EMX-MTLP

Onboard Meteor LakeU & H series Intel® BGA Processor (TDP: 15~28W) Thin Mini ITX motherboard

User's Manual

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Document Amendment History

Revision	Date	Ву	Comment
1 st	May 2025	Avalue	Initial Release

Declaration of Conformity

FC

This device complies with part 15 FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the FCC rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

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

CE statement

The product(s) described in this manual complies with all application European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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This manual is intended to be used as a practical and informative guide only and is subject

to change without notice. It does not represent a commitment on the part of Avalue. This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support and Assistance

1. Visit the Avalue website at https://www.avalue.com/ where you can find the latest information about the product.

2. Contact your distributor or our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

To receive the latest version of the user's manual; please visit our Web site at: www.avalue.com

Product Warranty (Returns & Warranties policy)

1. Purpose

Avalue establishes the following maintenance specifications and operation procedures for providing the best quality of service and shortened repair time to our customers.

2. Warranty

2.1 Warranty Period

Avalue endeavors to offer customers the most comprehensive post-sales services and protection; besides offering a 2-year warranty for standard Avalue products, an extended warranty service can also be provided based on additional request from the customer. Within the warranty period, customers are entitled to receive comprehensive and prompt repair and warranty.

Standard products manufactured by Avalue are offered a 2-year warranty, from the date of delivery from Avalue. For ODM/OEM products manufactured by Avalue or PCBA with conformal coating, will follow up the define warranty of the agreement, otherwise will be offered 1-year warranty for ODM/OEM products but non-warranty for PCBA with conformal coating. For outsourcing parts kit by Avalue (ex: Motherboard, LCD touch panel, CPU, RAM, HDD) are offered a 6-month warranty, and Mobile/Tablet PC battery are offered a warranty of the half year, from the date of delivery by Avalue. Products before the mass production stage, i.e. engineering samples are not applied in this warranty or service policy. For extended warranty and cross-territory services, product defects resulting from design, production process or material are covered by the pre-set warranty period after the date of delivery from Avalue. For non-Avalue products, the product warranty and repair time shall be based on the service standards provided by the original manufacturer; in principle Avalue will provide these products a warranty service for no more than one year.

2.2 Maintenance services within the warranty period

In the case of Avalue product DOA (Defect-on-Arrival) when the customer finds any defect within 1 month after the delivery, Avalue will replace it with a new product in a soonest way. Except for custom products, once the customer is approved of a Cross-Shipment Agreement, which allows for delivery a new product to the customer before receiving the defective one, Avalue will immediately proceed with new product replacement for the said DOA case. On validation of the confirmed defect, Avalue is entitled to reserve the right whether to provide a new product for replacement. For the returned defective new product, it is necessary to verify that there shall be no bruise, alteration, scratch or marking to the appearance, and that none of the delivered accessories missing; otherwise, the customer will be requested to pay a processing fee. On the other hand, if the new product defect is resulting from incorrect configuration or erroneous use by the user instead of any problem of the hardware itself, the customer will also be requested to pay for relevant handling fees.

As for other conditions, Avalue will handle defects by way of repair. The customer will be requested to send the defective product to an Avalue authorized service center, and Avalue will return the repaired product back to the customer as soon as possible.

2.3 Ruling of an out-of-warranty defect

The following situations are not included in the warranty:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident or other causes. Avalue reserves the right for the ruling of the aforementioned situations.
- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules of non-Avalue products and accessories shall be in accordance with standards set up by the original manufacturer. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiration of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number.
- Products before the mass production stage, i.e. engineering samples.

3. Procedure for sending for repair

3.1 Attain a RMA number

A customer's rejected product returned for repair shall have a RMA (Return Merchandise Authorization) number. Without a RMA number, Avalue will not provide any repair service for the rejected product, and the product will be returned to the customer at customer's cost. Avalue will not issue any notice for the return of the product.

Each returned product for repair shall have a RMA number, which is simply the authorization of the return for repair; it is not a guarantee that the returned goods can be repaired or replaced. For applying for a RMA number, the customer may enter the eRMA webpage of Avalue https://www.avalue.com/en/member and log-in with an account number and a password authorized by Avalue. The system will then automatically issue a RMA number.

When applying for the RMA number, it is essential to fill in basic information of the customer and the product, together with detailed description of the problem encountered. If possible, avoid using ambiguous words such as "does not work" or "problematic". Without a substantial description of the problem, it is hard to start the repair and will cause prolonged repair time. Lacking detailed statement of fault steps also makes the problem hard to be identified, sometimes resulting in second-time repairs. In case the customer can't define the cause of problem, please contact Avalue application engineers. Sometimes when the problem can be resolved even before the customer sends back the product.

On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

3.2 Return of faulty product for repair

It is recommended that the customer not to return the accessories (manual, connection cables, etc.) with the products for repair, devices such as CPU, DRAM, CF memory card, etc., shall also be removed from the faulty goods before return for repair. If these devices are relevant to described repair problems and necessary to be returned with the goods; please clearly indicate the items included in the eRMA application form. Avalue shall not be responsible for any item that is not itemized. Moreover, make sure the problem(s) are detailed in the "Problem Description" field.

In the list of delivery, the customer may fill-in a value which is lower than the actual value, to prevent customs levying a higher tax over the excessive value of the return goods. The customer shall be held responsible for extra fees caused by this. We strongly recommend that "Invoice for customs purpose only with no commercial value" be indicated on the delivery note. Also for the purpose of expedited handling, please printout the RMA number and put it in the carton, also indicate the number outside of the carton, with the recipient addressing to Avalue RMA Department.

When returning the defective product, please use an anti-static bag or ESD material to pack it properly. In case of improper packing resulting in damages in the transportation process, Avalue reserves the right to reject the un-repaired faulty good at the customer's costs. Furthermore, it is suggested that the faulty goods shall be sent via a door-to-door courier service. The customer shall be held responsible for any customs clearance fee or extra expenses if Air-Cargo is used for the delivery.

In case of a DOA situation of a new product, Avalue will be responsible for the product and the freight. If the faulty goods are within the warranty period, the sender will take responsibility for the freight. For an out-of-warranty case, the customer shall be responsible for the freight of both trips.

3.3 Maintenance Charge

Avalue will charge a moderate repair fee for the following conditions:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident

or other causes. Avalue reserves the right for the ruling of the aforementioned situations.

- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules for non-Avalue products and accessories shall be in accordance with standards set up by the original supplier. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiry of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number
- Products before the mass production stage, i.e. engineering samples.
- In case the products received are examined as NPF (No Problem Found) within the warranty period, the customer shall be responsible for the freight of both trips.
- Please contact your local distributor to examine in advance to prevent unnecessary freight cost.

For system failure of out-of-warranty products, Avalue will provide a quotation prior to repair service. When the customer applies for the cost, please refer to the Quotation number. In case the customer does not return the DOA product that has already been replaced by a new one, or the customer does not sign back the quotation of the out-of-warranty maintenance, Avalue reserves the right of whether or not to provide the repair service. In case the customer does not reply in 3 months, Avalue shall directly scrap or return the product back to customer at customer's cost without further notice to the customer.

3.4 Maintenance service of phased-out products

For servicing phased-out products, Avalue provides an extended period, starting the date of phase-out, as a guaranteed maintenance period of such products, for continuance of the maintenance service to meet customer's requirements. In case of unexpected factors causing Avalue to be unable to repair/replace a warranted but phased-out product, Avalue will, depending on the availability, upgrade the product (free of charge with continued warranty period as of the original product), or, give partial refund (based on the length of the remaining warranty period) to solve this kind of problem.

3.5 Maintenance Report

On completion of repair of a defective product, a Maintenance Report indicating the maintenance result and part(s) replaced (if any) will be sent to the customer together with the product. If the customer demands an additional maintenance analysis report, a service fee of various level will be charged depending on the warranty status. In case the analysis result shows that the defect attributes to Avalue's faulty design or process, the analysis fee will be exempted.

4. Service Products

Avalue provides service products to manage with different customer needs. Should you have any need, please consult to Avalue Sales Department.

