EM PRO mini® NUCE – Revision 5 - Device Reference Manual – P

E.E.P.D.
...just embedded!

Manufacturer

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FCC and CE Disclaimer

E.E.P.D. GmbH gives no warranty at all that their products will meet the FCC and CE standards when used in combination with other third-party products or when used in any other way than specified.

Warranty

The warranty and/or guarantee conditions according to the current terms and conditions of E.E.P.D. GmbH apply.

Product Returns

If you return the EM PRO system to E.E.P.D. GmbH please remove all connections and peripheral equipment.

Protect the unit with a suitable packaging, preferably use the original packaging.

Packaging

The EM PRO system is in a protective package to avoid damage during transport.

This protective package should be recycled in an environmentally friendly way after use.

Disposal of Device

At the end of the lifetime please dispose and/or recycle the components of the device accordingly.

Technical Support

For technical information about hardware and software please contact: **support@eepd.de**

Table of Contents

Symbols

The red danger sign warns you if incorrect operation puts your life or health at great risk. Both the components and the peripherals could be destroyed.

The orange warning sign warns you that an incorrect or missing operation could seriously endanger your health or destroy the used components.

The yellow caution sign indicates that an incorrect or missing action could damage the components.

The yellow ESD symbol indicates that electrostatic sensitive components could be destroyed. Unpack shielded components only with ESD protection such as an ESD wristband or on an ESD protected area.

The information sign gives you further information and advice for optimal use of this product.
For example, it draws your attention to necessary or optional accessories.

Safety Instructions

Safety of People

The product generates considerable heat. The housing transports this heat to the environment and thus becomes hot. Take care if you touch the housing as this may cause burns!

Please follow all safety instructions at the installation site. Make sure that no or only necessary cables are connected to the EM PRO mini @system during installation.

If access to the EM PRO mini® system interfaces is not available after installation, all necessary connections must be made before.

Device Safety

The EM PRO mini® system operates exclusively within the specified DC voltage range. Repair work should only be made by an authorized and certified specialty retailer or by the manufacturer's customer service. Do not open the device to avoid damage.

Modifications that have not been approved by the manufacturer void the warranty. Dust, dirt, moisture, and extreme temperatures may significantly impair proper operation.

The device may only be opened by a qualified person.

Cooling System

The EM PRO mini® system consists of a compact, robust metal housing with ventilation holes. It is equipped with an automated fan. To ensure sufficient heat dissipation, never cover the ventilation holes of the case. Do not place any objects onto the device.

1 System Information

1.1 Required Tools

For the installation of the EM PRO mini® the following standard tools are recommended:

- Cable connection: Slot screwdriver
- Rail mounting: Torx screwdriver T10

Other required tools are depending on the installation place and method.

1.2 OS Support

Microsoft® Windows® 11

Microsoft® Windows® 11 IoT Enterprise

Microsoft® Windows® 10

Microsoft® Windows® 10 IoT Enterprise

Linux Ubuntu 24.04 LTS.

1.3 Intended Use

The EM PRO mini® is a personal computer to be used with Windows® 11, Windows® 10, Windows® 10 IoT Enterprise or Linux Ubuntu 24.04 LTS.
It has been designed for office and workshop environments.

1.4 Options

Please contact our sales department for ordering information of optional product features.

Options	Description
Memory modules*	Max. 2x 32 GB dual-channel up to DDR4-3200 SO-DIMM memory with ECC support
SSD*	64 GB – 2 TB
Operating System*	Windows® 11, Windows® 10, Windows® 10 IoT Enterprise, Linux Ubuntu 24.04 LTS
* factory assembled on request # ODM option	

Tab. 1: Options

1.5 Accessories

Please contact our sales department for ordering information.

Accessories	Description
Power supply (90 W / 19 V)	Power supply incl. cable with EU plug
Display cable	Cable MiniDP to HDMI, 2 m, with interlock Cable MiniDP to DP, 2 m
DIN rail clip	DIN rail clip with screws for „TS35“ DIN rails
VESA mounting kit	VESA mounting plate with screws

Tab. 2: Accessories

1.6 Scope of Delivery

Before you begin installation, please check that your shipment is complete and contains the items listed on the delivery note.

1.6.1 Type Label

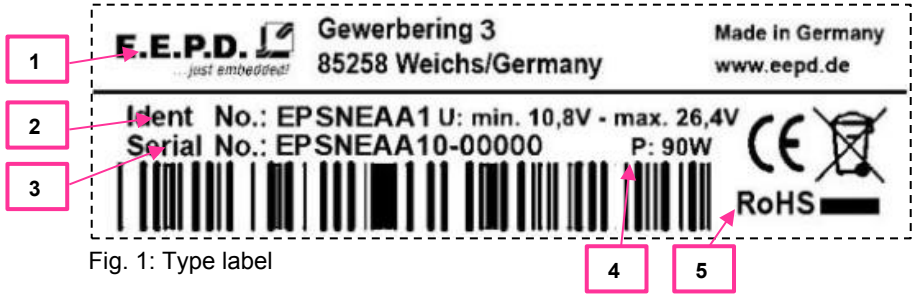


Fig. 1: Type label

1 – Manufacturer

2 – Product name

3 – Serial number with barcode

4 – Power input voltage range

5 – Certification information

1.7 System Dimensions

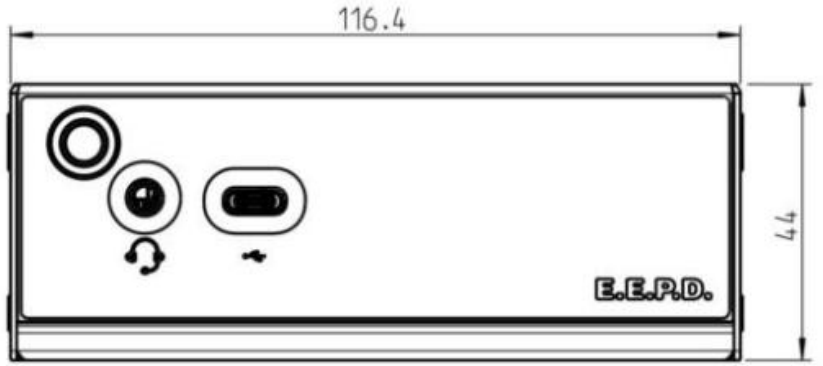


Fig. 2: Dimensions frontside, all values approx. in mm

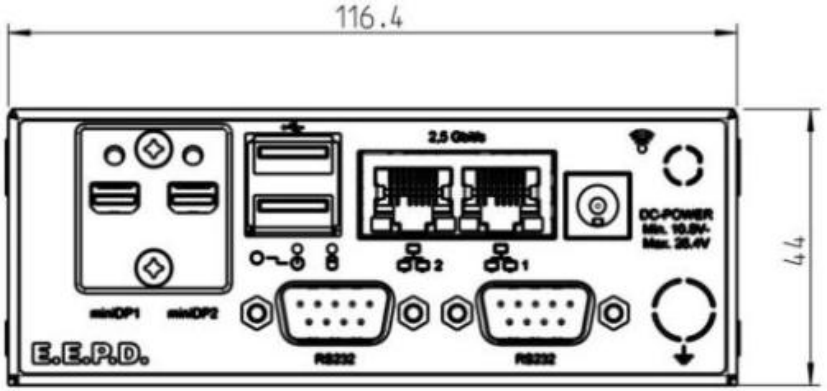


Fig. 3: Dimensions backside, all values approx. in mm

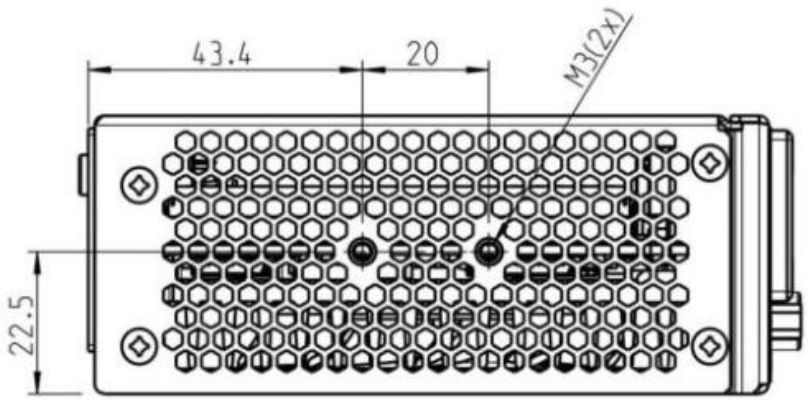


Fig. 4: Dimensions left side, all values approx. in mm

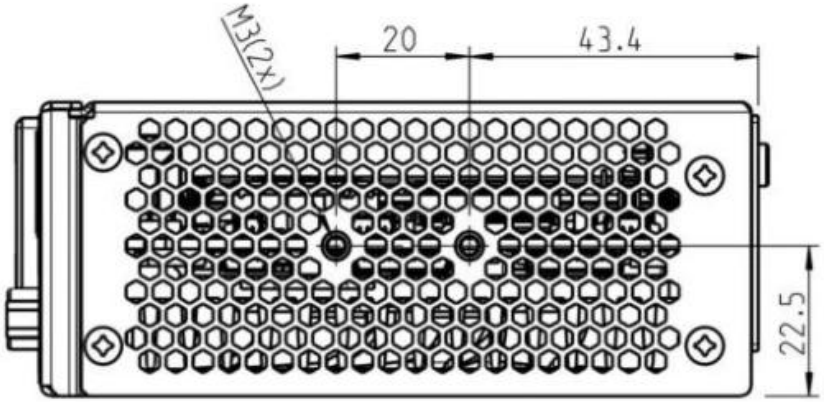


Fig. 5: Dimensions right side, all values approx. in mm

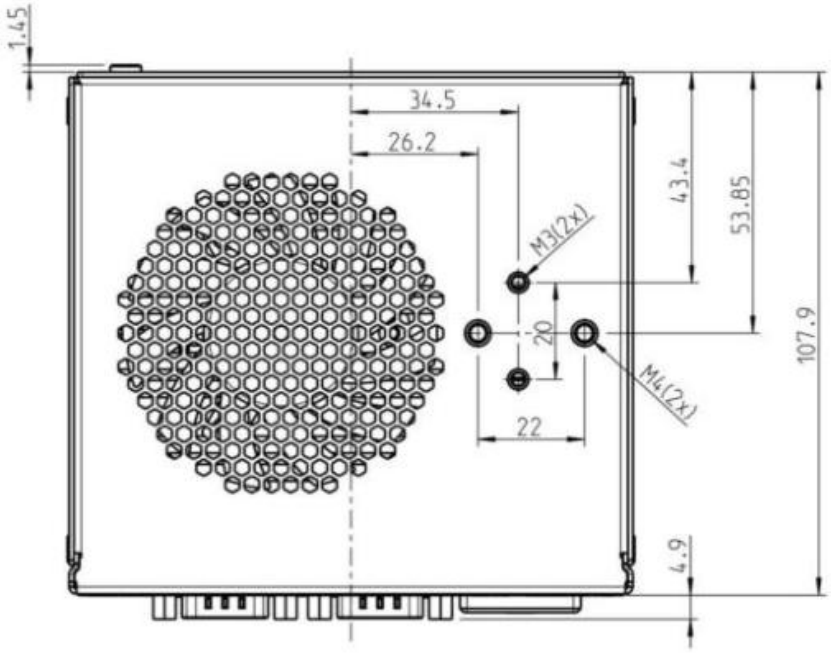
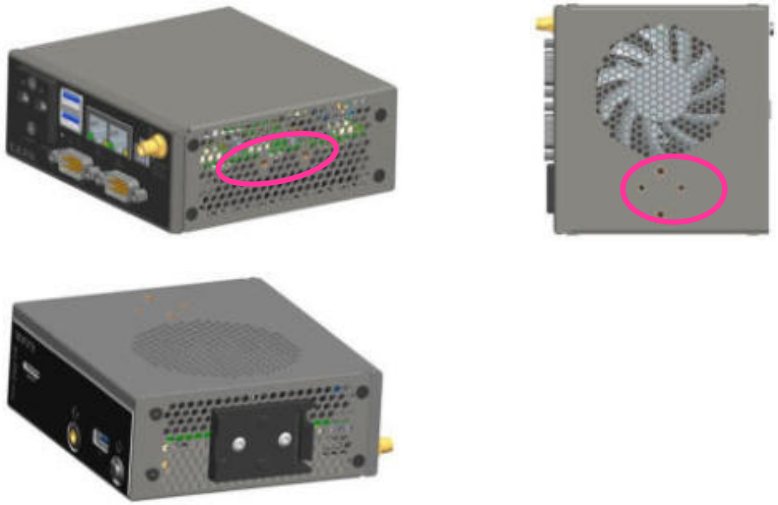


Fig. 6: Dimensions bottom side, all values approx. in mm

1.8 DIN Rail Mounting (optional)

The EM PRO mini® is designed for DIN rail mounting. There are threaded sleeves for mounting the optional DIN rail holder in various positions *(Fig. 7*).



