

JSL-50 Motherboard



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JSL50 Motherboard

User Manual

(Version 1.0)

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NO.	Description	Issue Date:
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Contents

JSL50 Motherboard1
User Manual1
(Version 1.0)1
Chapter 1 Product Introduction
1.1 Brief Introduction3
1.2 Parameters
1.3 Connector Diagram4
1.4 Mini PCs I/O Interface5
Chapter 2 Hardware6
2.1 Installations6
2.2 Jumper Setting6
2.3 Memory Slots6
2.4 Display Interfaces6
2.5 Storage Interfaces (Screen Printing: M.2_N/S)7
2.6 Expansion Slots (Screen Printing: M.2_E)7
2.7 USB Interfaces7
2.8 LAN7
2.9 Audio Interface7
2.10 Board Power Supply (Screen printing: PWR)7
2.11 Power Button (Screen printing: PWON)7
2.12 CPU Fan (Screen printing: CPUFAN)7
2.13 CMOS Clearance/Retention (Screen printing: CLR_CMOS)7
Chapter 3 BIOS Setup9
3.1 Entering the BIOS
3.2 Main Setup (BIOS info, Date, Time)
3.3 Advanced Settings10
3.4 Chipset21
3.5 Security23
3.6 Boot24
3.7 Save & Exit25

Chapter 1 Product Introduction

1.1 Brief Introduction

The JSL50 motherboard is a 4x4 small form factor motherboard based on the Intel Jasper Lake processor, designed to be used for Ultra-compact mini pcs and various IoT solutions.

1.2 Parameters

CPU:

- Intel[®] Celeron[®] Processor N5095A, 4Cores 4Threads, Burst Frequency: 2.90GHz, Base Frequency: 2.00GHz, 4 MB L3 Cache, TDP: 15W.
- Intel[®] Celeron[®] Processor N5095, 4Cores 4Threads, Burst Frequency: 2.90GHz, Base Frequency: 2.00GHz, 4 MB L3 Cache, TDP: 15W.
- Intel[®] Celeron[®] Processor N5105, 4Cores 4Threads, Burst Frequency: 2.90GHz, Base Frequency: 2.00GHz, 4 MB L3 Cache, TDP: 10W.

Memory: 2x SO-DIMM DDR4-2933MHz, supports dual channel up to 32GB for maximum memory capacity.

GPU: Integrated Graphics based on CPU, display via 2x HDMI2.0

Storage: 1 x M.2 Key M slot, supports 2242/2280 SATA/NVMe SSD

USB: 2x USB3.2 Gen 1, 2x USB2.0, 1xType-C

Type C: 1xUSB-C Full-functioned (supports USB3.2 Gen 2 upstream/Display Port 1.4 Alt Mode).

Ethernet: One RTL8111H Network Controllers on-board, Data Rate Per Port: 1.0Gbps

Audio: High-Definition Realtek Audio Codec, supports 1xLine-out and 1xMic-in.

Expansion: 1x M.2_Key E Slot type 2230 for Wi-Fi Modules.

Board Dimension: 120mm x 120 mm

Chassis Dimension:

MUC-5095: 128.7mm x 128.7mm x 41.5mm

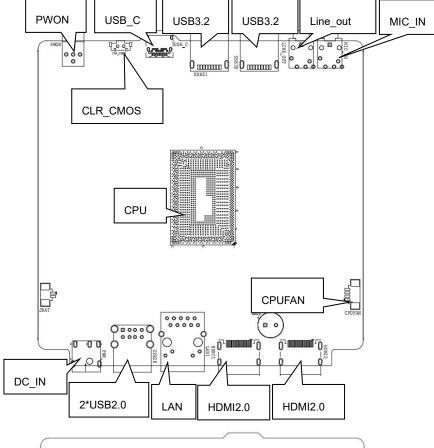
MTN-JSL50: 128mm x 130mm x 52mm

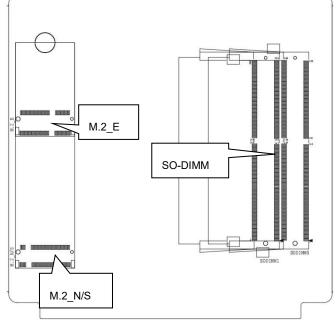
Power: 12V DC-in

Working Temperature: 0°C~50°C



1.3 Connector Diagram







1.4 Mini PCs I/O Interface

MUC-5095



MTN-JSL50



Chapter 2 Hardware

2.1 Installations

Please refer to the following steps for installations:

