faytech, nice touch.

FAY-KLU

Industrial Motherboard

E16034
First Edition
November 2019

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Acknowledgments

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If there is a defect, you can request an RMA number (Return Merchandise Authorization) at support@faytech.com. For further information please read this instruction manual in detail.

For support outside of China, we work with local representatives / local service partners together who may work on our behalf in our name. On request, more information can be given by contacting the above mentioned contact details.

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Appendix

Chapter 1

Product overview

1.1 Package contents

Check your industrial motherboard package for the following items.

☑ 1 x Industrial Motherboard

If any of the above items is damaged or missing, contact your distributor or sales representative immediately.

1.2 Features

- Intel® 7th gen. 14nm KabyLake U, FCBGA1356

  Core i7-7600U, 2C/4C, 2.8/3.9(turbo)GHz, 4M, 300MHz/1.15GHz (Turbo) GFX, ~15W TDP

  Core i5-7300U, 2C/4C, 2.6/3.5(turbo)GHz, 3M, 300MHz/1.10GHz (Turbo) GFX, ~15W TDP

  Core i3-7100U, 2C/4C, 2.4GHz, 3M, 300MHz/1.00GHz (Turbo) GFX, ~15W TDP

  Celeron 3965U, 2C, 2.2GHz, 2M, 300MHz/900MHz (Turbo) GFX, ~15W TDP
- 1 x SO-DIMM, max. 16GB, single channel non-ECC DDR4 1866/2133 MHz
- SATA 6.0 Gb/s x 1, USB 3.0 x 6
- 1 x PCIe [x1] straddle type, 1 x Mini Card + mSATA (with SIM card) full/ half size BOM OPTION, 1 x M.2 E-key (22 x 30mm) for wireless devices
- 1 x HDMI, 1 x eDP or LVDS (BOM option), 1 x DP

1.3 Specifications

SYSTEM	
CPU	Intel® 7th gen. 14nm KabyLake U, FCBGA1356 Core i7-7600U, 2C/4C, 2.8/3.9(turbo)GHz, 4M, 300MHz/1.15GHz (Turbo) GFX, ~15W TDP Core i5-7300U, 2C/4C, 2.6/3.5(turbo)GHz, 3M, 300MHz/1.10GHz (Turbo) GFX, ~15W TDP Core i3-7100U, 2C/4C, 2.4GHz, 3M, 300MHz/1.00GHz (Turbo) GFX, ~15W TDP Celeron 3965U, 2C, 2.2GHz, 2M, 300MHz/900MHz (Turbo) GFX, ~15W TDP
Memory	1 x SO-DIMM, max. 16 GB, DDR4 1866/2133 non-ECC Singal channel memory
Graphics	Intel® HD Graphics
I/O chipset	Fintek F81866D
LAN	1 x LAN1 connector (POE LAN RJ45 connector, POE power connect to 2x2 2.54mm pin header)
Audio	1 x Realtek ALC3236 Audio CODEC
TPM	1 x Nuvoton NPCT650ABAYX TPM 2.0
Expansion slots	1 x PCIe x1 straddle type 1 x Mini Card + mSATA (with SIM card) x full/ half size BOM OPTION 1 x M.2 E-key (22 x 30mm) for wireless device
BIOS	16MB Flash ROM, AMI BIOS
Wake on LAN/PXE	Yes (WOL/PXE)
Watchdog Timer	1~255 steps by software program
H/W Status Monitor	Monitors CPU/System temperature Monitors Vcore/5V/3.3V/12V voltages
Smart Fan Control	Yes
Power State	S3, S4, S5
Graphics	
Graphics chipset	Intel® HD Graphics
Graphics multi display	eDP or LVDS +DP, eDP or LVDS +HDMI, HDMI+DP, HDMI+DP+eDP or LVDS
HDMI	Up to 4096 x 2160 @30 Hz(HDMI 1.4b)
eDP	Up to 4196 x 2160 @60 Hz, (colay LVDS, BOM OPTION)
DP	Up to 4096 x 2160 @60 Hz (support DP1.2)
LVDS	Support EDID, Up to 1920 x 1200 @ 60Hz, Resolution read from EEPROM, LCD Default 640*480
LVDS Inverter Control	Voltage / PWM, 1 x DC 5V/12V for LCD backlight inverter board
Environement & Power & ME	
Battery	Lithium battery
Power requirement	1 x 2-pin onboard power input connector (12 VDC ±10%)
Operating temperature	32ºF~140ºF (0ºC~60ºC)

(continued on the next page)

Environement & Power & ME	
Operating humidity	0%~90% relative humidity, non-condensing
Certificate	CE & FCC class A
Form factor	EPIC Form Factor, 4.53"x6.5" (115mmx165mm)
I/O	
Storage	1 x Serial ATA 6.0 Gb/s connector 1 x 5V/12V SATA power connector
USB	6 x USB 3.0 ports (4 ports at I/O shield, 2 ports on board)
Display I/O	1 x HDMI, 1 x eDP or LVDS(BOM option), 1 x DP
Audio I/O	1 x Line-out / Mic-In on board header 1 x SPDIF output box header
LAN I/O	1 x RJ-45 (POE), 1 x RJ-45
Serial port	1 x RS-232/422/485 (COM1 supports 5V/12V/RI option), 3 x RS-232 (COM3 / COM4 only support Tx/Rx)
DIO	8-bit Digital I/O interface (4-in /4-out)
Placement	
Rear I/O (low profile)	1 x DP (vertical) 1 x POE LAN (RJ-45) port 1 x LAN (RJ-45) port 4 x USB 3.0 port stack type connector (blue) 1 x HDMI port 1 x COM (COM1, RS232/422/485; RI / 5V / 12V)
Internal I/O	1 x 12V DC-IN power connector (2-pin) 1 x PCIe x1 straddle type (optional) 1 x SATA 6.0 Gb/s connector (standard, 7-pin) 1 x Front panel box header (2 x 5 pin, k10, 2.00mm) 1 x eDP/LVDS box header (2 x 15 pin, 2.00mm) 1 x SD card box header (2 x 5pin, 2.00mm, controlled by cardreader AU6465) 1 x M.2 E-key slot (NGFF2230, 22 x 30mm) for wireless devices 1 x Default full size Mini card slot (support mSATA BOM OPTION) 2 x USB 3.0 box headers (2 x 5 pin, 2.00mm) 1 x 4-pin SATA power connector (wafer, 4-pin, 2.50mm) 3 x RS232 box header (COM 2 & COM 3 & COM 4, 2 x 5 pin, 2.00mm, COM3 / COM4 only support Tx/Rx) 1 x SPDIF output box header (2 x 5 pin, k4, 2.00mm) 1 x Line-out / Mic-in header (2 x 5 pin, k8, 2.00mm) 1 x SIM card connector (2 x 5pin, 2.00mm) 1 x DIO connector (2 x 5 pin, 2.00mm) 2 x LCD Backlight control/ LCD panel voltage box header (2 x 5 pin, 2.00mm) (1 x 6 pin, 2.00mm)
Others	
OS supported	Windows® 10 64-bit Ubuntu16.04