Symbolic view for both sides.

Fig. 7: DIN rail holder positions

Please follow the instructions below:

- Mount the top-hat rail holder with the two M3X6mm screws at the intended fastening points (see *Fig. 7)*. The top-hat rail holder is suitable for “TS35” DIN rails.
- Place the system on the DIN rail. Swivel it inwards until it snaps securely into place.
- To detach the system, push it from bottom to top. Swivel it outwards and remove it.

1.9 VESA Mounting (optional)

The EM PRO mini® is also designed for VESA mounting. There is an optional VESA mount available (*Fig. 8*).

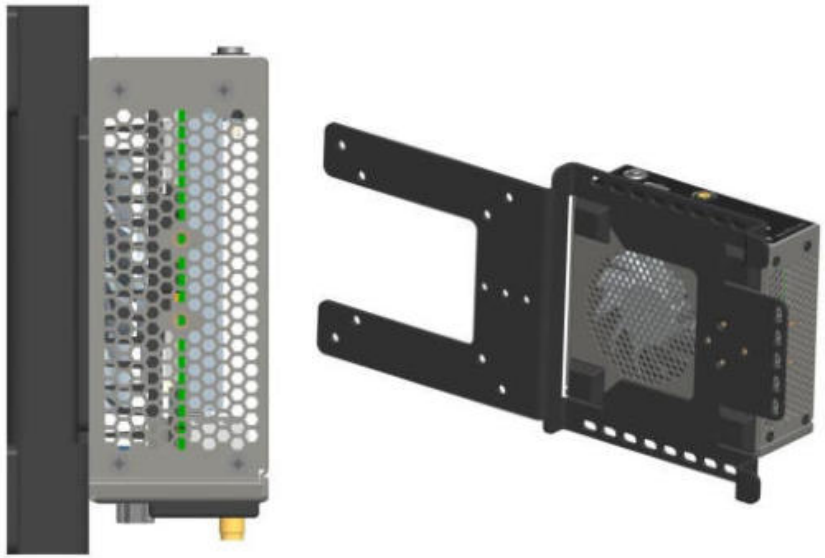


Fig. 8: Side view VESA mounted system

2 Technical Data

- AMD Ryzen™ Embedded V2000 series:
  V2516 / 6C / 12T / 2.1 GHz – 3.95 GHz / 15 W (10 – 25 W)
  V2718 / 8C / 16T / 1.7 GHz – 4.15 GHz / 15 W (10 – 25 W)
- Memory: max. 2x 32 GB dual channel up to DDR4-3200 SO-DIMM memory with ECC support
- Ethernet: 2x Intel® i225-LM with 2.5 Gbit/s with IEEE1588, TSN-support, Wake-on-LAN supported by ETH1
- WiFi/BT (ODM option only):
  802.11 AC with diversity / Bluetooth version 5
- SSD (optional):
  1x M.2 PCIe/SATA + 1 PCIe only, 64 GB – 2 TB each slot
- USB ports:
  2x USB 3.2 Gen2, (10 Gb/s, OCP = 1.5 A each) at the rear side
  1x USB-C 3.2 Gen2 (10 Gb/s, OCP = 3 A) or USB-C Alt-mode at the front side
- Serial ports: 2x RS-232/485 (HDX/FDX) on D-Sub DE-9
- Display output:
  2x Mini DP++, v1.4, up to 3840 x 2160 @ 60 Hz,
  1x USB-C Alt-mode up to 3840 x 2160 @ 60 Hz (only as secondary monitor)
- Sound: MIC in / headphone out at 3.5 mm Audio Jack, CTIA version
- Cooling:
  CPU fan, 5 V, max. 250 mA, not fused
  Auxiliary fan, 5 V, max. 250 mA, not fused
- Controllable FAN (PWM + Tacho), temperature sensor, power supply voltage monitoring and watchdog
- Power and status LEDs
- Power supply: min. 10.8 V / max. 26.4 V (DC), min. 90 W / recommended 120 W, 10 A fused
- Power connector:
  2-pin barrel connector for external DC power and ground
  CUI devices power plug ID 2.5 mm, AD 5.5 mm, max. 7 A
- Power limit:
  Internal and external 3.3 V power max. 25 W
  Internal and external 5 V power max. 45 W
  Internal and external power is related to m.2 connectors, USB, FAN and SATA power
- AMD® firmware Trusted Platform Module
- TPM 2.0 support (Infineon SLB 9670)
- Operating temperature: min. 0 °C to max. +50 °C ambient
  commercial grade, adequate cooling provided, depending on variant and cooling system
  CPU throttling may occur at higher ambient temperatures
- Storage temperature: -40 °C to +85 °C, non-condensing
- Relative humidity: 95 % @ 40 °C, non-condensing while stored, 89 % while working
- Housing: sturdy metal case
- Mounting: stand-alone, hat rail (optional), VESA (optional)
- Dimensions approx.: 117 x 115 x 51 mm
- Weight: approx. 700 g + options

3 Interfaces

3.1 Connection Overview

The EM PRO mini® is equipped with the following standard interfaces:

1 – 2x MiniDP++ connector
2 – Dual-USB 3.2 Gen2 port, type A
3 – 2x Ethernet 10/100/1000/2500 Mbit/s (RJ45), Port 1 supports WoL
4 – Power supply
5 – Power button (auxiliary power button on the rear side → 5a)
6 – 2x Serial port RS-232/485
7 – Sound 3.5 mm MIC in / headphone out, CTIA version
8 – USB-C port
9 – WiFi/BT (ODM option only)

Front View

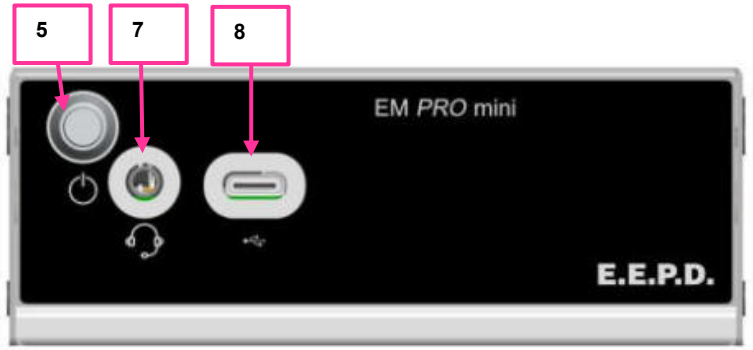


Fig. 9: EM PRO mini® front view

Rear View

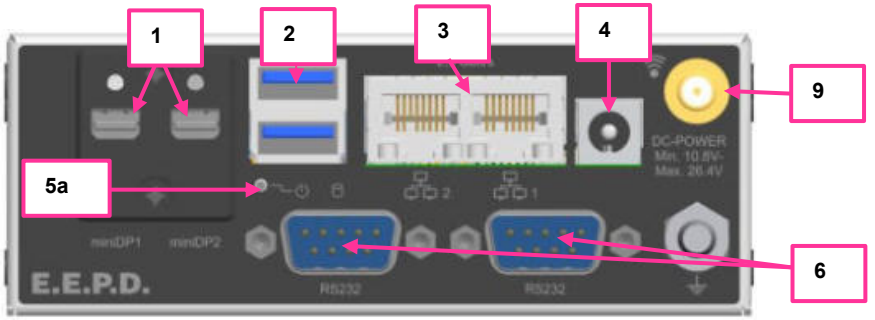


Fig. 10: EM PRO mini® rear view

3.2 Power Button with LED

The power button has an integrated LED that lights up a green ring around the power button when the system is turned on.
Press the power button (*Fig. 11*) once to switch the computer on and off.
Press and hold the power button (>4 Sec.) to hard power off the system.
Hard power off may result in data loss.

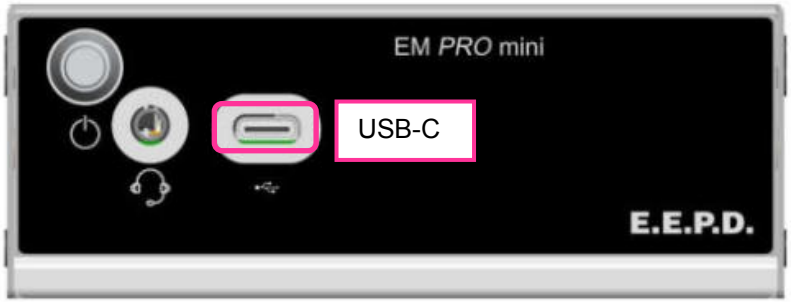


Fig. 11: Power Button with LED

3.3 HDD/SSD LED

See *Fig. 12* for the location of the second Power-LED and the HDD/SSD-LED.

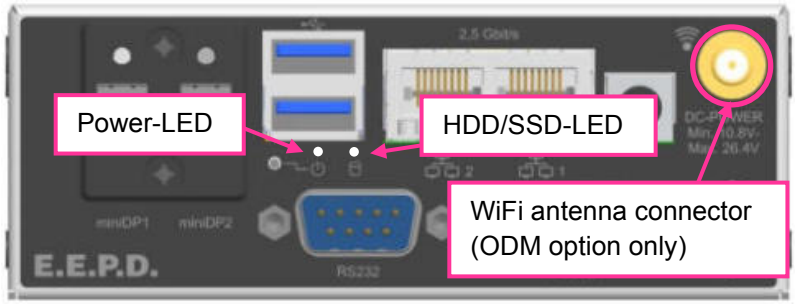


Fig. 12: Power-LED | HDD/SSD-LED

3.4 Mini Display Ports

Standard pin assignment

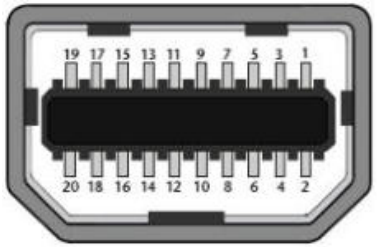


Fig. 13: Mini DisplayPort schematic

CAUTION

Important Note:
There are two types of DisplayPort cables available:

If you connect the display directly to the Mini DP, please use cable with Pin 20 not connected.

If you use active cables/adapters (e. g. Mini DP to DP, Mini DP to HDMI), please use cable with Pin 20 (supply voltage) on both ends that are connected.

Possible effects if wrong cable is used:
System might not start up properly.
Dongle doesn't work properly (e. g. black display).

3.5 Dual-USB 3.2 Gen2 Port

Standard pin assignment

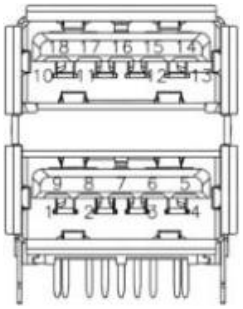


Fig. 14: Dual-USB 3.2 Gen2 schematic

3.6 2.5 Gigabit Ethernet Dual-Port

Standard pin assignment

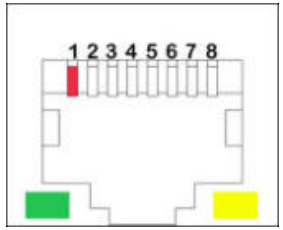


Fig. 15: Ethernet schematic

Yellow LED
Speed-LED is on during 2.5 or 1 Gbit transmission and switched off during 10/100 Mbit transmission.

Green LED
Link-/Activity-LED is permanently on to indicate an active connection on the Ethernet port. LED blinks during communication with the Ethernet network.

