# **DA-680 Series Hardware User Manual**

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www.moxa.com/products



### **DA-680 Series Hardware User Manual**

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Thank you for purchasing the Moxa DA-680 industrial computer, a multi-functional embedded computer designed specifically for IEC 61850-3 substation automation systems.

This manual covers hardware installation, connector interfaces, and BIOS setup of the DA-680. For software configuration and management, please refer to the user manual for the operating system on your computer.

# **Overview**

The DA-680 computer is built around an Intel® Core<sup>™</sup> i3 processor and comes with 8 Gigabit Ethernet ports, 1 VGA port, 8/16 isolated RS-485 serial ports, and 5 USB ports. Additionally, one 2.5" HDD/SSD slot and one mSATA slot are included to enable storage expansion for industrial applications that require large storage space for edge data acquisition. With IEC 61850-3, IEEE 1613, and IEC 60255 compliance, the DA-680 is sure to deliver stable and reliable system operation for power applications.

# **Model Descriptions and Package Checklist**

The DA-680 Series includes the following models:

- DA-680-I-8-WL3-HH: 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 8 RS-485 ports, mSATA, SATA, USB, dual Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- DA-680-I-8-WL3-H: 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 8 RS-485 ports, mSATA, SATA, USB, single Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- DA-680-I-16-WL3-HH: 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 16 RS-485 ports, mSATA, SATA, USB, dual Power, without RAM, mSATA and OS, -25 to 55°C operating temperature
- DA-680-I-16-WL3-H: 19-inch 1U Rackmount computer with Intel i3-8145UE, with 8 Gigabit Ethernet ports, VGA, 16 RS-485 ports, mSATA, SATA, USB, single Power, without RAM, mSATA and OS, -25 to 55°C operating temperature

Each basic system model package includes the following items:

- DA-680 rackmount computer
- Rack-mounting kit
- Quick Installation Guide (printed)
- Warranty card

# Appearance

**Front View** 





# Dimensions



# **Features**

The DA-680 computer comes with the following features:

- IEC 61850-3, IEEE 1613, and IEC 60255 compliance for power substation automation systems
- 8th Gen Intel® Core™ processor
- 1 built-in DDR4 memory socket
- 1 mSATA for installing OS and 1 SSD/HDD for storage expansion
- 8 Gigabit Ethernet ports for network redundancy
- 5 USB ports for connecting high-speed peripherals
- 8 or 16 isolated RS-485 ports
- Supports both 100 to 240 VAC and 100 to 240 VDC power inputs (single power and dual-power models available)

# **Hardware Block Diagram**

### **DA-680 Basic System**



# **Hardware Specifications**



### NOTE

The latest specifications for Moxa's products can be found at <a href="https://moxa.com">https://moxa.com</a>.

The DA-680 embedded computers are compact and rugged, making them suitable for industrial applications. The LED indicators enable quick troubleshooting and effective monitoring of the computer. Multiple ports are provided for connecting a variety of devices. The DA-680 embedded computers come with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. This chapter describes the hardware installation and connector interfaces of the DA-680 embedded computers.

# **Installing Rack-mounting Ears**

The DA-680 computer comes with a rack-mounting kit for installing the computer on a rack. The rackmounting kit includes 2 rack-mounting ears and 8 screws (size: M4x8 mm), 4 screws for each mounting ear.



### ΝΟΤΕ

The two rack-mounting ears are not identical. Refer to the diagram above to identify the correct left and right rack-mounting ears and ensure that you use them correctly to mount the computer.

Follow the instructions below to install the computer.

- 1. Attach the left rack-mounting ear to the left side of the DA-680 computer and secure the four screws.
- 2. Attach the other rack-mounting ear to the right side of the computer and secure it with the four screws.





# **Wiring Requirements**

The following common safety precautions should be observed before installing any electronic device:

• Power wires and communication/signal wires should be routed through separate paths. If power and communication/signal wires must cross paths, make sure the wires are perpendicular at the intersection point.



#### NOTE

Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- Use the type of signal transmitted through a wire to determine which wires should be bundled together and which ones should be kept separate. The rule of thumb is that wiring that carries similar electrical signals can be bundled together.
- When necessary, we strongly advise labeling the wiring for all devices in the system.



#### ATTENTION

Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

### ATTENTION

#### Safety First!

Be sure to disconnect the power cord before installing and/or wiring your device.

#### **Electrical Current Caution!**

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum rating, the wiring could overheat, causing serious damage to your equipment.

#### Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

### **Restricted Access Location**

This equipment is intended to be used in Restricted Access Locations, such as a computer room, with access limited to SERVICE PERSONAL or USERS who have been instructed on how to handle the metal chassis of equipment that is so hot that special protection may be needed before touching it. The location should only be accessible with a key or through a security identity system.