Chapter 2

Motherboard information

2.1 Before you proceed

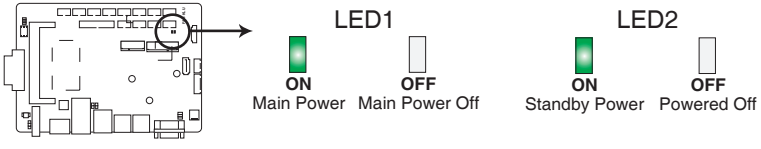
Take note of the following precautions before you install motherboard components or change any motherboard settings.

CAUTION!

- Unplug the power cord from the wall socket before touching any component.
- Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.

Main and Standby Power LEDs

The motherboard comes with one standby power LED and main power LED that light up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LEDs.

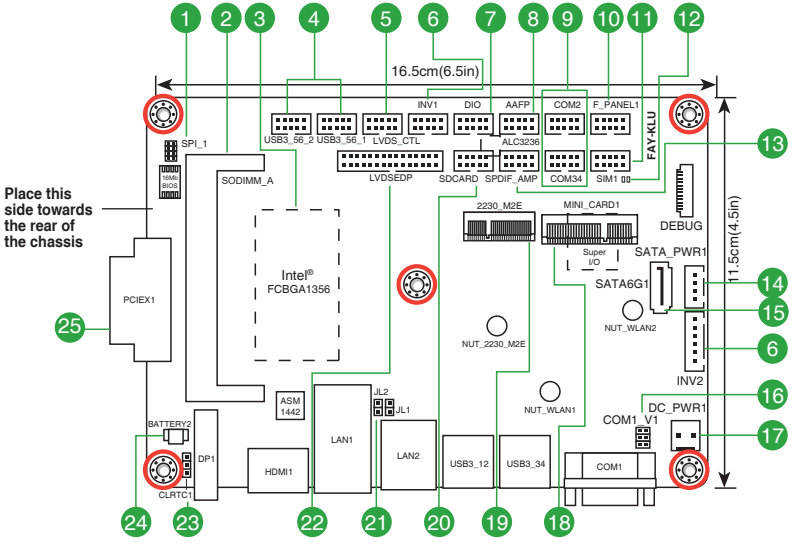


FAY-KLU Onboard LEDs

2.2 Motherboard layout

NOTE: Place five screws into the holes indicated by circles to secure the motherboard to the chassis.

CAUTION! Do not overtighten the screws! Doing so can damage the motherboard.



Connectors/Jumpers/Slots		Page
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24.	Battery connector (2-pin BATTERY1)	2-18
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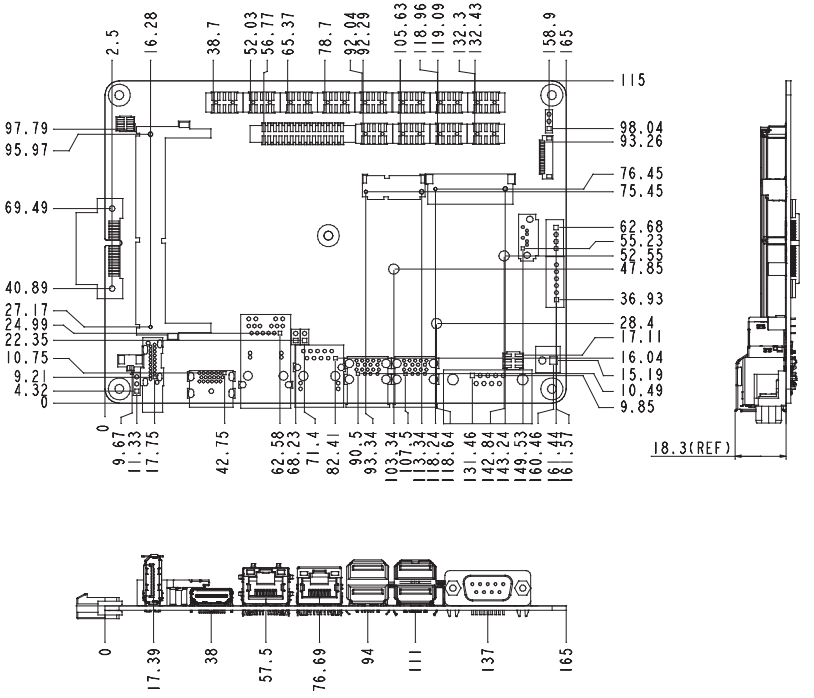
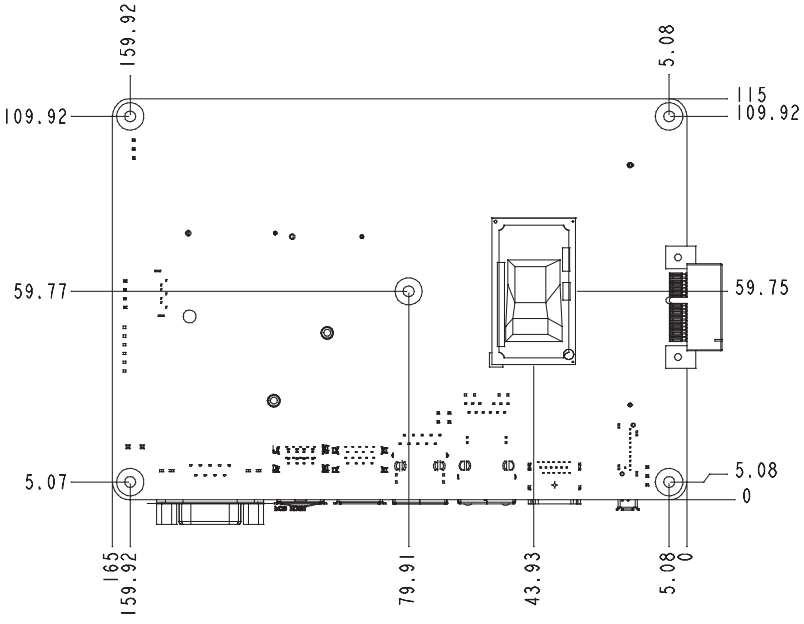
2.3 Screw size