3.7 Power Connector (DC)

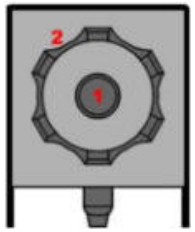


Fig. 16: Power connector schematic

Counterpart - plug:

CUI Devices Power Plug ID 2.5 mm, AD 5.5 mm, max. 7 A
Ordering number: PP3-002B

Pin	Signal	Description
1	PVIN	DC+ (min 10.8 V to max. 26.4 V)
2	GND	Ground

Tab. 3: Pin assignment power connector

3.8 Front USB-C Port

Standard pin assignment

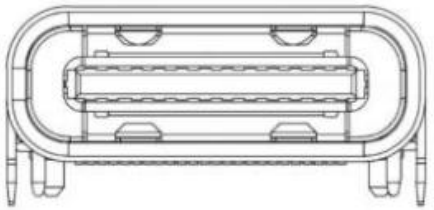


Fig. 17: USB-C schematic

3.9 Serial Ports

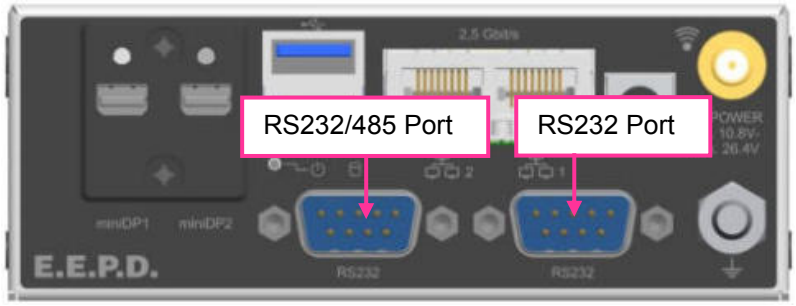


Fig. 18: Serial ports

This option must be enabled in the BIOS → UART Configuration Options, see chapters *6.4.10.1 UART Port 1 Configuration* and *6.4.10.2 UART Port 2 Configuration.*
The serial RS232/485 interface is provided by a multiprotocol transceiver. The RS232 mode is connected to four wires. The connector is a standard 9-pin D-Sub connector (*Fig. 19*).

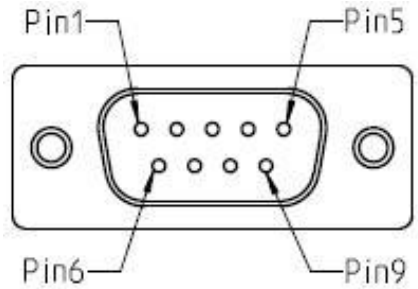


Fig. 19: 9-pin D-SUB connector schematic

9-pin D-Sub	Signal RS-232	Signal RS-485 FDX only	Signal RS485/HDX for Win 10/11 only
1	-	RS485-TX_N	RS485-RX/TX_N
2	-	-	
3	RXD	RS485-TX_P	RS485-RX/TX_P
4	RTS	-	
5	TXD	RS485-RX_P	
6	CTS	-	
7	-	RS485-RX_N	
8	-	-	
9	VCC 5 V +/-5%, max. 500 mA not fused	VCC 5 V +/-5%, max. 500 mA not fused	VCC 5 V +/-5%, max. 500 mA not fused

Tab. 4: Pin assignment RS232/485

4 Opening the System

1. Turn off the system and disconnect from the electrical outlet.
2. Remove the 8 screws (M3X4) (4 screws each side, see *Fig. 20* / *Fig. 21*).
3. Lift the cover (*Fig. 22*).
4. The assembly is carried out in reverse order.

CAUTION

Do not remove any screws other than those specified, otherwise the warranty will be void and you may damage the EM PRO mini.

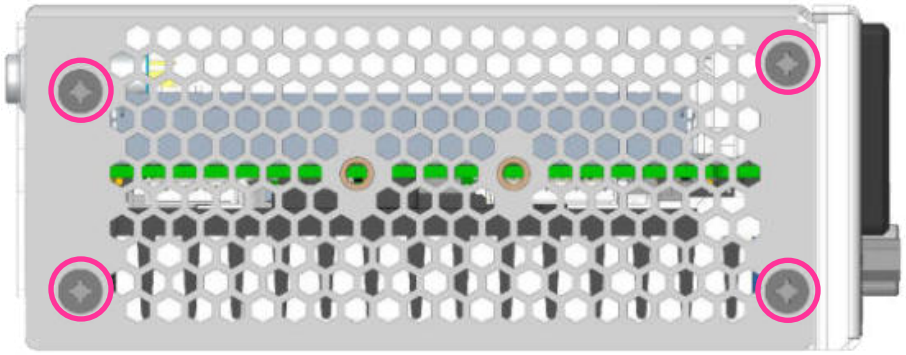


Fig. 20: Screws on the left side

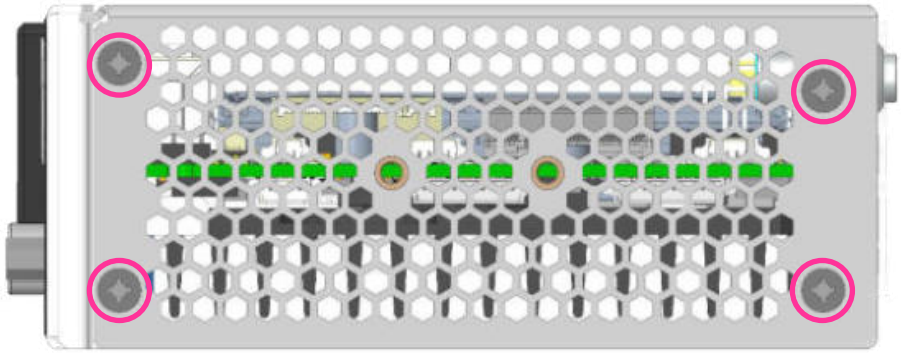


Fig. 21: Screws on the right side

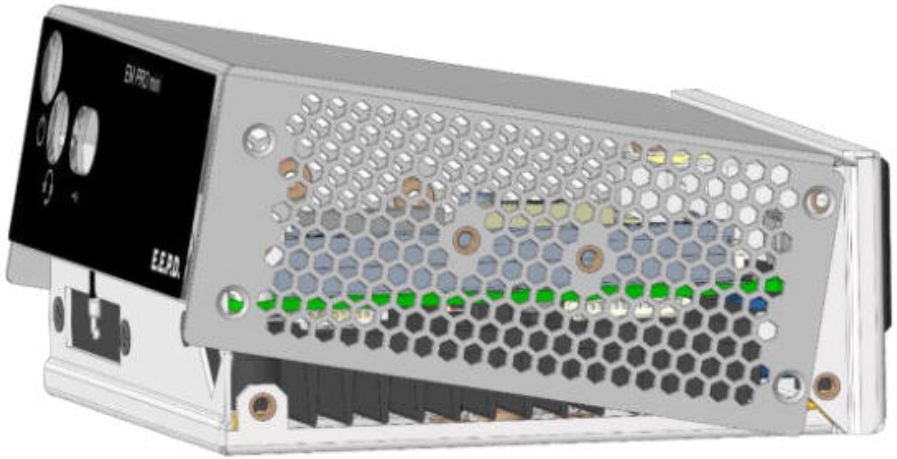


Fig. 22: Cover lifting

4.1 Installing M.2 Modules/SSD

Insert the module into the corresponding slot (*Fig. 24*) at an angle. Press it down on the side that protrudes and secure it with the screw provided.

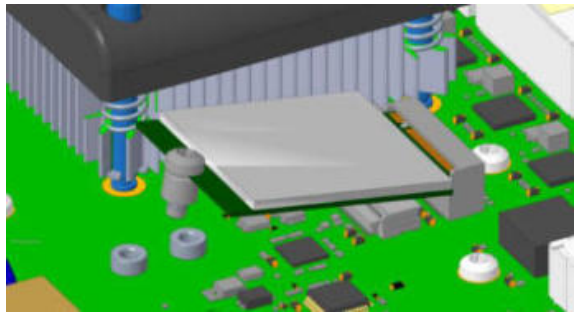


Fig. 23: M.2 module assembly

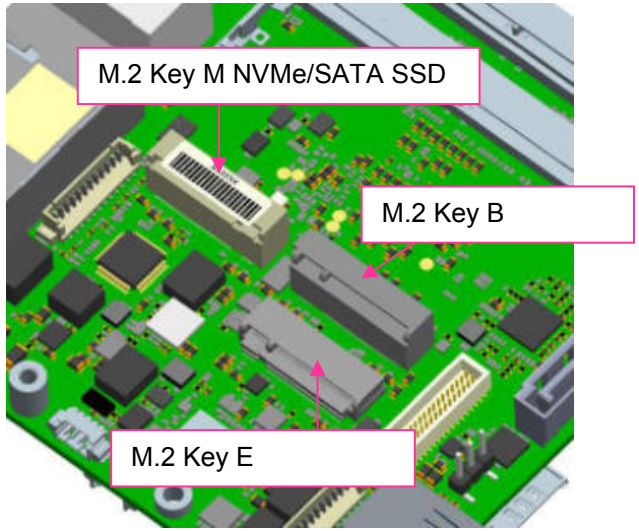


Fig. 24: M.2 module position

4.2 Installing RAM Modules

To install the memory modules, the battery holder must be loosened by the marked screw:

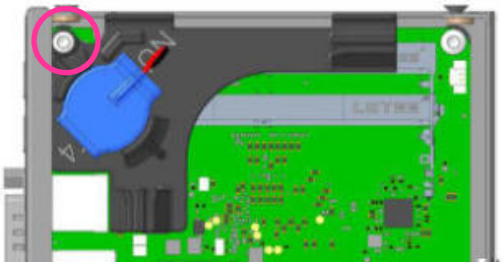


Fig. 25: Installing SO-DIMM modules

Use only 1.2 V DDR SO-DIMM modules compliant with the DDR4 standard.
Dual channel DDR4 SO-DIMM memory, max. 2x 32 GB, up to 3200 MT/s, with ECC support.
Only use modules approved by E.E.P.D.

Assembly:
First slide RAM module into the RAM socket.
Then press the module in direction to the board till you hear it snap.

Disassembly:
First press both clamps outwards.
Then the RAM module will set upright automatically.
Remove the module from the socket.

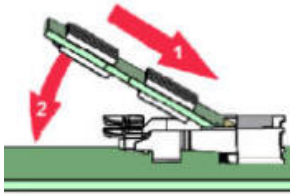


Fig. 26: RAM Assembly

5 Commissioning

If connections are no longer accessible after system installation, connect all cables before final mounting.

Only connect the power cable when the power supply is switched off.

Before commissioning, we recommend connecting or inserting:

- Monitor
- USB keyboard and mouse
- Network cable (optional)
- DC power supply

Other plug & play devices can be connected after commissioning.

5.1 Switching on the Device / Operation

After all preparations have been made, the system is ready to be connected to the power supply.
Press the power button to switch on the system. When the system is powered, the Power LED on the power button will be on.
If an operating system is installed, it will start now. An operating system installation can be performed with installation media such as USB stick, USB DVD drive or PXE remote network start. The BIOS boot order has to be adjusted accordingly. To enter the BIOS setup, press the [ESC] key immediately after switching on.
Please refer to the operating system manual for switching off / shutting down.

6 UEFI/BIOS

The following description shows a snapshot of the BIOS setup. Later BIOS updates may change the content slightly.

Asterisk (*) indicates default setting.

6.1 Entering Setup

Power on the board and press and hold [ESC] immediately to enter Setup.

6.2 Most Common Settings

- Firmware / BIOS Version:
  Setup Utility → Main (chapter *6.3*)
  or Setup Utility → AMD PBS → AMD Firmware Version (chapter *6.8.1*)

- Boot / PXE Boot
  Boot Manager
  or Setup Utility → Boot (chapter *6.7*)

- Change shared graphics memory
  Setup Utility → AMD CBS → NBIO Common Options → GFX Configurations → UMA Frame Buffer Size (chapter *6.9.2.1*)

- TDP, fan control, boost mode
  TDP setting (chapter *6.9.2.2*):
  Setup Utility → AMD CBS → NBIO Common Options → SMU Common Options → System Configuration
  Fan control (chapter *6.9.2.2.1*):
  Setup Utility → AMD CBS → NBIO Common Options → SMU Common Options → CPU and Auxiliary Fan Control
  Boost mode (chapter *6.9.1*):
  Setup Utility → AMD CBS → CPU Common Options → Core Performance Boost

- USB power
  USB Power off in S5 (chapter *6.4.9*):
  Setup Utility → Advanced → NUCE Options → USB Power off in S5
  or
  USB VCC control (chapter *6.4.5*):
  Setup Utility → Advanced → USB Configuration

6.3 Main Menu

Once you enter the Setup Utility, the Main Menu will appear on the screen:

Fig. 27: Main Menu

This setup menu shows an overview of board configuration, CPU type, memory and firmware revisions.

