IEI Integration Corp.

MODEL:

CNR-CPO-8500T

Patient Observer PC with Intel® RealSense™ Depth Camera D415, Intel® Core™ i5-8500T CPU, HDMI, GbE, Mic-in, Line-out, Four USB 3.1 Gen 1 and RoHS

User Manual

Rev. 1.03 – August 27, 2019

RoHS Lead Free

Revision

Date	Version	Changes
June 19, 2019	1.00	Initial release
July 30, 2019	1.01	Modified FCC warning content
August 21, 2019	1.02	Added stand mounting instruction (Section 3.5) Added System Troubleshooting (Section 3.8) Removed Red LED (Section 1.7, 1.8)
August 27, 2019	1.03	Add FCC MPE warning content

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Manual Conventions

WARNING

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously.

CAUTION

Cautionary messages should be heeded to help reduce the chance of losing data or damaging the product.

NOTE

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes.

HOT SURFACE

This symbol indicates a hot surface that should not be touched without taking care.

OPERATING INSTRUCTION

Follow operating instructions or consult instructions for use.

IEC 60417-5009: STAND-BY

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: CNR-CPO-8500T Patient Observer PC

The CNR-CPO-8500T is a patient observer PC with Intel® RealSense™ Depth Camera D415. It equips with the Intel® Core™ i5-8500T processor, and is preinstalled with one 4 GB DDR4 SO-DIMM and 128 GB M.2 SSD. Other peripherals, including one GbE port, four USB 3.1 Gen 1 port, one line-out jack, one mic-in jack and one HDMI port, ensure simplified connectivity to a variety of external peripheral devices. The expected service life of this medical device is 2 years.

1.2 Usability

1.2.1 Intended Use

The CNR-CPO-8500T is a computer used for collecting general purpose medical data.

1.2.2 Intended User Profile

- Intended User: Physician
- Age: 25 ~ 60
- Weight: Not relevant
- Nationality: English manual readable
- Patient state: Adults or infants
- Education level: at least 8 years of intensive reading experience (school)

- Knowledge: Minimum - read and understand "westernized Arabic" numerals when written in Arial font
  can distinguish: every parts of body as described in user manual
  understand the potential risk hazard regarding to misjudgment of diagnostic images
  Language understanding: English
- Permissible impairments:
  mild reading vision impairment or vision corrected to log MAR 0,2 (6/10 or 20/32)
  one arm/hand system capable of guiding and holding device
  average degree of aging-related short term memory impairment
  impaired by 40 % resulting in 60 % of normal hearing at 500 Hz to 2 kHz
- Part of the body or type of tissue applied to or interacted with: hands and fingers, expected contact time shall be less than 1 min

1.2.3 Operating Principle

A computer processing system box has four main components: arithmetic logic unit (ALU), control unit, memory, and input and output devices (collectively termed I/O). These parts are interconnected by buses. The control unit, ALU, and registers are collectively known as a central processing unit (CPU), the unit processes and delivers patients electronic information to an external plug in screen.

- Hospital or clinics, professional healthcare personnel use only.
- Indoor use only, not for use in shower, bath tub or sink, the device is to be placed on the desk.
- Expected to function normally
- Conditions of operating state:
  Temperature range: 0°C to 30°C
  Relative humidity range: 5% to 95%, non-condensing
  Relative altitude range: 0 to 2000 m
- Frequency of use: once to 10 times a day
- The device is to be fixed and kept outside of patient area

1.3 Features

The CNR-CPO-8500T features the following:

- Built-in Intel® RealSense™ Depth Camera D415
- On-board Intel® Core™ i5-8500T processor
- 4 GB DDR4 SO-DIMM preinstalled
- 128 GB M.2 SSD preinstalled
  One GbE port
- Four USB 3.1 Gen 1 (5Gb/s) ports
- One HDMI 1.4 port
- 802.11 ac with Bluetooth v4.1
- RoHS compliant

1.4 Front Panel

The followings are found on the front panel.

- Intel® RealSense™ Depth Camera D415 module
- Speaker
- Microphone

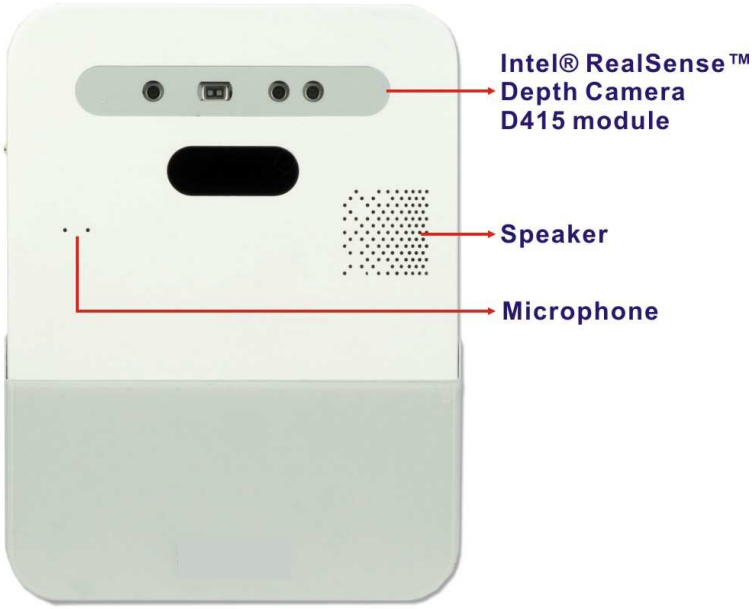

Figure 1-2: Front Panel

1.5 I/O Panel

The I/O panel is protected by a cover that can be opened by loosening the two captive screws. The followings are found on the I/O panel.

- 1 x 19 V DC input jack
- 1 x RJ-45 connector
- 4 x USB 3.1 Gen 1 port
- 1 x HDMI port
- 1 x Line-out jack
- 1 x Mic-in jack
- 1 x Power button
- 1 x Reset button

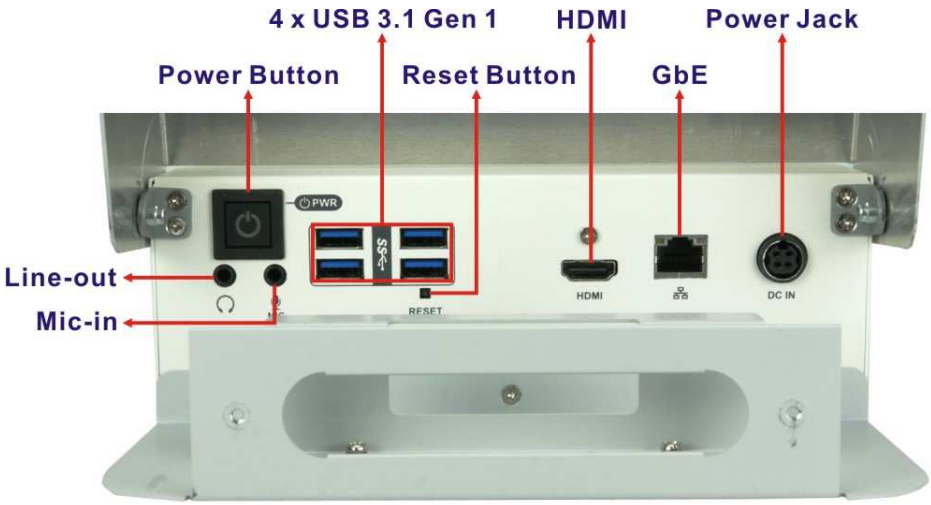

Figure 1-3: I/O Panel

1.6 Rear Panel

The rear panel has the VESA 100 mounting screw holes for mounting (**Figure 1-4**).

Figure 1-4: Rear Panel

1.7 Side Panels

Both side panels contain the Wi-Fi antenna connectors and the LED indicators for indicating camera status (**Figure 1-5**).

The LED indicator behavior is listed below.

- OFF: Camera is not active. Patient can be assured of privacy.
- GREEN: Camera is on/active.
- YELLOW: Camera is in privacy mode.

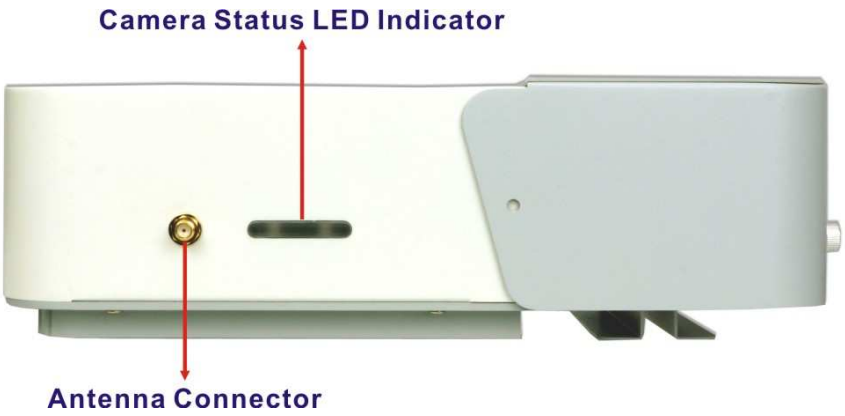

Figure 1-5: Side Panel

1.8 System Specifications

The CNR-CPO-8500T technical specifications are listed in **Table 1-1**.

