Please read the instructions in detail before using the product



User's Guide Verion: v1.0





Update Table

Version	Changelist	Author	Date
VI.0	First Vasion	WRI	292/11/22
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1 Attention

Brand

Product name and brand mentioned in this user's guide are the property of the company.

Notices:

- 1. Please read the instructions in detail before using the motherboard to avoid damaging the motherboard by wrong operation.
- 2. Please store or use the product in the environment of -10° C <=Work Station <=+50 °C, 95%RH, to avoid damaging the product for too hot or cold.
- 3. Please do not do strongly mechanical shake, and do not operate the product before ESD protection.
- 4. Please disconnect all power cables from the existing system before you add or remove a device.
- 5. Make sure your power supply is set to correct voltage, namely DC 18~36V
- 6. Forbid to repair, modify or alter the product by self. If it causes any damage, we don't take any responsibility.



2 Preface

2.1 Product Features

Thank you for choosing Q6AMV-B-1A1 computer !

This product is a computer for industrial control system. It is based on Intel's Alder Lake platform, and use the QH610 chipset. It can support the 12th & 13th generation of Intel Core \Pentium\Celeron Desktop CPU. MKMD-Q6AMV-B-1A supports Win10, Win11 and Linux (kernel version 5.10 or above). The dimensions of the computer is 200mm (length) ×164mm (width) ×69mm (height) .

The chassis of this product is composed of aluminum alloy heatsink parts and the metal sheet part. The aluminum alloy heatsink part is sandblasted on the surface and anodized with Iron grey matte. The metal sheet part is made of SGCC with a thickness of T=1.5mm, and the surface is painted black.

This product is based on Intel 12th generation high performance processor, and equipped with rich IO interface. This product is simple in appearance, firm in structure and stable in function. It is a industrial PC product for machine vision, and industrial automation applications.



2.2 Table of specifications

Main features			
Processor	Intel 12th/13th Core i3/i5/i7 or Pentium/ Celeron processor of LGA1700 Socket (TDP 65W(1))		
Chipset	H610		
Memory	2×DDR4 260-PinSODIMM, Up to 64GB 3200MT/s		
Storego	1×M.2 2280 M-Key(supports SATA3.0)		
Storage	1×SATA3.0 2.5 inch HDD Bay		
Network	4×RJ45 Gigabit Ethernet Interfaces (Ethernet Controller: Intel I211AT)		
Extension feature	s		
	1×DP1.4a Display Port (Max Resolution: 7680x4320@60Hz)		
	1×HDMI 2.0b Display Port (Max Resolution: 4096x2160@60Hz)		
	4×RJ45 Gigabit Ethernet Interface		
IO interface	4×USB3.0 Ports & 2×USB2.0 Ports		
	2×RS232 Serial Ports (COM1&2 supports RS232/485/422 selections)		
	1×Multiple IO Connector (8×DI & 8×DO & 4×Channel Light source with external triggers)		
	3×Reserved antenna holes		
Enternalism State	1×M.2 3042/52 B-Key for 4G module extension		
Extension Slots	1×M.2 2230 E-Key for WIFI & Bluetooth Module extension		
System features			
O.S	Win10/Win11/Linux/Unix		
Dower Supply	18~36V DC Input②		
	5.08-2×2 Pin Terminals Connector		
Mechanical featur	res		
Materials	Aluminium Alloy & SGCC		
Dimensions	200mm (L) ×164mm (W) ×69mm (H)		
Installation	Wall mount		
Operating environment			
Tomporatura	Operating temperature: -20°C~+50°C		
	Storage temperature: -40°C~+85°C		
Relative humidity	Power Off: 95%, does not condense at 25 to 30 temperatures		

Notice:

①This product supports Intel Core12/13th LGA1700 package and processors with TDP no higher than 65W;

⁽²⁾To use 24V light source output, the host should use 24V power input;



3 Product view

3.1 Product pictures



IO in the back



IO on the side



vertical view



3.2 Physical dimensions



Notice:: The dimensions in the drawing are uniform in millimeters (mm) .



