Delta MH1 User Guide

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Preface

Thank you for purchasing this product. This user guide provides information about the MH1 Series motion control PAC.

This user guide includes:

- Product inspection and model explanation
- Specifications and product interface
- Installation
- Description of BIOS setting
- System operation and setting
- EcNavi software installation and application
- EzDMC operating instructions

Product features:

MH1 Series motion control PAC supports DMCNET (Delta Motion Control Network) or EtherCAT (Ethernet Control Automation Technology) control interface to fulfill users' requirements. DMCNET offers high-performance multi-axis expansion capability to simultaneously control 12 axes of motion control in 1 ms and supports a variety of motion control modules, such as linear interpolation, arc interpolation, spiral interpolation, and continuous interpolation. Delta's EtherCAT motion control solution supports all EtherCAT master functions, and is capable of controlling up to 100 slave stations within 1 ms cycle time. It also supports 35 homing modes, point-to-point position control, speed control, and torque control; 2 groups of linear interpolation, 3 groups of arc, 2D, and helical interpolation are also provided.

The complete motion control functions of the MH1 Series will be able to meet the needs of the diverse industry. This product is the optimal integration platform for multi-axis synchronous control. It is easy to assemble with better stability and scalability. This is the one and only choice for industrial upgrading.

How to use this user guide:

This user guide can be used as a reference while applying the MH1 Series motion control PAC, which contains information regarding product installation, setting, as well as instructions on how to use and maintain this product.

DELTA technical services:

Please consult your DELTA equipment distributor or DELTA Customer Service Center if you encounter any problems.

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June, 2017

Product Inspection and Model Explanation

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This chapter introduces the MH1 series regarding its product inspection, product model explanation, and safety precautions. Please read through this chapter before using the product.

1.1   Product inspection

Please check the following once you receive the product:

1.   Packaging: Make sure the product's packaging is intact.

2.   Bubble wrap: For protection of the product; make sure the stickers are securely attached to the bubble wrap.

3.   PAC: Check if the appearance is intact and all accessories are included.

4.   Product installation instructions: Check if an instruction sheet is included.
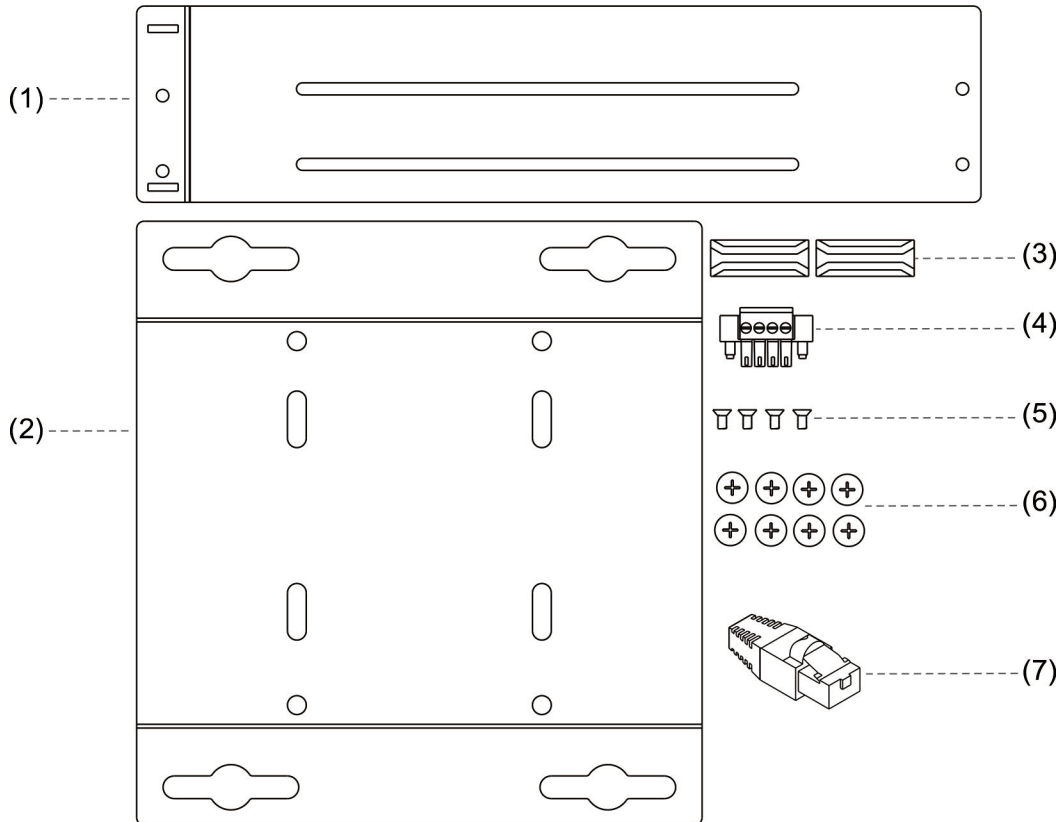
No.	Item		Quantity
(1)	Metal sheet for securing the PCI / PCIe card		1
(2)	Securing base		1
(3)	Plastic component for securing the PCI / PCIe card		2
(4)	Power connector		1
(5)	Small black screw		4
(6)	Large flat head screw		8
(7)	Terminal resistor	MH1 - A12/C50/C70 D Series	1
		MH1 - A12/C50/C70 E Series	0
		MH1 - A12/C50/C70 N Series	0
		MH1 - S30D	2

1.2   Product model explanation

$$\underline{\text{MH1}} - \underline{\text{A12}}\ \underline{\text{D}} - \underline{\text{A}}\ \underline{0}\ \underline{1}\ \underline{\text{D}}\ \underline{\text{G}}$$

(1)   (2)   (3)   (4) (5) (6) (7) (8)

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(1)	Product type	MH1 = Motion control PAC (1st generation)
(2)	Processor	A12 = Intel Atom E3845 Quad Core 1.91 GHz C50 = Intel Core i5-3610ME Dual Core 2.7 GHz C70 = Intel Core i7-3612QE Quad Core 2.1 GHz S30 = VIA Nano X2 Dual Core 1.2 GHz
(3)	Expansion interface	N = None D = DMCNET E = EtherCAT
(4)	Expansion card slot	N = None A = Two PCI slots B = Two PCIe slots (x1+x1) C = Two PCIe slots (x4+x1)

(5)	Internal memory & memory space		DRAM	micro-SD
		0	4 GB	-
		3	4 GB + 4 GB	

(6)	CFast card & SSD		CFast	SSD
		0	-	-
		1	16 GB	-
		3	32 GB	-
		4	-	64 GB
		5	-	128 GB

(7)	Customer code	D = DELTA standard version
(8)	Operation system and software	0 = non-OS D = w/ Windows XP Embedded E = w/ Windows XP Embedded + RTX OS + EtherCAT Master F = w/ Windows 7 Embedded (32-bit) + RTX OS + EtherCAT Master G = w/ Windows 7 Embedded (32-bit) H = w/ Windows 7 Embedded (64-bit) M = w/ Windows 7 Embedded (64-bit) + IMP

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1.3 Safety precautions

■ To avoid severe damage caused by possible electric shock, please unplug the power supply connector of the PAC before moving the PAC.

■ Before connecting or disconnecting any signal cables from the PAC, please make sure all power cables are unplugged.

■ Please make sure the voltage power supply unit is adjusted to the standard level used in the country/region where the PAC is installed. If you are unsure of the supplying voltage of the given area, please contact the local power company for more information.

■ If the power supply unit is damaged, do not repair it by yourself. Please contact Delta's technicians or local distributors for assistance.

■ How to force shutdown the PAC?

 (1) Press and hold the power button for 5 seconds to force a shutdown; wait for at least 5 seconds before pressing the power button again to restart the PAC.

 (2) You may not be able to press the power button to restart the PAC if failing to follow the procedure above. In this case, you will need to force shutdown again by following the above instructions. (That is, press and hold the power button for 5 seconds and wait for another 5 seconds before pressing the power button again.)

■ It is recommended to install this product in a case with proper protection.

■ This product is designed for industrial automation equipment and applications. To avoid danger, please read this user guide carefully and follow the instructions for installation.

■ Failure to operate this product in accordance with the instructions provided in this user guide may result in damage to the equipment or malfunction.

Specifications and Product Interface

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This chapter includes the product specifications and product interface. Please refer to this chapter if disassembling the removable components is needed.

2.1   Electrical specifications

Item		MH1-A12 D/E/N	MH1-C50 D/E/N	MH1-C70 D/E/N
Processor system	Processor	Intel Atom E3845 Quad Core 1.91 GHz	Intel Core i5-3610ME Dual Core 2.7 GHz	Intel Core i7-3612QE Quad Core 2.1 GHz
	System chipset	N/A	Intel QM77	
	BIOS	AMI BIOS	AMI BIOS	
	Memory	DDR3L-1333 Default 4 GB, support ECC	2 x DDR3-1600 Default 4 GB, Max 16 GB, support ECC	
	Non-volatile memory	128 KB MRAM	128 KB MRAM	
Expansion display		2560x1600 / 60Hz	2048x1536 / 75 Hz	
Output / input connector	Network interface	2 x IEEE 802.3/802.3u/802.3ab 1 Gbps		
	BUS communication interface	DMCNET™ (12-Axis) - (A12D/C50D/C70D Series products) 2 x EtherCAT - (A12E/C50E/C70E Series products) N/A - (A12N/C50N/C70N Series products)		
	USB	4 x USB 2.0		
	Serial communication port	1 x RS-232 (Supports hardware flow control)		
	Digital input	1-CH isolated, Sink type, 24 V_{DC} (5 mA/CH) - (A12D/C50D/C70D Series products)		
	Digital output	1-CH isolated, Sink type, 24 V_{DC} (10 mA/CH) - (A12D/C50D/C70D Series products)		
	Encoder input	2-CH isolated, EA± / EB± - (A12D/C50D/C70D Series products)		
	Compare output	2-CH isolated, CMP± - (A12D/C50D/C70D Series products)		
	Expansion interface[1]	2 x PCI slot or 1 x PCIe x4 slot + 1 x PCIe x1 slot (C50/C70 Series products) 2 x PCI slot or 1 x PCIe x1 slot + 1 x PCIe x1 slot (A12E/N Series products) 2 x PCI slot (A12D Series products)		
Storage device	CFast card	1 x CFast card (Optional)		
	SSD[1]	1 x 2.5" SATA SSD (Optional)		
Power supply requirement	Input voltage type	15 ~ 30 V_{DC}		
	Power consumption[2]	24V / 1A / 24W	24V / 1.25A / 30W	24V / 1.42A / 34W
Mechanism	Mounting	Desk / wall mounting		
	Weight	3.4 Kg	3.9 Kg	3.9 Kg
	Dimensions	127 x 175 x 250 mm (W x H x D)		
Environment	Operation temperature	0°C ~ 50°C		
	Storage temperature	-30°C ~ 85°C		
	Relative humidity	0% ~ 90% RH (non-condensing)		
	Pollution degree	Pollution degree 2		
	Vibration test	2 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr / axis		
	Shock test	75 G, IEC 60068-2-27, half-sine wave, 11 ms duration		
	Safety approval	CE		
Supported software	Microsoft Windows	Window 7.0, Window 7 Embedded	Window 7.0, Window XP Embedded, Window 7 Embedded	

Note:
1.   Max. power limit: PCIe x4 slot is 25W, PCIe x1 slot is 10W, PCI slot is 10W, SSD is 5W.
2.   When CPU is running at full capacity, excluding external storage device (CFast card / SSD) and expansion interface (PCI / PCIe card).

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Item		MH1-S30D
Processor system	Processor	VIA Nano X2 Dual Core 1.2 GHz
	System chipset	VIA VX900
	BIOS	AMI BIOS
	Memory	1xDDR3-1066, Default 4 GB, Max 8 GB
	Non-volatile memory	128 KB MRAM
Expansion display		VGA 2048x1536 / 75 Hz
Output / input connector	Network interface	2 x IEEE 802.3/802.3u/802.3ab 1 Gbps
	BUS communication interface	DMCNET (2 x 6-axis)
	USB	4 x USB 2.0
	Serial communication port	1 x RS-232 (Supports hardware flow control)
	Expansion interface [1]	2 x PCI slot or 1 x PCIe x1 slot + 1 x PCIe x1 slot
Storage device	CFast card	1 x CFast card (Optional)
	SSD[1]	1 x 2.5" SATA SSD (Optional)
	Micro-SD card	1 x Micro-SD card (Optional)
Power supply requirement	Input voltage type	12 ~ 30 V_{DC}
	Power consumption[2]	24V / 1.5A / 36W
Mechanism	Mounting	Desk / wall mounting
	Weight	3.9 Kg
	Dimensions	127 x 175 x 250 mm (W x H x D)
Environment	Operation temperature	0 °C ~ 50 °C
	Storage temperature	-30 °C ~ 85 °C
	Relative humidity	0% ~ 90% RH (non-condensing)
	Pollution degree	Pollution degree 2
	Vibration test	2 Grms, IEC 60068-2-64, random, 5 ~ 500 Hz, 1 hr / axis
	Shock test	75 G · IEC 60068-2-27, half-sine wave, 11 ms duration
	Safety approval	CE
Supported software	Microsoft Windows	Window 7.0, Window XP Embedded, Window 7 Embedded

Note:
1. Max. power limit: PCIe x1 slot is 10W, PCI slot is 10W, SSD is 5W.
2. When CPU is running at full capacity, excluding external storage device (CFast card / SSD) and expansion interface (PCI / PCIe card).

2.2   Dimensions

Dimensions of MH1 Series PAC: 230 mm(L) x 127 mm(W) x 175 mm(H)
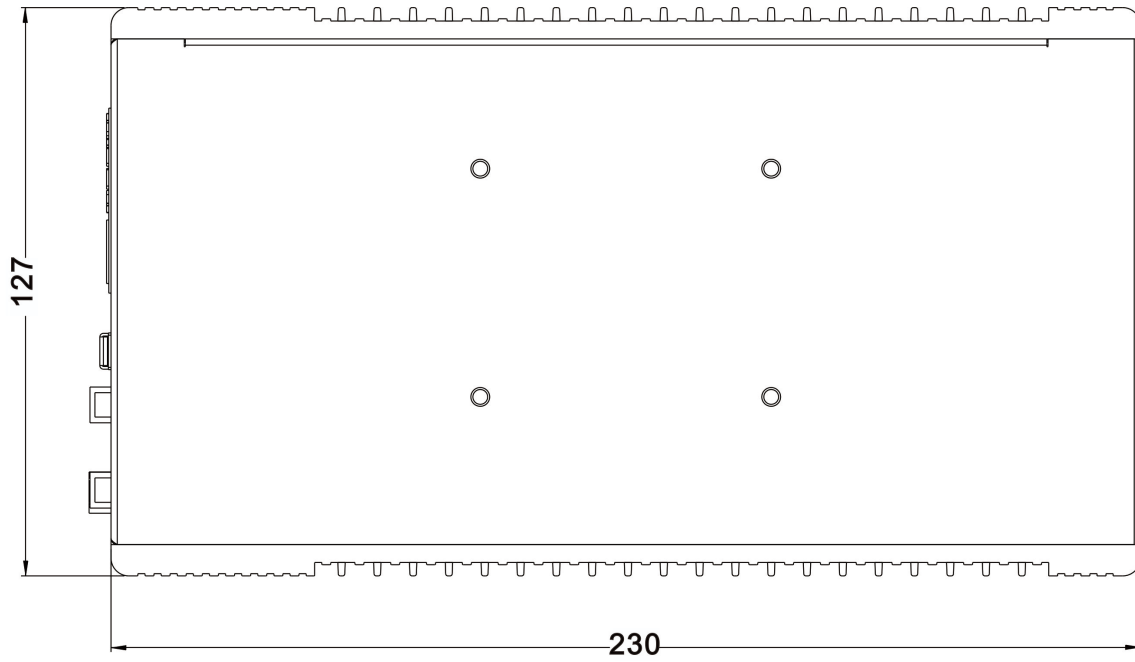
Figure 2.2.1   Bottom view of the MH1 Series PAC
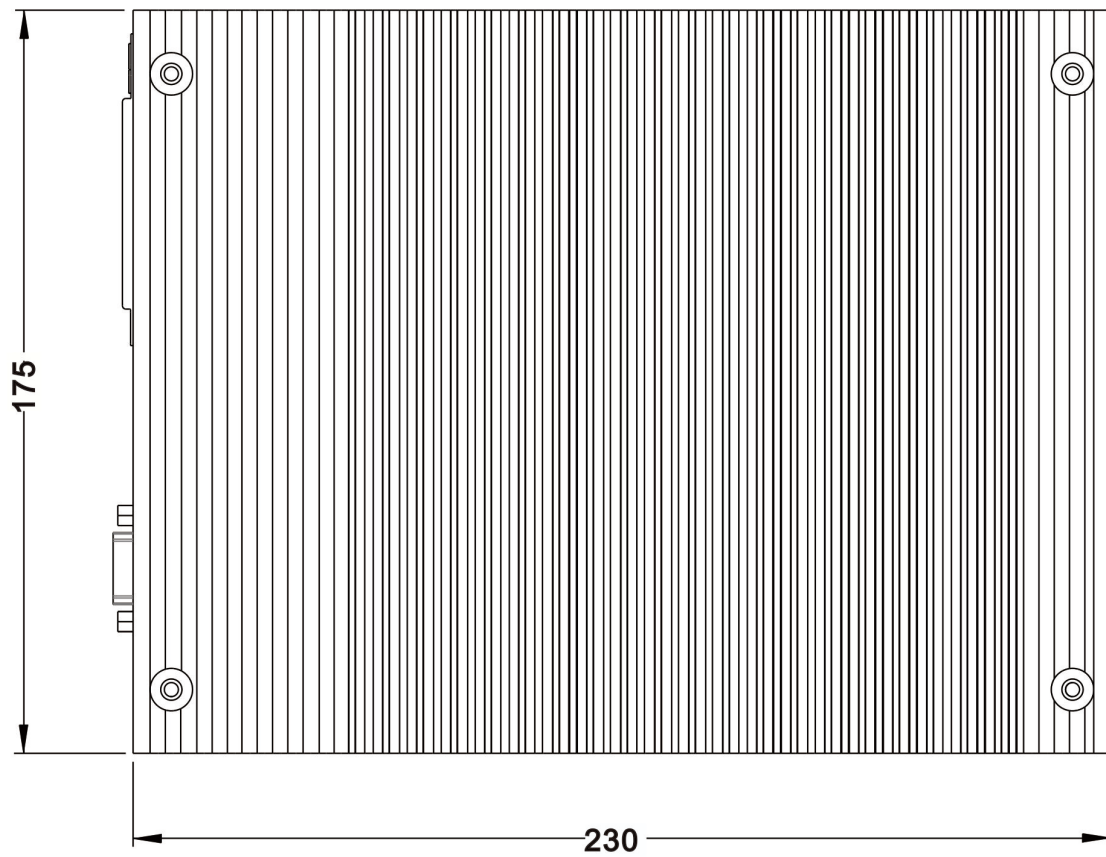
Figure 2.2.2   Side view of the MH1 Series PAC
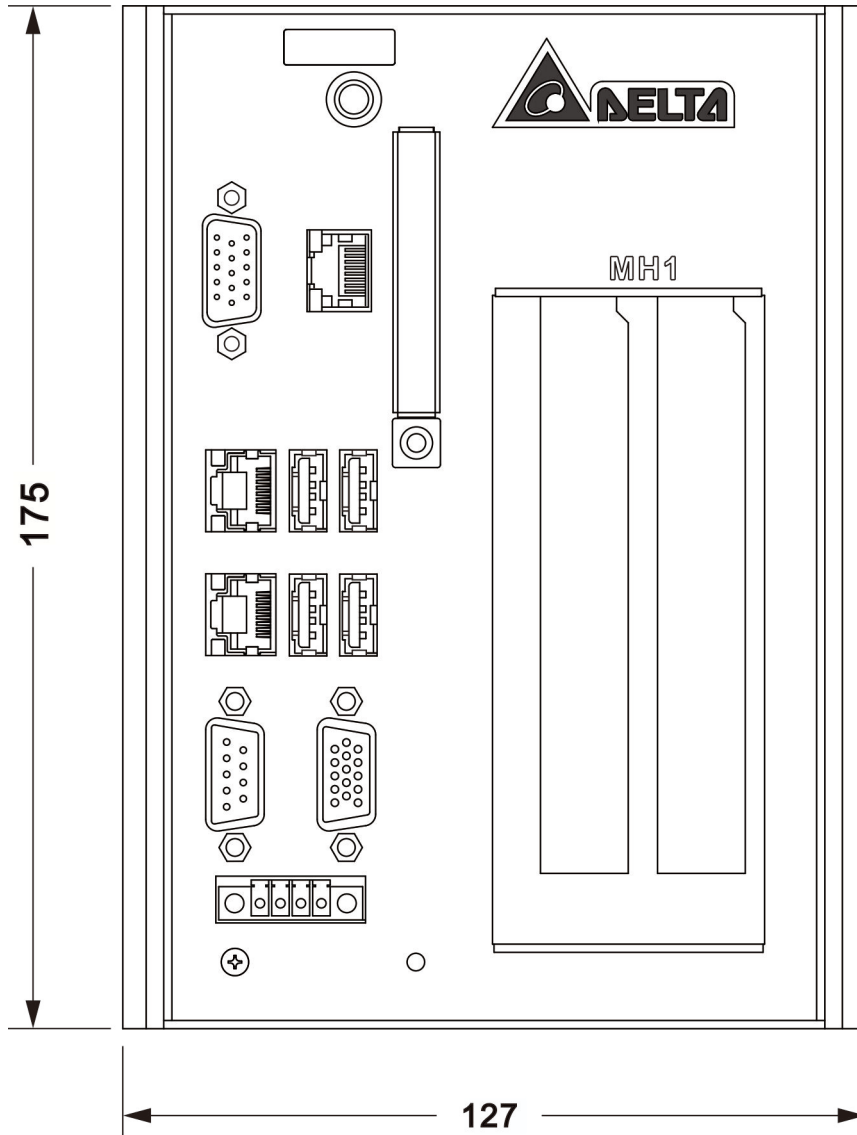
Figure 2.2.3   Front view of the MH1 Series PAC

Dimensions of the base of MH1 Series PAC: 150 mm(L) x 160 mm(W) x 6 mm(H)
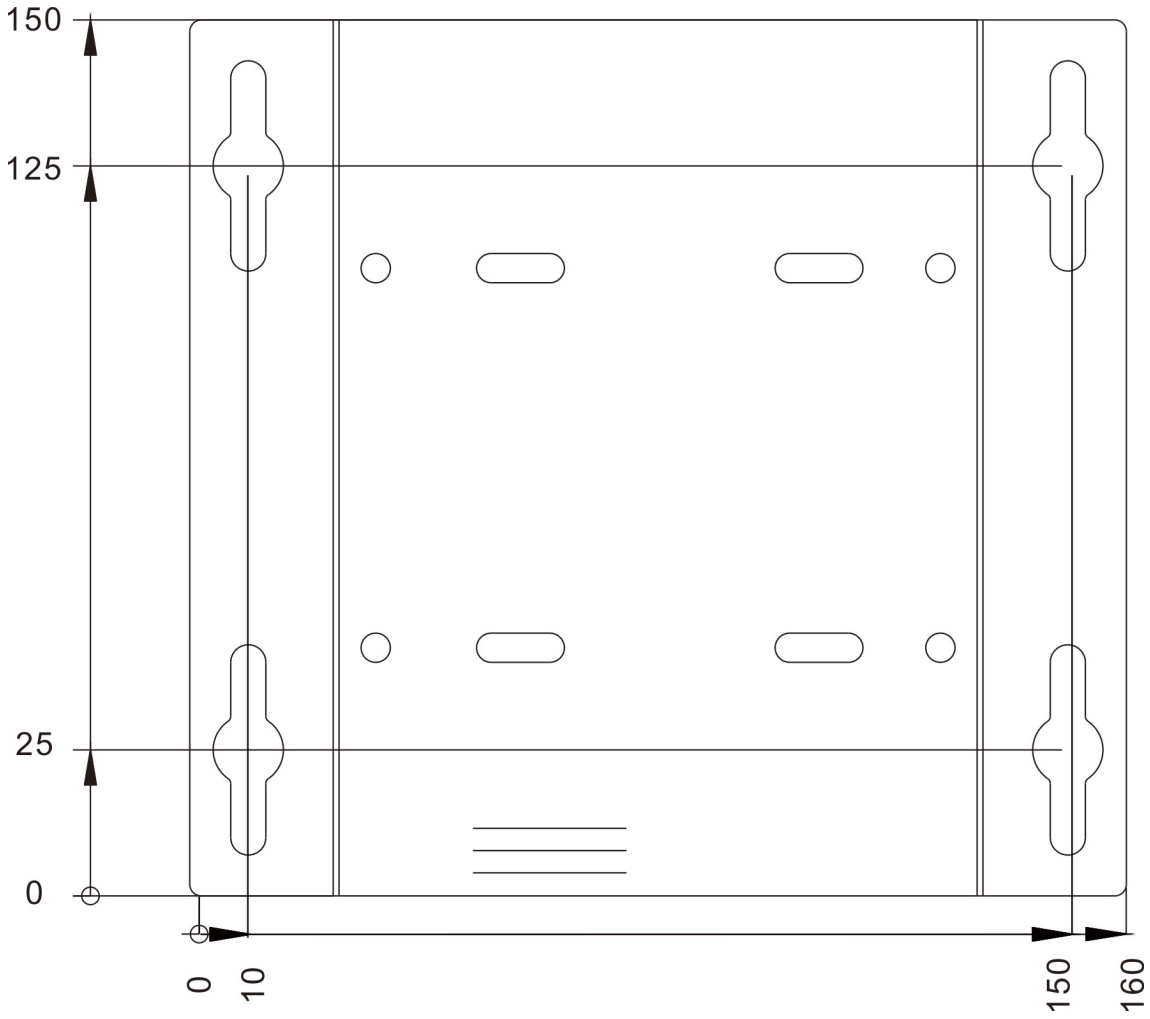
Figure 2.2.4   Front view of the base
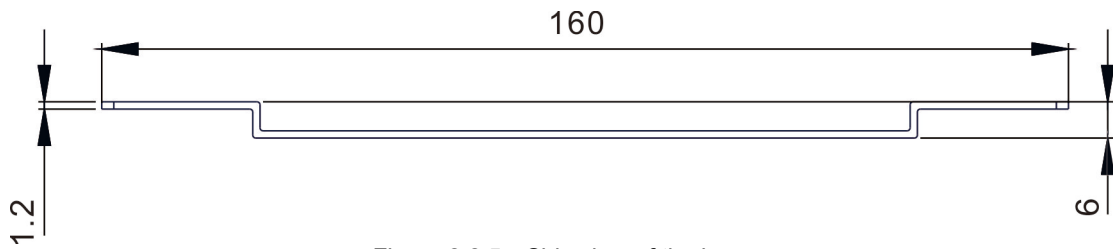
Figure 2.2.5   Side view of the base

2.3   Product interface

2.3.1   MH1 - A12/C50/C70 D Series

The figure below shows the product interface of MH1 - A12/C50/C70 D Series PAC.
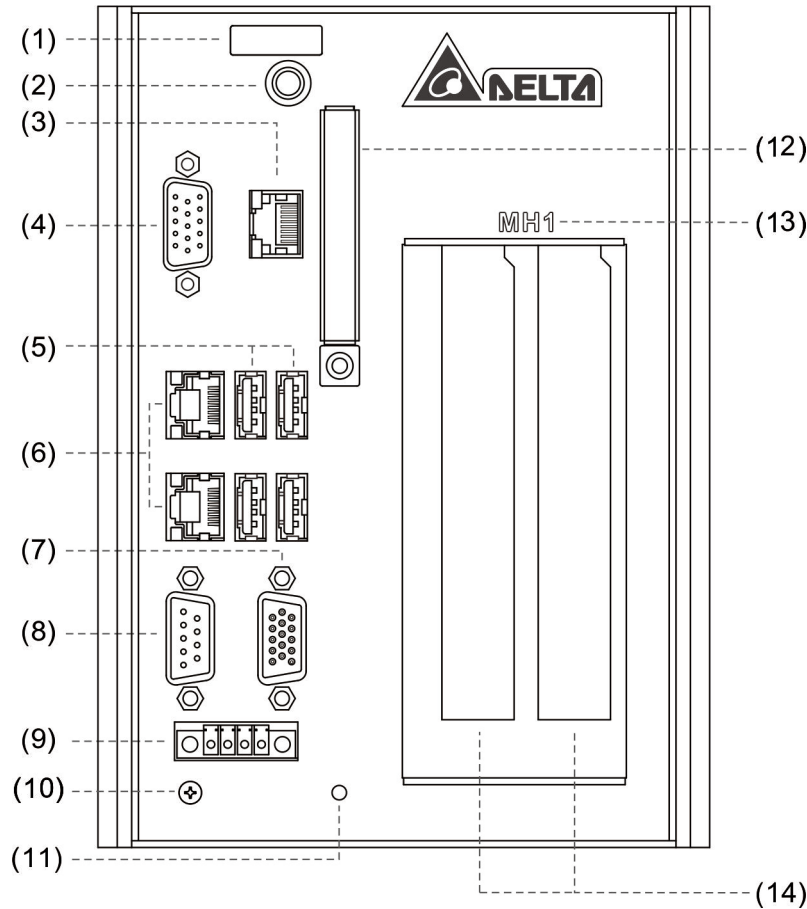
Description of each connector is as follows:

No.	Description	No.	Description
(1)	LED indicator	(8)	RS-232 serial port
(2)	Power On / Off switch	(9)	Power supply connector
(3)	DMCNET connector	(10)	GND screw
(4)	GPIO connector	(11)	Reset switch
(5)	USB 2.0 port	(12)	CFast card slot
(6)	Gigabit LAN port	(13)	Product name
(7)	VGA port	(14)	PCI / PCIe expansion slots

2.3.2 MH1 - A12/C50/C70 E Series

The figure below shows the product interface of MH1 - A12/C50/C70 E Series PAC.
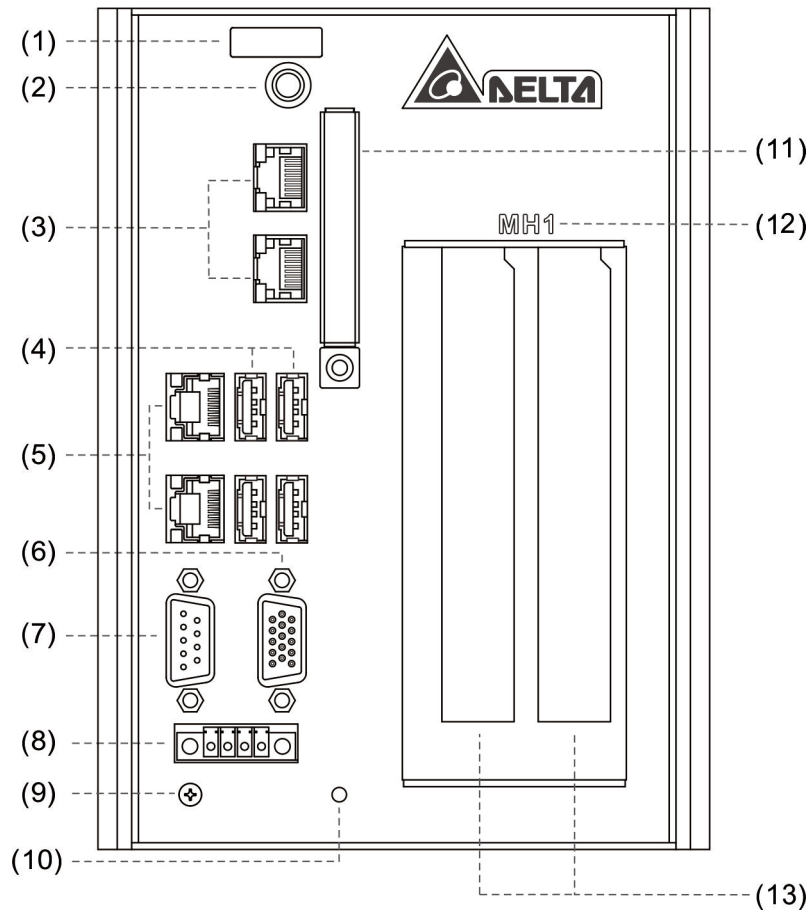
Description of each connector is as follows:

No.	Description	No.	Description
(1)	LED indicator	(8)	Power supply connector
(2)	Power On / Off switch	(9)	GND screw
(3)	EtherCAT connector	(10)	Reset switch
(4)	USB 2.0 port	(11)	CFast card slot
(5)	Gigabit LAN port	(12)	Product name
(6)	VGA port	(13)	PCI / PCIe expansion slots
(7)	RS-232 serial port		

2.3.3 MH1 - A12/C50/C70 N Series

The figure below shows the product interface of MH1 - A12/C50/C70 N Series PAC.
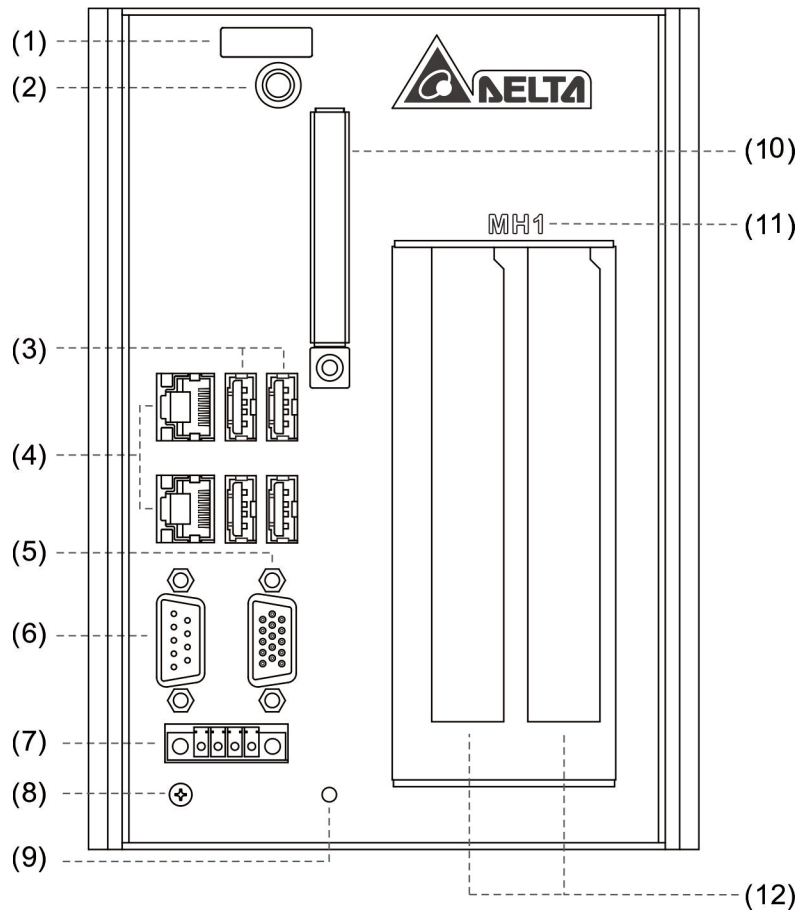
Description of each connector is as follows:

No.	Description	No.	Description
(1)	LED indicator	(7)	Power supply connector
(2)	Power On / Off switch	(8)	GND screw
(3)	USB 2.0 port	(9)	Reset switch
(4)	Gigabit LAN port	(10)	CFast card slot
(5)	VGA port	(11)	Product name
(6)	RS-232 serial port	(12)	PCI / PCIe expansion slots

