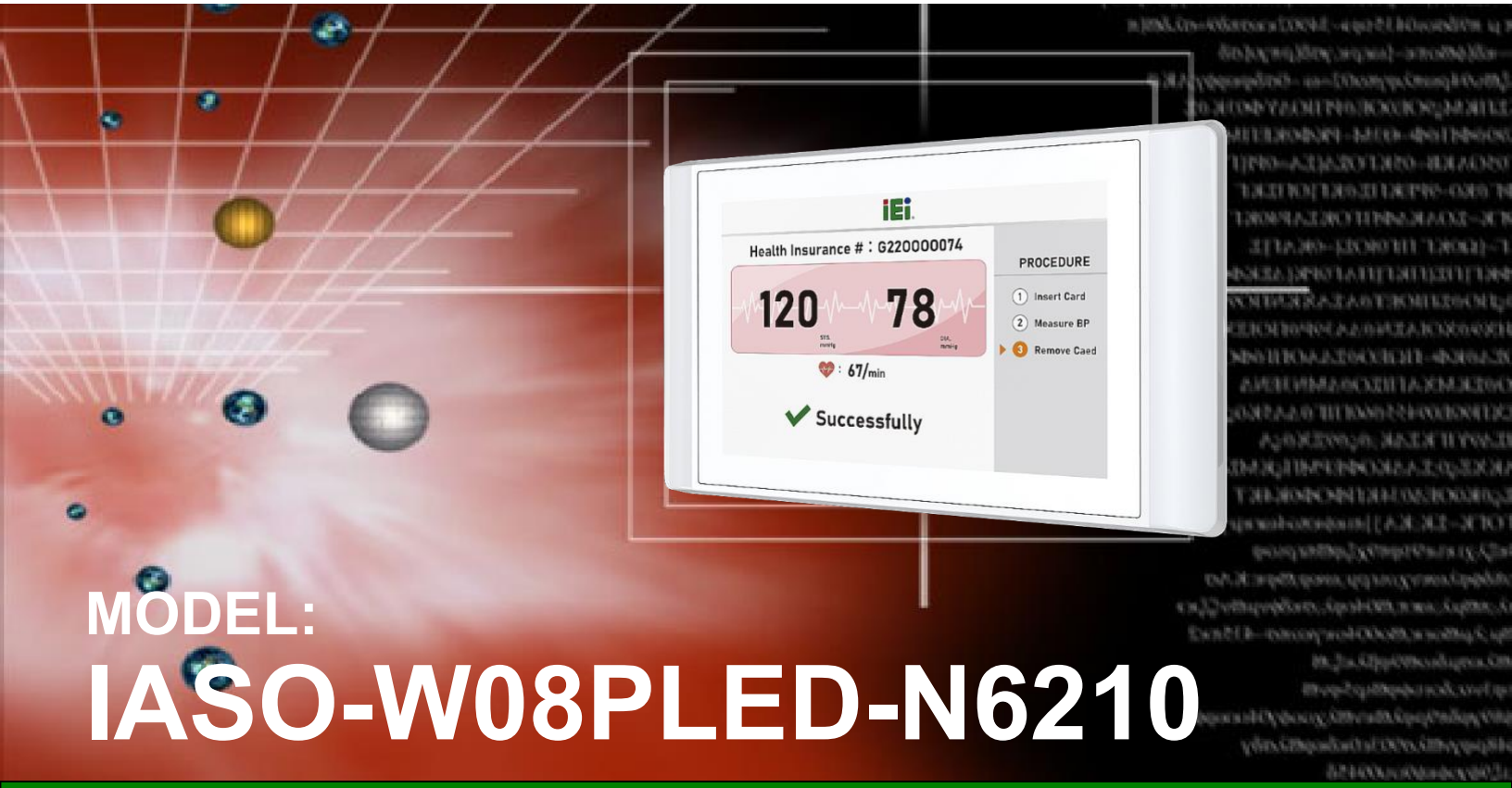
IEI Integration Corp.



MODEL:

IASO-W08PLED-N6210

8" Panel PC with Intel® Celeron® Processor N6210, P-CAP Touchscreen, 8 GB LPDDR4x, 128GB eMMC, USB 3.2 Gen 1, 1GbE, PoE, Audio and RoHS

User Manual

Rev. 1.01 - February 24, 2025

RoHS Lead Free

Revision

Date	Version	Changes
March 7, 2025	1.00	Initial release
February 24, 2025	1.01	Patch update

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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.

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Chapter

1

Introduction

1.1 Overview

Figure 1-1: IASO-W08PLED-N6210 Panel PC

The IASO-W08PLED-N6210 is an Intel® Celeron® Processor N6210 powered panel PC designed for easy and simplified integration into healthcare applications. The system has onboard 8GB LPDDR4x memory and 128GB eMMC for storage and memory capacity.

Two USB 3.2 Gen 1 ports provide simplified connectivity to a variety of external peripheral devices. One GbE RJ-45 connector allow for smooth connection of the system to an external LAN. An M.2 A-key slot is also available for installing the optional Wi-Fi 6E module to provide wireless communication.

The GbE connector also supports IEEE802.3 PoE, making the panel PC a PoE powered device (PD).

1.2 Features

The IASO-W08PLED-N6210 features are listed below:

- Compact fanless panel PC for easy installation
- P-CAP touchscreen with 10-point multi-touch and optical bonding
- Intel® Celeron® Processor N6210 platform
- On-board 8 GB LPDDR4x memory
- On-board 128 GB eMMC
- Programmable LED light bars on both sides
- One GbE RJ-45 with PoE
- Wi-Fi 6E high efficiency wireless (optional)
- Internal speaker
- Two USB 3.2 Gen 1 (5Gb/s) ports

1.3 Front Panel

The front side of the IASO-W08PLED-N6210 is a flat-bezel panel with an 8" LCD screen surrounded by an ABS/PC plastic frame. The LED bars are located on both sides of the front panel.

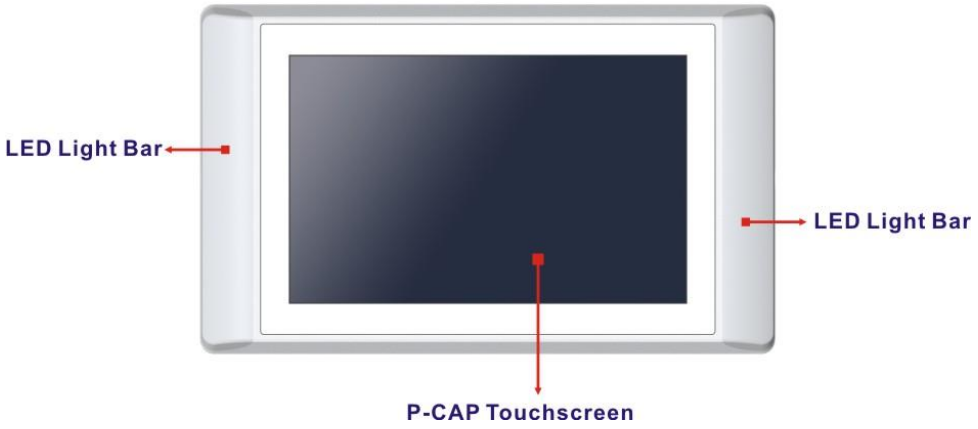


Figure 1-2: Front View

1.4 Bottom Panel

The bottom panel of the IASO-W08PLED-N6210 has the following connectors and components (**Figure** 1-3):

- 1 x 12 V DC input jack (standard)
- 1 x 1GbE RJ-45 supporting PoE
- 2 x USB 3.2 Gen 1 connector (5Gb/s)
- 1 x Audio-out connector
- 1 x Power button
- 1 x Reset button
- 1 x AT/ATX power mode switch
- 1 x Clear CMOS button

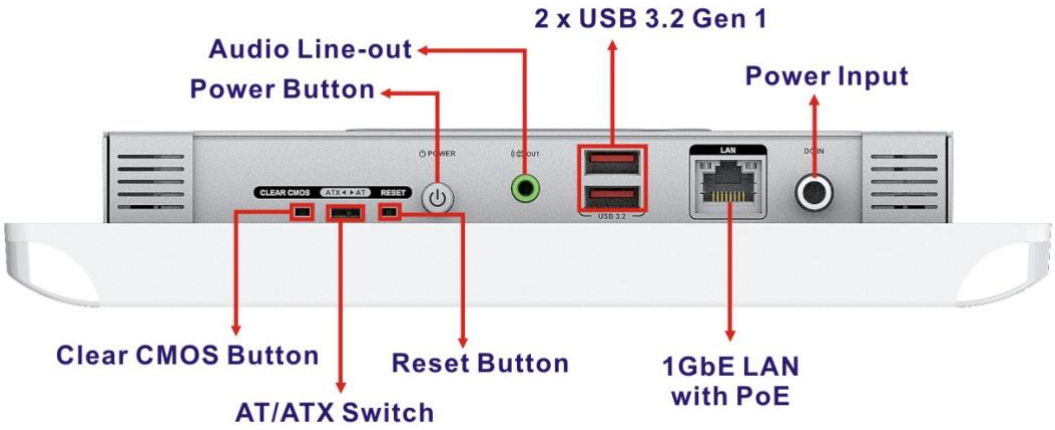


Figure 1-3: Bottom Panel

1.5 Rear Panel

The rear panel contains four retention screw holes that support VESA 75 mount (**Figure** 1-4).