- 1. Read the user manual carefully to make sure all the adjustments on the JSL50 are correct.
- 2. Installing the Memory:
 - Press the ejector tab of the memory slot outwards with your fingertips.
 - Hold the memory module and align the key to the module with that on the memory slot.
 - Gently push the module into the slot until the ejector levers return completely to the closed position, holding the module in place when the module touches the bottom of the slot. To remove the module, press the ejector levers outwards to unseat the module.
- 3. Installing the expansion cards:
 - Locate the expansion slots and remove the screw, insert the cards into the slot at a 45-degree angle then attach the screw to the expansion cards, gently press down on it then install the screw back.
- 4. Connect all signal wires, cables, panel control wiring, and power supplies.
- 5. Start the computer and complete the setup of the BIOS program.

The board's components are integrated circuits and can easily be damaged by Electrostatic Discharge or ESD; therefore, please follow the instructions:

- Hold the board's edge when handing, and do not touch onboard pins, components, or plug sockets.
- When touching integrated circuit components (such as CPU, RAM, etc.), please wear an antistatic wrist strap/glove to avoid electrostatic discharge damage to the board or other sensitive components.
- Before installing the integrated circuits/sensitive components, place the sensitive components in anti-static bags to keep them safe from ESD.
- Please make sure the power switch is OFF before plugging the power plug.

2.2 Jumper Setting

Please configure the jumpers according to your requirements before installing the hardware.

How to identify the first header of jumpers and pins: Observe the mark beside the jumper or pins and find the header marked by "1" or bold line or triangular symbol. Or observe the rear panel and the header with a square solder pad is the first header.

2.3 Memory Slots

The board provides 2xSO-DIMM DDR4-2933MHz slot and supports dual channel, up to 32GB for memory. Notes: Make sure to hold the memory module and align the key to the module with that on the memory slot. While choosing a memory module, please make sure the module matches the board's specifications.

2.4 Display Interfaces

The board features two HDMI2.0 standard interfaces.

2.5 Storage Interfaces (Screen Printing: M.2_N/S)

The board provides 1x M.2 Key_M slot, supports 2280/2242 SATA/NVMe SSD. The protocol is self-adaptive to SATA/NMVe.

2.6 Expansion Slots (Screen Printing: M.2_E)

The board provides 1x M.2_Key E slot, type 2230 for Wi-Fi and Bluetooth Modules.

2.7 USB Interfaces

The board supports 2x USB3.2 Gen1, 1xType-C and 2x USB2.0 interfaces.

2.8 LAN

The board features a 1xRJ45 LAN interface with a high-speed RTL8111H network controller, data rate per port: 1.0Gbps; supports network wake-up (Magic packet wake-up), and PXE network boot.

LED Status Indicators:

LI_LED Status (Green)	Function	ACT_LED Status (Orange)	Function
Always on	Network Connected	Flashing	Data transmission

2.9 Audio Interface

The board features a Realtek ALC897 High-Definition Audio Codec, supports 1xLine-out (Green) and

1xMic-in (Pink).

2.10 Board Power Supply (Screen printing: PWR)

The board supports 12V DC-IN for power supply.

2.11 Power Button (Screen printing: PWON)

The board features a power button with a light indicator above (Blue LED).

2.12 CPU Fan (Screen printing: CPUFAN)

The board features one CPU cooling fan socket (2.0mm pitch).

