ADM-AL30

Autonomous Driving
ECU Computer

User's Manual

Manual Rev.: 1.0

Revision Date: April 18, 2025

Part No: 50M-41056-1000

LEADING EDGE COMPUTING

Revision History

Revision	Release Date	Description of Change(s)
1.0	2025-04-18	Official release

Preface

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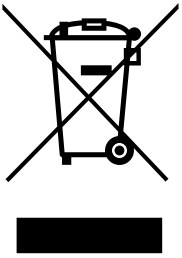

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Battery Labels (for products with battery)

California Proposition 65 Warning

WARNING: This product can expose you to chemicals including acrylamide, arsenic, benzene, cadmium, Tris(1,3-dichloro-2-propyl) phosphate (TDCPP), 1,4-Dioxane, formaldehyde, lead, DEHP, styrene, DINP, BBP, PVC, and vinyl materials, which are known to the State of California to cause cancer, and acrylamide, benzene, cadmium, lead, mercury, phthalates, toluene, DEHP, DIDP, DnHP, DBP, BBP, PVC, and vinyl materials, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Trademarks

Product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

Additional information, aids, and tips that help users perform tasks.

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.
ATTENTION: Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.
AVERTISSEMENT: Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.

Table of Contents

List of Tables

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List of Figures

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1 Introduction

1.1 Overview

The ADLINK ADM-AL30 features an Intel® Core™ processor and one PCIe x16 for GPU expansion. DDR5 memory and standard NVIDIA RTX4000 SFF card makes the ADM-AL30 a powerful autonomous-driving ECU.

ADM-AL30 features a first-of-its-kind 88Q6113 automotive Ethernet switch by Marvell. It is fully compliant with IEEE 802.3 automotive standard, delivering high-bandwidth with advanced routing and security. For more info, please visit the Marvell 88Q6113 product page.

1.2 Features

- 12th Generation Intel® Core™ i7-12700E / i9-12900E processor
- R680E chipset
- Standard 128GB DDR5 RAM, 4x 32GB SODIMM
- Expansion: 1x PCIe Gen4 x16 slot, featuring NVIDIA RTX 4000 SFF Ada gen card
- 1x DisplayPort, 1x HDMI, supporting 2 independent displays
- 4x External USB ports (USB 3.2 Gen 2)
- 2x Intel X710 10GbE with M12 connector
- 4x CAN 2.0, additional 8x optional CAN FD via M.2 module, all via Molex CMC connector
- 2x RS232 COM ports
- Marvell 88Q6113 automotive gigabit switch, 8x 1G BASE-T1, MATEnet connector
- 2x Onboard SATA 6Gb/s port for 2.5” SSD and 1x 2280 NVMe/SATA M.2 slot
- Built-in 9V DC to 36V DC power input

1.3 Packing List

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from your dealer before returning any product to ADLINK. Ensure that the following items are included in the package.

- ADM-AL30
- Accessory box (mounting bracket, screws, CAN test cable for the optional M.2 CAN-FD modules, PWR test cable with ignition switch)

1.4 Optional Accessories

- 450W AC-DC adapter

2 Specifications

2.1 ADM-AL30

System Core	
Processor	Intel® Core™ i9-12900E (8 P-cores/8 E-cores, 65W, up to 5.0 GHz) Intel® Core™ i7-12700E (8 P-cores/4 E-cores, 65W, up to 4.8 GHz)
Chipset	R680E
Memory	128 GB DDR5 SODIMM (32GB x4)
I/O Interface	
Display	1x DP++, 1x HDMI (2 independent displays)
GPU	NVIDIA RTX 4000 SFF Ada gen card
Ethernet	2x Intel X710 10GbE with M12 connector 8x 1G BASE-T1 with MATEnet connector
Serial Ports	COM1/2: RS-232
CAN bus	Standard: 4x CAN 2.0 (Molex CMC connector) Optional: 8x CAN FD (Molex CMC connector)
USB	4x USB 3.2 Gen2 + 1x internal USB 2.0
M.2	1x M.2 2230, E-key, PCIe Gen3 x1 (for WiFi/BT module) 2x M.2 2280, M-key, PCIe Gen3 x2 (for optional CAN FD modules)
TPM	TPM 2.0
Storage	
2.5" SATA	Standard: 1x 2TB; additional SSD optional
NVMe/SATA M.2 2280	1x 512GB NVMe
Physical	
Dimensions	325 x 258 x 145mm
Weight	8.835 Kg
Power Supply	
DC Input	9 to 36V
AC Input (optional)	450W AC-DC adapter

Environmental	
Operating Temperature	-20°C to 60°C (without GPGPU card) 0°C to 45°C (with GPGPU card)
Storage Temperature	-40°C to 85°C (excluding storage devices)
Humidity	approx. 95% @ 40°C (non-condensing)
Vibration	Operating: 3 Grms, 5-500 Hz, 3 axes @ 1 hr (w/2.5" SSD) Operating: 5 Grms, 5-500 Hz, 3 axes @ 30 mins (w/ 2.5” SSD)
Shock	Operating: 50 Grms, half sine 11ms duration (w/ 2.5" SSD)
ESD	Contact +/-4kV, Air +/-8kV
EMC	CE/FCC, class A, EN 55032/35 ; ISO 7637-2: 2011, Level 3, E-Mark, RCM
Design Compliance	ISO 16750-2

2.2 ADM-AL30 Functional Block Diagram

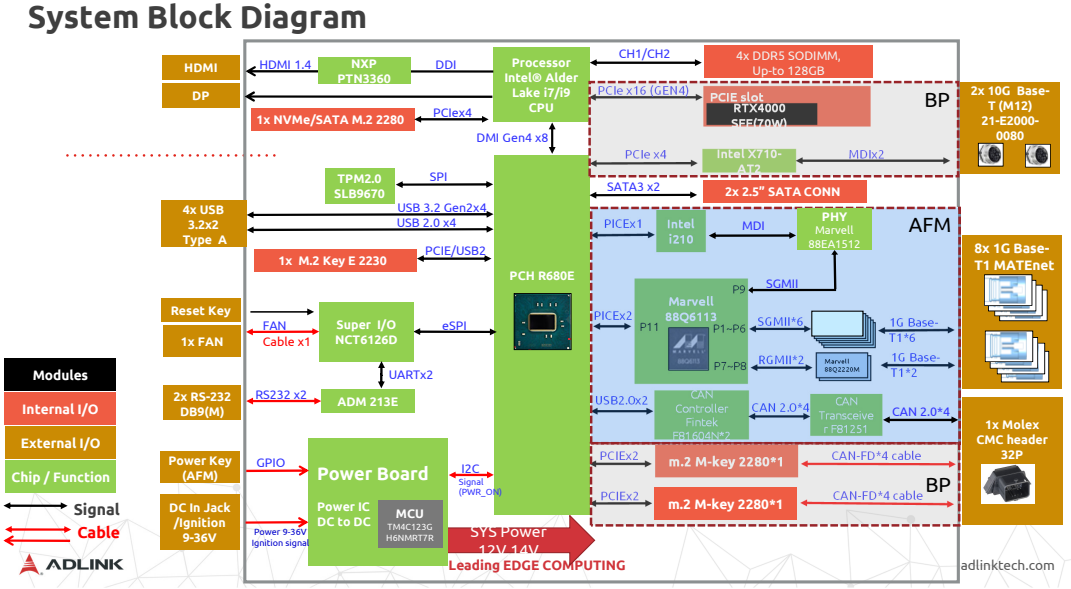

Figure 2-1: ADM-AL30 Functional Block Diagram

2.3 Display Options

With computing and graphic performance enhancement from its 12th Generation Intel processors, the ADM-AL30 can support two independent displays in the following configurations:

	Port	Resolution
Display Option 1	DisplayPort1	4096x2304@60Hz
Display Option 2	HDMI1	3840x2160 @ 60Hz

Table 2-1: Maximum Resolution

2.4 Mechanical Dimensions

All dimensions in millimeters.