2.3.4 MH1 - S30D

The figure below shows the product interface of MH1 - S30D PAC.
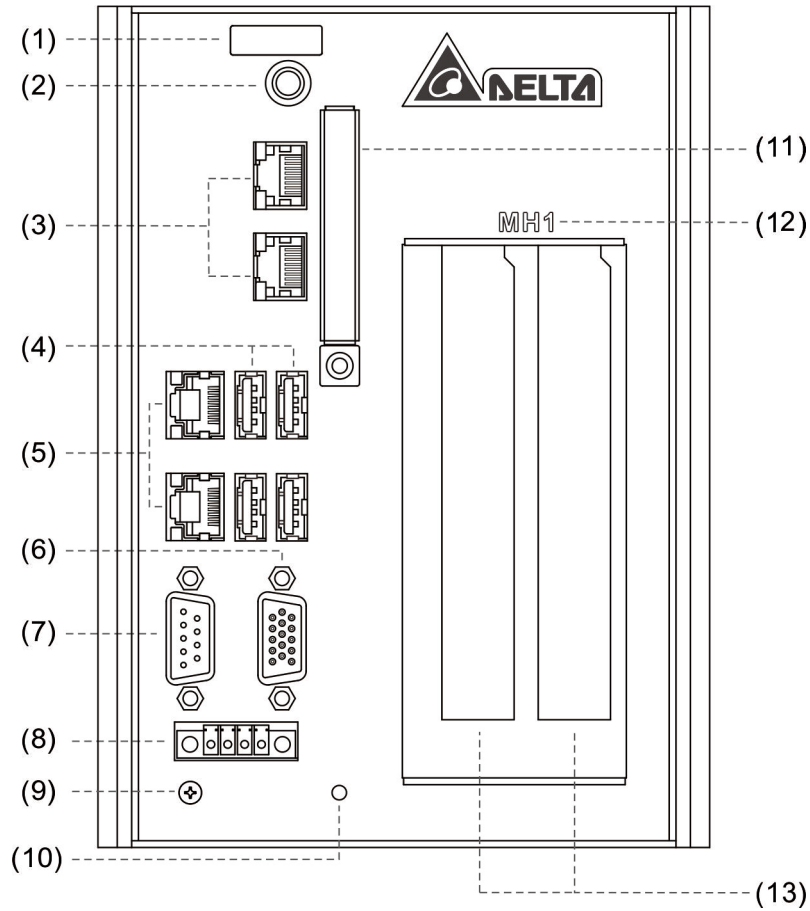
Description of each connector is as follows:

No.	Description	No.	Description
(1)	LED indicator	(8)	Power supply connector
(2)	Power On / Off switch	(9)	GND screw
(3)	DMCNET port	(10)	Reset switch
(4)	USB 2.0 port	(11)	CFast card slot
(5)	Gigabit LAN port	(12)	Product name
(6)	VGA port	(13)	PCI / PCIe expansion slots
(7)	RS-232 serial port	-	-

2.3.5   Motion control fieldbus communication interface (connector)

■   MH1-D Series: The following shows the detail of the DMCNET connector and its pin assignment.
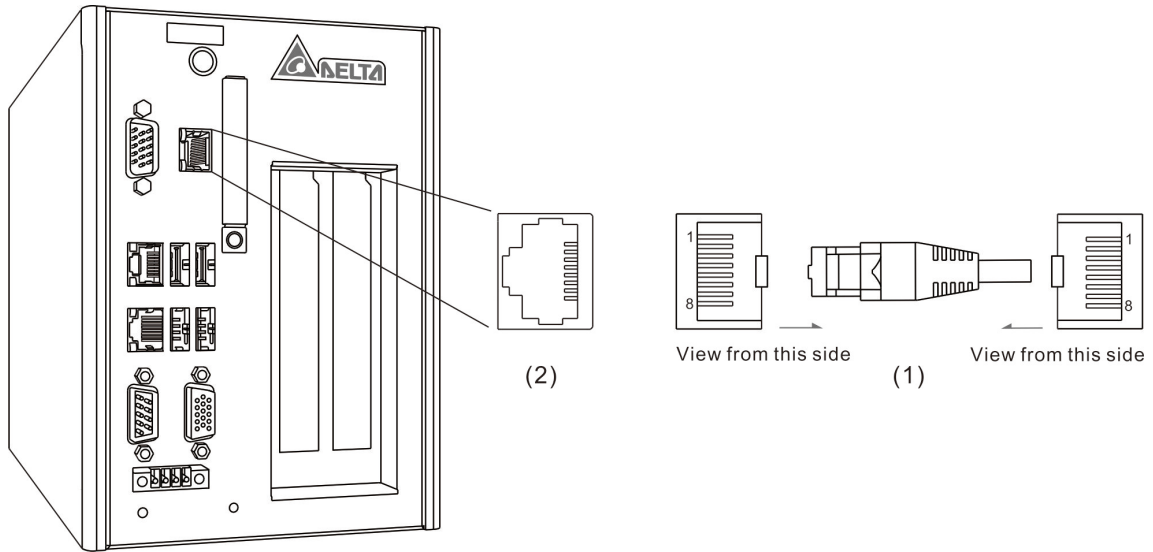
(1) DMCNET connector (male)   (2) DMCNET connector (female)

Pin assignment of DMCNET connector is as follows:

PIN	Description
1	1st RS485 transmission signal (+)
2	1st RS485 transmission signal (-)
3	2nd RS485 transmission signal (+)
4	NC
5	NC
6	2nd RS485 transmission signal (-)
7	External GND
8	External GND

Indicator description of DMCNET port:

	Indicator display	Description
LED (right)	Yellow	DMCNET enabled
LED (left)	Green	DMCNET power indicator

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■   MH1-D Series: The following shows the detail of the GPIO connector and its pin assignment.
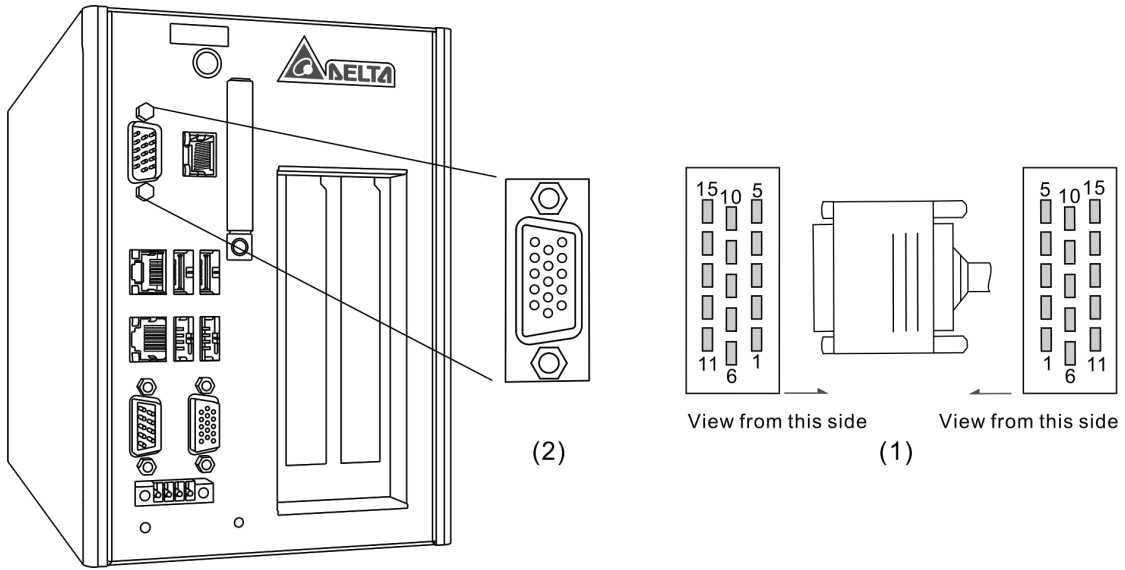
(1) GPIO connector (male)   (2) GPIO connector (female)

Pin assignment of GPIO connector is as follows:

PIN	Description
1	QEP_A_1-
2	QEP_B_1-
3	QEP_A_2-
4	QEP_B_2-
5	External GND
6	QEP_A_1+
7	QEP_B_1+
8	QEP_A_2+
9	QEP_B_2+
10	GPIO_IN
11	QEP_CMP_1+
12	QEP_CMP_1-
13	QEP_CMP_2+
14	QEP_CMP_2-
15	GPIO_OUT

■ MH1-E Series: The following shows the detail of the EtherCAT connector and its pin assignment.

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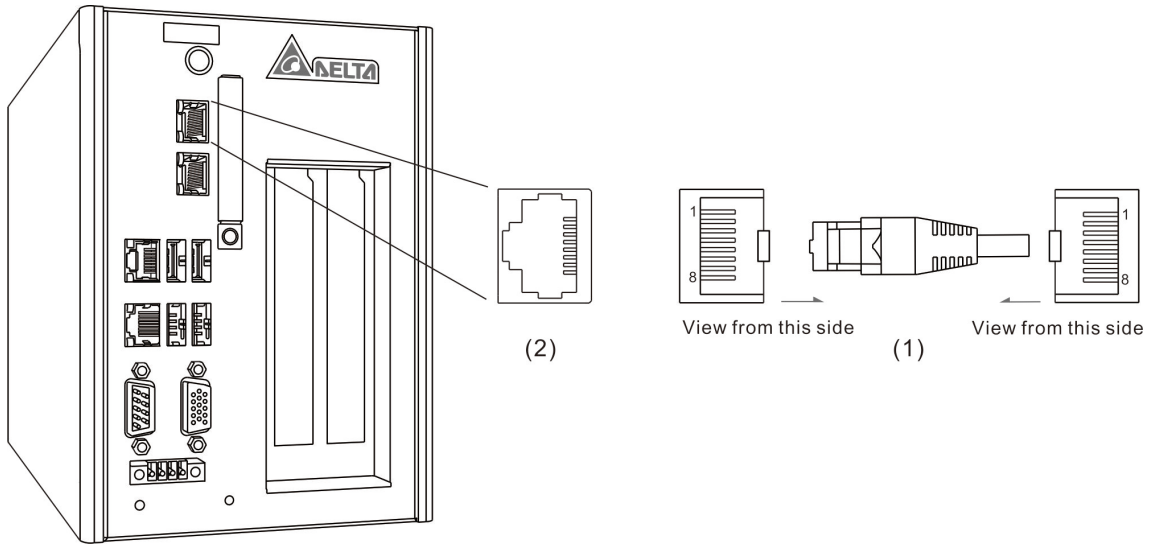
(1) EtherCAT connector (male)   (2) EtherCAT connector (female)

Pin assignment of EtherCAT connector is as follows:

PIN	Description
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

Indicator description of EtherCAT connector:

	Indicator display	Description
LED (left)	Non-flashing (Green)	Network connected
	Flashing (Green)	Transmission in progress

2.3.6 Ethernet connector

■ The following shows the detail of the Gigabit LAN connector and its pin assignment.

View from this side   View from this side
(2)   (1)
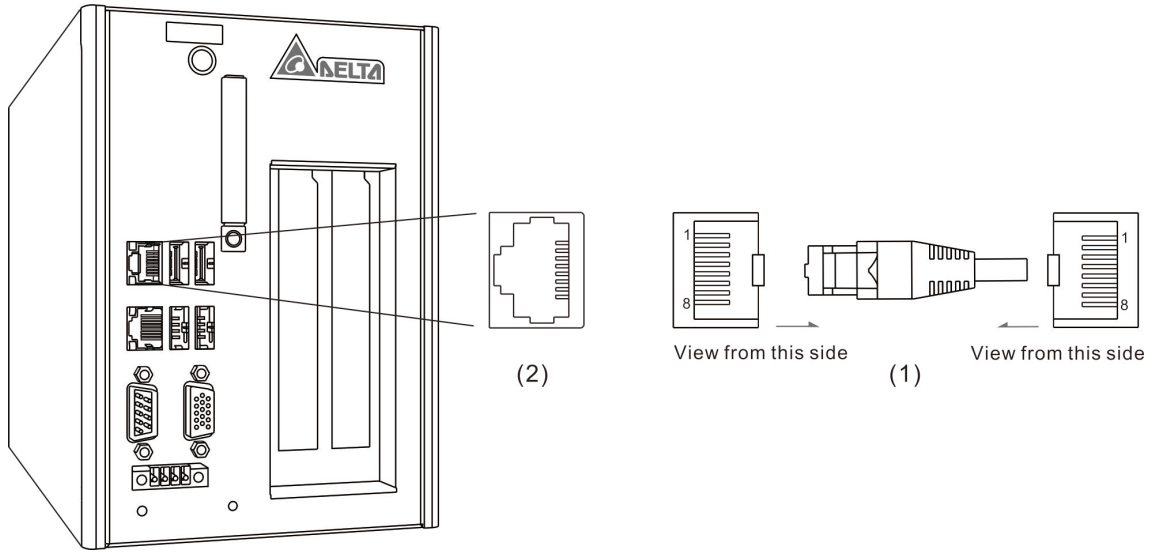
(1) Gigabit LAN connector (male)   (2) Gigabit LAN connector (female)

Pin assignment of Gigabit LAN connector is as follows:

PIN	Description
1	TX+_1
2	TX-_1
3	TX+_2
4	TX+_3
5	TX-_3
6	TX-_2
7	TX+_4
8	TX-_4

Indicator description of Ethernet connector:

	Indicator display	Description
LED (left)	Non-flashing (Green)	Network connected
	Flashing (Green)	Transmission in progress
LED (right)	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

2.3.7   USB connector

■   The following shows the detail of the USB 2.0 connector and its pin assignment.
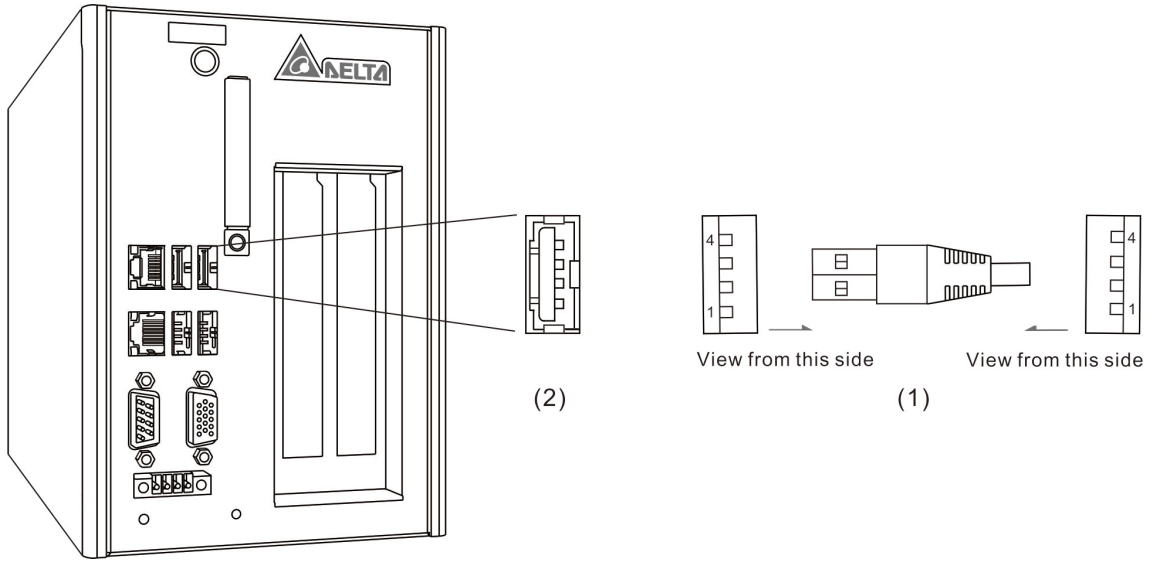
(1)   USB 2.0 connector (male)   (2) USB 2.0 connector (female)

Pin assignment of the USB 2.0 connector is as follows:

PIN	Description
1	Power supply (+5V)
2	D-
3	D+
4	GND

2.3.8 VGA connector

◼ The following shows the detail of the VGA connector and its pin assignment.
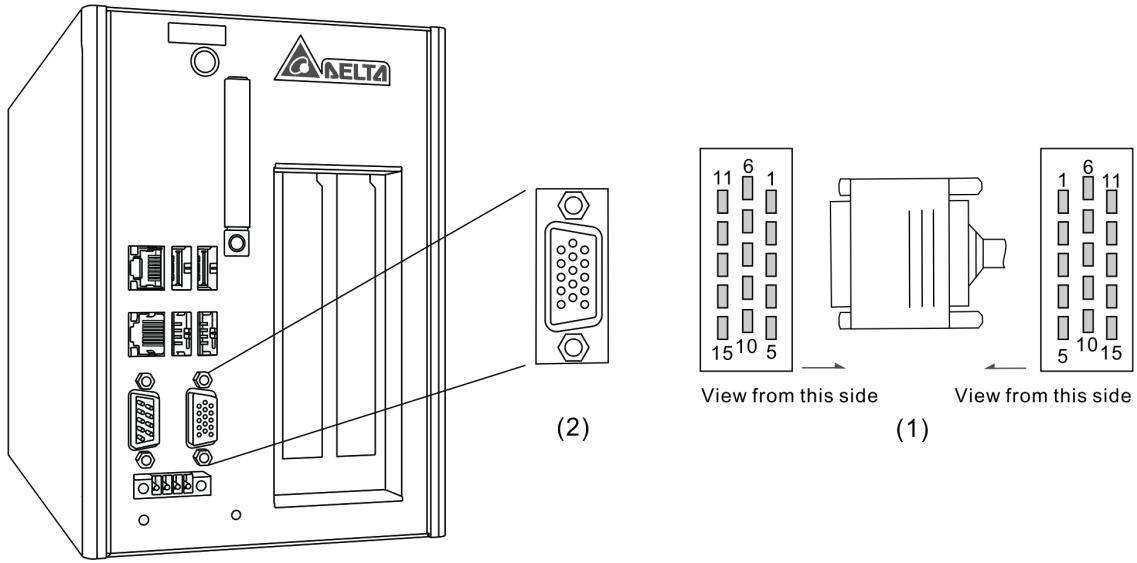
(1) VGA connector (male)   (2) VGA connector (female)

Pin assignment of the VGA connector is as follows:

PIN	Description	PIN	Description
1	Red	9	+5V
2	Green	10	GND
3	Blue	12	SDA
5	GND	13	H-Sync
6	GND	14	V-Sync
7	GND	15	SCL
8	GND	Others	NC

2.3.9   RS-232 Serial communication port

The following shows the detail of the RS-232 connector and its pin assignment.
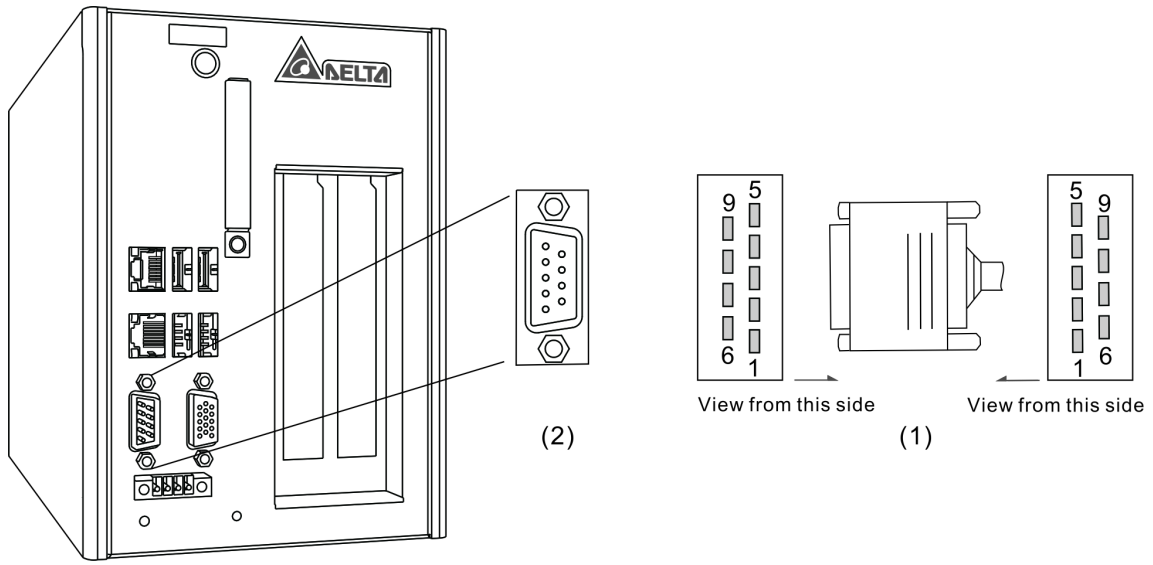
(1) RS-232 serial connector (male)   (2) RS-232 serial connector (female)

Pin assignment of the RS-232 connector is as follows:

PIN	Description
1	NC
2	RX
3	TX
4	NC
5	GND
7	RTS
8	CTS
9	NC

2.3.10   Power connector

The following shows the detail of the power connector and its pin assignment.
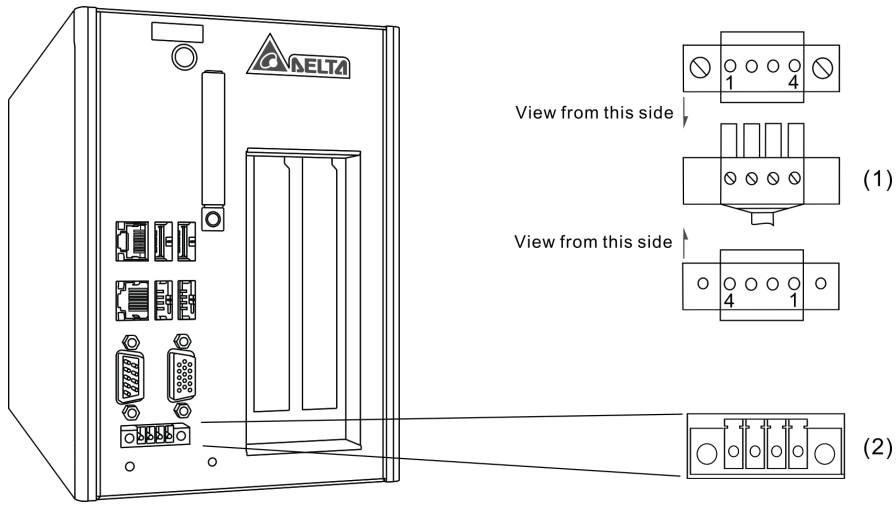
(1)   Power connector (male)   (2) Power connector (female)

Description of the power connector is as follows:

PIN	Description
1	Main power supply (+24V)
2	GND
3	GND (FG)
4	UPS reset signal (S)

2.4   Description of internal connectors

There are three types of converter board available, which are:

1.   PCI & PCI (two PCI slots) as shown in Figure 2.4.1.

2.   PCIe x 4 & PCIe x 1 (one PCIe x 4 slots, one PCIe x 1 slot) as shown in Figure 2.4.2.

3.   PCIe x 1 & PCIe x 1 (two PCIe x 1 slots) as shown in Figure 2.4.3.
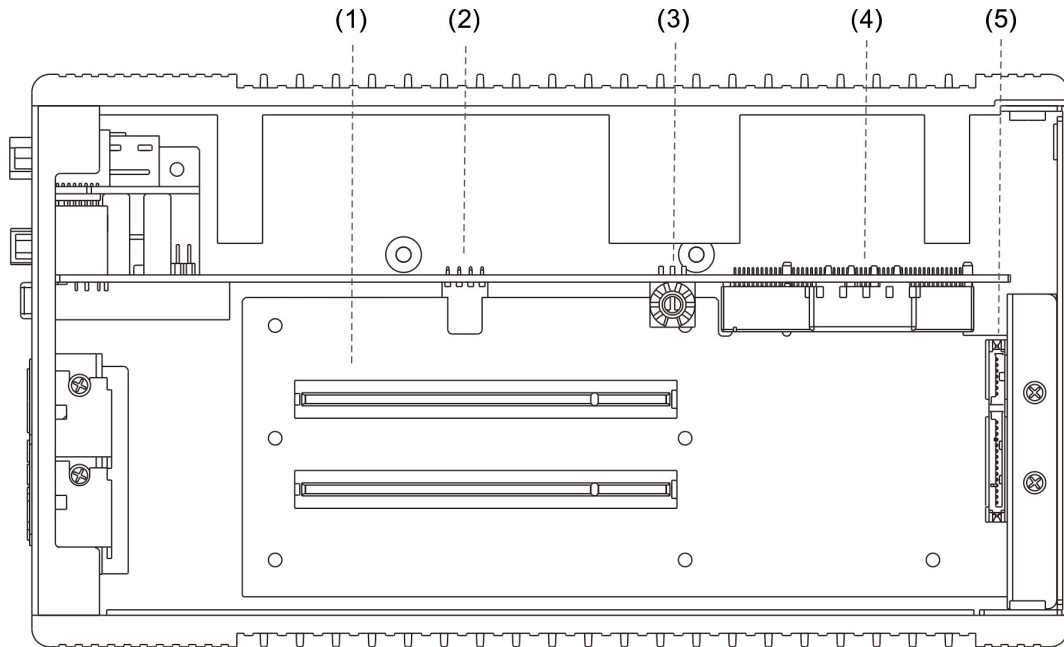
Figure 2.4.1   Top view of the internal of MH1 Series (two PCI slots)
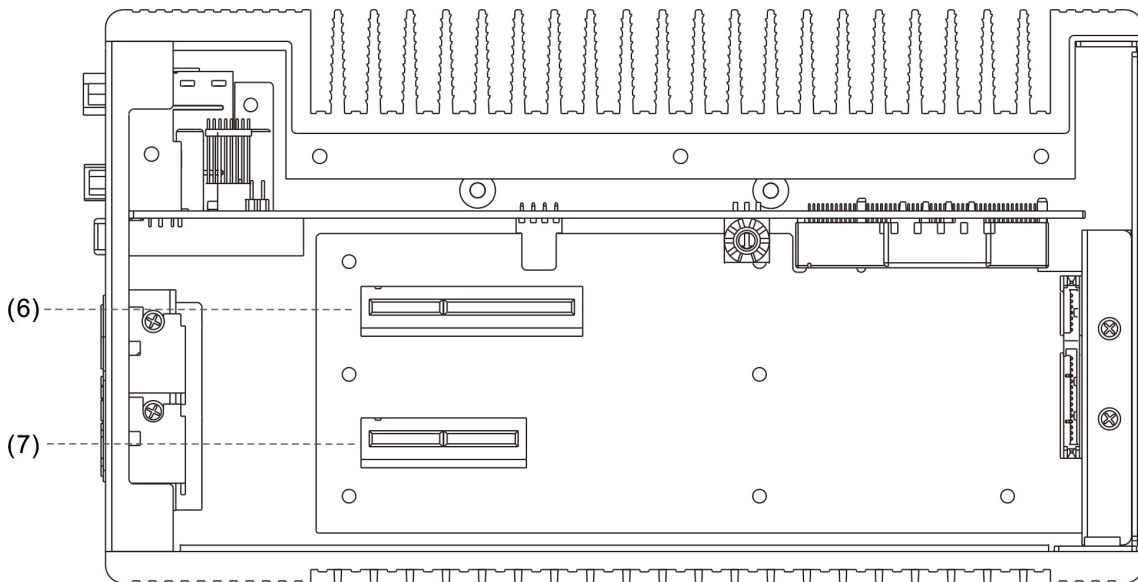
Figure 2.4.2   Top view of the internal of MH1 Series (one PCIe x4 slot + one PCIe x1 slot)

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(8)
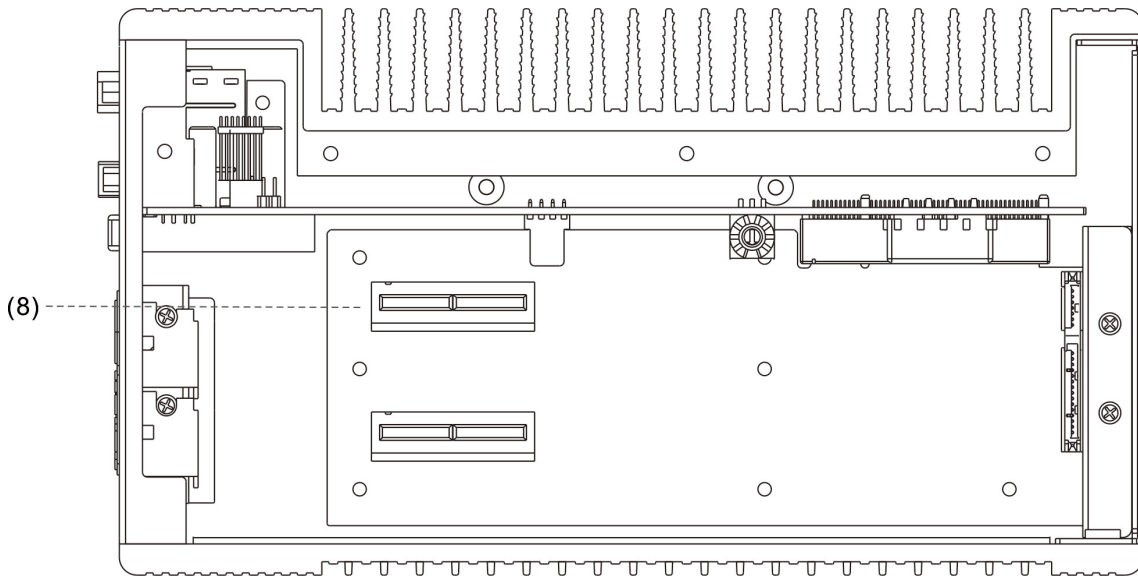
Figure 2.4.3   Top view of the internal of MH1 Series (two PCIe x1 slots)

Description of internal connectors is as follows:

No.	Description
(1)	PCI card slot
(2)	Compare connector
(3)	Station knob
(4)	12V power supply connector
(5)	SSD card slot
(6)	PCIe x4 card slot
(7)	PCIe x1 card slot
(8)	PCIe x1 card slot

2.4.1   Compare connector
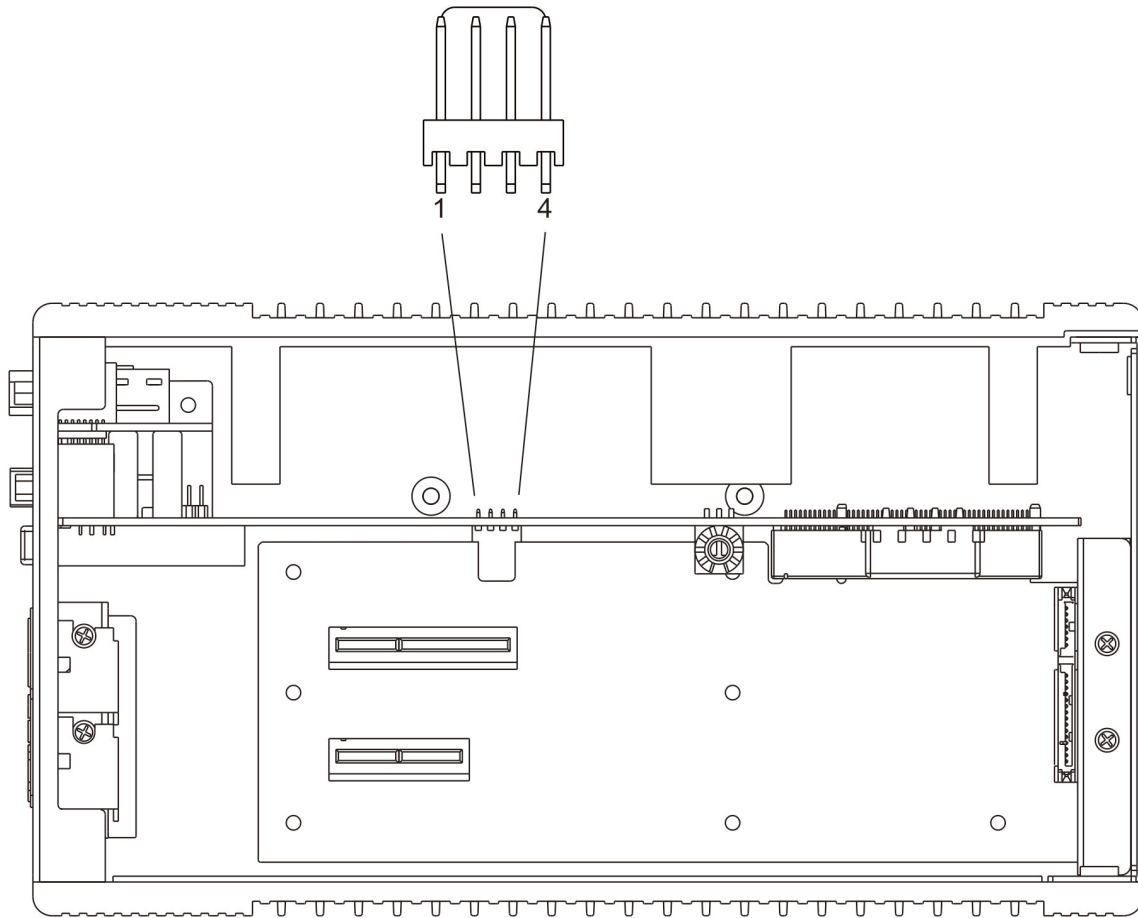
Pin assignment of Compare connector is as follows:

PIN	Description
1	Single Compare Out
2	GND
3	Differential Compare Out +
4	Differential Compare Out -

2.4.2   DMC Series Card ID

Card ID is selected via the knob. Its setting range is 0 ~ 15.
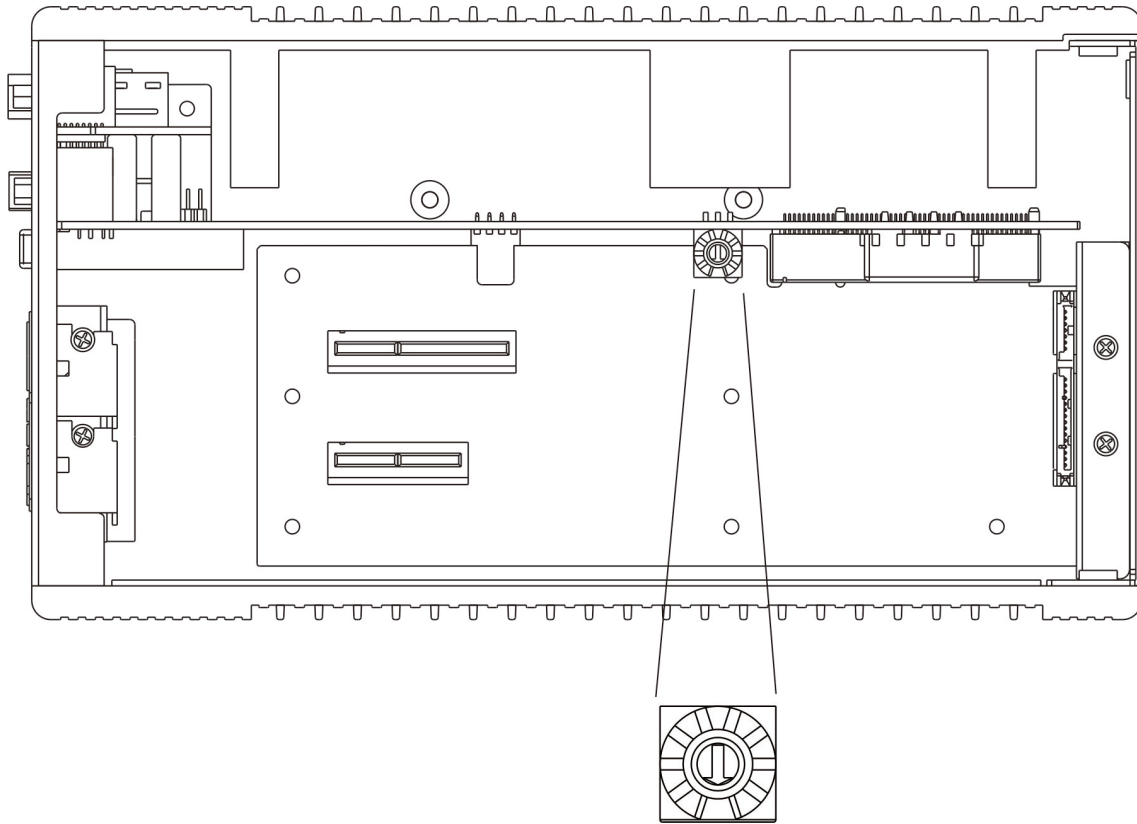
2.4.3   12V power connector
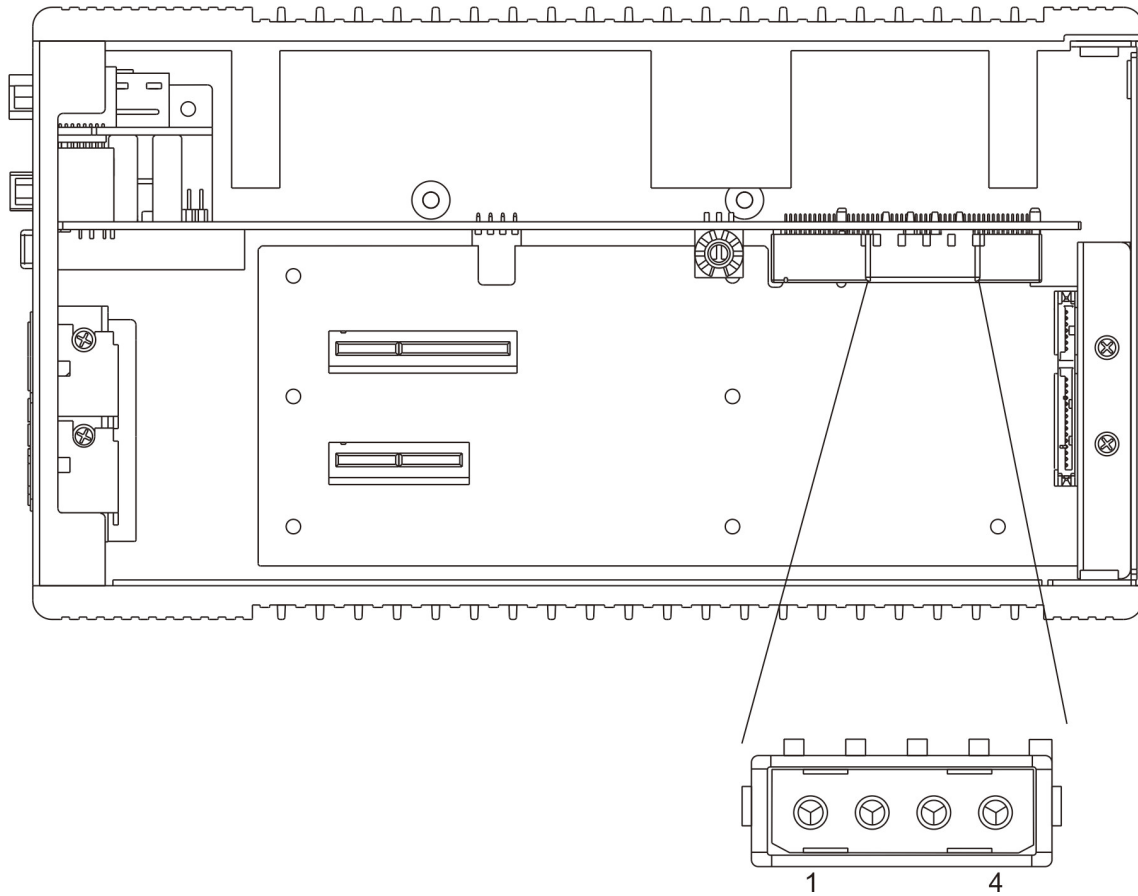
Pin assignment of 12V power connector is as follows:

PIN	Description
1	Power supply (+12V) (Max. supply current 7A)
2	GND
3	GND
4	N/A

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2

Installation

3

This chapter introduces how to install the MH1 series PAC, including vertical and wall mounting methods. Installations for PCI / PCIe, CFast card, and SSD are also included.