2.3.1 Component side

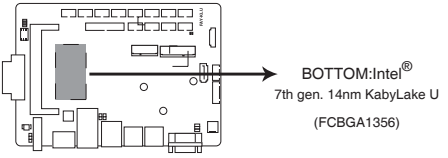


2.3.2 Solder side



2.4 Central Processing Unit (CPU)

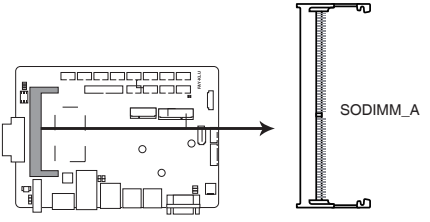
This motherboard comes with an integrated Intel® processor.



FAY-KLU CPU socket FCBGA1356

2.5 System memory

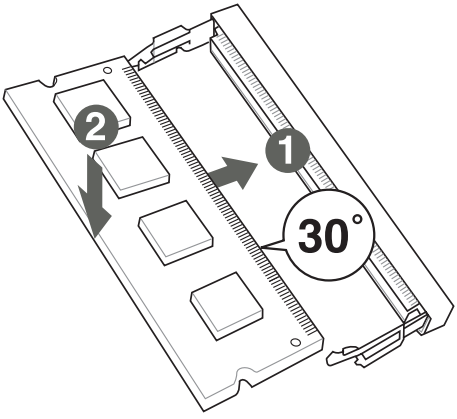
This motherboard comes with one Double Data Rate 4 (DDR4) Small Outline Dual Inline Memory Module (SO-DIMM) socket. The figure illustrates the location of the DDR4 DIMM socket:



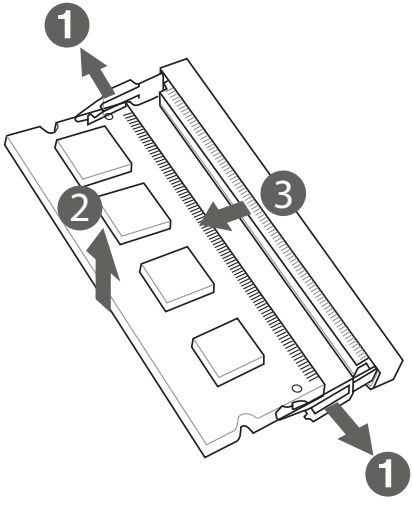
FAY-KLU SODIMM slot

Installing a DIMM

To install a SO-DIMM



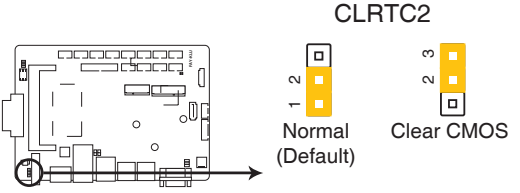
To remove a SO-DIMM



2.6 Jumpers

1. Clear RTC RAM (3-pin CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.



FAY-KLU Clear RTC RAM

To erase the RTC RAM:

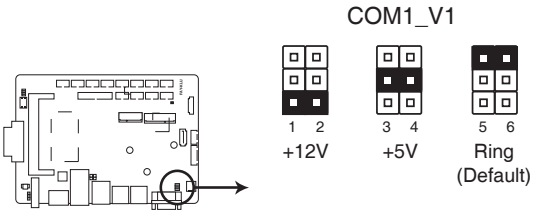
1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
3. Plug the power cord and turn ON the computer.
4. Hold down the **<Del>** key during the boot process and enter BIOS setup to reenter data.

CAUTION! Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

NOTES:

- If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After clearing the CMOS, reinstall the battery.
- You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the CPU Parameter Recall (C.P.R) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

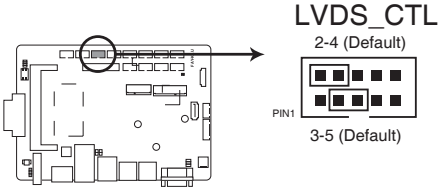
2. COM1 RI/+5V/+12V selector (6-pin COM1_V1)



FAY-KLU COM1 Ring/+5V/+12V Selection

Setting	Pins
+12V	1-2
+5V	3-4
RI (Default)	5-6

3. LVDS panel voltage selection (10-pin LVDS_CTL)

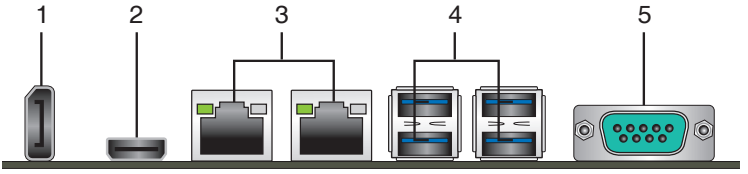


FAY-KLU LVDS_CTL

Setting	Pins
Set +V_PANEL to +3V (Default)	2-4
Set LVDS backlight control to DC mode (Default)	3-5