Defect Analysis Report (DAR)

Avalue provides DAR (Defect Analysis Report) services aiming to elevating customer satisfaction. A DAR includes defect cause identification/verification/suggestion and improvement precautions, with instructions on correct usage for the avoidance of any reoccurrence.

Upgrade Service

Avalue is capable to provide system upgrade service for customization requirements. This upgrade service is applicable for main parts, such as CPU, memory, HDD, SSD, storage devices; also replacements motherboards of systems. Please contact Avalue sales for details to evaluate the possibility of system upgrade service and obtain information of lead time and price.

Safety Instructions

Safety Precautions

Before installing and using this device, please note the following precautions.

- 1. Read these safety instructions carefully.
- 2. Keep this User's Manual for future reference.
- 3. Disconnected this equipment from any AC outlet before cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.

7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

8. Use a power cord that has been approved for using with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to

avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel. If one of the following situations arises, get the equipment checked by service personnel:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it work according to the user's manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

14. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

15. Equipment intended only for use in a RESTRICTED ACCESS AREA.

Explanation of Graphical Symbols

Â	Warning	A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.
$\underline{\mathbb{V}}$	Caution	A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.
L	Note	A NOTE provides additional information intended to avoid inconveniences during operation.
DC		Direct current.
		Alternating current
Ċ		Stand-by, Power on
FC		FCC Certification
CE		CE Certification
		Follow the national requirements for disposal of equipment.
3		Stacking layer limit
		This side up

	Fragile Packaging
Ť	Beware of water damage, moisture-proof
	Carton recyclable
	Handle with care
	Follow operating instructions of consult instructions for use.

Disposing of your old product

WARNING:

There is danger of explosion if the battery is mishandled or incorretly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or ther liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

CAUTION:

- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.

- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION

- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.

- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

Mise en garde!

AVERTISSEMENT : Il existe un risque d'explosion si la batterie est mal manipulée ou remplacée de manière incorrecte. Remplacez uniquement par le même type de batterie. Ne le démontez pas et ne tentez pas de le recharger en dehors du système. Ne pas écraser, percer, jeter au feu, court-circuiter les contacts externes ou exposer à l'eau ou à d'autres liquides. Jetez la batterie conformément aux réglementations locales et aux instructions de votre fournisseur de services.

MISE EN GARDE:

- Pile au lithium Attention : Danger d'explosion si la pile n'est pas remplacée correctement. Remplacer uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.

- L'élimination d'une BATTERIE dans le feu ou dans un four chaud, ou l'écrasement ou le découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION

- Laisser une BATTERIE dans un environnement à température extrêmement élevée pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

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1. Getting Started

1.1 Safety Precautions

Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before installation, please ensure all the items listed in the following table are included in the package.

ltem	Description	Q'ty
1	EMX-MTLP motherboard	1
2	SATA cable	1
3	SATA power cable	1
4	I/O shield	1
5	Heatsink (only for 125U/15W SKU)	1
6	Graphite Radiator Film (only for 125U/15W SKU)	2

Note:

Before using the motherboard power, ensure the power pinout, cables, and voltage match to avoid equipment damage.



If any of the above items is damaged or missing, contact your retailer.

1.3 Manual Objectives

This manual describes in details Avalue Technology EMX-MTLP Single Board.

We have tried to include as much information as possible, but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up EMX-MTLP or change the standard configurations. Whilst all the necessary information is available in this manual, we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.4 System Specifications

System			
0.511	Onboard Meteor Lake-U & H series Intel® BGA Processor (TDP: 15~28W)		
CPU	H-Series: 28W, U-Series: 15W		
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM		
I/O Chip	EC-ITE: IT5782VG		
System Memory	Two 262-pin DDR5 up to 5600MHz SO-DIMM socket, supports up to 64GB Max		
Watchdog Timer	H/W Reset, 1sec. – 65535sec./min.1sec. or 1min. step		
H/W Status	CPU temperature monitoring		
Monitor	Voltage monitoring		
WONTO	CPU fan speed control		
	Intel® VMD RAID 0/1		
RAID	**supported by identical interface (PCIe or SATA)		
KAID	PCIe interface: 2 x M.2 Key M		
	SATA interface: 2 x SATA port		
ТРМ	Onboard NuvoTon NPCT760AABYX (7.2.3.1) support SPI TPM 2.0		
iAMT	Yes		
Expansion Slot			
	1 x M.2 Key-B 2242/3042/3052 with USB3.2 Gen1x1 (from USB Hub IC), PCIe x1		
	Signal, Nano SIM card slot for LTE/IO Cards support WWAN+GNSS or PCIe x1 SSD,		
	and USB2.0.		
	* Only supports one SIM card		
MO	* Does not support I2S and PCM functions		
M.2	* Only supports one SIM card (co-lay 1 x 10pin FPC connector for uSIM card adapter)		
	* 1 x 1 x 3 pin, pitch 2.00mm connector for M.2 module card 3.3V and 3.8V selection		
	(Jumper default: 1-2 for 3.3V)		
	1 x M.2 Key E 2230 support Wi-Fi module and (1 x PCIe x1 & USB 2.0 Signal)		
	2 x M.2 Key M 2280 (PCIe x4) slot for storage NVMe SSD		
PCle	1 x PCle x4 Gen4 slot with PClex8 slot		
Storage			
M.2	2 x M.2 Key M 2280 (PCIe x4) slot for storage NVMe SSD		
SATA	2 x SATA III		
Edge I/O			
LAN	1 x Intel® i226-LM 2.5 Gigabit Ethernet Controller		
	U -		

	1 x Intel® i226-V 2.5 Gigabit Ethernet Controller
	1 x USB Type C on rear I/O, 5V@3A, support USB3.2 Gen2x2 (20G), no PCIe signal.
USB	2 x USB3.2 Gen2 Type A, +5VSB/0.9A
	2 x USB3.2 Gen1 on rear I/O (from USB Hub IC)
DP	2 x DP (1 from DP connector, 1 from Type C)
HDMI	2 x HDMI2.0
Audio	Line-out & Mic-in
DC Input	Screw type DC in connector
Onboard I/O	
	COM 1:
	COM 1 support RS- RS232/422/485 connector, with / RI & +5V & +12V Supported
	and RS422/485 by BIOS setting.
	2 x 5 pin, pitch 2.00mm connector for COM1: support RS-232 connector (JCOM1)
	2 x 3 pin, pitch 2.00mm header for COM1: support RS-232 connector, Pin 9 with / RI
	& +5V & +12V Supported (JCOM1_PW) Max: 1A
	2 x 3 pin, pitch 2.00mm pin header for COM1: support RS422/485 connector, Pin 5
СОМ	with / +5V Supported. (J485-1)
	Max: 1A
	COM2:
	2 x 5 pin, pitch 2.00mm pin header for COM2 support RS-232 connector (JCOM2)
	COM3 to 6:
	2 x 20 pin, pitch 2.00mm pin header for COM3~6: support RS-232 connector
	(JCOM3_6)
USB	3 x 2 x 5 pin, pitch 2.54mm connector for 6 USB 2.0, +5VSB/0.5A (each port)
CRIO	2 x 10 pin, pitch 2.00mm pin header for 16-bit GPIO, +3.3S level SMBUS (JDIO1)
GPIO	(Max. 1A output)
SATA Power	1 x 4 pin, pitch 2.54mm Wafer for 5/12V Power SATA Power,1A
CPU/System	1 x 4 pin, pitch 2.54mm Wafer for CPU fan connector with smart fan function
FAN	supported
TAN	1 x 3 pin, pitch 2.54mm Wafer for System fan connector
Buzzer	Onboard BUZZER 5V 85dB SMD
Front Panel	2 x 5 pin, pitch 2.54mm pin header for Front panel
RTC Battery	1 x 2 pin, pitch 1.25mm Wafer horizontal type connector for CR2450
AT/ATX	1 x 3 pin, pitch 2.54mm pin header for AT/ATX jumper (JAT1)
Selector	
Clear CMOS	1 x 3 pin, pitch 2.00mm pin header for CMOS clear (JCMOS1)
LVDS	2 x 20 pin, pitch 1.25mm Wafer connector for LVDS (JLVDS1)
	2 x 10 pin, pitch 1.25mm Wafer connector for eDP (JEDP1)
LCD Backlight	1 x 3 pin, pitch 2.00mm Wafer connector LCD backlight brightness adjustment