3

3.1 Vertical mounting

■ As shown in the figure below, place the PAC in this direction, so you can see the bottom. Fix the 4 large flat head screws to secure the base onto the PAC. Then, use the other four large flat head screws to secure both sides of the base onto the sheet metal of the equipment.
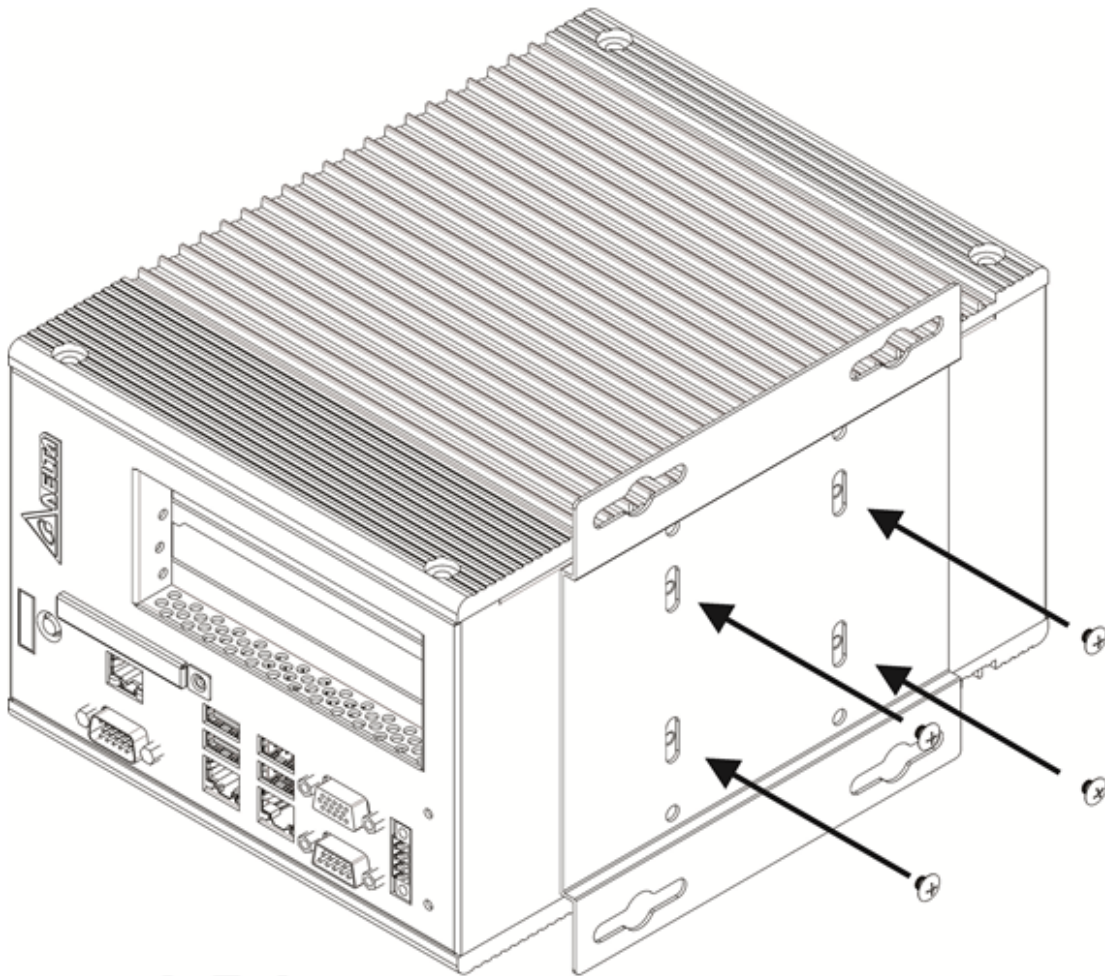
3.2 Wall mounting

■ As shown in the figure below, place the PAC in this direction, so you can see the back. Fix the 4 large flat head screws to secure the base onto the PAC. Then, use the other four large flat head screws to secure both sides of the base onto the sheet metal of the equipment.
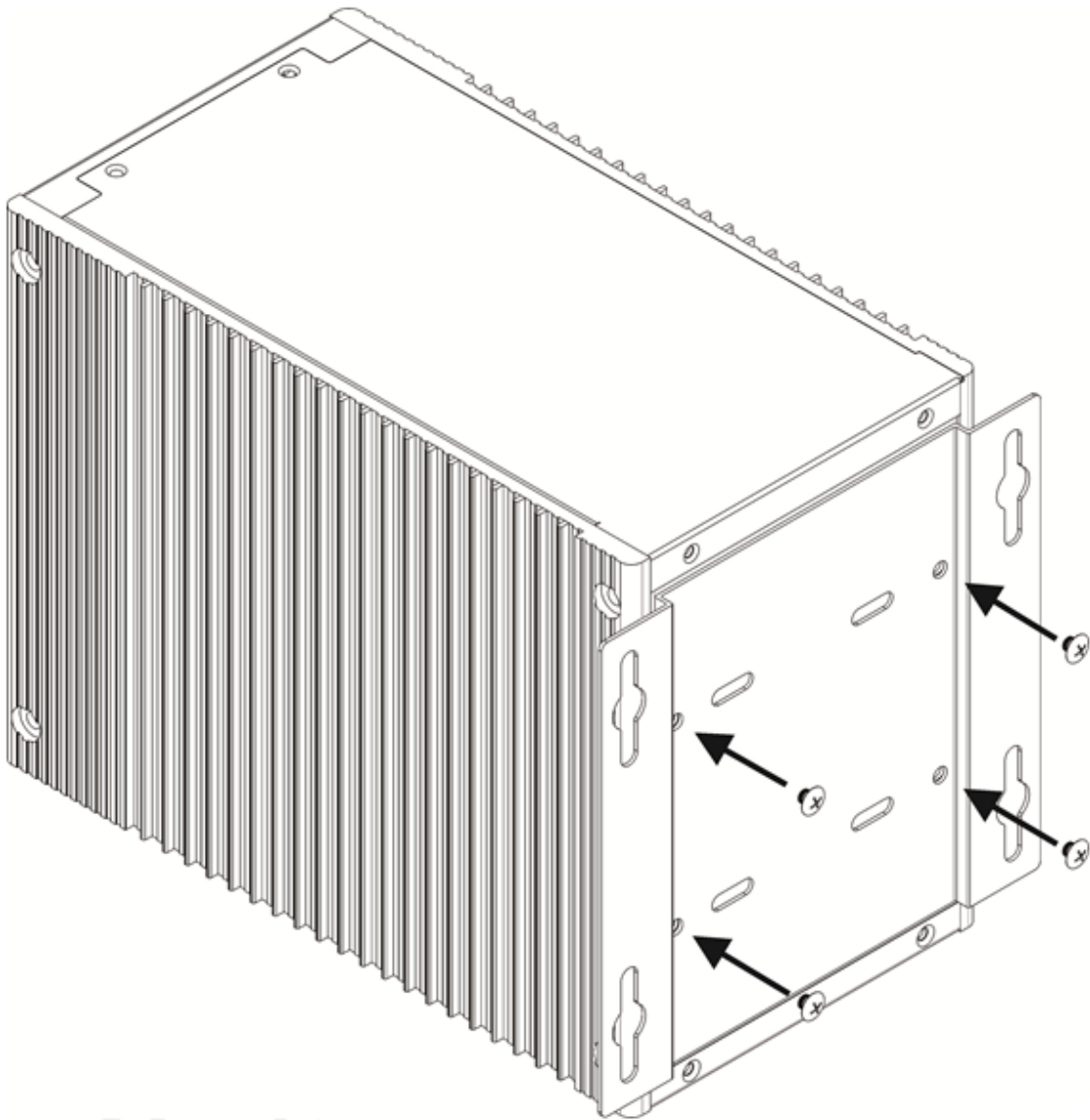
3.3   Installation of PCI / PCIe card

■   Insert the PCI card (3) into the PCI slot from the top to bottom and make sure it fits firmly.

■   Place the securing metal sheet (2) in the direction as shown in the figure below.

     Then, fix the 4 screws to secure the PCI / PCIe card.

■   Put on the top cover (1) and tighten the 4 screws to secure the cover.
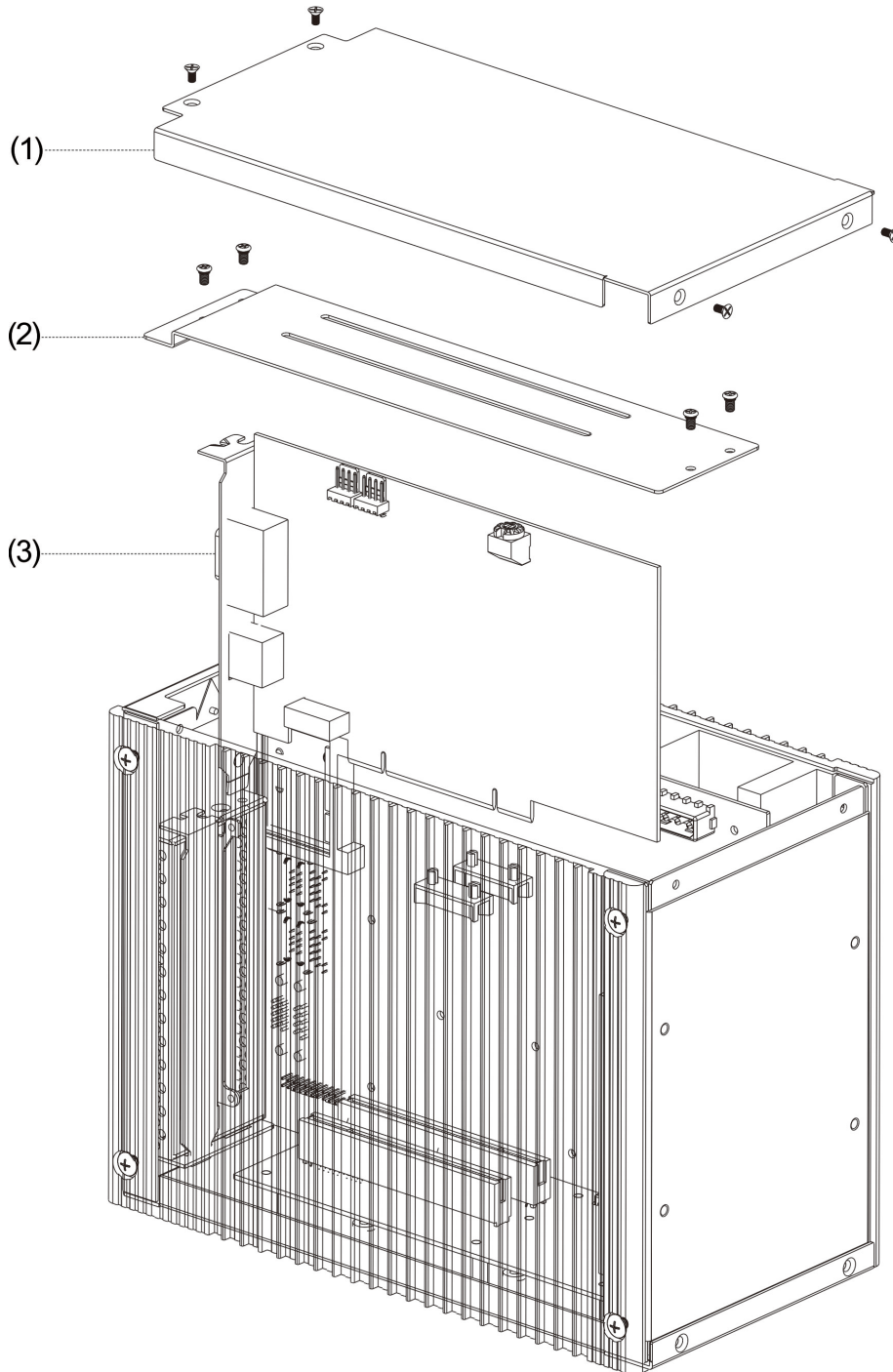
No.	Description
(1)	Top cover
(2)	Securing metal sheet
(3)	PCI card

3.4   Installation of CFast card

■   Remove the screws from the protection cover (1) for the CFast card and then remove the cover. See Figure 3.4.1.

■   Insert the CFast card into the slot.

■   Put the protection cover back and fix the screws. See Figure 3.4.2.
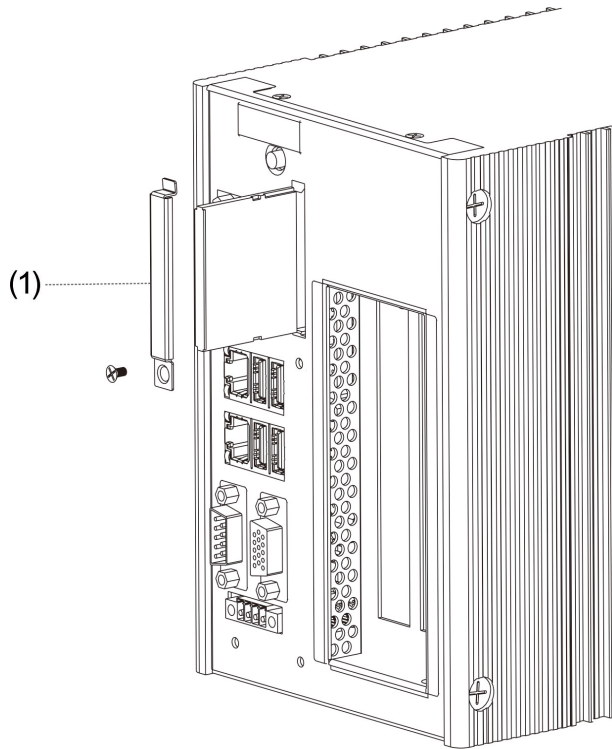
Figure 3.4.1   Remove screws from the protection cover   Figure 3.4.2   Installation completed
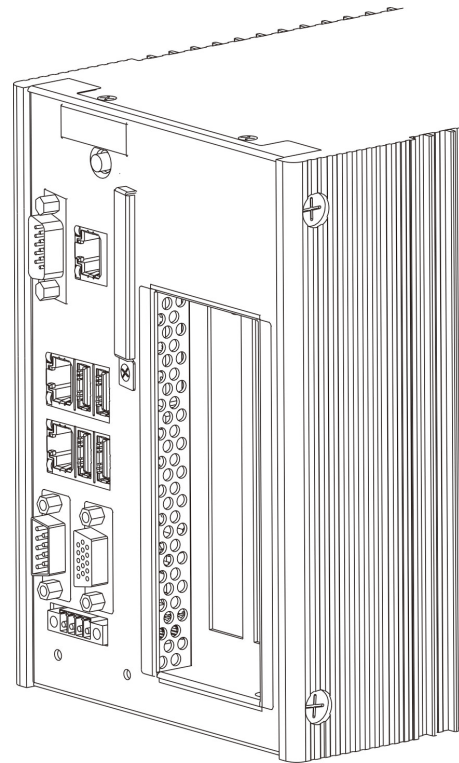
No.	Description
(1)	Protection cover

3.5   Installation of SATA SSD

■ Place the SSD (1) with the metal sheet for securing the SSD (4) together and tighten with 4 screws.

■ Install the metal sheet for securing the SSD (4) into the slot as shown in the figure below.

■ Place the securing metal sheet (3) in the direction as shown in the figure below.
   Then, fix the 4 screws to secure the components.

■ Put on the top cover (2) and tighten the 4 screws to secure the cover.
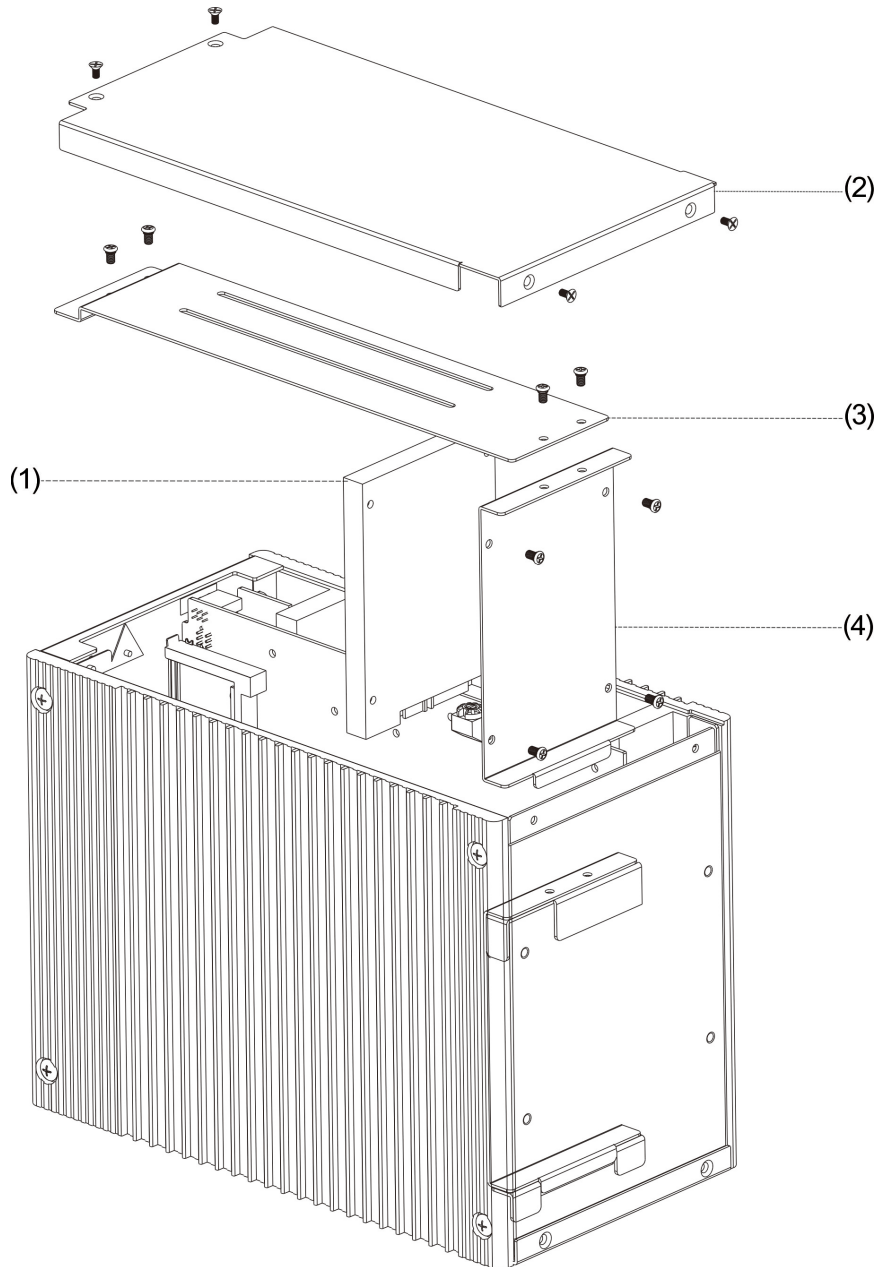
No.	Description
(1)	SSD
(2)	Top cover
(3)	Securing metal sheet
(4)	Metal sheet for securing the SSD

■ **SSD installation scheme**

The illustration below shows the side view and top view when the installation of SSD is completed.

3-7

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3

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BIOS

<div style="text-align: right; font-size: 4em;">4</div>
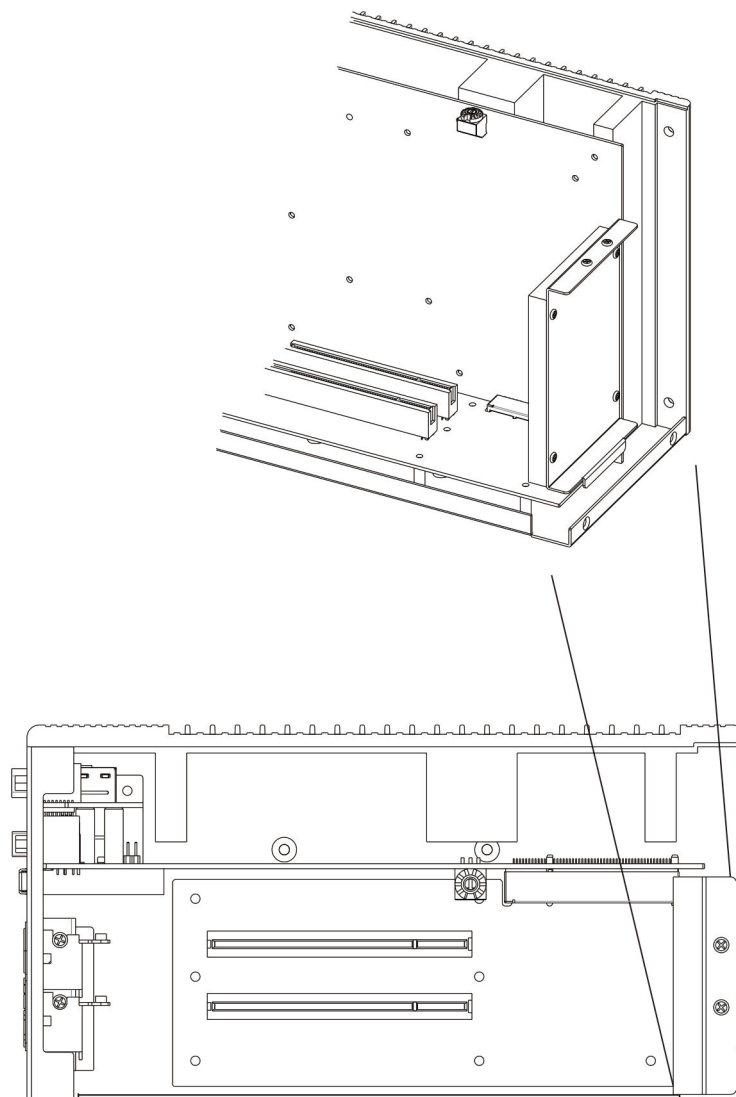
This chapter provides BIOS related settings and instructions for MH1-A12/C50/C70/S30.

4

4.1   MH1-A12 Series BIOS operation and setting

When the screen displays "Press <Del> or <F2> to enter setup" when the PAC is booted, press **Del** or **F2** to enter the BIOS setting screen.

1.   Functions of each key

Key	Function	Key	Function
↑↓← →	Navigate between items	F1	Help
Enter	Enter or select current item	F2	Restore to previous settings
+ , -	Adjust value	F3	Restore to default settings
Esc	Exit	F4	Save all current settings

2.   Overview of the main menu

Menu option	Function	Menu option	Function
Main	Basic system settings	Boot	Boot settings
Advanced	Advanced function settings	Security	Security settings
Chipset	Chipset settings	Save & Exit	Save options and exit

(Use ← , → to navigate between menu options)

4.1.1 Main

Main options include Total Memory, System Language, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

   BIOS Information                                    ▲  Choose the system default
   BIOS Vendor                  American Megatrends       language
   Core Version                 5.010
   Compliancy                   UEFI 2.4; PI 1.3
   Project Version              P04
   Build Date and Time          09/17/2015 22:43:05

   CPU Configuration
   Microcode Patch              901
   BayTrail SoC                 D0 Stepping

   KSC Information
   KSC Version                  N/A

   Memory Information                                     →←: Select Screen
   Total Memory                 2048 MB (DDR3U)           ↑↓: Select Item
                                                          Enter: Select
   GOP Information                                        +/-: Change Opt.
   Intel(R) GOP Driver          [N/A]                     F1: General Help
                                                          F2: Previous Values
   TXE Information                                        F3: Optimized Defaults
   Sec RC Version               00.05.00.00               F4: Save & Exit
   TXE FW Version               01.00.02.1060             ESC: Exit

   System Language              [English]              ▼

              Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Item	Default
System Language	English
System Date	N/A
System Time	N/A

4.1.2 Advanced

Advanced options include NCT5577D SIO Configuration, HW Monitor, etc. as shown below:

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Main  Advanced  Chipset  Security  Boot  Save & Exit

    ▶ NCT5577D Super IO Configuration                          System Super IO Chip
    ▶ H/W Monitor                                              Parameters.
    ▶ IDE Configuration
    ▶ Miscellaneous Configuration
    ▶ LPSS & SCC Configuration
    ▶ SDIO Configuration
    ▶ USB Configuration
    ▶ Platform Trust Technology
    ▶ Security Configuration

                                                               →←: Select Screen
                                                               ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit


                    Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Item	Default
NCT5577D Super IO Configuration	N/A
H/W Monitor	N/A
IDE Configuration	N/A
Miscellaneous Configuration	N/A
LPSS & SCC Configuration	N/A
SDIO Configuration	N/A
USB Configuration	N/A
Platform Trust Configuration	N/A
Security Configuration	N/A

4.1.3 Chipset

Chipset options include North Bridge, South Bridge, etc. as shown below:

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ North Bridge                                        North Bridge Parameters
 ▶ South Bridge




                                                   ↔: Select Screen
                                                   ↑↓: Select Item
                                                   Enter: Select
                                                   +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F3: Optimized Defaults
                                                   F4: Save & Exit
                                                   ESC: Exit



            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Item	Default
North Bridge	N/A
South Bridge	N/A

4
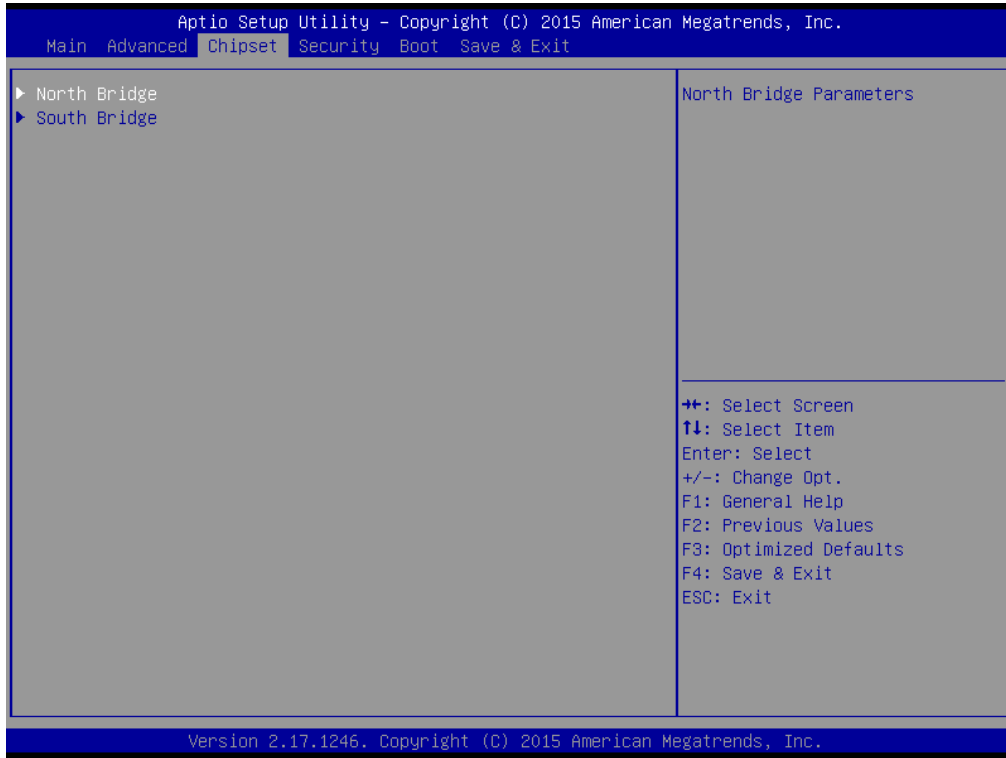
■ **North Bridge**

North Bridge options include Intel IGD Configuration, Max TOLUD, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
                Chipset

 ▶ Intel IGD Configuration                                    Config Intel IGD Settings.

   Memory Information

   Total Memory                          2048 MB (DDR3U)

   Memory Slot0                          2048 MB (DDR3U)
   Memory Slot2                          Not Present

   Max TOLUD                             [2.5 GB]


                                                              →←: 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	Default	Description
Intel IGD Configuration	N/A	Configuration of Intel internal graphics display chipset
Max TOLUD	2.5 GB	TOLUD settings

■   **South Bridge**

South Bridge options include USB Configuration and others as shown below:

```
         Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
              Chipset

  ▶ Azalia HD Audio                                   Azalia HD Audio Options
  ▶ USB Configuration

    High Precision Timer              [Enabled]
    Restore AC Power Loss             [Power On]

    Serial IRQ Mode                   [Quiet]

    Global SMI Lock                   [Enabled]
    BIOS Read/Write Protection        [Enabled]




                                                    →←: 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	Default
Azalia HD Audio	N/A
USB Configuration	N/A
High Precision Timer	Enabled
Restore AC Power Loss	Power On
Serial IRQ Mode	Quiet
Global SMI Lock	Enabled
BIOS Read/Write Protection	Enabled

4

■ **Auto boot when power is applied**

To enable or disable auto boot function when power is applied, please follow the steps as follows:

1. On the Chipset screen, select **South Bridge** as shown in Figure 4.1.3.1.

2. Select **Restore AC Power Loss** and set to **Power On** or **Power Off** as shown in Figure 4.1.3.2:

   Power On: Once power is applied, the PAC will automatically boot; no need to press Start button.

   Power Off: Once power is applied, press Start button to boot the PAC.

```
         Aptio Setup Utility - Copyright (C) 2016 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Save & Exit

  ▶ North Bridge                                     South Bridge Parameters
  ▶ South Bridge




                                                     ↔: Select Screen
                                                     ↑↓: Select Item
                                                     Enter: Select
                                                     +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit



         Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Figure 4.1.3.1

```
            Aptio Setup Utility – Copyright (C) 2016 American Megatrends, Inc.
             Chipset

        ▶ Azalia HD Audio                                        Select AC power state when
        ▶ USB Configuration                                      power is re-applied after a
                                                                 power failure.
          High Precision Timer              [Enabled]
          Restore AC Power Loss             [Power On]

          Serial IRQ Mode                   [Quiet]

          Global SMI Lock                   [Enabled]
          BIOS Read/Write Protection        [Enabled]


                                                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



            Version 2.17.1246. Copyright (C) 2016 American Megatrends, Inc.
```

Figure 4.1.3.2

4

4.1.4 Security

Security options include Administrator Password, User Password, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

     Password Description                               Set Administrator Password

     If ONLY the Administrator's password is set,
     then this only limits access to Setup and is
     only asked for when entering Setup.
     If ONLY the User's password is set, then this
     is a power on password and must be entered to
     boot or enter Setup. In Setup the User will
     have Administrator rights.
     The password length must be
     in the following range:
     Minimum length                      3
     Maximum length                      20

                                                        →←: Select Screen
                                                        ↑↓: Select Item
     Administrator Password                             Enter: Select
     User Password                                      +/-: Change Opt.
                                                        F1: General Help
     ▶ Secure Boot menu                                 F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Item	Default	Description
Administrator Password	N/A	Set / change system administrator password
User Password	N/A	Set / change user password
Secure Boot menu	N/A	-

4.1.5   Boot

Boot options include Setup Prompt Timeout, Bootup NumLock State, etc. as shown below:

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Main  Advanced  Chipset  Security  Boot  Save & Exit

       Boot Configuration                                        Number of seconds to wait for
       Setup Prompt Timeout                1                     setup activation key.
       Bootup NumLock State                [On]                  65535(0xFFFF) means indefinite
                                                                 waiting.
       Quiet Boot                          [Disabled]
       Fast Boot                           [Disabled]


       Boot Option Priorities
       Boot Option #1                      [UEFI: SMI USB DISK ...]
       Boot Option #2                      [SMI USB DISK 1100]
       Boot Option #3                      [UEFI: Built-in EFI ...]