Specifications	CNR-CPO-8500T
Processor	Intel® Core™ i5-8500T processor (6-core, 2.1 GHz, 9MB cache, TDP=35 W)
Chipset	Intel® H310
Memory	2 x 260-pin 2666 MHz single-channel DDR4 SO-DIMM slot Preinstalled with one 4 GB (system max. 64 GB)
Storage	128 GB M.2 SSD (up to 500 GB)
Ethernet	1 x GbE by Intel® I219 PHY
Wi-Fi/Bluetooth	802.11 ac with Bluetooth v4.1 2 x External Wi-Fi antenna
USB	4 x USB 3.1 Gen 1 (5Gb/s)
Display	1 x HDMI 1.4
Audio	1 x Line-out 1 x Mic-in
Microphone	Internal Omni-directional microphone (supports for external directional microphone array)
Speaker	Echo/Noise cancelling
Camera	RealSense D415: 1 x Built-in 1 x Detachable option; pan/tilt/zoom option IR Emitter: 850nm
LED Indicators	2 x Multi-colored LEDs to indicate camera state & network status (yellow and green)
Buttons and Switches	Power button Reset button

CNR-CPO-8500T Patient Observer

Power Input	19 V DC input jack (4-pin DIN)
Power Adapter	120 W medical power adapter (Darfon, H1120-B0) Input AC: 100 V ~ 240 V, 2.0-1.0A Output DC: 19 V, 6.31A
Mounting	VESA 100
EMI/Safety	Safety: 60601-1 EMC: 60601-1-2 FCC R&TTE
Temperature	Operating: 30ºC (room temperature) Storage/Transportation: -20ºC ~ 60ºC
Humidity	Operating/Storage/Transportation: 10% ~ 90% (non-condensing)
Pressure	Operating/Storage/Transportation: 700hpa ~ 1060hpa
Weight	2.8 kg
Dimensions (WxDxH)	201.0 mm x 263.5 mm x 72.6 mm
Supported OS	Windows 10

Table 1-1: Technical Specifications

1.9 Dimensions

The dimensions are shown below.

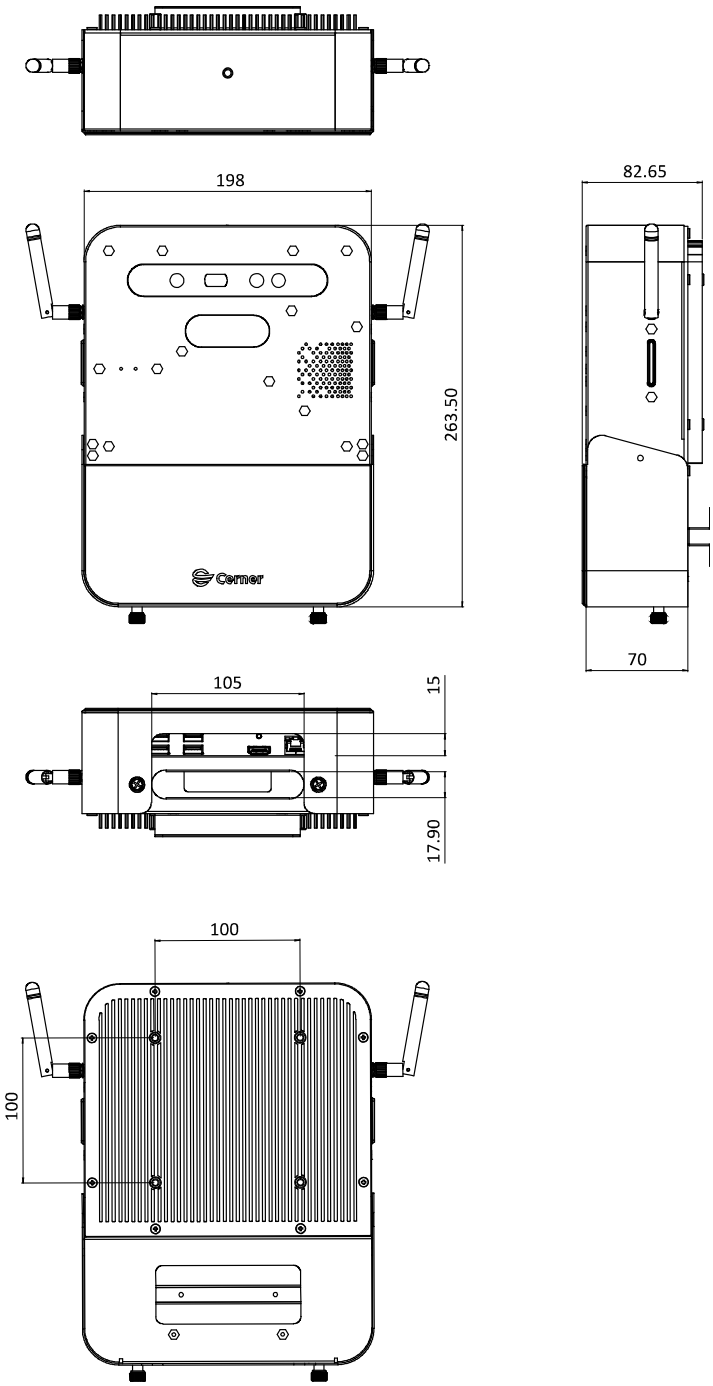

Figure 1-6: Dimensions (Unit: mm)

Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- ***Wear an anti-static wristband***: Wearing an anti-static wristband can prevent electrostatic discharge.
- ***Self-grounding***: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- ***Use an anti-static pad***: When configuring any circuit board, place it on an anti-static mat.
- ***Only handle the edges of the PCB***: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

2.2 Unpacking Precautions

When the CNR-CPO-8500T is unpacked, please do the following:

- Follow the anti-static guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.

2.3 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the reseller or vendor the CNR-CPO-8500T was purchased from.

The CNR-CPO-8500T is shipped with the following components:

Quantity	Item	Image
1	CNR-CPO-8500T patient observer PC	
1	Medical-grade power adapter	
1	US medical power cord	
2	Antenna	

Table 2-1: Packing List

Chapter

3

Installation

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the maintenance of the CNR-CPO-8500T may result in permanent damage to the CNR-CPO-8500T and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the CNR-CPO-8500T. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the CNR-CPO-8500T is accessed internally, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: - When configuring the CNR-CPO-8500T, place it on an anti-static pad. This reduces the possibility of ESD damaging the CNR-CPO-8500T.
- ***Only handle the edges of the PCB***: - When handling the PCB, hold the PCB by the edges.

3.2 Installation Precautions

WARNING:

No modification of this equipment is allowed, including the change of system battery

Please do not touch other patient and this medical device at the same time.

Professional installation instruction

1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

2. Installation location

The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

3. External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC/IC limit and is prohibited.

4. Installation procedure

Please refer to user's manual for the detail.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.

When installing the CNR-CPO-8500T, please follow the precautions listed below:

- **Power turned off**: When installing the CNR-CPO-8500T, make sure the power is off. Failing to turn off the power may cause severe injury to the body and/or damage to the system.
- **Certified Engineers**: Only certified engineers should install and modify onboard functionalities.

- **Anti-static Discharge**: If a user open the bottom panel of the CNR-CPO-8500T, to configure the jumpers or plug in added peripheral devices, ground themselves first and wear an anti-static wristband.

3.3 I/O Interface Connectors

This section provides an overview of the I/O interface connectors of the CNR-CPO-8500T.

3.3.1 RJ-45 Connector

The CNR-CPO-8500T has one RJ-45 connector. The RJ-45 connector enables connection to WAN. The pinouts for the RJ-45 connector are listed in **Table 3-1**.

Pin	Description	Pin	Description
1	MDIA0+	5	MDIA2-
2	MDIA0-	6	MDIA1-
3	MDIA1+	7	MDIA3+
4	MDIA2+	8	MDIA3-

Table 3-1: RJ-45 Connector Pinouts

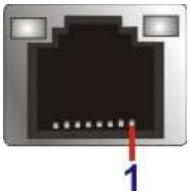

Figure 3-1: RJ-45 Connector

3.3.2 USB 3.1 Gen 1 Connector

The CNR-CPO-8500T has four external USB 3.1 Gen 1 connector. The pinouts for the USB 3.1 Gen 1 connector are listed in **Table 3-2**.