Brightness	(PWM/DC) (Jumper default: 1-2 for PWM) (JBLS1)				
LCD Inverter	2 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter backlight connector				
	(JBL1 for LVDS ; JBL2 for eDP)				
BIOS SPI	2 x	4 pin, pitch 2.00mm	pin header for BIOS S	SPI (JBIOS1)	
eSPI	2 x	2 x 6 pin, pitch 2.00mm connector for eSPI debug (JESPI1)			
EC Debug	1 x	3 pin, pitch 2.00mm	connector for EC inte	rnal flash (JEC_1)
Audio	2 x	6 Pin, pitch 2.54mm	(black color pin head	er for MIT)	
DC-Input	DC	in +12V~24V (screv	v type)		
Amp Connector	1 x	4 pin, pitch wafer 2.	00mm connector for 6	W x 2 Speaker (SP	K1)
Other	2 x	4 pin, pitch 2.00mm	pin header for LAN A	ctivity Indicator LEE	D (JLAN_LED1)
Other	8~9)mA			
Display					
Graphic	Into	No I PC Craphics			
Chipset		el® Xe LPG Graphics	,		
	2 x	HDMI 2.0: 3840 x 2	160@60 Hz(based on	DQV actual test da	ated 2024/9/13)
	1 x	DP1.4a: Max: 7680	x 4320@30 Hz		
Spec. &	1 X	USB Type C suppo	rts 3840 x 2160@60H	z based on actual t	est.
Resolution			-		
	LVDS: 1920 x 1080 Dual channel 18/24-bits LVDS (Chrontel CH7511B eDP to LVDS)				
		,	04@60 H -		
Multiple Display		P1.2: Max 4096 x 23	Display: 2 x HDMI, D		
Multiple Display Audio	Qua		. Display. 2 X HDIVII, D	P, Type-C, LVDS, 0	eDP
Audio Codec	Rea	altek ALC888S audic			
Addio Codec			ereo Class-D 6W x 2 A	udio Amplifier	
Ethernet					
	1 1	Intal® :226 M 2 5 (Pigebit Ethernet Centr	allar	
LAN Chipset			Gigabit Ethernet Control		
			gabit Ethernet Control		
LAN Spec.	10/	TOU/ TOUD Dase-TX G	BbE compatible & 2.5 (Max. 1G LA	-	
			/LINK		ED
		LED	Definition	LED	Definition
		Light Off	No Link	Solid Orange	1G
LED Indicator		Solid Yellow	Connection	Solid Green	100M
	Yellow Flashing Activity Light Off 10M				
	Max. 2.5G LAN Port				
		ACT	/LINK	SPEED	
			Definition	LED	Definition
		Light Off	No Link	Solid Orange	2.5G

		Solid Yellow	Connection	Solid Green	1G/100M		
		Yellow Flashing	Activity	Light Off	10M		
Mechanical &							
Environmental							
Specification							
Power Requirement	DC	in +12V ~ +24V					
	Sin	Single power ATX Support S0, S4, S5					
ACPI	ACPI 5.0 Compliant						
Power Mode			able Through Jumper				
	•	15W CPU SKU su	- .				
Operating	•	28W CPU SKU su	ıpport: 0~50°C, heatsir	nk with FAN integra	ated		
Temp.	w/	HDD & SSD, ambier	nt with 0.5 m/s Air flow	-			
Storage Temp.	-40	~ +75°C					
Operating Humidity	40°	40°C @ 95% Relative Humidity, Non-condensing					
Size (L x W)	6.7	6.7" x 6.7" (170mm x 170mm)					
Weight	•	15W: 510g (shipp	ing with heatsink)				
Weight	•	• 28W: 273g (shipping w/o cooler)					
	Pad	ckage Vibration Test	•				
	Reference IEC60068-2-64 Testing procedures						
	Test Fh: Vibration broadband random Test						
	1. PSD: 0.026G²/Hz, 2.16 Grms						
	2. Non-operation mode						
	3. Test Frequency: 5-500Hz						
	4. Test Axis: X,Y and Z axis						
	5. 30 min. per each axis						
	6. I	6. IEC 60068-2-64 Test:Fh					
Vibration Test							
	Random Vibration Operation						
	Reference IEC60068-2-64 Testing procedures						
	Test Fh : Vibration broadband random Test						
	1. PSD: 0.00454G²/Hz, 1.5 Grms						
	2. (Operation mode					
	3. Test Frequency : 5-500Hz						
	4. Test Axis : X,Y and Z axis						
	5. 30 minutes per each axis						
	6. I	EC 60068-2-64 Test	::Fh				

	Random Vibration Non Operation	
	Reference IEC60068-2-64 Testing procedures	
	Test Fh : Vibration broadband random Test	
	1. PSD: 0.01818G²/Hz, 3.0 Grms	
	2. Non Operation mode	
	3. Test Frequency : 5-500Hz	
	4. Test Axis : X,Y and Z axis	
	5. 30 minutes per each axis	
	6. IEC 60068-2-64 Test:Fh	
	Packing Drop	
	Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed	
Drop Test	Drop Test	
	1 One corner , three edges, six faces	
	2 ISTA 2A, IEC-60068-2-32 Test:Ed	
	Win11 64bit	
OS Information	Linux	



Note: Specifications are subject to change without notice.

1.5 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of EMX-MTLP.



2. Hardware Configuration

EMX-MTLP User's Manual 2.1 Product Overview



2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:

0 0		1 2 3 O
Open	Closed	Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Jumpers		
Label	Function	Note
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.00mm
JAT1	AT/ATX Power Mode Select	3 x 1 header, pitch 2.54mm
JM2BP1	M.2 KeyB power selector	3 x 1 header, pitch 2.00mm
JCOM1_PW1	COM1 pin9 signal selector	3 x 2 header, pitch 2.00mm
JBLS1	LVDS Backlight Power Select	3 x 1 header, pitch 2.00mm

The following tables list the function of each of the board's jumpers and connectors.

Connectors		
Label	Function	Note
JBL1	LVDS Backlight connector	5 x 1 wafer, pitch 2.00mm
JBL2	eDP Backlight connector	–Note: Matching connector: JST PHR-5
SODIMM1/2	2x 260-pin DDR5 5600MTs SO-DIMM	

	, manaan	
	Socket Supports Up to 64GB	
JFAN1	CPU fan connector	4 x 1 wafer, pitch 2.54mm
JSPWR1	SATA Power connector	4 x 1 wafer, pitch 2.54mm
JFAN2	System fan connector	3 x 1 wafer, pitch 2.54mm
SPK1	Amplifier Wafer	4 x 1 wafer, pitch 2.00mm
JESPI1	ESPI Debug Header	6 x 2 header, pitch 2.00mm
BT1	RTC Battery connector	2 x 1 wafer, pitch 1.25mm
JCOM1	Serial port 1 connector	5 x 2 header, pitch 2.00mm
JCOM2	Serial port 2 connector	5 x 2 header, pitch 2.00mm
JCOM3_1	Serial port 3~6 connector	20 x 2 header, pitch 2.00mm
JPWR2	4pin ATX Power connector	2 x 2 wafer, pitch 4.20mm
J485-1	Serial Port 1 RS485/422 Mode connector	3 x 2 header, pitch 2.00mm
JUSB1/2/3	USB2.0 connector 1/2/3	5 x 2 header, pitch 2.54mm
JFAUD1	Front Audio connector	6 x 2 header, pitch 2.54mm
JPD1	JPD connector	4 x 2 header, pitch 2.00mm
JLAN_LED1	LAN Active Indicator LED connector	4 x 2 header, pitch 2.00mm
JFP1	Front Panel connector	5 x 2 header, pitch 2.54mm
JBIOS	BIOS SPI connector	4 x 2 header, pitch 2.00mm
JEC_1	EC_Program	3 x 1 header, pitch 2.00mm
JDIO1	General purpose I/O connector	10 x 2 header, pitch 2.00mm
JLVDS1	LVDS connector	20 x 2 wafer, pitch 1.25mm Note: Matching connector: Hirose DF-40DS-1.25C
JEDP1	eDP connector	10 x 2 wafer, pitch 1.25mm Note: Matching connector: Hirose DF-20DS-1.25C
M2KM1	M.2 2280 TYPE M Slot	
M2KM2	M.2 2280 TYPE M Slot	
M2KB1	M.2 2242/3042/3052 Type B Slot	
M2KE1	M.2 2230 Type E Slot	
JSATA1/2	Serial ATA connector 1/2	
PCIE1	PClex8 connector (for PClex4 signal)	
DCIN1	12~24V Power connector	
DP1	DP connector	