       Hard Drive BBS Priorities                                 →←: Select Screen
                                                                 ↑↓: Select Item
                                                                 Enter: Select
                                                                 +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit




                    Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Item	Default	Description
Setup Prompt Timeout	1	-
Bootup NumLock State	On	-
Quiet Boot	Disabled	-
Boot Option Priorities	N/A	-
Hard Drive BBS Priorities	N/A	Hard drive boot priorities

4

4.1.6 Save & Exit

Save & Exit options include Save Changes and Exit, Discard Changes and Exit, etc. as shown below:

```
              Aptio Setup Utility – Copyright (C) 2015 American Megatrends, Inc.
          Main  Advanced  Chipset  Security  Boot  Save & Exit

       Save Changes and Exit                           Exit system setup after saving
       Discard Changes and Exit                        the changes.
       Save Changes and Reset
       Discard Changes and Reset

       Save Options
       Save Changes
       Discard Changes

       Restore Defaults
       Save as User Defaults
       Restore User Defaults

       Boot Override                                   →←: Select Screen
       UEFI: Built-in EFI Shell                        ↑↓: Select Item
       UEFI: SMI USB DISK 1100                         Enter: Select
       SMI USB DISK 1100                               +/-: Change Opt.
                                                       F1: General Help
       Launch EFI Shell from filesystem device        F2: Previous Values
     ► Reset System with ME disable ModeMEUD000        F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit


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```

Item	Default	Description
Save Changes and Exit	N/A	-
Discard Changes and Exit	N/A	-
Save Changes and Reset	N/A	-
Discard Changes and Reset	N/A	-
Save Changes	N/A	-
Discard Changes	N/A	-
Restore Defaults	N/A	-
Save as User Defaults	N/A	-
Restore User Defaults	N/A	-
Boot Override	N/A	Force boot option

4.2 MH1-C50/C70 Series BIOS operation and setting

When the screen displays "Press <Del> or <F2> to enter setup" when the PAC is booted, press

Del or **F2** to enter the BIOS setting screen.

1. Functions of each key

Key	Function	Key	Function
↑↓← →	Navigate between items	F1	Help
Enter	Enter or select current item	F2	Restore to previous settings
+ , -	Adjust value	F3	Restore to default settings
Esc	Exit	F4	Save all current settings

2. Overview of the main menu

Menu option	Function	Menu option	Function
Main	Basic system settings	Boot	Boot settings
Advanced	Advanced function settings	Security	Security settings
Chipset	Chipset settings	Save & Exit	Save options and exit

(Use ← , → to navigate between menu options)

4.2.1   Main

Main options include Total Memory, System Language, etc. as shown below:

```
                    Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit

     IGFX VBIOS Version              2153              ▲  Set the Time. Use Tab to
     Memory RC Version               1.8.0.0              switch between Time elements.
     Total Memory                    4096 MB (DDR3)
     Memory Frequency                1333 Mhz

     PCH Information
     Name                            PantherPoint
     Stepping                        04/C1
     LAN PHY Revision                N/A

     ME FW Version                   8.0.20.1513
     ME Firmware SKU                 1.5MB

     SPI Clock Frequency
     DOFR Support                    Unsupported       →←: Select Screen
     Read Status Clock Frequency     33 MHz            ↑↓: Select Item
     Write Status Clock Frequency    33 MHz            Enter: Select
     Fast Read Status Clock Frequency 33 MHz           +/-: Change Opt.
                                                       F1: General Help
     System Language                 [English]         F2: Previous Values
                                                       F3: Optimized Defaults
     System Date                     [Thu 01/01/2009]  F4: Save & Exit
     System Time                     [00:00:47]        ESC: Exit

     Access Level                    Administrator     ▼

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```

Item	Default
System Language	English
System Date	N/A
System Time	N/A

4.2.2 Advanced

Advanced options include PCI Subsystem Settings, HW Monitor, etc. as shown below:

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
        Main  Advanced  Chipset  Boot  Security  Save & Exit

 ▶ PCI Subsystem Settings                                   PCI, PCI-X and PCI Express
 ▶ ACPI Settings                                            Settings.
 ▶ CPU Configuration
 ▶ SATA Configuration
 ▶ Thermal Configuration
 ▶ DPTF Configuration
 ▶ Intel(R) Rapid Start Technology
 ▶ PCH-FW Configuration
 ▶ USB Configuration
 ▶ H/W Monitor
 ▶ Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ Network Stack Configuration
 ▶ Intel RC Drivers Version Detail                          →←: Select Screen
 ▶ CPU PPM Configuration                                    ↑↓: Select Item
 ▶ Sandybridge DTS Configuration                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit

                Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Item	Default
PCI Subsystem Settings	N/A
ACPI Settings	N/A
CPU Configuration	N/A
SATA Configuration	N/A
Thermal Configuration	N/A
DPTF Configuration	N/A
Intel® Rapid Start Technology	N/A
PCH-FW Configuration	N/A
USB Configuration	N/A
H/W Monitor	N/A
Super IO Configuration	N/A
Serial Port Console Redirection	N/A
Network Stack Configuration	N/A
Intel RC Drivers Version Detail	N/A
CPU PPM Configuration	N/A
Sandybridge DTS Configuration	N/A

4

■ **Enable HT (Hyper Thread)**

To enable or disable HT (Hyper Thread), please follow the steps as follows:

1. On the Advanced screen, select **CPU Configuration** as shown in Figure 4.2.2.1.

2. Select **Hyper-Threading** and set to **Enable** or **Disable** as shown in Figure 4.2.2.2.

```
          Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
    Main  Advanced  Chipset  Boot  Security  Save & Exit

 ▶ PCI Subsystem Settings                            CPU Configuration Parameters
 ▶ ACPI Settings
 ▶ CPU Configuration
 ▶ SATA Configuration
 ▶ Thermal Configuration
 ▶ DPTF Configuration
 ▶ Intel(R) Rapid Start Technology
 ▶ PCH-FW Configuration
 ▶ USB Configuration
 ▶ H/W Monitor
 ▶ Super IO Configuration
 ▶ Serial Port Console Redirection
 ▶ Network Stack Configuration
 ▶ Intel RC Drivers Version Detail         .  →←: Select Screen
 ▶ CPU PPM Configuration                      ↑↓: Select Item
 ▶ Sandybridge DTS Configuration              Enter: Select
                                              +/-: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit


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```

Figure 4.2.2.1

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Advanced

  CPU Configuration                                              ▲  Enabled for Windows XP and
                                                                    Linux (OS optimized for
  Intel(R) Core(TM) i5-3610ME CPU @ 2.70GHz                         Hyper-Threading Technology)
  CPU Signature                         306a9                       and Disabled for other OS (OS
  Microcode Patch                       19                          not optimized for
  Max CPU Speed                         2700 MHz                    Hyper-Threading Technology).
  Min CPU Speed                         1200 MHz                    When Disabled only one thread
  CPU Speed                             2700 MHz                    per enabled core is enabled.
  Processor Cores                       2
  Intel HT Technology                   Supported
  Intel VT-x Technology                 Supported
  Intel SMX Technology                  Supported
  64-bit                                Supported
                                                                 ──────────────────────────────
  L1 Data Cache                         32 kB x 2                  ➜⬅: Select Screen
  L1 Code Cache                         32 kB x 2                  ⬆⬇: Select Item
  L2 Cache                              256 kB x 2                 Enter: Select
  L3 Cache                              3072 kB                    +/-: Change Opt.
                                                                   F1: General Help
  Hyper-threading                       [Enabled]                  F2: Previous Values
  Active Processor Cores                [All]                      F3: Optimized Defaults
  Limit CPUID Maximum                   [Disabled]                 F4: Save & Exit
  Execute Disable Bit                   [Disabled]                 ESC: Exit
  Intel Virtualization Technology       [Disabled]
  Hardware Prefetcher                   [Enabled]              ▼

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```

Figure 4.2.2.2

4.2.3   Chipset

Chipset options include PCH-IO Configuration, System Agent (SA) Configuration, etc. as shown below:

```
           Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit

   ▶ PCH-IO Configuration                                    PCH Parameters
   ▶ System Agent (SA) Configuration





                                                            ↔: 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	Default
PCH-IO Configuration	N/A
System Agent (SA) Configuration	N/A

■ **PCH-IO Configuration**

PCH-IO Configuration options include PCI Express Configuration, USB Configuration, etc.
as shown below:

```
             Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
              Chipset

   Intel PCH RC Version           1.8.0.1              PCI Express Configuration
   Intel PCH SKU Name             QM77                 settings
   Intel PCH Rev ID               04/C1

 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ PCH Azalia Configuration
 ▶ BIOS Security Configuration

   Board Capability               [SUS_PWR_DN_ACK]
   Display Logic                  [Enabled]
   CLKRUN# Logic                  [Enabled]
   SB CRID                        [Disabled]
                                                        ─────────────────────────
   High Precision Event Timer Configuration             →←: Select Screen
   High Precision Timer           [Enabled]             ↑↓: Select Item
                                                        Enter: Select
   SLP_S4 Assertion Width         [4-5 Seconds]         +/-: Change Opt.
   Restore AC Power Loss          [Power On]            F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```

Item	Default
PCI Express Configuration	N/A
USB Configuration	N/A
PCH Azalia Configuration	N/A
BIOS Security Configuration	N/A
Board Capability	SUS_PWR_DN_ACK
Display Logic	Enabled
CLKRUN# Logic	Enabled
SB CRID	Disabled
High Precision Timer	Enabled
SLP_S4 Assertion Width	4-5 Seconds
Restore AC Power Loss	Power On

■   **System Agent (SA) Configuration**

System Agent (SA) Configuration options include VT-d, CHAP Device (B0:D7:F0), etc.

as shown below:

```
             Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
                 Chipset

  System Agent Bridge Name          IvyBridge             Check to enable VT-d function
  System Agent RC Version           1.8.0.0               on MCH.
  VT-d Capability                   Supported

  VT-d                              [Enabled]
  CHAP Device (B0:D7:F0)            [Disabled]
  Thermal Device (B0:D4:F0)         [Disabled]
  Enable NB CRID                    [Disabled]
  BDAT ACPI Table Support           [Disabled]
  C-State Pre-Wake                  [Disabled]

  ▶ Graphics Configuration
  ▶ DMI Configuration
  ▶ NB PCIe Configuration                                 ►◄: Select Screen
  ▶ Memory Configuration                                  ↑↓: Select Item
  ▶ Memory Thermal Configuration                          Enter: Select
  ▶ GT – Power Management Control                         +/–: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F3: Optimized Defaults
                                                          F4: Save & Exit
                                                          ESC: Exit


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```

Item	Default
VT-d	Enabled
CHAP Device (B0:D7:F0)	Disabled
Thermal Device (B0:D4:F0)	Disabled
Enable NB CRID	Disabled
BDAT ACPI Table Support	Disabled
C-State Pre-Wake	Disabled
Graphics Configuration	N/A
DMI Configuration	N/A
NB PCIe Configuration	N/A
Memory Configuration	N/A
Memory Thermal Configuration	N/A
GT – Power Management Control	N/A

4

■ **Auto boot when power is applied**

To enable or disable auto boot function when power is applied, please follow the steps
as follows:

1. On the Chipset screen, select **PCH-IO Configuration** as shown in Figure 4.2.3.1.

2. Select **Restore AC Power Loss** and set to **Power On** or **Power Off** as shown in
   Figure 4.2.3.2:

   Power On: Once power is applied, the PAC will automatically boot; no need to press
   Start button.

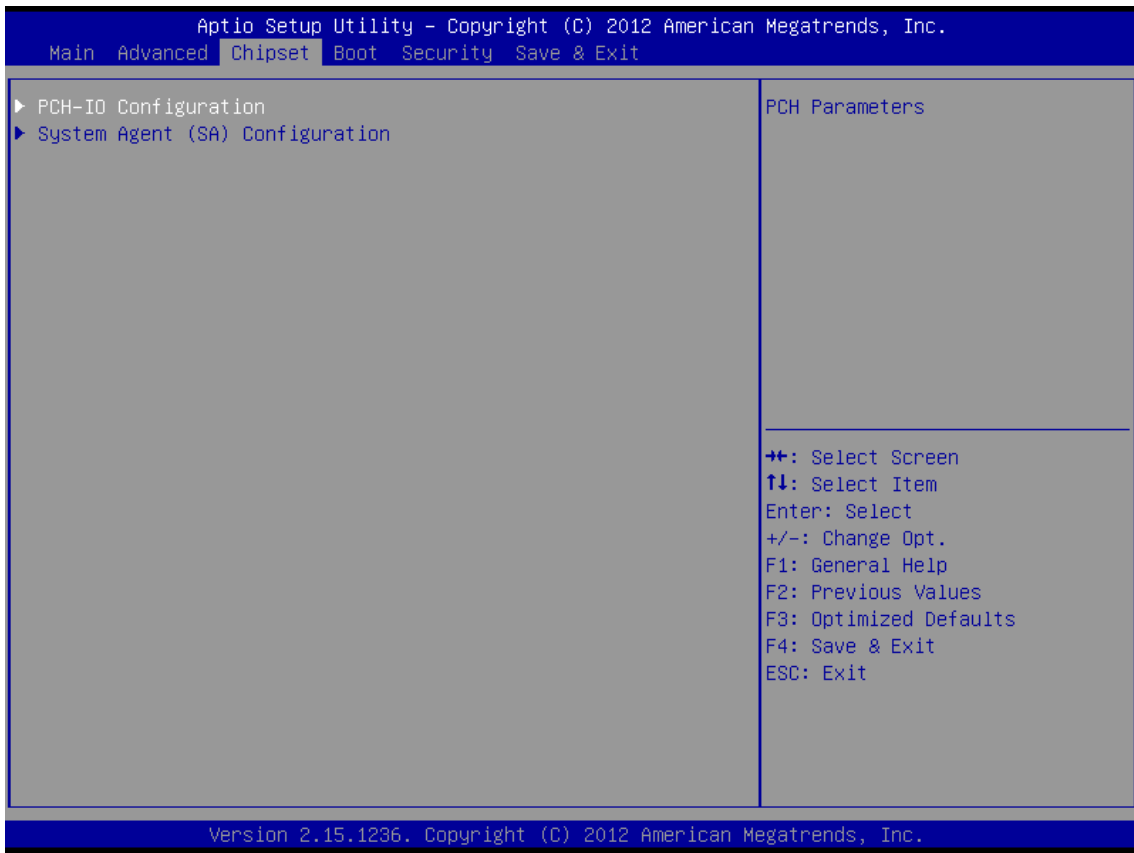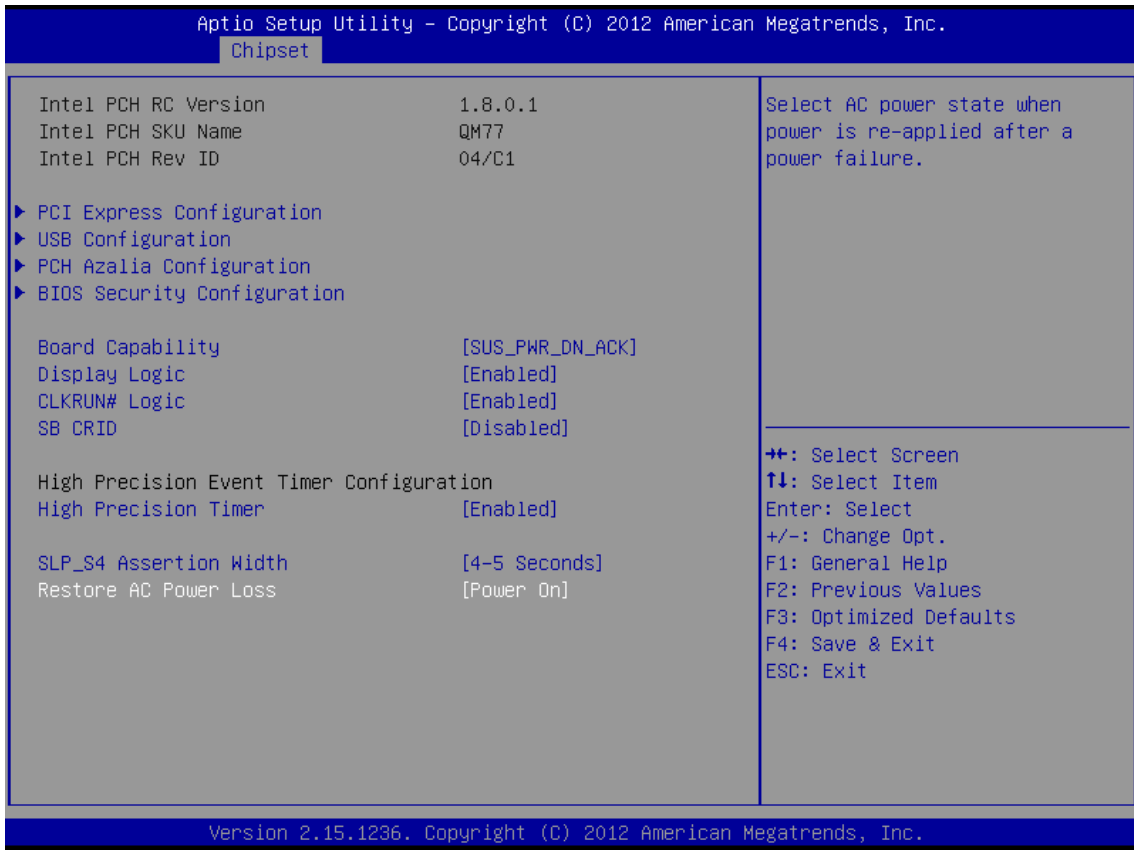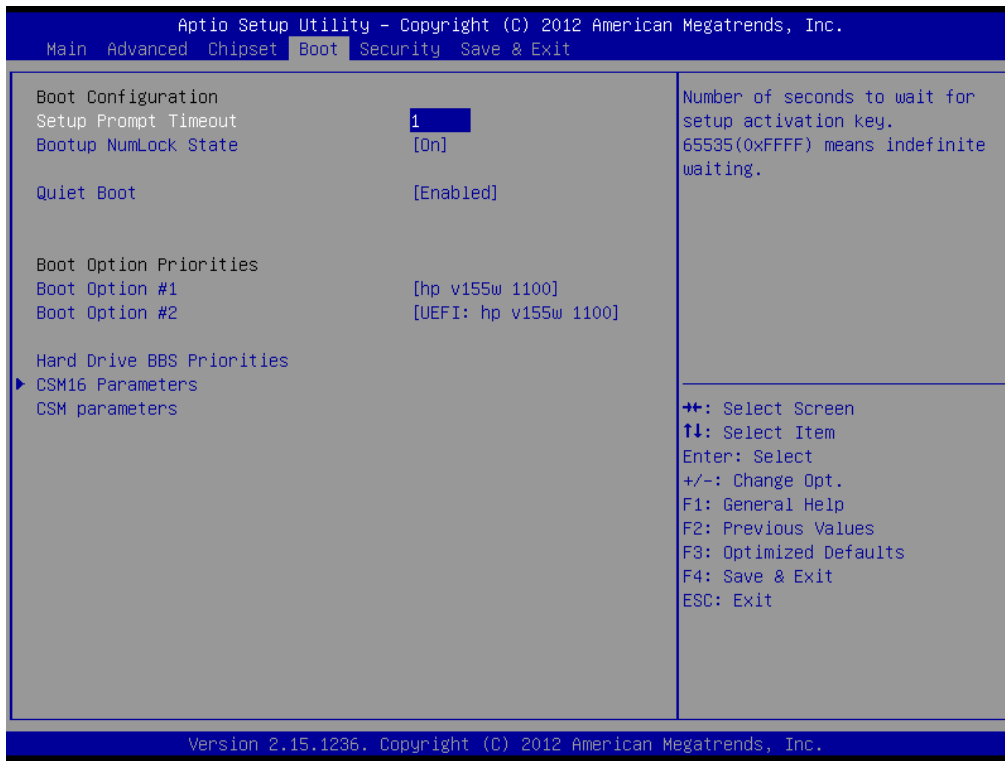   Power Off: Once power is applied, press Start button to boot the PAC.

```
            Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit
 ┌──────────────────────────────────────────────────┬─────────────────────────────┐
 │ ▶ PCH-IO Configuration                            │ PCH Parameters              │
 │ ▶ System Agent (SA) Configuration                 │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   │                             │
 │                                                   ├─────────────────────────────│
 │                                                   │ →←: Select Screen           │
 │                                                   │ ↑↓: Select Item             │
 │                                                   │ Enter: Select               │
 │                                                   │ +/-: Change Opt.            │
 │                                                   │ F1: General Help            │
 │                                                   │ F2: Previous Values         │
 │                                                   │ F3: Optimized Defaults      │
 │                                                   │ F4: Save & Exit             │
 │                                                   │ ESC: Exit                   │
 │                                                   │                             │
 │                                                   │                             │
 └──────────────────────────────────────────────────┴─────────────────────────────┘
             Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Figure 4.2.3.1

4

```
              Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
                Chipset

   Intel PCH RC Version          1.8.0.1              Select AC power state when
   Intel PCH SKU Name            QM77                 power is re-applied after a
   Intel PCH Rev ID              04/C1                power failure.

 ▶ PCI Express Configuration
 ▶ USB Configuration
 ▶ PCH Azalia Configuration
 ▶ BIOS Security Configuration

   Board Capability             [SUS_PWR_DN_ACK]
   Display Logic                [Enabled]
   CLKRUN# Logic                [Enabled]
   SB CRID                      [Disabled]
                                                      ⇥: Select Screen
   High Precision Event Timer Configuration           ↑↓: Select Item
                                                      Enter: Select
   High Precision Timer         [Enabled]             +/–: Change Opt.
                                                      F1: General Help
   SLP_S4 Assertion Width       [4-5 Seconds]         F2: Previous Values
   Restore AC Power Loss        [Power On]            F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit

              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Figure 4.2.3.2

4.2.4   Boot

Boot options include Setup Prompt Timeout, Bootup NumLock State, etc. as shown below:

```
                Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
      Main  Advanced  Chipset  Boot  Security  Save & Exit

      Boot Configuration                                      Number of seconds to wait for
      Setup Prompt Timeout                 1                   setup activation key.
      Bootup NumLock State                 [On]                65535(0xFFFF) means indefinite
                                                               waiting.
      Quiet Boot                           [Enabled]


      Boot Option Priorities
      Boot Option #1                       [hp v155w 1100]
      Boot Option #2                       [UEFI: hp v155w 1100]

      Hard Drive BBS Priorities
    ▶ CSM16 Parameters                                         →←: Select Screen
      CSM parameters                                           ↑↓: Select Item
                                                               Enter: Select
                                                               +/-: Change Opt.
                                                               F1: General Help
                                                               F2: Previous Values
                                                               F3: Optimized Defaults
                                                               F4: Save & Exit
                                                               ESC: Exit




                Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Item	Default	Description
Setup Prompt Timeout	1	-
Bootup NumLock State	On	-
Quiet Boot	Enabled	-
Boot Option Priorities	N/A	-
Hard Drive BBS Priorities	N/A	Hard drive boot priorities

4.2.5 Security

Security options include Administrator Password, User Password, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
     Main  Advanced  Chipset  Boot  Security  Save & Exit

   Password Description                               Set Administrator Password

   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length                     3
   Maximum length                     20            ➜←: Select Screen
                                                    ↑↓: Select Item
   Administrator Password                           Enter: Select
   User Password                                    +/-: Change Opt.
                                                    F1: General Help
   ▶ Secure Boot menu                               F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



              Version 2.15.1236. Copyright (C) 2012 American Megatrends, Inc.
```

Item	Default	Description
Administrator Password	N/A	Set / change system administrator password
User Password	N/A	Set / change user password
Secure Boot menu	N/A	-

4.2.6   Save & Exit

Save & Exit options include Save Changes and Exit, Discard Changes and Exit, etc.

as shown below:

4

```
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
  Main  Advanced  Chipset  Boot  Security  Save & Exit

 Save Changes and Exit                              Exit system setup after saving
 Discard Changes and Exit                           the changes.
 Save Changes and Reset
 Discard Changes and Reset

 Save Options
 Save Changes
 Discard Changes

 Restore Defaults
 Save as User Defaults
 Restore User Defaults

 Boot Override
 hp v155w 1100
 UEFI: hp v155w 1100                                ➜←: Select Screen
                                                    ↑↓: Select Item
 Launch EFI Shell from filesystem device            Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit



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```

Item	Default	Description
Save Changes and Exit	N/A	-
Discard Changes and Exit	N/A	-
Save Changes and Reset	N/A	-
Discard Changes and Reset	N/A	-
Save Changes	N/A	-
Discard Changes	N/A	-
Restore Defaults	N/A	-
Save as User Defaults	N/A	-
Restore User Defaults	N/A	-
Boot Override	N/A	Force boot option

4.3   MH1-S30D BIOS operation and setting

When the screen displays "Press <Del> or <F2> to enter setup" when the PAC is booted, press **Del** or **F2** to enter the BIOS setting screen.

1.   Functions of each key

Key	Function	Key	Function
↑↓← →	Navigate between items	F1	Help
Enter	Enter or select current item	F2	Restore to previous settings
+ , -	Adjust value	F3	Restore to default settings
Esc	Exit	F4	Save all current settings

2.   Overview of the main menu

Menu option	Function	Menu option	Function
Main	Basic system settings	Boot	Boot settings
Advanced	Advanced function settings	Security	Security settings
Chipset	Chipset settings	Save & Exit	Save options and exit

(Use ← , → to navigate between menu options)

4.3.1   Main

Main options include Total Memory, System Language, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
   Main  Advanced  Chipset  Boot  Security  Save & Exit

   BIOS Information                                          Choose the system default
   BIOS Vendor               American Megatrends            language
   Core Version              4.6.4.0
   Compliancy                UEFI 2.0
   Project Version           1APBN 0.06 x64
   Build Date and Time       02/25/2014 10:39:52

   Memory Information
   Total Memory              4096 MB (DDR3)

   System Language           [English]

   System Date               [Tue 03/04/2014]
   System Time               [10:37:12]                     →←: Select Screen
                                                            ↑↓: Select Item
   Access Level              Administrator                   Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit




              Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
System Language	English
System Date	N/A
System Time	N/A

4.3.2   Advanced

Advanced options include Launch PXE OpROM, Launch Storage OpROM, etc. as shown below:

```
                  Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
          Main  Advanced  Chipset  Boot  Security  Save & Exit

                                                              PCI, PCI-X and PCI Express
          Legacy OpROM Support                                Settings.
          Launch PXE OpROM                   [Disabled]
          Launch Storage OpROM               [Enabled]

         ▶ PCI Subsystem Settings
         ▶ ACPI Settings
         ▶ CPU Configuration
         ▶ IDE Configuration
         ▶ Other Setting
         ▶ USB Configuration
         ▶ Clock Generator Configuration
         ▶ Demo Board
                                                              →←: Select Screen
                                                              ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F3: Optimized Defaults
                                                              F4: Save & Exit
                                                              ESC: Exit



                  Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
Launch PXE OpROM	Disabled
Launch Storage OpROM	Enabled
PCI Subsystem Settings	N/A
ACPI Settings	N/A
CPU Configuration	N/A
IDE Configuration	N/A
Other Setting	N/A
USB Configuration	N/A
Clock Generator Configuration	N/A
Demo Board	N/A

4.3.3   Chipset

Chipset options include North Bridge, South Bridge, etc. as shown below:

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Chipset  Boot  Security  Save & Exit

                                                            North Bridge Parameters
   ▶ North Bridge
   ▶ South Bridge




                                                            →←: Select Screen
                                                            ↑↓: Select Item
                                                            Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F3: Optimized Defaults
                                                            F4: Save & Exit
                                                            ESC: Exit




              Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
North Bridge	N/A
South Bridge	N/A

4
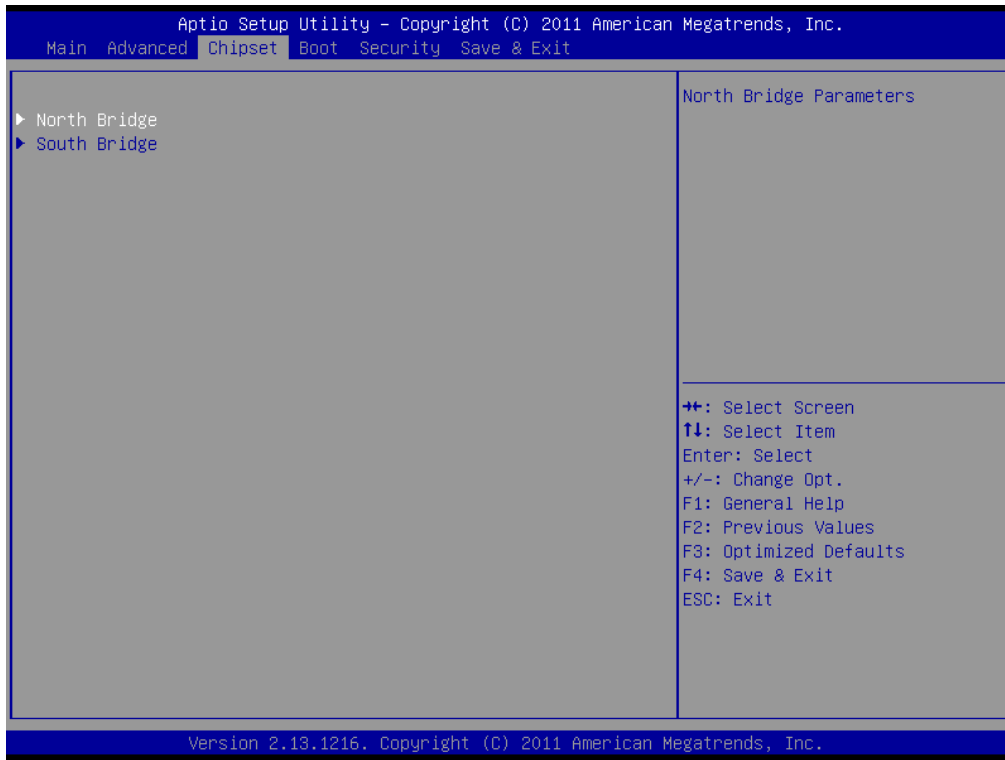
■   **North Bridge**

North Bridge options include DRAM Configuration, PCIe Configuration, etc. as shown below:

```
                 Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                     Chipset

                                                                    Note. Choose [Manual] for each
    VX900 S/P/E Setting              [E->P->S]                       NB functions S/P/E independent
    Generic Debug Enable            [Disabled]                       setting.

  ▶ DRAM Configuration
  ▶ Video Configration
  ▶ PCIE Configuration
  ▶ V-Link Configration




                                                                    ↔: Select Screen
                                                                    ↑↓: Select Item
                                                                    Enter: Select
                                                                    +/-: Change Opt.
                                                                    F1: General Help
                                                                    F2: Previous Values
                                                                    F3: Optimized Defaults
                                                                    F4: Save & Exit
                                                                    ESC: Exit




                 Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
VX900 S/P/E Setting	E->P->S
Generic Debug Enable	Disabled
DRAM Configuration	N/A
Video Configuration	N/A
PCIe Configuration	N/A
V-Link Configuration	N/A

■ **DRAM Configuration**

DRAM Configuration options include DRAM Clock and others as shown below:

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                 Chipset

Memory Information                                          ▲ Select DRAM frequency.
Current FSB Frequency            1066 MHz
Current DRAM Frequency           1066 MHz

Total Memory                     4096 MB (DDR3)
Memory Slot0                     4096 MB (DDR3)
Memory Slot1                     Not Present
DRAM Configuration
DRAM Clock                       [By SPD]
DRAM Timing                      [Auto by SPD]
SDRAM CAS Latency [DDR2/DDR3]    [7T/8T]
Bank Interleave                  [SPD]
Precharge to Active(Trp)[DDR2/DDR3  [9T/11T]
Active to Precharge(Tras)[DDR2/DDR  [20T/30T]   ➔⬅: Select Screen
Active to CMD(Trcd)[DDR2/DDR3]   [9T/11T]        ⬆⬇: Select Item
REF to ACT/REF(Trfc)             [10T/156T]      Enter: Select
ACT(0) to ACT(1) (Trrd)          [9T/9T]         +/-: Change Opt.
Read to Precharge (Trtp)[DDR2/DDR3  [5T/6T]      F1: General Help
Write to Read CMD (Twtr)         [9T/9T]         F2: Previous Values
Write Recovery Time (Twr)[DDR2/DDR  [6T/8T]      F3: Optimized Defaults
DDR3 CAS Write Latency           [11T]           F4: Save & Exit
Tfaw - 4*Trrd                    [15T]           ESC: Exit

Output Impedance Control         [Normal]
Memory Chip ODT[DDR2/DDR3]       [Auto]       ▼

            Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
DRAM Clock	By SPD
DRAM Timing	Auto by SPD
SDRAM CAS Latency	7T/8T
Bank Interleave	SPD
Precharge to Active (Trp)	9T/11T
Active to Precharge (Tras)	20T/30T
Active to CMD (Trcd)	9T/11T
REF to ACT/REF (Tric)	10T/156T
ACT(0) to ACT(1) (Trrd)	9T/9T
Read to Precharge (Trtp)	5T/6T
Write to Read CMD (Twtr)	9T/9T
Write Recovery Time (Twr)	6T/8T
DDR3 CAS Write Latency	11T
Tfaw – 4*Trrd	15T

4

```
          Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
          Chipset

Read to Precharge (Trtp)[DDR2/DDR3    [5T/6T]              ▲ Dynamic CKE
Write to Read CMD (Twtr)               [9T/9T]
Write Recovery Time (Twr)[DDR2/DDR     [6T/8T]
DDR3 CAS Write Latency                 [11T]
Tfaw – 4*Trrd                          [15T]

Output Impedance Control               [Normal]
Memory Chip ODT[DDR2/DDR3]             [Auto]
DDR3 Dynamic ODT                       [Auto]
BA0 SEL                                [A13]
BA1 SEL                                [A14]
BA2 SEL                                [A15]
VR Interleave Address Bit 0            [A17]
VR Interleave Address Bit 1            [A16]         ◄►: Select Screen
Virtual Rank Interleave                [Auto]        ↑↓: Select Item
BA Scramble                            [Enabled]     Enter: Select
DRDY Timing                            [Default]     +/-: Change Opt.
VGA Share Memory (Frame Buffer)        [512 MB]      F1: General Help
Internal VGA DVO Support               [Disabled]    F2: Previous Values
Dram init Method                       []            F3: Optimized Defaults
Remap Function Control                 [Enabled]     F4: Save & Exit
CPU Direct Access Frame Buffer         [Disabled]    ESC: Exit
DRAM Self Refresh                      [Enabled]
Dynamic CKE                            [Enabled]   ▼

          Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
Output Impedance Control	Normal
Memory Chip ODT	Auto
DDR3 Dynamic ODT	Auto
BA0 SEL	A13
BA1 SEL	A14
BA2 SEL	A15
VR Interleave Address Bit 0	A17
VR Interleave Address Bit 1	A16
Virtual Rank Interleave	Auto
BA Scramble	Enabled
DRDY Timing	Default
VGA Share Memory (Frame Buffer)	512 MB
Internal VGA DV0 Support	Disabled
Dram init Method	N/A
Remap Function Control	Enabled
CPU Direct Access Frame Buffer	Disabled
DRAM Self Refresh	Enabled
Dynamic CKE	Enabled

■ **Video Configuration**

Video Configuration options include UMA Enable and others as shown below:

4

```
Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
 Chipset

Video Configuration                                          UMA Enable/Disable.

UMA Enable                       [Enabled]
Select Display Device Control    [MANUAL]
Select Display Device 1          [LCD]
Select Display Device 2          [CRT]
Panel Type                       9
Panel Type2                      2
TV H/W Layout                    [Default]
TV Type                          [NTSC]
TV Output Connector              [CVBS (Composite)]
HDTV Type                        [HDTV 720P]
Select HDTV Output Connector     [R/G/B]
Enging Clock Control             [Disabled]
ECLK Frequency                   250                         →←: Select Screen
SSC On/Off                       [Enabled]                   ↑↓: Select Item
SSC Path Selection               [External]                  Enter: Select
SSC Original/FiFo Mode           [Original]                  +/-: Change Opt.
Display Clock SSC                [Mode 1 (8X)]               F1: General Help
Linux Video IP Enablement        [Enable all]               F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit

          Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
UMA Enable	Enabled
Select Display Device Control	MANUAL
Select Display Device 1	LCD
Select Display Device 2	CRT
Panel Type	9
Panel Type2	2
TV H/W Layout	Default
TV Type	NTSC
TV output Connector	CVBS (Composite)
HDTV Type	HDTV 720P
Select HDTV Output Connector	R/G/B
Engine Clock Control	Disabled
SSC On/Off	Enabled
SSC Path Selection	External
SSC Original/FiFo Mode	Original
Display Clock SSC	Mode 1 (8X)
Linux Video IP Enablement	Enabled all

■ **PCIe Configuration**

PCIe Configuration options include PCIe PE0 Control and others as shown below:

```
             Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                  Chipset

   PCIE Configuration                                          Select Maximum Payload Size.