Pin	Description	Pin	Description
1	VCC	6	USB3_RX+
2	USB_DATA-	7	GND
3	USB_DATA+	8	USB3_TX-
4	GND	9	USB3_TX+
5	USB3_RX-		

Pin	Description	Pin	Description

Table 3-2: USB 3.1 Gen 1 Port Pinouts

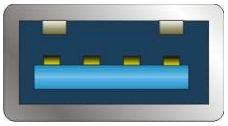

Figure 3-2: USB 3.1 Gen 1 Port

3.3.3 VGA Connector

The CNR-CPO-8500T has a HDMI 1.4 connector on the I/O panel. The HDMI connector can connect to an HDMI device. The pinouts for the HDMI connector are listed in **Table 3-3**.

Pin	Description	Pin	Description
1	HDMI_DATA2	2	GND
3	HDMI_DATA2#	4	HDMI_DATA1
5	GND	6	HDMI_DATA1#
7	HDMI_DATA0	8	GND
9	HDMI_DATA0#	10	HDMI_CLK
11	GND	12	HDMI_CLK#
13	N/C	14	N/C
15	HDMI_SCL	16	HDMI_SDA
17	GND	18	+5V
19	HDMI_HPD	20	HDMI_GND
21	HDMI_GND	22	HDMI_GND
23	HDMI_GND		

Table 3-3: VGA Connector Pinouts

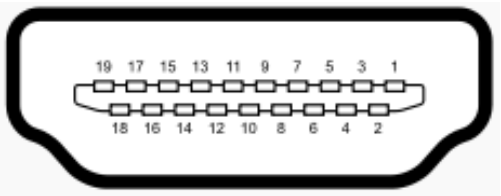

Figure 3-3: HDMI Connector Pinout Locations

3.4 Installing the Power Adapter

CAUTION:

The Darfon, H1120-B0 power adapter came with the CNR-CPO-8500T is a forming part of the medical device.

There is a space in the bottom part of the CNR-CPO-8500T for installing the provided power adapter. Be sure to install the power adapter before start using the patient observer.

Step 1: Loose the two captive screws shown below, and open the cover.

Figure 3-4: Captive Screw Removal

Step 2: Remove the pre-installed bracket by removing the two retention screws shown below.

Figure 3-5: Power Adapter Bracket Retention Screws

Step 3: Orient the power adapter to a proper position. Take the provided power cord and pass it through the hole to connect to the power adapter. Place the bracket onto the power adapter and install the two previously-removed screws to secure it.

Figure 3-6: Secure the Power Adapter

Step 4: Organize the power adapter cable, and place it in the space between the power adapter and the bottom panel. Connect the power adapter to the power jack on the I/O panel.

Figure 3-7: Captive Screw Removal

Step 5: Connect other peripheral device cables before closing and securing the cover.

3.5 Mounting the System

CAUTION:

Use suitable mounting apparatus to avoid risk of injury.

WARNING!

Two or more people should mount the CNR-CPO-8500T. Dropping or bumping the system during installation can cause serious or irreparable damage to the system.

The CNR-CPO-8500T is VESA (Video Electronics Standards Association) compliant, please follow the steps below.

Step 1: Locate the screw holes on the rear of the CNR-CPO-8500T. This is where the bracket will be attached.

Figure 3-8: Stand Mounting Retention Screw Holes

Step 2: Align the screw holes with the mounting bracket of the stand.

Step 3: To secure the CNR-CPO-8500T to the bracket, insert the retention screws (M4*10) came with the stand into the screw holes and tighten them.

3.6 Powering On the System

WARNING:

To avoid risk of electric shock, this equipment must only be connected to supply mains with protective earth.

To power on the system, follow the steps below:

Step 1: Follow the procedure described in **Section 3.4** to install the power adapter, and connect the power jack.

Step 2: Connect the other end of the power cord to a power source.

Press the power button on the I/O panel of the CNR-CPO-8500T (**Figure 3-9**). The power LED on the power button lights up in blue (**Figure 3-9**).

Figure 3-9: Power Button

3.7 Resetting the System

The reset button enables the user to reboot the system when the system is turned on. The reset button location is shown in **Figure 3-10**. Press the reset button to reboot the system.

Figure 3-10: Reset Button

3.8 System Troubleshooting

If after turning the system on, there is no power (indicated by the power LED on the power button not turning on) please do the following:

Step 1: Check that the power cable connector of the power adapter is properly connected to the power jack on the system I/O panel.

Step 2: Check that the power cord is properly connected to the power adapter.

Step 3: Check that the power cord connector is properly plugged into the power source.

Step 4: Make sure the power button is turned on.

Step 5: If the boot-up screen appears it means the power LED has become disconnected.

If the above steps have been completed and the system still doesn't turn on, please contact the sales representatives the system was purchased from.

Chapter

4

BIOS

4.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

NOTE:

Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

4.1.1 Starting Setup

The UEFI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

Press the **DEL** or **F2** key as soon as the system is turned on or

Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL** or **F2** key is pressed, restart the computer and try again.

4.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
+	Increase the numeric value or make changes
-	Decrease the numeric value or make changes

Key	Function
Page Up key	Move to the previous page
Page Dn key	Move to the next page
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Load previous values
F3	Load optimized defaults
F4	Save changes and Exit BIOS

Table 4-1: BIOS Navigation Keys

4.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window, press **Esc** key.

4.1.4 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration
- Advanced – Changes the advanced system settings
- Chipset – Changes the chipset settings
- Security – Sets User and Supervisor Passwords
- Boot – Changes the system boot configuration
- Save & Exit – Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

4.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered. The **Main** menu gives an overview of the basic system information.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Main   Advanced   Chipset   Security   Boot   Save & Exit

BIOS Information                                  Set the Date. Use Tab to
BIOS Vendor                American Megatrends    switch between Date
Core Version               5.13                   elements.
Compliancy                 UEFI 2.6; PI 1.4
Project Version            B531AT04.ROM
Build Date and Time        04/03/2019 15:25:27

iWDD Vendor                iEi
iWDD Version               B531ET15.bin

Processor Information
Name                       CoffeeLake DT
Type                       Intel(R) Core(TM)
                           i5-8500T CPU @ 2.10GHz
Speed                      2100 MHz
ID                         0x906EA
Stepping                   U0
Number of Processors       6Core(s) / 6Thread(s)
Microcode Revision         84
GT Info GT2 (0x3E92)

IGFX VBIOS Version         1010
Memory RC Version          0.7.1.58               ----------------------
Total Memory                4096 MB               →←:  Select Screen
Memory Frequency            2133 MHz              ↑↓:  Select Item
                                                  Enter:   Select
PCH Information                                   +/-:  Change Opt.
Name                       CNL PCH-H              F1:   General Help
PCH SKU                    Q370                   F2:   Previous Values
Stepping                   B0                     F3:   Optimized Defaults
                                                  F4:   Save & Exit
ME FW Version              12.0.0.1068            ESC:  Exit
ME Firmware SKU            Corporate SKU

Access Level               Administrator

System Date                [Thu 06/12/2019]
System Time                [16:10:27]

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```

BIOS Menu 1: Main

The **Main** menu has two user configurable fields:

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

➔ **System Time [xx:xx:xx]**

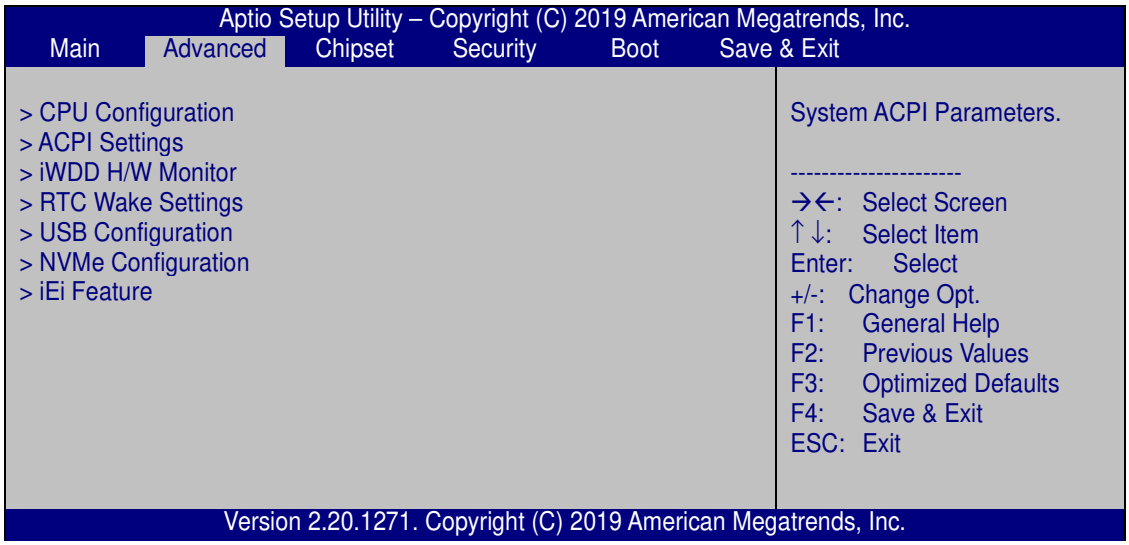
Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