CPUFAN (Screen Printing: CPUFAN)

Pin	Signal
1	GND
2	VCC 5V
3	TAC
4	CTL

2.13 CMOS Clearance/Retention (Screen printing: CLR_CMOS)

CMOS is powered by onboard button batteries. Clearing CMOS will permanently remove the previous system settings and restore the board system to original settings (factory settings).

Step 1: Turn off the PC and disconnect the power.

Step 2: Press CLR_CMOS for 10 seconds then disconnect.

Step 3: Restart the device, press the button to enter the BIOS, press F9 load the optimal default value, then press F10 save, exit the settings.

CMOS (Screen Printing: CLR_CMOS)

Pin	Setting	Function
1-2	Close	Clear COMS

 \triangle Please do not clear COMS when the PC is connected to power in case board damages.



Chapter 3 BIOS Setup

3.1 Entering the BIOS

- 1. Turn on the computer and press <Delete> entering the BIOS
- 2. After the computer is turned on, keep pressing F11, select enter Setup
- 3. BIOS Hotkeys:

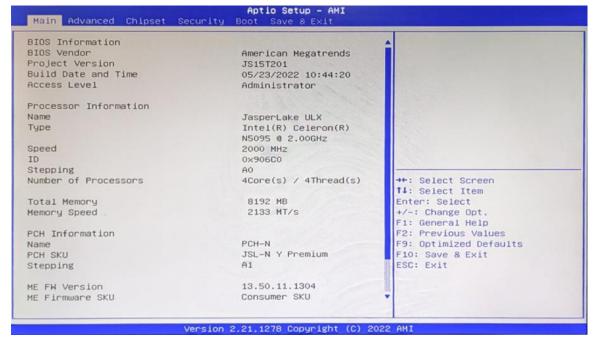
F9: Restore to Factory setting.

F10: Save and Exit.

ESC: Exit

3.2 Main Setup (BIOS info, Date, Time)

When you enter the BIOS Setup utility the first things you will encounter is the Main Setup screen. Shown below is the Main BIOS Setup screen. You can always return to the Main setup by selecting the Main tab.



System Date: Sets the date. MM/DD/YY format. System Time: Set the time. HH:MM: SS format.



3.3 Advanced Settings

 Connectivity Configuration CPU Configuration Power & Performance PCH-FW Configuration 	Configure Connectivity related options
Thermal Configuration Trusted Computing	
ACPI Settings	
Super IO Configuration	
Hardware Monitor	
 Watch Dog Configuration 	
 S5 RTC Wake Settings AMI Graphic Output Protocol Policy 	
 USB Configuration 	
Network Stack Configuration	++: Select Screen
▶ NVMe Configuration	14: Select Item
SDIO Configuration	Enter: Select
	+/-: Change Opt.
Tls Auth Configuration	F1: General Help
	F2: Previous Values F9: Optimized Defaults
	F10: Save & Exit
	ESC: Exit

Select any of the items in the left frame of the screen. The advanced sections allow you to configure, improve and set up system features according to the preference of the CPU Configuration. All Advanced BIOS Setup options are described as follows.

3.3.1 Power & Performance

Options
<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>

CPU-Power Management Control GT-Power Management Control



3.3.2 CPU-Power Management Control

CPU - Power Management Control		Select the performance state
PO Fused Max Core Ratio	N/A	starting from reset vector.
P1 Fused Max Core Ratio	N/A	
P2 Fused Max Core Ratio	N/A	
P3 Fused Max Core Ratio	N/A	
Boot performance mode	[Max Non-Turbo	
	Performance]	
<pre>Intel(R) SpeedStep(tm)</pre>	[Enabled]	
Race To Halt (RTH)	[Enabled]	
Intel(R) Speed Shift Technology	[Enabled]	
Per Core P State OS control mode	[Enabled]	
HwP Autonomous Per Core P State	[Enabled]	
HwP Autonomous EPP Grouping	[Enabled]	++: Select Screen
EPB override over PECI	[Disabled]	14: Select Item
HwP Fast MSR Support	[Enabled]	Enter: Select
HDC Control	[Enabled]	+/-: Change Opt.
Turbo Mode	[Enabled]	F1: General Help
 View/Configure Turbo Options 		F2: Previous Values
CPU VR Settings		F9: Optimized Defaults
SA Imon Correction	[Enabled]	F10: Save & Exit
Platform PL1 Enable	[Disabled]	ESC: Exit
Platform PL2 Enable	[Disabled]	
Power Limit 4 Override	[Disabled]	
C states	[Enabled]	•

Intel[®] Speedstep[®](TM):

Enhanced Intel SpeedStep[®] Technology enables the operating system to control multiple frequencies and voltage points for optimal performance and power efficiency.