Interface Introduce

3 4 9 10 11 1 2 5 6 7 8 0 DF 10101 1 10101 2 HDMI **()** Ϋ́ Α ۵٬ ۵۵٬ ۵۵٬ ۵۵٬ ۵۵٬ ۲۵٬ ۲۵٬ ۲۵٬ ۲۰٬ ۲۰٬ ۲۰٬ ۲۰٬ ۵۰٬ ۵۰٬ ۵۰٬ ۵۰٬ ۵۰٬ ۲۰٬ 12 13 16 17 14 15 18 19 20 ANT1 ANT3 ANT2

4.1 Function indication diagram of chassis interface

Interface Description:

- 1 5.08-2×2pin DC-IN Terminals 3 HDMI 2.0b display Port DB9 Serial Port 2 6 0 USB3.0 Type-A Port 9 Power button HDD LED status indicator LED(red , Blink) ⓓ B RJ45 Gigabit Ethernet 4 RJ45 Gigabit Ethernet 2 ß Ground point (M4 stud) Ð 19 Reserved antenna hole 2
- DP Display Port 0 4 DB9 Serial Port 1 USB2.0 Type-A Port 6 8 USB3.0 Type-A Port ⓓ Power status indicator LED (green, on) DIO&Light source terminals Ð RJ45 Gigabit Ethernet 3 ٩ RJ45 Gigabit Ethernet 1 16 Reserved antenna hole 1 ß 20 Reserved antenna hole 3

4



4.2 Pin Definition

(1) COM1&2 Serial Ports

Notice: COM1, COM2 can select RS232/RS485/RS422 by Setting BIOS parameters. The Pin definitions are

		Pin definitions	8
pin	RS232	RS485	RS422
1	DCD	D-	TX-
2	SIN	D+	TX+
3	SOUT		RX+
4	DTR		RX-
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS		
9	RI		

shown in the table below:



(2) DIO&Light source terminals



pin#	Signal	description	pin#	Signal	description
1	GND	Ground	2	24V	External power input for light source
3	T4-	Negative trigger signal input of light source channel 4	4	CH4-	Negative pole of light source power supply channel 4
5	T4+	Positive trigger signal input of light source channel 4	6	CH4+	Positive pole of light source power supply channel 4
7	Т3-	Negative trigger signal input of light source channel 3	8	CH3-	Negative pole of light source power supply channel 3
9	T3+	Positive trigger signal input of light source channel 3	10	CH3+	Positive pole of light source power supply channel 3
11	T2-	Negative trigger signal input of light source channel 2	12	CH2-	Negative pole of light source power supply channel 2
13	T2+	Positive trigger signal input of light source channel2	14	CH2+	Positive pole of light source power supply channel 2
15	T1-	Negative trigger signal input of light source channel 1	16	CH1-	Negative pole of light source power supply channel 1
17	T1+	Positive trigger signal input of light source channel 1	18	CH1+	Positive pole of light source power supply channel 1
19	DOC	Common pin of digital out port	20	DIC	Common pin of Digital input
21	DO8	Digital output port 8	22	DI8	Digital input port 1
23	DO7	Digital output port 7	24	DI7	Digital input port 1
25	DO6	Digital output port 6	26	DI6	Digital input port 1
27	DO5	Digital output port 5	28	DI5	Digital input port 1
29	DO4	Digital output port 4	30	DI4	Digital input port 1
31	DO3	Digital output port 3	32	DI3	Digital input port 1
33	DO2	Digital output port 2	34	DI2	Digital input port 1
35	DO1	Digital output port 1	36	DI1	Digital input port 1



Notice:

Function Item	Parameter Description
light source	 The light source channel adopts PWM mode to adjust the brightness. Each light source channel supports 24V/3A output, but there is a limitation that four channels can support 80W output, in total. Each light source channel can work with a independent external trigger signal input, and the trigger signal Voltage level is 5~12V.
DI	 The DI input supports NPN/PNP mode, and an external power supply is required Optical isolation voltage is DC 2500V DI input voltage range: 12~30V High level input shall be more than 12V, and low level input shall be less than 5V CI input common pin shall be connected to external high level
DO	 The DO output supports NPN mode , and an external power supply is required Optical isolation voltage is DC 2500V The maximum current of DO output is 300mA The leakage current is less than 0.1mA The CO pin needs to be grounded

(3) USB Port

Standard USB Type-A definition, omitted here.