External metal parts of this equipment are extremely hot!! Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

# **Connecting the Power**

The DA-680 Series includes single-power and dual-power models that use terminal block(s) located on the rear panel. Connect the power cord wires to the screws on the power input and then tighten the screws. The **Power** LED will light up to indicate that power is being supplied to the DA-680, after which the BIOS will initialize the flash disk module, causing the **Storage** LED to blink. It should then take about 30 to 60 seconds for the operating system to complete the boot-up process.

# **Wiring the Power Inputs**

Refer to the following illustration and table for details on wiring the power inputs to the DA-680 computer. The table uses the reference numbers in the diagram to identify the lines in the terminal blocks.





#### H Model Power Terminal Block Pin Assignment

<b>Terminal Number</b>	Description	Note		
1	NC	No function		
2	PWR1 Line	PWR1 Line is connected to the Line terminal for the AC power		
2	PWRILINE	source 1.		
3	NC	No function		
4	PWR1 Neutral	PWR1 Neutral is connected to the Neutral terminal for the AC		
4		power source 1.		
5	NC	No Function		
6	loround	Ground should be connected to the ground terminal for AC		
0		power source 1.		
7	NO	Normal open pin for the alarm relay.		
8	COM	COM pin for the alarm relay.		

#### HH Model Power Terminal Block Pin Assignment

<b>Terminal Number</b>	Description	Note
1	PWR2 Line	PWR2 Line is connected to the Line terminal for the AC power
T		source 2.
2	PWR1 Line	PWR1 Line is connected to the Line terminal for the AC power
2	PWRILINE	source 1.
3	PWR2 Neutral	PWR2 Neutral is connected to the Neutral terminal for the AC
5	PWRZ Neuliai	power source 2.
4	PWR1 Neutral	PWR1 Neutral is connected to the Neutral terminal for the AC
4		power source 1.
5	Ground	Ground should be connected to the ground terminal for AC
5		power source 2.
6	6 Ground	Ground should be connected to the ground terminal for AC
0		power source 1.
7	NO	Normal open pin for the alarm relay.
8	8 COM COM pin for the alarm relay.	

### **Grounding the Chassis**

A grounding connector is located on the rear panel of the computer.



Connect the grounding connector on the chassis to the earth (ground). The minimum wire diameter is 18 AWG.





#### ATTENTION

If protective earthing is used as a safeguard, the instructions shall require connection of the equipment protective earthing conductor to the installation protective earthing conductor (for example, by means of a power cord connected to a socket-outlet with earthing connection).

A power button on the rear panel can be used to power the computer when it is in sleep or hibernate mode.



# **Reset Button**

Pressing the **Reset** button initiates a hardware warm reboot. The button plays the same role as a desktop PC's reset button. After pressing the reset button, the system will reboot automatically. During normal use, you should NOT use the Reset Button. You should only use this button if the software is not working properly. To protect the integrity of data being transmitted or processed, you should always reset the system from the operating system using the software reboot function.



# LED

There are 60 LED indicators on the front panel.

HIM, FORT

Information about each LED indicator is given in the following table:

LED	Color	Description		
Power	Green	Power is on		
FOWEI	Off	No power input or power error exists		
Storage	Yellow/Blinking	Data is being written to or read from the storage unit		
Storage	Off	Storage unit is idle		
Power Fail 1	Red	Power 1 has failed (for dual power models only)		
	Off	Power is being properly supplied		
Power Fail 2	Red	Power 2 has failed (for dual power models only)		
	Off	Power is being properly supplied		
	Green	100 Mbps Ethernet mode		
Gigabit LAN LEDs 1-6	Yellow	1000 Mbps (Gigabit) Ethernet mode		
	Off	Not operating, or in 10 Mbps Ethernet mode		
Serial Port TX 1-12	Green	Serial port is transmitting data		
	Off	Not operating		
Serial Port RX 1-12	Yellow	Serial port is receiving data		
	Off	Not operating		
Programmable 1-6 Green		Defined by user		

# **Connecting to Displays**

The DA-680 comes with 1 VGA interface on the rear panel for connecting a display.



# **Connecting USB Devices**

The DA-680 comes with 2 USB 2.0 ports on the front panel and 3 USB 3.0 ports on the rear panel. The USB ports can be used to connect to other peripherals, such as flash drives, for expanding the system's storage capacity. In addition, both USB ports support system boot up, which can be activated by modifying the BIOS settings. See "*Chapter 3* **BIOS Setup**" for details.



### Installing a USB Dongle Kit

You can use a USB dongle kit to secure your USB dongle inside your DA-680 computer.