BIOS Settings	Options	Description
Language	<English>*	
System Time	No options	Set the time. Use tab to switch between time elements [hour:min:sec]. Valid range is from 0 to 23, 0 to 59, 0 to 59. INCREASE/REDUCE: +/-.
System Date	No options	Set the date. Use tab to switch between date elements [month:day:year]. Valid range is from 1 to 12, 1 to 31, 2000 to 2099. (Error checking will be done against month/day/year combinations that are not supported.) INCREASE/REDUCE: +/-.
About this Software		

Tab. 5: Main Menu

6.4 Advanced Menu

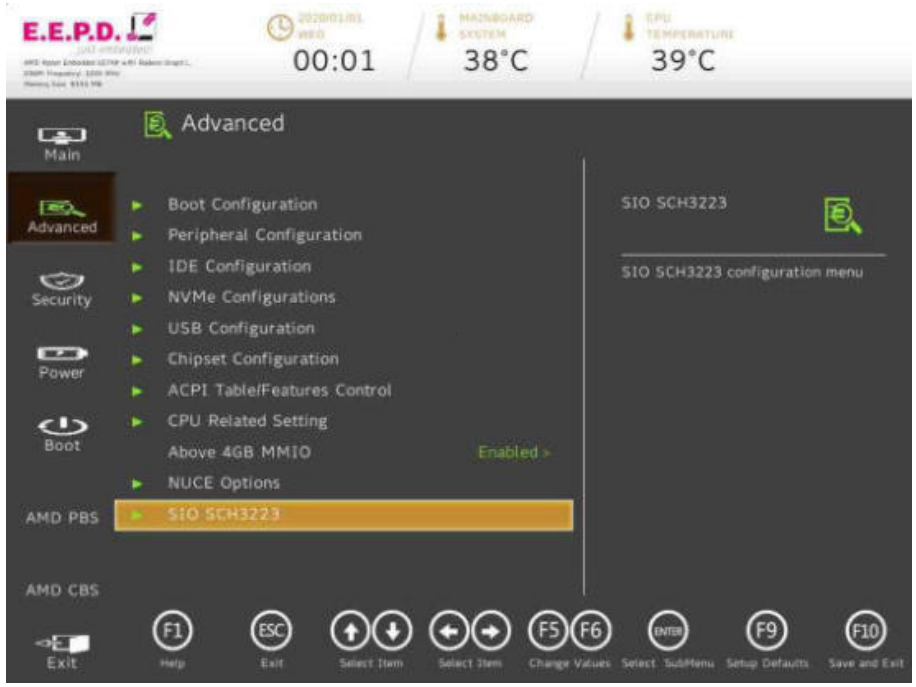


Fig. 28: Advanced Menu

BIOS Settings	Options	Description
Boot Configuration	See submenu	Configures Boot Settings.
Peripheral Configuration	See submenu	Configures the peripheral devices.
IDE Configuration	See submenu	Select the IDE controller and hard disk drive type installed in your system
NVMe Configurations	See submenu	This function shows the connected NVMe devices.
USB Configuration	See submenu	Configures the USB support
Chipset Configuration	See submenu	Advanced Chipset Configuration Options.
ACPI Table/Features Control	See submenu	Configures ACPI Tables/Features setting.
CPU Related setting	See submenu	CPU Related setting
Above 4GB MMIO	<Disabled> <Enabled>*	Enable/Disable above 4GB MemoryMappedIO BIOS assignment. It's only available with Uefi Boot Mode.
NUCE Options	See submenu	Configure: PIC watchdog, Wake on LAN, Power LED, USB Power off in S5
SIO SCH3223	See submenu	SIO SCH3223 configuration menu

Tab. 6: Advanced Menu

6.4.1 Boot Configuration

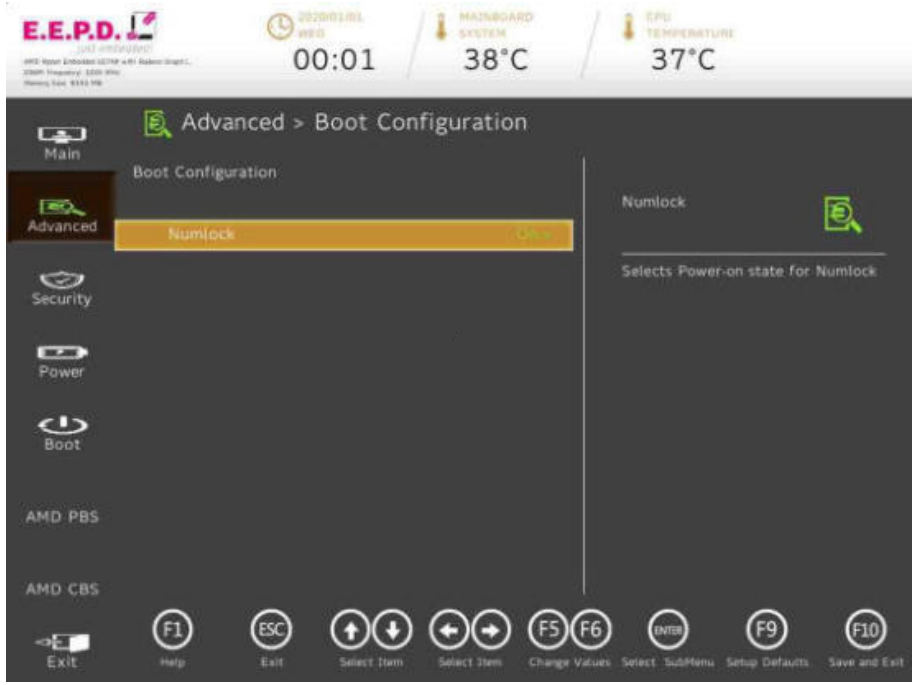


Fig. 29: Boot Configuration

BIOS Settings	Options	Description
Numlock	<Off> <On>*	Configuration of Numlock key at power up.

Tab. 7: Boot Configuration

6.4.2 Peripheral Configuration

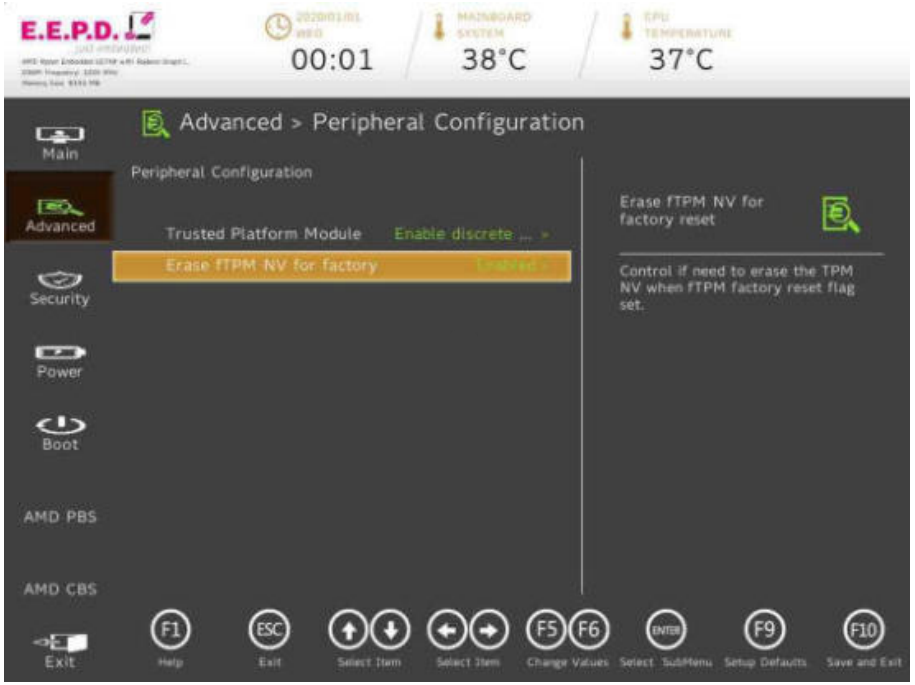


Fig. 30: Peripheral Configuration

BIOS Settings	Options	Description
Trusted Platform Module	<Disabled> <Enable discrete TPM>* <Enable firmware TPM>	Enable/Disable TPM physical presence. Need to reboot when set from disable to enable before selecting TPM Operation.
Erase fTPM NV for factory reset	<Disabled> <Enabled>*	Control if need to erase the TPM NV when fTPM factory reset flag set.

Tab. 8: Peripheral Configuration

6.4.3 IDE Configuration

Fig. 31: IDE Configuration

BIOS Settings	Options	Description
SATA	<Disabled> <Auto>*	AUTO: Auto detect the SATA controller. DISABLED: Disable the SATA controller
SATA Configure as	<IDE> <AHCI>*	Set SATA Configure Type
SATA-Controller	See submenu	Enable/Disable SATA Controller
Serial ATA Port 0 [Not Installed]	See submenu	Serial ATA Port 0 Device configuration
Serial ATA Port 1 [Not Installed]	See submenu	Serial ATA Port 1 Device configuration
Serial ATA Port 2 [Not Installed]	See submenu	Serial ATA Port 2 Device configuration

Tab. 9: IDE Configuration

6.4.3.1 SATA-Controller

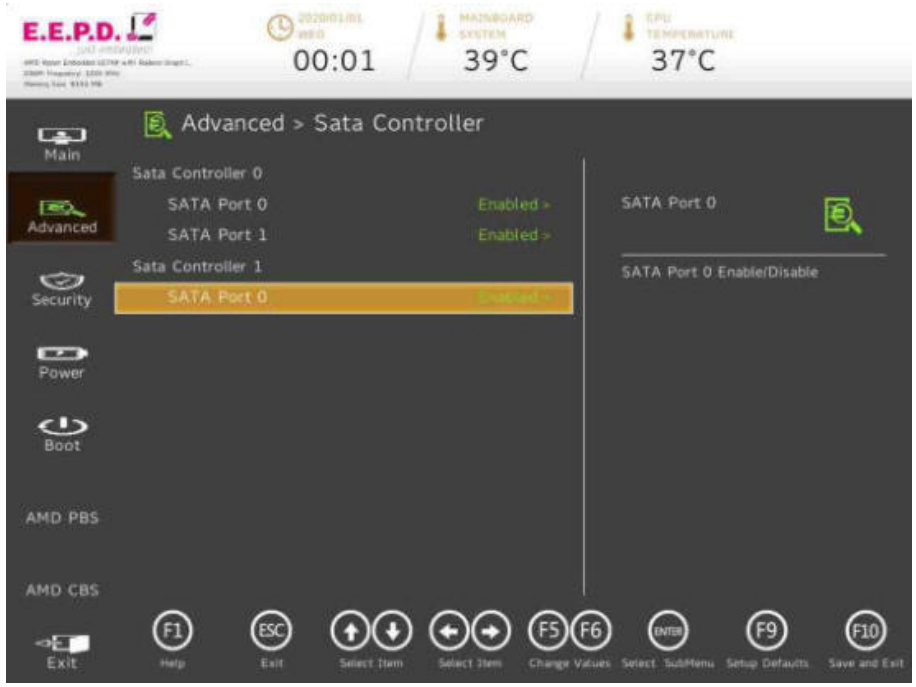


Fig. 32: SATA Controller

BIOS Settings	Options	Description
SATA Port 0	<Disabled> <Enabled>*	SATA Port 0 Enable/Disable
SATA Port 1	<Disabled> <Enabled>*	SATA Port 1 Enable/Disable
SATA Port 0	<Disabled> <Enabled>*	SATA Port 0 Enable/Disable

Tab. 10: SATA Controller

6.4.4 NVMe Configurations

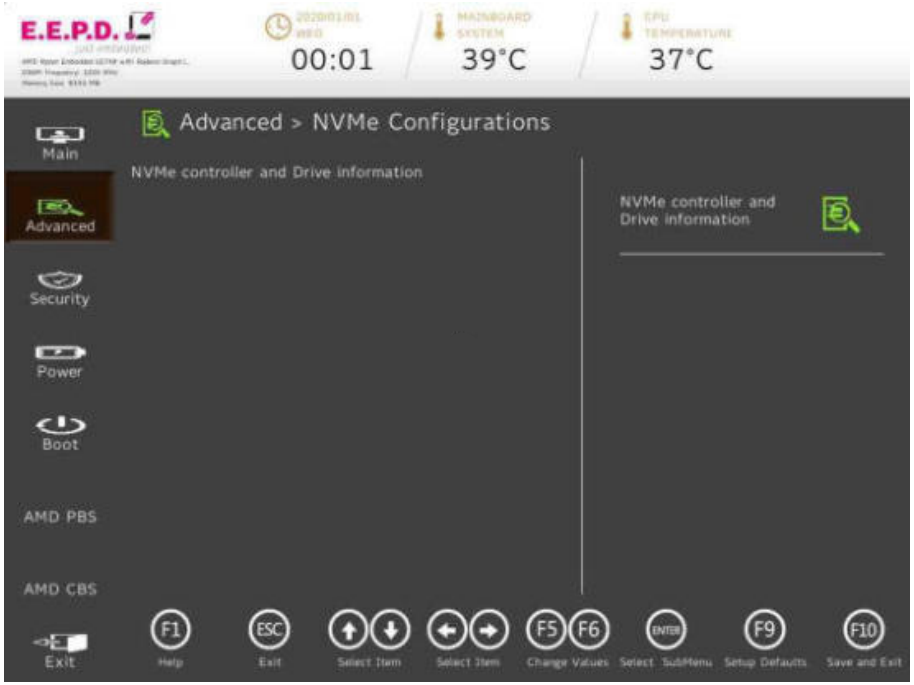


Fig. 33: NVMe Configurations

BIOS Settings	Options	Description
NVMe controller and Drive information		This function shows the connected NVMe devices.