TYPEC1	For DP and USB3.2 Gen2x2, 5V@3A
HDMI1	HDMI connector
USB1/2	USB3.2 connector 1/2
LAN1/2	2 x RJ-45 Ethernet
LOUT1	Line-out audio jack
MIC1	Mic-in audio jack

2.3 Setting Jumpers & Connectors

2.3.1 Clear CMOS (JCMOS1)



* Default

2.3.2 AT/ATX Power Mode Select (JAT1)



* Default

Normal*



Clear CMOS









M.2 KeyB power selector (JM2BP1) 2.3.3



3.38V

1	3

* Default

COM1 pin9 signal selector (JCOM1_PW1) 2.3.4



* Default

RI*

1	5



+12V

1	5

+	5	V

1	5

2.3.5 LVDS Backlight Power Select (JBLS1)







* Default

2.3.6 LVDS Backlight connector (JBL1)





Signal	PIN
+5V	5
LVDS_BKLADJ	4
LVDS_BKLTEN	3
GND	2
+12V	1

. Su 0 • \bigcirc , i 1 Ð 0 Γ ş;; <u>.....</u> းဝိုး

eDP Backlight connector (JBL2)

2.3.7



Signal	PIN
+5V	5
EDP_BKLADJ	4
EDP_RT_BKLTEN	3
GND	2
+12V	1

2.3.8 CPU fan connector (JFAN1)





Signal	PIN
PWM	4
TACH	3
+12V	2
GND	1



2.3.9 System fan connector (JFAN2)

3		1
	•	

Signal	PIN
GND	1
+12V	2
TACH	3

2.3.10 SATA Power connector (JSPWR1)





Signal	PIN
+5V	1
GND	2
GND	3
+12V	4

2.3.11 Amplifier Wafer (SPK1)





Signal	PIN
RSPK-	4
RSPK+	3
LSPK-	2
LSPK+	1

2.3.12 ESPI Debug Header (JESPI1)



	11
	1

Signal	PIN	PIN	Signal
ESPI_ALERT1#	12	11	ESPI_RST#
GND	10	9	ESPI_CS1#
ESPI_CLK_80P	8	7	ESPI_IO3_80P
ESPI_CS#	6	5	ESPI_IO2_80P
PLT_RST#_BUF	4	3	ESPI_IO1_80P
+3.3V	2	1	ESPI_IO0_80P

2.3.13 Serial port 1 connector (JCOM1)



Note: Pin9 can be selected by jumper (JCOM1_PW1) to RI / +5V / +12V

	9
	1
	0 0 0 0

Signal	PIN	PIN	Signal
NC	10	9	RI#
CTS#	8	7	RTS#
DSR#	6	5	GND
DTR#	4	3	TXD
RXD	2	1	DCD#

2.3.14 Serial port 2 connector (JCOM2)



	9
	1

Signal	PIN	PIN	Signal
NC	10	9	RI#
CTS#	8	7	RTS#
DSR#	6	5	GND
DTR#	4	3	TXD
RXD	2	1	DCD#
User's Manual

2.3.15 Serial port 3~6 connecto	or (JCOM3_1)
---------------------------------	--------------

	39
	1



Signal	PIN	PIN	Signal
NC	40	39	RI6#
CTS6#	38	37	RTS6#
DSR6#	36	35	GND
DTR6#	34	33	TXD6
RXD6	32	31	DCD6#
NC	30	29	RI5#
CTS5#	28	27	RTS5#
DSR5#	26	25	GND
DTR5#	24	23	TXD5
RXD5	22	21	DCD5#
NC	20	19	RI4#
CTS4#	18	17	RTS4#
DSR4#	16	15	GND
DTR4#	14	13	TXD4
RXD4	12	11	DCD4#
NC	10	9	RI3#
CTS3#	8	7	RTS3#
DSR3#	6	5	GND
DTR3#	4	3	TXD3
RXD3	2	1	DCD3#

2.3.16 RTC Battery connector (BT1)





Signal	PIN
+VDD_RTC	1
GND	2

2.3.17 4pin ATX Power connector (JPWR2)





Signal	PIN	PIN	Signal
GND	2	4	+V12-24_DCIN
GND	1	3	+V12-24_DCIN

2.3.18 Serial Port 1 RS485/422 Mode connector (J485-1)



	5
	1

Signal	PIN	PIN	Signal
GND	6	5	+5V
422RX-	4	3	422RX+
485TX+	2	1	485TX-

User's Manual

2.3.19 USB2.0 connector (JUSB1)



1	
7	

Signal	PIN	PIN	Signal
+5V	1	2	+5V
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
		10	NC

2.3.20 USB2.0 connector (JUSB2)



1	
7	

Signal	PIN	PIN	Signal
+5V	1	2	+5V
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
		10	NC

2.3.21 USB2.0 connector (JUSB3)



1	
7	

Signal	PIN	PIN	Signal
+5V	1	2	+5V
DATA-	3	4	DATA-
DATA+	5	6	DATA+
GND	7	8	GND
		10	NC

2.3.22 Front Audio connector (JFAUD1)



1			11

Signal	PIN	PIN	Signal
FRONT_RIN	1	2	FRONT_LIN
GND	3	4	GND
LINE2_R	5	6	LINE2_L
MIC2_R	7	8	MIC2_L
AMP_DIS_JD	9	10	LINE2_JD
MIC2_JD	11	12	GND

User's Manual

2.3.23 JPD connector (JPD1)



1	
7	

Signal	PIN	PIN	Signal
X_LDO_3V3	1	2	X_SML1_CLK_R
X_EEPROM_I2C_SCL	3	4	X_SML1_DAT_R
X_EEPROM_I2C_SDA	5	6	X_PMCALERT#_R
GND	7	8	GND

2.3.24 LAN Active Indicator LED connector (JLAN_LED1)



1		7

Signal	PIN	PIN	Signal
FRONT_LAN1_ACT	1	2	FRONT_LAN1_LINK100_1000#
GND	3	4	FRONT_LAN1_LINK2500#
FRONT_LAN2_ACT	5	6	FRONT_LAN2_LINK100_1000#
GND	7	8	FRONT_LAN2_LINK2500#

EMX-MTLP User's Manual 2.3.25 Front Panel connector (JFP1)





Function	Signal	PIN	PIN	Signal	Function
HDD	HDD_LED+	1	2	PWR_LED+	Power
LED	HDD_LED-	3	4	PWR_LED-	LED
Reset	SYS_RST#	5	6	PWRBTN#	Power
button	GND	7	8	GND	button
	NC	9			

2.3.26 eDP connector (JEDP1)





Signal	PIN	PIN	Signal
VCC_PAL	19	20	VCC_PAL
TXP2	17	18	HPD
TXN2	15	16	GND
GND	13	14	AUXP
TXP1	11	12	AUXN
TXN1	9	10	GND
GND	7	8	NC
TXP0	5	6	TXP3
TXN0	3	4	TXN3
GND	1	2	GND

2.3.27 LVDS connector (JLVDS1)





Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
+5V	6	5	+3.3V
GND	8	7	GND
DATAP0	10	9	DATAP1
DATAN0	12	11	DATAN1
GND	14	13	GND
DATAP2	16	15	DATAP3
DATAN2	18	17	DATAN3
GND	20	19	GND
DATAP4	22	21	DATAP5
DATAN4	24	23	DATAN5
GND	26	25	GND
DATAP6	28	27	DATAP7
DATAN6	30	29	DATAN7
GND	32	31	GND
CLK1P	34	33	CLK2P
CLK1N	36	35	CLK2N
GND	38	37	GND
+12V	40	39	+12V