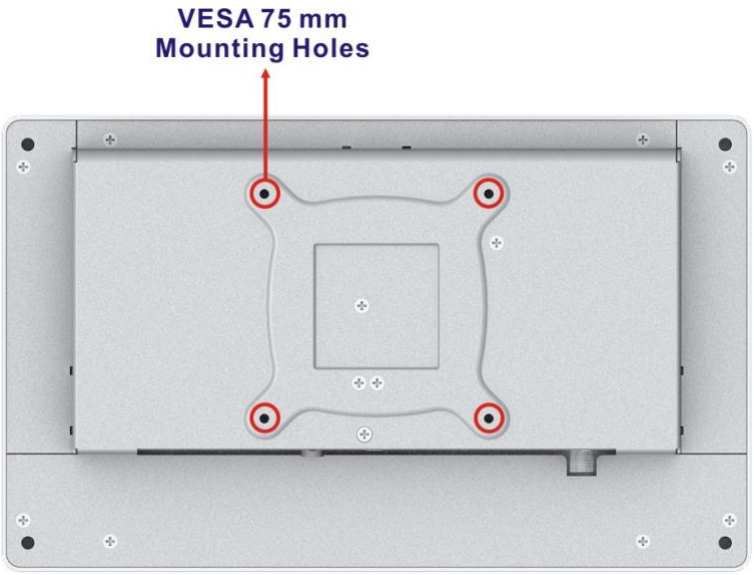


Figure 1-4: Rear View

1.6 System Specifications

The technical specifications for the IASO-W08PLED-N6210 systems are listed below.

LCD and Touchscreen	
LCD Size	8"
Max. Resolution	1280 (W) x 800 (H)
Brightness (cd/m²)	350
Contrast Ratio	800:1
LCD Color	16.7M
Pixel Pitch (mm)	0.13455 (H) x 0.13455 (V)
Viewing Angle (H-V)	170°/170°
Backlight MTBF	15,000 hrs
Touchscreen	Projected capacitive type
Multi-touch	10-point touch
Touch Controller	ILI
Surface Hardness	6H
System	
CPU	Intel® Celeron® N6210 (code-named Elkhart Lake, 1.2GHz, dual-core, 6.5W TDP)
Memory	On-board 8 GB LPDDR4x
Storage	On-board 128 GB eMMC
Expansions	1 x M.2 2242 M key slot (PCIe/SATA*) 1 x M.2 2230 A key slot (PCIe + USB, optional Wi-Fi module) ** The default setting for the M.2 M key is SATA; to switch to PCIe, you'll need to adjust the configuration in the BIOS.*
GbE Controller	Intel® I226 Ethernet controller
Wi-Fi and Bluetooth	IEEE 802.11a/b/g/n/ax (Wi-Fi 6E via Intel® AX210) , Bluetooth v5.2 (optional)

I/O Ports & Buttons	1 x 12V DC input jack 1 x 1GbE LAN (RJ-45) with PoE 2 x USB 3.2 Gen 1 (5Gb/s) Type-A 1 x Audio line-out jack 1 x Reset button 1 x Clear CMOS button 1 x Power button 1 x AT/ATX power mode switch	
Audio	One 1.5W internal speaker	
Physical		
Color	White	
Construction Material	Front bezel: PC Rear cover: ABS+PC	
Mounting	VESA 75 mm x 75 mm	
Dimensions (W x H x D)	250.1 mm x 152.1 mm x 42.6 mm	
Weight (Net)	1.0 kg	
Environment		
Storage/Transportation	**Temperature**	-20ºC - 60ºC
	Humidity	10% - 95% (non-condensing)
	Pressure	700 hPa - 1060 hPa
Operating	**Temperature**	0ºC - 40ºC
	Humidity	20% - 80% (non-condensing)
	Pressure	700 hPa - 1060 hPa
Vibration	1G	
Shock	Operating Shock: 5G peak acceleration (11ms duration) Non-Operating Shock: 15G peak acceleration (11ms duration)	

Thermal	Fanless
EMC & Safety	CE, CB, FCC Class B Part15
Supported OS	Windows 11, Linux Ubuntu
Power	
Power Input	12 V DC
PoE	IEEE 802.3af (Class 3) 12.95W / IEEE 802.3at (Class 4) 25.5W
Power Adapter	36 W FSP FSP036-RHBN3 power adapter (**P/N**: 63040-010036-210-RS)
	Input: 100 V AC - 240 V AC, 50 Hz - 60 Hz, 1.8 A
	Output: 12 V ⎓ 3.0 A

Table 1-1: System Specifications

1.7 Dimensions

The IASO-W08PLED-N6210 dimensions are shown below.

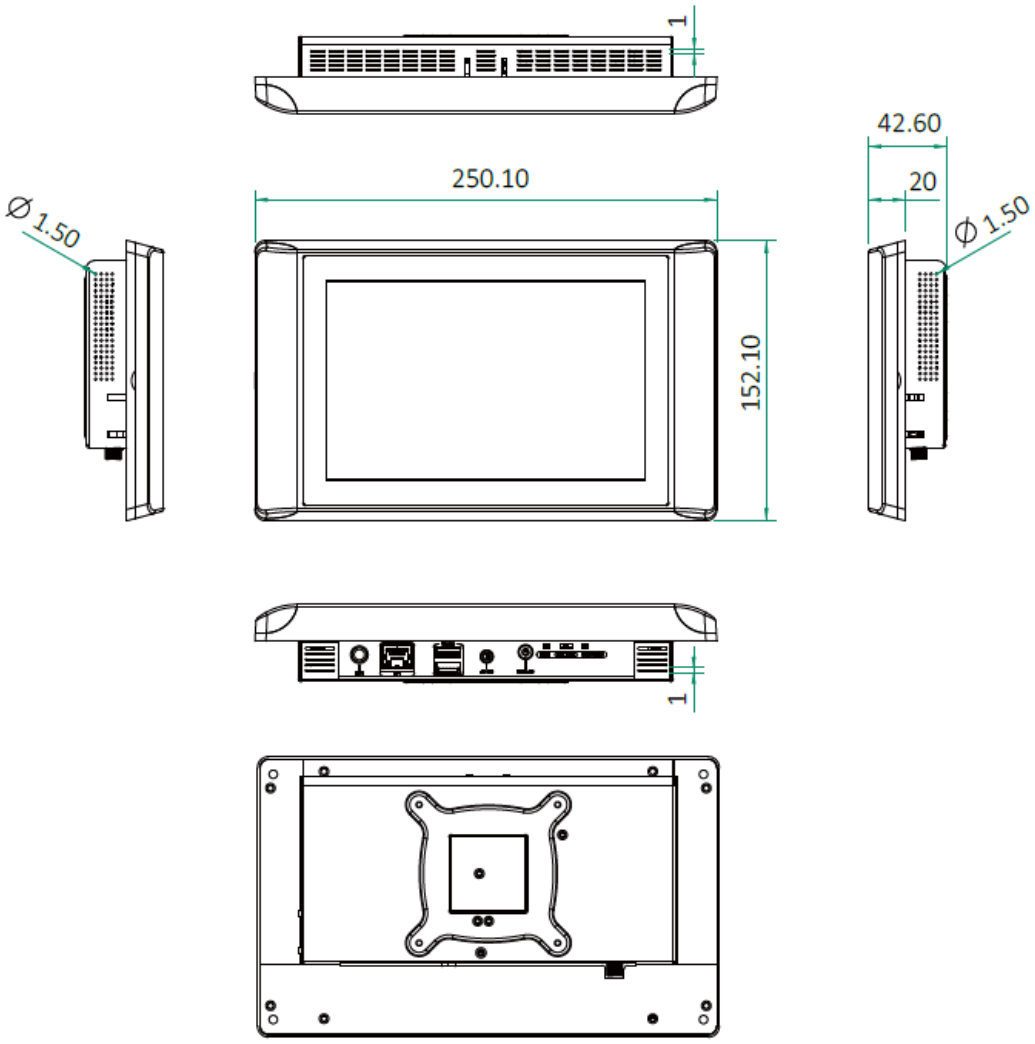


Figure 1-5: Dimensions (mm)

Chapter

2

Unpacking

2.1 Unpacking

To unpack the panel PC, follow the steps below:

WARNING

The front side LCD screen has a protective plastic cover stuck to the screen. Only remove the plastic cover after the panel PC has been properly installed. This ensures the screen is protected during the installation process.