Tab. 11: NVMe Configurations

6.4.5 USB Configuration

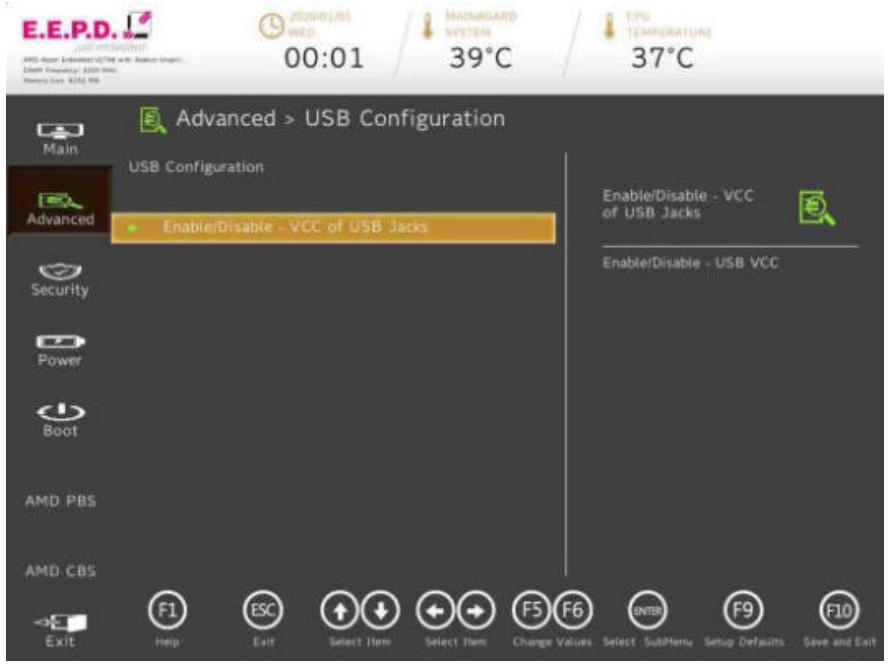


Fig. 34: USB Configuration

BIOS Settings	Options	Description
Enable/Disable – VCC of USB Jacks	See submenu	Enable/Disable – USB VCC

Tab. 12: USB Configuration

Note:
In order to not exclude yourself from the BIOS setup, at least one USB port should be enabled at all times.

6.4.5.1 Enable/Disable – VCC of USB Jacks

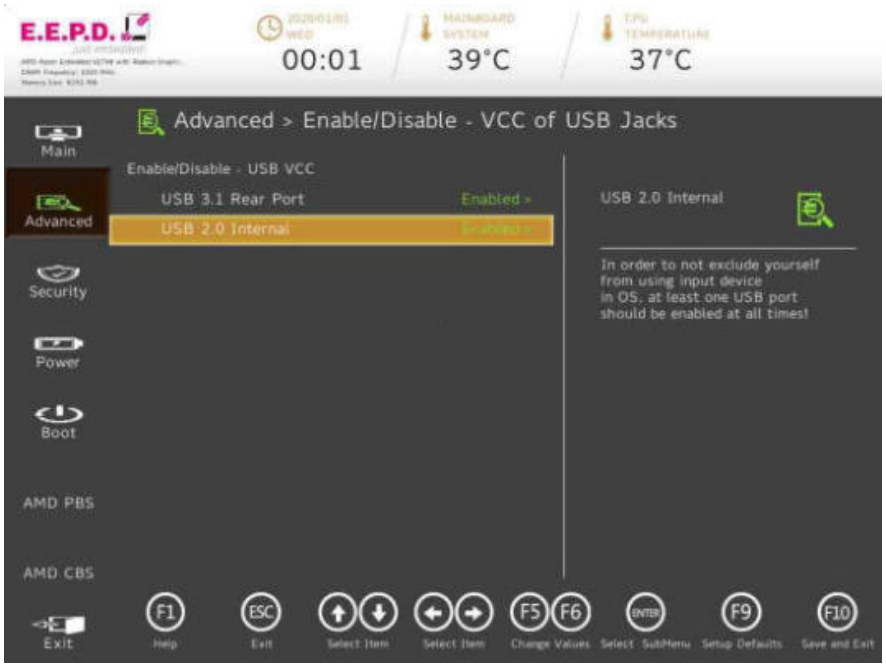


Fig. 35: USB Ports

BIOS Settings	Options	Description
USB 3.1 Rear Port	<Disabled> <Enabled>*	This function allows you to enable or disable the power for the Rear USB port.
USB 2.0 Internal	<Disabled> <Enabled>*	This function allows you to enable or disable the power for the internal USB port.

Tab. 13: USB Ports

6.4.6 Chipset Configuration

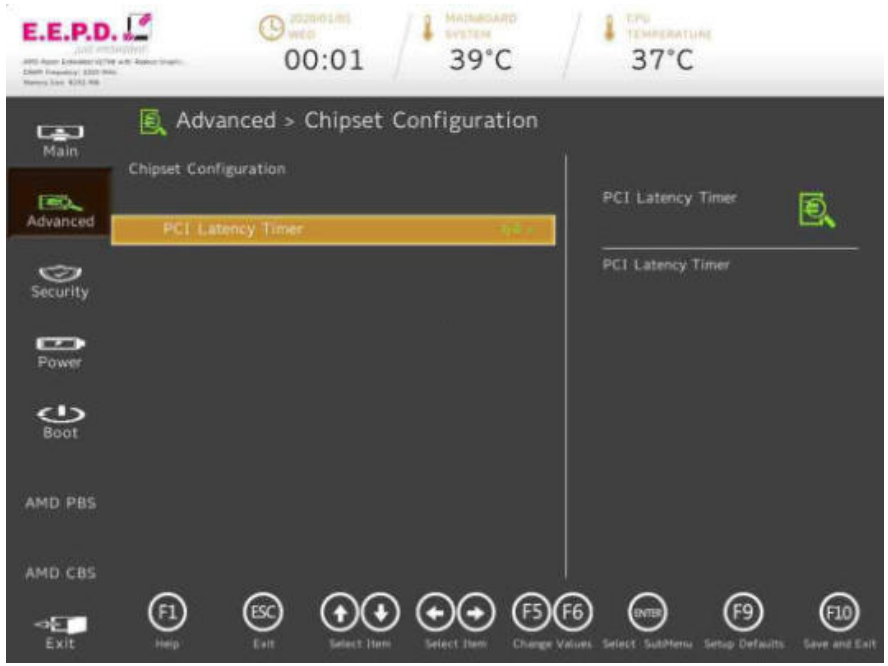


Fig. 36: Chipset Configuration

BIOS Settings	Options	Description
PCI Latency Timer	<32> <64>* <96> <128> <160> <192> <224> <248>	PCI Latency Timer

Tab. 14: Chipset Configuration

6.4.7 ACPI Table/Features Control

Fig. 37: ACPI Table/Features Control

BIOS Settings	Options	Description
HPET - HPET Support	<Disabled> <Enabled>*	High Precision Event Timer is supported in Windows Vista or above. HPET controller should not been seen in Windows XP no matter enable/disable in SCU. If this feature is enabled, the HPET table will be added into ACPI Tables.

Tab. 15: ACPI Table/Features Control

6.4.8 CPU Related setting

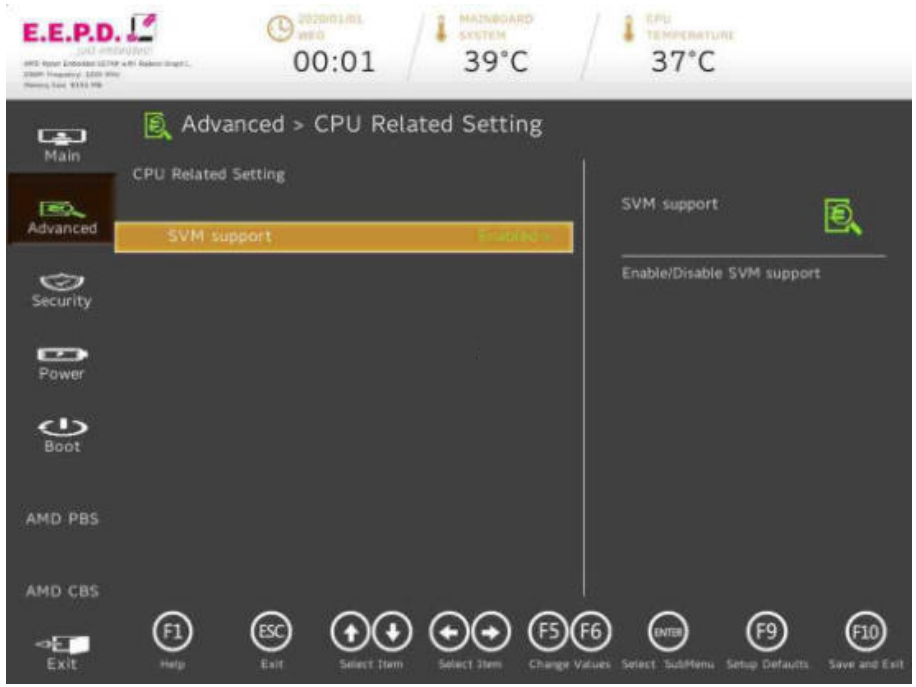


Fig. 38: CPU related setting

BIOS Settings	Options	Description
SVM support	<Disabled> <Enabled>*	Enable/Disable SVM support SVM mode is an option to enable a so-called secure virtual machine

Tab. 16: CPU Related setting

6.4.9 NUCE Options

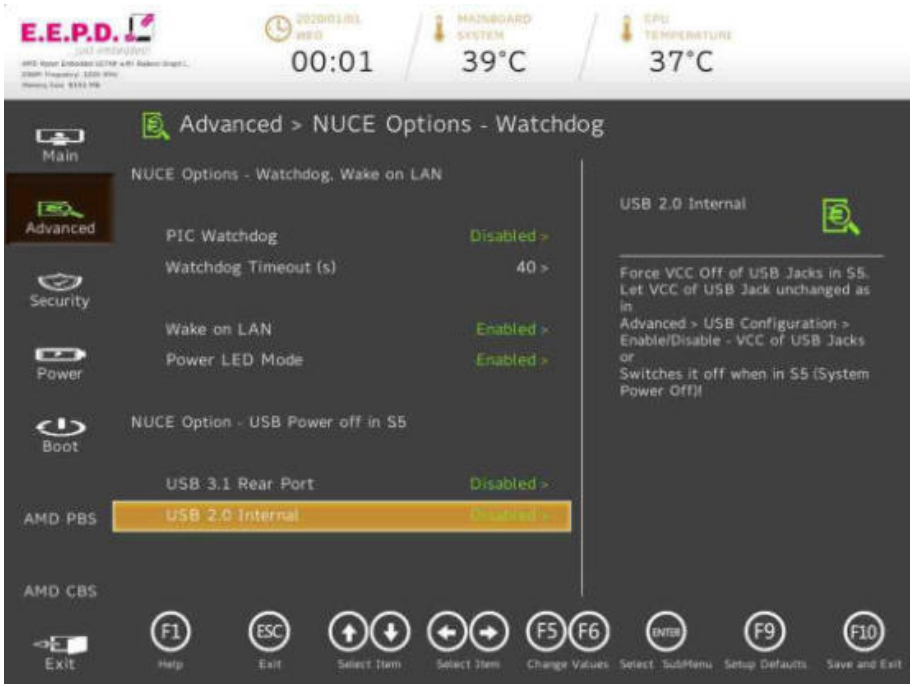


Fig. 39: NUCE options

BIOS Settings	Options	Description
PIC Watchdog	<Disabled>* <Enabled>	Enable/Disable the PIC watchdog
Watchdog Timeout (s)	Adjust value [30-254] Default value [40]*	Seconds before PIC watchdog times out. Range 30-254 seconds.
Wake on LAN	<Disabled> <Enabled>*	Enable/Disable Wake on LAN
Power LED Mode	<Disabled> <Enabled>*	Set Power LED Mode (Enable/Disable)

USB 3.1 Rear Port	<Disabled>* <Enabled>	Force USB VCC Off in S5. [Disabled]: Leaves VCC of USB Jack unchanged as in Advanced > USB Configuration > Enable/Disable - VCC of USB Jacks [Enabled]: Switches USB VCC off in S5 (System Power Off)!
USB 2.0 Internal	<Disabled>* <Enabled>	

Tab. 17: NUCE options

API or code sample to reset watchdog on request.