2.3.28 EC_Program (JEC_1)



	1

PIN	Signal
3	GND
2	EC_SMCLK_DEBUG
1	EC_SMDAT_DEBUG

2.3.29 General purpose I/O connector (JDIO1)



1					19

Signal	PIN	PIN	Signal
DI0	1	2	DO0
DI1	3	4	DO1
DI2	5	6	DO2
DI3	7	8	DO3
DI4	9	10	DO4
DI5	11	12	DO5
DI6	13	14	DO6
DI7	15	16	DO7
5V_SMB_CLK	17	18	5V_SMB_DATA
GND	19	20	+5V

2.3.30 BIOS SPI connector (JBIOS1)



1		7

Signal	PIN	PIN	Signal
+1.8V	1	2	GND
SPI_ROM_CS#	3	4	SPI_ROM_CLK
SPI_ROM_MISO	5	6	SPI_ROM_MOSI
SPI_HOLD#	7	8	SPI_WP#

3. Drivers Installation

All the drivers are available on Avalue Downloads Area (<u>https://www.avalue.com/en/support/download</u>). Type the model name and press Enter to find all the relevant software, utilities, and documentation.

Chips	set			Total 1 Fi
No.	Release Date	Title, Description	Operating System	Downlo
01	2025-05-09	Intel MTL Chipset driver 10.1.19627.8423 Intel MTL Chipset driver 10.1.19627.8423	Windows 11 64bit	
Audio) Release Date	Title, Description	Operating System	Total 2 Fi Downlo
01	2025-05-09	Realtek Audio Driver 9721.1 Realtek Audio Driver 9721.1	Windows 11 64bit	
02	2025-05-09	Intel(R)_SST_MTL_v20.40.10915.2 Intel(R)_SST_MTL_v20.40.10915.2	Windows 11 64bit	
		(For reference only	')	

Note: Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.



Step 3. Click Install.



Intel(R) Chipset Device Software Completion	intel
You have successfully installed the following product:	
Intel(R) Chipset Device Software	
Press Finish to complete the setup process.	
	Finish

Step1. Click Next.



Step 2. Click Accept.

Step 4. Click Finish to complete setup.

3.2 Install VGA Driver

All drivers can be found on the Avalue

Official Website:

www.avalue.com.



Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.

intel. _G	aphics Driver Installer	^
Pre-Install	The installer will install the following components: - Intel® Graphics Driver - Intel® Graphics Command Center	
Setup		
Install		
Done!	Execute a clean installation A clean installation removes all old drivers and restores Intel settings to the default value	
	(Back Start)	

Step 3. Click Accept.



Step1. Click Begin installation.



Step 2. Click I agree.

intel. Grap	hics Driver Installer	
Pre-Install	Installing new graphics driver	
Setup	Show details	
Install		
Done!		

Step 4.

intel. Grap	bhics Driver Installer 11.0916.7	×
Pre-Install	Installation complete!	
—— Setup	You need to restart your system in order to apply the driver changes.	
Install		
Done!	Show.details	
	Finish Reboot	Required

Step 5. Click Finish to complete setup.

3.3 Install ME Driver		
All drivers can be found on the Avalue	Setup	×
Official Website:	Intel® Management Engine Component Destination Folder	s (intel)
www.avalue.com. Note: The installation procedures an screen shots in this section are based on Windows 11 operation system.	Click Next to install to the default folder, or click Char C:\Program Files (x86)\Intel\Intel(R) Management E	
Setup Intel® Management Engine Components Welcome You are about to install the following product: Intel® Management Engine Components 2420.6.16.0 It is strongly recommended that you exit all programs before continuing.	Intel Corporation Step 3. Click Next. Setup Intel® Management Engine Component Progress Please wait while the product is being installed.	< Back Next > Cancel
Click Next to continue, or click Cancel to exit the setup program.	Cancel Intel Corporation	<back next=""> Cancel</back>
Stand Click Next to continue installati	Califer	

Step 4.

×



Step 5. Click Finish to complete setup.

Step1. Click Next to continue installation.



Step 2. Click Next.

3.4 Install Audio Driver

All drivers can be found on the Avalue Official Website:

emolar website.

www.avalue.com.



Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.

The the	tallShield Wizard Complete InstallShield Wizard has successfully installed Realtek Audio Driver. Before you can use program, you must restart your computer.
	anglani, foa nazerestare foar comparen —
	res, I want to restart my computer now. No, I will restart my computer later. Iove any disks from their drives, and then click Finish to complete setup.
InstallShield	

Step 3. Click Finish to complete setup.



Step1. Click Next.



Step 2.





Step 2. Click Next.

Setup
Intel® Serial IO
Progress
Please wait while the product is being installed.

Cancel

< Back

Next >



Intel Corporation



Step 6. Click Finish to complete setup.

3.6 Install Ethernet Driver

All drivers can be found on the Avalue

Official Website:

www.avalue.com.



Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.



Step 3. Click Close.

Intel® Network Connections		×
intel. Network C	onnections	
		s
	Install Drivers	1
	View User Guides	
	View Release Notes	
Networking at Intel.com		Version: 28.2.0.0

Step1. Click **Install Drivers** to continue installation.

Installing Drivers			
Install or update drivers	s for Intel® Network Con	nections.	
	ОК	Cancel	

Step 2. Click OK.

All drivers can be found on the Avalue			×
Official Website:	\leftarrow	Update Drivers - HD Audio Driver for Display Audio	
www.avalue.com		How do you want to search for drivers?	
Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.		 → Search automatically for drivers Windows will search your computer for the best available driver and install it on your device. → Browse my computer for drivers Locate and install a driver manually. 	
			Cancel

×

-

Step 3. Click Browes my computer for drivers.

 action
 Yiew
 bit

 Image: Distribution
 Audio Driver for Display Audio

 Image: Distribution
 State of Display Audio

 Image: Distribution
 Audio Driver for Display Audio

 Image: Distribution
 Distribution

 Image: Distri Eile Action View Help

Step1. Click High Definition Audio Controller.

🛃 Device Manager



Step 2. Click Action Update driver.



Step 4. Click Next.

>	GPIO_Tool
>	Graphic driver
>	i225_i226
	Intel Power and Thermal Analysis Tool 0
~	Intel Smart Sound Technology(ISST)
	iSST-Win10 Win11-10.29.00.8467
	Drivers
<	>



on Audio Controller	Update Drivers - High Def
	Installing drivers

×

Step 6.



Step 7. Click Close to complete setup.

3.8 Install Intel@NPU Driver

All drivers can be found on the Avalue Official Website:

www.avalue.com.



Note: The installation procedures and screen shots in this section are based on Windows 11 operation system.

¢	Update Drivers - PCI Device	×
	How do you want to search for drivers?	
	→ Search automatically for drivers Windows will search your computer for the best available driver and install it on your device.	
	→ Browse my computer for drivers Locate and install a driver manually.	
		Cancel

Step 2.



Step1. Click PCI Device.



Step 3.



Step 4. Click OK.



Step 5. Click Close to complete setup.

User's Manual



4.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

4.2 Starting Setup

AMI BIOS[™] is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <ESC> or immediately after switching the system on, or

By pressing the < ESC> or key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <ESC> or to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

4.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
1	Move to previous item
\downarrow	Move to next item
<i>←</i>	Move to the item in the left hand
\rightarrow	Move to the item in the right hand
Esc key	Main Menu Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values
F3 key	Optimized defaults
F4 key	Save & Exit Setup

• Navigating Through The Menu Bar

Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

• To Display a Sub Menu

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A " \geq " pointer marks all sub menus.

4.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the <Enter> key again.

4.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

4.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

4.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.