Step 1: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the external (second) box.

Step 2: Open the external (second) box.

Step 3: Use box cutters, a knife or a sharp pair of scissors that seals the top side of the internal (first) box.

Step 4: Lift the panel PC out of the boxes.

Step 5: Remove both polystyrene ends, one from each side.

Step 6: Pull the plastic cover off the panel PC.

Step 7: Make sure all the components listed in the packing list are present.

2.2 Packing List

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IASO-W08PLED-N6210 was purchased from or contact an IEI sales representative directly by sending an email to iei_medical@ieiworld.com.

The IASO-W08PLED-N6210 panel PC is shipped with the following components:

Quantity	Item	Image
1	IASO-W08PLED-N6210 panel PC	
1	Power adapter, 63040-010036-210-RS (FSP FSP036-RHBN3, 36W)	
1	Power cord (EU, 183cm)*	
	Power cord (US/Canada, 183cm)*	

*Either one; shipped according to the country code of the order.

Chapter

3

Installation

3.1 Safety Precautions

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

- ***Remove the Power cord form A.C. MAINS if it will not to be used for a long time.***
- ***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.
- ***Follow the electrostatic precautions*** outlined below whenever the IASO-W08PLED-N6210 is opened.
- ***Make sure the power is turned off and the power cord is disconnected*** whenever the IASO-W08PLED-N6210 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 IASO-W08PLED-N6210 chassis is opened when the IASO-W08PLED-N6210 is running. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
- **DO NOT LEAVE THIS EQUIPMENT IN AN UNCONTROLLED ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60° C (140° F). IT MAY DAMAGE THE EQUIPMENT.**
- ***If considerable amounts of dust, water, or fluids enter the IASO-W08PLED-N6210***, turn off the power supply immediately, unplug the power cord, and contact the IASO-W08PLED-N6210 vendor.
- ***Never replace or repair any components on your own.*** If the components of the IASO-W08PLED-N6210 fails or malfunctions it must be shipped back to IEI to be repaired. Please contact the system vendor, reseller or an IEI sales person directly.
- **DO NOT**:
  - Drop the IASO-W08PLED-N6210 against a hard surface.

- Strike or exert excessive force onto the LCD panel.
- Touch any of the LCD panels with a sharp object
- In a site where the ambient temperature exceeds the rated temperature

3.2 Anti-static Precautions

WARNING

Failure to take ESD precautions during the maintenance of the IASO-W08PLED-N6210 may result in permanent damage to the IASO-W08PLED-N6210 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IASO-W08PLED-N6210. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IASO-W08PLED-N6210 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.
- ***Use an anti-static pad***: When configuring the IASO-W08PLED-N6210, place it on an anti-static pad. This reduces the possibility of ESD damaging the IASO-W08PLED-N6210.

3.3 Installation Precautions

When installing the panel PC, please follow the precautions listed below:

- **Certified Engineers**: Only certified engineers should install and modify the hardware settings.
- **Power turned off**: When installing the panel PC, 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.
- **Anti-static Discharge**: If a user open the rear panel of the panel PC, to plug in added peripheral devices, ground themselves first and wear an anti-static wristband.

WARNING

1. DO NOT modify this equipment without authorization of manufacturer.

2. DO NOT power up the IASO-W08PLED-N6210 while the front panel is facing down on a sheet of conductive foam. Doing so may cause the touch panel to malfunction due to the large surface area of contact between the conductive form and the touch panel.

3.4 GbE Connection

The RJ-45 connector on the bottom panel allows 1GbE connection to be made to a Local Area Network. It supports PoE and PoE+ functions. Connect the Ethernet (PoE) port to the inline power from the power injector or a suitably powered switch port. The Ethernet cable must be a shielded outdoor rated Category 5e (CAT5e), or better, cable.

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

Table 3-1: Ethernet Connector Pinouts

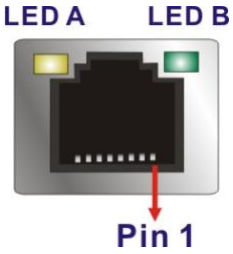


Figure 3-1: Ethernet Connector

LED	Description	LED	Description
A	PoE status on: 30W, IEEE 802.3at blinking: 15W, IEEE 802.3af	B	green: 1 Gb/s orange: except for 1 Gb/s

Table 3-2: Connector LEDs

3.5 AT/ATX Mode Selection

AT or ATX power mode can be used on the IASO-W08PLED-N6210. The selection is made through an AT/ATX switch located on the bottom panel (**Figure** 3-2).

Figure 3-2: AT/ATX Switch Location

3.6 VESA Mounting

The IASO-W08PLED-N6210 is VESA (4 screws: M4 type, 6 mm length min.) compliant and can be mounted on a mounting device with a 75 mm interface pad. The IASO-W08PLED-N6210 VESA mount retention screw holes are shown below. Refer to the installation guide that came with the mounting device to mount the IASO-W08PLED-N6210.

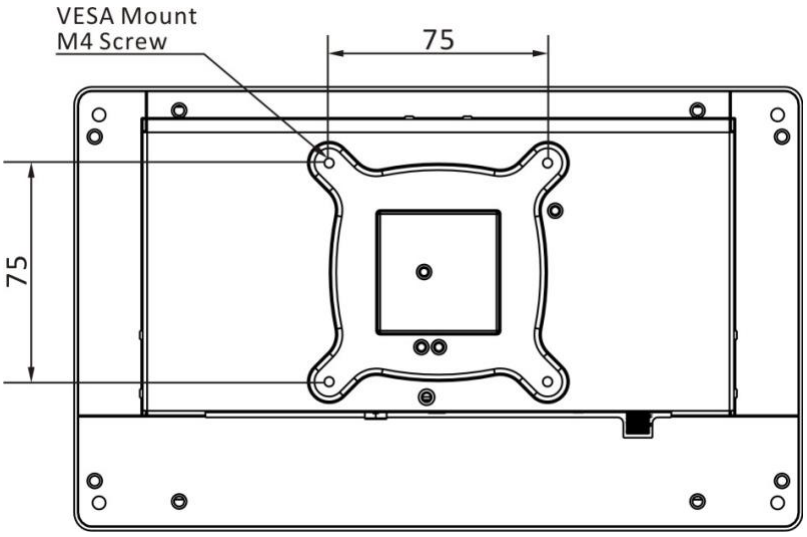


Figure 3-3: VESA Mounting Retention Screw Holes

WARNING

Use suitable mounting apparatus and be sure to secure the screws of the mounting apparatus tightly to avoid risk of injury.

3.7 Powering On the System

WARNING

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

To prevent potential malfunctions or damage to the device, do not connect both the Power Adapter and POE (Power over Ethernet) simultaneously.

To power on the system, follow the steps below:

Step 1: Connect the power cord to the power adapter. Connect the other end of the power cord to a power source. Connect the power adapter to the power connector of the IASO-W08PLED-N6210. **NOTE:** The FSP036-RHBN3 power adapter came with the IASO-W08PLED-N6210 is a forming part of the device.

Figure 3-4: Power Input Connector and Power Button

Step 2: Locate the power button on the bottom panel (Figure 3-4).

Step 3: Long press the power button to turn on the IASO-W08PLED-N6210.

Step 4: To force shutdown the panel PC, long-press the power button for 10 seconds.