Intel[®] Speed Shift Technology:

An energy-efficient frequency control method by the hardware rather than relying on OS control. Processor decision is based on the different system constraints for example Workload demand, and thermal limits while taking into consideration the minimum and maximum levels and activity window of performance requested by the operating system. Default enabled.

Turbo Mode

The Turbo mode refers to Nehalem's "Integrated Power Gate" power management technology, which allows running off some cores and adding power to the others so that they run at a higher frequency. The capacity of the entire CPU remains unchanged, and the efficiency of the CPU is optimized. Default enabled.

C states

Idle States (C-states) are used to save power when the processor is idle. C0 is the operational state, meaning that the CPU is doing useful work 100% load. C1 is the first idle state, C2 the second, and so on, where more power-saving actions are taken for numerically higher C-states. C1 to C3 cuts off the clock inside the CPU, and C4 to C6 reduces the CPU voltage. Default enabled.

Enhanced C states

C1 to C3 cuts the clock inside the CPU. C4 and C6 mode reduces CPU voltage. Features two way "Enhanced" mode, enable by default.

3.3.3 GT-Power Management Control

GT - Power Management Control		Check to enable render standby support.
RC6(Render Standby) Maximum GT frequency Disable Turbo GT frequency	[Enabled] [Default Max Frequency] [Disabled]	Suppor C.
		<pre>++: Select Screen t4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>

Maximum GT frequency:

Maximum GT Frequency, Default max frequency.

Disable Turbo GT frequency:

Disable Turbo GT Frequency mode, Default disabled.

3.3.4 Thermal Configuration

Thermal Configuration	Enable All Thermal Functions" is Enabled it Enables 'Memory
Enable All Thermal Functions [Disabled] CPU Thermal Configuration Platform Thermal Configuration Intel(R) Dynamic Tuning Technology Configuration	Thermal Management', 'Active Trip Points', 'Critical Trip Points'.Set to disabled for Manual Configuration
	++: Select Screen †4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Enable All Thermal Functions

CPU Thermal Configuration:

Unlocks the temperature setting, the "Tcc Activation Offset" is the temperature adjustment option, the highest temperature is 105°C. Change the temperature by minus the number of degrees you wish to change. For example, minus 0(105-0) to set the temperature at 105°C, minus 20(105-20) to set the temperature at 85°C. **Platform Thermal Configuration**

Intel[®] Dynamic Tuning Technology Configuration



3.3.5 ACPI Settings

Advanced	Aptio Setup - AMI	
CPI Settings		Enables or Disables BIOS ACP Auto Configuration.
nable ACPI Auto Configuration	[Disabled]	
nable Hibernation CPI Sleep State	[Enabled] [S3 (Suspend to RAM)]	
		++: Select Screen
		<pre>t4: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
		F1: General help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
		F10: Save & Exit

Enable ACPI Auto Configuration

Enable or disable BIOS ACPI Auto Configuration.

Enable Hibernation

Enable or disables the ability to hibernate.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

3.3.6 Super IO Configuration



Serial Port 1 Configuration

Set parameters of serial port 1.

Serial Port: Enable or disable serial port (COM).

Device Setting (Read-only): Displays serial ports' interrupt and location.

Change Setting: Change serial port settings and suggest setting "Auto" as default.