CAUTION

Enabling watchdog leads to the reset of the board after time out. Please contact EEPD for further instructions.

6.4.10 SIO SCH3223

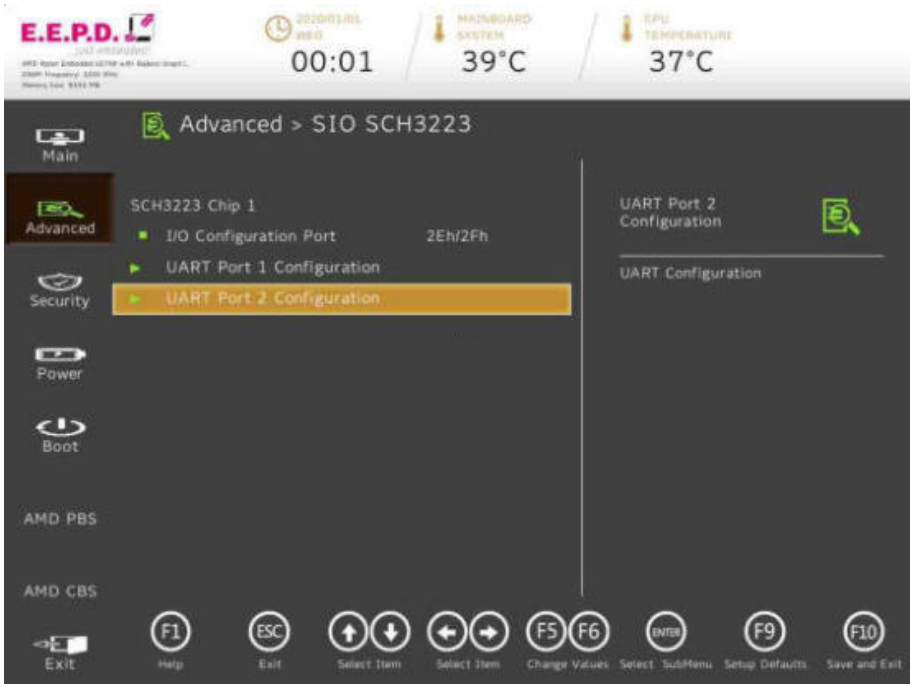


Fig. 40: SIO SCH3223

BIOS Settings	Options	Description
UART Port 1 Configuration	See submenu	UART Configuration
UART Port 2 Configuration	See submenu	UART Configuration

Tab. 18: SIO SCH3223

6.4.10.1 UART Port 1 Configuration

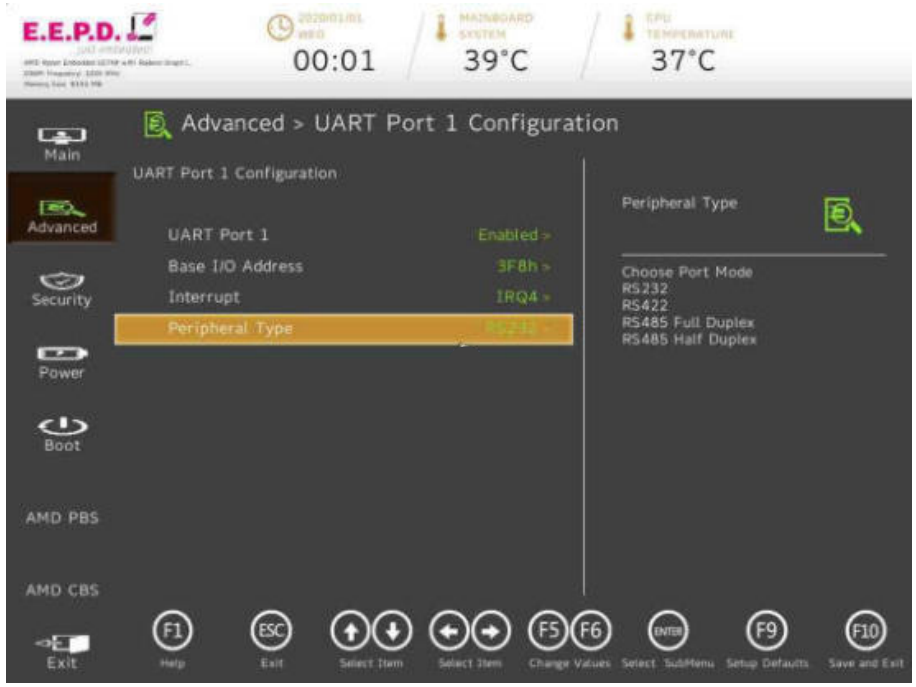


Fig. 41: UART Port 1 Configuration

BIOS Settings	Options	Description
UART Port 1	<Disabled> <Enabled>*	Configure UART port using options: [Disabled] Disable device [Enabled] Enable device and use below settings
Base I/O Address	<3F8h>* <2F8h> <3E8h> <2E8h> <338h> <228h> <220h> <238h>	System I/O base resources
Interrupt	<IRQ3> <IRQ4>* <IRQ6> <IRQ7> <IRQ11>	System interrupt resources
Peripheral Type	<RS232>* <RS422> <RS485 FULL DUPLEX> <RS485 HALF DUPLEX>	Choose Port Mode: RS232 RS422 RS485 Full Duplex RS485 Half Duplex

Tab. 19: UART Port 1 Configuration

6.4.10.2 UART Port 2 Configuration

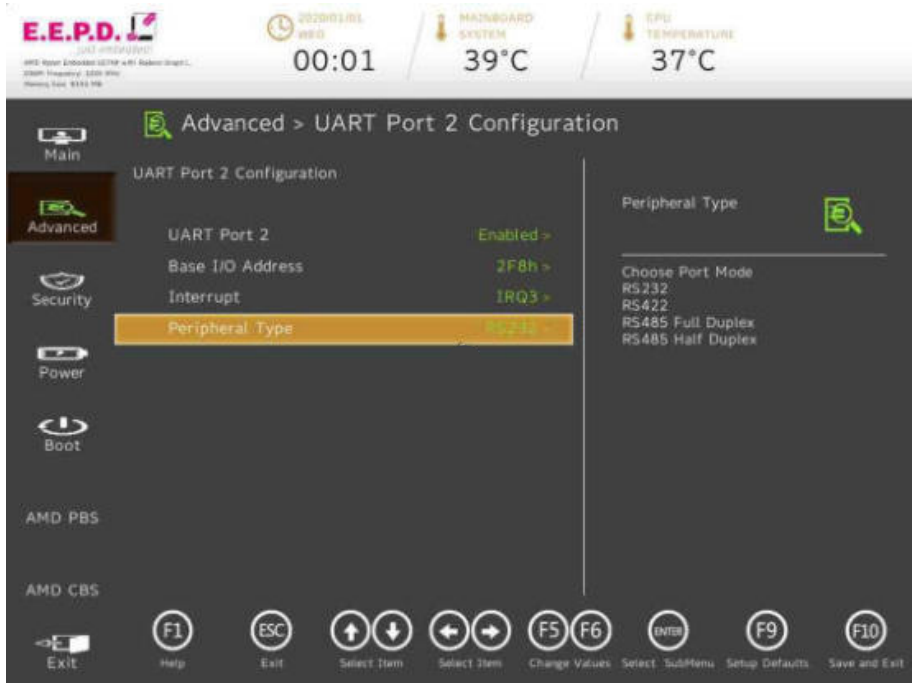


Fig. 42: UART Port 2 Configuration

BIOS Settings	Options	Description
UART Port 2	<Disabled> <Enabled>*	Configure UART port using options: [Disabled] Disable device [Enabled] Enable device and use below settings
Base I/O Address	<3F8h> <2F8h>* <3E8h> <2E8h> <338h> <228h> <220h> <238h>	System I/O base resources
Interrupt	<IRQ3>* <IRQ4> <IRQ6> <IRQ7> <IRQ11>	System interrupt resources
Peripheral Type	<RS232>* <RS422> <RS485 FULL DUPLEX> <RS485 HALF DUPLEX>	Choose Port Mode: RS232 RS422 RS485 Full Duplex RS485 Half Duplex

Tab. 20: UART Port 2 Configuration

6.5 Security Menu

Fig. 43: Security Menu

BIOS Settings	Options	Description
Current TPM Device	<Not Detected> <TPM 1.2> <TPM 2.0 (DTPM)>*	Current TPM Device: TPM1.2, or TPM2.0.
TrEE Protocol Version	<1.0> <1.1>*	TrEE Protocol Version: 1.0 or 1.1
TPM Availability	<Available>* <Hidden>	When hidden, doesn't expose TPM to OS
TPM Operation	<No Operation>* <Enable> <SetPCRBanks(Algorithm)> <LogAllDigests> <SetPPRequiredForClear_True> <SetPPRequiredForClear_False> <SetPPRequiredForTurnOn_False> <SetPPRequiredForTurnOn_True> <SetPPRequiredForTurnOff_False> <SetPPRequiredForTurnOff_True> <SetPPRequiredForChangePCRs_False> <SetPPRequiredForChangePCRs_True> <SetPPRequiredForChangeEPS_False> <SetPPRequiredForChangeEPS_True> <ChangeEPS>	Select one of the supported operations to change TPM2 state.
Clear TPM	<Disabled>* <Enabled>	Clear TPM. Removes all TPM context associated with a specific Owner.
Set Supervisor Password	None	Install or change the password and the length of password must be greater than one character.