3.8 Clear CMOS

If the IASO-W08PLED-N6210 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, push the clear CMOS button for three seconds, then restart the system. The clear CMOS button location is shown in **Figure** 3-5.

Figure 3-5: Clear CMOS Button Location

3.9 Reset the System

The reset button enables user to reboot the system when the system is on. The reset button location is shown in **Figure** 3-6. Press the reset button to reboot the system.

Figure 3-6: Reset Button Location

3.10 System Maintenance

If the components of the IASO-W08PLED-N6210 fail, they must be replaced. Please contact the system reseller or vendor to purchase the replacement parts.

NOTE:

A user cannot replace a motherboard. If the motherboard fails it must be shipped back to IEI to be replaced. Please contact the system vendor, reseller or an IEI sales person directly.

Chapter

4

Driver Installation

4.1 Available Drivers

All the drivers for the IASO-W08PLED-N6210 are available on IEI Resource Download Center (https://download.ieiworld.com). Type IASO-W08PLED-N6210, and press Enter to find all the relevant software, utilities, and documentation.

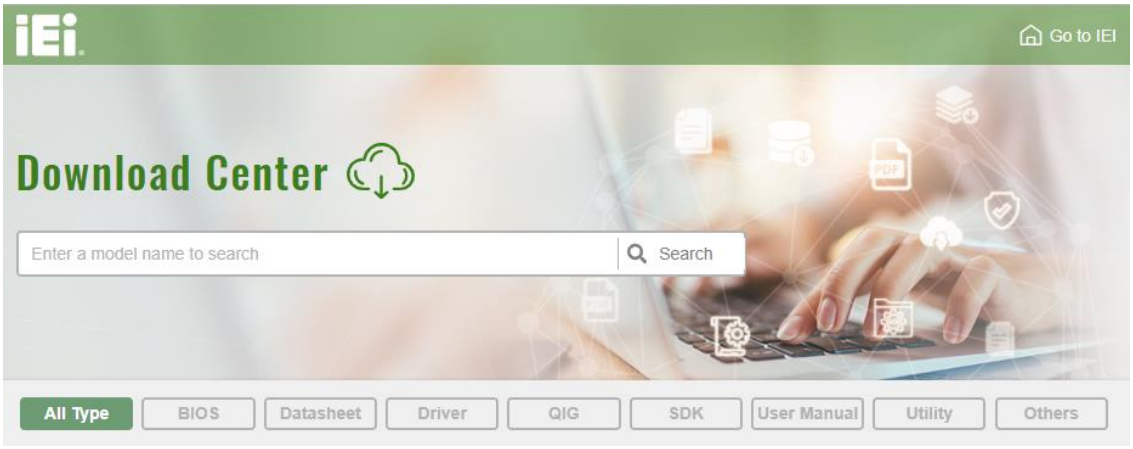
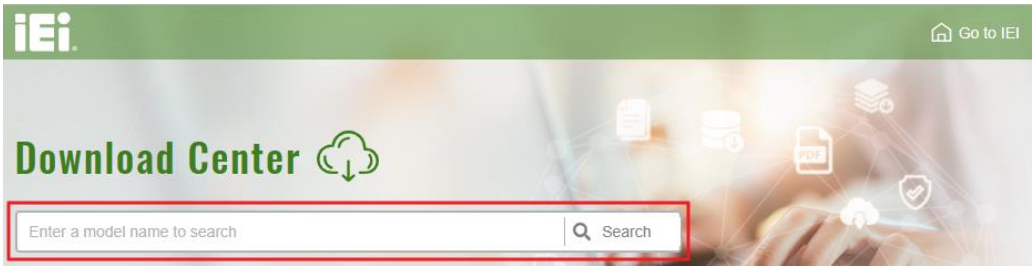


Figure 4-1: IEI Resource Download Center

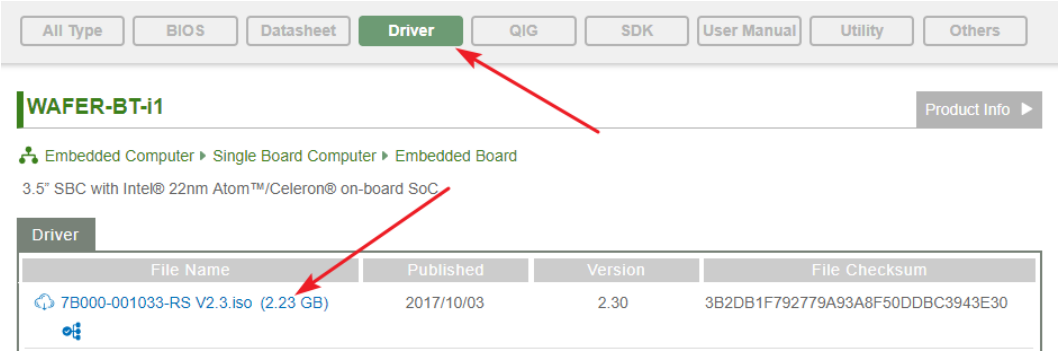
4.2 Driver Download

To download drivers from IEI Resource Download Center, follow the steps below.

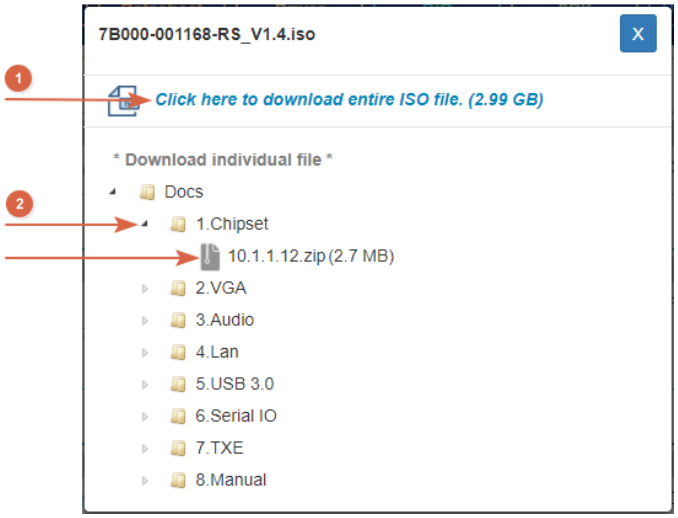
Step 1: Go to https://download.ieiworld.com. Type IASO-W08PLED-N6210, and press Enter.



Step 2: All product-related software, utilities, and documentation will be listed. You can choose **Driver** to filter the result.



Step 3: Click the driver file name on the page and you will be prompted with the following window. You can download the entire ISO file (❶), or click the small arrow to find an individual driver and click the file name to download (❷).



NOTE:

To install software from the downloaded ISO image file in Windows 8, 8.1 or 10, double-click the ISO file to mount it as a virtual drive to view its content.

Chapter

5

LED Bar Control

5.1 Overview

WARNING

The LED light is only for aesthetic purpose, not for warning use. The LED color cannot be configured to red, yellow and green.

This chapter provides detailed instructions on how to control the LED bar. It is organized into the following sections:

LED Bar Overview

This section provides an overview of the LED bar, explaining its structure and capabilities. The LED bar consists of multiple segments arranged linearly, and each segment can be controlled independently to display various colors and patterns.

LED Control Examples

This section provides examples of LED control on two different operating systems: Windows and Ubuntu. Follow the instructions below to effectively control the LED bar on each system.

- LED Control on Windows:

Before you begin controlling the LED bar, ensure that you have all the necessary resources in place. In Section 5.3.1, you will find step-by-step instructions for controlling the LED bar on Windows 10 (x64) using C++. The instructions cover tasks such as initializing data structures, adjusting brightness, changing LED colors, and closing the connection using the SMBus API.

- LED Control on Ubuntu:

Before proceeding with LED control on Ubuntu 22.04, make sure you have completed the necessary preparations. In Section 5.3.2, you will learn how to compile and run the LED control code on Ubuntu 22.04. Additionally, you will discover how to customize the LED control code according to your specific requirements.

Follow the provided instructions carefully to effectively control the LED bar on your desired operating system.

LED Bar Demo App (Windows Only)

This section introduces a demo application designed exclusively for Windows users. The LED Bar Demo App allows you to explore and experience the various control capabilities of the LED bar. The following features are included:

- Initialization: Establish the necessary connections with the LED bar controller.
- Mode Selection: Choose the desired LED bar mode, such as color cycling, pattern display, or static color.
- Parameter Specification: Define the parameters for the selected mode, including color values, animation speed, or pattern configuration.
- Activation: Apply the settings to the LED bar to activate the desired visual effects.