Main Advanced Security Boot	Aptio Setup – AMI Save & Exit MEBx	
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level EC 5782 Firmware AT Jumper BIOS Name System Language	American Megatrends 5.32 UEFI 2.9; PI 1.7 9AAMA 1.00 X64 05/16/2025 13:52:12 Administrator 06 AT EMXMTLOD [English]	Choose the system default language
▶ Intel RC Version System Date System Time	[Fri 05/16/2025] [15:17:55]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Versi	ion 2.22.1293 Copyright (C) 202	25 AMI
Main	Aptio Setup – AMI	
Intel RC Version		
Board Information Board Name	EMX-MTLP(EMXMTLOD)	
Processor Information Name Type Speed ID Stepping Package Number of Efficient-core(s) Number of Efficient-core(s) Number of Performance-core(s) Number of Low Power E-core(s) Microcode Revision GT Info IGFX GOP Version Memory RC Version Total Memory Memory Frequency PCH Information	MeteorLake ULT Intel(R) Core(TM) Ultra 5 125U 1300 MHz 0xA06A4 C0 Not Implemented Yet 8Core(s) / 8Thread(s) 2Core(s) / 4Thread(s) 2Core(s) / 2Thread(s) 25 0x7D45 22.0.1063 1.5.4.0 8192 MB 4800 MHz	<pre>+*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

4.6.1.1 System Date

Use the system date option to set the system date. Manually enter the Month, day and year.

4.6.1.2 System Time

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



Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen. Visit the Avalue website (<u>www.avalue.com</u>) to download the latest product and BIOS information.

4.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

A; Main Advanced Security Boot Save &	otio Setup - AMI Exit MEBx
 Connectivity Configuration CPU Configuration Power & Performance System Agent (SA) Configuration PCIE Configuration PCH-IO Configuration PCH-FW Configuration Trusted Computing ACPI Settings Board & Panel Configuration EC 5782 HW monitor SS RTC Wake Settings Serial Port Console Redirection USB Configuration Network Stack Configuration NVMe Configuration 	Configure Connectivity related options ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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4.6.2.1 Connectivity Configuration

Advanced	Aptio Setup — AMI	
CNVi CRF Present CNVi Configuration CNVi Mode	No [Auto Detection]	This option configures Connectivity. [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVI) will be enabled; [Disable Integrated] disables Integrated Solution. NOTE: When CNVI is present, **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vers	ion 2.22.1293 Copyright (C)	2025 AMI

Item	Options	Description
CNVi Mode	Disable Integrated Auto Detection [Default] ,	This option configures Connectivity. [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled; [Disable Integrated] disables Integrated Solution. NOTE: When CNVi is present, the GPIO pins that are used for radio interface cannot be assigned to the other native function.

4.6.2.2 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.

Advanced	Aptio Setup – AMI	
Advanced CPU Configuration > Efficient-core Information ID Brand String VMX SMX/TXT CPU Flex Ratio Settings Intel (VMX) Virtualization Technology Active Performance-cores Active Efficient-cores	Aptio Setup - AMI OxA06A4 Intel(R) Core(TM) Ultra 5 125U Supported Supported 27 [Enabled] [All] [All]	Displays the E-core Information ++: Select Screen 1J: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled [Default]	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	All [Default] /7/6/5/4/3/2/1	Number of P-cores to enable in each processor package. Note: Number of Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Active Efficient-cores	All [Default] /31/30/29/28/27/26/25/ 24/23/22/21/20/19/18/17 /16/15/14/13/12/11/10/9/ 8/7/6/5/4/3/2/1/0	Number of E-cores to enable in each processor package. Note: Number of Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

4.6.2.2.1 Efficient-core Information

Advanced	Aptio Setup – AMI	
Efficient-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	32 KB × 10 64 KB × 10 2048 KB × 2 12 MB	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt, F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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4.6.2.2.2 Performance-core Information

Advanced	Aptio Setup – AMI	
Performance-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	48 КВ × 2 64 КВ × 2 2048 КВ × 2 12 МВ	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	2.22.1293 Copyright (C) 2025	AMI

4.6.2.3 Power & Performance

Power & Performance	CPU – Power Management Contro.
	Options
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help
	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

EMX-MTLP User's Manual 4.6.2.3.1 CPU - Power Management Control

Boot Max Frequency [Enabled] Intel(R) SpeedStep(tm) [Enabled] Intel(R) Speed Shift Technology [Enabled] Turbo Mode [Enabled] C states [Enabled] Enhanced C-states [Enabled] ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit	Advanced	Aptio Setup – AMI	
<pre>fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit</pre>	Boot Max Frequency Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Turbo Mode C states	(Enabled) (Enabled) (Enabled) (Enabled)	Enable/Disable Boot Maximum Frequency in CPU strap.
ESC: EXIL			<pre>fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>

Item	Options	Description
Boot Max Frequency	Disabled Enabled [Default]	Enable/Disable Boot Maximum Frequency in CPU strap.
Intel(R) SpeedStep(tm)	Disabled Enabled [Default]	Allows more than two frequency ranges to be supported.
Intel(R) Speed Shift Technology	Disabled Enabled [Default]	Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Disabled Enabled [Default]	Enable/Disable processor Turbo Mode.
C states	Disabled Enabled [Default]	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.
Enhanced C-states	Disabled Enabled [Default]	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

4.6.2.4 System Agent (SA) Configuration

Advanced	Aptio Setup – AMI	
System Agent (SA) Configuration		Memory Configuration Parameters
 Memory Configuration Graphics Configuration VMD setup menu 		
NPU Device (B0:D11:F0)	[Enabled]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Item	Options	Description
NPU Device (B0:D11:F0)	Enabled [Default] Disabled	Enable/Disable NPU (Neural Processing Unit) Device.

4.6.2.4.1 Memory Configuration

Advanced	Aptio Setup – AMI	
Advanced Memory Configuration Memory RC Version Memory Frequency tCL-tRCD-tRP-TRAS MC 0 Ch 0 DIMM 0 Size Number of Ranks Manufacturer MC 1 Ch 0 DIMM 0	Aptio Setup - AHI 1.5.4.0 4800 MHz 40-39-39-77 Populated & Enabled 8192 MB (DDR5) 1 Kingston Not Populated / Disabled	
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Ver	sion 2.22.1293 Copyright (C) 2025	AMI

EMX-MTLP User's Manual 4.6.2.4.2 Graphics Configuration

Advanced	Aptio Setup – AMI	
Graphics Configuration		Select AUTO set IGD to be Primary Display if no external
Primary Display		Primary Display if no external Graphics Device connected otherwise external Graphics Device detected on first PCIe port will be Primary Display or Select IGFX for IBD to be Primary Display Or Select HG for Hybrid Gfx. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ver	sion 2.22.1293 Copyright (C) 2025 AMI

Item	Options	Description
Primary Display	Auto [Default] IGFX	Select AUTO set IGD to be Primary Display if no external Graphics Device connected otherwise external Graphics Device detected on first PCIe port will be Primary Display or Select IGFX for IGD to be Primary Display Or Select HG for Hybrid Gfx.

4.6.2.4.3 VMD setup menu

Advanced	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD controller
Enable VMD controller		controller
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Options	Description
Enable VMD controller	Disabled [Default] Enabled	Enable/Disable VMD controller

4.6.2.5 PCIE Configuration

Aptio Setup -	- AMI
SOC Configuration > PCI Express Root Port PXPA3(M.2 KeyE) > PCI Express Root Port PXPB1(M.2 KeyB) > PCI Express Root Port PXPB3(LAN1-I226) > PCI Express Root Port PXPB4(LAN2-I226) > PCI Express Root Port PXPC(PCIE slot) IOE Configuration > PCI Express Root Port PXPD(M.2 KeyM1) > PCI Express Root Port PXPE(M.2 KeyM2)	<pre>PCI Express Root Port Settings. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.22.1293 Copyr:	ight (C) 2025 AMI

4.6.2.5.1 PCI Express Root Port PXPA3(M.2 KeyE)

Advanced	Aptio Setup — AMI	
POI Express Root Port PXPA3 ASPM L1 Substates POIe Speed	[Enabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port.
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Item	Options	Description
PCI Express Root Port PXPA3	Disabled Enabled [Default]	Control the PCI Express Root Port.
	Disabled[Default]	
	LOs	Set the ASPM Level: Force L0s – Force all links to L0s
ASPM	L1	State AUTO – BIOS auto configure DISABLE –
	L0sL1	Disables ASPM
	Auto	