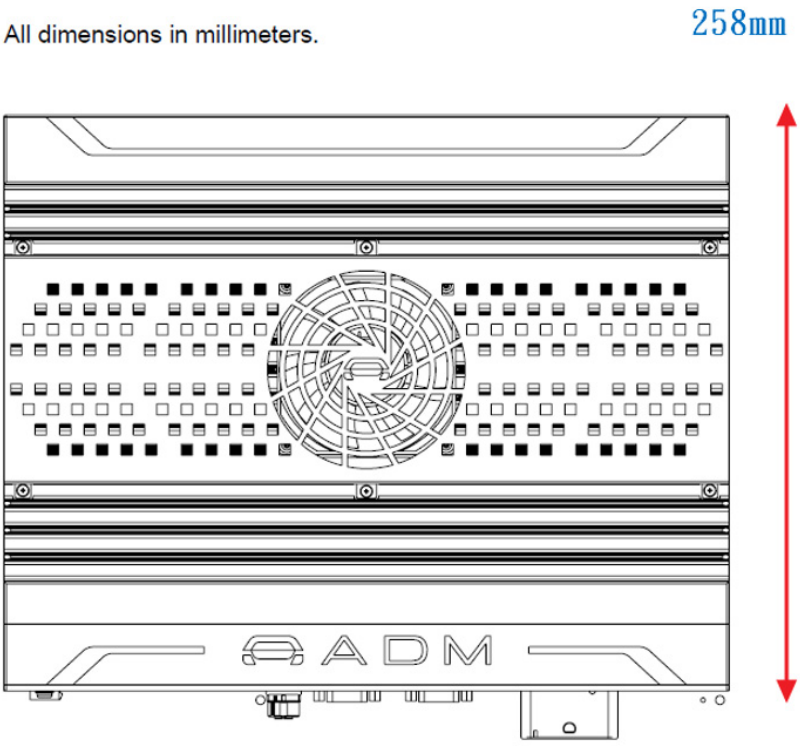

Figure 2-2: ADM-AL30 Top View

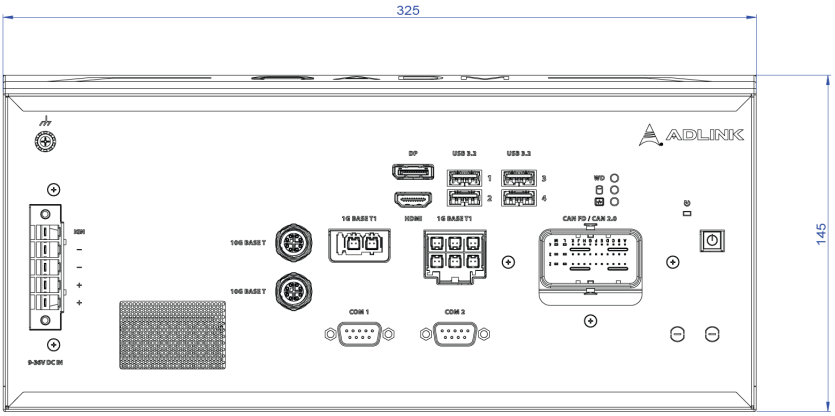

Figure 2-3: ADM-AL30 Front View

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3 System Layout

3.1 Front Panel I/O

The ADM-AL30 provides the following front panel features.

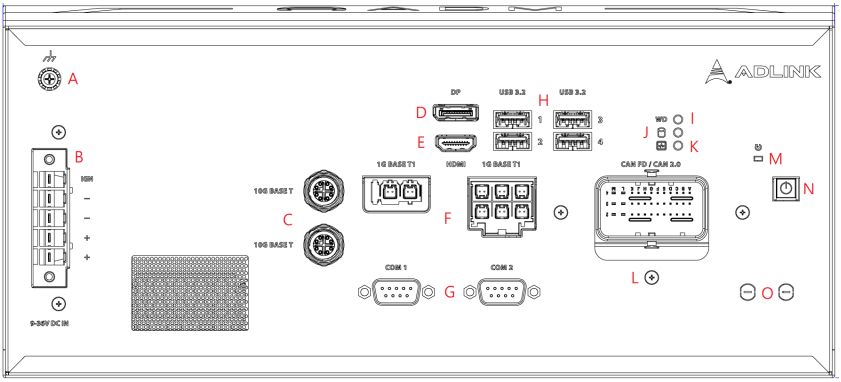


Figure 3-1: Front Panel I/O

A	Ground	**I**	LED - Watchdog
B	9-36V DC In	**J**	LED - SATA activity
C	M12 connector for 10GbE	**K**	LED - Diagnostics
D	DisplayPort++	**L**	CAN FD / CAN 2.0 connector
E	HDMI	**M**	Reset button
F	1GbE Base-T1 connector	**N**	Power button
G	RS-232 DB9 male connector	**O**	Wi-Fi/BT antenna connector (optional)
H	USB 3.2		

Table 3-1: Front/Side Panel I/O Legend

3.1.1 Power Button

The power button is a non-latched push button with a blue LED indicator.

System Status	Power LED
System turn on	Light ON
Suspend (S3)	Blinking
Hybernation (S4)	Blinking
Power OFF (S5)	Light OFF

3.1.2 LED Indicators

The three LEDs on the front panel indicate the following.

LED Indicator	Location	Color	Description
Watchdog (WD)	Top	Yellow	Indicates watchdog timer status. When watchdog timer starts, the LED will be on until system boot up success. When system does not boot up and the timer is expired, the system will automatically reboot.
SATA (HD)	Middle	Orange	When blinking, indicates the SATA is active.
Diagnostic (DG)	Bottom	Green	If lit continuously, indicates no physical storage is connected. If blinking, indicates no memory is installed on either SO-DIMM socket.

3.1.3 PCI Express x16 Slot

One PCI express x16 slot supports expansion with standard PCIe Gen4 cards and full PCI express x16 signals.

3.1.4 Reset Button

The reset button executes a hard reset for the ADM-AL30.

3.1.5 DisplayPort Connector

A DisplayPort connector on the front panel can connect to VGA, DVI, HDMI and DisplayPort monitors using corresponding adapters.