2.7 Connectors

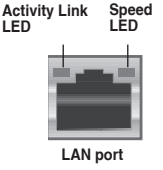
2.7.1 Rear panel connectors



1. **DisplayPort connector.** This port connects a device with DisplayPort connector.
2. **HDMI port.** This port is for a High-Definition Multimedia Interface (HDMI) connector, and is HDCP compliant allowing playback of HD DVD, Blu-Ray, and other protected content.
3. **LAN (RJ-45) ports.** These ports allow Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
Off	No link	Off	10 Mbps connection
Orange	Linked	Orange	100 Mbps connection
Orange (Blinking)	Data activity	Green	1 Gbps connection
Orange (Blinking then steady)	Ready to wake up from S5 mode	_	_



4. **USB 3.0 port.** This 9-pin Universal Serial Bus (USB) port connects to USB 3.0/2.0 devices.

NOTES:

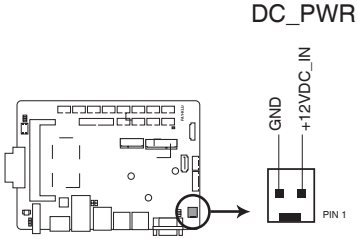
- USB 3.0 devices can be used for data storage only.
- Due to the design of the Intel® 300 series chipset, all USB devices connected to the USB 2.0 and USB 3.0 ports are controlled by the xHCI controller. Some legacy USB devices must update their firmware for better compatibility.
- We strongly recommend that you connect USB 3.0 devices to USB 3.0 ports for a faster and better performance from your USB 3.0 devices.

5. **COM port.** This 9-pin COM port is for pointing devices or other serial devices

2.7.2 Internal connectors

1. 12V DC power connector (2-pin DC_PWR)

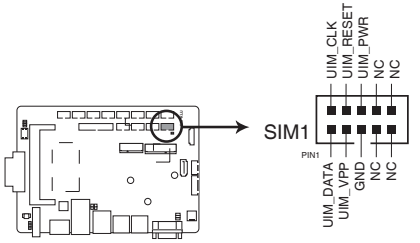
This port connects to a 12V DC power adapter.



FAY-KLU 12V DC power connector

2. SIM card connector (10-pin SIM1)

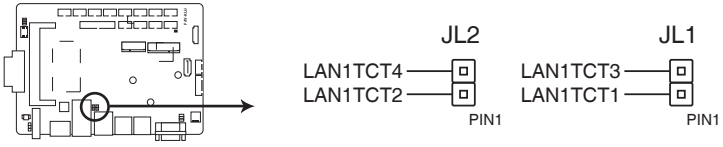
This port connects to a SIM card reader module.



FAY-KLU SIM CARD connector

3. Internal POE LAN connectors (2-pin JL1, JL2)

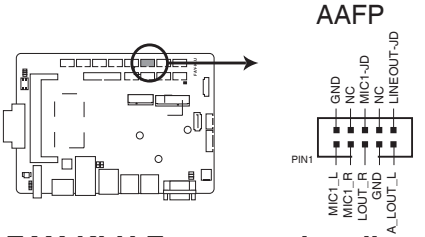
Connect the POE LAN power cables to this connector.



FAY-KLU Internal POE LAN connectors

4. Front panel audio connector (10-pin AAFP)

This connector is for a chassis-mounted front panel audio I/O module that supports HD Audio audio standard. Connect one end of the front panel audio I/O module cable to this connector.

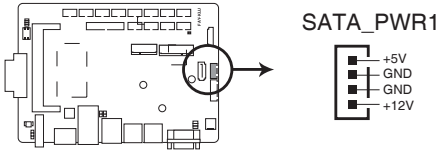


FAY-KLU Front panel audio connector

IMPORTANT: We recommend that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

5. SATA power connector (4-pin SATA_PWR1)

This connector is for the SATA power cable. The power cable plug is designed to fit this connector in only one orientation. Find the proper orientation and push down firmly until the connector completely fit.

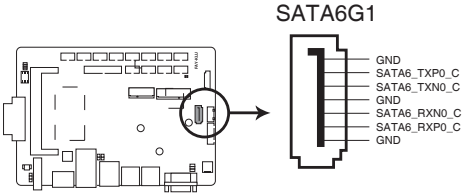


FAY-KLU SATA_PWR1 connector

IMPORTANT: The SATA power connector supports 1A current to the maximum.

6. Serial ATA 6.0Gb/s connectors (7-pin SATA6G1)

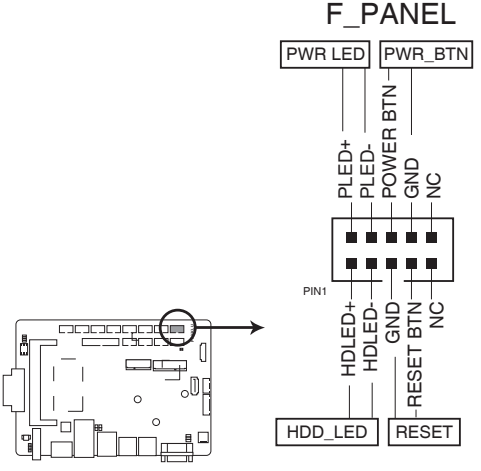
These connectors connect to Serial ATA 6.0 Gb/s hard disk drives and optical drives via Serial ATA 6.0 Gb/s signal cables.



FAY-KLU SATA6G connector

7. System panel connector (10-pin F_PANEL1)

This connector supports several chassis-mounted functions.



FAY-KLU Front panel connector

- **System power LED (2-pin PWR_LED)**

  This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard disk drive activity LED (2-pin HDD_LED)**

  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.