4.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

4.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications or enable the Intel Virtualization Technology.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

CPU Configuration                                   When enabled, a VMM can
                                                    utilize the additional hardware
Type                        Intel(R) Core(TM)       capabilities provided by
                            i5-8500T CPU @ 2.10GHz  Vanderpool Technology.
ID                          0x906EA
Speed                       2100 MHz
L1 Data Cache               32 kB x 6
L1 Instruction Cache        32 kB x 6               ----------------------
L2 Cache                    256 kB x 6              →←:   Select Screen
L3 Cache                    9 MB                    ↑↓:   Select Item
L4 Cache                    N/A                     Enter:    Select
VMX                         Supported               +/-:  Change Opt.
SMX/TXT                     Supported               F1:   General Help
                                                    F2:   Previous Values
Intel (VMX)Virtualization   [Disabled]              F3:   Optimized Defaults
Technology                                          F4:   Save & Exit
Active Processor Cores      [All]                   ESC:  Exit
Intel(R) SpeedStep(tm)      [Enabled]
C states                    [Disabled]
Intel Trusted Execution Technology  [Disabled]

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```

BIOS Menu 3: CPU Configuration

➔ **Intel (VMX) Virtualization Technology [Disabled]**

Use the **Intel (VMX) Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**	**DEFAULT**	Disables Intel Virtualization Technology.
➔ **Enabled**		Enables Intel Virtualization Technology.

➔ **Active Processor Cores [All]**

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

- ➔ **All** **DEFAULT** Enable all cores in the processor package.
- ➔ **1** Enable one core in the processor package.
- ➔ **2** Enable two cores in the processor package.
- ➔ **3** Enable three cores in the processor package.
- ➔ **4** Enable four cores in the processor package.
- ➔ **5** Enable five cores in the processor package.

➔ **Intel(R) SpeedStep(tm) [Enabled]**

Use the **Intel(R) SpeedStep(tm)** option to enable or disable the Intel® SpeedStep Technology which allows more than two frequency ranges to be supported.

- ➔ **Disabled** Disables Intel® SpeedStep Technology
- ➔ **Enabled** **DEFAULT** Enables Intel® SpeedStep Technology

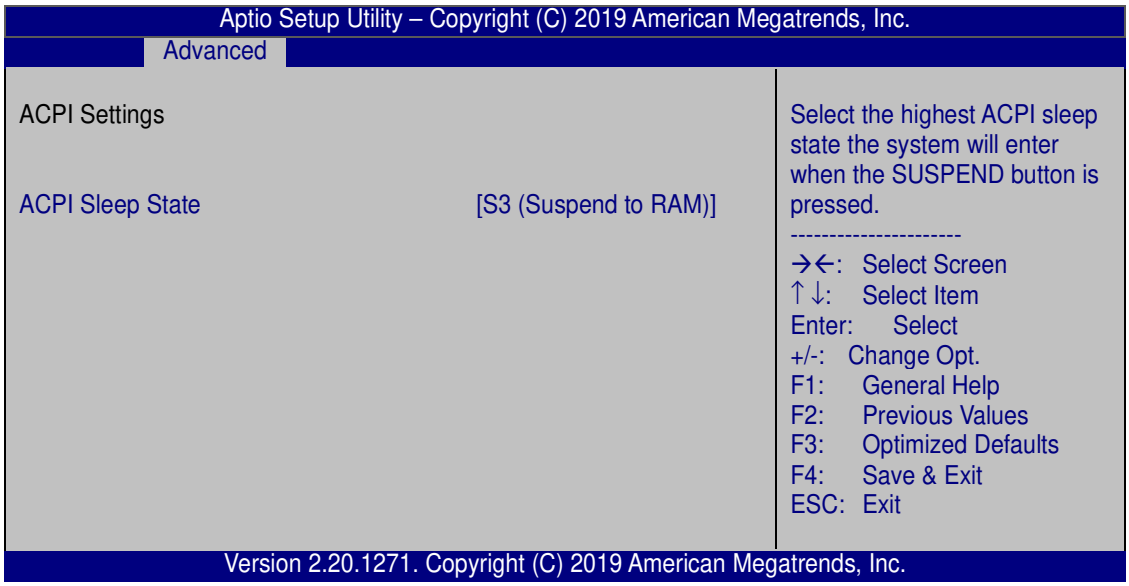
➔ **C States [Disabled]**

Use the **C States** BIOS option to enable or disable CPU power management which allows CPU to go to C states when it is not 100% use.

- ➔ **Disabled** **DEFAULT** Disables CPU power management.
- ➔ **Enabled** Enables CPU power management.

4.3.2 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 4**) configures the Advanced Configuration and Power Interface (ACPI) options.



BIOS Menu 4: ACPI Configuration

➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

➔ **S3 (Suspend to RAM)**	**DEFAULT**	The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

4.3.3 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 5**) contains the fan configuration submenu, and displays operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

PC Health Status                                  Smart Fan Mode Select

CPU temperature                  : +44ºC

CPU_FAN1 Speed                   : N/A            ---------------------
                                                  →←:   Select Screen
CPU_CORE                         : +0.844 V       ↑↓:   Select Item
+5V                              : +5.131 V       Enter:   Select
+DDR                             : +1.196 V       +/-:   Change Opt.
+3.3V                            : +3.317 V       F1:   General Help
+3.3VSB                          : +3.271 V       F2:   Previous Values
                                                  F3:   Optimized Defaults
> Smart Fan Mode Configuration                    F4:   Save & Exit
                                                  ESC:   Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 5: iWDD H/W Monitor

➔ **PC Health Status**

The following system parameters and values are shown. The system parameters that are monitored are:

- System Temperatures:
  CPU Temperature
- Fan Speed:
  CPU Fan Speed
- Voltages:
  CPU_CORE
  +5V
  +DDR
  +3.3V
  +3.3VSB

4.3.3.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 6**) to configure the CPU/system fan temperature and speed settings.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

Smart Fan Mode Configuration                          Smart Fan Mode Select

CPU_FAN1 Smart Fan Control          [Auto Mode]
Auto mode fan start temperature      40               ---------------------
Auto mode fan off temperature        30               →←:  Select Screen
Auto mode fan start PWM              30               ↑↓:  Select Item
Auto mode fan slope PWM              2                Enter:   Select
                                                      +/-:  Change Opt.
                                                      F1:   General Help
                                                      F2:   Previous Values
                                                      F3:   Optimized Defaults
                                                      F4:   Save & Exit
                                                      ESC:  Exit

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```

BIOS Menu 6: Smart Fan Mode Configuration

➔ **CPU_FAN1 Smart Fan Control [Auto Mode]**

Use the **CPU_FAN1 Smart Fan Control/SYS_FAN1 Smart Fan Control** option to configure the CPU/System Smart Fan.

➔ **Manual Mode**		The fan spins at the speed set in Manual Mode settings.
➔ **Auto Mode**	**DEFAULT**	The fan adjusts its speed using Auto Mode settings.

➔ **Auto mode fan start/off temperature**

Use the + or – key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

➔ **Auto mode fan start PWM**

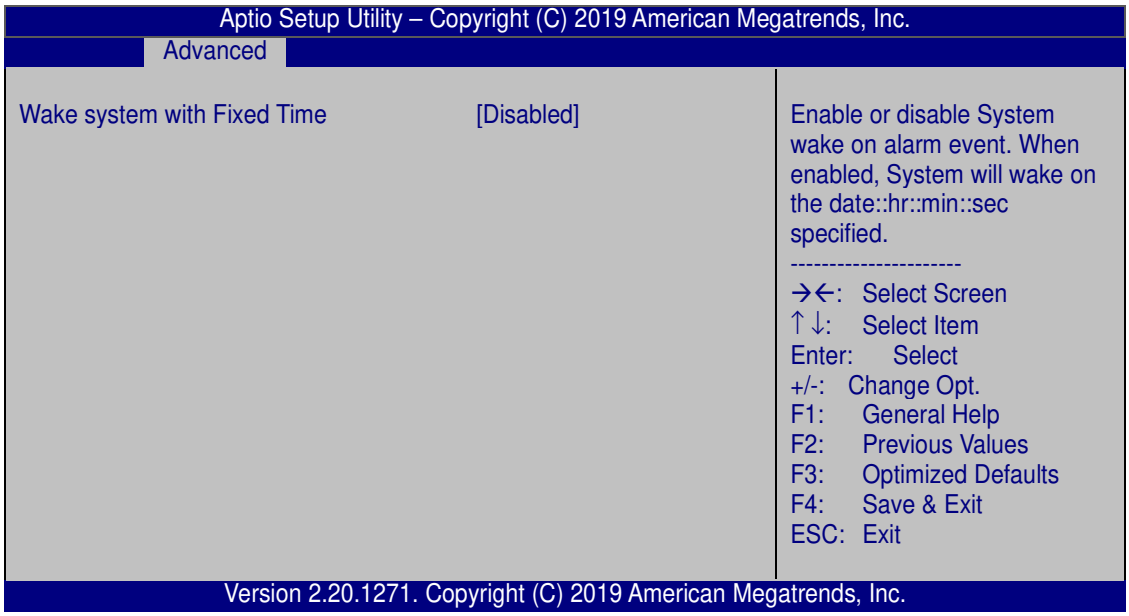
Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ **Auto mode fan slope PWM**

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 8.