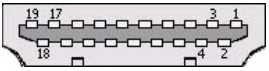
Figure 3-2: DisplayPort Connector Pin Definition

Pin	Signal	Pin	Signal
1	CN_DDPx0+	11	GND
2	GND	12	CN_DDPx3-
3	CN_DDPx0-	13	CN_DDPx_AUX_SEL
4	CN_DDPx1+	14	CN_DDPx_CONFIG2
5	GND	15	CN_DDPx_AUX+
6	CN_DDPx1-	16	GND
7	CN_DDPx2+	17	CN_DDPx_AUX-
8	GND	18	CN_DDPx_HPD
9	CN_DDPx2-	19	GND
10	CN_DDPx3+	20	+V3.3_DDPx_PWR_CN

Table 3-2: DisplayPort Pin Definition

3.1.6 HDMI Connector

The ADM-AL30 provides one HDMI connector for connection to an external monitor.



Pin #	Signal	Pin #	Signal
1	CON_HDMI_TX2_P	2	GND
3	CON_HDMI_TX2_N	4	CON_HDMI_TX1_P
5	GND	6	CON_HDMI_TX1_N
7	CON_HDMI_TX0_P	8	GND
9	CON_HDMI_TX0_N	10	CON_HDMI_CLK_P
11	GND	12	CON_HDMI_CLK_N
13	N/C	14	N/C
15	DVI_SCL_SINK	16	DVI_SDA_SINK
17	GND	18	P_+5V0_HDMI_CN
19	CON_HDMI_HPD_5V0		

Table 3-3: HDMI Connector Pin Definition

3.1.7 USB 3.2 Ports

The ADM-AL30 provides four USB 3.2 Gen 2 supporting Type-A connection on the front panel. All USB 3.2 ports are compatible with SuperSpeed Gen2, high-speed, full-speed, and low-speed USB devices. USB1 and USB2 Provide 1.6A current each, and USB3,4 share 1.6A current. The full 1.6A current is available if only one port is used.

3.1.8 DC Power Input

9-36V DC

Figure 3-3: DC Power Input

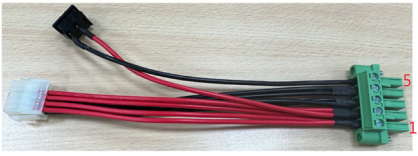
Pin	Signal
1	V+ (DC IN)
2	V+ (DC IN)
3	V- (GND)
4	V- (GND)
5	Ignition

Table 3-4: DC Power Input Pin Definition

Use an approved power source as certified by IEC or UL. If you need an adaptor, optional accessories or further assistance, contact ADLINK for further information. The maximum operational altitude is 2000 m with an output that meets LPS and SELV (ES1) circuits.

NOTE:

A switch must be used on the V+/Ignition pins if the supplied PWR test cable is not used.



Power Source Rating

	Voltage	Current
DC Power Source	9 to 36V DC	8.75 to 30A
AC-to-DC Adapter	24V DC	18.75A

Before providing DC power, ensure the voltage and polarity provided are compatible with the DC input. Improper input voltage and/or polarity can cause system damage.
AVERTISSEMENT: Avant de fournir de l'énergie DC à cet appareil, veuillez vous assurer que la tension et la polarité fournies sont compatibles avec l'entrée DC. Une tension d'entrée et/ou polarité incorrectes peuvent causer des dommages au système.

Power Consumption

Idle Mode (EIST Disabled)	With NVIDIA GPU	Without NVIDIA GPU
24V Input	2.63 A	1.86 A
Power Consumption	63.12 W	44.64 W

Load Mode (EIST Disabled)	With NVIDIA GPU	Without NVIDIA GPU
24V Input	8.51 A	4.30 A
Power Consumption	204.24 W	103.20 W

Idle Mode (EIST Disabled)	With NVIDIA GPU	Without NVIDIA GPU
12V Input	5.24 A	3.78 A
Power Consumption	62.88 W	45.36 W

Load Mode (EIST Disabled)	With NVIDIA GPU	Without NVIDIA GPU
12V Input	17.35 A	8.56 A
Power Consumption	208.20 W	102.72 W

3.1.9 COM Port Connectors

The ADM-AL30 provides two COM ports through DB9 connectors, supporting only RS-232 protocol.

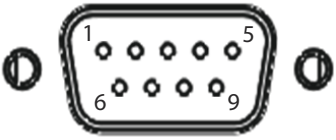


Figure 3-4: COM Port Pin Definition

Pin	Signal Name
	RS-232
1	DCD#
2	RXD
3	TXD
4	DTR#
5	GND
6	DSR#
7	RTS#
8	CTS#
9	RI#

Table 3-5: DB9 Pin Definitions

3.1.10 SATA Connector

The SATA connector supports transfer up to 6.0Gb/s.

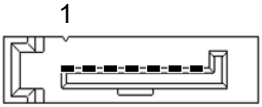


Figure 3-5: SATA Connector

Pin	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

Table 3-6: SATA Connector Pin Definition

3.1.11 M12 Connector for 10GbE

.

Figure 3-6: M12 Connector for 10GbE

Pin	Signal
1	X710_1_MDI1_T_DP0
2	X710_1_MDI1_T_DN0
3	X710_1_MDI1_T_DP1
4	X710_1_MDI1_T_DN1
5	X710_1_MDI1_T_DP3
6	X710_1_MDI1_T_DN3
7	X710_1_MDI1_T_DN2
8	X710_1_MDI1_T_DP2

Table 3-7: M12 Connector Pin Definition

3.1.12 1GbE BASE-T1 Connector (2x3)

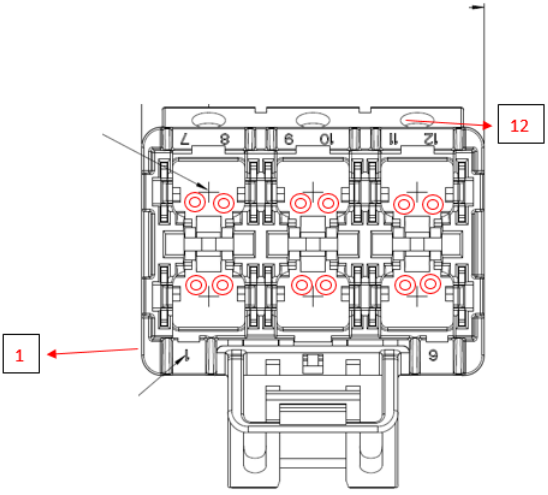


Figure 3-7: 1GbE Base-T1 Connector (2x3)

Pin	Signal
1	ETH1_MDI_CONN_P
2	ETH1_MDI_CONN_N
3	ETH2_MDI_CONN_P
4	ETH2_MDI_CONN_N
5	ETH3_MDI_CONN_P
6	ETH3_MDI_CONN_N
7	ETH4_MDI_CONN_P
8	ETH4_MDI_CONN_N
9	ETH5_MDI_CONN_P
10	ETH5_MDI_CONN_N
11	ETH6_MDI_CONN_P
12	ETH6_MDI_CONN_N

Table 3-8: 1GbE Base-T1 Connector (2x3) Pin Definition

3.1.13 1GbE BASE-T1 Connector (1x2)

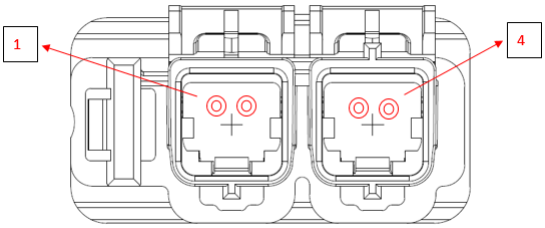


Figure 3-8: 1GbE Base-T1 Connector (1x2)