(4) **DP Port**

Standard DP definition, omitted here.

(5) HDMI Port

Standard HDMI definition, omitted here.

(6) Audio Port

MIC-IN & LINE-OUT Use standard 3.5mm audio interface definition, omitted here.

(7) DC connector

JP/CN	pin#	Signal	
	1	V-	
ng ny	2	V+	
DC_IN	3	V-	
	4	V+	

5

Installation method



This host is wall mounted, please refer to the following figure for installation:

Notice:

- (1) Please ensure that the strength of the installation wall is enough to support the weight of the host;
- (2) Please select M3.5/M4 mounting bolts and ensure that the installation depth of 4 bolts is more than 35mm;
- (3) Please ensure that the installation height of the machine $H \le 1m$;



6

Power Supply

6.1 pictures



6.2 Table of specifications

Specifications	
Input	100-240V~2.34A 50~60Hz
Output	24V~7.5A 180W

Notice:

- ① Ensure that the AC voltage source connected to the plug power meets the input parameters
- 2 Ensure that the DC voltage output of the plug power matches the power input of the laptop
- ③ Using the power adapter, first connect the AC line to the adapter, then plug the green DC terminal of the power

lead into the computer, and finally plug the power lead into electrical outlet and switch on at electrical outlet (if

applicable in your locale)

4 Do not place the power adapter in an overheating environment to not reduce service life



7

BIOS Setup

When starting up and running, press the <F2> key on the keyboard to enter the

BIOS setup program.

After the setting is over, you need to press F10 or pass the save option in <Save & Exit> for the current setting to take effect.

7.1 Date and time settings

When you enter the BIOS setting interface, you can set the date and time in the first interface, as shown below:

Main Settings Advanced Chipset	Aptio Setup – AMI Security Boot Save & Exit	
PCIE GEN4 Dekel FW Version PCIE GEN5 HS-Phy Recipe Version PCIE GEN5 HS-Phy FW Version Memory RC Version Total Memory Memory Frequency	1520786085.1520786085 3.12 3.0.9.3.0.0 0.0.3.116 4096 MB 2400 MHz	Set the Time. Use Tab to switch between Time elements.
PCH Information Name PCH SKU Stepping ChipsetInit Intel Module Rev ChipsetInit OEM Module Rev	PCH-S H610 B1 160.2.153.1013 160.2.153.1018	
Package TXT Capability of Platform/PCH Production Type	Not Implemented Yet Unsupported Production	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt.</pre>
ME FW Version ME Firmware SKU PMC FW Version	Consumer SKU 160.2.0.1039	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
System Language System Date System Time	[English] [Fri 01/01/2021] [00:03:40]	ESC: Exit
Version	2 22 1284 Conuright (C) 2022	AMT

Notice:

System Time: Set the time;

System Date : Set the date;

7.2 Settings Common function settings

1. Incoming call power on setting

Enter the BIOS setting interface, select<Settings> \rightarrow <AC Power Loss Setting>to set the options, select "Power ON" to start the power on function, and change it to "Power Off" to turn off the power on function.