Ensure that you have the necessary resources, such as the LED bar controller, and follow the instructions carefully to control the LED bar effectively. Refer to the specific documentation or user manual for further guidance.

5.2 Preparations

Before proceeding with the LED bar setup, ensure the following prerequisites are met.

5.2.1.1 Install the Required Libraries

Make sure to install the necessary libraries to support the LED bar functionality.

Step 1: Install the following two packages:

- EcSDK-Setup-x64-v14.msi
- SMBAPI-setup-x64-v14.msi

Step 2: After installing the packages, restart your computer.

5.2.1.2 Driver Installation

Follow the steps below to install the "IEISMBDrv" device driver (version 1.0.0.6). Make sure to follow each step carefully for a successful installation.

Step 1: Open the command prompt in command line mode and run it as administrator.

Step 2: Unzip the **driver_SMBDRV_1.0.0.6.zip** file and locate the "install.bat" file.

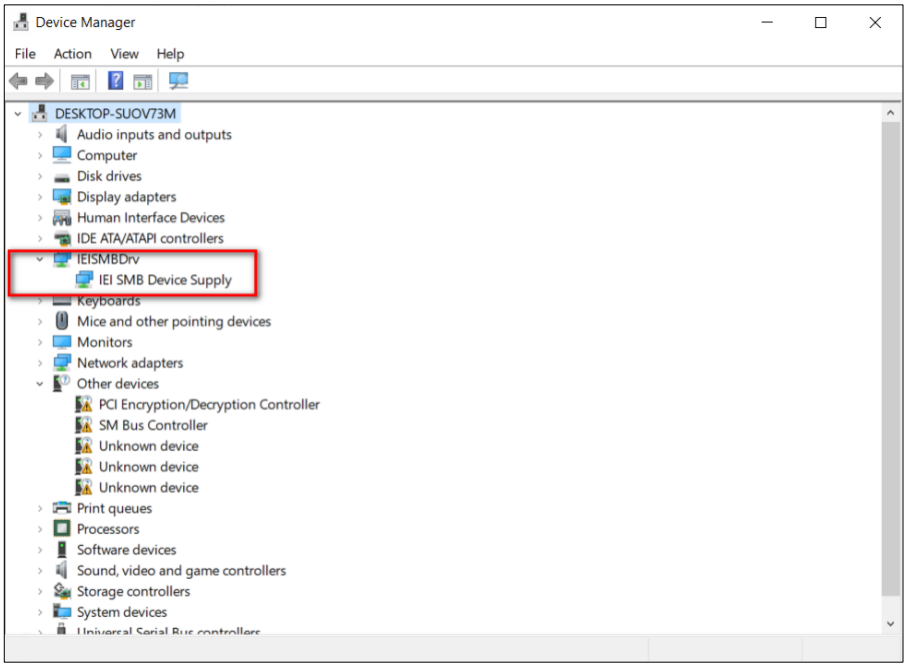
Step 3: Run file: "**install.bat**".

```
C:\Users\ce\Desktop\Signed_1152921505696248896\drivers\SMBDRV>install.bat

C:\Users\ce\Desktop\Signed_1152921505696248896\drivers\SMBDRV>devcon.exe install SMBDRV.inf Root\SMBDRV
Device node created. Install is complete when drivers are installed...
Updating drivers for Root\SMBDRV from C:\Users\ce\Desktop\Signed_1152921505696248896\drivers\SMBDRV\SMBDRV.inf.
Drivers installed successfully.

C:\Users\ce\Desktop\Signed_1152921505696248896\drivers\SMBDRV>
```

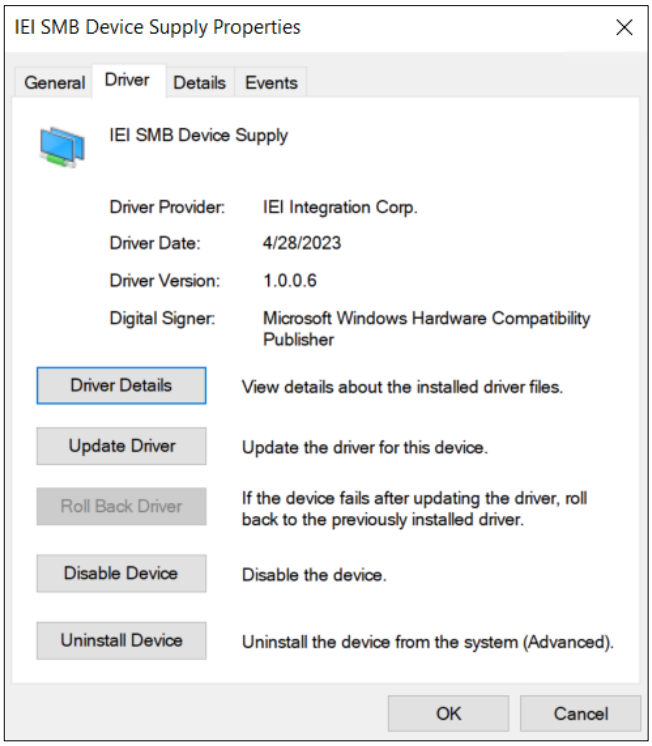
Step 4: Reboot your computer.

Step 5: After rebooting, you will be able to see the device named "IEISMBDrv" and its corresponding driver (version 1.0.0.6).

Device “IEISMBDrv” on Device Manager:



IEI SMB Device Driver is v1.0.0.6:



5.3 LED Control Example

5.3.1 Windows and Windows 11

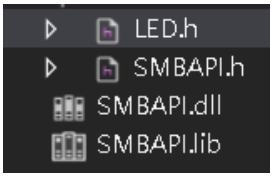
Use the following example program. For detailed information, please refer to the **DemoLED_example.cpp** file.

5.3.1.1 Preparations:

Before proceeding, make sure to complete the following preparations:

Step 1: Include the headers **SMBAPI.h** and **LED.h** (if using any necessary defines).

Step 2: Import the **SMBAPI.lib** and **SMBAPI.dll** files.



Step 3: Prepare the data structures: **SMB_INFO** and **SMB_BLK_INFO**.

```
typedef struct _SMB_INFO {
  → UCHAR → count;  → → //reserved
  → USHORT →addr;  → → //SMBus slave device ID
  → USHORT →commad; → //SMBus command
  → ULONG → data;  → → //Read/Write data
} SMB_INFO, *PSMB_INFO;
```

Refer to the example below:

```
#include ".\your_folder\SMBAPI.h"
#include ".\your_folder\LED.h"
```

5.3.1.2 Call SMBus API (SMB_Open) and Initialize Required Data Structures

This function is used to open the SMBus driver. For detailed APIs and data structures, refer to the "SMB_API.doc" document.

```
m_hDev = SMB_Open();
if (m_hDev == NULL)
{
   printf("Can not open GPIDRV !");
}
```

This API function is provided by the DLL.

SMB_Open

```
HANDLE WINAPI SMB_Open(
  → void
);
```

This function is used to open the SMBus device driver. If the function succeeds, it will return the handle of the driver.

5.3.1.3 Initialize the LED Status

To initialize the LED status, follow the steps below, which are divided into three sections. Each section includes the following sub-steps:

(1) Set the values for address, data, and command.

(2) Call the function `SMB_WriteByte()`.

Refer to the process outlined below for detailed instructions on initializing the LED status.

```
SMB_INFO smbInfo;
smbInfo.addr = 0xD0;
smbInfo.data = 0x01;
smbInfo.command = 0x00;
SMB_WriteByte(m_hDev, &smbInfo);

smbInfo.addr = 0xD0;
smbInfo.data = 0xFF;
for (int ii = 0x14; ii <= 0x17; ii++)
{
   smbInfo.command = ii;
   SMB_WriteByte(m_hDev, &smbInfo);
}

smbInfo.command = 0x01;
smbInfo.data = 0x00;
SMB_WriteByte(m_hDev, &smbInfo);
```

5.3.1.4 Write to LED

5.3.1.4.1 Adjusting LED Brightness

Ensure that the value provided for brightness is between 1 and 255.

(1) Set the values for address and command.

(2) Set data (Set the desired value for the LED brightness.)

(3) Call the function `SMB_WriteByte()`.