Pin	Signal
1	ETH7_MDI_CONN_P
2	ETH7_MDI_CONN_N
3	ETH8_MDI_CONN_P
4	ETH8_MDI_CONN_N

Table 3-9: 1GbE Base-T1 Connector (1x2) Pin Definition

3.1.14 CMC Connector

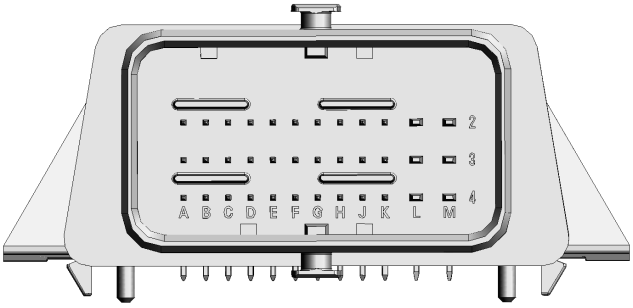


Figure 3-9: CMC Connector

Pin	Signal	Pin	Signal
A4	Ground	J3	CAN-FD6_L
B4	CAN-FD1_H	K3	Ground
C4	CAN-FD1_L	A2	Ground
D4	Ground	B2	CAN-FD7_H
E4	CAN-FD2_H	C2	CAN-FD7_L
F4	CAN-FD2_L	D2	Ground
G4	Ground	E2	CAN-FD8_H
H4	CAN-FD3_H	F2	CAN-FD8_L
J4	CAN-FD3_L	G2	Ground
K4	Ground	H2	CAN1H
A3	Ground	J2	CAN1L
B3	CAN-FD4_H	K2	Ground
C3	CAN-FD4_L	L4	CAN2H
D3	Ground	M4	CAN2L
E3	CAN-FD5_H	L3	CAN3H
F3	CAN-FD5_L	M3	CAN3L
G3	Ground	L2	CAN4H
H3	CAN-FD6_H	M2	CAN4L

Table 3-10: CMC Connector Pin Definition

3.1.15 USB 2.0 Connector

One USB 2.0 Type-A connector is provided on the mainboard for internal USB dongle.

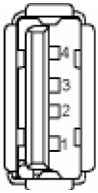


Figure 3-10: USB Port

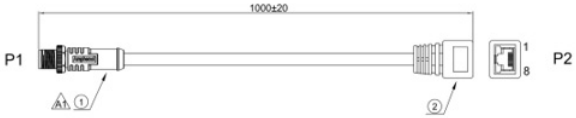
Pin	Signal
1	Vcc
2	Data-
3	Data+
4	GND

Table 3-11: USB Port Pin Definition

3.1.16 Cable Connectors

2x 10GbE

- M12 Connector: Amphenol MSXS-08BMMM-SL7X01
- 10GbE to RJ45 cable (ADLINK PN: 30-01322-0020-A0)



8x 1GbE Base-T1

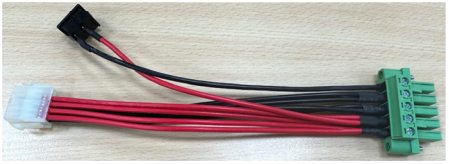
- 2x3 port: TE 2339800-1 (Code A, with compatible parts suggested on website)
- 1x2 port: TE 2305987-1 (Code A, with compatible parts suggested on website)

CAN (4x CAN 2.0 and 8x CAN FD), part of the CMC connector

- CMC header: Molex 477320361
- Compatible receptacle: Molex 643202311

Power

- Optional 450W AC-DC power adapter: (ADLINK P/N : 31-62192-0000-A0)
- Power cable and ignition switch: included in the accessory box (ADLINK P/N 30-22128-0000-A0)



- Terminal block compatible with ADM-AL30 power connector: Dinkle EC762VM-05P (ADLINK P/N : 20-C2049-1050)

3.1.17 M.2 Locations

Main Board Top Side:

1x M.2 2280, M-key, PCIe Gen3 x4 |SATA
(automatic detection for NVMe/SATA OS drive).

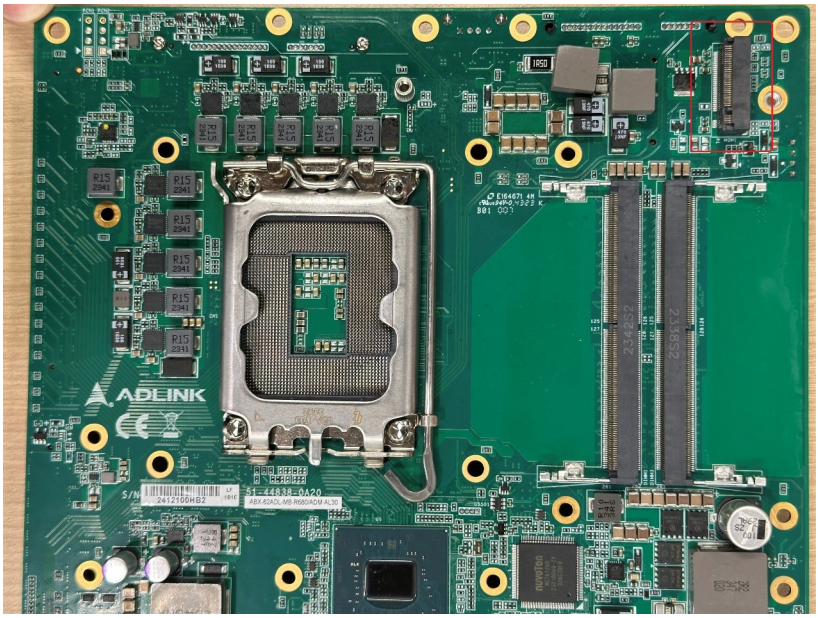
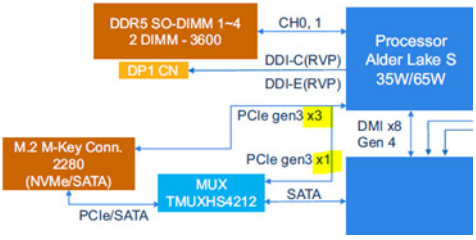


Figure 3-11: M.2 Main Board Top Side

The M.2 M-key slot is a combination NVMe/SATA slot for installing the OS. Signal is controlled via a TI mux. When NVMe drive is used, it uses full PCIe Gen3 x4 bandwidth (1 lane pass-thru via the mux, 3 lanes straight from PCH).



Main Board Bottom Side:

1x M.2 2230, E-key, PCIe Gen3 x1 (for Wi-Fi/BT module).