Tab. 21: Security Menu

6.5.1 Storage Password Setup Page

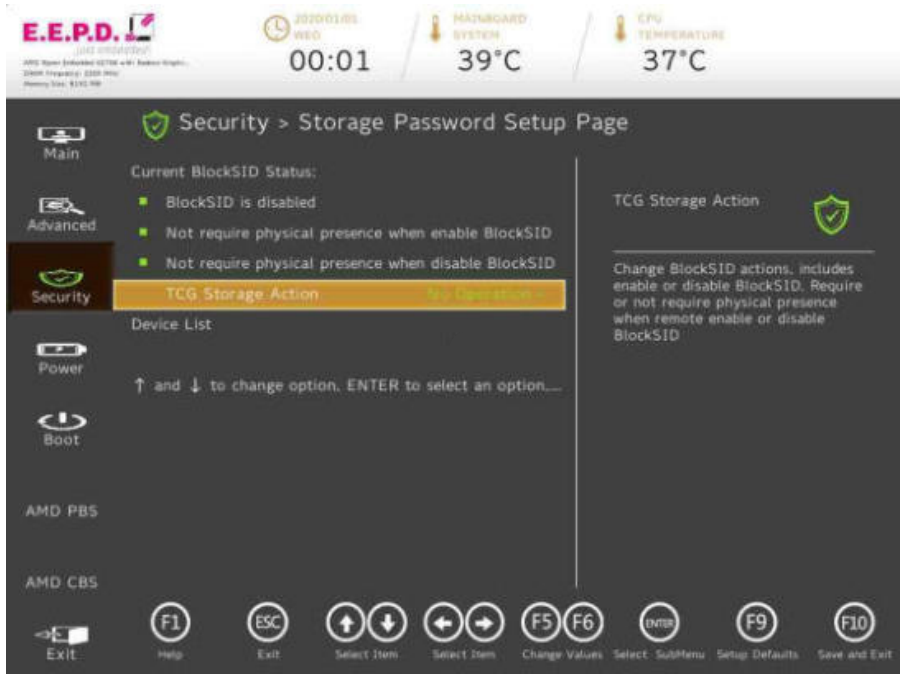


Fig. 44: Storage Password Setup Page

BIOS Settings	Options	Description
TCG Storage Action	<No Operation>* <Enable_BlockSIDFunc> <Disable_BlockSIDFunc> <PPRequiredForEnableBlockSID_True> <PPRequiredForEnableBlockSID_False> <PPRequiredForDisableBlockSID_True> <PPRequiredForDisableBlockSID_False>	Change BlockSID actions, includes enable or disable BlockSID, Require or not require physical presence when remote enable or disable BlockSID

Tab. 22: Storage Password Setup Page

6.6 Power Menu

Fig. 45: Power Menu

BIOS Settings	Options	Description
Auto Wake on S5	<Disabled>* <By Every Day> <By Day of Month>	Auto wake on S5, By Day of Month or Fixed time of every day

Tab. 23: Power Menu

6.7 Boot Menu

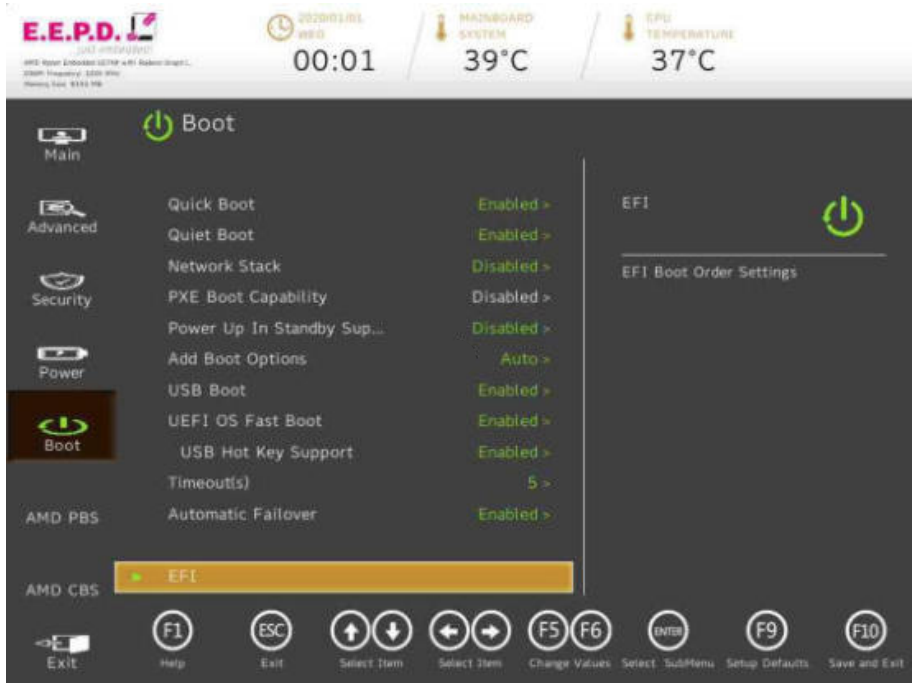


Fig. 46: Boot Menu

BIOS Settings	Options	Description
Quick Boot	<Enabled>* <Disabled>	Allows InsydeH2O to skip certain tests while booting. This will decrease the time needed to boot the system.
Quiet Boot	<Enabled>* <Disabled>	Disables or enables booting in Text Mode.
Network Stack	<Disabled>* <Enabled>	Network Stack Support: Windows 8 BitLocker Unlock
		UEFI IPv4/IPv6 PXE Legacy PXE OPROM
PXE Boot capability	<Disabled>*	Disabled: Support Network Stack UEFI PXE: IPv4/IPv6 Legacy: Legacy PXE OPROM only
Power Up In Standby Support	<Enabled> <Disabled>*	Disable or enable Power Up in Standby Support. The PUIS feature set allows devices to be powered-up into the Standby power management state to minimize inrush current at power-up and to allow the host to sequence the spin-up of devices.
Add Boot Options	<First> <Last> <Auto>*	Position in Boot Order for Shell, Network and Removables
USB Boot	<Enabled>* <Disabled>	Disables or enables booting to USB boot devices.
UEFI OS Fast Boot	<Enabled>* <Disabled>	If enabled the system firmware does not initialize keyboard and check for firmware menu key.
USB Hot Key Support	<Disabled>* <Enabled>	Enable/Disable to support USB hot key while booting. This will decrease the time needed to boot the system.
Timeout(s)	Adjust value [0-10] Default value [5]	The number of seconds that the firmware will wait before booting the original default boot selection.
Automatic Failover	<Disabled> <Enabled>*	Enable: if boot to default device fail, it will directly try to boot next device. Disable: if boot to default device fail, it will pop warning message then go into firmware UI.
EFI	See submenu	EFI Boot Order Settings

Tab. 24: Boot Menu

6.7.1 EFI

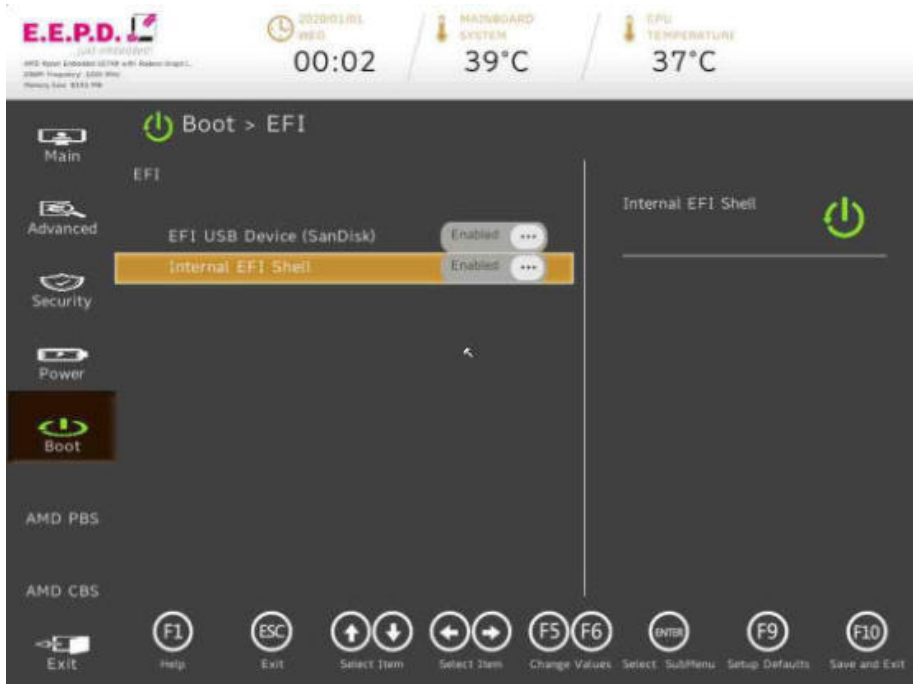


Fig. 47: EFI

BIOS Settings	Options	Description
EFI USB Device (SanDisk)	<Enabled>* <Disabled>	
Internal EFI Shell	<Enabled>* <Disabled>	

Tab. 25: EFI

6.8 AMD PBS Menu

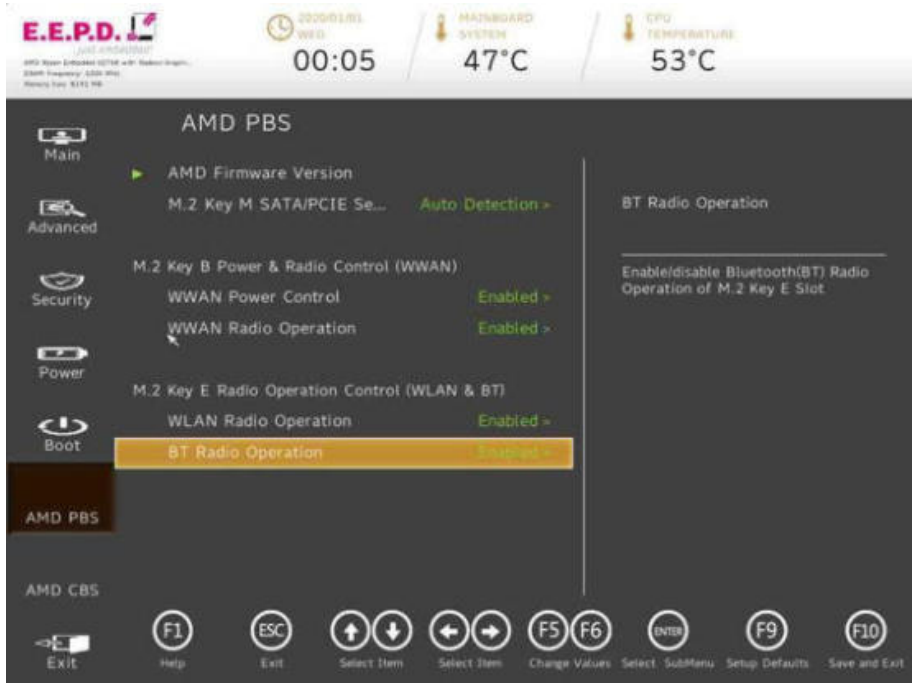


Fig. 48: AMD PBS Menu

BIOS Settings	Options	Description
AMD Firmware Version	See submenu	Show all of AMD Firmware Version
M.2 Key M SATA/PCIE Selection	<Force PCIE> <Force SATA> <Auto Detection>*	M.2 Key M SATA/PCIE Selection usage: SATA, PCIE or Auto Detection
WWAN Power Control	<Enabled>* <Disabled>	Enable/disable Power of M.2 Key B Slot (WWAN)
WWAN Radio Operation	<Enabled>* <Disabled>	Enable/disable Radio Operation of M.2 Key B Slot (WWAN)
WLAN Radio Operation	<Enabled>* <Disabled>	Enable/disable WLAN Radio Operation of M.2 Key E Slot
BT Radio Operation	<Enabled>* <Disabled>	Enable/disable Bluetooth (BT) Radio Operation of M.2 Key E Slot

Tab. 26: AMD PBS Option

6.8.1 AMD Firmware Version

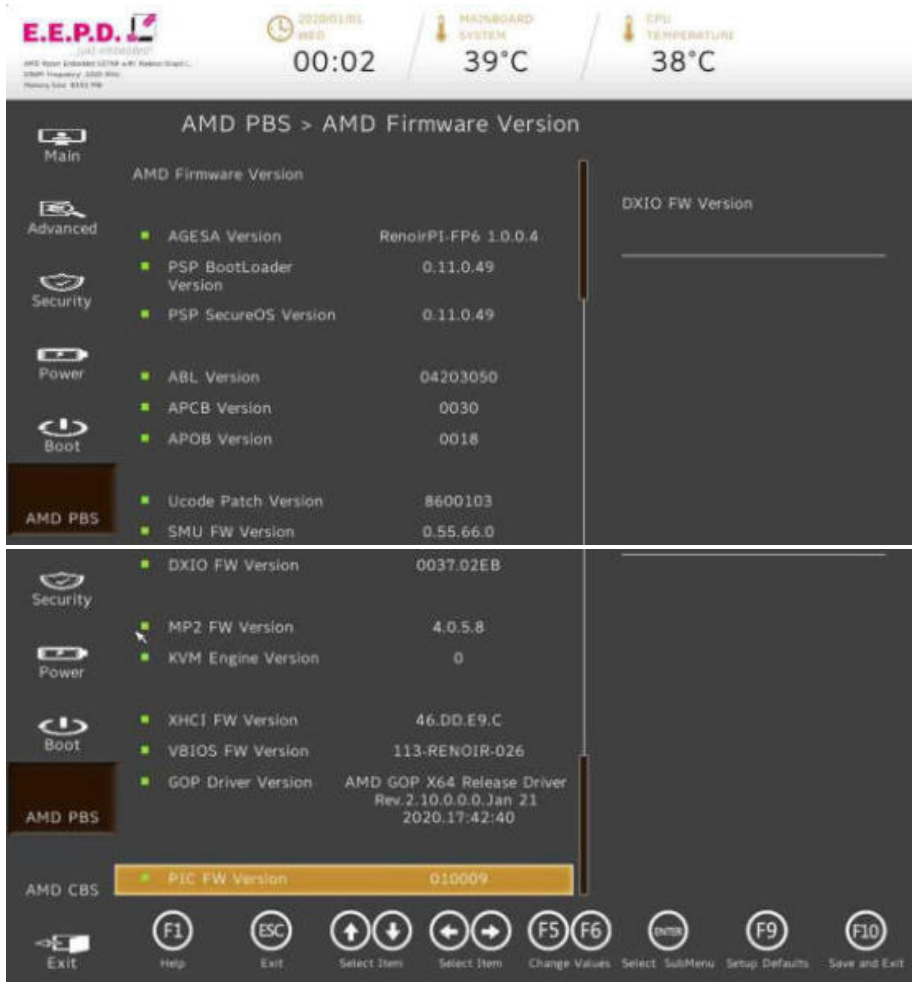


Fig. 49: AMD Firmware Version

6.9 AMD CBS Menu

Fig. 50: AMD CBS Menu

BIOS Settings	Options	Description
CPU Common Options	See submenu	CPU Common Options
NBIO Common Options	See submenu	NBIO Common Options
FCH Common Options	See submenu	FCH Common Options