4.3.4 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 7**) enables the system to wake at the specified time.



BIOS Menu 7: RTC Wake Settings

➔ **Wake system with Fixed Time [Disabled]**

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be

selected:

Wake up every day

Wake up date

Wake up hour

Wake up minute

Wake up second

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

4.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 8**) to read USB configuration information and configure the USB settings.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

USB Configuration                                   Enables Legacy USB support.
                                                    AUTO option disables legacy
USB Controllers:                                    support if no USB devices are
        2 XHCIs                                     connected. DISABLE option
USB Devices:                                        will keep USB devices
        1 Keyboard                                  available only for EFI
                                                    applications.
Legacy USB Support              [Enabled]
                                                    ---------------------
                                                    →←:  Select Screen
                                                    ↑↓:  Select Item
                                                    Enter:   Select
                                                    +/-:  Change Opt.
                                                    F1:   General Help
                                                    F2:   Previous Values
                                                    F3:   Optimized Defaults
                                                    F4:   Save & Exit
                                                    ESC:  Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 8: USB Configuration

➔ **Legacy USB Support [Enabled]**

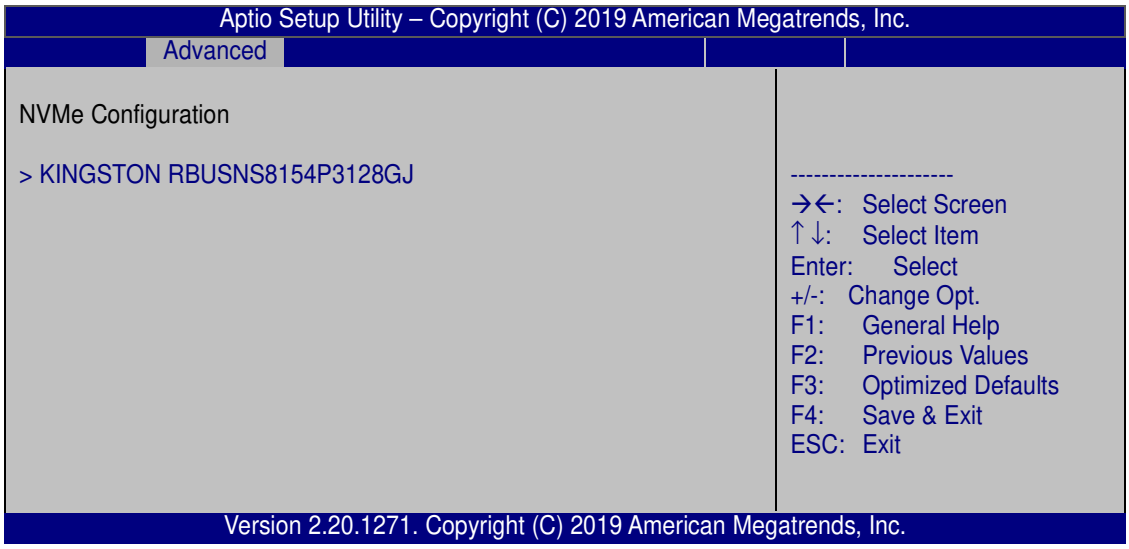
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Disabled**		Legacy USB support disabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

4.3.6 NVMe Configuration

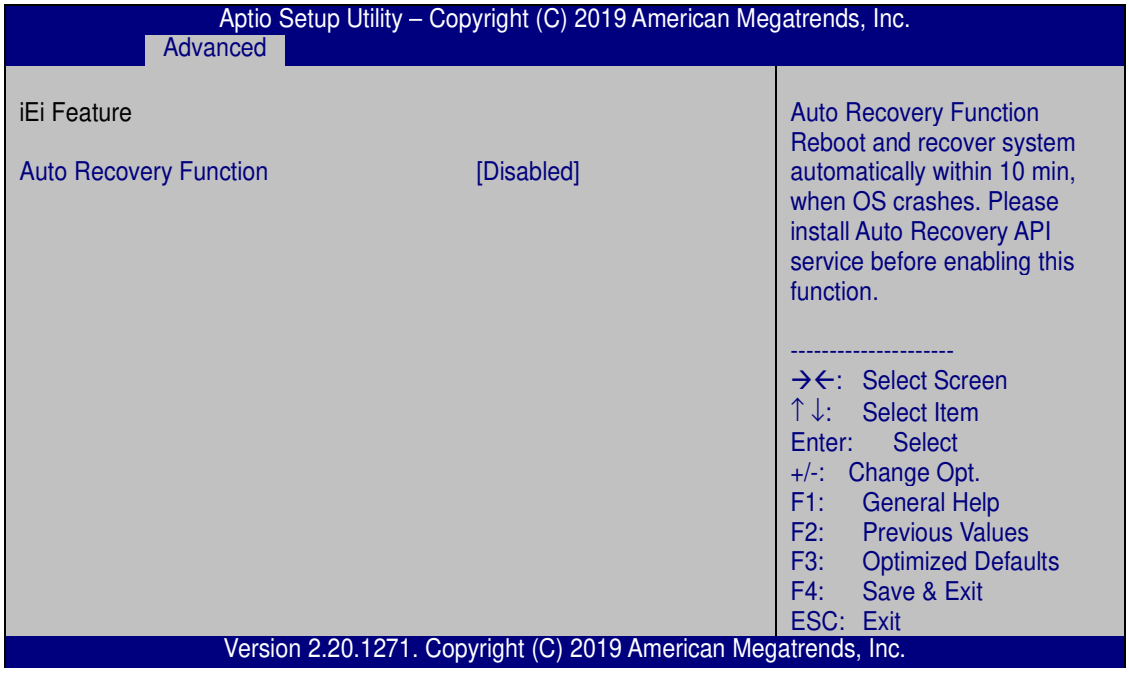
Use the **NVMe Configuration** (**BIOS Menu 9**) menu to display the NVMe controller and device information.



BIOS Menu 9: NVMe Configuration

4.3.7 IEI Feature

Use the I**EI Feature** menu (**BIOS Menu 10**) to configure One Key Recovery function.



BIOS Menu 10: IEI Feature

➔ **Auto Recovery Function [Disabled]**

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

➔ **Disabled**	**DEFAULT**	Auto recovery function disabled
➔ **Enabled**		Auto recovery function enabled

4.4 Chipset

Use the **Chipset** menu (**BIOS Menu 11**) to access the PCH IO and System Agent (SA) configuration menus.

WARNING!

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Main    Advanced    Chipset    Security    Boot    Save & Exit

> System Agent (SA) Configuration          System Agent (SA)
> PCH-IO Configuration                     Parameters

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

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 11: Chipset

4.4.1 System Agent (SA) Configuration

Use the **System Agent (SA) Configuration** menu (**BIOS Menu 12**) to configure the System Agent (SA) parameters.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                    Chipset
System Agent (SA) Configuration                    VT-d capability

VT-d                          Supported
VT-d                          [Disabled]           ---------------------
                                                   →←:  Select Screen
> Memory Configuration                             ↑↓:  Select Item
> Graphics Configuration                           Enter:   Select
> PEG Port Configuration                           +/-:  Change Opt.
                                                   F1:   General Help
                                                   F2:   Previous Values
                                                   F3:   Optimized Defaults
                                                   F4:   Save & Exit
                                                   ESC:  Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 12: System Agent (SA) Configuration

➔ **VT-d [Disabled]**

Use the **VT-d** option to enable or disable VT-d capability.

➔ **Disabled** **DEFAULT** Disables VT-d capability.

➔ **Enabled** Enables VT-d capability.