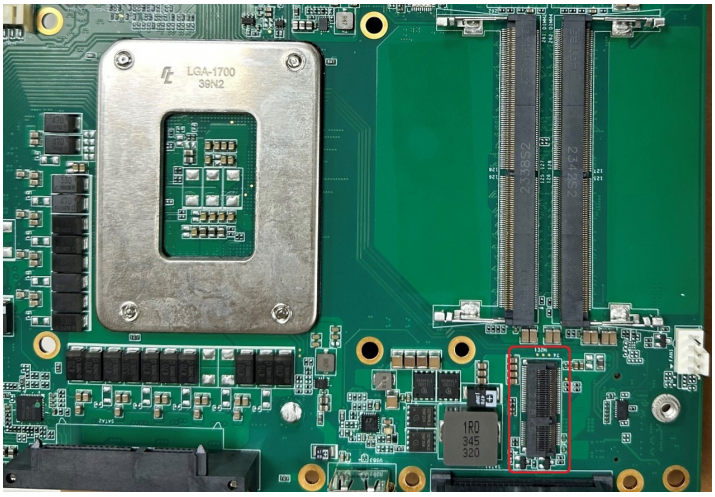


Figure 3-12: M.2 Main Board Bottom Side

Backplane:

M2M1/M2M2: 2x M.2 2280, M-key, PCIe Gen3 x2
(for optional CAN FD modules).

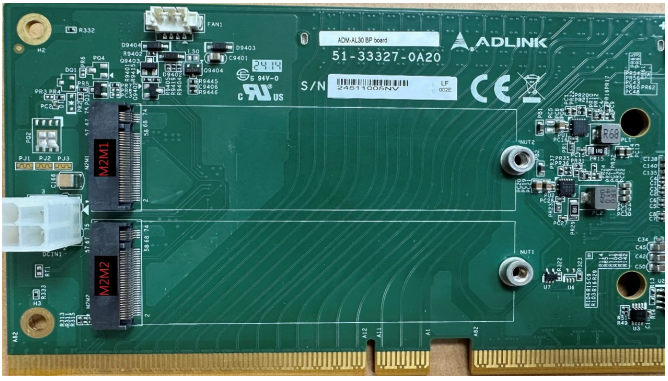


Figure 3-13: M.2 Backplane

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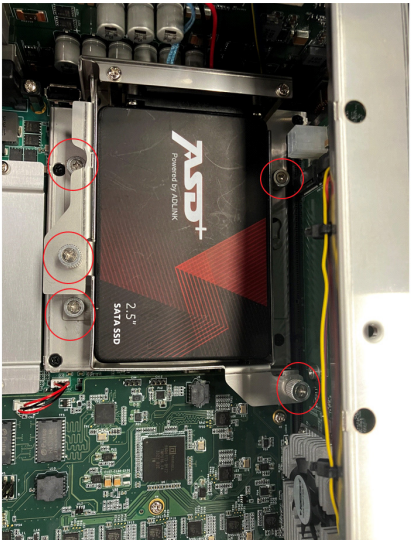
4 Getting Started

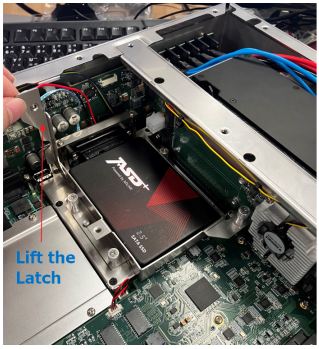
4.1 SSD Removal

To remove SSD, follow the steps below.

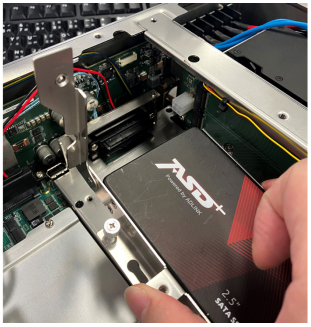
1. Remove the 5 thumb screws.



2. Lift the latch.



3. Remove the SSD module with upward motion.



4.2 Driver Installation

Note that Marvell 88Q6113 configuration is not covered in this manual. For details regarding switch configuration, refer to the user's manual and other technical documents directly from Marvell Customer Portal.

User registration is required: https://marvell-customers.okta.com/app/adobe_cq/exk4imp61Axt6uagx4x6/sso/saml

ADLINK also maintains a list of technical notes regarding 88Q6113 applications, which will be updated in this manual as needed.

4.2.1 Marvell 88Q6113 Driver Installation

1. Download Marvell driver from ADLINK Github.
2. Command: cd marvell_switch_pcie_driver_gpl2-ubuntu22.04
3. cd src
4. make clean
5. make all
6. lspci | grep 0f13 // you should see "Ethernet controller: Marvell Techology Group Ltd. Device 0f13 (rev 01)." If note, restart the computer and continue from Step 4.
7. Sudo insmod oak_pci.ko debug=0x00 chan=10 txs=32 rxs=32 rto=100 mhdr=0 jumbo=1
8. sudo dmesg | grep –A 8 "Marvell PCIe Switch Driver" #Can use this command to verify if the MAC Address has been successfully changed.

4.2.2 PEAK CAN Driver Installation

For Ubuntu, PEAK CAN driver is already included. To check the status of PEAK CAN module, run the following command:
sudo lspci | grep -i peak07:00.0 Network controller: PEAK-System Technik GmbH Device 001a (rev 01)

4.2.3 Fintek CAN 2.0 Driver Installation

For Ubuntu, Fintek driver is not included by default.

Download driver for Ubuntu 22.04.3 from here: Fintek USB to CAN 2.0 A/B (F81604).

Link to USB to CAN 2.0 A/B (F81604) Linux version at the bottom of the page.

Also need to download dependencies from official repository.

4.3 Marvell Ethernet Switch Reset Workaround

Some settings such as TCAM, VLAN, and ATU, written via Marvell's "developmentcfg" tool, are reset after the power is turned off and on.

As a work-around, Marvell has provided additional tools to address this issue. Although this is a more complicated process, the desired settings are retained to ensure safety and smooth system operation.

These are the necessary utilities: "ASCT Windows version", "Create_secure_image_tool", "Flash_path_tool", and "Download-Image". All files can be obtained directly from Marvell Customer Portal.

1. Prepare a Windows-based computer; this will be used as a client to connect and config the Marvell chip.

2. Prepare a RJ45-to-BaseT1 converter to connect ADM-AL30 to the client computer.

3. Download the original 88Q6113 firmware "88Q6113_flash.bin" from Marvell 's portal.

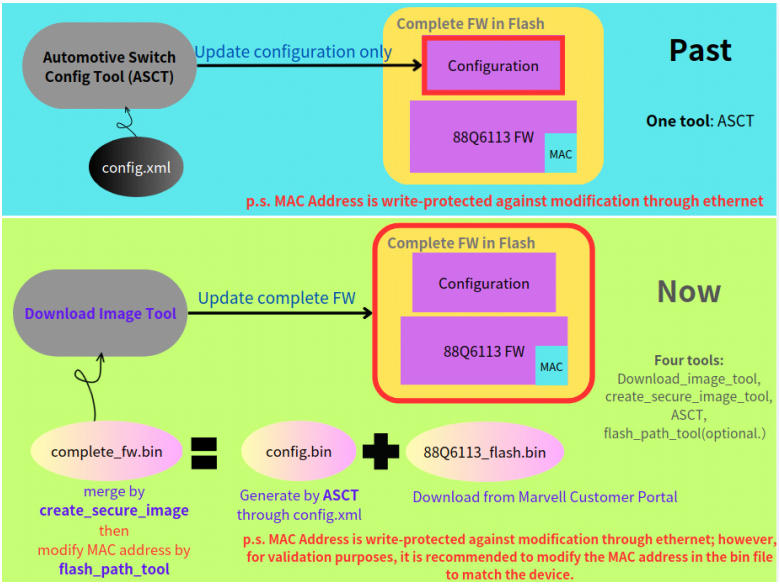
4. On the Windows computer, generate a new "config.xml" file using ASCT; this XML contains all the desired set-

tings and modifications. Then export the config as a bin file “config.bin”.