- **ATX power button/soft-off button (2-pin PWR_BTN)**

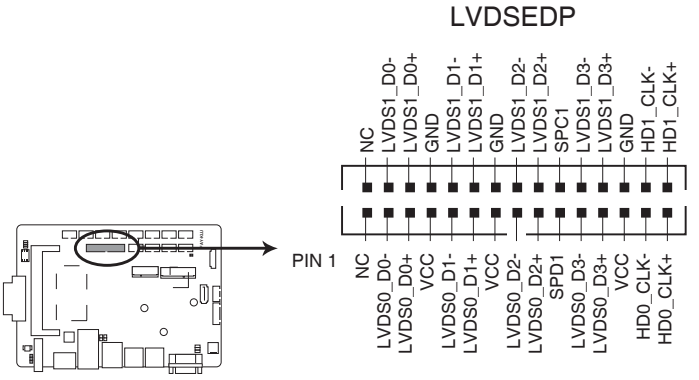
  This 2-pin connector is for the system power button.

- **Reset button (2-pin RESET)**

  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

8. LVDS/EDP connector (30-pin LVDSEDP)

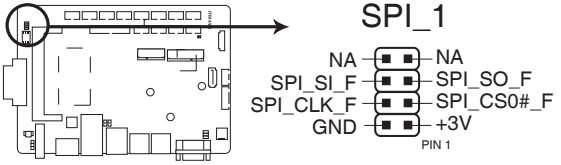
This connector is for an internal LVDS or embedded DisplayPort connection.



FAY-KLU LVDSEDP Panel Signal connector

9. BIOS programming connector for Aaeon (8-pin SPI1)

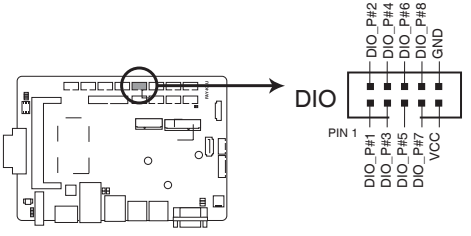
Use this connector to flash the BIOS ROM.



FAY-KLU BIOS Programmable connector

10. Digital I/O connector (10-pin DIO)

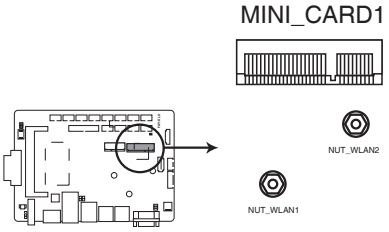
This connector includes 8 I/O lines (In/Out programmable). All of the Digital I/O lines are programmable and each I/O pin can be individually programmed to support various devices.



FAY-KLU Digitial I/O connector

11. Mini PCIe x1 slot

Use this connector to connect Minicard readers.



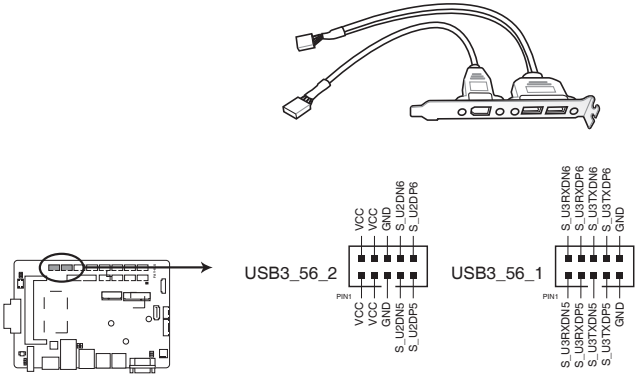
FAY-KLU MINICARD slot

NOTES:

- The Mini-card module is purchased separately.
- Mini_card 1 supports mSATA function.

12. USB 3.0 connectors (10-pin USB3_56_1, USB3_56_2)

Connect a USB 3.0 module to any of these connectors for additional USB 3.0 front or rear panel ports. These connectors comply with USB 3.0 specifications and provide faster data transfer speeds of up to 5 Gbps, faster charging time for USB-chargeable devices, optimized power efficiency, and backward compatibility with USB 2.0.

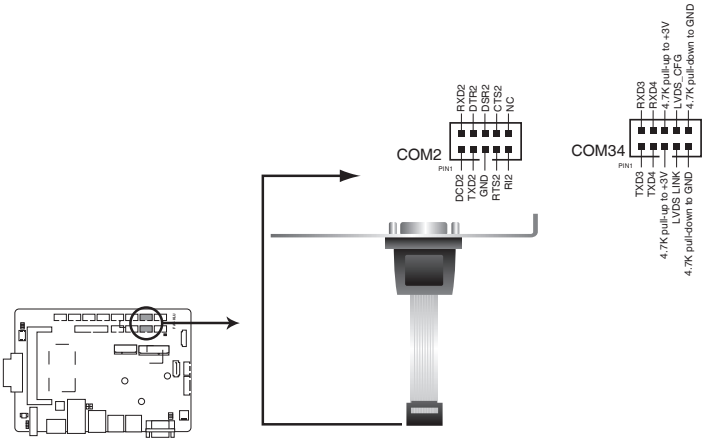


FAY-KLU USB3.0 connectors

NOTE: The USB module cable is purchased separately.

13. Serial port connectors (10-1 pin COM2, COM34)

These connectors are for serial (COM) ports. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



FAY-KLU Serial port (COM) connectors

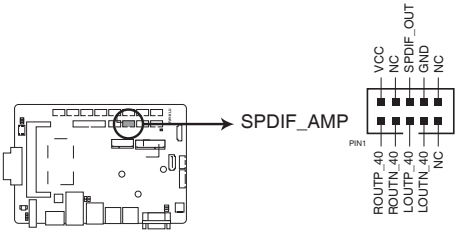
NOTES:

- The COM module is purchased separately.
- These COM ports support RS-232.

14. Audio amplifier and digital audio connector (10-pin SPDIF_AMP)

The upper line of pins, close to the edge of the motherboard, are for an external audio amplifier.