   Maximum Payload Size              [Auto]
   Reset PCIe When Link Fail         [Enabled]
   Reset PE0 When Link Fail          [Enabled]
   Reset PE1 When Link Fail          [Enabled]
   Reset PE2 When Link Fail          [Enabled]
   Reset PE3 When Link Fail          [Enabled]
   ASPM Support                      [Auto]
   PCIE Target Link Speed            [Auto]
   PCIE Root Port                    [Enabled]
   PCIE PE0 Control                  [Enabled]
   PCIE PE1-3 Control                [Enabled]
                                                             ➜←: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit



             Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
Maximum Payload Size	Auto
Reset PCIe When Link Fail	Enabled
Reset PE0 When Link Fail	Enabled
Reset PE1 When Link Fail	Enabled
Reset PE2 When Link Fail	Enabled
Reset PE3 When Link Fail	Enabled
ASPM Support	Auto
PCIe Target Link Speed	Auto
PCIe Root Port	Enabled
PCIe PE0 Control	Enabled
PCIe PE1-3 Control	Enabled

■   **South Bridge**

South Bridge options include VX900 S/P/E Setting, High Speed Support, etc. as shown below:

```
         Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
            Chipset

  VX900 S/P/E Setting                    [E->P->S]         ▲  Note. Choose [Manual] for each
                                                              SB functions S/P/E independent
  SDIO / Card Reader Configuration                            setting.
  SDIO Host controller                   [Enabled]
  Voltage Support 1.8v                   [Disabled]
  High Speed Support                     [Enabled]
  Base Clock Frequency For SD Clock      [48MHz]
  Timeout Clock Frequency                [48MHz]
  SDIO PAD Slew Rate Control             [3.3V/3ns]
  Card Reader Host Controller            [Enabled]
  SD/MMC Card Control by                 [SDIO Controller]

  Audio Configuration
  OnChip HDAC Device                     [Enabled]         ←→: Select Screen
  HD Audio FIFO 256 Bytes Supported      [Enabled]         ↑↓: Select Item
                                                           Enter: Select
  USB Configuration                                        +/-: Change Opt.
  OnChip UHCI 1 Device                   [Enabled]         F1: General Help
  OnChip UHCI 2 Device                   [Enabled]         F2: Previous Values
  OnChip UHCI 3 Device                   [Enabled]         F3: Optimized Defaults
  OnChip UHCI 4 Device                   [Enabled]         F4: Save & Exit
  OnChip EHCI 1 Device                   [Enabled]         ESC: Exit

  USBD Configuration                                    ▼

         Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
VX900 S/P/E Setting	E->P->S
SDIO Host controller	Enabled
Voltage Support 1.8v	Disabled
High Speed Support	Enabled
Base Clock Frequency For SD Clock	48MHz
Timeout Clock Frequency	48MHz
SDIO PAD Slew Rate Control	3.3V/3ns
Card Reader Host Controller	Enabled
SD/MMC Card Control by	SDIO Controller
OnChip HDAC Device	Enabled
HD Audio FIFO 256 Bytes Supported	Enabled
OnChip UHCI 1 Device	Enabled
OnChip UHCI 2 Device	Enabled
OnChip UHCI 3 Device	Enabled
OnChip UHCI 4 Device	Enabled
OnChip EHCI 1 Device	Enabled

4

```
            Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
            Chipset

 USB Device Mode Control          [Disabled]         ▲  SMBus Clock Control

 CEC Configuration
 OnChip CEC Device                [Disabled]

 SNMI Configuration
 APIC Cycle Control               [CCA]
 PCICFG Cycle Control             [BLOCK]

 High Precision Event Timer Configuration
 High Precision Timer             [Enabled]

 SB Other Configuration
 WATCHDOG Timer Enable            [Enabled]              ←→: Select Screen
 WATCHDOG Timer RUN/STOP          [Stop]                 ↑↓: Select Item
 WATCHDOG Timer ACTION            [Power Off]            Enter: Select
 WATCHDOG Timer COUNT             [1023SEC]              +/-: Change Opt.
 PCI Delay Transaction            [Enabled]              F1: General Help
                                                         F2: Previous Values
 Restore AC Power Loss            [Power On]             F3: Optimized Defaults
 PCI to PCI Bridge                [Enabled]              F4: Save & Exit
 Keyboard/Mouse Wakeup Control    [Enabled]              ESC: Exit
 SMBus Device Switch              [New SMBus Device]
 SMBus Clock Switch               [128K Clock]        ▼

            Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
USB Device Mode Control	Disabled
OnChip CEC Device	Disabled
APIC Cycle Control	CCA
PCICFG Cycle Control	BLOCK
High Precision Timer	Enabled
WATCHDOG Timer Enable	Enabled
WATCHDOG Timer RUN/STOP	Stop
WATCHDOG Timer ACTION	Power Off
WATCHDOG Timer COUNT	1023SEC
PCI Delay Transaction	Enabled
Restore AC Power Loss	Power On
PCI to PCI Bridge	Enabled
Keyboard/Mouse Wakeup Control	Enabled
SMBus Device Switch	New SMBus Device
SMBus Clock Switch	128K Clock

4

```
              Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
                Chipset

  PCICFG Cycle Control              [BLOCK]                    ▲ DVP or VCP Pad Switch

  High Precision Event Timer Configuration
  High Precision Timer             [Enabled]

  SB Other Configuration
  WATCHDOG Timer Enable            [Enabled]
  WATCHDOG Timer RUN/STOP          [Stop]
  WATCHDOG Timer ACTION            [Power Off]
  WATCHDOG Timer COUNT             [1023SEC]
  PCI Delay Transaction            [Enabled]

  Restore AC Power Loss            [Last State]
  PCI to PCI Bridge                [Enabled]          ↔: Select Screen
  Keyboard/Mouse Wakeup Control    [Enabled]          ↑↓: Select Item
  SMBus Device Switch              [New SMBus Device]  Enter: Select
  SMBus Clock Switch               [128K Clock]        +/-: Change Opt.
                                                       F1: General Help
  Peripheral Configuration                             F2: Previous Values
  OnBoard LAN Enable               [OnBoard PCIE Lan E...]  F3: Optimized Defaults
                                                       F4: Save & Exit
  UART Configuration                                   ESC: Exit
  OnChip UART Mode                 [LEGACY]
  IRQ3/4 Used by Legacy UART       [UART0/1(GFX)]
  DVP or VCP Pad                   [VCP]             ▼

              Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default
OnBoard LAN Enable	OnBoard PCIe LAN Enabled
OnChip UART Mode	LEGACY
IRQ3/4 Used by Legacy UART	UART0/1(GFX)
DVP or VCP Pad	VCP

4

4.3.4   Boot

Boot options include Setup Prompt Timeout, Bootup NumLock State, etc. as shown below:

```
                    Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
      Main  Advanced  Chipset  Boot  Security  Save & Exit

   Boot Configuration                                               Number of seconds to wait for
   Setup Prompt Timeout                  3                          setup activation key.
   Bootup NumLock State                  [On]                       65535(0xFFFF) means indefinite
                                                                    waiting.
   Quiet Boot                            [Disabled]

   CSM16 Module Version                  07.69

   GateA20 Active                        [Upon Request]
   Option ROM Messages                   [Force BIOS]
   INT19 Trap Response                   [Immediate]
   CSM Support                           [Enabled]
   UEFI Boot                             [Disabled]               →←: Select Screen
                                                                  ↑↓: Select Item
   Boot Option Priorities                                         Enter: Select
   Boot Option #1                        [SATA  PS: CFast 3M...]  +/-: Change Opt.
                                                                  F1: General Help
   Hard Drive BBS Priorities                                      F2: Previous Values
                                                                  F3: Optimized Defaults
                                                                  F4: Save & Exit
                                                                  ESC: Exit



                    Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default	Description
Setup Prompt Timeout	3	-
Bootup NumLock State	On	-
Quiet Boot	Disabled	-
GateA20 Active	Upon Request	-
Option ROM Messages	Force BIOS	-
INT19 Trap Response	Immediate	-
CSM Support	Enabled	-
UEFI Boot	Disabled	-
Boot Option Priorities	N/A	-
Hard Drive BBS Priorities	N/A	Hard drive boot priorities

4.3.5   Security

Security options include Administrator Password, User Password, etc. as shown below:

```
                Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
    Main  Advanced  Chipset  Boot  Security  Save & Exit

   Password Description                                  Set Setup Administrator
                                                         Password
   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password must be 3 to 20 characters long.


   Administrator Password
   User Password                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
   HDD Security Configuration:                           +/-: Change Opt.
   HDD 0:CFast 3ME                                       F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit




                Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default	Description
Administrator Password	N/A	Set / change system administrator password
User Password	N/A	Set / change user password
HDD Security Configuration	N/A	Configuration of hard drive security

4.3.6 Save & Exit

Save & Exit options include Save Changes and Exit, Discard Changes and Exit, etc.

as shown below:

```
          Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.
       Main  Advanced  Chipset  Boot  Security  Save & Exit

     Save Changes and Exit                          Attempts to Launch EFI Shell
     Discard Changes and Exit                       application (Shellx64.efi)
     Save Changes and Reset                         from one of the available
     Discard Changes and Reset                      filesystem devices

     Save Options
     Save Changes
     Discard Changes

     Restore Defaults
     Save as User Defaults
     Restore User Defaults

     Boot Override                                   →←: Select Screen
     SATA  PS: CFast 3ME                             ↑↓: Select Item
                                                     Enter: Select
     Launch EFI Shell from filesystem device         +/-: Change Opt.
                                                     F1: General Help
                                                     F2: Previous Values
                                                     F3: Optimized Defaults
                                                     F4: Save & Exit
                                                     ESC: Exit