4.4.1.1 Memory Configuration

Use the **Memory Configuration** submenu (**BIOS Menu 13**) to view memory information.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Chipset

Memory Configuration

DIMM1                          Populated & Enabled
    Size                       4096 MB (DDR4)
    Number of Ranks            1
    Manufacturer               UnKnown
DIMM2                          Not Populated/Disabled

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

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 13: Memory Configuration

4.4.1.2 Graphics Configuration

Use the **Graphics Configuration** (**BIOS Menu 14**) menu to configure the video device connected to the system.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Chipset

Graphics Configuration                                  Keep IGFX enabled based on
                                                        the setup options. If user want
Internal Graphics              [Enabled]                to support Dual Display by
DVMT Pre-Allocated             [32M]                    Internal Graphics & External
DVMT Total Gfx Mem             [MAX]                    Graphics. Internal Graphics
                                                        item should be set to Enabled
                                                        and Primary Display item
                                                        should be set to IGFX.
                                                        ----------------------
                                                        →←:  Select Screen
                                                        ↑↓:  Select Item
                                                        Enter:   Select
                                                        +/-:  Change Opt.
                                                        F1:   General Help
                                                        F2:   Previous Values
                                                        F3:   Optimized Defaults
                                                        F4:   Save & Exit
                                                        ESC:  Exit

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 14: Graphics Configuration

➔ **Internal Graphics [Enabled]**

Use the **Internal Graphics** option to configure whether to keep IGFX enabled. If user wants to support dual display by internal graphics and external graphics, this Internal Graphics option should be set to Enabled and the above Primary Display option should be set to IGFX.

➔ **Auto**		Auto mode
➔ **Disabled**		Disables IGFX.
➔ **Enabled**	**DEFAULT**	Enables IGFX.

➔ **DVMT Pre-Allocated [32M]**

Use the **DVMT Pre-Allocated** option to set the amount of system memory allocated to the integrated graphics processor when the system boots. The system memory allocated can

then only be used as graphics memory, and is no longer available to applications or the operating system. Configuration options are listed below:

- 32M **Default**
- 64M

➔ **DVMT Total Gfx Mem [MAX]**

Use the **DVMT Total Gfx Mem** option to select DVMT5.0 total graphic memory size used by the internal graphic device. The following options are available:

- 128M
- 256M
- MAX **Default**

4.4.1.3 PEG Port Configuration

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                    Chipset

PEG Port Configuration                          Enable or Disable the Root
                                                Port
PEG 0:1:0                    Not Present
   Enable Root Port          [Enabled]          ----------------------
   Max Link Speed            [Auto]             →←:   Select Screen
PEG 0:1:1                    Not Present        ↑↓:   Select Item
   Enable Root Port          [Enabled]          Enter:    Select
   Max Link Speed            [Auto]             +/-:  Change Opt.
                                                F1:   General Help
> PEG Port Feature Configuration                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 15: PEG Port Configuration

➔ **Enable Root Port [Enabled]**

Use the **Enable Root Port** option to enable or disable the PCI Express (PEG) controller.

➔ **Disabled**		Disables the PCI Express (PEG) controller.
➔ **Enabled**	**DEFAULT**	Enables the PCI Express (PEG) controller.

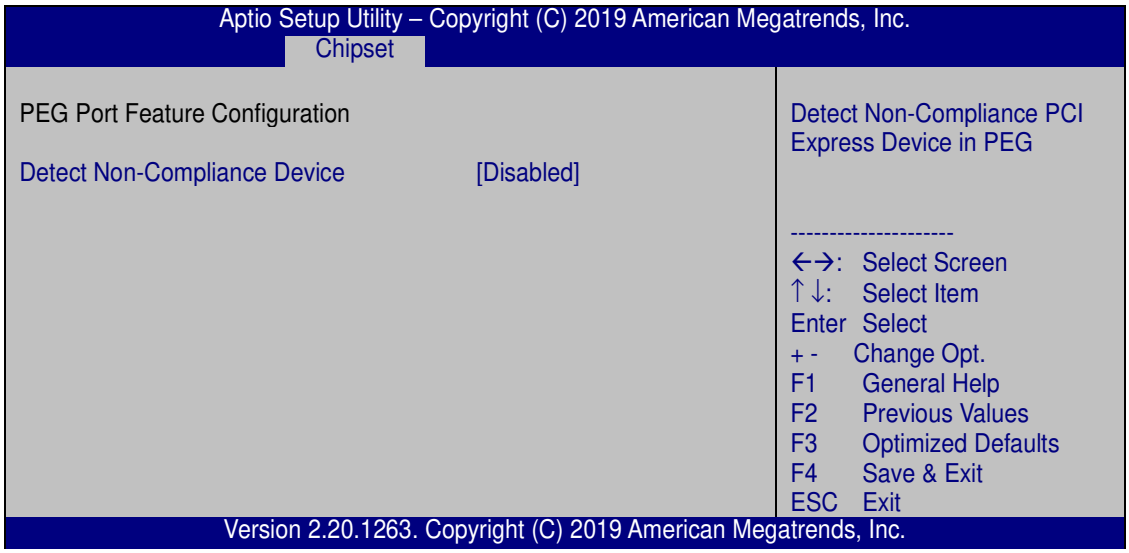
➔ **Max Link Speed [Auto]**

Use the **Max Link Speed** option to select the maximum link speed of the PCI Express slot. The following options are available:

- Auto **Default**
- Gen1
- Gen2
- Gen3

4.4.1.3.1 PEG Port Feature Configuration

Use the **PEG Port Feature Configuration** submenu (**BIOS Menu 16**) to configure the SA PCIe settings.



BIOS Menu 16: PEG Port Feature Configuration

➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to enable or disable detecting if a non-compliance PCI Express device is connected to the PCI Express slot.

➔ **Disabled**	**DEFAULT**	Disables to detect if a non-compliance PCI Express device is connected to the PCI Express slot.
➔ **Enabled**		Enables to detect if a non-compliance PCI Express device is connected to the PCI Express slot.

4.4.2 PCH-IO Configuration

Use the **PCH-IO Configuration** menu (**BIOS Menu 17**) to configure the PCH parameters.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                    Chipset

PCH-IO Configuration                                  Select AC power state when
                                                      power is re-applied after a
Auto Power Button Status          [Disable (ATX)]     power failure.
Restore AC Power Loss             [Last State]
                                                      ---------------------
> PCI Express Configuration                           →←:   Select Screen
> HD Audio Configuration                              ↑↓:   Select Item
                                                      Enter:    Select
Power Saving Function(ERP)        [Disabled]          +/-:  Change Opt.
USB Power SW1                     [+5V DUAL]          F1:   General Help
                                                      F2:   Previous Values
                                                      F3:   Optimized Defaults
                                                      F4:   Save & Exit
                                                      ESC:  Exit

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 17: PCH-IO Configuration

➔ **Restore AC Power Loss [Last State]**

Use the **Restore AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off.
➔ **Power On**		The system turns on.
➔ **Last State**	**DEFAULT**	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Saving Function(ERP) [Disabled]**

Use the **Power Saving Function(ERP)** BIOS option to enable or disable the power saving function.

➔ **Disabled**	**DEFAULT**	Power saving function is disabled.
➔ **Enabled**		Power saving function is enabled. It will reduce power consumption when the system is off.

➔ **USB Power SW1 [+5V DUAL]**

Use the **USB Power SW1** BIOS option to configure whether to provide power to the four external USB 3.1 Gen 1 connectors when the system is in S3/S4 sleep state. This option is valid only when the above **Power Saving Function (ERP)** BIOS option is disabled.

➔ **+5V DUAL**	**DEFAULT**	Power is provided to the external USB 3.1 Gen 1 connectors when the system is in S3/S4 sleep state
➔ **+5V**		Power is not provided to the external USB 3.1 Gen 1 connectors when the system is in S3/S4 sleep state

4.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 18**) to configure the PCIe Mini slot.

Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc. Chipset	
PCI Express Configuration > M.2(A) Slot	PCI Express Root Port Settings. ---------- →←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.	

BIOS Menu 18: PCI Express Configuration

4.4.2.1.1 M2 (A) Slot

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Advanced

M.2(A) Slot                    [Enabled]        Select PCI Express port
PCIe Speed                     [Auto]           speed.
Detect Non-Compliance Device   [Disabled]
                                                ---------------------
                                                →←:  Select Screen
                                                ↑↓:  Select Item
                                                Enter:   Select
                                                +/-:  Change Opt.
                                                F1:   General Help
                                                F2:   Previous Values
                                                F3:   Optimized Defaults
                                                F4:   Save & Exit
                                                ESC:  Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 19: MPCIE1 Slot

➔ **M2(A) Slot [Enabled]**

Use the **M2(A) Slot** option to enable or disable the M.2 slot.