3.3.7 Hardware Monitor

Aptio Setup - AMI	
and the second sec	Smart Fan function setting
: +43 °C : +30 °C : 1071 RPM : N/A : +1.639 V : +1.221 V : +3.337 V : +5.106 V	**: Select Screen 14: Select Item
	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
	: +43 °C : +30 °C : 1071 RPM : N/A : +1.639 V : +1.221 V : +3.337 V

PC Health Status

The PC health status displays CPU temperature, system temperature, fan speed, and other relevant voltage values. The above parameters have a certain range, and the system cannot run beyond these ranges.

- 1. CPU Temperature
- 2. System Temperature
- 3. CPU Fan Speed
- 4. SYS Fan Speed
- 5. VCore: Core Voltage
- 6. VDDQ: RAM Voltage
- 7. +3.3V: 3.3V
- 8. +5V: 5V
- 9. Smart Fan Function:
 - Automatic Mode
 - Full on Mode
 - Manual Mode

3.3.8 Watch Dog Configuration



Watch Dog Configuration

WDT Timeout Mode select: Disabled, Minute or Second

3.3.9 S5 RTC Wake Settings

Advanced	Aptio Setup – AMI	
Hake system from S5	[Disebled]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s)
	Hake system from St Disabled Fixed Time Dynamic Time	<pre>**: Select Screen t4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
	Version 2.21.1278 Copyright	(C) 2022 AMI

Wake system From S5: timing boot settings, disabled by default.

Fixed Time: Select Fixed Time and the system will wake on the Hr: Min: Sec specified.



Dynamic Time: Select Dynamic Time and the system will wake on a dynamic time.

3.3.8 USB Configuration

Advanced	Aptio Setup - AMI	
USB Configuration		Enables Legacy USB support. AUTO option disables legacy
USB Module Version	25	support if no USB devices are connected. DISABLE option will
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices: 1 Keyboard		
Legacy USB Support	(Enabled)	
XHCI Hand-off USB Mass Storage Driver Support	[Enabled] [Enabled]	
USB hardware delays and time-outs:		++: Select Screen
USB transfer time-out Device reset time-out	[20 sec] [20 sec]	11: Select Item Enter: Select
Device power-up delay	[Auto]	+/-: Change Opt.
		F1: General Help
		F2: Previous Values F9: Optimized Defaults
		F10: Save & Exit
		ESC: Exit
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Legacy USB Support

Enable Legacy USB support. Disables legacy support if no USB devices are connected. Select enable will keep USB devices available under UEFI's support.

XHCI Hand-off

A workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by the USB XCHI driver.

USB Mass Storage Driver Support

Enable(default) or disable USB Mass Storage Driver Support.

USB transfer time-out

Time-out value for control, bulk, and interrupt transfers, default time:20 second.

Device reset time-out

USB mass storage device start unit command time-out, default time:20 second.

Device Power-up Delay

Maximum time the device will take before it properly reports itself to the host controller.



3.3.11 Network Stack Configuration

Advanced	Aptio Setup — AMI	
Network Stack IPv4 PXE Support IPv4 HTTP Support IPv6 PXE Support IPv6 HTTP Support PXE boot wait time Media detect count	[Enabled] [Enabled] [Disabled] [Disabled] [Disabled] 0 1	Enable/Disable UEFI Network Stack
		<pre>→+: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
	/ersion 2.21.1278 Copyright ()	C) 2022 AMI

Network Stack

PXE Network boot setting, disabled by default.

3.3.12 NVME Configuration

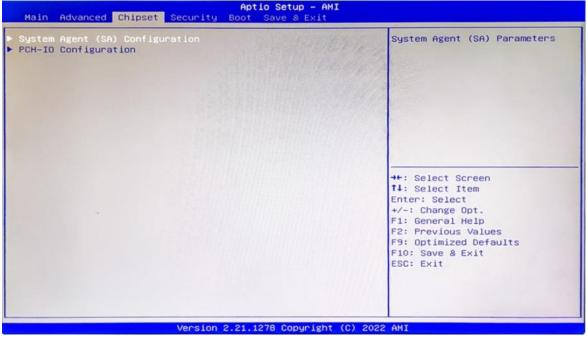


The capacity and model of the SSD will be displayed under the option after the NVMe protocol SSD has been installed.