5. Combine #1 & #2 above into a new single bin file “complete_fw.bin” using “Create_secure_image_tool”.

6. Then, use “Flash_path_tool” to modify the MAC address of the new bin file “complete_fw.bin” to match the on-board MAC address sticker.

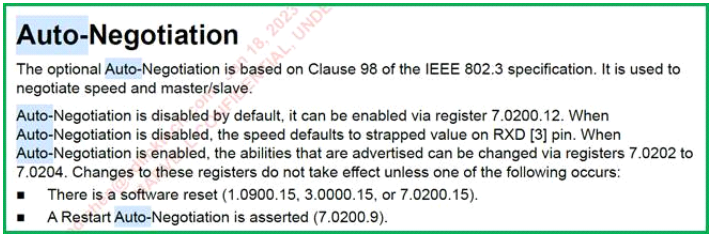
7. Finally, use “DownloadImage” to burn the newly created bin file unto the Marvell chip. Once finished, power-cycle the system for the new settings to take effect



4.4 Marvell Ethernet Switch Speed Adjustment

To adjust the speed of the Marvell Ethernet Switch, do the following:

1. From the Marvell Customer Portal, download the datasheet “88Q222x(M)_88Q120xM_Datasheet_TD-000217-05”.
   - ▷ Table 87, page 108, lists the speed settings for 88Q6113.
   - ▷ Port auto negotiation is disabled by default.
   - ▷ Default configuration is listed in “al30_cfg.xml”.



Auto-Negotiation

The optional Auto-Negotiation is based on Clause 98 of the IEEE 802.3 specification. It is used to negotiate speed and master/slave.

Auto-Negotiation is disabled by default, it can be enabled via register 7.0200.12. When Auto-Negotiation is disabled, the speed defaults to strapped value on RXD [3] pin. When Auto-Negotiation is enabled, the abilities that are advertised can be changed via registers 7.0202 to 7.0204. Changes to these registers do not take effect unless one of the following occurs:

- There is a software reset (1.0900.15, 3.0000.15, or 7.0200.15).
- A Restart Auto-Negotiation is asserted (7.0200.9).

2. To change the settings:
   - ▷ Smi address 0x0001 = PHY1 (mapped to switch port 1)
   - ▷ Value 0xC001 = Master mode, Speed 1000

```
<phy_operation>
    <op_name>Set speed and mode</op_name>
    <smi_address>0x0001</smi_address>
    <smi_external>true</smi_external>
    <offset>0x0834</offset>
    <value>0xC001</value>
    <clause>0x002D</clause>
    <smi_device>0x0001</smi_device>
</phy_operation>
```

3. The parameters must be set in the firmware before uploading it onto 88Q6113.

4. To do this, copy the original firmware "88Q6113_flash.bin" from "88Q6113_fw_bin" directory to "flash_patch_tool" directory.

5. Then, copy 88Q6113_flash.bin in "flash_patch_tool" to "create_secure_image" directory.

6. Using AutomotiveSwitchV4.exe's "GUI Mode," convert the switch configuration from .xml to .bin.
   - ▷ Go to File> Load Configuration, choose your switch config .xml. Then click "Runtime Operation Settings" and check that the configurations have been loaded. Go to Commands > Export Configuration to File, where config.bin will be generated.
   - ▷ Make sure to use GUI Mode, otherwise the contents of the .bin file may be different than required.

7. Copy config.bin under "automotive_switch_config_win" to "create_secure_image" directory.

8. Use create_secure_image_v3.exe to merge the configuration (config.bin) with the original firmware (88Q6113_flash.bin) into a new bin file.
   - ▷ create_secure_image_v3.exe -imagefile=88Q6113_flash.bin -partitionoffset=0x0B0000 -partitionsize=0x090000 -cfgimagefile=al30_cfg.bin -acceptanycfg

9. Copy 88Q6113_flash.bin to "flash_patch_tool" directory.

10. Use patch_image.exe to change the MAC address within.
    - ▷ This MAC address will not be loaded, just need to match the current MAC Address on 88Q6113, current MAC address can be checked by executing the Patch Image application in "flash_patch_tool" directory.
    - ▷ patch_image.exe -fwimage=88Q6113_flash.bin -aes-gen=2 -devicenum=0xf -macad-dress=00:30:64:00:11:22 -show

11. Copy 88Q6113_flash.bin to "DownloadImage_v2.08.0001" directory.

12. Use DownloadImage_v2.exe to upload the firmware via Ethernet by executing the following three commands.
    - ▷ DownloadImage_v2 -ha34-73-5A-F6-87-59 -if88Q6113_flash.bin -dt2 -io0x100000 -is0x40000 -da00-30-64-00-11-22 -dn15
    - ▷ DownloadImage_v2 -ha34-73-5A-F6-87-59 -if88Q6113_flash.bin -dt1 -io0x0C0000 -is0x40000 -da00-30-64-00-11-22 -dn15
    - ▷ DownloadImage_v2 -ha34-73-5A-F6-87-59 -if88Q6113_flash.bin -dt3 -io0x0B0000 -is0x4000 -da00-30-64-00-11-22 -dn15

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Appendix A BIOS Setup

The Basic Input/Output System (BIOS) is a program that provides a basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features applied to the ADM-AL30. The BIOS Setup program includes menus for configuring settings and enabling features of the ADM-AL30. Most users do not need to use the BIOS Setup program, as the ADM-AL30 ships with default settings that work well for most configurations.

Enter BIOS Setup by selecting DEL when the system is powered on the POST (Power On Self Test) message is displayed.The ADM-AL30 supports one-time Boot Menu allowing selection of boot device. Enter the Boot Menu by selecting F7 at POST.


NOTE:

- BIOS options listed are for reference only.
- Different configurations can affect BIOS behavior.
- Displayed material may reflect only the BIOS version corresponding to initial release and may differ from that of the purchased motherboard.

5.1 Menu Structure

This section presents the six primary menus of the BIOS Setup Utility. Use the following table as a quick reference for the contents of the BIOS Setup Utility. The subsections in this section describe the submenus and setting options for each menu item. The default setting options are presented in **bold**, and the function of each setting is described in the right hand column of the respective table.

Main	Advanced	Chipset
BIOS Information System Information System Date System Time	►CPU Configuration ► Power Management ► Serial Port Console Redirection ► USB Configuration ► Trusted Computing ►Onboard Devices Configuration ► NCT6126D Hardware Monitor ► BIOS Watchdog Timer	►System Agent (SA) Configuration ►PCH-IO Configuration ►BackPlane PCIe Configuration Holdoff timer

Security	Boot	Save & Exit	MeBx
Password Description Secure Boot Menu	Boot Configuration	Save Options Default Options Boot Override	Intel® ME Password

► indicates a submenu, gray text indicates info only.

5.2 Main

Contains basic system information for the ADM-AL30.

Changing BIOS settings may lead to incorrect controller behavior and possible inability to boot.

BIOS Information

Shows current system BIOS Vendor, BIOS Version, Build Date, MRC Version, GOP Version and ME FW Version.