➔ **Disabled**		Disables the M.2 slot.
➔ **Enabled**	**DEFAULT**	Enables the M.2 slot.

➔ **PCIe Speed [Auto]**

Use this option to select the support type of the PCI Express slots. The following options are available:

- Auto **Default**
- Gen1
- Gen2

➔ **Detect Non-Compliance Device [Disabled]**

Use the **Detect Non-Compliance Device** option to enable or disable detecting if a non-compliance PCI Express device is connected to the PCI Express slot.

➔ **Disabled** **DEFAULT** Disables to detect if a non-compliance PCI Express device is connected to the PCI Express slot.

➔ **Enabled** Enables to detect if a non-compliance PCI Express device is connected to the PCI Express slot.

4.4.2.2 HD Audio Configuration

Use the **HD Audio Configuration** menu (**BIOS Menu 20**) to configure the PCH Azalia settings.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Chipset

HD Audio Subsystem Configuration Settings                Control Detection of the
                                                         HD-Audio device.
HD Audio                          [Enabled]              Disable = HDA will be
                                                         unconditionally disabled
                                                         Enabled = HDA will be
                                                         unconditionally enabled
                                                         Auto = HDA will be enabled if
                                                         present, disabled otherwise.
                                                         ----------------------
                                                         →←:  Select Screen
                                                         ↑↓:  Select Item
                                                         Enter:   Select
                                                         +/-:  Change Opt.
                                                         F1:   General Help
                                                         F2:   Previous Values
                                                         F3:   Optimized Defaults
                                                         F4:   Save & Exit
                                                         ESC:  Exit

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 20: HD Audio Configuration

➔ **HD Audio [Auto]**

Use the **HD Audio** option to enable or disable the High Definition Audio controller.

➔ **Disabled** The onboard High Definition Audio controller is disabled.

➔ **Enabled** **DEFAULT** The onboard High Definition Audio controller is enabled.

4.5 Security

Use the **Security** menu (**BIOS Menu 21**) to set system and user passwords.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Main    Advanced    Chipset    Security    Boot    Save & Exit

Password Description                                  Set Administrator Password

If ONLY the Administrator's password is set,
then this only limits access to Setup and is          ---------------------
only asked for when entering Setup.                   →←:   Select Screen
If ONLY the User's password is set, then this         ↑↓:   Select Item
is a power on password and must be entered to         Enter:   Select
boot or enter Setup. In Setup the User will           +/-:   Change Opt.
have Administrator rights.                            F1:    General Help
The password length must be:                          F2:    Previous Values
Minimum length                    3                   F3:    Optimized Defaults
Maximum length                    20                  F4:    Save & Exit
                                                      ESC:   Exit
Administrator Password
User Password

Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

BIOS Menu 21: Security

➔ **Administrator Password**

Use the **Administrator Password** to set or change a administrator password.

➔ **User Password**

Use the **User Password** to set or change a user password.

4.6 Boot

Use the **Boot menu** (**BIOS Menu 22**) to configure system boot options.

```
Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
Main   Advanced   Chipset   Security   Boot   Save & Exit

Boot Configuration                                  Select the keyboard NumLock
Bootup NumLock State          [On]                  state
Quiet Boot                    [Enabled]
                                                    ---------------------
UEFI Boot                     [Disabled]            →←:  Select Screen
Launch PXE OpROM              [Disabled]            ↑↓:  Select Item
Option ROM Messages           [Force BIOS]          Enter:  Select
                                                    +/-:  Change Opt.
Boot Option Priorities                              F1:  General Help
Boot Option #1                [KINGSTON             F2:  Previous Values
                              RBUSNS8154P3128GJ]    F3:  Optimized Defaults
                                                    F4:  Save & Exit
Hard Drive BBS Priorities                           ESC:  Exit

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```

BIOS Menu 22: Boot

➔ **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **Quiet Boot [Enabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**		Normal POST messages displayed
➔ **Enabled**	**DEFAULT**	OEM Logo displayed instead of POST messages

➔ **UEFI Boot [Disabled]**

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

➔ **Enabled**		Enables to boot from the UEFI devices.
➔ **Disabled**	**DEFAULT**	Disables to boot from the UEFI devices.

➔ **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

➔ **Disabled**	**DEFAULT**	Ignore all PXE Option ROMs
➔ **Enabled**		Load PXE Option ROMs.

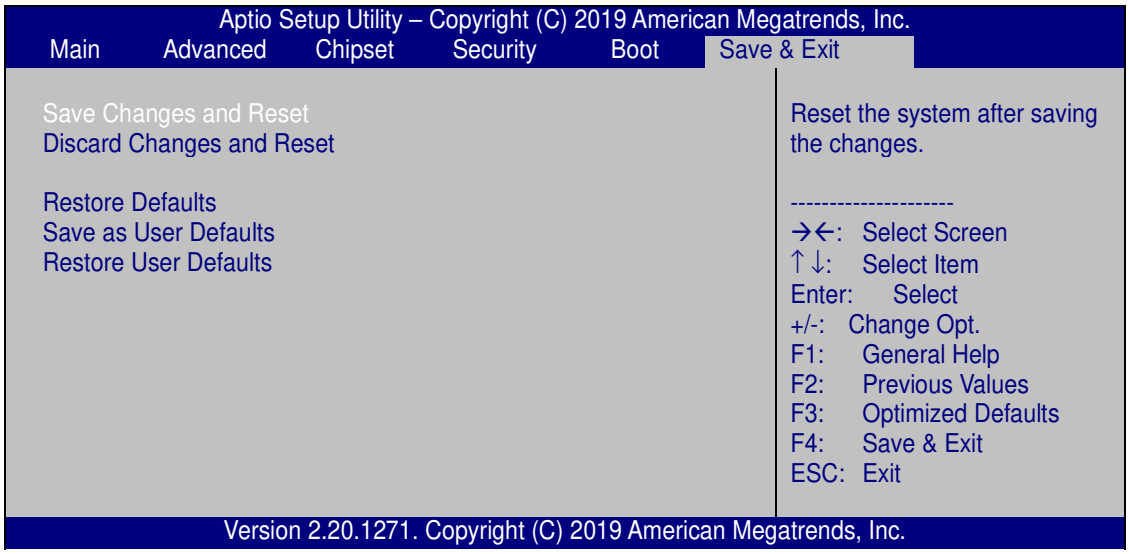
➔ **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

➔ **Force BIOS**	**DEFAULT**	Sets display mode to force BIOS.
➔ **Keep Current**		Sets display mode to current.

4.7 Save & Exit

Use the **Save & Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 23: Exit

➔ **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

➔ **Discard Changes and Reset**

Use the **Discard Changes and Reset** option to exit the system without saving the changes made to the BIOS configuration setup program.

➔ **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

➔ **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

➔ **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

Appendix

A

Regulatory Compliance

DECLARATION OF CONFORMITY

This equipment is in conformity with the following EU directives:

- EMC Directive (2004/108/EC, 2014/30/EU)
- Low-Voltage Directive (2006/95/EC, 2014/35/EU)
- RoHS II Directive (2011/65/EU, 2015/863/EU)
- Ecodesign Directive 2009/125/EC

If the user modifies and/or install other devices in the equipment, the CE conformity declaration may no longer apply.

If this equipment has telecommunications functionality, it also complies with the requirements of the Radio Equipment Directive 2014/53/EU.

English IEI Integration Corp declares that this equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.
Български [Bulgarian] IEI Integration Corp. декларира, че този оборудване е в съответствие със съществените изисквания и другите приложими правила на Директива 2014/53/EU.
Česky [Czech] IEI Integration Corp tímto prohlašuje, že tento zařízení je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53/EU.
Dansk [Danish] IEI Integration Corp erklærer herved, at følgende udstyr overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EU.
Deutsch [German] IEI Integration Corp, erklärt dieses Gerät entspricht den grundlegenden Anforderungen und den weiteren entsprechenden Vorgaben der Richtlinie 2014/53/EU.
Eesti [Estonian] IEI Integration Corp deklareerib seadme seadme vastavust direktiivi 2014/53/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

Español [Spanish] IEI Integration Corp declara que el equipo cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU.
Ελληνική [Greek] IEI Integration Corp ΔΗΛΩΝΕΙ ΟΤΙ ΕΞΟΠΛΙΣΜΟΣ ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 2014/53/EU
Français [French] IEI Integration Corp déclare que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU.
Italiano [Italian] IEI Integration Corp dichiara che questo apparecchio è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU.
Latviski [Latvian] IEI Integration Corp deklarē, ka iekārta atbilst būtiskajām prasībām un citiem ar to saistītajiem noteikumiem Direktīvas 2014/53/EU.
Lietuvių [Lithuanian] IEI Integration Corp deklaruoja, kad šis įranga atitinka esminius reikalavimus ir kitas 2014/53/EU Direktyvos nuostatas.
Nederlands [Dutch] IEI Integration Corp dat het toestel toestel in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU.
Malti [Maltese] IEI Integration Corp jiddikjara li dan prodott jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 2014/53/EU.
Magyar [Hungarian] IEI Integration Corp nyilatkozom, hogy a berendezés megfelel a vonatkozó alapvetõ követelményeknek és az 2014/53/EU irányelv egyéb elõírásainak.
Polski [Polish] IEI Integration Corp oświadcza, że wyrobu jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 2014/53/EU.
Português [Portuguese] IEI Integration Corp declara que este equipamento está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/EU.

Româna [Romanian] IEI Integration Corp declară că acest echipament este in conformitate cu cerinţele esenţiale şi cu celelalte prevederi relevante ale Directivei 2014/53/EU.
Slovensko [Slovenian] IEI Integration Corp izjavlja, da je ta opreme v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 2014/53/EU.
Slovensky [Slovak] IEI Integration Corp týmto vyhlasuje, že zariadenia spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 2014/53/EU.
Suomi [Finnish] IEI Integration Corp vakuuttaa täten että laitteet on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish] IEI Integration Corp förklarar att denna utrustningstyp står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU.

FCC WARNING

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

CNR-CPO-8500T Patient Observer

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

EN 60601-1

TUV Rheinland Product Safety mark for compliance with EN 60601-1.

Appendix

B

Safety Precautions

WARNING:

The precautions outlined in this chapter should be strictly followed. Failure to follow these precautions may result in permanent damage to the CNR-CPO-8500T.

B.1 Safety Precautions

Please follow the safety precautions outlined in the sections that follow:

B.1.1 General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

- ***To prevent the risk of electric shock, make sure power cord is unplugged from wall socket.*** To fully disengage the power to the unit, please disconnect the power cord from the ac outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
- ***Users must not allow SIP/SOPs and the patient to come into contact at the same time.***
- ***Follow the electrostatic precautions*** outlined below whenever the CNR-CPO-8500T is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the CNR-CPO-8500T is being installed, moved or modified.
- ***Do not apply voltage levels that exceed the specified voltage range***. Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
- ***Electric shocks can occur*** if the CNR-CPO-8500T chassis is opened when the CNR-CPO-8500T is running. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

- ***Do not drop or insert any objects*** into the ventilation openings of the CNR-CPO-8500T.
- ***If considerable amounts of dust, water, or fluids enter the CNR-CPO-8500T***, turn off the power supply immediately, unplug the power cord, and contact the CNR-CPO-8500T vendor.
- ***DO NOT***:
  Drop the CNR-CPO-8500T against a hard surface.
  In a site where the ambient temperature exceeds the rated temperature

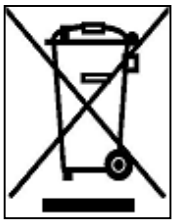
B.1.2 Product Disposal

CAUTION:

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

- Outside the European Union - If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority so as to comply with the correct disposal method.
- Within the European Union:



EU-wide legislation, as implemented in each Member State, requires that waste electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you need to dispose of your display products, please follow the guidance of your local authority, or ask the shop where you purchased the product. The mark on electrical and electronic products only applies to the current European Union Member States.

Please follow the national guidelines for electrical and electronic product disposal.

B.1.3 Classification

- Power by Class I power adapter
- No Applied Part
- No protection against the ingress of water: IPX0
- Mode of operation: Continuous Operation
- The equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide: Not AP or APG Category.

B.2 Maintenance and Cleaning Precautions

When maintaining or cleaning the CNR-CPO-8500T, please follow the guidelines below.

B.2.1 Maintenance and Cleaning

Prior to cleaning any part or component of the CNR-CPO-8500T, please read the details below.

- Use dry cloth for cleaning dust on the external chassis while the power cord is unplugged from wall socket.
- The interior of the CNR-CPO-8500T does not require cleaning. Keep fluids away from the CNR-CPO-8500T interior.
- Be cautious of all small removable components when vacuuming the CNR-CPO-8500T.
- Turn the CNR-CPO-8500T off before cleaning the CNR-CPO-8500T.
- Never drop any objects or liquids through the openings of the CNR-CPO-8500T.
- Avoid eating, drinking and smoking within vicinity of the CNR-CPO-8500T.

B.2.2 Cleaning Tools

Some components in the CNR-CPO-8500T may only be cleaned using a product specifically designed for the purpose. In such case, the product will be explicitly mentioned in the cleaning tips. Below is a list of items to use when cleaning the CNR-CPO-8500T.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the CNR-CPO-8500T.
- ***Water*** – A cloth moistened with water can be used to clean the CNR-CPO-8500T.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the CNR-CPO-8500T as they may damage the plastic parts.
- ***Vacuum cleaner*** – Using a vacuum specifically designed for computers is one of the best methods of cleaning the CNR-CPO-8500T. Dust and dirt can restrict the airflow in the CNR-CPO-8500T and cause its circuitry to corrode.

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS. Contact IEI support or visit the IEI website for drivers for other operating systems.

The Watchdog Timer is a hardware-based timer that attempts to restart the system when it stops working. The system may stop working because of external EMI or software bugs. The Watchdog Timer ensures that standalone systems like ATMs will automatically attempt to restart in the case of system problems.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

The Watchdog Timer is activated through software. The software application that activates the Watchdog Timer must also deactivate it when closed. If the Watchdog Timer is not deactivated, the system will automatically restart after the Timer has finished its countdown.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H     ;setting the time-out value
        MOV     BL, 30        ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1    ;is the application over?
        JNE     W_LOOP        ;No, restart the application

        MOV     AX, 6F02H     ;disable Watchdog Timer
        MOV     BL, 0;
        INT     15H

;
; EXIT ;
```