	Disabled[Default]	
L1 Substates	L1.1	PCI Express L1 Substates settings.
	L1.1&L1.2	
PCle Speed	Auto[Default]	
	Gen1	
	Gen2	Configure DCIs Speed
	Gen3	Configure PCIe Speed
	Gen4	
	Gen5	

4.6.2.5.2 PCI Express Root Port PXPB1(M.2 KeyB)

	[Enabled]	Control the DOT Dunners Doot
The second se	[Disabled] [Disabled] [Auto]	Control the PCI Express Root Port.
	22.1293 Copyright (C) 2025	<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Item	Options	Description
PCI Express Root Port PXPB1	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

Advanced	Aptio Setup – AMI	
POI Express Root Port PXPB3 ASPM L1 Substates PTM PCIe Speed	[Enabled] [Disabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port. ++: Select Screen 14: Select Item Enter: Select
		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

4.6.2.5.3 PCI Express Root Port PXPB3(LAN1-I226)

Item	Options	Description
PCI Express Root Port PXPB3	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

EMX-MTLP User's Manual 4.6.2.5.4 PCI Express Root Port PXPB4(LAN2-I226)

Advanced	Aptio Setup – AMI	
PCI Express Root Port PXPB4 ASPM L1 Substates PTM PCIe Speed	[Enabled] [Disabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port. ++: Select Screen
		<pre>fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Item	Options	Description
PCI Express Root Port PXPB4	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed
4.6.2.5.5 PCI Express Root Port PXPC(PCIE slot)

Advanced	Aptio Setup – AMI	
PCI Express Root Port PXPC ASPM L1 Substates PCIe Speed	(Enabled) [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2025	АМТ

Item	Options	Description
PCI Express Root Port PXPC	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCle Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

EMX-MTLP User's Manual 4.6.2.5.6 PCI Express Root Port PXPD(M.2 KeyM1)

Advanced	Aptio Setup — AMI	
PCI Express Root Port PXPD ASPM L1 Substates PCIe Speed	[Enabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port. +*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versi	on 2.22.1293 Copyright (C) 2025 AMT

Item	Options	Description
PCI Express Root Port PXPD	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

Advanced Advanced PCI Express Root Port PXPE [Enabled] ASPM [Disabled] L1 Substates [Disabled] PCIE Speed [Auto] **: Select Screen 11: Substates [Pointscheren PCIE Speed [Auto] **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Item	Options	Description
PCI Express Root Port PXPE	Disabled Enabled [Default]	Control the PCI Express Root Port.
ASPM	Disabled [Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM
L1 Substates	Disabled [Default] L1.1 L1.1&L1.2	PCI Express L1 Substates settings.
PCIe Speed	Auto [Default] Gen1 Gen2 Gen3 Gen4 Gen5	Configure PCIe Speed

4.6.2.5.7 PCI Express Root Port PXPE(M.2 KeyM2)

EMX-MTLP User's Manual 4.6.2.6 PCH-IO Configuration

Advanced Advanced) Setup – AMI
PCH-IO Configuration ▶ SATA Configuration ▶ HD Audio Configuration	SATA Device Options Settings
	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.129	3 Copyright (C) 2025 AMI

4.6.2.6.1 SATA Configuration

Advanced	Aptio Setup – AMI	
SATA Configuration		Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection	[Enabled] [AHCI]	
Serial ATA Port O(SATA1) Port O SATA Device Type	Empty [Enabled] [Solid State Drive]	
Serial ATA Port 1(SATA2) Port 1 SATA Device Type	Empty [Enabled] [Solid State Drive]	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Item	Options	Description
SATA Controller(s)	Enabled [Default] Disabled	Enable/Disable SATA Device.
Port 0/1	Disabled Enabled [Default]	Enable/Disable SATA Port
SATA Device Type	Hard Disk Drive Solid State Drive [Default]	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive

4.6.2.6.2 HD Audio Configuration

Advanced	Aptio Setup – AMI	
HD Audio Subsystem Configu HD Audio	ration Settings [Enabled]	Control Detection of the HD-Audio device. Disabled = HOA will be unconditionally disabled Enabled = HOA will be unconditionally enabled. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1293 Copyright	(C) 2025 AMI

Item	Options	Description
HD Audio	Disabled Enabled [Default]	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.

4.6.2.7 PCH-FW Configuration

Advanced	Aptio Setup – AMI	
ME Firmware Version ME Firmware Mode ME Firmware SKU ME Firmware Status 1 ME Firmware Status 2 ME Firmware Status 3 ME Firmware Status 4 ME Firmware Status 5 ME Firmware Status 6 ME State TPM Device Selection	18.0.10.2351 Normal Mode Corporate SKU 0x9000255 0x6B008300 0x00000000 0x00000000 0x02600000 0x00000000 (Enabled) [dTPM]	When Disabled, ME will be put into ME Temporarily Disabled Mode. NOTE: Once this option is changed and saved, it is grayed out to prevent command been sent again before reset.
▶ Firmware Update Configuration		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	n 2.22.1293 Copyright (C) 2029	

Item	Options	Description
ME State	Disabled Enabled [Default]	When Disabled, ME will be put into ME Temporarily Disabled Mode. NOTE: Once this option is changed and saved, it is grayed out to prevent command been sent again before reset.

TPM Device Selection	dTPM [Default] PTT	Selects TPM device: PTT or dTPM. PTT – Enables PTT in SkuMgr dTPM 1.2 – Disables PTT in SkuMgr Warning! PTT/dTPM will be disabled and all data saved on it will be lost.
-------------------------	------------------------------	--

4.6.2.7.1 Firmware Update Configuration

Advanced	Aptio Setup – AMI	
Me FW Image Re-Flash	[Disabled]	Enable/Disable Me FW Image Re-Flash function.
Vers	ion 2.22.1293 Copyright (C	C) 2025 AMI

Item	Options	Description
Me FW Image Re-Flash	Disabled [Default] Enabled	Enable/Disable Me FW Image Re-Flash function.

4.6.2.8 Trusted Computing

Advanced	Aptio Setup – AMI	[
TPM 2.0 Device Found Firmware Version: Vendor:	7.2 NTC	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and
		INTIA interface will not be available.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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ltem	Options	Description
Security Device Support	Disable Enable [Default]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

4.6.2.9 ACPI Settings

Advanced	Aptio Setup – AMI	
ACPI Settings		Enables or Disables System
Enable Hibernation		ability to Hibernate (05/S4 Sleep State). This option may not be effective with some operating systems. ++: Select Screen 1J: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
LV	ersion 2.22.1293 Copyright ((C) 2025 AMI

ltem	Options	Description
Enable Hibernation	Disabled Enabled [Default] ,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

4.6.2.10 Board & Panel Configuration

Advanced	Aptio Setup – AMI	
Board & Panel Configuration LVDS Active Panel CH7511 EDID Panel Option Panel Brightness Panel Back Light PWM Frequency Power Off mode(EU 2013/617) PRR-On After PWR-Fail Watch Dog USB Standby Power M.2 Key-B CFG > SHOW DMI INFO	[Enabled] [1024x768 24/1] [BIOS] [1003] [200] [Traditional S5] [Off] [Enabled] [Disabled] [Enabled] 1111:N/A	Active Internal LVDS(eDP->Ch7511-to-LVDS) +*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 202	5 AMI