Note: This step only needs to be performed once.

Refer to the example below:

```
SMB_INFO smbInfo;
smbInfo.addr = 0xD0;
smbInfo.command = 0x12;
smbInfo.data = 196; // brightness
SMB_WriteByte(m_hDev, &smbInfo);
```

5.3.1.4.2 Changing LED Color

Change the LED color using different writing modes, distinguishing between simultaneous changes to all LEDs or individual LED updates.

A. Changing Colors of All LEDs (Use writeblock API):

This method allows you to change the colors of all LEDs simultaneously. Ensure that the RGB values provided for both methods fall within the range of 1 to 255 to achieve the desired LED colors.

Step 1: Prepare the **smbBlkInfo** Data Structure: Set the values for address, count, mode_i2c, and command. Here, 'count' represents the RGB values for 5 LEDs, making a total of 15 values (3 values per LED multiplied by 5).

```
SMB_BLK_INFO smbBlkInfo;
smbBlkInfo.addr = 0xD0;
smbBlkInfo.count = 15;
smbBlkInfo.mode_i2c = 0;
smbBlkInfo.command = 0xA1;
```

Step 2: Write RGB Data to `smbBlkInfo.data`.

Regarding RGB LED data and sequencing, the following information is provided:

Data Source:

The RGB data in the 'colorarray' mentioned here is simulated for a breathing (or color pattern) effect. However, you have the option to replace it with your own data.

Refer to the example below:

```
for (int LED = 0; LED < 5; LED++)
{
smbBlkInfo.data[LED * 3] = colorarrary[LED].R;
smbBlkInfo.data[LED * 3 + 1] = colorarrary[LED].G;
smbBlkInfo.data[LED * 3 + 2] = colorarrary[LED].B;
printf(" %d, %d, %d\n", colorarrary[LED].R, colorarrary[LED].G, colorarrary[LED].B);
}
```

LED Sequence and its Relation to colorarray:

There are a total of 15 LED values arranged in the following sequence:

colorarray[0].R, colorarray[0].G, colorarray[0].B,
colorarray[1].R, colorarray[1].G, colorarray[1].B,
colorarray[2].R, colorarray[2].G, colorarray[2].B,
colorarray[3].R, colorarray[3].G, colorarray[3].B,
colorarray[4].R, colorarray[4].G, colorarray[4].B.

In this sequence, the first group of R, G, B values represents LED0, the second group represents LED1, and so on for LED2, LED3, and LED4. These LEDs

correspond to the LED bar on both sides of the Panel PC, arranged from **top to bottom** (synchronized on both sides).

The configuration for different platforms:

In the **DemoLED_example.cpp** file, the configuration of "is_reverse_led" and "is_separate_left_right" depends on the platform.

```
bool is_reverse_led = true;
bool is_separate_left_right = true;
```

- If "is_reverse_led" is set to False, the order of the LEDs will be as mentioned earlier in 2b.
- If "is_reverse_led" is set to True, the LED(i) order needs to be reversed.

For example,
(colorarray[0].R, colorarray[0].G, colorarray[0].B) corresponds to LED4, (colorarray[1].R, colorarray[1].G, colorarray[1].B) corresponds to LED3, and so on for LED2, LED1, and LED0. The LED order for the two-side Panel PCs is from top to bottom.

- If "is_separate_left_right" is set to True, the LED settings for the left and right sides need to be configured separately, using addresses 0xC2 and 0xC1.
- If "is_separate_left_right" is set to False, it indicates that the LEDs on both sides of display synchronously.
- The mentioned address refers to the 'addr' field within the SMB_BLK_INFO data structure.
- For the IASO-W08 platform, both "is_reverse_led" and "is_separate_left_right" should be set to True.
- For the IASO-10 platform, both "is_reverse_led" and "is_separate_left_right" should be set to False.

The correspondence between LED(i) and colorarray(i) is as follows:

```
//for Left LED
SMB_BLK_INFO smbBlkInfoLeft;
smbBlkInfoLeft.addr = 0xC2;
smbBlkInfoLeft.count = 15;
smbBlkInfoLeft.mode_i2c = 0;
smbBlkInfoLeft.command = 0xA1;

for (int LED = 0; LED < 5; LED++)
{
   sh = (LED) * 3;
   if (is_reverse_led==true)
   {
         i_led = 4 - LED;
   }
   else
   {
         i_led = LED;
   }
   smbBlkInfoLeft.data[sh] = colorarrary[i_led].R;
   smbBlkInfoLeft.data[sh + 1] = colorarrary[i_led].G;
   smbBlkInfoLeft.data[sh + 2] = colorarrary[i_led].B;
   printf(" %d, %d, %d\n", colorarrary[i_led].R, colorarrary[i_led].G,
colorarrary[i_led].B);
}

//for Right LED
SMB_BLK_INFO smbBlkInfoRight;
smbBlkInfoRight.addr = 0xC1;
smbBlkInfoRight.count = 15;
smbBlkInfoRight.mode_i2c = 0;
smbBlkInfoRight.command = 0xA1;

for (int LED = 0; LED < 5; LED++)
{
   sh = (LED) * 3;
```

```
  if (is_reverse_led==true)
  {
        i_led = LED;
  }
  else
  {
        i_led = 4 - LED;
  }
  smbBlkInfoRight.data[sh] = colorarrary[i_led].R;
  smbBlkInfoRight.data[sh + 1] = colorarrary[i_led].G;
  smbBlkInfoRight.data[sh + 2] = colorarrary[i_led].B;
  printf(" %d, %d, %d\n", colorarrary[i_led].R, colorarrary[i_led].G,
colorarrary[i_led].B);
}
```

For more detailed usage, please refer to the content of the **DemoLED_example.cpp** file.

Step 3: The final step is to call the SMB_WriteBlock() function to write the values.

```
SMB_WriteBlock(m_hDev, &smbBlkInfo);
```

B. Changing Color of a Single LED (Use writebyte API):

This method enables you to change the color of a specific LED. Ensure that the RGB values provided for both methods fall within the range of 1 to 255 to achieve the desired LED colors.

Follow these steps to configure the LED settings:

Step 1: Setting the Address to 0xD0

Step 2: LED Index (led_i): Use the LED index to specify which LED to target. For example, LED0, LED1, LED2, LED3 and LED4. (from **top to bottom**).

Step 3: Set Data: Set the desired value for the R, G, or B component of the LED.

Step 4: Set Command: Select the appropriate command for the R, G, or B component.

Refer to the example below:

```
SMB_INFO smbInfo;
smbInfo.addr = 0xD0;
int led_i=0 //0,1,2,3,4

smbInfo.data = R_Value;
smbInfo.command = (0x02 + (led_i * 3)) + 0; //R
SMB_WriteByte(m_hDev, &smbInfo);

smbInfo.data = G_Value;
smbInfo.command = (0x02 + (led_i * 3)) + 1; //G
SMB_WriteByte(m_hDev, &smbInfo);

smbInfo.data = B_Value;
smbInfo.command = (0x02 + (led_i * 3)) + 2; //B
SMB_WriteByte(m_hDev, &smbInfo);
```

For the case when "is_reverse_led" is set to True and "is_separate_left_right" is set to True, please refer to the usage in the **DemoLED_example.cpp** file.

5.3.1.5 Call the SMBus API (SMB_Close) to Close the Connection

This function is used to close the SMBus driver. Refer to the example below:

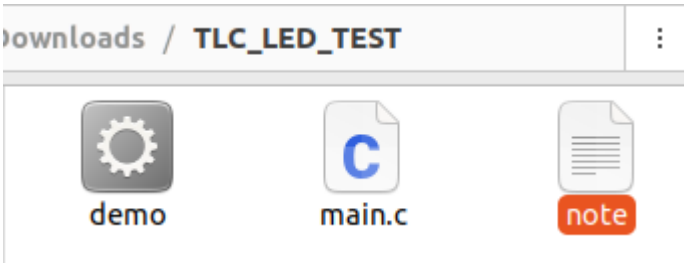
```
SMB_INFO smbInfo;
smbInfo.addr = 0xD0;

for (int ii = 0x14 ; ii <= 0x17 ; ii++)
{
   smbInfo.command = ii;
   smbInfo.data = 0x00;
   SMB_WriteByte(m_hDev, &smbInfo);
}

smbInfo.command = 0x00;
smbInfo.data = 0x11;
SMB_WriteByte(m_hDev, &smbInfo);

SMB_Close(m_hDev);
```

5.3.2 Ubuntu 22.04

Follow the instruction below to control the LED bar on Ubuntu 22.04.