          Version 2.13.1216. Copyright (C) 2011 American Megatrends, Inc.
```

Item	Default	Description
Save Changes and Exit	N/A	-
Discard Changes and Exit	N/A	-
Save Changes and Reset	N/A	-
Discard Changes and Reset	N/A	-
Save Changes	N/A	-
Discard Changes	N/A	-
Restore Defaults	N/A	-
Save as User Defaults	N/A	-
Restore User Defaults	N/A	-
Boot Override	N/A	Force boot option

System Operation and Setting

<div style="text-align: right; font-size: 200%;">5</div>

This chapter introduces the operation and settings of the system, which are the basic operations of the non-programming function. Users can learn how to set up the system write-protect (EWF) function, security function, create system backup image file, and restore system with the image file.

5

5.1   Description of system environment

- Windows OS: Microsoft Windows Embedded Standard operating system.

- IntervalZeroRTX: Real-time operating system (optional); EtherCAT must be used with RTX environment.

- DMCNET: DMCNET operating interface (EzDMC) provided.

- EtherCAT: EtherCAT operating interface (EcNavi) provided; must be used with RTX environment.

5.2 Write-protect (EWF) function settings
5.2.1 How to set EWF by EWFSwitch

The purpose of the EWF function is to control whether changes can be made to the C Drive (hard drive). When EWF is enabled, the writing to the C Drive will only exist in the memory; once the system is rebooted, the changed data will not be saved as to protect the C Drive. Execute EWFSwitch.exe on the desktop.

5.2.2 How to check current EWF status

■ When EWFSwitch is executed, check Current Status. As shown below, Disable indicates that EWF is currently disabled and the changes will be saved after rebooting.
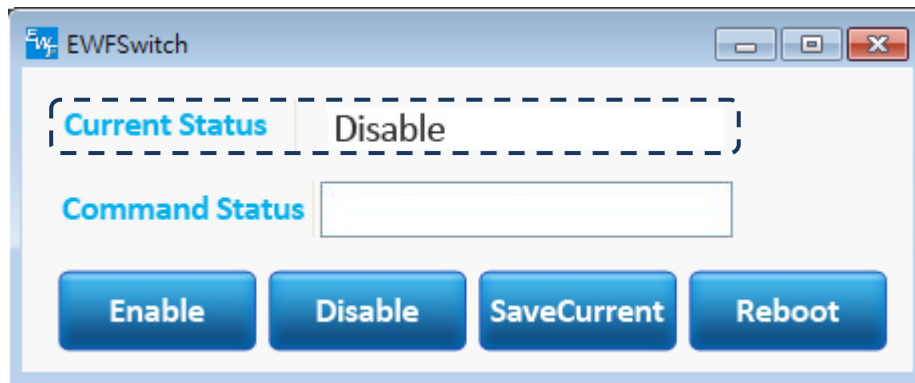
5

■ As shown below, Enable indicates that EWF is currently enabled and the changes will not be saved after rebooting.
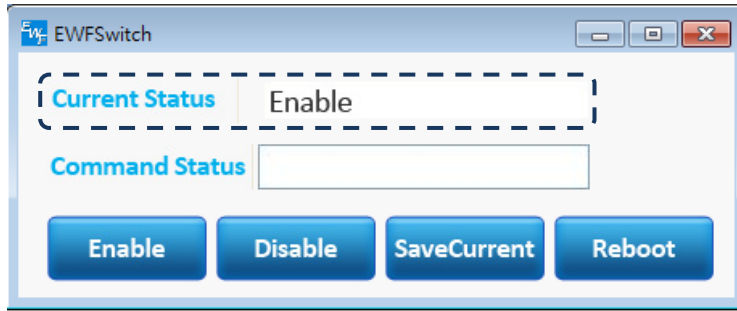
5.2.3   How to enable EWF

■ Click **Enable**, then click **Reboot** to enable EWF function.
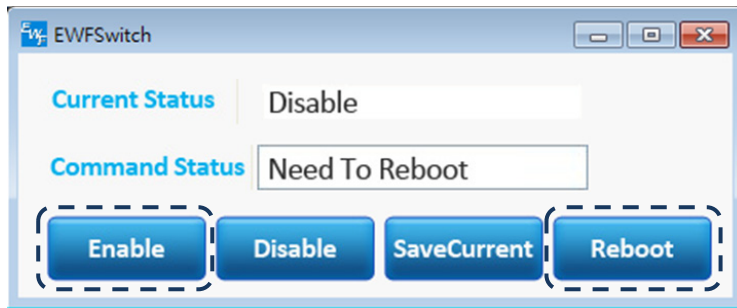
5.2.4   How to disable EWF

■   Click **Disable**, then click **Reboot** to disable EWF function.

5
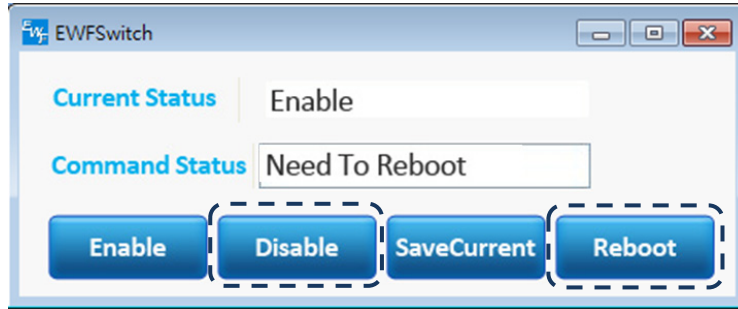
5.2.5   How to save changes when EWF is enabled

■   Click **SaveCurrent**, then click **Reboot** to save current changes when write-protection is enabled.
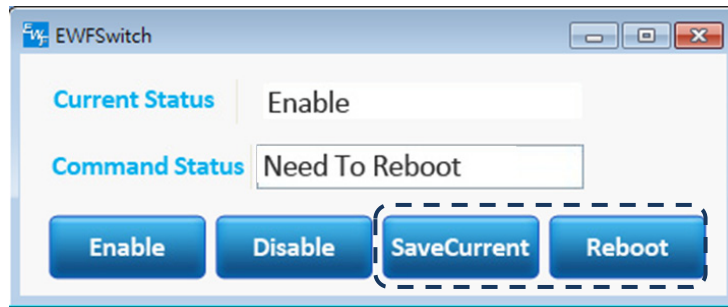
5.2.6   How to fix EWF

■   Current Status shows Need Fix as shown below when executing EWFSwitch.

This situation may occur after cloning the hard drive with Ghost.
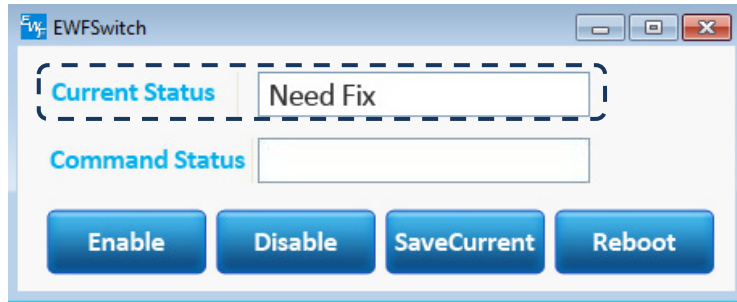
■   Please follow the steps below to fix EWF

Execute Step (1) only if the PAC is configured with CFast (system) and SSD (drive).

If only configured with CFast, skip to Step (2).

(1)   As shown below, execute EWF_Fix_CFast_SSD.reg on the desktop of the PAC operating system. Execution of EWF_Fix_CFast_SSD.reg is to modify the system registry; thus, when executing EWF_Fix_CFast_SSD.reg, a warning will pop-up to confirm if users trust the source of this registry file. Click **Yes** to confirm.

5
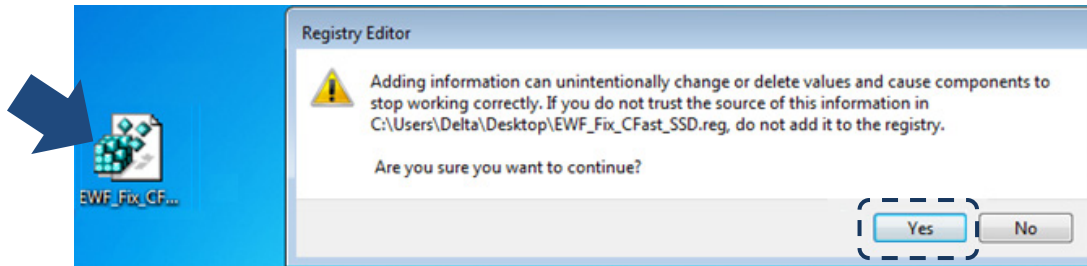
(2)   Click **Start**, type "ewf", then press **Enter** to open the command window. Enter "5" in the command window and press **Enter**.
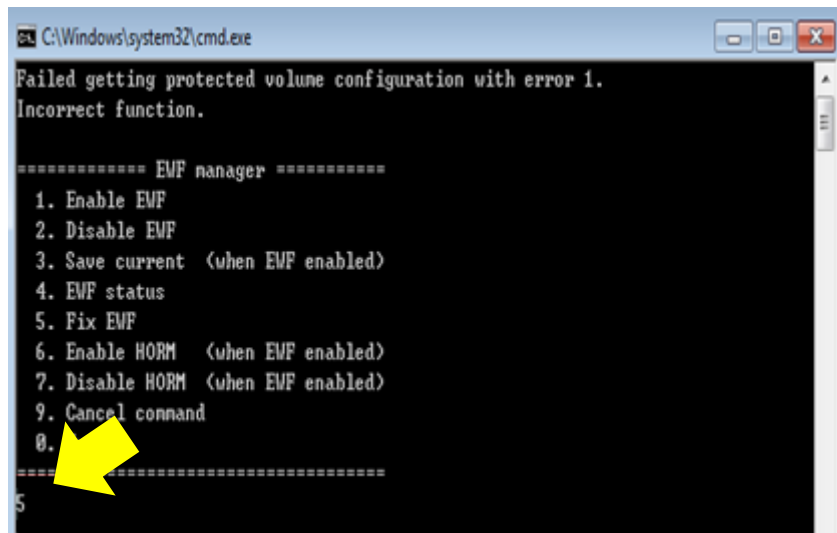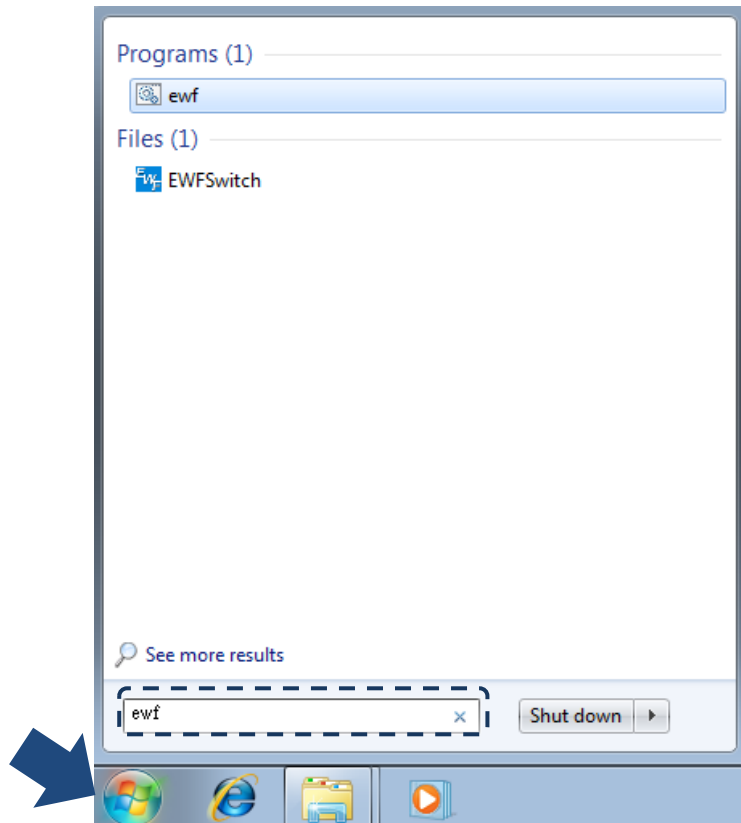
(3)   After the above steps are completed, please reboot.

5.3   Security setting

■   Please refer to the Security section in the DMC_Programming_Guide Manual.

5.4   System restore

After installing the required software, create an image backup. Then, whenever users need to restore the system, you may use the image backup file to restore. The following steps will demonstrate how to create a bootable USB flash drive, and use this flash drive to create an image backup. Then, you may use this image backup to restore the system when needed.

5.4.1   How to create a bootable USB flash drive

Please follow the instructions below to create a bootable USB flash drive:

(1)   Prepare a blank USB flash drive.

(2)   Download BootUSB.gho. This is the image file for the bootable USB flash drive and it is available on Delta's website.

Download link:
http://www.deltaww.com/services/DownloadCenter2.aspx?secID=8&pid=2&tid=0&CID=06&itemID=060203&typeID=1&downloadID=,&title=--%20Select%20Product%20Series%20--&dataType=8;&check=1&hl=en-US

(3)   Download Ghost32.exe. This program is to create the bootable flash drive, which is available from third parties instead of Delta.

(4)   Execute Ghost32.exe, select **Local** > **Disk** > **From Image**. This will restore the image file to the flash drive. Please see below for details:
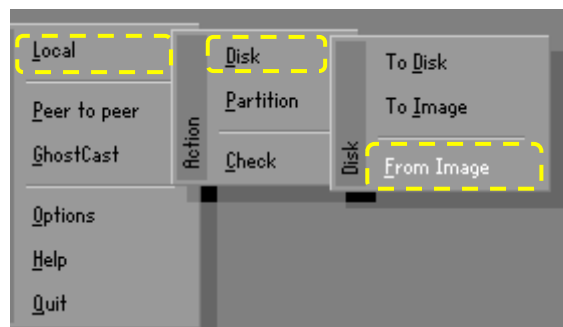
(5)   Select and open the source image file of BootUSB.gho.

5

Image file name to restore from

Look in:	E: 1.3: [] NTFS drive		

Name	Size	Date
		2015/06/24 05:13:22 PM
BootUSB.gho	2,254,591	2015/06/24 04:23:36 PM

File name:	BootUSB.gho	Open
Files of type:	*.GHO	Cancel
Image file description:		
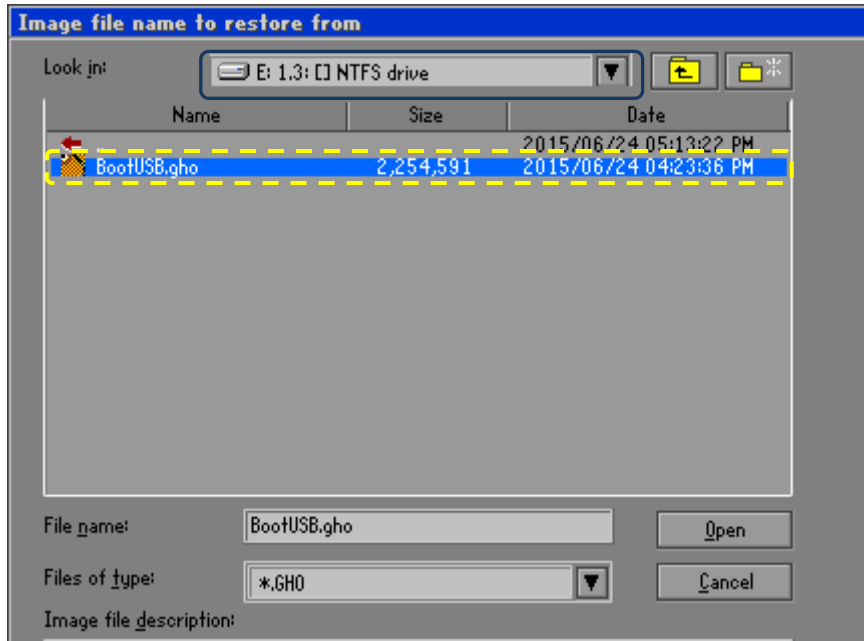
(6)   Select the USB flash drive as the destination that the image file will restore to.

Select local destination drive by clicking on the drive number

Drive	Location	Model	Size(MB)	Type	Cylinders	Heads	Sectors
1	Local	ST3500418AS	476938	Basic	60801	255	63
2	Local	TOSHIBA TransMemory 1.0	14800	Basic	1886	255	63
80	Local	OS Volumes	491725	Basic	62686	255	63

OK   Cancel
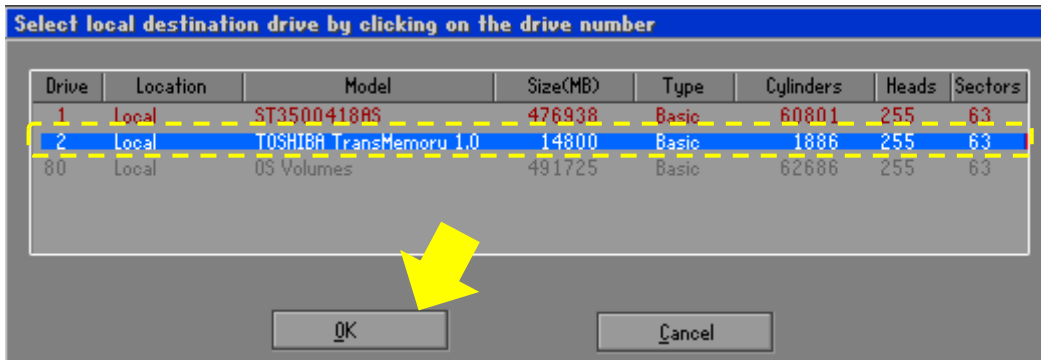
(7)   No need to re-size. Click **OK**.

Destination Drive Details

Part	Type	Letter	ID	Description	Label	New Size	Old Size	Data Size
1	Primary	G:	0c	Fat32	TOSHIBA	14794	14799	16
					Free	5	0	
					Total	14800	14800	16

OK   Cancel
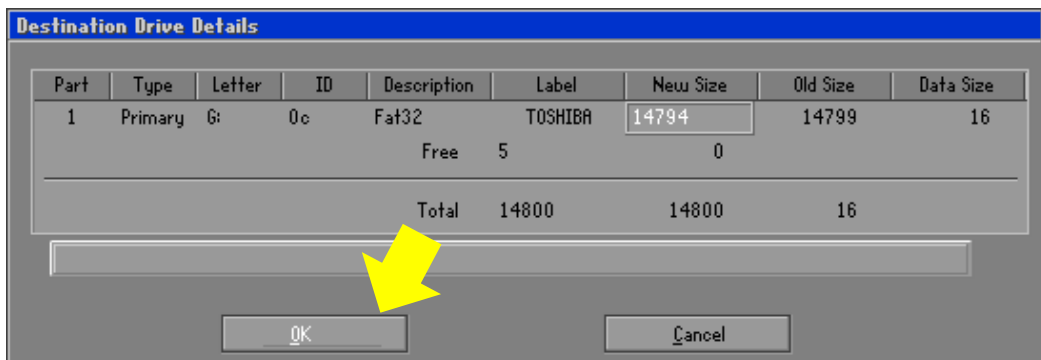
5

(8)   Click **Yes** to proceed.

(9)   Wait for the restore to complete. When the following window appears, select **Continue**.

(10) Select **Quit** and click **Yes** to exit the program. Then the bootable USB flash drive is created.
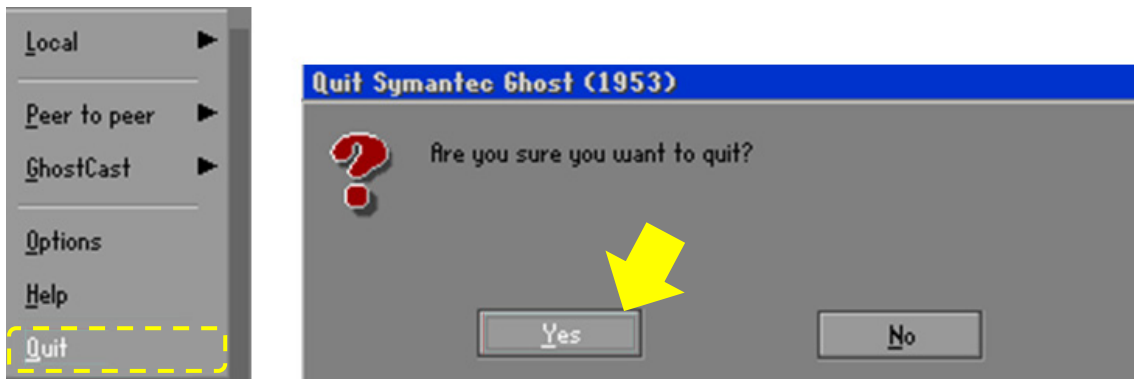
5.4.2 How to create an image backup

(1) Launch the system to be backed up and check the system status. Execute EWFSwitch.exe, click **Disable**, then click **Reboot** to disable EWF function. If the system has RTX software installed, please proceed to Step (2), otherwise skip to Step (3) after rebooting.
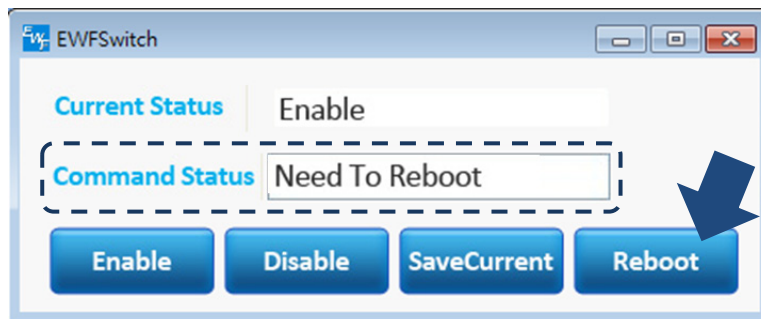
(2) Please open **Programs** > **IntervalZero** > **RTX 201X** > **RTX Properties**. In the **RTX Properties** menu, select **System**, and confirm the **Startup Type** is **Manual** to prevent the backup system from opening the RTX automatically.

(3) Insert the USB flash drive created by following the instructions in Section 5.4.1.

(4) Enter **BIOS**, then select **Hard Drive BBS Priorities** to change the boot sequence priority to boot from USB flash drive, and press **F4** to save the settings.
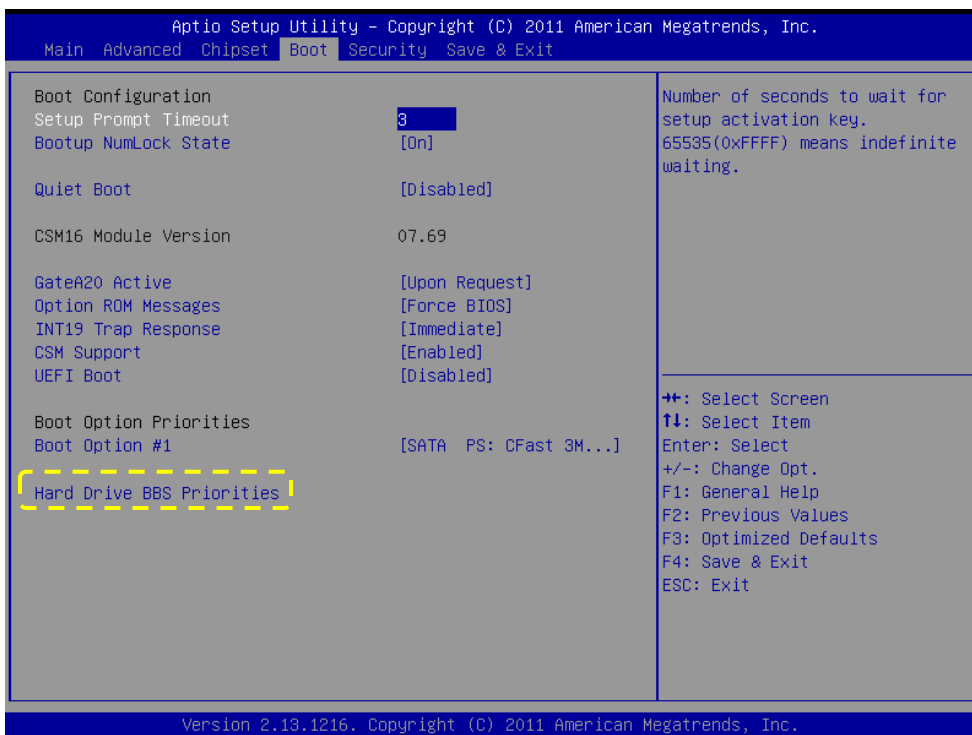
5

(5) In the Ghost window, select **Local** > **Disk** > **To Image** to backup the current data in the CFast card to the image file.
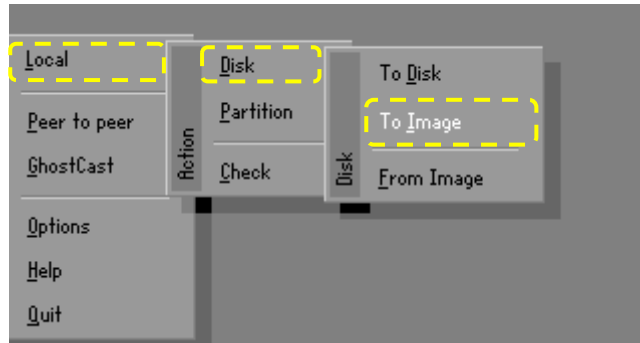
(6) Select CFast card as the source to backup.
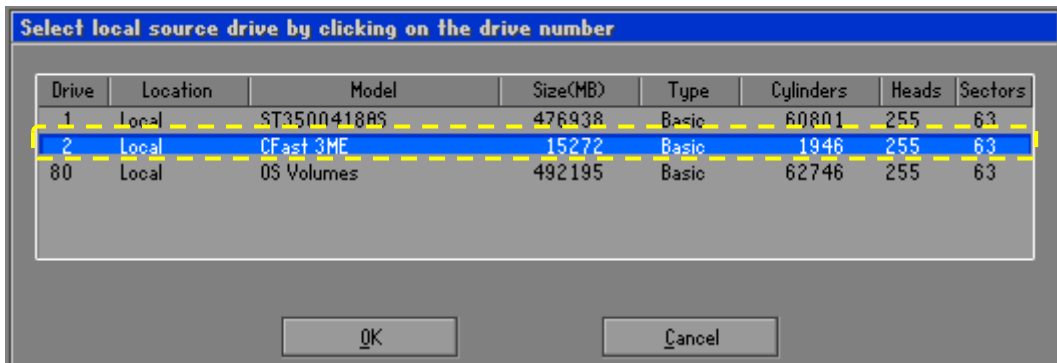
(7) Specify the image file name and choose to save the image file to the flash drive.

Indicate the root directory of the selected file

Selected file
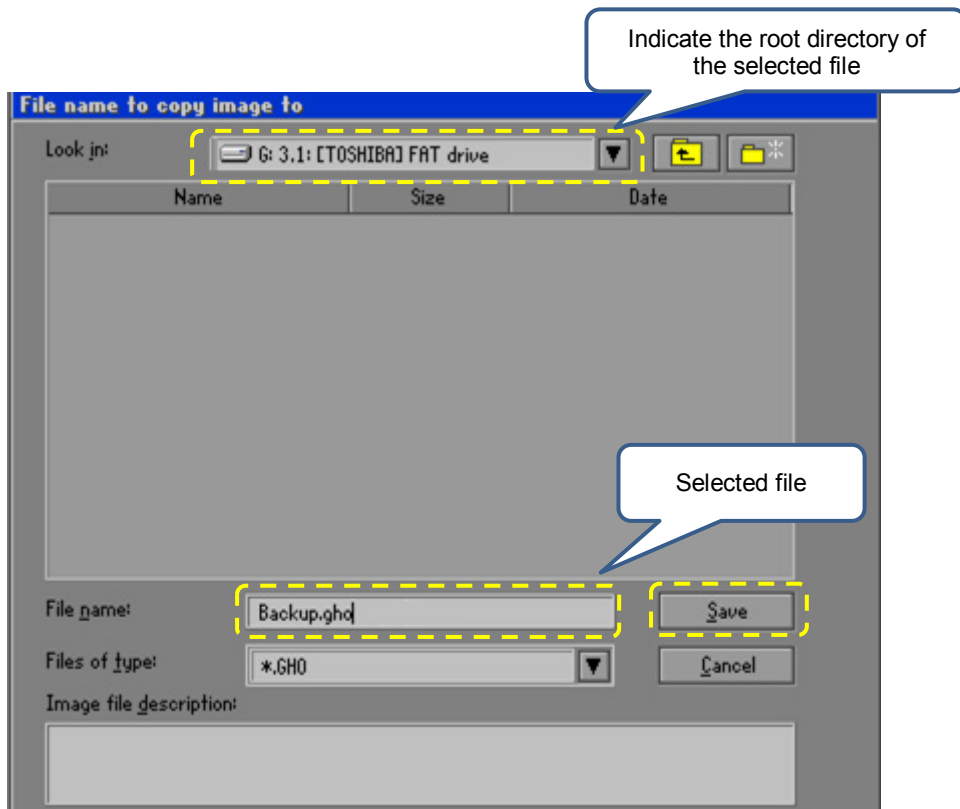
(8)   Select **High** and click **Yes** to start creating the image file. Wait for the image file to be created, then reboot.

5
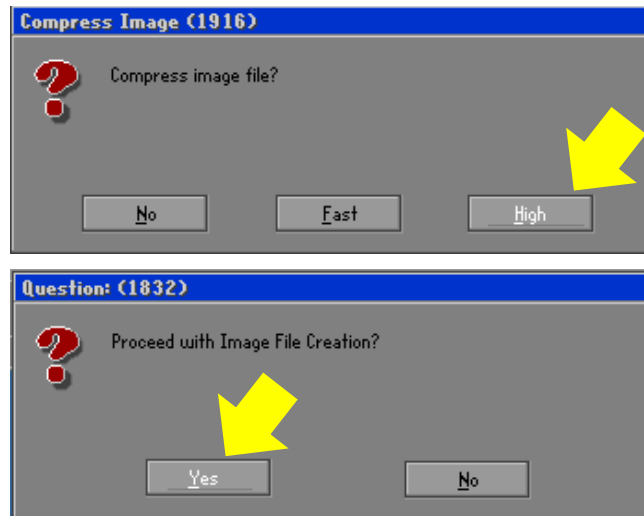
(9)   Save the backup image file for restoring when needed.

5.4.3   How to backup license file before restoring with image file

If the PAC has RTX installed, users need to backup two license files before restoring. They are:

(1)   Path to RTX license file---RTX2012.lic:

     WINXP   C:\Documents and Settings\All users\Application Data\IntervalZero

     WIN7   C:\ProgramData\IntervalZero

(2)   Path to Security authentication file---S3503539980063603: C:\Windows

     If the PAC is still able to boot normally, you may use PACRecoveryBackUpFile.exe to backup these two files.

     Download link:

     http://www.deltaww.com/services/DownloadCenter2.aspx?secID=8&pid=2&tid=0&CID=06&itemID=060203&typeID=1&downloadID=EtherCAT,&title=EtherCAT&dataType=8;&check=1&hl=en-US

If the PAC cannot boot normally, users may use the tool to read the CFast card to backup these two files from their respective path:

(1)   Execute PACRecoveryBackUpFile.exe in the flash drive that will be created into the backup flash drive.
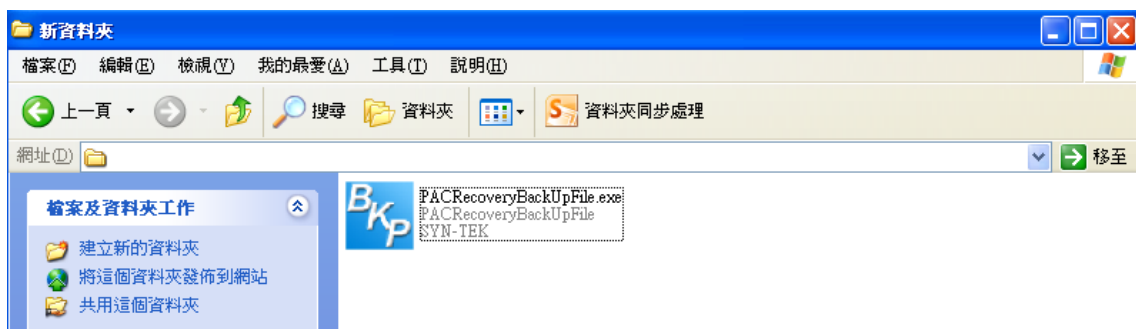
5

(2)   When backing up, a folder will be generated in the same path as
PACRecoveryBackUpFile.exe to save the backup files. Specify the folder name in the
FolderName field, or the default is BackUpFolder. The RTX license file in XP and WIN7 are
in different path locations, so the OS selection needs to be specified.
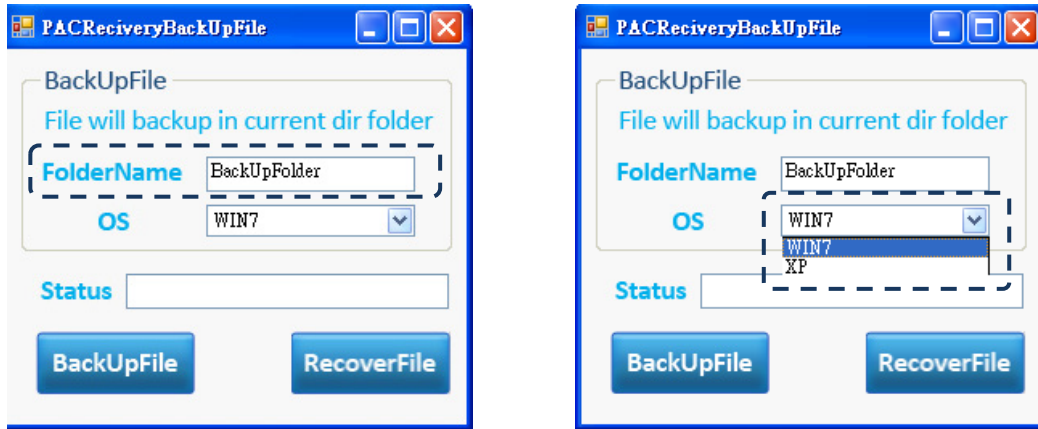
(3)   Click **BackUpFile** to start backup. After the backup is complete, Status will display OK,
then a folder is generated in the flash drive to save the backup files.
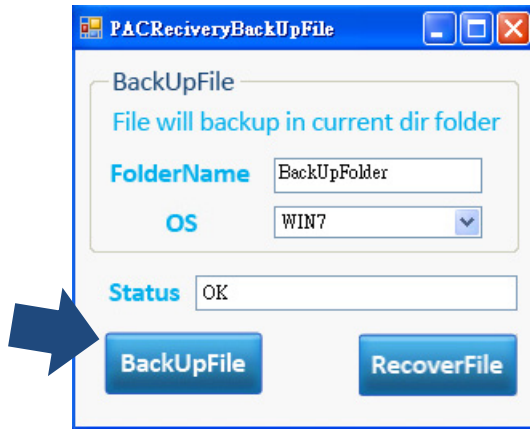
5.4.4   How to restore with image file

(1)   Insert the bootable USB flash drive containing the backup image.

(2)   Enter **BIOS** > **Hard Drive BBS Priorities** to change the boot sequence priority to boot from USB flash drive, and press **F4** to save the settings.

(3)   In the Ghost window, select **Local** > **Disk** > **From Image**. This will restore the image file to the CFast card.
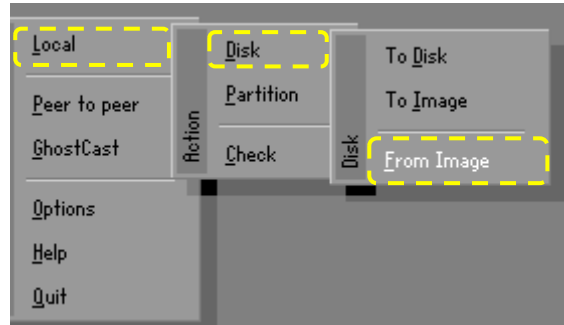
(4)   Select the source image file.
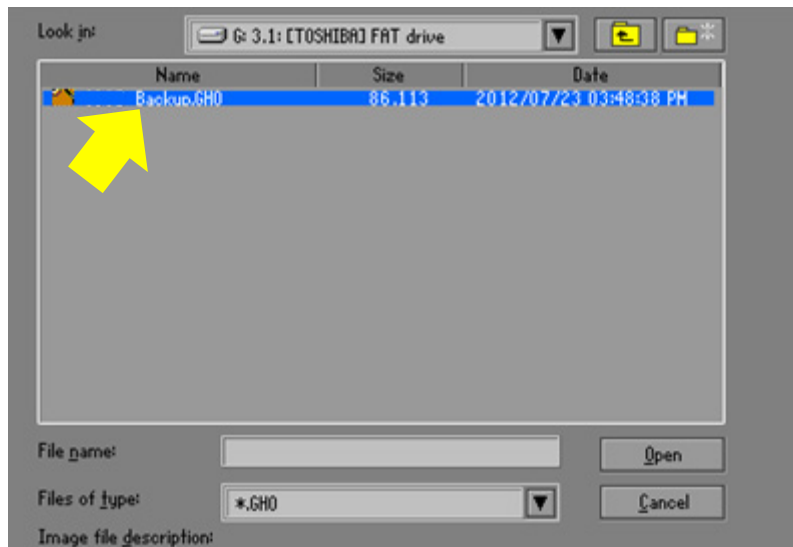
(5)   Select the CFast card as the destination that the image file will restore to.
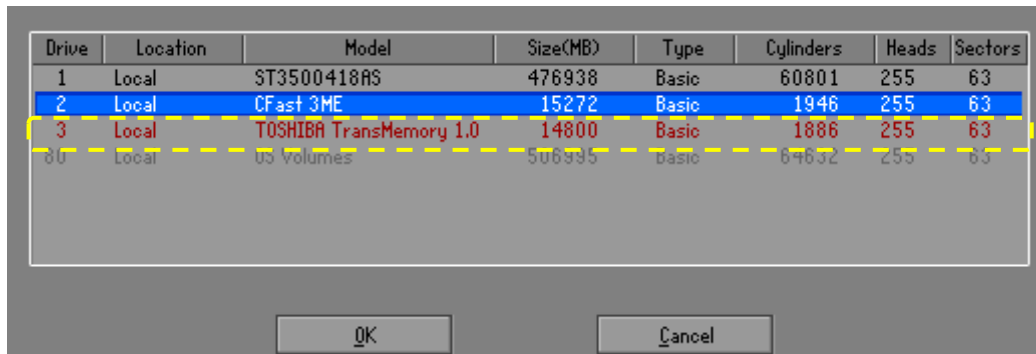
5

(6) Re-size each disk. If not needed, click **OK**.

Part	Type	Letter	ID	Description	Label	New Size	Old Size	Data Size
1	Primary	J:	07	NTFS	WES2009	7640	7640	727
2	Primary	K:	07	NTFS	Data	7624	7624	40
				Free	7		7	
				Total	15272		15272	768

OK   Cancel
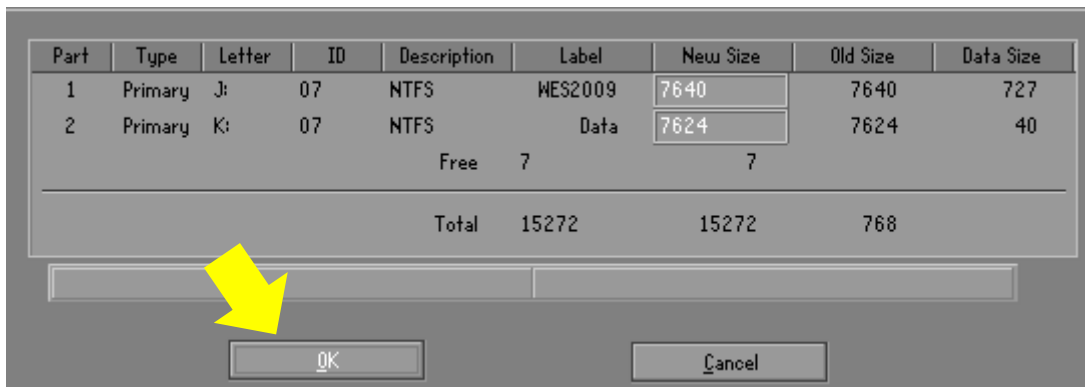
(7) Click **Yes** to restore the image file to the CFast card. Wait for the restore to complete, then reboot.

Question: (1822)

Proceed with disk restore?
Destination drive will be permanently overwritten.

Yes   No
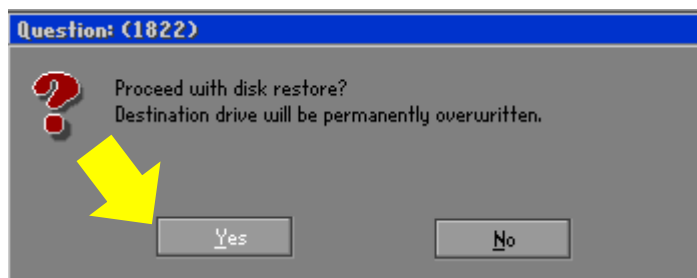
(8) If RTX is included, users need to place the backup RTX license and Security authentication file in the corresponding path, then you can use PACRecoveryBackUpFile.exe to restore the system.

Download link:
http://www.deltaww.com/services/DownloadCenter2.aspx?secID=8&pid=2&tid=0&CID=06&itemID=060203&typeID=1&downloadID=EtherCAT,&title=EtherCAT&dataType=8;&check=1&hl=en-US

Execute PACRecoveryBackUpFile.exe and specify the folder name of the backup folder.

Specify the OS selection, then click **RecoverFile** to restore the files in the specified FolderName to the corresponding path.

PACRecoveryBackUpFile

BackUpFile
File will backup in current dir folder

FolderName   BackUpFolder
OS   WIN7

Status

BackUpFile   RecoverFile

PACRecoveryBackUpFile

BackUpFile
File will backup in current dir folder

FolderName   BackUpFolder
OS   WIN7

Status   OK

BackUpFile   RecoverFile
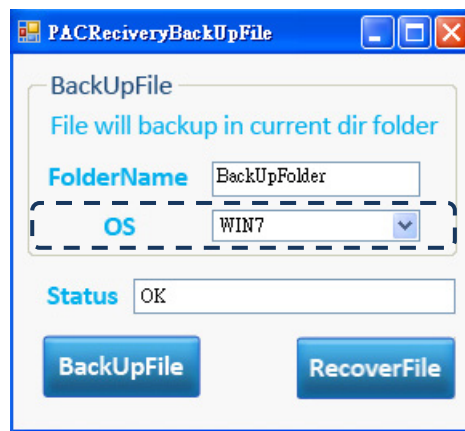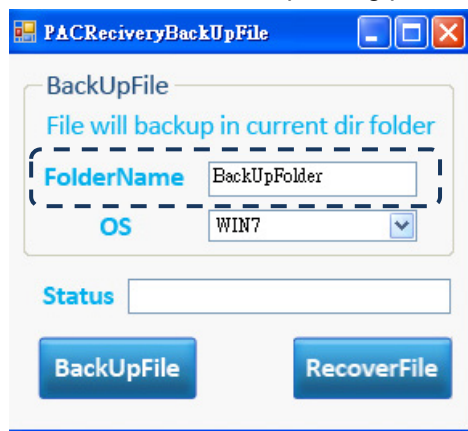