Settings	Aptio Setup – AMI	
Settings Restore AC Power Loss	[Power On] Restore AC Power Loss - Power On Power Off Last State	<pre>Specify what state to go to when power is re-applied after a power failure (G3 state). +: Select Screen 1: Select Item nter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	ancian 2 22 4284 Canunight (P)	2022 ANT



2. Watchdog settings

Enter the BIOS setting interface, select<Settings> \rightarrow <Watchdog Setting>, and set the<Watchdog Setting>option according to your needs, as shown in the following figure:

Settings	Aptio Setup – AM	мт
WatchDog Setting		<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>
	Version 2.22.1284 Copyright	t (C) 2022 AMI

Notice: The input value is 0~255



3.power-on by alarm

Enter the BIOS setting interface, select the option<Settings> \rightarrow <S5 RTC Wake Setting> \rightarrow <Wake system with Fixed Time>, set the default value to "Enable", and then set the scheduled boot time according to your needs, as shown in the following figure:

Settings	Aptio Setup — AMI	
Wake system with Fixed Time	[Disabled] — Wake system with Fixed Time — Enabled Disabled	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified Select Screen Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	/ersion 2.22.1284 Copyright (C) 202	2 AMI

Set the hour/minute/second of startup respectively, such as 8:30:00

Settings	Aptio Setup – AMI	
Wake system with Fixed Time Wake up hour Wake up minute Wake up second	[Enabled] 8 30 0	0 - 59 →+: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	.22.1284 Copyright (C) 2022	AMI

Notice: After setting "OK", it means that the motherboard will start automatically at this time of day



4.PXE startup function

Enter the BIOS setting interface, select the<Advanced>---<Network Stack>option, and change the default value to "Enabled", as shown below:

Advanced	Aptio Setup – AMI	
Network Stack	[Disabled] Network Stack Disabled Enabled	Enable/Disable UEFI Network Stack ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1284 Copyright (C) 2022 AMI		

 $Then \, open \, IPv4 \, PXE \, Support \, to \, enable \, the \, corresponding \, PXE \, function, which \, takes \, effect \, after \, restart.$

Aptio Setup – AMI Advanced		
Network Stack IPv4 PXE Support IPv4 HTTP Support IPv6 PXE Support IPv6 HTTP Support PXE boot wait time Media detect count	[Enabled] [Disabled] [Disabled] [Disabled] [Disabled] O 1	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 PXE Support Disabled Enabled H+: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F3: Previous Values F9: Optimized Defaults F10: Save & Exit ESC: Exit</pre>
Ver	sion 2.21.1278 Copyright (C) 2021	L AMI



5. Disable the bios write protection function by bios flushing

Before updating the bios, you need to turn off the bios write protection function option to execute it, specifically:Enter the BIOS setting interface, select the<Settings> \rightarrow <Special Setting> \rightarrow <BIOS Lock>option, and set this option to "Disable", as shown below:





6.UEFI/Legacy startup mode selection

Enter the BIOS setting interface, select the option<Advanced> \rightarrow <Special Setting> \rightarrow <Boot option filter>, and select the settings in the pop-up box, as shown below:

Advanced	Aptio Setup – AMI	
Compatibility Support Module Configuration		This option controls
CSM Support	[Enabled]	Legacy/UEFI RUMS priority
CSM16 Module Version	N/A, reset required	
GateA20 Active INT19 Trap Response	[Upon Request] [Immediate]	
Boot option filter Option ROM execution Network Storage Video Other PCI devices	[UEFI only] Boot option filter UEFI and Legacy Legacy only UEFI only [UEFI]	<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	2.22.1284 Copyright (C) 2022	AMI

7.SATA HDD mode selection

Enter the BIOS setting interface, select the <Chipset>→<SATA

Configuration> \rightarrow <SATA Mode Selection>option, and select the settings in the pop-up box, as shown below:

Chi	Aptio Setup – AMI ipset	
SATA Configuration		Determines how SATA
SATA Controller(s)	[Enabled]	controller(s) operate.
SATA Mode Selection	[AHCT]	
SATA Test Mode	[Disabled]	
Aggressive LPM Support	[Disabled]	and a second
Serial ATA Port O	Empty	
Software Preserve	Unknown	
Port 0	[Enabled]	
Hot Plug	[Disabled]	
Configured as eSATA	SATA Mode Selection —	
External	AHCI	
Spin Up Device	A CONTRACTOR OF	++: Select Screen
SATA Device Type		T↓: Select Item
Topology	[Unknown]	Enter: Select
SATA Port 0 DevS1p	[Disabled]	+/-: Change Opt.
DITO Configuration	[Disabled]	F1: General Help
DITU Value	625	F2: Previous Values
DM Value	15	F3: Uptimized Defaults
Serial Ala Port 1	Empty	F4: Save & EXIT
Software Preserve	Unknown	ESU: EXIL
Port 1	[Enabled]	
	[DISabled]	
Configured as eshin	not Fing Supported	
=		
Version 2,22,1284 Convright (C) 2022 AMT		