Item	Ianual Options	Description
Active Panel	Disabled Enabled [Default]	Active Internal LVDS (eDP -> Ch7511-to-LVDS)
CH7511 EDID Panel Option	1024x768 24/1 [Default] 800x600 18/1 1024x768 18/1 1366x768 18/1 1024x600 18/1 1024x600 18/1 1280x800 18/1 1920x1200 24/2 1920x1080 18/2 1280x102424/2 1440x900 18/2 1600x120024/2 1366x768 24/1 1920x1080 24/2 1680x1050 24/2	Port1–EDP to LVDS (Chrotel 7511) Panel EDID Option
Panel Brightness Control Method	BIOS [Default] OS driver	Panel Brightness Control Method. 1. BIOS 2. OS Driver
Panel Brightness	0% 25% 50% 75% 100% [Default]	Select Panel back light PWM duty.
Panel Back Light PWM Frequency	200 [Default] 1k 10k 20k	Select Panel back light PWM Frequency.
Power Off mode(EU 2013/617)	Traditional S5 [Default] Off mode with WOLan1 Off mode w/o WOL(ErP)	Power Off mode (EU 2013/617).
PWR-On After PWR-Fail	Off [Default] On Last start	AC loss resume.
Wake Up by Ring	Disabled Enabled [Default]	Wake Up by Ring from S4/S5
Watch Dog	Disabled [Default] 30 Sec 40 Sec 50 Sec 1 Min 2 Min 10 Min 20 Min	Select WatchDog.
USB Standby Power	Disabled Enabled [Default]	Enabled/Disabled USB Standby Power during S4/S5

4.6.2.10.1 SHOW DMI INFO

Advanced	Aptio Setup - AMI	
SHOW DMI INFO System Manufacturer System Product System Serial Number Baseboard Version Baseboard Serial Number	Default string Default string Default string Default string Default string Default string	<pre>+*: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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4.6.2.11 Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to $4.6.2.11.1 \sim 4.6.2.11.6$ for more information.

Advanced	Aptio Setup – AMI	
Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
Super IO Chip > Serial Port 1 Configuration > Serial Port 2 Configuration > Serial Port 3 Configuration > Serial Port 4 Configuration > Serial Port 6 Configuration > Serial Port 6 Configuration	IT5782	+: Select Screen +: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Description
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COM1).
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COM2).
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COM3).
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COM4).
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COM5).

Serial Port 6 Configuration Set Parameters of Serial Port 6 (COM6).

4.6.2.11.1 Serial Port 1 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 1 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3F8h; IRQ=4;	(COM)
UART 232 422 485	[UART 232]	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).
UART 232 422 485	UART 232 [Default] , UART 422 UART 485	Change the Serial Port as RS232/422/485

4.6.2.11.2 Serial Port 2 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	(Enabled) IO=2F8h; IRQ=3;	(COM)
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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Item	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).

4.6.2.11.3 Serial Port 3 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 3 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3E8h; IRQ=5;	(COM)
		++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).

4.6.2.11.4 Serial Port 4 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 4 Configuration		Enable or Disable Serial Port (COM)
Serial Port Device Settings	[Enabled] IO=2E8h; IRQ=5;	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versio	on 2.22.1293 Copyright (C)	2025 AMI

ltem	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).

4.6.2.11.5 Serial Port 5 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 5 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=220h; IRQ=5;	<pre>(CDM) ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	2.22.1293 Copyright (C) 2025	5 AMI

Item	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).

4.6.2.11.6 Serial Port 6 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 6 Configuration		Enable or Disable Serial Port (COM)
Serial Port Device Settings	[Enabled] IO=228h; IRQ=5;	(CDM)
	an 2.22.1293 Copyright (C) 2	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Item	Options	Description
Serial Port	Enabled [Default] , Disabled	Enable or Disable Serial Port (COM).

4.6.2.12 EC 5782 HW monitor

Advanced	Aptio Setup - AMI	
Advanced PC Health Status Smart Fan Function CPU temperature System temperature CPU Fan Speed System Fan Speed VIN VCORE Power On(SO) Duration(Total) Count SO Times(Total) Count SS Times(Total) Count After G3 Times(Total)	[Disabled] : +31 C : +32 C : 6911 RPM : N/A : 23.357 V : 1.095 V : 00:00:12 : N/A : N/A	Enable or Disable Smart Fan ++: Select Screen T1: Select Item
Versi	on 2.22.1293 Copyright (C)	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

ltem	Options	Description
Smart Fan Function	Disabled [Default] , Enabled	Enable or Disable Smart Fan

4.6.2.13 S5 RTC Wake Settings

Advanced	Aptio Setup – AMI	
Wake system from S5	[Disabled]	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) ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESO: Exit
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Item	Options	Description
Wake system from S5	Disabled [Default] , Fixed Time Dinamic Time	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)

4.6.2.14 Serial Port Console Redirection

Advanced	Aptio Setup – AMI	
COMO Console Redirection ▶ Console Redirection Settings COM1(Pci Bus0,Dev0,Func0) (Disabled)		Console Redirection Enable or Disable. ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Item	Options	Description
Console Redirection	Disabled [Default] , Enabled	Console Redirection Enable or Disable.
Console Redirection EMS	Disabled [Default] , Enabled	Console Redirection Enable or Disable.

4.6.2.15 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.



ltem	Options	Description
USB transfer time-out	1 sec 5 sec 10 sec 20 sec [Default]	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec [Default] 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto [Default] Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken form Hub descriptor.

Advanced	Aptio Setup – AMI	
Network Stack	[Disabled]	Enable/Disable UEFI Network Stack ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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4.6.2.16 Network Stack Configuration

ltem	Options	Description
Network Stack	Enabled Disabled [Default]	Enable/Disable UEFI Network Stack.

4.6.2.17 NVMe Configuration



4.6.3 Security

Aptio Setup – AMI Main Advanced <mark>Security</mark> Boot Save & Exit MEBx		
Password Description If ONLY the Administrator's then this only limits access only asked for when entering If ONLY the User's password is a power on password and m boot or enter Setup. In Setu have Administrator rights. The password length must be in the following range: Minimum length Maximum length Administrator Password User Password Secure Boot	password is set, to Setup and is Setup. is set, then this ust be entered to	Set Administrator Password ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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• Administrator Password

Set setup Administrator Password

• User Password

Set User Password

4.6.4.1 Security Boot

Security	Aptio Setup – AMI	
System Mode	User	Secure Boot feature is Active if Secure Boot is Enabled,
Secure Boot	[Disabled] Not Active	Platform Key(PK) is enrolled and the System is in User mode. The mode change requires
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Custom]	platform reset
▶ Expert Key Management		
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
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ltem	Options	Description
Secure Boot	Disabled Enabled [Default]	Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset

EMX-MTLP User's Manual		
Secure Boot Mode	Standard Custom [Default]	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

4.6.4.1.1 Expert Key Management

Security security		
Vendor Keys Factory Key Provision Restore Factory Keys Reset To Setup Mode Enroll Efi Image Export Secure Boot variables	Valid [Enabled]	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode
Secure Boot variable Siz Platform Key (PK) 86 Key Exchange Keys (KEK) 306 Authorized Signatures (db) 613 Forbidden Signatures(dbx) 1783 Authorized TimeStamps(dbt) OSRecovery Signatures(dbr)	2 1 Test(AMI) 6 2 Factory 3 4 Factory 6 371 Factory 0 0 No Keys	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Item	Options	Description
Factory Key Provision	Disabled Enabled [Default]	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode

4.6.4 Boot

Main Advanced Security Boot	Aptio Setup - AMI Save & Exit MEBx	
Boot Configuration Setup Prompt Timeout Bootup NumLock State Fast Boot Quiet Boot	1 [On] [Disabled] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Boot Option Priorities Boot Option #1	[UEFI: InnostorInnostor 1.00, Partition 1 (InnostorInnostor 1.00)]	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Fxit
Vers	ion 2.22.1293 Copyright (C) 200	

Item	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	On [Default] Off	Select the keyboard NumLock state
Fast Boot	Disabled [Default] Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Quiet Boot	Disabled [Default] Enabled	Enables or disables Quiet Boot option
Boot Option #1	Sets the system boot or	der

4.6.5 Save and Exit



4.6.5.1 Save Changes and Reset

Reset the system after saving the changes.

4.6.5.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

EMX-MTLP User's Manual 4.6.5.3 *Restore Defaults*

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

4.6.5.4 UEFI: InnostorInnostor 1.00, Partition 1 (Innostor Innostor 1.00)

4.6.6 MEBx

Aptio Setup – AMI Main Advanced Security Boot Save & Exit <mark>MEBx</mark>	
Intel(R) ME Password	<pre>MEBx Login ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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ltem	Description
Intel(R) ME Password	MEBx Login

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5. Mechanical Drawing