System Information

Shows current system Project Name, FM Board ID, FM Board Information, CPU Board Version, CPU Branding String, CPU Frequency, Total Memory, Memory Frequency, and PCH SKU.

System Time/System Date

Allows adjustment of system time and date, as follows.

1. Highlight System Time or System Date using the up and down <Arrow> keys.
2. Enter new values using the keyboard and select <Enter>.
3. Select < Tab > to move between fields.


NOTE:

The date must be entered in MM/DD/YY format, and the time in HH:MM:SS. The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

5.3 Advanced

Feature	Options
CPU Configuration	submenu
Power Management	submenu
Serial Port Console Redirection	submenu
USB Configuration	submenu
Trusted Computing	submenu
NCT6126D Hardware Monitor	submenu
BIOS Watchdog Timer	submenu
Intel(R) Ethernet Network Adapter X710-TL – XX: XX: XX: XX: XX:XX	submenu


CAUTION:

Setting incorrect or conflicting values in Advanced BIOS Setup may cause system malfunction.

Accesses advanced options of the ADM-AL30.

5.3.1 CPU Configuration

Active Performance-cores

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

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.

Intel (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hyper-Threading

Enabled for Windows and Linux (optimized for Hyper-Threading Technology) and Disabled for other OS (not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.

Intel Trusted Execution Technology

Enables utilization of additional hardware capabilities provided by Intel(R) Trusted Execution Technology. Changes require a full power cycle to take effect.

C States

Enable/Disable CPU Power Management. Allows CPU to go to C states when it is not 100% utilized.

TCC Activation Offset

Offset from factory set TCC activation temperature at which the Thermal Control Circuit must be activated. TCC will be activated at: TCC Activation Temp - TCC Activation Offset. TCC Activation Offset range is 0 to 63.

5.3.2 Power Management

State After G3

Specifies the state to go to when power is re-applied after a power failure (G3 state).

RTC Wake system from S5

Enable or disable System wake on alarm event. Select FixedTime for the system to wake at the hr::min::sec specified. Select DynamicTime for the system to wake at the current time + Increase minute(s).

PCIe Wake

Enables/disables PCI Express wake capability.

5.3.3 Serial Port Console Redirection

COM1

Console Redirection

Enables/disables SIO COM1 Console Redirection.

Console Redirection Settings

Specify how the host computer and the remote computer (in use) exchange data. Both computers should have the same or compatible settings.

5.3.4 USB Configuration

USB Mass Storage Driver Support

Enables/disables USB mass storage driver support.

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset time-out

USB mass storage device Start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller, where Auto uses default value for Root port 100ms, and for Hub port the delay is taken from Hub descriptor.

5.3.5 Trusted Computing

Security Device Support

Enables/disables BIOS support for security device. OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

SHA256 PCR Bank

Enables/disables SHA256 PCR Bank.

Pending Operation

Schedules Operation for the Security Device. Computer will reboot during restart in order to change State of Security Device.

Platform Hierarchy

Enables/disables Platform Hierarchy.

Storage Hierarchy

Enables/disables Storage Hierarchy.

Endorsement Hierarchy

Enables/disables Endorsement Hierarchy.

Physical Presence Spec Version

Directs OS to support PPI Spec Version 1.2 or 1.3. Some HCK tests may not support 1.3.

PH Randomization

Enables or Disables Platform Hierarchy randomization. **DO NOT ENABLE THIS QUESTION IN PRODUCTION PLATFORMS. THIS IS FOR DEVELOPMENT TESTING.** OVERRIDE Change-PlatformAuth ELINK for production platforms supporting TXT.

5.3.6 NCT6126D HW Monitor

Displays CPU/Board Temperatures, System/Backplane fan speeds, and various Voltages.

System Fan Control Mode

Configures fan control mode from Manual Mode, Auto Mode, and SMART FAN IV.

Manual Mode

Allows configuration of a set fan duty cycle.

Auto Mode

Fan runs at automatic speed for optimal thermal solution.

SMART FAN IV

Four temperatures and four fan duties can be user-configured.

5.3.7 BIOS Watchdog Timer

BIOS POST Watchdog

Disable disables WatchDog Timer, Second Mode enables Watch-dog Timer in second mode, Minute Mode enables Watchdog Timer in minute mode.

5.3.8 Intel(R) Network Adapter X710-TL

LLDP

Enables/disables LLDP.

5.4 Chipset

Setting incorrect or conflicting values in Chipset BIOS Setup may cause system malfunction.

5.4.1 System Agent (SA) Configuration

System Agent (SA) Configuration

Displays and configures VT-d capability and provides settings for Memory, Graphics, DMI/OPI configuration, and VMD setup menu.

5.4.1.1 Memory Configuration

Memory Configuration

Displays memory speed, size, maker, and configuration.

5.4.1.2 Graphics Configuration

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be the Primary Display.

Internal Graphics

Keeps IGFX enabled based on Setup options.

GTT Size

Selects GTT Size.

Aperture Size

Selects Aperture Size.

DVMT Pre-Allocated

Selects DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

5.4.1.3 DMI/OPI Configuration

DMI/OPI Configuration

Displays DMI link speed and width.

DMI Max Link Speed

Sets DMI Speed to Gen1/Gen2/Gen3/Gen4.

5.4.1.4 VMD Setup Menu

Enable VMD Controller

Enables/disables VMD controller.

5.4.2 PCH-IO Configuration

PCH-IO Configuration

Configures SATA, NVMe, VMD, and Security.

5.4.2.1 SATA Configuration

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Controller Speed

Sets maximum speed the SATA controller can support.

SATA HDD 1

Enables/disables SATA HDD 1.

SATA HDD 2

Enables/disables SATA HDD 2.

M.2 SATA

Enables/disables M.2 SATA.

5.4.2.2 NVMe Configuration

Displays NVMe device status.

5.4.2.3 Security Configuration

BIOS Lock

Enables/disables PCH BIOS Lock Enable. Required to be enabled to ensure SMM flash protection.

5.4.3 BackPlane PCIe Configuration

Displays BackPlane model name, slot information, speed control, and time tunings.

PCIe Speed #1/#2

Configures PCIe Max. speed, maximum detection speed for installed device, minimum PERST# signal active time, and maximum time PCIe device must enter L0 after PERST# is deasserted.

5.5 Security

If only the Administrator password is set, access is limited and the password is requested upon Setup. If User password is set, it acts as a power-on password and must be entered to boot or enter setup.

Administrator Password

Sets Administrator Password.

User Password

Sets User Password.

Secure Boot Menu

Configures Secure Boot.

5.5.1 Secure Boot Menu

Secure Boot

Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. Mode change requires platform reset.

Secure Boot Mode

Selects from Standard or Custom. In Custom, Secure Boot Policy variables can be configured by a physically present user without full authentication.

Key Management

Enables expert users to modify Secure Boot Policy variables without full authentication.

5.6 Boot

Boot Configuration

Specifies the priority of boot devices, all of which are detected during POST and displayed. Target Boot Option # and click to select the desired device.

Setup Prompt Timeout

Number of seconds to wait for setup activation key. The maximum value is 8.

Bootup Num-Lock State

Sets keypad Number Lock status following boot.

Quiet Boot

Option	Description
Disabled	Directs BIOS to display POST messages
Enabled	Directs BIOS to display the OEM logo.