Appendix

D

Hazardous Materials Disclosure

D.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2011/65/EU Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	O	O	O	O	O	O
Display	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011)

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 (now replaced by GB/T 26572-2011)

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	O	O	O	O	O	O
显示	O	O	O	O	O	O
印刷电路板	O	O	O	O	O	O
金属螺帽	O	O	O	O	O	O
电缆组装	O	O	O	O	O	O
风扇组装	O	O	O	O	O	O
电力供应组装	O	O	O	O	O	O
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 (现由 GB/T 26572-2011 取代) 标准规定的限量要求。

Appendix

E

EMC Table

Guidance and manufacturer's declaration – electromagnetic emissions		
The model CNR-CPO-8500T is intended for use in the electromagnetic environment specified below. The customer or the user of the model CNR-CPO-8500T should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The model CNR-CPO-8500T uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The model CNR-CPO-8500T is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Comply	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Comply	

Recommended separation distances between portable and mobile RF communications equipment and the model CNR-CPO-8500T

The model CNR-CPO-8500T is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the model CNR-CPO-8500T can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the model CNR-CPO-8500T as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz $d = 1{,}2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1{,}2\sqrt{P}$	**800 MHz to 2,5 GHz** $d = 2{,}3\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Guidance and manufacturer's declaration – electromagnetic immunity			
The model CNR-CPO-8500T is intended for use in the electromagnetic environment specified below. The customer or the user of the model CNR-CPO-8500T should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±15 kV air	±8 kV contact ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±2 kV for input/output lines	±2 kV for power supply lines ±2 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % *U*T (>95 % dip in *U*T) for 0,5 cycle 40 % *U*T (60 % dip in *U*T) for 5 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles <5 % *U*T (>95 % dip in *U*T) for 5 sec	<5 % *U*T (>95 % dip in *U*T) for 0,5 cycle 40 % *U*T (60 % dip in *U*T) for 5 cycles 70 % *U*T (30 % dip in *U*T) for 25 cycles <5 % *U*T (>95 % dip in *U*T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the model CNR-CPO-8500T requires continued operation during power mains interruptions, it is recommended that the model CNR-CPO-8500T be powered from an uninterruptible power supply or a battery.

Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: *UT* is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration – electromagnetic immunity			
The model CNR-CPO-8500T is intended for use in the electromagnetic environment specified below. The customer or the user of the model CNR-CPO-8500T should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment – guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	6 Vrms 150 kHz to 80 MHz 10 V/m 80 MHz to 2,5 GHz	6 Vrms 10 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the model CNR-CPO-8500T, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = 1{,}2\sqrt{P}$ $d = 1{,}2\sqrt{P}$ 80 MHz to 800 MHz $d = 2{,}3\sqrt{P}$ 800 MHz to 2,5 GHz where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).

			Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the model CNR-CPO-8500T is used exceeds the applicable RF compliance level above, the model CNR-CPO-8500T should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the model CNR-CPO-8500T.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than V/m.