section carefully.



Avoid Electrostatic Discharge (ESD)

Observe ESD-safe handling procedures when working with this product. Always use this product in a properly grounded work area and wear appropriate ESD-preventive clothing and/or accessories.

Always store this product in ESD-protective packaging when not in use.

Safe Handling Precautions

The SYS-ITX-N-6425E contains a high number of I/O connectors with connection to sensitive electronic components. This creates many opportunities for accidental damage during handling, installation and connection to other equipment. The list here describes common causes of failure found on boards or systems returned to WINSYSTEMS for repairs. This information is provided as a source of advice to help you prevent damaging your SYS-ITX-N-6425E (or any vendor's) embedded computer boards.

ESD Damage – This type of damage is usually almost impossible to detect, because there is no visual sign of failure or damage. The symptom is that the board or system eventually simply stops working, because some component becomes defective. Usually the failure can be identified and the chip can be replaced. To prevent ESD damage, always follow proper ESD-prevention practices when handling computer boards.

Damage during handling or storage – On some boards or systems we have noticed physical damage from mishandling. A common observation is that a screwdriver slipped while installing the board, causing a gouge in the PCB surface and cutting signal traces or damaging components.

Another common observation is damaged board corners, indicating the board was dropped. This may or may not cause damage to the circuitry, depending on what is near the corner. Most of our boards are designed with at least 25 mils clearance between the board edge and any component pad, and ground / power planes are at least 20 mils from the edge to avoid possible shorting from this type of damage. However, these design rules are not sufficient to prevent damage in all situations.

A third cause of failure is when a metal screwdriver tip slips, or a screw drops onto the board while it is powered on, causing a short between a power pin and a signal pin on a component. This can cause over-voltage / power supply problems described below. To avoid this type of failure, only perform assembly operations when the system is powered off.

Sometimes boards are stored in racks with slots that grip the edge of the board. This is a common practice for board manufacturers. However, our boards are generally very dense, and if the board has components very close to the board edge, they can be damaged or even knocked off the board when the board tilts back in the rack. Winsystems recommends that all our boards be stored only in individual ESD-safe packaging. If multiple boards are stored together, they should be contained in bins with dividers between boards. Do not pile boards on top of each other or cram too many boards into a small location. This can cause damage to connector pins or fragile components.

Power supply wired backwards – Some of our power supplies and boards are not designed to withstand a reverse power supply connection. This will destroy each IC that is connected to the power supply (i.e. almost all ICs). In this case the board will most likely will be unrepairable and must be replaced. A chip destroyed by reverse power or by excessive power will often have a visible hole on the top or show some deformation on the top surface due to vaporization inside the package. **Check twice if your power supply or board does not reverse power protection before applying power!**

Bent connector pins – This type of problem is often only a cosmetic issue and is easily fixed by bending the pins back to their proper shape one at a time with needle-nose pliers. The most common cause of bent connector pins is when a cable or board is pulled off a connector by rocking it back and forth left to right, from one end of the connector to the other. As the board is rocked back and forth it pulls out suddenly, and the pins at the end get bent significantly. The same situation can occur when pulling a ribbon cable off of a pin header. If the pins are bent too severely, bending them back can cause them to weaken unacceptably or even break, and the connector must be replaced.

Power Supply

Power Supply Budget

Evaluate your power supply budget. It is good practice to budget twice the typical power requirement for all of your devices.

Zero-Load Power Supply

Use a zero-load power supply whenever possible. A zero-load power supply does not require a minimum power load to regulate. If a zero-load power supply is not appropriate for your application, then verify that the embedded computer's typical load is not lower than the power supply's minimum load. If the embedded computer does not draw enough power to meet the power supply's minimum load, then the power supply does not regulate properly and can cause damage to the SYS-ITX-N-6425E.



Use Proper Power Connections (Voltage)

When verifying the voltage, measure it at the power connector on the SYS-ITX-N-6425E. Measuring it at the power supply does not account for voltage drop through the wire and connectors.

Power the SYS-ITX-N-6425E using J1 (+12 V DC). Verify the power connections. Incorrect voltages can cause catastrophic damage.

Power Harness

Minimize the length of the power harness. This reduces the amount of voltage drop between the power supply and the SYS-ITX-N-6425E.

Gauge Wire

Use the largest gauge wire available for your application and connector. Most connector manufacturers have a maximum gauge wire they recommend for their pins.

Contact Points

For maximum reliability, WINSYSTEMS boards typically use connectors with gold finish contacts. It is critical that the contact material in the mating connectors is matched properly (gold to gold and tin to tin). Contact areas made with dissimilar metals can cause oxidation/corrosion, resulting in unreliable connections.