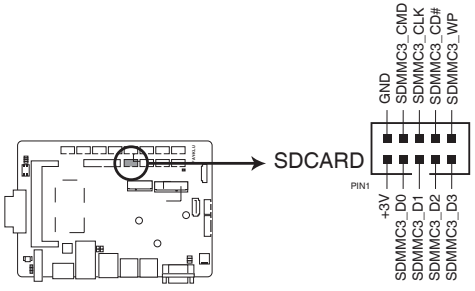
The lower line of pins are for an additional Sony/Philips Digital Interface (S/PDIF) port. Connect the S/PDIF Out module cable to this connector, then install the module to a slot opening at the back of the system chassis.



FAY-KLU SPDIF_AMP connector

15. SD Card connector (10-pin SDCARD)

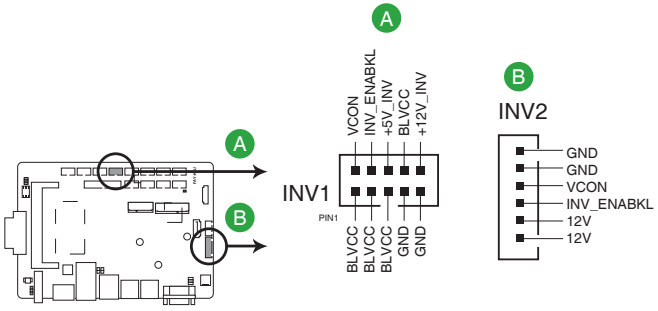
This connector is for a SD Card module.



FAY-KLU SDCARD connector

16. Backlight inverter power connectors (10-pin INV1, 6-pin INV2)

Connect the backlight inverter power cables to these connectors.

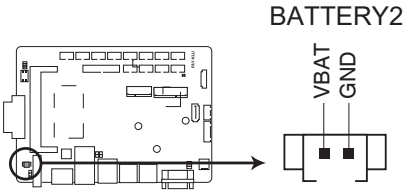


FAY-KLU Inverter connectors

IMPORTANT: The backlight inverter power connector supports 1A current to the maximum.

17. Battery connector (2-pin BATTERY1)

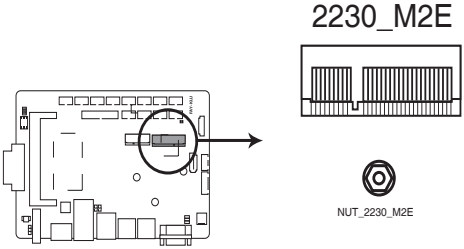
This connector is for the lithium CMOS battery.



FAY-KLU Battery connector

18. M.2 E-key connector (2230_M2E)

This connector is for M.2 E-key (22 x 30mm) wireless devices.



FAY-KLU M.2(SOCKET3) slot

Chapter 3

BIOS setup

3.1 BIOS setup

Use the BIOS Setup to configure settings. The BIOS screens include navigation keys and help to guide you in using the BIOS Setup program.

Entering BIOS Setup at startup

To enter BIOS Setup at startup:

Press <Delete> during the Power-On Self Test (POST). If you do not press <Delete>, POST continues with its routine.

Entering BIOS Setup after POST

To enter BIOS Setup after POST:

- Press **<Ctrl>+<Alt>+<Del>** simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on. Do this option only if you failed to enter BIOS Setup using the first two options.

NOTE: Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.

IMPORTANT:

- The default BIOS settings for this motherboard apply to most working conditions and ensures optimal performance. If the system becomes unstable after changing any BIOS settings, load the default settings to regain system stability. Select the option **Restore Defaults** under the Save & Exit Menu. See section **3.7 Save & Exit Menu**.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

Menu bar

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

Main	For changing the basic system configuration.
Advanced	For changing the advanced system settings.
Chipset	For viewing and changing chipset settings.
Security	For setting up BIOS security settings.
Boot	For changing the system boot configuration.
Save & Exit	For selecting the exit options and loading default settings.

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

3.2 Main menu

The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

3.2.1 System Date [Day MM/DD/YYYY]

Allows you to set the system date.

3.2.2 System Time [HH:MM:SS]

Allows you to set the system time.

3.3 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

3.3.1 Power Management

Power Mode [ATX Type]

Select power supply mode. Configuration options: [ATX Type] [AT Type]

The following items appear when you set Power Mode to [ATX Type].

Restore AC Power Loss [Always Off]

[Last State] The system goes into either off or on state, whatever the system state was.

[Always On] The system goes into on state after an AC power loss.

[Always Off] The system goes into off state after an AC power loss.

RTC Wake system from S5 [Disabled]

[Disabled] Disables system wake up from S5.

[Fixed Time] The system will wake up at the specified hr::min::sec. Configuration options: [Disabled] [Enabled] .

[Dynamic Time] The system will wake up at the current time plus a specified number of minutes.

The following items appear when Fixed Time is enabled.

Wake up day/hour/minute/second [0]

Specify the values for day/hour/minute/second.

The following item appears when Wake System with Dynamic Time is enabled.

Wake up minute increase [1]

Specify the number of minutes added to the current time before waking up system. Input value range: [1~5]

Resume from RI# [Enabled]

Enable or disable Resume from RI#. Configuration options: [Disabled] [Enabled]

Resume from PCIE [Enabled]

Enable or disable Resume from PCIE. Configuration options: [Disabled] [Enabled]

3.3.2 CPU Configuration

The items in this menu show CPU-related information.

Hyper-threading [Enabled]

The Intel Hyper-Threading Technology allows a hyper-threading processor to appear as two logical processors to the operating system, allowing the operating system to schedule two threads or processes simultaneously.

[Enabled] Two threads per activated core are enabled.

[Disabled] Only one thread per activated core is enabled.

Configuration options for active processor cores are dependent on the installed CPU.

Intel (VMX) Virtualization [Enabled]

[Enabled] Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

[Disabled] Disables this function.