7.3 Other function settings

1.Boot setting function

Enter the BIOS setting interface, select the<boot>option, and then set the

required startup sequence, as shown below

Main Settings Advanced	Aptio Setup – AMI Chipset Security Boot Save & Exi	t
Boot Configuration Setup Prompt Timeout Bootup NumLock State Quiet Boot	1 [On] [Disabled]	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Boot Option Priorities Fast Boot	[Disabled]	
		<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>
	Version 2.22.1284 Copyright (C) 202	2 AMI

Notice: The subsequent options can be set in turn to set the starting priority order.



2. Temperature, voltage and FAN speed detection

Enter the BIOS setting interface, and press<Advanced> \rightarrow <Hardware Monitor>to enter this interface, where you can view the relevant detection values, as shown below:

Advanced	Aptio Setup — AMI	
Advanced Pc Health Status CPU temperature System temperature CPU_Fan Speed VCore VDDQ +V12S +V3.3S +V5S VCCIN_AUX V1P8A VBAT > CPU Fan Function > SYS Fan Function	Aptio Setup - AMI : +60 : +34 : 5273 RPM : +0.891 V : +11.199 V : +12.144 V : +3.333 V : +5.040 V : +1.815 V : +3.124 V	CPU Fan function setting ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versir	nn 2.22.1284 Converight (C) 20	22 AMI

Notice: This bios displays the current CPU temperature.

CPU_FAN Function: Select "Enable" to enable CPU_ Intelligent speed regulation function of FAN FAN power supply.

SYS_FAN Function: Select "Enable" to enable CPU_ Intelligent speed regulation function of FAN FAN power supply.



3. Password setting function

Enter the BIOS setting interface, select the<Security>option, and then set the superuser password and ordinary user password, as shown below:



4. Optimize. Save settings

Enter the BIOS setting interface, select the<Save&Exit>option to optimize. Save the settings, as shown below:

Main Settings Advanced Ch	Aptio Setup - ipset Security Boot	AMI Save & Exit	
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override		<pre>Exit system s the changes. ++: Select sc ti: Select It Enter: Select t/-: Change C F1: General F F2: Previous F3: Optimizec F4: Save & E> ESC: Exit</pre>	preen iem ipt. lelp Values i Defaults (it
Ve	rsion 2.22.1284 Copyr.	ght (C) 2022 AMI	



Save changes and Exit:	Save the current settings and exit the BIOS setting interface. The current
settings take effect;	
Discard changes and Exit:	Do not save the current settings, and exit the BIOS setting interface;
Save changes and Reset:	Save the current settings and restart the computer, and the current settings will
take effect;	
Discard changes and Reset:	Do not save the current settings, and restart the computer;
Save changes:	Save the current settings without exiting the BIOS setting interface;
Discard changes:	Discard the current settings and go back to the settings before the change
operation;	
Restore Defaults:	Load the factory default settings as the current settings, which will take effect
after saving and exiting;	
Save as User Defaults:	The current settings are saved as user default settings;
Restore User Defaults:	Load the user default value as the current setting, which needs to be saved to
take effect.	

Appendix: Introduction to related shortcut key functions

- 1. Press F2 to enter BIOS when starting up;
- 2. Press F12 when starting up to call up the device boot menu;
- 3. After entering the bios interface, the shortcut key F9 is equivalent to initializing the BIOS setting value;
- 4. After entering the bios interface, F10 saves the settings and restarts;