EcNavi Software Installation and Application

6

This chapter introduces how to install and uninstall the software driver as well as its features. EcNavi software needs to be installed on Windows® operating systems, and it is developed for users to control and monitor a variety of modules and servo drives.

6.1   Driver installation and uninstallation

Please refer to the following screenshots and steps to install or uninstall the driver:

(1)   Open the content folder of the disc, select, and execute "setup.exe" in the EtherCATDisk
       folder.
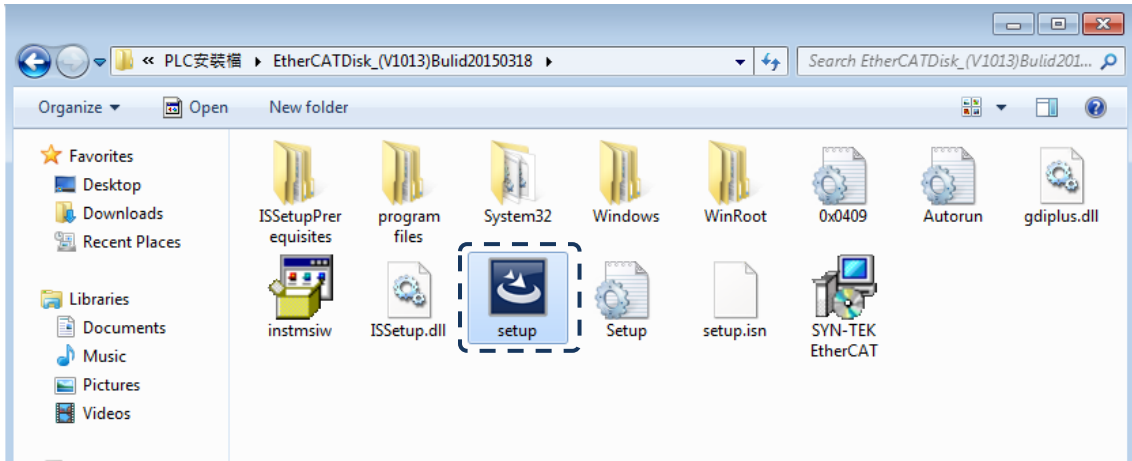
(2)   If there are required packages that are missing, the InstallShield Wizard will pop-up with the
       required packages for installation, then press **Install**.
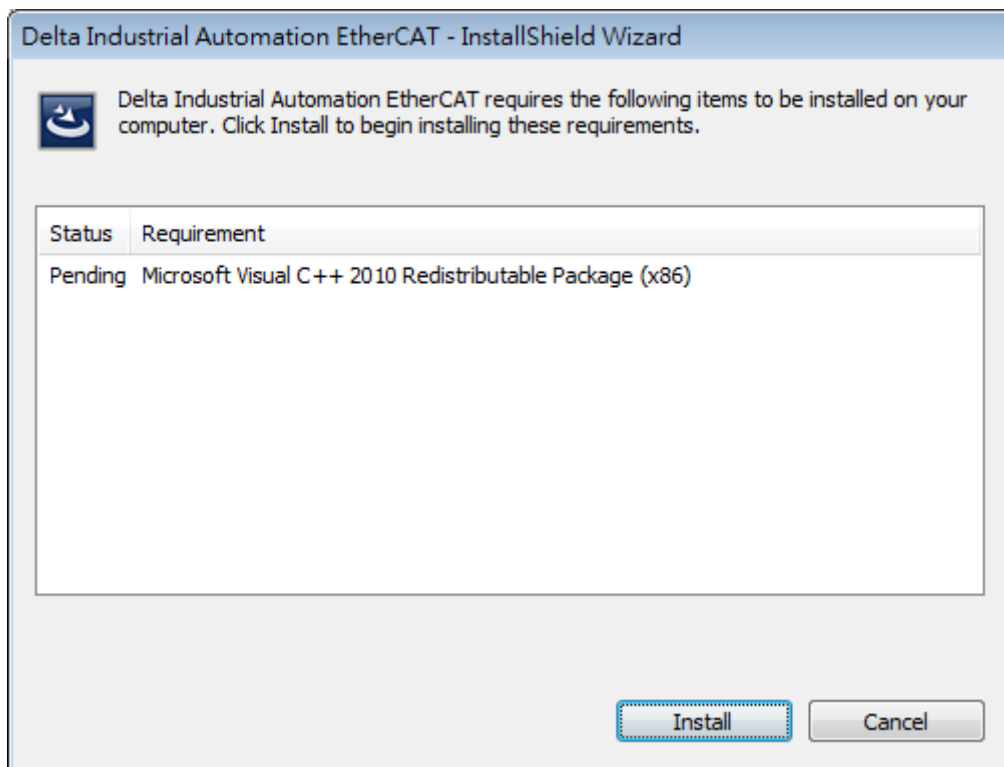
(3)   The InstallShield Wizard will check the system and prepare for installation.
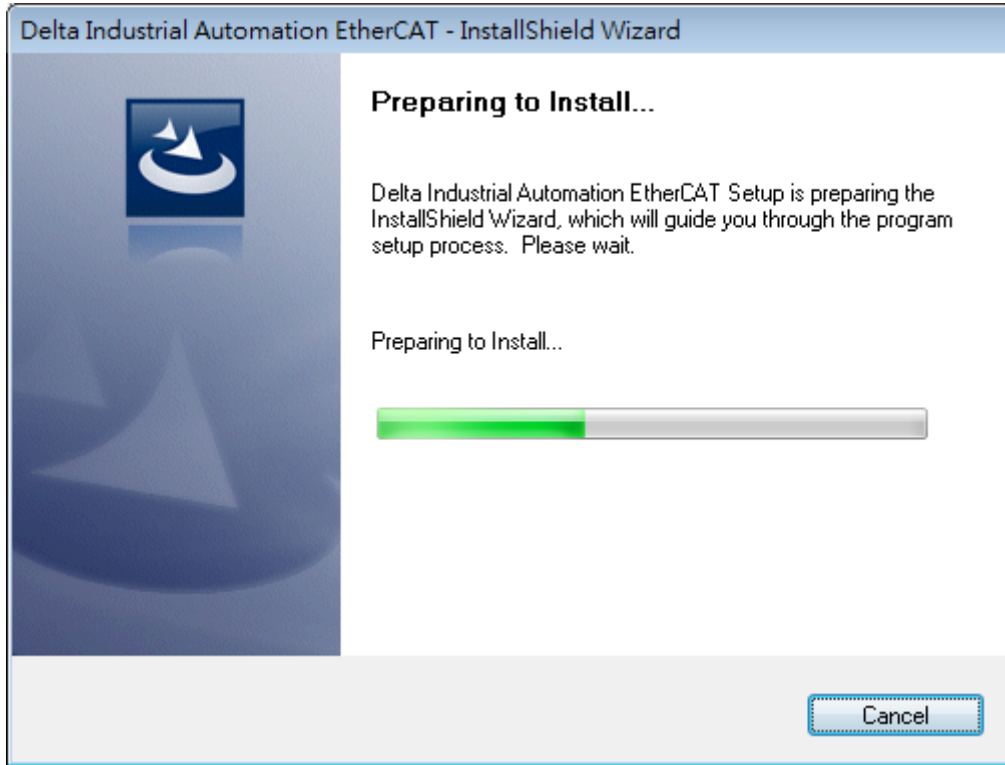
(4)   Once the system check is complete, start the software installation procedure.

Click **Next** to continue.
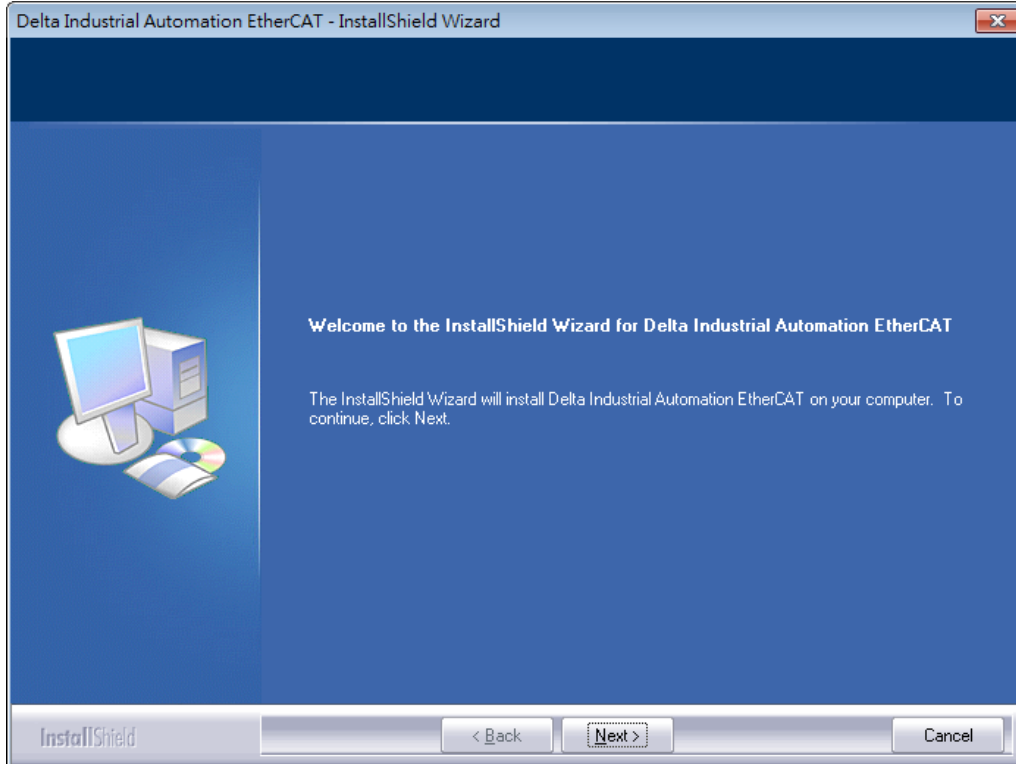
(5)   Select the destination folder for the software to be installed (default folder is recommended), click **Next** to continue.
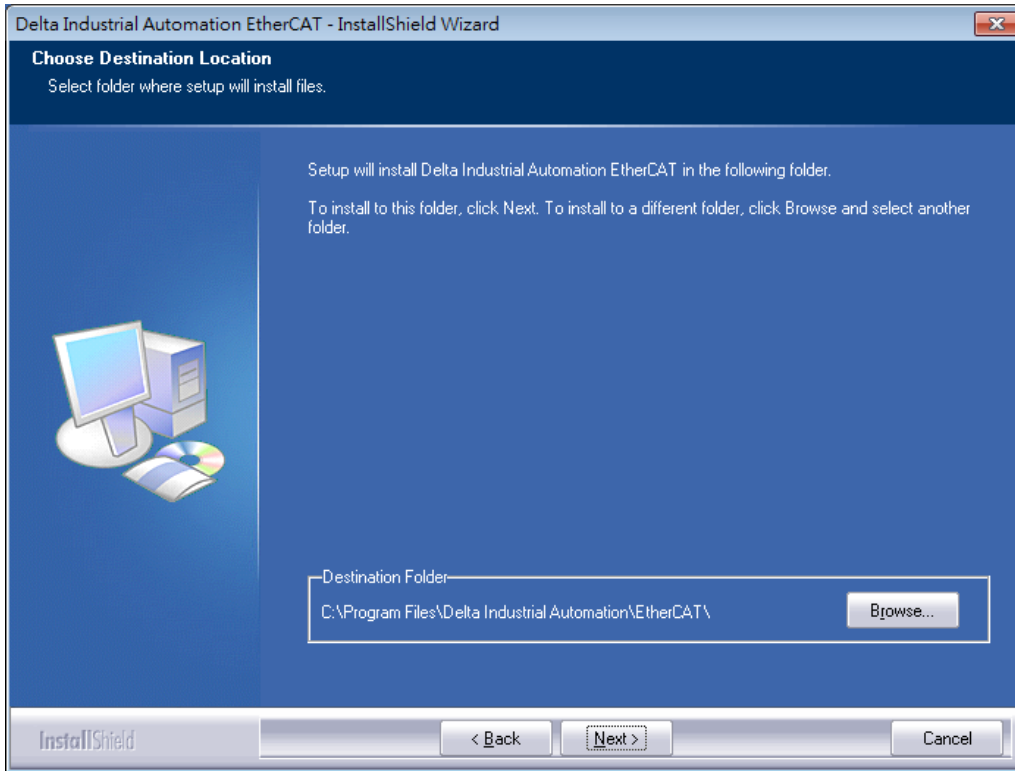
(6)   When the software installation is in progress, please do not interrupt the process.
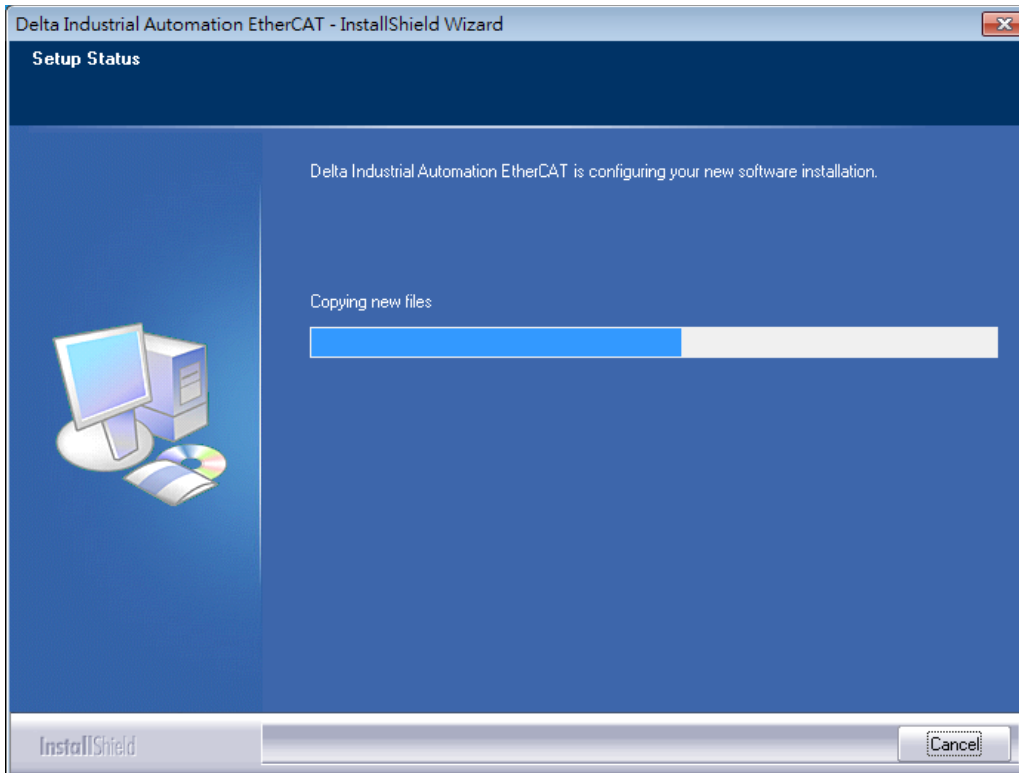
(7)   Once the software installation is complete, click **Finish** to exit the InstallShield Wizard.
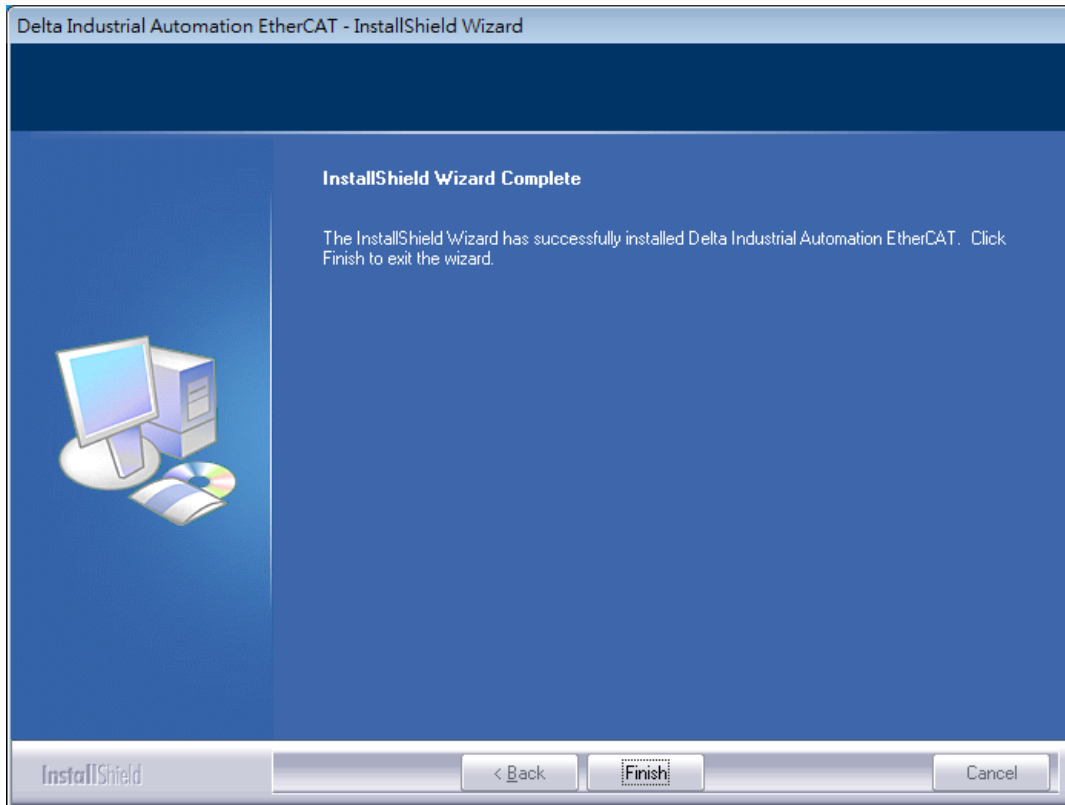
6

6.2 Application features

EcNavi is compatible with all MH1 Series.

6.2.1 EcNavi software interface

EcNavi is a software designed for users to control and monitor a variety of EtherCAT modules and servo drives. This section introduces the basic functions of EcNavi. For more details, please refer to the EcNavi User Guide.
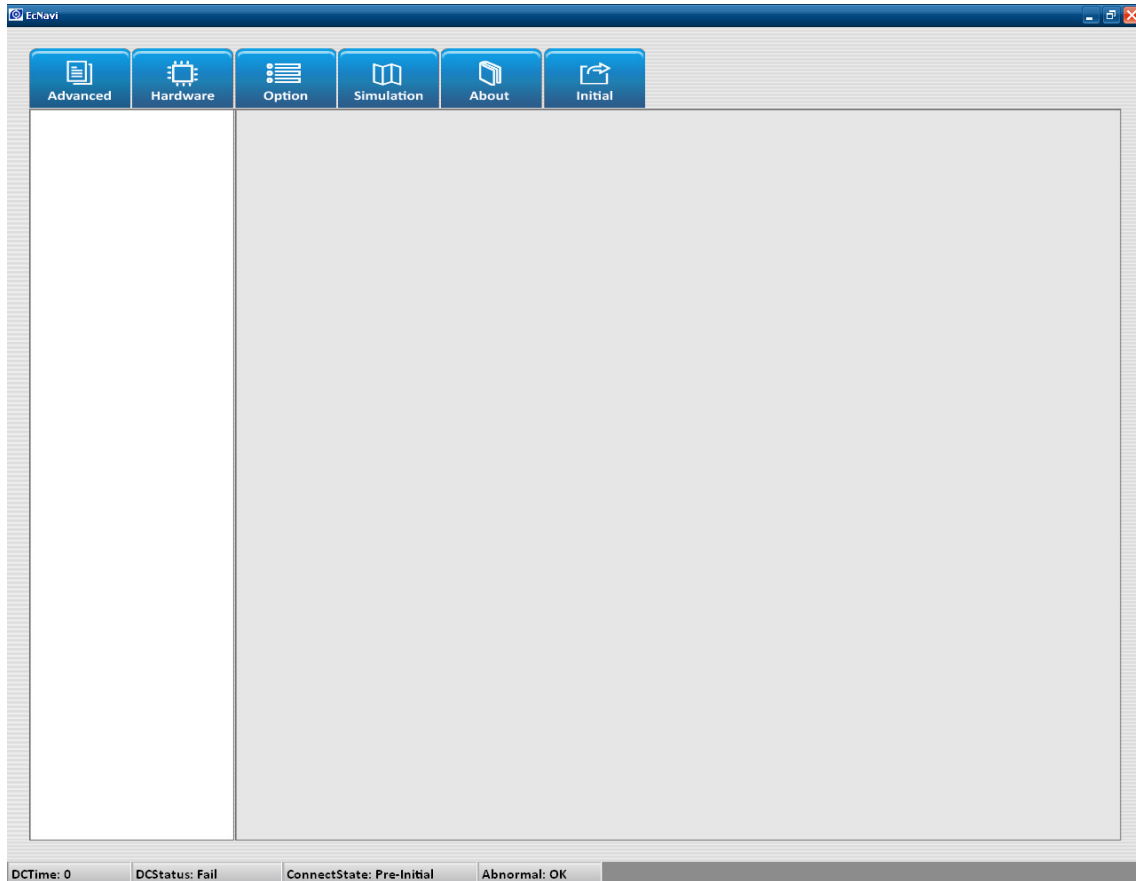
Figure 6.2.1.1

6.2.2   Advanced

Click **Advanced** as shown in Figure 6.2.1.1 and the following options will be available:

■   Read AutoConfig (Read module and DC data from the file)

To activate this function, specify the setting file during initialization (※Activate prior to

initialization). Click **Set** and select the file path, then click **Finish Setting**.
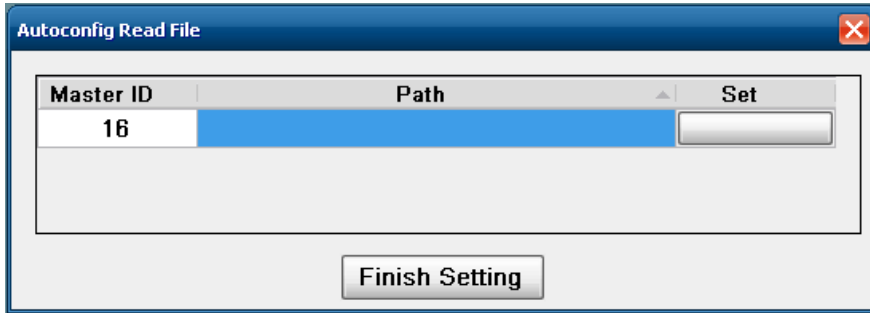
■   Set Master DC Time

To activate this function, select the DC Time during initialization (※Activate prior to initialization).

After selecting the DC Time, click **Finish Setting**.
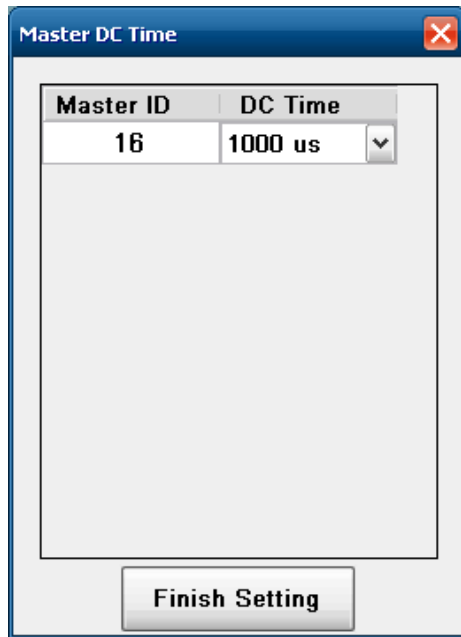
6

■   Set Slave DC Time

Reconnect: After selecting the DC Time for each slave, click this button to reconnect with the new parameters.

Save File: Save selected settings.

Set Alias: Set the station number of each slave.
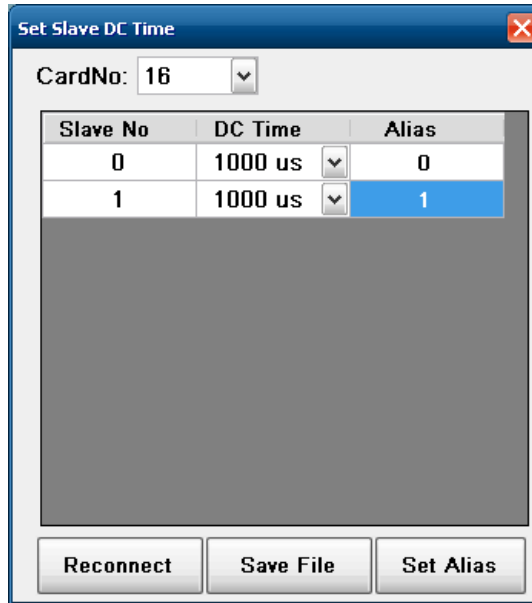
■   Enable Alias

If this is enabled, you will be asked if user-defined station numbers are needed when initializing.

Note: Activate prior to initialization.

If the **Alias** option is checked, it indicates that users will define the station numbers.
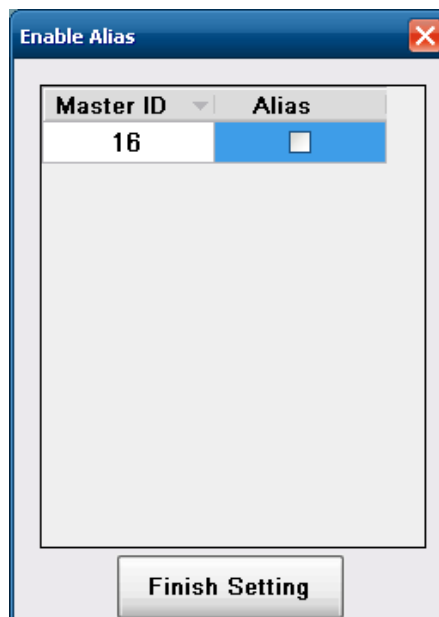
6.2.3 Hardware

■ Reset System

Disconnect the connection from all slaves and disable the connection of EtherCAT.

■ Clear AutoConfig File

If reading the AutoConfig file fails, use this button to reset.
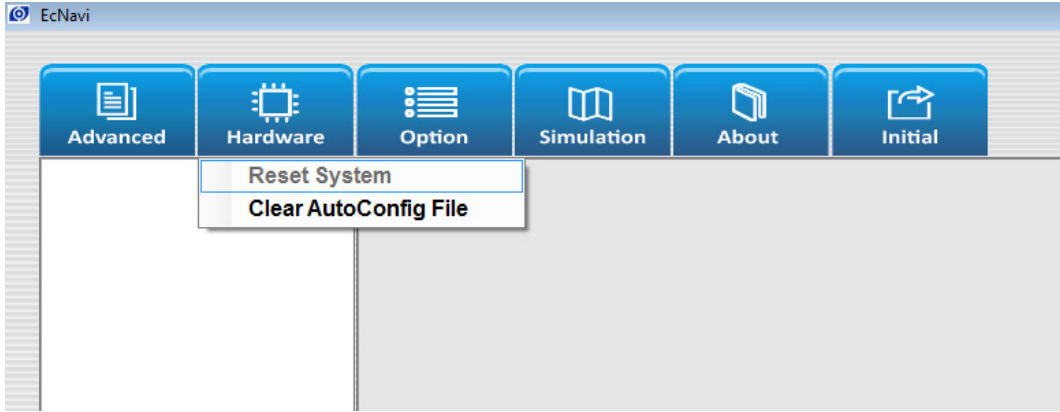
6.2.4 Simulation

■ Position Scope

Use this window to monitor the position of each axis. Select the specified axis and monitoring condition. Click **Start** to start monitoring.

6
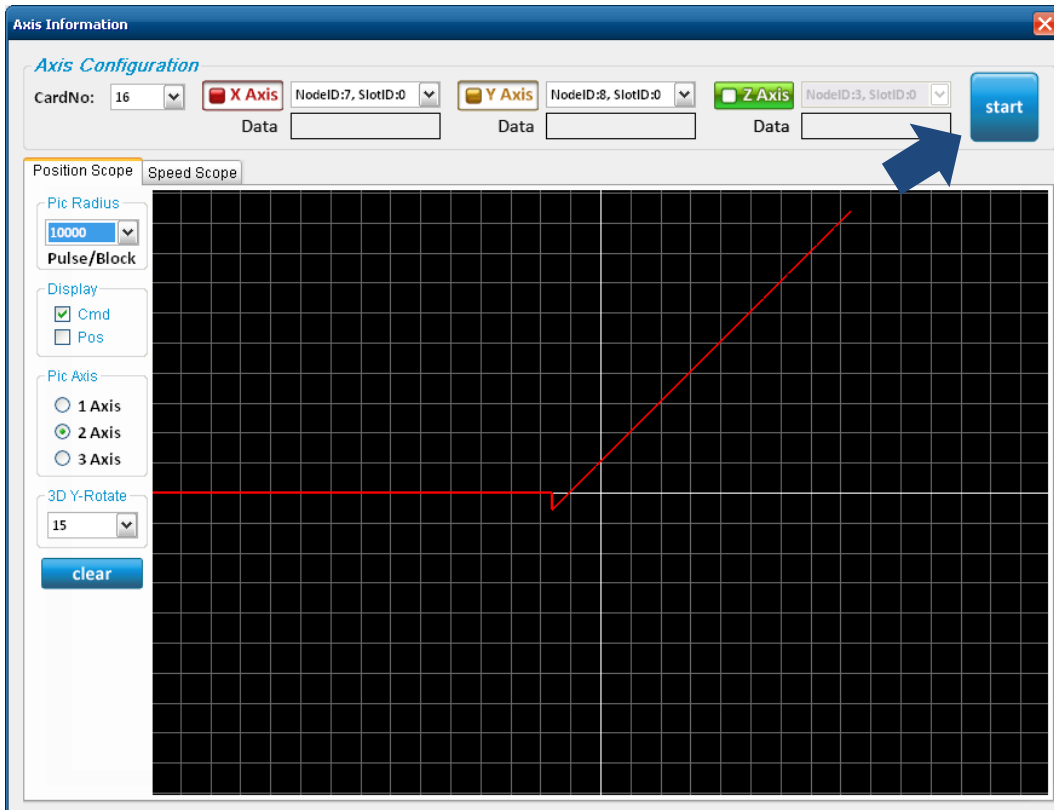
■   Speed Scope

Use this window to monitor the speed curve of each axis. Select the specified axis and curve
options to display. Click **Start** to start monitoring.
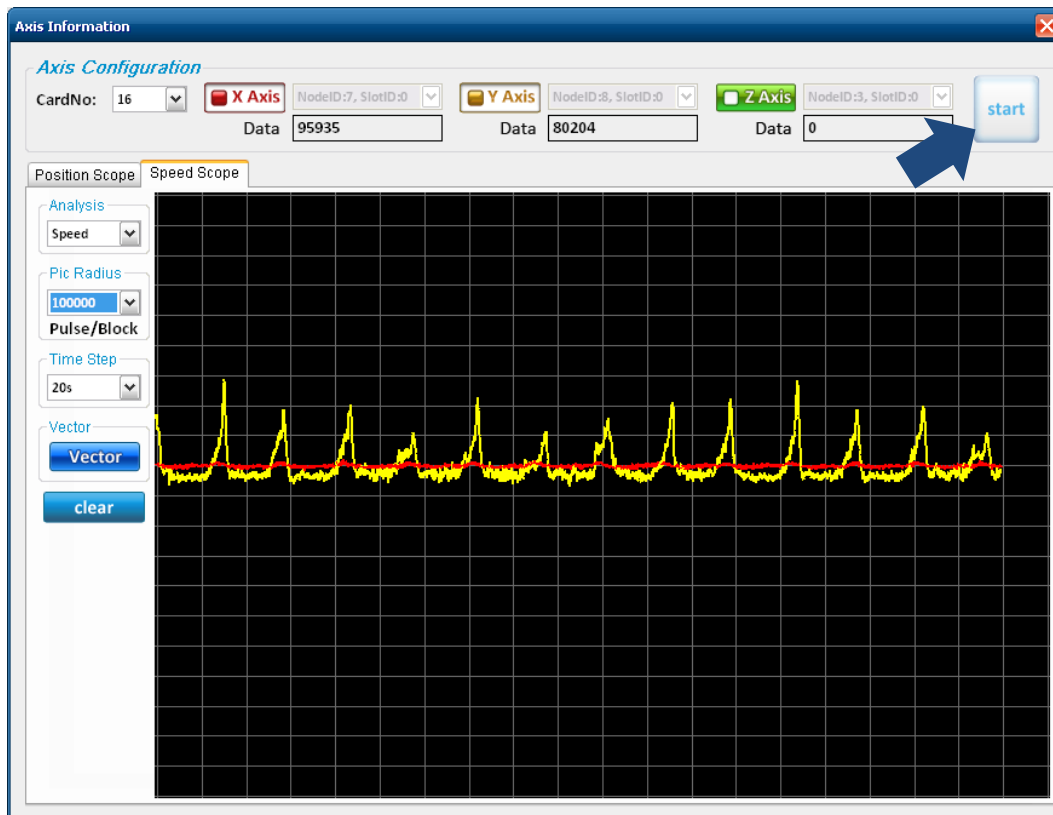
6.2.5 Option

■ Error Code

When an error message window pops up, you may use this function to find out the meaning of each error code. Select the error code from the drop-down list. Then, the corresponding descriptions about the error code will be displayed on the right.
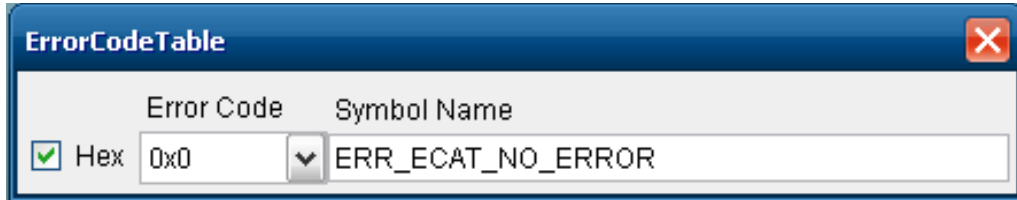
■ Power Consumption Calculation

This function can be used to calculate the current value of each module. Enter the module number and the system will automatically calculate the required current value so that users could know if additional power expansion module is needed.
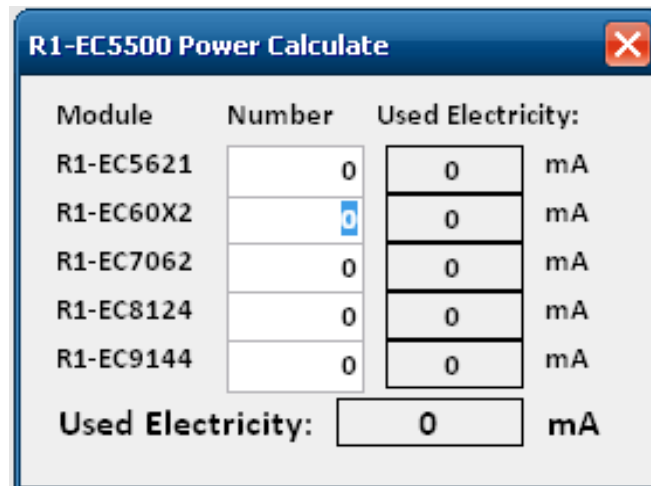
6.2.6 ESIC

This function can be used to define the OD Code corresponded by each module.

Load Information: The system will read the corresponding XML file from the C:\EtherCAT\ESI folder and regard its value as default. Then users can define the OD Code for this module.

Find the OD Code from the left column (ALL OD Code) and double click to add the OD Code to the right column (Choose OD Code). To remove an OD Code, double click the OD Code in the right column.

Reset Setting: Reset the OD Code items to the default value in the XML file.

Insert OD Code: Click this button when the setting is complete, and the settings of this page will be temporarily saved.

Save Dat File: Save the set OD Code options.

Save ESIC File: Save the settings of the current page. Users may save multiple sets of settings and switch easily. To access a saved setting, select the profile by the ReadESICFile option in the Module Name drop-down list.

Set Slave PDO OD Code

Step1. Select Module And Channel

Module Name: A2E   **Load Information**

VendorID: 0x1DD   ProductCode: 0x10305070   RevisionNo: 0x2040608

◉ Slave Tx   ○ Slave Rx   0x1A00

Step2. Setup PDO OD Code

ALL OD Code

Index:	SubIndex:	BitSize:
0x0	0x0	0x8
0x2000	0x0	0x10
0x2001	0x0	0x10
0x2002	0x0	0x10
0x2003	0x0	0x10
0x2004	0x0	0x20
0x2005	0x0	0x20
0x2006	0x0	0x20

Choose OD Code

Index:	SubIndex:	BitSize:
0x6064	0x0	0x20
0x606C	0x0	0x20
0x6041	0x0	0x10
0x6077	0x0	0x10
0x6061	0x0	0x8

Black Color : Normal   Red Color : Recommendation   Blue Color : Requirement

Step3. Finish Setting

Insert OD Code   **Save Dat File**   **Save ESIC File**

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6.2.7 CANopen

■ This function can be used to monitor and control the corresponding Slave SDO and PDO.

■ CANopen SDO

Users can enter the specified SDO address in the Index and SubIndex fields and set the content of DataSize and Send Data. Click **Send** to set the value of the specified address and the setting result will be displayed in the RTCode column. Set the corresponding value in the fields, then press **Read** to read the value of the current address, and the value will be displayed in the Read Data column.
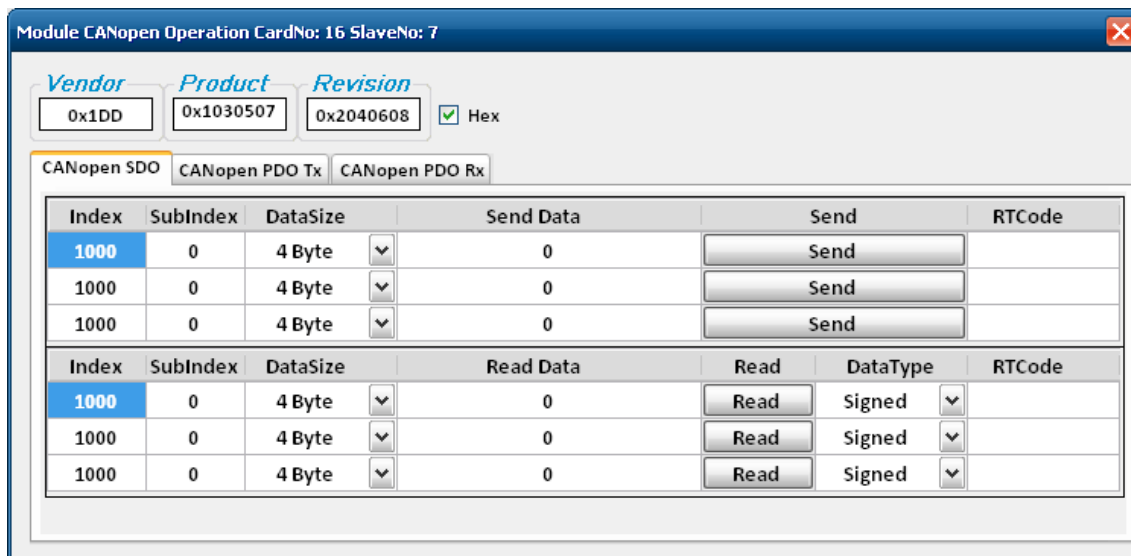
■ CANopen PDO Tx

This window displays the current status of the Tx OD Code specified by Slave. Users may also enter values in the Send Data column, then click **Send** to set the corresponding values of the Tx OD Code.

6
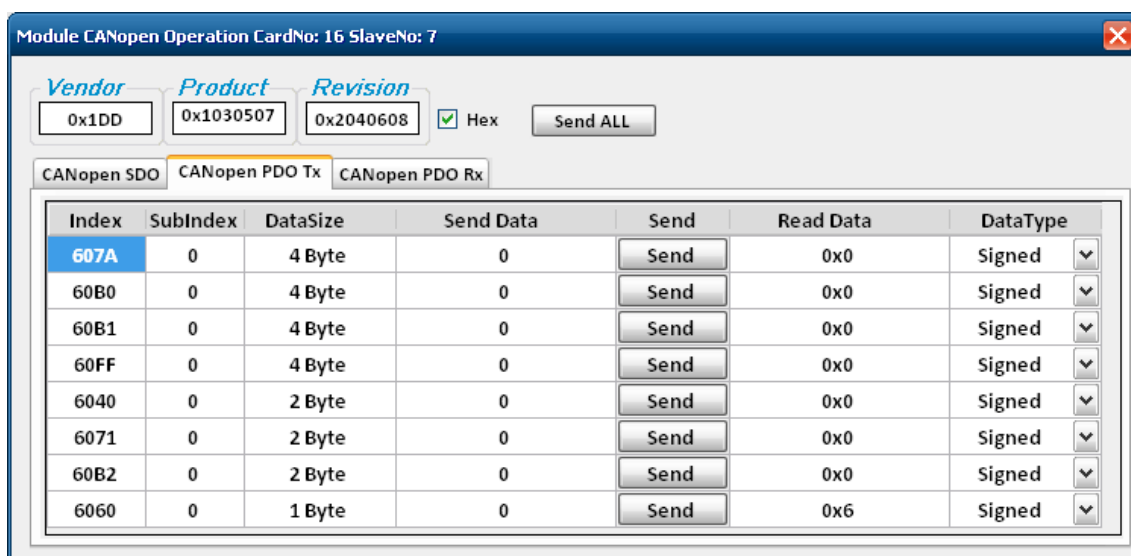
■   CANopen PDO Rx

This window displays the current status of the Rx OD Code specified by Slave.

Index	SubIndex	DataSize	Read Data	DataType	
6064	0	4 Byte	0x164CD	Signed	˅
606C	0	4 Byte	0xFFFFFFF1	Signed	˅
6041	0	2 Byte	0x650	Signed	˅
6077	0	2 Byte	0x0	Signed	˅
6061	0	1 Byte	0x6	Signed	˅

Module CANopen Operation CardNo: 16 SlaveNo: 7

Vendor: 0x1DD
Product: 0x1030507
Revision: 0x2040608
☑ Hex

CANopen SDO | CANopen PDO Tx | CANopen PDO Rx

6.2.8   Security

◼ Set the verify key and user password.

Check Verifykey: Confirm that the verification key of the motion card is correct.

Login: Enter the user password to login. Change Password and Write Verifykey options will become available after login.

Change Password: Change user password.

Write Verifykey: Change verification key.

There are four kinds of **Status**:

Check-Out: Status unconfirmed.

Busy: Check if password is correct.

Fail: Verification key / password incorrect.

Success: Verification key / password correct.

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6.2.9   About

■   This window displays the current EtherCAT_DLL.dll path and version.

6.2.10   Initial

■   Activate motion card and initialize connection.
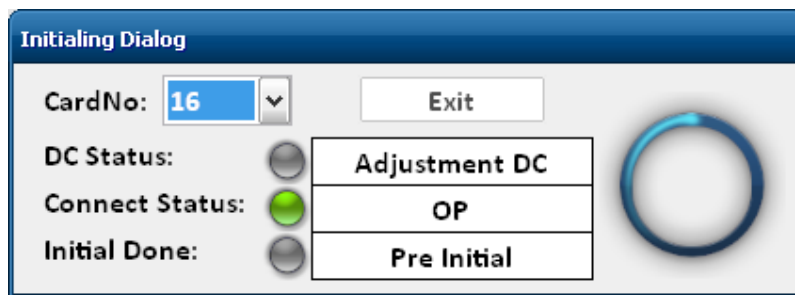
6.2.11   Find Slave

■   Click **Find Slave** to start searching for connected modules and the result will be listed in the left column.
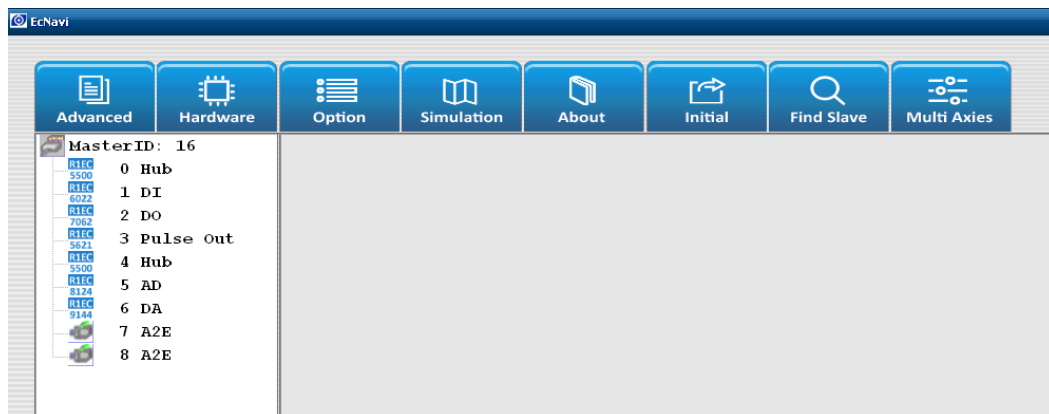
6.2.12   Multiple Axes

■   9 kinds of multi-axis synchronous modes are provided for multiple axis motion control.

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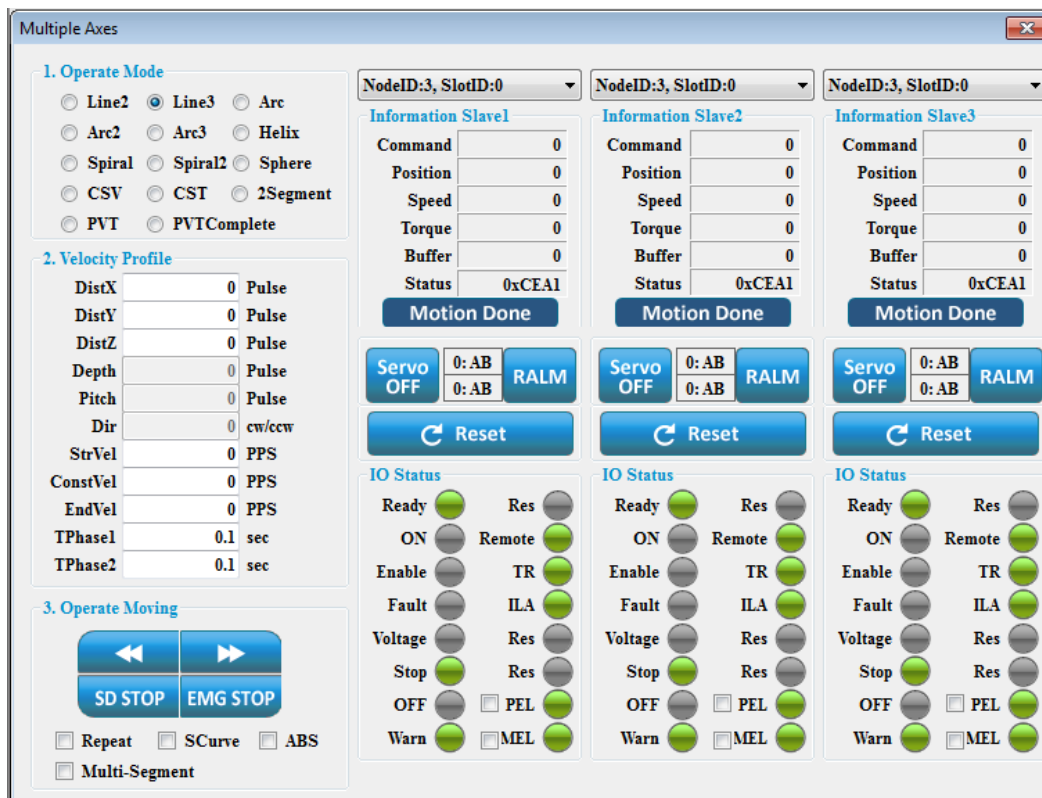
(1) **Operate Mode:** Moving mode selection. When each mode applies different number of axes, the available parameters and number of axes in the window will also change accordingly.

(2) **Velocity Profile:** Parameter settings for each mode.

(3) **Operate Moving:** Motion control.

◄◄	Move in reverse direction	☐ Repeat	Move back and forth between current position and target position
►►	Move in forward direction	☐ SCurve	S-curve acceleration and deceleration
SD STOP	Decelerate to stop	☐ ABS	Move in absolute motion
EMG STOP	Emergency stop		

(4) **Information Slave:**

Command: Specified pulse numbers sent by users.

Position: Current feedback pulse number from servo drive.

Speed: Current moving speed of servo drive.

Torque: Current torque of servo drive.

Buffer: Current amount of command that has not been executed by the system.

Status: Current status of servo drive.

Servo OFF	Click this button, servo drive will switch to On; click this button again, servo drive will switch to Off.
RALM	Clear current alarm.
↻ Reset Position	Reset currently recorded moving pulse number.

(5) IO Status: Current status of servo drive. It uses icons to display the Status of the Information Slave.

6.2.13   Delta Servo

■   Servo Capture Compare

This is used to test the Capture and Compare functions of Delta's servo drive.
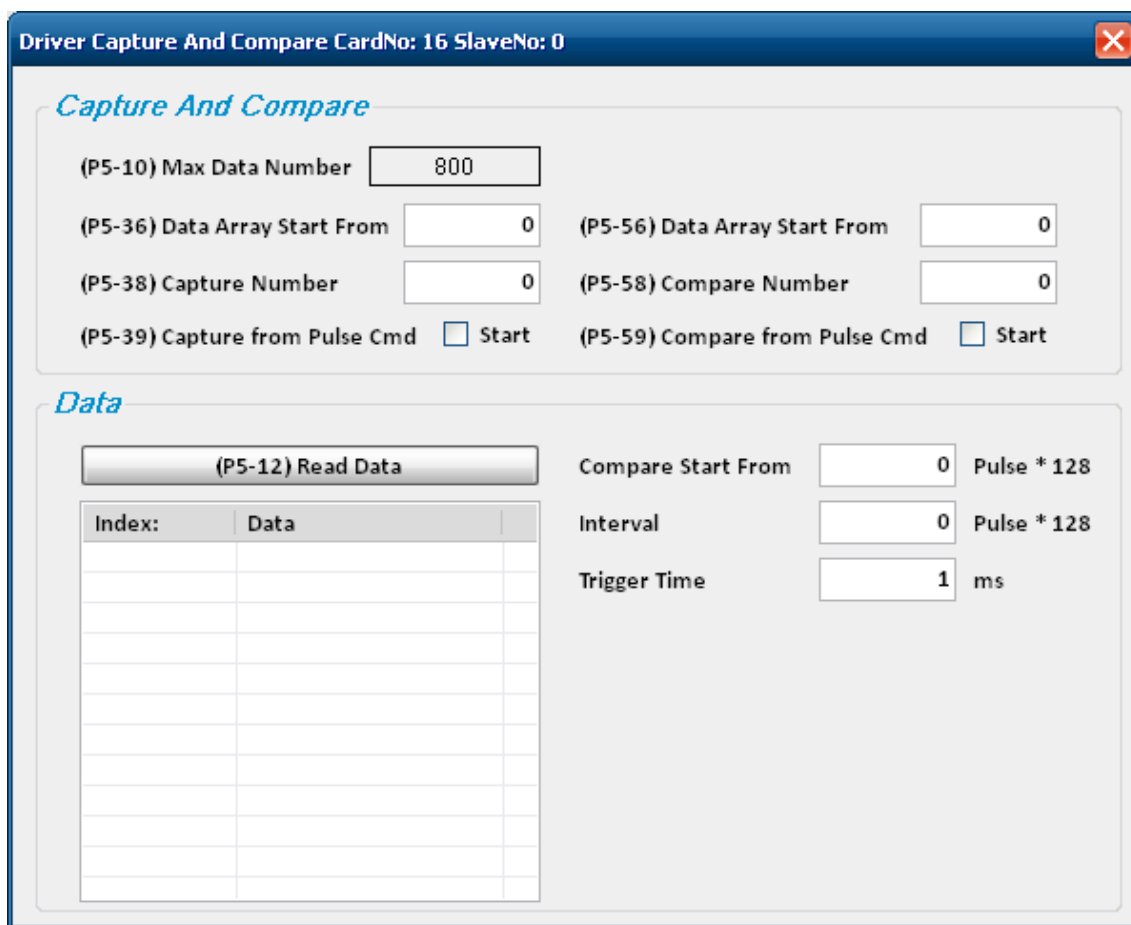
After setting the start address of data array, Capture / Compare amount, interval, and other parameters, check the **Start** box to enter Capture / Compare mode. Then, the servo drive will start moving and trigger Capture and Compare functions.

(P5-10) **Max Data Number:** Maximum amount of data.

(P5-36) **Data Array Start From:** Set the capturing start address of data array.

(P5-38) **Capture Number:** Number of capturing times.

(P5-39) **Capture from Pulse Cmd:** Enable Capture function.

(P5-56) **Data Array Start From:** Set the comparing start address of data array.

(P5-58) **Compare Number:** Number of comparing times.

(P5-59) **Compare from Pulse Cmd:** Enable Compare function.

(P5-12) **Read Data:** Click this button to read and display the data array of the drive.

Compare Start From: Initial pulse position specified for Compare function.

Interval: Pulse number between Compare intervals.

Trigger Time: Duration of a trigger.

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EzDMC Operating Instructions

7

EzDMC is a serial control tool to test the functionality of the serial connection. When EzDMC is operating, the system monitors and automatically categorizes connected expansion modules. Users may use the listed modules to determine if the serial control modules are functioning properly and select each expansion module for functional testing. The following introduces how to operate the functions of EzDMC.