Intel(R) SpeedStep(tm) [Enabled]

This item allows more than two frequency to be supported. Configuration options: [Disabled] [Enabled]

Intel(R) Speed Shift Technology [Enabled]

This item allows you to disable or enable the Intel(R) Speed Shift Technology support. Enabling this item will expose the CPPC v2 interface to allow for hardware controlled P-states. Configuration options: [Disabled] [Enabled]

HDC Control [Enabled]

This option allows HDC configuration.

[Enabled] Can be enabled by OS if the OS native support is available. If native OS support is not available, BIOS will try to enable it using the OOB interface when the latter is supported.

[Disabled] Disables this function.

Turbo Mode

This item enables or disables the processor Turbo Mode when you have enabled EMTTM. Configuration options: [Enabled] [Disabled]

View/Configure Turbo Options

The submenu allows you to configure the Turbo options.

Energy Efficient P-state [Enabled]

Allows you to enable or disable Energy Efficient P-state feature. Configuration options: [Enabled] [Disabled]

Package Power Limit MSR Lock [Disabled]

Allows you to enable or disable locking of Package Power Limit settings. Configuration options: [Enabled] [Disabled]

1-Core Ratio Limit Override [XX]

Allows you to set the 1-Core Ratio Limit. The values range from 0 to 83. The minimum range may vary with processors. The 1-core Ratio Limit must be higher than or equal to 2-core Ratio Limit, 3-core Ratio Limit and 4-core Ratio Limit.

2-Core Ratio Limit Override [XX]

Allows you to set the 2-Core Ratio Limit. The values range from 0 to 83. The minimum range may vary with processors. The 2-core Ratio Limit must be lower than or equal to 21-core Ratio Limit.

Energy Efficient Turbo [Enabled]

Allows you to enable or disable Energy Efficient Turbo feature. This feature randomly reduce the turbo frequency to increase the efficiency. Configuration options: [Enabled] [Disabled]

C states [Enabled]

This item enables or disables CPU power management and allows CPU to enter C states when it is not fully utilized. Configuration options: [Disabled] [Enabled]

Enhanced C states [Enabled]

This item enables or disables C1E. When enabled, the processor runs at lowest speed and all cores enter C-State. Configuration options: [Disabled] [Enabled]

C-State Auto Demotion [C1 and C3]

This item allows you to configure C-State Auto Demotion. Configuration options: [C1] [C3] [C1 and C3]

C-State Un-demotion [C1 and C3]

This item allows you to configure C-State Un-demotion. Configuration options: [C1] [C3] [C1 and C3]

Package C-State Demotion [Auto]

This item allows you to enable or disable Package C-State Demotion. Configuration options: [Disabled] [Enabled] [Auto]

Package C-State Un-demotion [Auto]

This item allows you to enable or disable Package C-State Un-demotion. Configuration options: [Disabled] [Enabled] [Auto]

3.3.3 Trusting Computing

Security Device Support [Disable]

Allows you to enable or disable BIOS support for security devices. Configuration options: [Disable] [Enable]

3.3.4 SATA Configuration

While entering Setup, the BIOS automatically detects the presence of SATA devices. The SATA Port items show **Not Installed** if no SATA device is installed to the corresponding SATA port.

SATA Controller(s) [Enabled]

Configuration options: [Enabled] [Disabled].

The following items appear only when you set **SATA Controller(s)** to [Enabled].

SATA Mode Selection [AHCI]

Allows you to set the SATA configuration.

[AHCI] Set to [AHCI] when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced Serial ATA features that increases storage performance on random workloads by allowing the drive to internally optimize the order of commands.

[RAID] Set to [RAID] when you want to create a RAID configuration from the SATA hard disk drives.

SMART Self Test [Disabled]

SMART (Self-Monitoring, Analysis and Reporting Technology) is a monitoring system that shows a warning message during POST (Power-on Self Test) when an error occurs in the hard disks. Configuration options: [Disabled] [Enabled]

SATA Port 0/1

Port 0/1 [Enabled]

These items become configurable when you set the SATA Mode Selection item to [AHCI] and [RAID], and allow you to enable/disable the SATA port(s). Configuration options: [Disabled] [Enabled]

Hot Plug [Disabled]

These items become configurable when you set the SATA Mode Selection item to [AHCI] and [RAID], and allow you to enable/disable SATA Hot Plug Support. Configuration options: [Disabled] [Enabled]

3.3.5 USB Configuration

The USB Devices item lists auto-detected values. If no USB device is detected, the item shows None.

Legacy USB Support [Enabled]

[Enabled] Enables the support for USB devices on legacy operating systems (OS).

[Disabled] USB devices are only available when running BIOS Setup.

[Auto] Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

3.3.6 PCH-FW Configuration

The items listed in this screen display firmware related information.

Firmware Update Configuration

Me FW Image Re-Flash [Disabled]

Allows you to enable or disable Me firmware Image Re-Flash function. Configuration options: [Disabled] [Enabled]

3.3.7 SIO Configuration

The items in this menu allow you to configure Super IO settings.

[*Active*] Serial Port 1

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]

The following two items appear only when you set **Use this device** to [Enabled].

Possible [Use Automatic Settings]

Allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3F8h; IRQ=4;] [IO=2F8h; IRQ=3]

Mode [RS232]

Allows you to select the Serial Port mode. Configuration options: [RS232] [RS422] [RS485]

[*Active*] Serial Port 2

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=2F8h; IRQ=3] [IO=3F8h; IRQ=4;]

[*Active*] Serial Port 3

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=3E8h; IRQ=11;] [IO=2E8h; IRQ=11;]

[*Active*] Serial Port 4

Use this device [Enabled]

Allows you to enable or disable this logical device. Configuration options: [Enabled] [Disabled]

Possible [Use Automatic Settings]

This item appears only when you set **Use this device** to [Enabled] and allows you to select an optimal setting for Super I/O devices. Configuration options: [Use Automatic Settings] [IO=2E8h; IRQ=11;] [IO=3E8h; IRQ=11;]

3.3.7 Hardware Monitor

This menu displays the system/CPU temperatures and power status.