The USB dongle kit includes a USB plate and a screw.





#### NOTE

The USB dongle kit is an optional accessory that can be purchased separately.

To install a USB dongle kit, do the following:

- 1. Power off the DA-680 computer and remove the top cover of the computer.
- 2. Find the location of the USB slot.



3. Attach the USB device to the USB port inside the DA-680 computer.

Place the USB plate on the rail and push right to the USB device as close as possible. Finally, fasten the screw on the plate.



4. Put back the top cover of the computer.

# **Serial Ports**

The DA-680 comes with 10 serial ports that support RS-485 mode that use terminal blocks. The pin assignments are printed on the rear cover of the product for your reference.



# **Gigabit LAN Ports**

The DA-680 has 8 Gigabit LAN ports. When a LAN cable is properly connected, the LEDs on the front panel will glow to indicate the connection status.

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Pin	100 Mbps	1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	-	TRD(2)+
5	-	TRD(2)-
6	Rx-	TRD(1)-
7	-	TRD(3)+
8	-	TRD(3)-

Refer to the following figure and table for the pin sequence and definitions.

# **Digital Outputs**

The DA-680 is provided with two digital outputs in a terminal block. Refer to the following figure for the location of the DO connectors.



Digital Output				
Output Channels	2 x sink type			
Output Current Max. 200 mA per channel				
On-state Voltage 24VDC nominal, open collector to 30VDC				
Isolation	3 KV optical isolation			
Connector Screw-fastened Terminal Block				

# **Relay Output**

The DA-680 is provided with a relay output located on the rear panel of the computer. The default setting is N.O. If you want to change N.O. to N.C., you should open the case and switch the jumper.



HH	Model					н	Model		
PWR1 +/L 2 PWR2 +/L -/N 1 3	-/N 4 -/[5	  =                 	COM 8	PWR1	N/C 1	+/L 2 N/C 3	-/N 4 N/C 5	-  -   6   NO   7	COM 8

<b>Terminal Number</b>	Description	Note	
7	NO	Normal open pin for the alarm relay.	
8	СОМ	COM pin for the alarm relay.	

_	N.O. (Default)	N.C.
No Power Status	Close	Open
Power ON (Normal)	Open	Close
Power OFF	Close	Open
Alert Trigger	Close	Open

# **Upgrading the Memory Module**

The DA-680 embedded computer supports 1 DDR4 SODIMM modules for up to 16 GB of memory. To upgrade the SDRAM memory module, follow these instructions:

- 1. Disconnect the DA-680 from its power source.
- 2. Unfasten the screws on the top of the computer, and then remove the top cover.
- 3. Find the location of the SDRAM memory slot.



4. Install the new memory module in the slot.

Make sure you insert the SDRAM in the correct direction. Push down the memory module, making sure that the two fasteners snap in place and are holding the module firmly.

#### NOTE

If a memory module is already installed in the slot, push the two fasteners to free the module and then remove the module.

F	
848HB	

5. Replace the top cover of the computer and fasten the screws.

# Installing a mSATA Storage Card

The DA-680 embedded computer comes with a mSATA slot. To install a mSATA storage card, do the following:

- 1. Disconnect the DA-680 from its power source.
- 2. Unfasten the screws on the top of the computer, and then take off the top cover.
- 3. Find the location of the mSATA slot.



4. Insert the mSATA storage card into the slot and fasten the two screws to secure the card to the slot.



5. Replace the top cover of the computer and fasten the screws.



#### ATTENTION

The DA-680 rackmount computer does not support hot swap and plug and play functions for the mSATA storage card. You must disconnect the power source from the computer before inserting or removing the mSATA storage card.

# **Installing SATA Hard Disks**

The DA-680 comes with one SATA slot that allows users to install a 2.5" SATA HDD/SSD. Follow these steps to install a SATA disk.

- 1. Disconnect the DA-680 from its power source.
- 2. Unfasten the screws on the top of the computer, and then take off the top cover.
- 3. Find SATA HDD/SSD location.



4. Remove screw and install 3 copper pillars as follow:



5. You should order the accessory kit and it will include tray, screw and cables as follow:



6. Place the SATA disk on the tray. Ensure that the SATA disk aligns with the screws on the storage tray.



7. Put this tray on the pillars and screw. Connect the cable to the PCB board as follow:



This chapter describes the BIOS settings of the DA-680 computer. The BIOS is a set of input/output control routines for peripherals, which are used to initialize system peripherals before the operating system is loaded. The BIOS setup allows the user to modify the system configurations of these peripherals' basic input/output interfaces.