5.3.2.1 Install Packages

Step 1: Ensure that you have the necessary files from the **TLC_LED_TEST.tgz** archive.



Step 2: Install the required packages, **i2c-tools** and **libi2c-dev**, using the following commands:

sudo apt-get install -y i2c-tools

```
ieisw@ieisw-Z699:~/Downloads/TLC_LED_TEST$ sudo apt-get install -y i2c-tools
```

sudo apt-get install -y libi2c-dev

```
ieisw@ieisw-Z699:~/Downloads/TLC_LED_TEST$ sudo apt-get install -y libi2c-dev
```

5.3.2.2 Compile and Run

Step 1: Add the necessary includes in the **main.c** file.

```
12 #include <stdio.h>
13 #include <stdlib.h>
14 #include <unistd.h>
15 #include <fcntl.h>
16
17 #include <sys/ioctl.h>
18
19 #include <linux/i2c.h>
20 #include <linux/i2c-dev.h>
21 #include <i2c/smbus.h>
```

Step 2: Compile the code to create the '**main_app**' executable.

gcc -o main_app main.c -lic2

```
ieisw@ieisw-Z699:~/Downloads$ gcc -o main_app main.c -li2c
```

Step 3: Run the executable file (main_app) as root.

sudo ./main_cpp

```
ieisw@ieisw-Z699:~/Downloads$ sudo ./main_app
Open I2C device
Set SLAVE ADDRESS
ioctl return 0
Open device successfully. Write sequence - MODE0
Mode setting successfully. Write sequence - IREF
IREF setting successfully. Write sequence - LED
LED setting successfully. Write sequence - PWM
Close device. Write sequence - MODE0
Demo Sequence Complete
```

5.3.2.3 Changing LED Color

Step 1: Set the REG_PWM0 register to 0xA1.

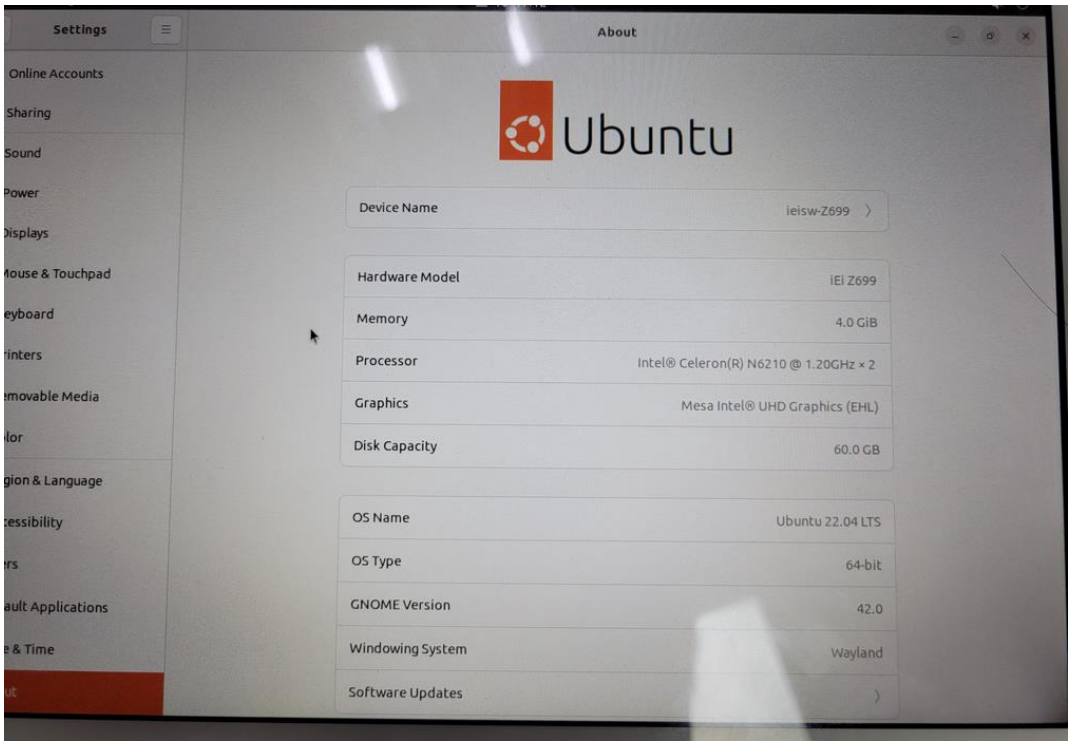
```
33 #define  SLAVE_ADDRESS          0xD0
34 #define  REG_MODE1              0x00
35
36 #define  REG_PWM0               0xA1
37 #define  REG_LEDOUT0            0x14
38 #define  REG_IREF               0x1C
```

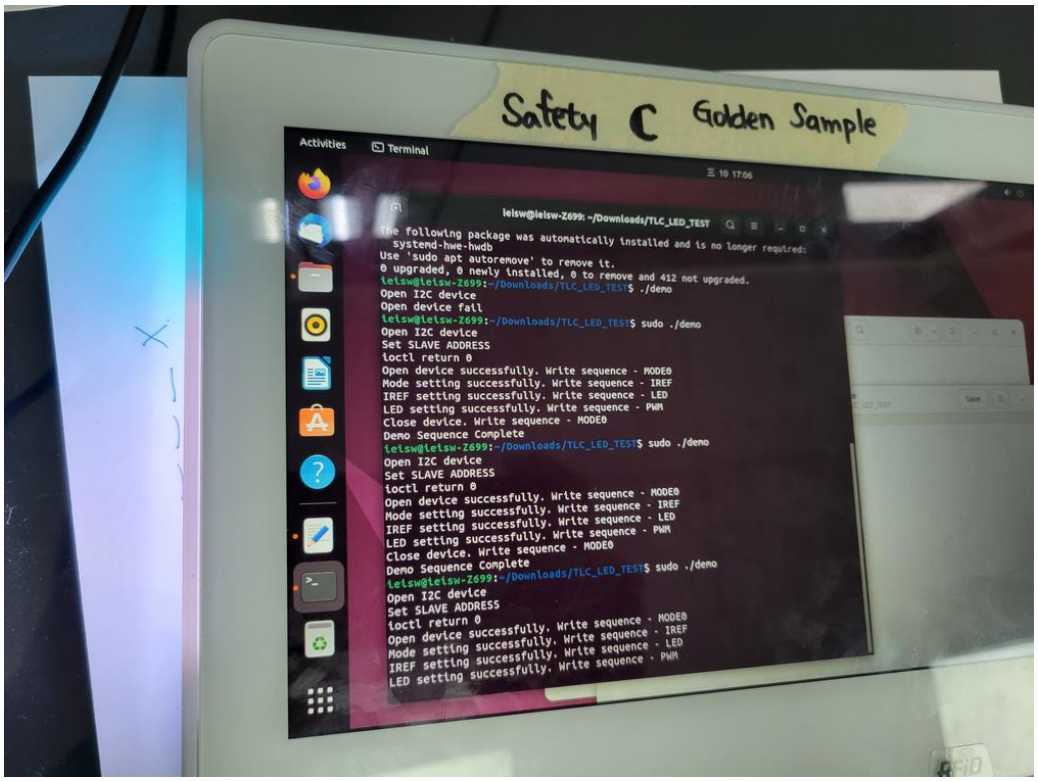
Step 2: Set the desired values for the LED's R, G, and B components.

Please refer to the usage in the **main_ubuntu.cpp** file.

```
commandPWM[0] = 0xFF; //LED0 (R,G,B) - White
commandPWM[1] = 0xFF;
commandPWM[2] = 0xFF;

commandPWM[3] = 0xFF; //LED1 (R,G,B) - Orange
commandPWM[4] = 0xA5;
commandPWM[5] = 0x00;

commandPWM[6] = 0x80; //LED2 (R,G,B) - Purple
commandPWM[7] = 0x00;
commandPWM[8] = 0x80;

commandPWM[9] = 0xFF; //LED3 (R,G,B) - Magenta
commandPWM[10] = 0x00;
commandPWM[11] = 0xFF;

commandPWM[12] = 0x00; //LED4 (R,G,B) - Blue
commandPWM[13] = 0x00;
commandPWM[14] = 0xFF;
```

5.3.2.4 OS Version & Result





5.4 LED Bar Demo App

In this Demo GUI App, we provide three examples of LED variations, including:

1. Color Cycling (Breathing Effect):

This example demonstrates the gradual transition of the LED color from Color1 to Color2, and then back to Color1. To start the simulation, click the START button. Click the STOP button to stop.