3.3.8 Digital IO Port Configuration

The items listed in this screen configure Digital IO settings.

DIO Port1~Port4 [Output], DIO Port5~Port8 [Input]

Configuration options: [Input] [Output]

The following item appears only when you set **DIO Port1~8** to [Output].

Output Level [High]

Configuration options: [High] [Low]

3.4 Chipset menu

The Chipset menu items allow you to change the settings for the chipset.

3.4.1 System Agent (SA) Configuration

DVMT Pre-Allocated [32M]

Allows you to select the DVMT 5.0 Pre-Allocated (fixed) graphic memory size for the internal graphics. Configuration options: [32M] [64M] [4M] [8M] [12M] [16M] [20M] [24M] [28M] [36M] [40M] [44M] [48M] [52M] [56M] [60M]

Primary Display [Auto]

Allows you to decide which graphics controller to use as the primary boot device. Configuration options: [Auto] [IGFX] [PEG]

Boot Display Device [VBIOS Default]

Select the video device which will be activated during POST. This setting has no effect if an external graphics device is present. The secondary boot display

selection appears based on your selection and the VGA mode is supported only on primary display. Configuration options: [VBIOS Default] [DP] [LVDS]

LVDS Panel Support [Enabled]

Enables or disables LVDS panel support. Configuration options: [Disabled] [Enabled]

LVDS Brightness Type [Normal]

Allows you to select the LVDS brightness type. Configuration options: [Normal] [Inverted]

LVDS Panel Type [1024x768 LVDS]

Configuration options: [VBIOS Default] [640x480 LVDS] [800x600 LVDS] [1024x768] LVDS [1280x1024 LVDS] [1366x768 LVDS][1440x900 LVDS] [1680x1050 LVDS] [1920x1080 LVDS] [1920x1200 LVDS] [1024x600 LVDS] [1280x800 LVDS]

LVDS Backlight [60%]

Allows you to select the brightness level of LVDS backlight. Configuration options: [100%] [80%] [60%] [40%] [20%]

LVDS Color Depth [Auto]

Select the color depth of the LCD panel to be used as display. Configuration options: [Auto] [24-bit] [18-bit]

LVDS Channel Type [Auto]

Select the channel type of the LCD panel to be used as display. Configuration options: [Auto] [Single] [Dual]

3.4.2 PCI-IO Configuration

HD Audio [Auto]

This item controls the detection of HD Audio devices. Configuration options: [Auto] [Disabled] [Enabled]

Mini PCI Express Port [Enabled]

This item controls the PCI Express Root Port. Configuration options: [Enabled] [Disabled]

Mini PCI Express Port Speed [Enabled]

This item configures the speed of PCI Express x1 slot. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

Onboard Realtek LAN [Enabled]

This item enables or disables the onboard Realtek LAN. Configuration options: [Enabled] [Disabled]

PCIEX1_1 Gen Speed [Enabled]

This item configures the speed of PCI Express x16 slot. Configuration options: [Auto] [Gen1] [Gen2] [Gen3]

3.5 Security menu

The Security menu items allow you to change the system security settings.

3.5.1 Administrator Password

If you have set an administrator password, we recommend that you enter the administrator password for accessing the system. Otherwise, you might be able to see or change only selected fields in the BIOS setup program.

To set an administrator password:

1. Select the Administrator Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change an administrator password:

1. Select the Administrator Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the Administrator Password item on top of the screen shows Not Installed.

3.5.2 User Password

If you have set a user password, you must enter the user password for accessing the system. The User Password item on top of the screen shows the default Not Installed. After you set a password, this item shows Installed.

To set a user password:

1. Select the User Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change a user password:

1. Select the User Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the user password, follow the same steps as in changing a user password, but press <Enter> when prompted to create/confirm the password. After you clear the password, the **User Password** item on top of the screen shows **Not Installed**.

3.6 Boot menu

The Boot menu items allow you to change the system boot options.

3.6.1 Boot Configuration

Quiet Boot [Enabled]

This item enables/disables Quiet Boot. Configuration options: [Disabled] [Enabled]

Launch PXE ROM [Disabled]

This item controls the execution of Legacy PXE OpROM. Configuration options: [Disabled] [Enabled]

Enable Sleep State [Disabled]

This item enables or disabled the system's entering sleep state. Configuration options: [Disabled] [Enabled]

Enable Hibernate State [Disabled]

This item enables or disabled the system's entering hibernation state. Configuration options: [Disabled] [Enabled]

3.6.2 Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

- To select the boot device during system startup, press <F7> during POST.
- To access Windows OS in Safe Mode, press <F8> after POST.

3.7 Save & Exit menu

Save Changes and Reset

Once you are finished making your selections, choose this option from the Save & Exit menu to ensure the values you selected are saved. When you select this option, a confirmation window appears. Select Yes to save changes and reset.

Discard Changes and Exit

This option allows you to exit the Setup program without saving your changes. When you select this option or if you press <Esc>, a confirmation window appears. Select Yes to discard changes and exit.

Restore Defaults

Save or restore User Defaults to all setup options.

Appendix

Notices

Federal Communications Commission Statement

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

- This device may not cause harmful interference.
- 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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, 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 or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to 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.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

电子电气产品有害物质限制使用标识要求：图中之数字为产品之环保使用期限。仅指电子电气产品中含有的有害物质不致发生外泄或突变从而对环境造成污染或对人身、财产造成严重损害的期限。

部件名称	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯(PBB)	多溴二苯醚(PBDE)
印刷电路板及其电子组件	×	○	○	○	○	○
外壳	×	○	○	○	○	○
电源适配器	×	○	○	○	○	○
外部信号连接头及线材	×	○	○	○	○	○
中央处理器与内存	×	○	○	○	○	○

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○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求，然该部件仍符合欧盟指令 2011/65/EU 的规范。

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