Pin Contacts

The pin contacts used in cabling are not given enough attention. The ideal choice for a pin contact uses a design similar to Molex's or Trifurcon's design that provides three distinct points to maximize the contact area and improve connection integrity in high shock and vibration applications.

Power Down

Make sure that power has been removed from the system before making or breaking any connections.



Power Supply OFF—The power supply should always be off before it is connected to the I/O module. Do not hot-plug the SYS-ITX-N-6425E on a host platform that is already powered.

I/O Connections OFF—I/O connections should also be off before connecting them to the embedded computer modules or any I/O cards. Connecting hot signals can cause damage whether the embedded system is powered or not.

Conformal Coating

Conformal coating by any source other than WINSYSTEMS voids the product warranty and will not be accepted for repair by WINSYSTEMS. If such a product is sent to WINSYSTEMS for repair, it will be returned at customer expense and no service will be performed. A WINSYSTEMS product conformally coated by WINSYSTEMS will be subject to regular WINSYSTEMS warranty terms and conditions.

Operations/Product Manuals

Every embedded computer has an Operations manual or Product manual.

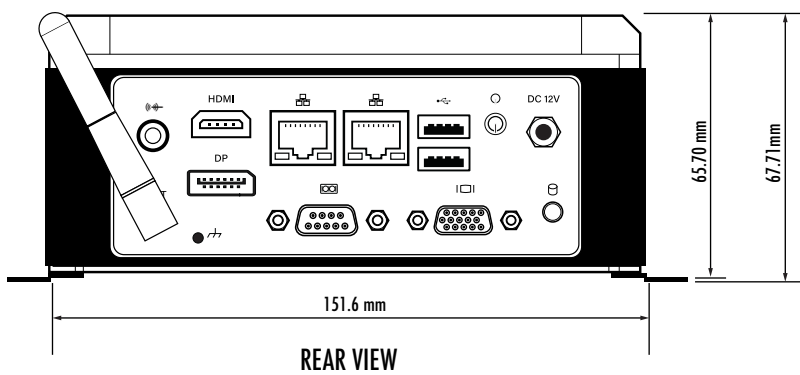
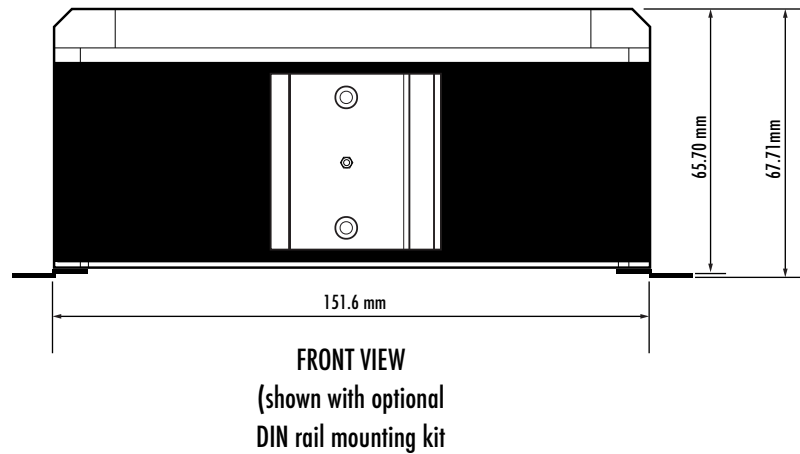
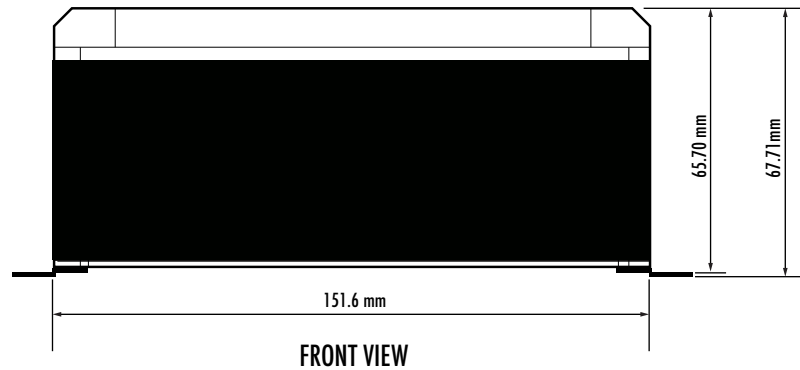
Periodic Updates—Operations/Product manuals are updated often. Periodically check the WINSYSTEMS website (<https://www.winsystems.com/>) for revisions.