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3.4 Chipset

Select the chipset tab from the setup screen to enter the chipset BIOS Setup screen.



System Agent (SA) Configuration: Northbridge configuration options, including video memory, display devices, and other options.

PCH-IO Configuration: Southbridge configuration options, including hard disk, sound card equipment, and other options



3.4.1 PCH-IO Configuration

Chipset	Aptio Setup – AMI	
PCH-ID Configuration PCI Express Configuration SATA And RST Configuration USB Configuration Security Configuration HD Audio Configuration SCS Configuration		PCI Express Configuration settings
State After G3	[S5 State]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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PCI Express Configuration SATA Configuration USB Configuration Security Configuration HD Audio Configuration SCS Configuration State After G3: S0 State S5 State (default)

3.5 Security

		Set Administrator Password
If ONLY the Administrator's pa then this only limits access t only asked for when entering S If ONLY the User's password is is a power on password and mus boot or enter Setup. In Setup have Administrator rights. The password length must be in the following range:	o Setup and is etup. set, then this t be entered to the User will	
Minimum length Maximum length	1 20	
Administrator Ressword User Password		<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
Secure Boot		F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit

Administrator Password: Set the Administrator Password.

User Password: Set User Password.

Secure Boot: Secure boot

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3.6 Boot

Main Advanced Chipset Securit	Aptio Setup - AMI Boot Save & Exit	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Show Full Logo FIXED BOOT ORDER Priorities Boot Option #1 Boot Option #2 Boot Option #3 Boot Option #4 Boot Option #5 Boot Option #6 Boot Option #7 • UEFI Application Boot Priorities	I [On] [Enabled] [Hard Disk] [CD/DVD] [SD] [USB Device] [Network] [UEFI AP:UEFI: Built-in EFI Shell]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit
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Setup Prompt Timeout:

Number of seconds that the firmware will wait before initiating the original default boot selection. A value of 0 indicates that the default boot selection is to be initiated immediately on boot. A value of 65535(0xFFFF) indicates that firmware will wait for user input before booting. This means the default boot selection is not automatically started by the firmware.

Bootup NumLock State:

Select the keyboard NumLock state

Show Full Logo:

Enabled/Disabled Displays customized boot logo.

Boot Option #1~#7:

Set the system boot order from Number 1 to Number 7.

UEFI Application boot Priorities:

UEFI application boot priority.

3.7 Save & Exit

Save Options Save Changes and Exit	Exit system setup after saving
Discard Changes and Exit	the changes.
Save Changes and Reset	
Discard Changes and Reset	ANNA CONTRACTOR
Save Changes	州2月4月前月 4月6日
Discard Changes	EDGUHH CAL
Default Options	
Restore Defaults Save as User Defaults	
Restore User Defaults	++: Select Screen
	14: Select Item
Boot Override	Enter: Select
UEFI: Built-in EFI Shell Launch EFI Shell from filesystem device	+/-: Change Opt. F1: General Help
Launch Eri Sheii from filesystem device	F2: Previous Values
	F9: Optimized Defaults
	F10: Save & Exit
	ESC: Exit

Save Changes and Exit:

Exit the system setup after saving the changes and continue to start the computer.

Discard Changes and Exit:

Exit the system setup without saving any changes and continue to start the computer.

Save Changes and Reset:

Reset the system after saving the changes.

Discard changes and Reset:

Reset the system without saving any changes.

Save Changes:

Save changes done so far to any of the options.

Discard Changes:

Discard changes done so far to any of the options.

Restore Defaults:

Restore/load default values for all the options.

Save as User Defaults:

Save the changes done so far as the user defaults.

Restore User Defaults:

Restore the user defaults to all the options.

Boot Override:

Boot device selection can override your boot priority. Select the specified boot device such as SATA, USB Flash Disk, EFI Shell, PXE, etc., and boot directly. Or press F11 boot by selecting the specified boot device.