2. Pattern Display (Wavelike LED Variation):

This example allows you to choose a specific color or a rainbow color effect.

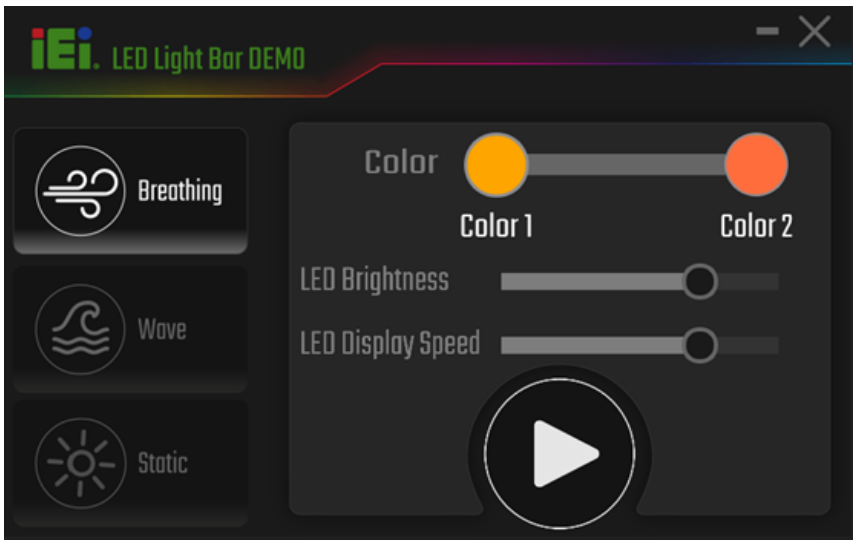
3. Static Color (Changing the Color of a Single LED):

This example enables you to change the color of a particular LED.

Additionally, you have control over the brightness and speed of color variations. Make your selections and follow the instructions to observe the desired LED variations.

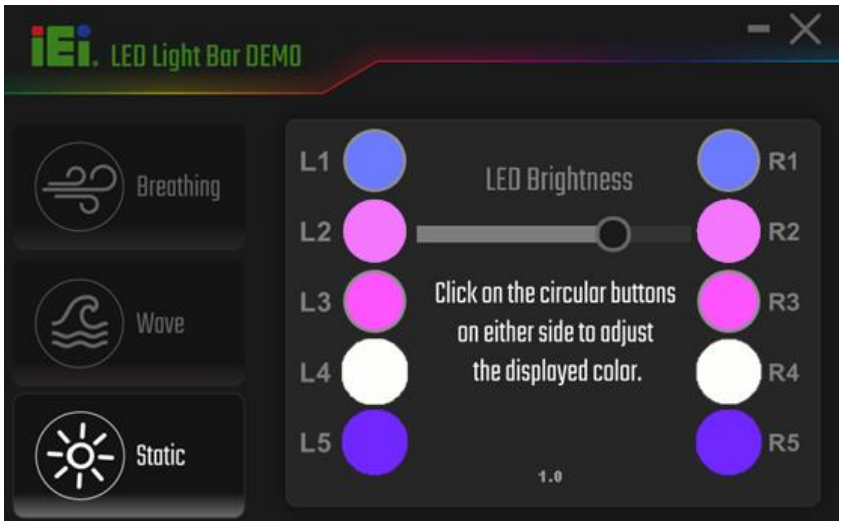
Color Cycling - Breathing Effect

Note: The terms Color1 and Color2 represent specific color values or presets that can be selected within the app.



Pattern Display - Wavelike LED Variation

Static Color - Changing the Color of a Single LED



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)

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.
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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 A 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

ROHS STATEMENT

The label on the product indicates this product conforms to European (EU) Restriction of Hazardous Substances (RoHS) that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

CHINA ROHS

The label on the product indicates 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.

Appendix

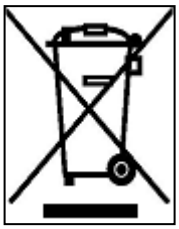
B

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–The device that produces less waste and is easier to recycle is classified as electronic device in terms of the European Directive 2012/19/EU (WEEE), and must not be disposed of as domestic garbage.



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.

Appendix

C

Maintenance and Cleaning Precautions

When maintaining or cleaning the IASO-W08PLED-N6210, please follow the guidelines below.

WARNING

If you dropped any material or liquid such as water onto the panel PC when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.

CAUTION

- For safety reasons, turn-off the power switch and unplug the panel PC before cleaning.
- Do not scratch or rub the screen with a hard object.
- Never use any of the following solvents on the panel PC. Harsh chemicals may cause damage to the cabinet and the touch sensor.
  Thinner Spray-type cleaner, Benzene, Wax, Abrasive cleaner, Acid or Alkaline solvent.

C.1.1 Maintenance and Cleaning

Prior to cleaning any part or component of the IASO-W08PLED-N6210, please read the details below.

- To clean the IASO-W08PLED-N6210,
  - remove dirt with a lightly moistened cloth. Then wipe the external chassis with a soft dry cloth.
  - use 75% ethanol alcohol to clean the external chassis.
- The interior of the IASO-W08PLED-N6210 does not require cleaning. Keep fluids away from the IASO-W08PLED-N6210 interior.

C.1.2 Cleaning Tools

Some components in the IASO-W08PLED-N6210 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 IASO-W08PLED-N6210.

- ***Cloth*** – Although paper towels or tissues can be used, a soft, clean piece of cloth is recommended when cleaning the IASO-W08PLED-N6210.
- ***Water/Ethanol alcohol*** – A cloth moistened with water or 75% ethanol alcohol can be used to clean the IASO-W08PLED-N6210.
- ***Using solvents*** – The use of solvents is not recommended when cleaning the IASO-W08PLED-N6210 as they may damage the plastic parts.
- ***Cotton swabs*** - Cotton swaps moistened with water are excellent tools for wiping hard to reach areas.
- ***Foam swabs*** - Whenever possible, it is best to use lint free swabs such as foam swabs for cleaning.

Appendix

D

Symbol Definitions

The following symbols appear on the product, its labeling, or the product packing. Each symbol carries a special definition, as defined below:

	Direct current		Fragile, handle with care
	AC current		Keep dry
	Protective earth (ground)		This side up
	Date of manufacture		Indicates the manufacturer
	Stand-by		Refer to instruction manual
	Indicates proof of conformity to applicable European Economic Community Council directives and to harmonized standards published in the official journal of the European Communities.		
	Tested to comply with FCC Class B standard.		
	This symbol indicates that the waste of electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.		
	This product is recyclable.		

Appendix

E

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 E-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

F

Error Beep Code

F.1 PEI Beep Codes

Number of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

F.2 DXE Beep Codes

Number of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

NOTE:

If you have any question, please contact IEI for further assistance.

Appendix

G

Hazardous Materials Disclosure

G.1 RoHS II Directive (2015/863/EU)

The details provided in this appendix are to ensure that the product is compliant with the RoHS II Directive (2015/863/EU). The table below acknowledges the presences of small quantities of certain substances in the product, and is applicable to RoHS II Directive (2015/863/EU).

Please refer to the following table.

Part Name	Toxic or Hazardous Substances and Elements									
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybromina ted Biphenyls	Polybromina ted Diphenyl Ethers	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate (BBP)	Dibutyl phthalate (DBP)	Diisobutyl phthalate (DIBP)
Housing	O	O	O	O	O	O	O	O	O	O
Display	O	O	O	O	O	O	O	O	O	O
Printed Circuit Board	O	O	O	O	O	O	O	O	O	O
Metal Fasteners	O	O	O	O	O	O	O	O	O	O
Cable Assembly	O	O	O	O	O	O	O	O	O	O
Fan Assembly	O	O	O	O	O	O	O	O	O	O
Power Supply Assemblies	O	O	O	O	O	O	O	O	O	O
Battery	O	O	O	O	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 Directive (EU) 2015/863.

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 Directive (EU) 2015/863.

G.2 China RoHS

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/T11364-2014 與 GB/T26572-2011 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/T11364-2014 與 GB/T26572-2011 标准规定的限量要求。