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7.1   Introduction to EzDMC functions

■   EzDMC is compatible with MH1-A12D / C50D / C70D.

Once EzDMC is launched, the program screen as shown below will appear on the computer system.
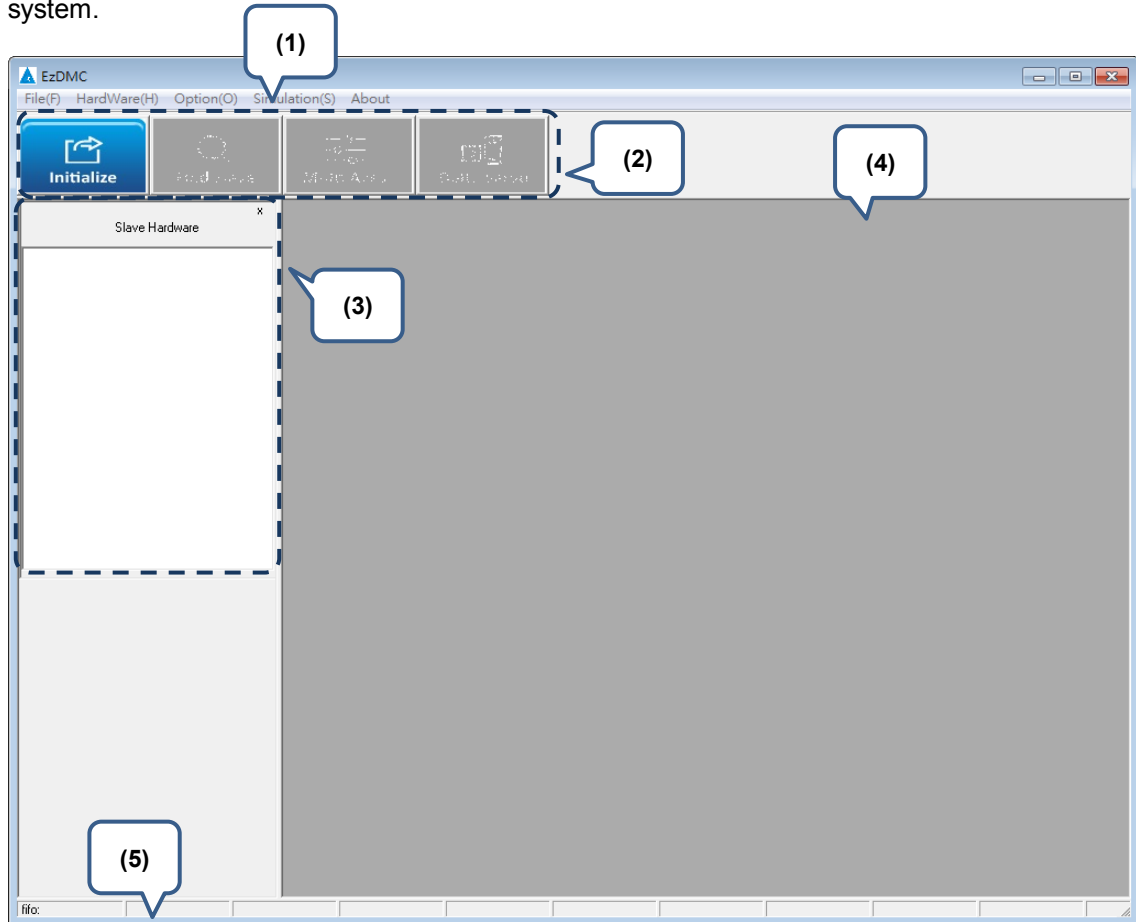
No.	Item	Description
(1)	Function menu	Select functions
(2)	Tool bar	Operate basic functions
(3)	Main controller system and expansion module list	Area for displaying main controller system and expansion module list
(4)	Message display area	Area for displaying basic messages of expansion functions and operation control
(5)	Program status display area	Displays connection status of the system

7.2   EzDMC connection procedure

When the PCI-DMC card and connection modules (e.g. drive and motor) are set up, please follow the testing procedures below to use EzDMC to test the serial connection:

(1) Open EzDMC.

(2) Find PCI-DMC card. (Refer to Section 7.3)

(3) Find connected expansion modules. (Refer to Section 7.4)

(4) Connect the expansion module to the single-axis and multi-axis serial motion control functions. (Refer to Section 7.6 and Section 7.7)

(5) Finish expansion module control.

(6) Reset PCI-DMC card. (Refer to Section 7.9)

(7) Exit EzDMC.

7.3   Find PCI-DMC card

To find the PCI-DMC card, click **Initialize** in the tool bar as shown below. This defines the amount and configuration status of all PCI cards in the current host system. When the search is complete, the device list will display the status of all found cards as well as the amount and configuration of the master cards.
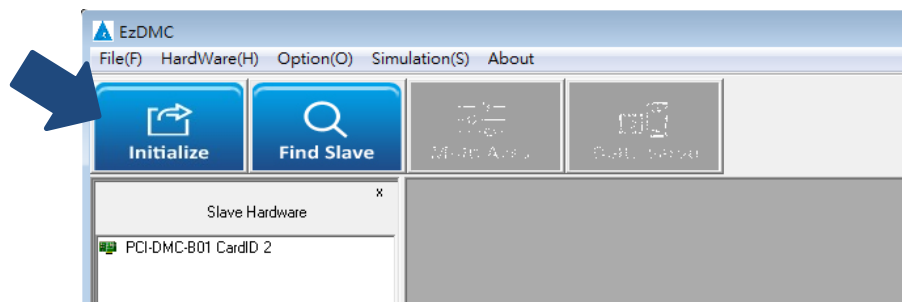
If no PCI-DMC cards are found after the search, an error message "No PCI_DMC Card Found!" will pop-up as shown below. Please check if the PCI-DMC card is properly installed in the host system. Or, turn off the power and remove the card, then follow the steps in Section 3.3 Installation of PCI / PCIe card to re-install the PCI-DMC card into a vacant PCI slot before finding the PCI-DMC card again.
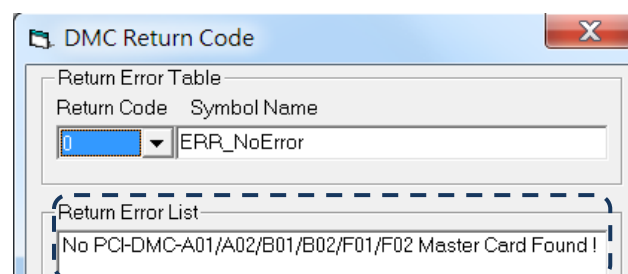
7.4   Find connected expansion modules

When the PCI-DMC card is found and defined, the serial communication connection is also established. Next, scan to see how many connected modules are linked in series on the same Ring. Click **Find Slave** in the tool bar as shown below to find available and working modules on the Ring as well as the properties of these connected modules.
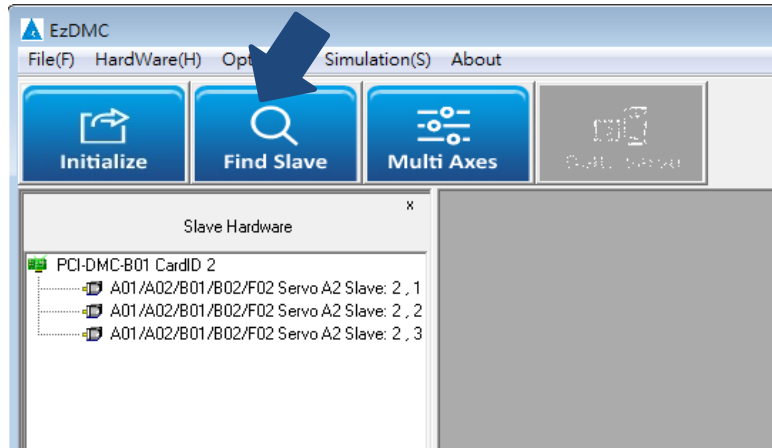
If no expansion modules are found to connect to after the search, an error message "No slave found!" will pop-up as shown below. Please check if the expansion modules are connected properly, and the power output is normal.
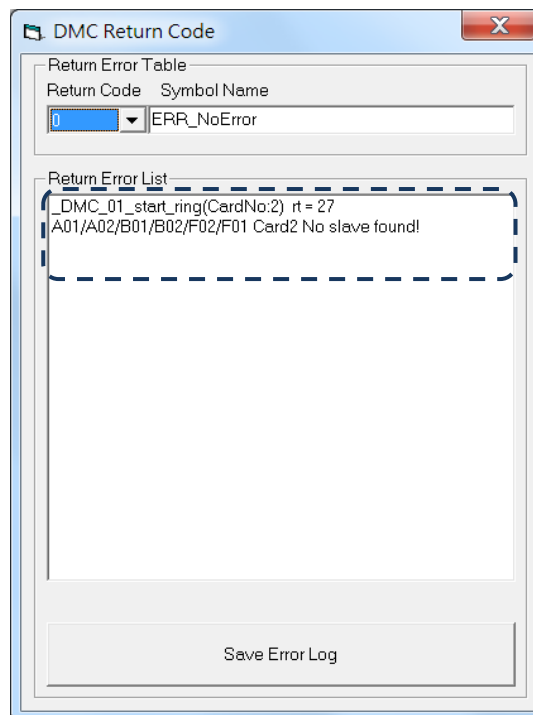
7.5   EzDMC status display

The status display at the bottom of EzDMC shows information about the current status of the
PCI-DMC card and DSP.
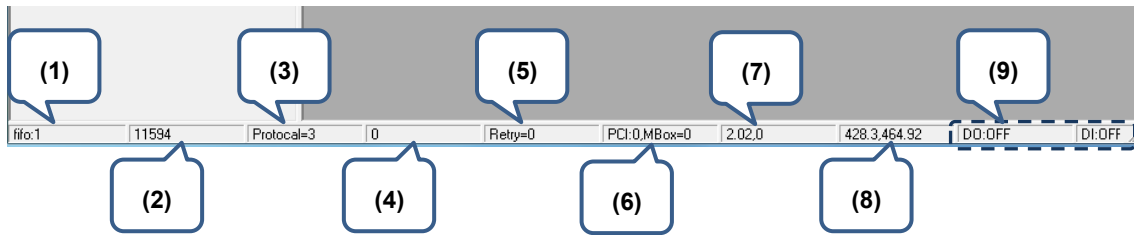
(1)   FIFO length.

(2)   Task time used.

(3)   Connection status of master card and expansion modules.

(4)   Master card connection error.

(5)   Times of SDO re-issuing.

(6)   Times of Mailbox delivery failure.

(7)   DSP interrupt signal count value 1.

(8)   DSP interrupt signal count value 2.

(9)   DI/O status of the cards.

7.6   Single-axis control interface for serial communication

When the connected expansion module is linked for serial communication, the next step is to test the expansion module operations. As shown in the figure below, you may click on any expansion module in the left column, then the display area on the right will pop-up a window with the single-axis control interface for the operation of that module.
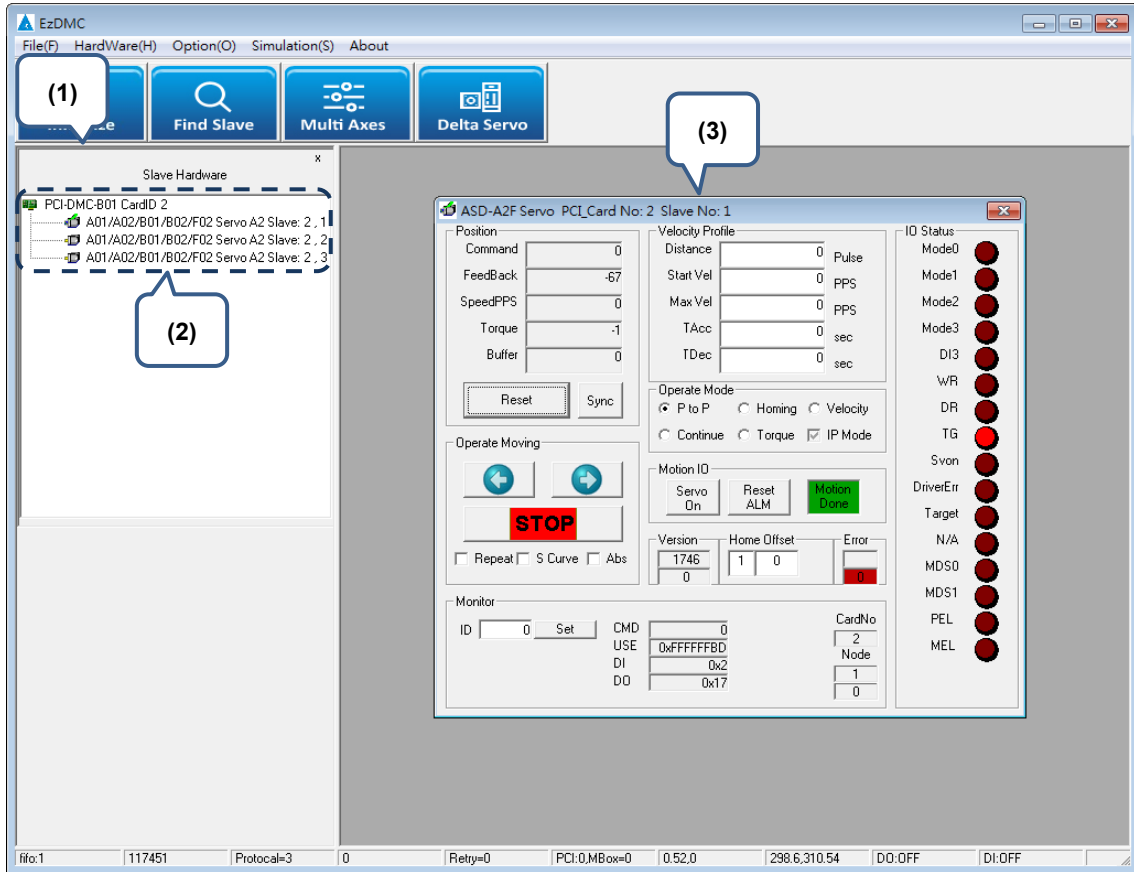
(1)   Left display area;

(2)   List of expansion modules;

(3)   Single-axis control interface.

The following will introduce the functions and purpose of each block in the single-axis control interface.
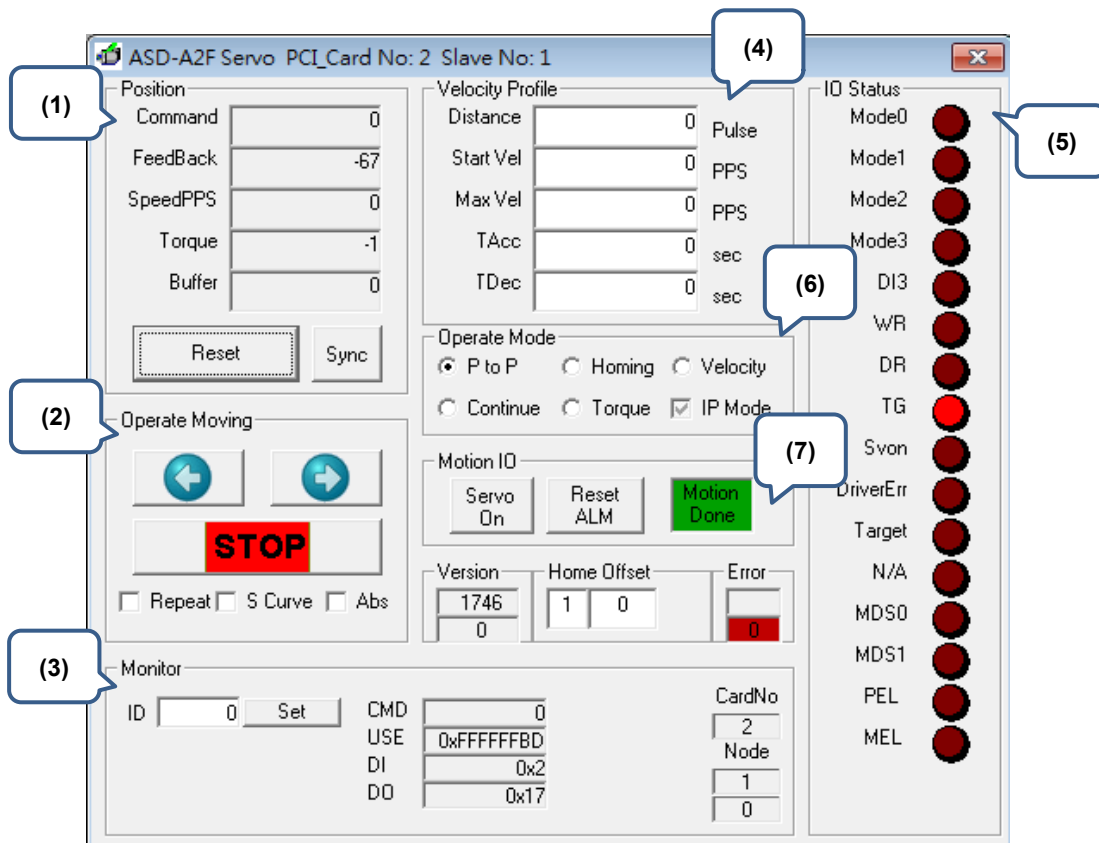
(1)   Display count values of motion status, including position, speed, torque, position reset function, and number of buffered commands.

(2)   Execute motion commands such as clockwise rotation, counterclockwise rotation, and stop.

■ Check the **Repeat** box to repeatedly execute clockwise and counterclockwise motions.

■ Check the **S Curve** box to set acceleration / deceleration as S-curve; otherwise, T-curve will be used.

■ Check the **Abs** box to use absolute motion; otherwise, relative motion will be used.

(3)   Set CANopen commands. The module's CANopen commands can be read / sent here.

(4)   Set motion commands, including motion distance, starting velocity, maximum velocity, and acceleration / deceleration time.

(5)   Display status of the connected expansion module using ON/OFF status signal.

(6)   Set motion operation mode, including point to point, homing, and constant velocity.

■ Check the **IP Mode** box to use PDO service for motion control; otherwise SDO service will be used.

(7)   Enable motor, set motion status display, and reset servo alarm message.

7

7.7   Multi-axis control interface for serial communication

When the connected expansion module is linked for serial communication, select **Multi Axes** in the tool bar of EzDMC to execute multi-axis control, then the display area on the right will pop-up a window with the multi-axis control interface of that module as shown in the figure below.
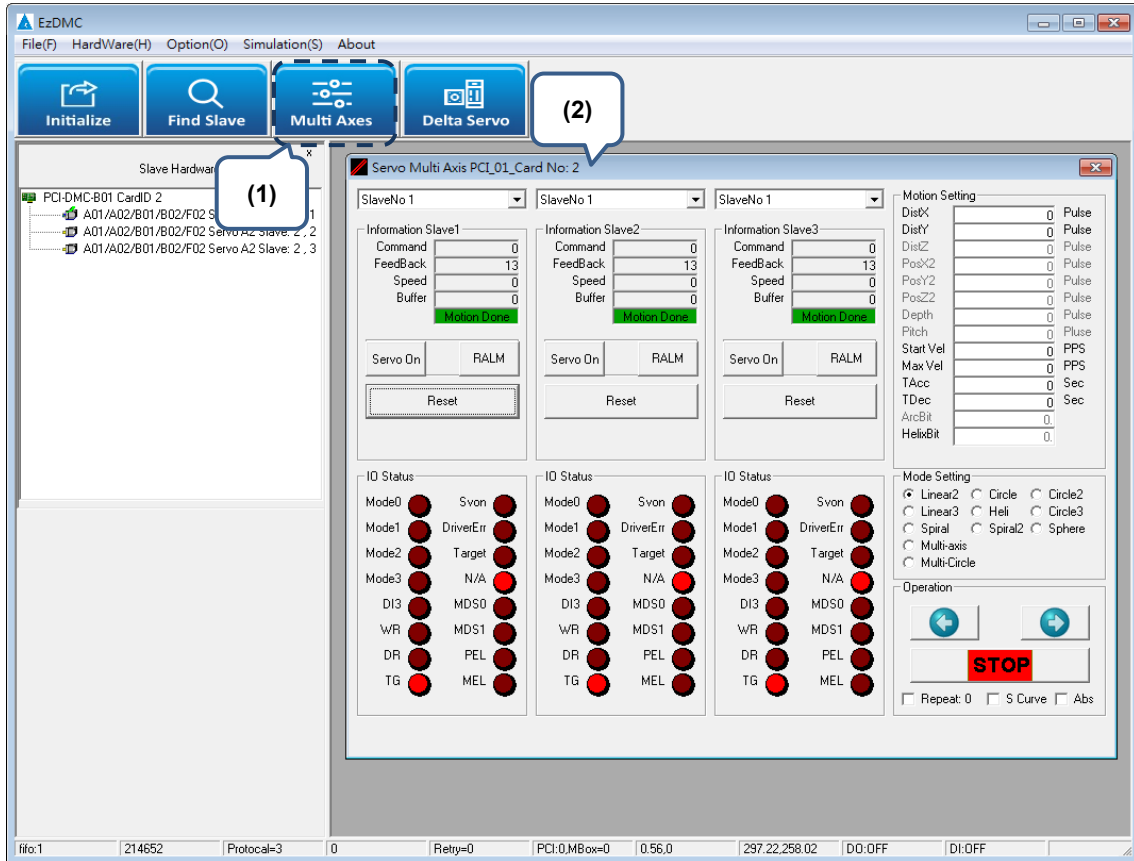
(1)   Multi Axis Control;

(2)   Multi-axis control interface window.

The following will introduce the functions and purpose of the four blocks in the multi-axis control interface.
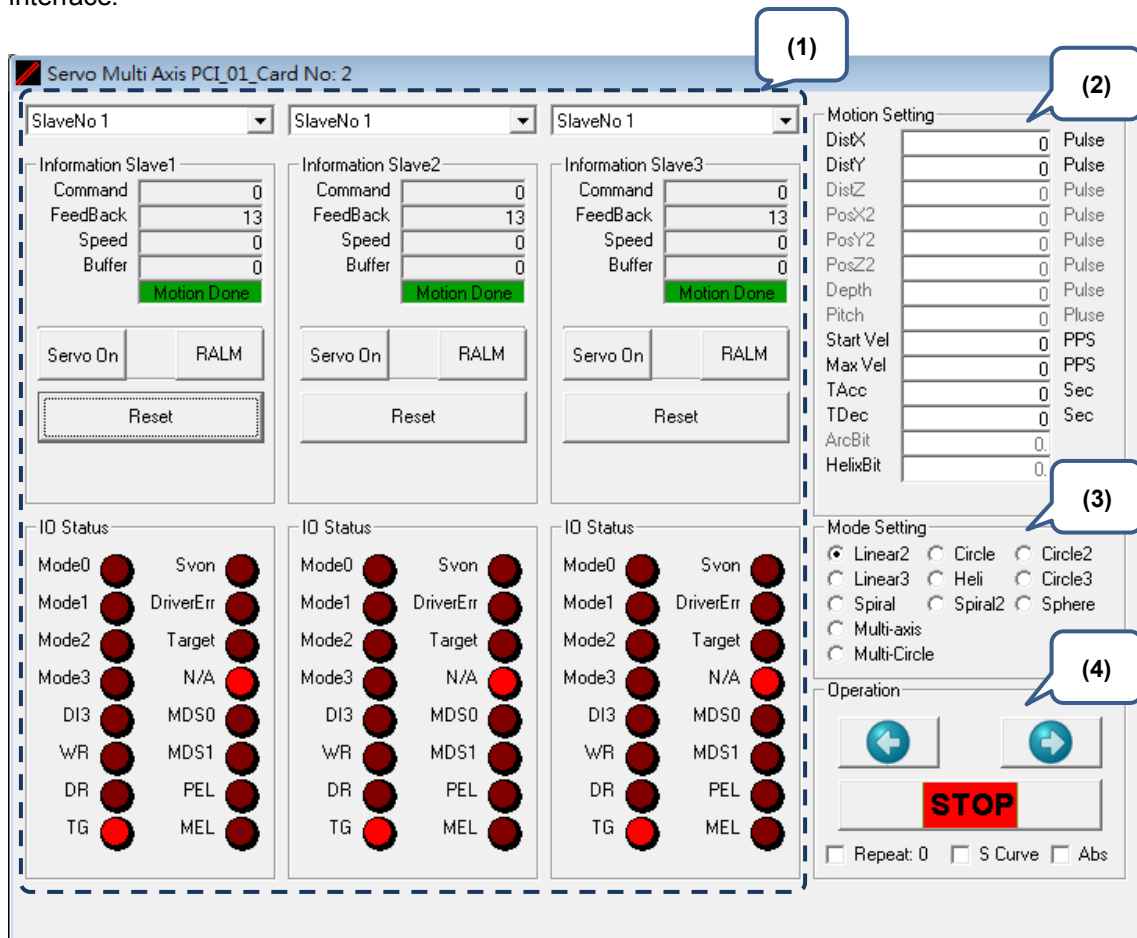
(1) Display motion status of the selected axis, position reset, and motor activation function.

(2) Motion Setting: Required motion parameter settings for motion control. These parameter settings are linked to the selections in block (3) Mode Setting. For example, if Linear2 is selected in Mode Setting, the Motion Setting will include DistX and DistY; if Linear3 is selected, then DistX, DistY, and DistZ will be included.

(3) Mode Setting: Set motion operation mode. The 6 multi-axis motion control commands available include 2-axis linear interpolation, 3-axis linear interpolation, 2-axis arc interpolation, and 3-axis spiral, etc.

(4) Operation: Execute motion commands such as clockwise rotation, counterclockwise rotation, and stop.

- Check the **Repeat** box to repeatedly execute clockwise and counterclockwise motions.
- Check the **S Curve** box to set acceleration / deceleration as S-curve; otherwise, T-curve will be used.
- Check the **Abs** box to use absolute motion; otherwise, relative motion will be used.

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7.8   Master Security control interface

The following will introduce the steps for setting up Master Security.

(1)   Click **Option** > **Security** to enter the Master Security control interface.
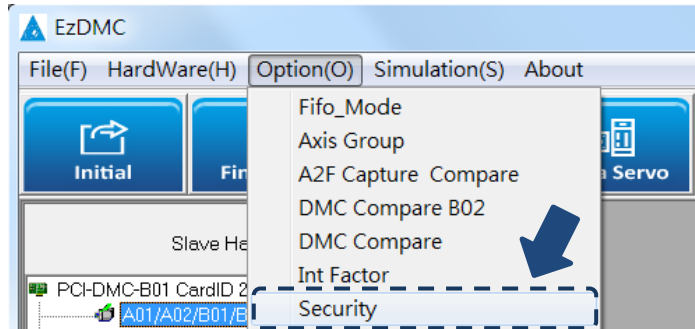
(2)   Select Card ID. of the PCI-DMC card, then login with the default password. The above input fields are all 1 ~ 8 digits and the range is hexadecimal values between 0 ~ F.

Default password	
Password1	FFFFFFFF
Password2	FFFFFFFF

(3)   If login is successful, the status will display "Pass" and access to the functions in blocks (3), (5), and (6) will be granted as shown in Figure 7.8.1; if not, the status will display "Failed" and users must re-login.
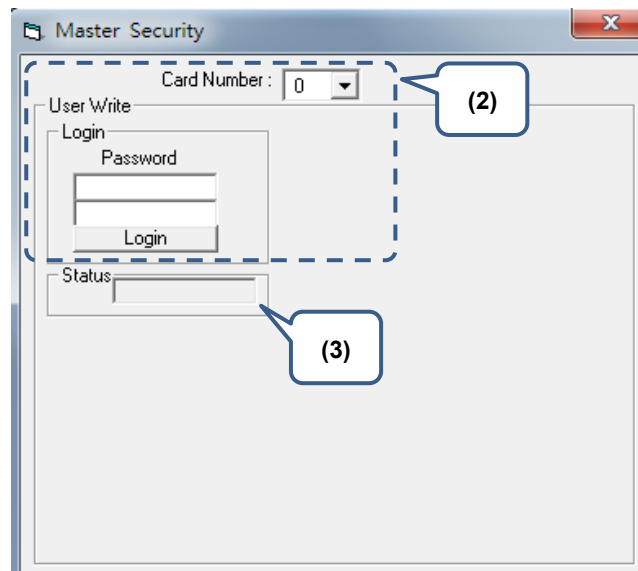
Master Security function description:
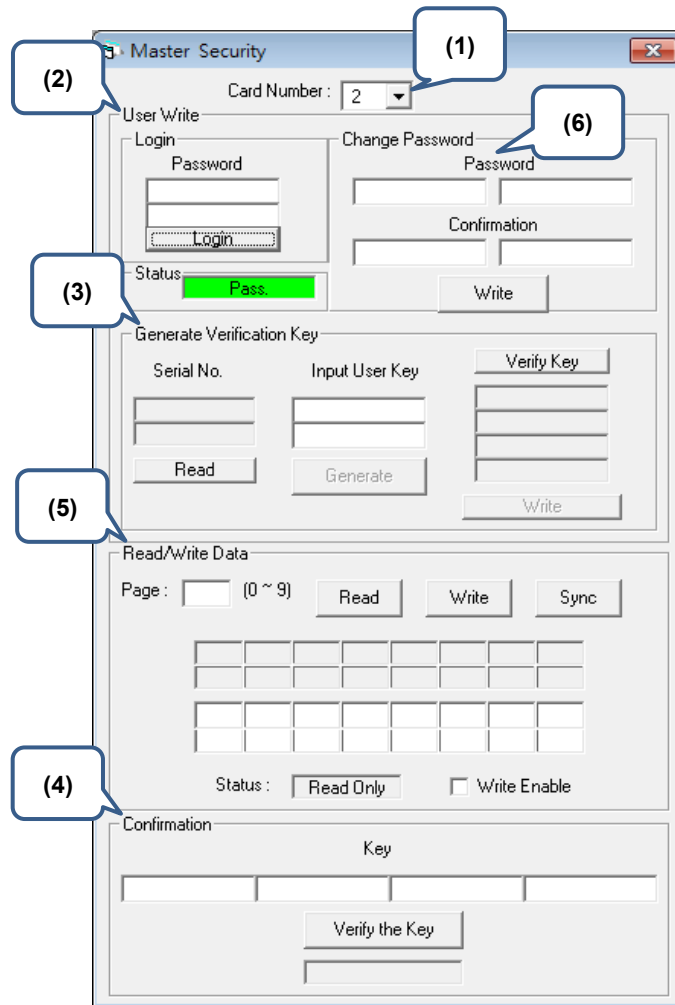
Figure 7.8.1   Master Security function description

The above input fields are all 1 ~ 8 digits and the range is hexadecimal values between 0 ~ F.

(1)   Card Number: Select Card No. of the DMCNET motion card.

(2)   Login & Status: User login and status display field.

(3)   Generate Verification Key: Generate verification key.

Click **Read** to read the motion card serial number, then users will be given two sets of

1 ~ 8-digit values made up of hexadecimal values between 0 ~ F.

Enter a user-defined User Key, then click **Generate** to generate a verification key. The input

and output values are all 1 ~ 8 digits and the range is hexadecimal values between 0 ~ F.

Click **Write** to write the generated Verification Key. If writing the key is successful, the status

in block (2) will display "Done"; if not, the status will display "Failed".

(4)   Verification confirmation field and status display.

Enter the 4 sets of Verification Key generated in the previous steps into the 4 fields, then click

Verify the Key. If the verification is successful, then the status bar below will display "Pass";

if not, the status bar will display "Failed".

(5)   Data read and write area. (Please refer to Figure 7.8.2 for details)

(6)   Change password.

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Enter two new passwords in the "Password" fields. Each is 1 ~ 8 digits and the range is hexadecimal values between 0 ~ F.

Re-enter the same passwords from the "Password" fields to the "Confirmation" fields for verification.

If the two passwords in "Password" and "Confirmation" match, the passwords will change by clicking **Write**. If the passwords don't match, then the status will display an error message "Confirmation Error", and you will need to retry changing the password.

Below is a more detailed description of block (5) in Figure 7.8.1.
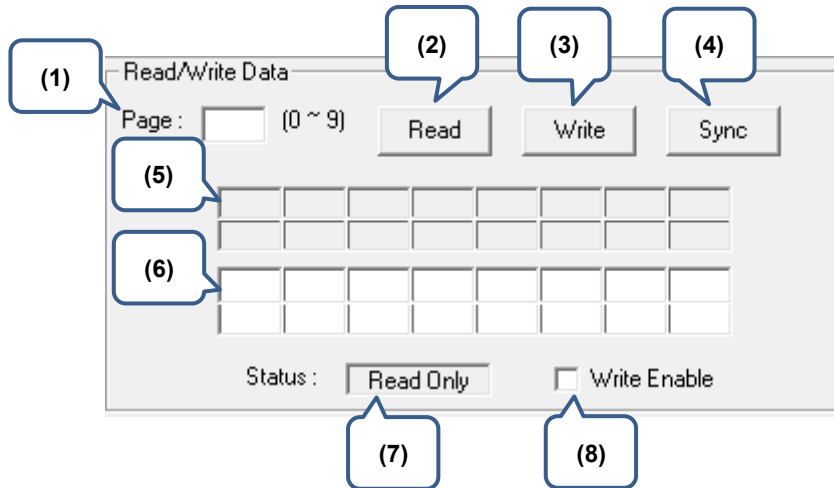
Figure 7.8.2   Master Security block (5) function

(1)   Page: Enter the page (0 ~ 9) to read from or write to.

(2)   Read: Read data from specified page.

(If read successful, then block (5) will display 16 sets of binary hexadecimal values between 0 ~ F)

(3)   Write: Write data to specified page.

In Figure 7.8.2 block (6), enter the desired 16 sets of binary hexadecimal values between 0 ~ F.

Check the **Write Enable** box, then the (7) status bar will display "Write/Read".

Click **Write** to write data.

(4)   Sync: Copy data from block (5) to block (6).

(5)   Display data when Read function is executed.

(6)   Fields for entering the data when Write function is executed.

(7)   Status: Display read / write status as either Read Only or Write/Read.

(8)   Write Enable: Change status to Write Enable.

7.9   Card reset

When the serial motion control is finished and prior to exiting the EzDMC program, please click
HardWare > **PCI_Card Reset** to reset the PCI-DMC card. Activate the PCI-DMC card again the
next time you wish to test / use the card to ensure the stability of data transmission / reception
and the validity of test data. As shown in the figure below, click this option to reset the card.
The card will be re-activated next time when **Search Card** is executed.
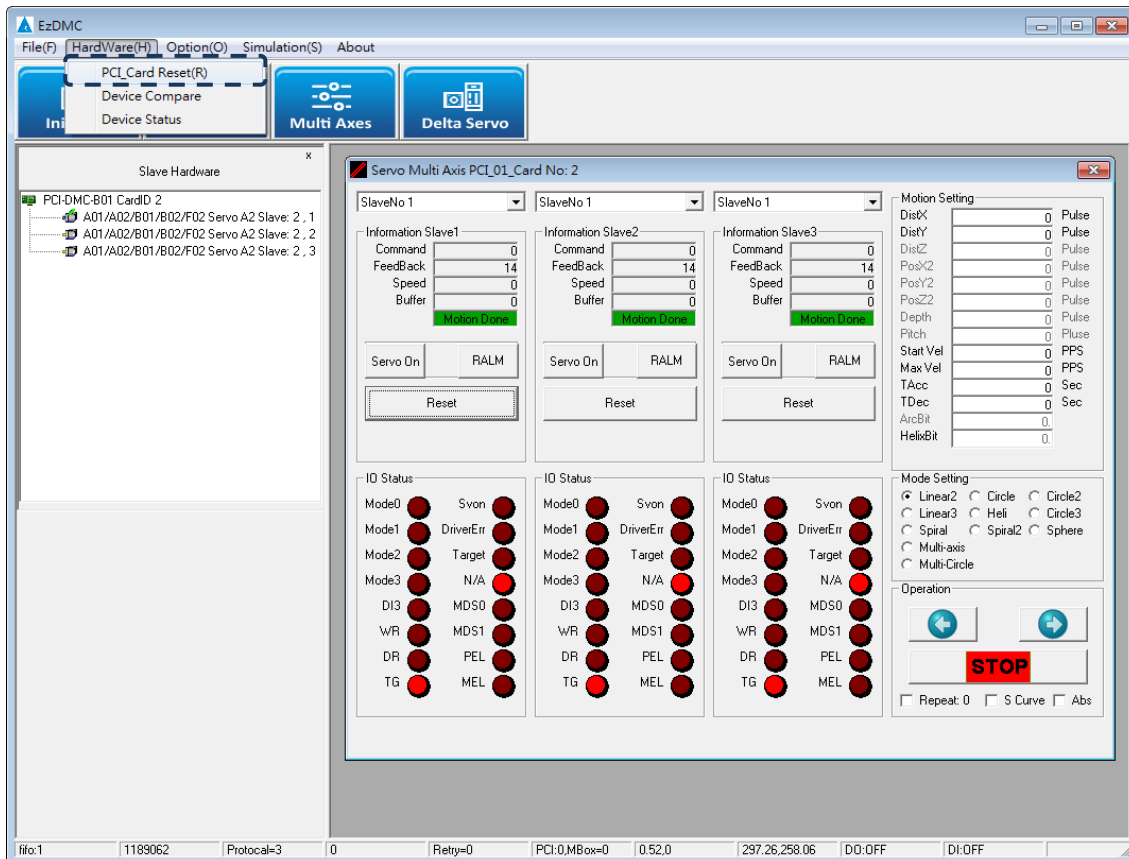
7.10   Parameter save function

Select **File** > **Save Configuration DMC** from the function menu to save the motion control parameters. Next time you open EzDMC, select **Load Configuration** from the function menu to load the previously set motion control parameters into EzDMC to begin motion control right away.
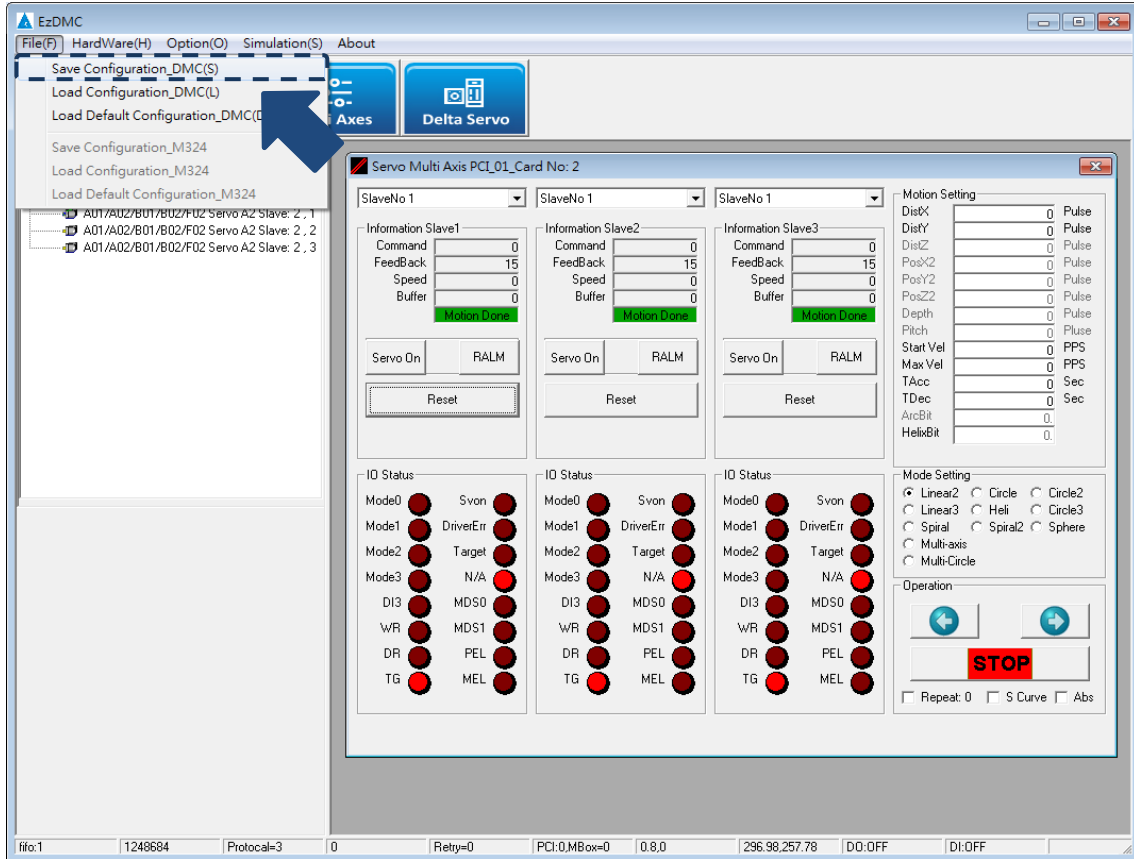
Revision History

Release date	Version	Chapter	Revision contents
June, 2017	V1.0 (First edition)		

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