Tab. 27: AMD CBS Menu

6.9.1 CPU Common Options

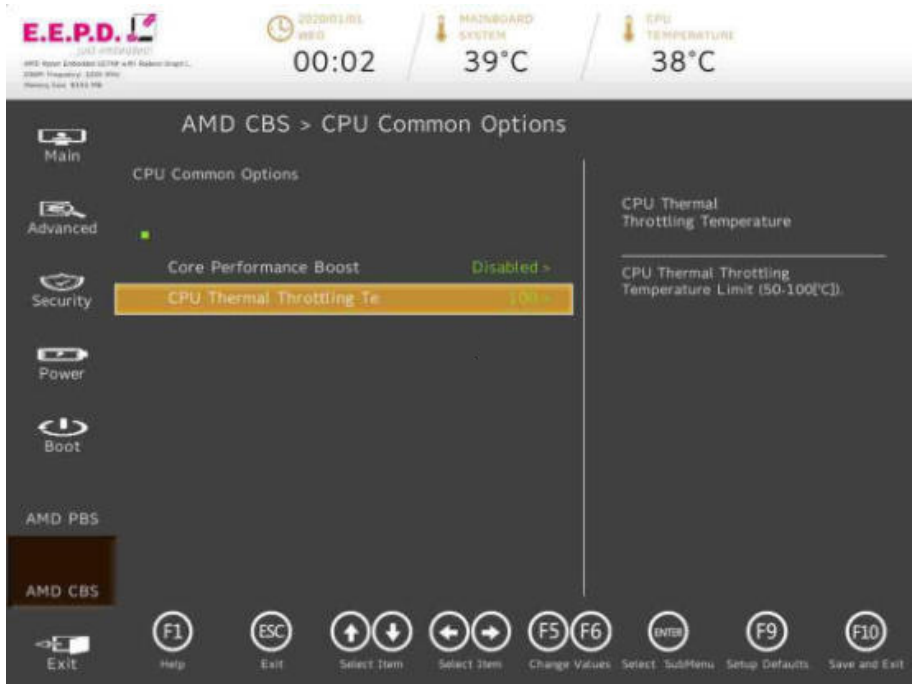


Fig. 51: CPU Common Options

BIOS Settings	Options	Description
Core Performance Boost	<Disabled>* <Auto>	This allows the processor to dynamically adjust and control the processor operating frequency to enable performance improvement.
CPU Thermal Throttling Temperature	Adjust value [50 - 100*]	CPU Thermal Throttling Temperature Limit (50-100[‘C])

Tab. 28: CPU Common Options

6.9.2 NBIO Common Options

Fig. 52: NBIO Common Options

BIOS Settings	Options	Description
GFX Configuration	See submenu	GFX Configuration
SMU Common Options	See submenu	SMU Common Options

Tab. 29: NBIO Common Options

6.9.2.1 GFX Configuration

Fig. 53: GFX Configuration

BIOS Settings	Options	Description
iGPU Configuration	<Auto>* <UMA_SPECIFIED> <UMA_AUTO> <UMA_GAME_OPTIMIZED>	UMA Mode Select UMA_SPECIFIED to set UMA Frame Buffer Size.
UMA Frame Buffer Size	<Auto> <64M> <128M> <256M> <384M> <512M> <80M> <96M> <768M> <1G> <2G>* <3G> <6G> <8G> <16G>	This allows the system to manage the amount of shared memory for graphics. For systems equipped with 8GB of RAM or more, set the UMA buffer size to 1GB or 2GB
UMA Version	<Legacy> <Non-Legacy> <Hybrid Secure> <Auto>*	UMA Legacy Version UMA Non-Legacy Version Hybrid Secure
GPU Host Translation Cache	<Disabled> <Enabled> <Auto>*	Option to disable GPU Host Translation Cache

Tab. 30: GFX Configuration

6.9.2.2 SMU Common Options

Fig. 54: SMU Common Options

BIOS Settings	Options	Description
CPU and Auxiliary Fan Control	See submenu	CPU and Auxiliary Fan Control
System Configuration	<10W – 54W POR Configuration> (depending on the system)	Warning: Select System Configuration may cause the system to hang, as some System Configuration may not be supported by your OPN.

Tab. 31: SMU Common Options

6.9.2.2.1 CPU and Auxiliary Fan Control

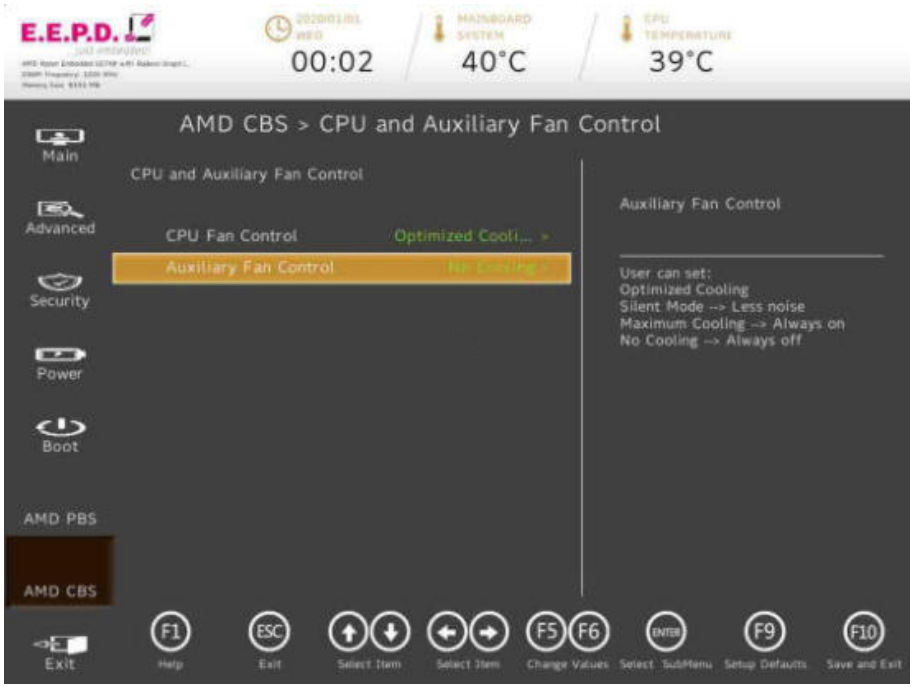


Fig. 55: CPU and Auxiliary Fan Control

BIOS Settings	Options	Description
CPU Fan Control	<Optimized Cooling>* <Silent Mode> <Maximum Cooling> <No Cooling>	Optimized Cooling → Automatic PWM control depending on temperature Silent Mode → Less noise (30%) Maximum Cooling → Always on (100%) No Cooling → Always off
Auxiliary Fan Control	<Optimized Cooling> <Silent Mode> <Maximum Cooling> <No Cooling>*	

Tab. 32: CPU and Auxiliary Fan Control

6.9.3 FCH Common Options

Fig. 56: FCH Common Options

BIOS Settings	Options	Description
Ac Power Loss Options	See submenu	Ac Power Loss Options

Tab. 33: FCH Common Options

6.9.3.1 Ac Power Loss Options

Fig. 57: Ac Power Loss Options

BIOS Settings	Options	Description
Ac Loss Control	<Always Off> <Always On>* <Previous>	This function allows you to set the power status after a power failure. Select [Always Off] to keep the system power off after a power failure. Select [Always On] to turn the system power after a power failure. Select [Previous] to allow the System to resume its last power state before a power failure.

Tab. 34: Ac Power Loss Options

6.10 Exit Menu

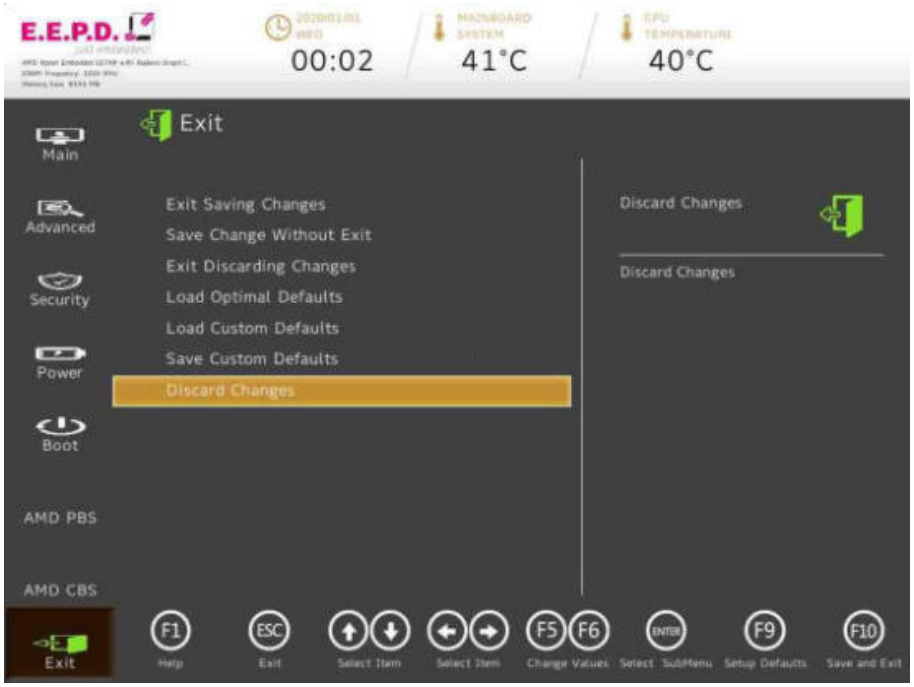


Fig. 58: Exit Menu

BIOS Settings	Options	Description
Exit Saving Changes		Exit system setup after saving your changes.
Save Change Without Exit		Save your changes without exiting system setup.
Exit Discarding Changes		Exit system setup without saving your changes.
Load Optimal Defaults		Load Optimal Defaults to all the setup options.
Load Custom Defaults		Load Custom Defaults to all the setup options.
Save Custom Defaults		Save changes done so far as Custom Defaults.
Discard Changes		Discard Changes done so far to any of the setup options.

Tab. 35: Exit Menu

Revision History

Date	Version	Changes	Proofed
17.05.2021	1.0	First release	
29.07.2021	1.1	BIOS Update and some corrections	
06.02.2025	5.0	Update to HW Rev.5	

Index of Figures

Index of Tables

List of Abbreviations

AC	Alternating current
APAC	Asia Pacific and countries
BIOS	Basic input/output system
BT	Bluetooth
DC	Direct current
DDR4	Fourth generation „double data rate“ memory technology
DP	Display port
EMEA	Europe, Middle East, Africa
GND	Ground
GNSS	Global Navigation Satellite System
IoT	Internet of Things
LTE	Long Term Evolution
MIC	Microphone
M.2	Next generation mSATA
NVME	Non-Volatile Memory Express
OCP	Over Current Protection
PWM	Pulse-width modulation
RAM	Random access memory
RS-232	Serial standard interface
RS-485	Serial standard interface
SD	Secure digital memory card
SIM	Subscriber identity module
SMA	Subminiature version A connector
SODIMM	Small outline dual inline memory module
SSD	Solid state drive
UART	Universal Asynchronous Receiver / Transmitter
USB	Universal serial bus
WLAN	Wireless local area network
WWAN	Wireless wide area network

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