Check Pinouts—Always check the pinout and connector locations in the manual before plugging in a cable. Many I/O modules have identical headers for different functions and plugging a cable into the wrong header can have disastrous results.

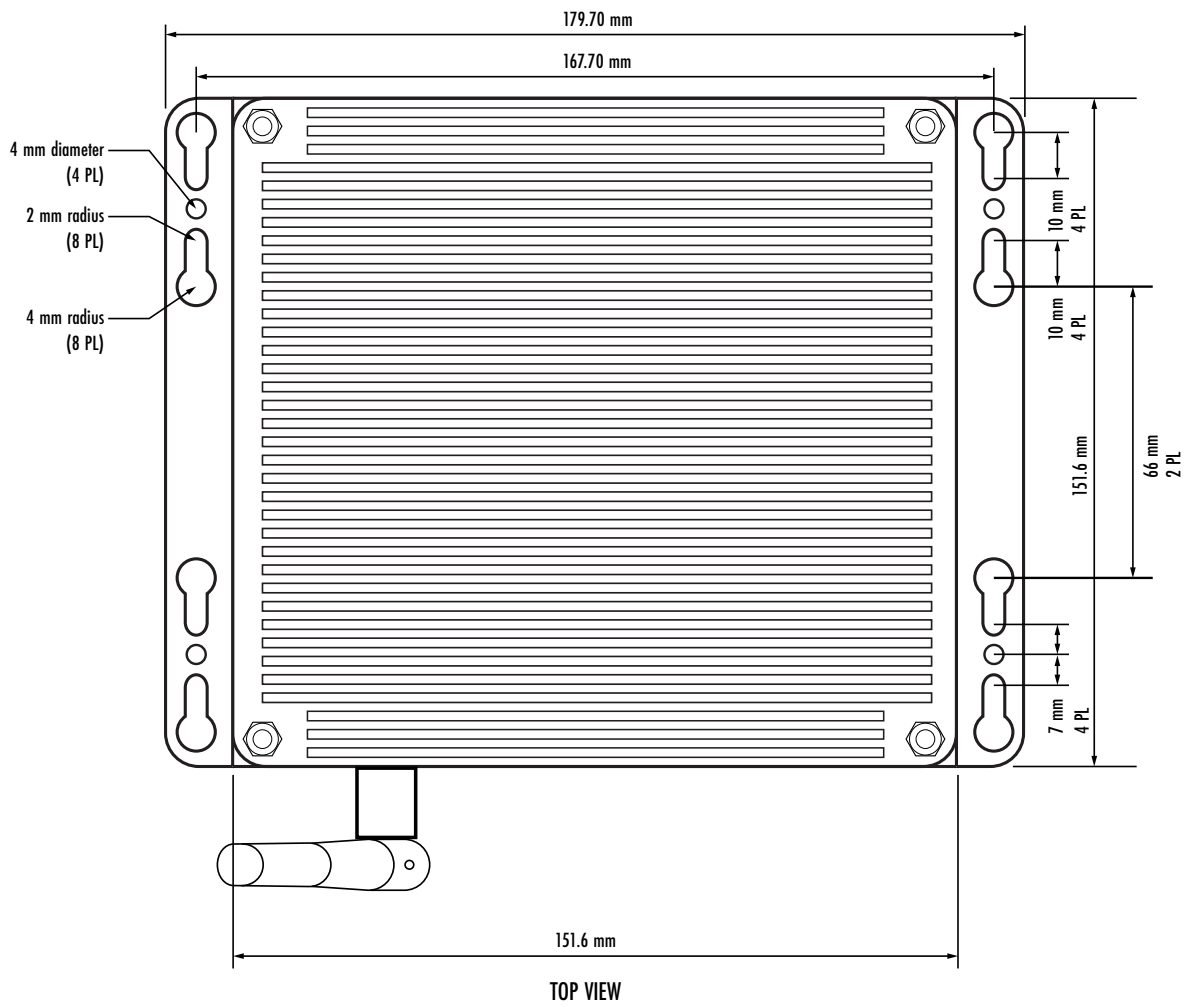
Contact an Applications Engineer—If a diagram or chart in a manual does not seem to match your board, or if you have additional questions, contact a WINSYSTEMS Applications Engineer at: +1-817-274-7553.

Appendix B. Mechanical Drawings

Front Views



Top View



Appendix C. Warranty Information

Full warranty information is at <https://winsystems.com/company-policies/warranty/>.