Fast Boot

Option	Description
Disable Link	Directs BIOS to perform all POST tests.
Enabled	Directs BIOS to skip certain POST tests to boot faster.

SATA Support

Option	Description
Last Boot SATA Devices Only	Only last boot SATA device will be available in Post.
All SATA Devices	All SATA devices will be available in OS and Post.

VGA Support

Option	Description
Auto	Only install Legacy OpRom with Legacy OS and logo would NOT be shown during post.
EFI Driver	EFI driver will still be installed with EFI OS.

USB Support

Option	Description
Disabled	All USB devices will NOT be available until after OS boot.
Full Initial	All USB devices will be available in OS and Post.
Partial Initial	USB Mass Storage and specific USB port/device will NOT be available before OS boot.

PS2 Device Support

Option	Description
Disable Link	PS2 devices will be skipped.
Enabled	PS2 devices will not be skipped.

Network Stack Driver Support

Option	Description
Disable Link	Network Stack Driver will be skipped.
Enabled	Network Stack Driver will not be skipped.

Redirection Support

Option	Description
Disable Link	Redirection function disabled.
Enabled	Redirection function enabled.

5.7 Save & Exit

Save Changes and Exit

Exits system setup after saving the changes.

Discard Changes and Exit

Exits system setup without saving any changes.

Save Changes and Reset

Resets the system setup after saving changes.

Discard Changes and Reset

Resets system setup without saving any changes.

Save Changes

Saves Changes so far to any of the setup options.

Discard Changes

Discards Changes so far to any of the setup options.

Restore Defaults

Sets all BIOS options to default settings, designed for maximum system stability but less than maximum performance. Select Restore Defaults if the computer encounters system configuration problems.

Save as User Defaults

Saves all changes so far as User Defaults.

Restore User Defaults

Restores user defaults to all setup options.

Important Safety Instructions

For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

- Read these safety instructions carefully.
- Keep the User's Manual for future reference.
- Read the Specifications section of this manual for detailed information on the recommended operating environment.
- It is recommended that the device be installed in Information Technology Rooms that are in accordance with Article 645 of the National Electrical Code and NFPA 75.
- To avoid electrical shock and/or damage to device:
  - Keep device away from water or liquid sources.
  - Keep device away from high heat or humidity.
  - Keep device properly ventilated (do not block or cover ventilation openings).
  - Always use recommended voltage and power source settings.
  - Always install and operate device near an easily accessible electrical outlet.
  - Secure the power cord (do not place any object on/over the power cord).
  - Only install/attach and operate device on stable surfaces and/or recommended mountings.
  - The power must be connected to a ground connection.
- If the device will not be used for long periods of time, turn off and unplug from its power source.
- Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools.
- A RTC battery is used to store and retain BIOS configurations.
- The device must be serviced by authorized technicians when:

- ▷ The power cord or plug is damaged
- ▷ Liquid has entered the device interior
- ▷ The device has been exposed to high humidity and/or moisture
- ▷ The device is not functioning or does not function according to the User's Manual
- ▷ The device has been dropped and/or damaged and/or shows obvious signs of breakage

- ▶ Disconnect the power supply cord before loosening the thumbscrews and always fasten the thumbscrews with a screwdriver before starting the system up
- ▶ It is recommended that the device be installed only in a ventilated environment where access is:
  - ▷ Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required
  - ▷ Only afforded by the use of a tool or lock and key, or other means of security, and controlled by the authority responsible for the location
- ▶ The wire of terminal block should be fixed by an authorized technician with a recommended wire range: 30-10 sol/str, wire type: Cu, torque (Lb IN.): 5.3

	**BURN HAZARD** **Hot surface! Do not touch!** Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching.

Consignes de Sécurité Importante

S'il vous plaît prêter attention stricte à tous les avertissements et mises en garde figurant sur l'appareil, pour éviter des blessures ou des dommages.

- *Lisez attentivement ces consignes de sécurité.*
- *Conservez le manuel de l'utilisateur pour pouvoir le consulter ultérieurement.*
- *Lisez la section Spécifications de ce manuel pour des informations détaillées sur l'environnement d'exploitation recommandé.*
- *Il est recommandé d'installer l'appareil dans des salles de technologie de l'information conformes à l'article 645 du National Electrical Code et à la NFPA 75.*
- *Lorsque l'installation/le montage ou la désinstallation/le retrait du périphérique est necessaire:*
  - *Mettez l'appareil hors tension et débranchez tous les cordons/câbles d'alimentation*
  - *TeRéinstallez tous les couvercles de châssis avant de rétablir l'alimentation*
- *Pour éviter les chocs électriques et/ou d'endommager l'appareil:*
  - *Tenez l'appareil à l'écart de toute source d'eau ou de liquide.*
  - *Tenez l'appareil à l'écart d'une forte chaleur ou d'une humidité élevée.*
  - *Maintenez l'appareil correctement ventilé (n'obstruer ou ne couvrez pas les ouvertures de ventilation).*
  - *Utilisez toujours les réglages de tension et de source d'alimentation recommandés.*
  - *Installez et utilisez toujours l'appareil près d'une prise de courant facilement accessible.*
  - *Fixez le cordon d'alimentation (ne placez aucun objet sur le cordon d'alimentation).*
  - *Installez/fixez et utilisez l'appareil uniquement sur des surfaces stables et/ou sur les fixations recommandées.*

- ▷ *L'ordinateur Smart Touch est alimenté par un adaptateur ou une source CC. Veuillez vous assurer que l'adaptateur ou la source CC doit conserver la connexion à la terre s'il est doté d'une protection.*

- ▶ Si l'appareil ne doit pas être utilisé pendant de longues périodes, éteignez-le et débranchez-le de sa source d'alimentation
- ▶ *N'essayez jamais de réparer l'appareil, qui ne doit être réparé que par un personnel technique qualifié à l'aide d'outils appropriés*
- ▶ *Une batterie de type Lithium peut être fournie pour une alimentation de secours ininterrompue ou d'urgence.*
- ▶ *L'appareil doit être entretenu par des techniciens agrees lorsque:*
  - ▷ Le cordon d'alimentation ou la prise est endommagé(e)
  - ▷ Un liquide a pénétré à l'intérieur de l'appareil.
  - ▷ L'appareil a été exposé à une forte humidité et/ou de la buée.
  - ▷ L'appareil ne fonctionne pas ou ne fonctionne pas selon le manuel de l'utilisateur.
  - ▷ L'appareil est tombé et/ou a été endommagé et/ou présente des signes évidents de dommage.
- ▶ *Débranchez le cordon d'alimentation avant de desserrer les vis à oreilles et serrez toujours les vis à oreilles avec un tournevis avant de mettre le système en marche.*
- ▶ *Le fil du bornier doit être fixé par un technicien agréé et recommandation pour la gamme de fils : 30-10 sol/str, type de fil : Cu, couple (Lb IN.) : 5,3*

	***RISQUE DE BRÛLURES*** ***Partie chaude!*** *Ne touchez pas cette surface, cela pourrait entraîner des blessures. Pour éviter tout danger, laissez la surface refroidir avant de la toucher.*

Getting Service

Ask an Expert: https://www.adlinktech.com/en/Askanexpert

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