# **Entering the BIOS Setup**

To enter the BIOS setup utility, press the **F2** key while the system is booting up. The main **BIOS Setup** screen opens up with the following options:

- **Continue:** Continue to boot up
- Boot Manager: Select the device for booting up
- Device Management: Enter the device configuration menu
- Boot From File: Select the UEFI boot up file
- Administer Secure Boot: Enter the secure boot menu
- **Setup Utility:** Enter the BIOS configuration menu
- Intel® Management Engine BIOS Extension: Enter the AMT configuration menu

Select F2 to enter the BIOS configuration.

From	t Page	
Front Page		
	This se	election will direct the system to ne to booting process
F1 Help 1/4 Select Item	Enter Select ► SubMenu	

When you enter Setup Utility, a basic description of each function key is listed at the bottom of the screen.

F1	General Help
F5/ F6	Change Values
F9	Setup Defaults
F10	Save and Exit

↑↓-	Select Item
$\longleftrightarrow$	Select Menu
ESC	Exit
EN TER	Select or go to Submenu.

The BIOS configuration screen will be shown when you enter the **Setup Utility** option, as shown in the following figure.

Main Advanced Security Pow	Setup Utility	Rev. 5.	
Project Name BIOS Version	DA-680 V1. 0. 0S04	s	his is the help for the hour, minute, econd field. Valid range is from 0 to 3. 0 to 59. 0 to 59. INCREASE/REDUCE :
Processor Type System Memory Speed Total Memory	Intel(R) Core(TM) i 2400 MHz 8192 MB		, o to 55, o to 55. InckLH3E7KEDUCE . 
CPUID: CPU Stepping: L1 Data Cache: L1 Instruction Cache: L2 Cache: L3 Cache: Number Of Processors: Microcode Rev: PCH Rev / SKU GOP Ver: Intel HE Version / SKU System Time System Date	0x806EC (WhiskeyLake 806EC (V0 Stepping) 32 KB 32 KB 256 KB 4096 KB 2 Core(s) / 4 Threat 00000082 30 (D0 Stepping) / 0 SKU 9.0.1105 12.0.71.1681 / CORP [16:54:361] [12/22/2022]	d(s) CNL PCH-LP (U) Premium R	
F1 Help Esc Exit	1/4 Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

Ν

### NOTE

The **Processor Type** information will vary depending on the computer model that you have purchased.

# **Administer Secure Boot**

Secure Boot helps computers resist attacks and infection from malware. The feature defines an interface between operating system and firmware/BIOS. It detects tampering with boot loaders, key operating system files, and unauthorized option ROMs by validating their digital signatures.



### **UEFI Secure Boot enable**

Please set as "enabled" in "Restore Secure Boot to Factory Settings" under Administer Secure Boot menu.

Press F10 as save and exist.

Moxa has included the Microsoft key in the BIOS by default. If you cannot boot up the computer using a non-Windows OS, use the following examples.



# Enroll EFI Image

Enter into "Administer Secure Boot" once again and see "Select a UEFI file as trusted for execution", put loader into database which named and followed UEFI standard \EFI\BOOT\BOOT{machine type short-name}.

E.g. efi\boot\BootX64.efi, Debian (EFI\debian\grubx64.efi), Suse(EFI\opensuse\grubx64.efi)

	Administer (	
Administer Secure Boot		
		Administer Secure Boot
System Status:		
Secure Boot Database Secure Boot Status User Customized Security Options:	Installed and Locked Enabled NO	<. > < > B00TX64. EF I
▶Select a UEFI file as trusted for execut Enforce Secure Boot Erase all Secure Boot Settings Restore Secure Boot to Factory Settings	tion <enabled> <disabled> <disabled></disabled></disabled></enabled>	
▶PK Options ▶KEK Options ▶DB Options ▶DBX Options		

### **Enroll Customer Key**

Enter into "DB OPTION" and enroll your key. Please make sure your key is CRT format and use RSA 2048 or better.

# **Main Page**

The **Main** page displays basic system hardware information, such as model name, BIOS version, and CPU type.

		Setup Utility	Rev. 5.0
Main Advanced Security Power E	Boot Exit		
Project Name BlOS Version Processor Type System Hemory Speed Total Memory	DA-680 V1.0.0S04 Intel(R) Core(TH) i 2400 MHz 8192 MB	3-8145UE CPU @ 2.20GHz	This is the help for the hour, minute, second field. Valid range is from 0 to 23, 0 to 59, 0 to 59. INCREASE/REDUCE : +/
CPUID: CPU Stepping: L1 Data Cache: L2 Cache: L2 Cache: L3 Cache: Number Of Processors: Microcode Rev: PCH Rev / SKU GOP Ver: Intel ME Version / SKU System Date	0x806EC (WhiskeyLak 806EC (V0 Stepping) 32 KB 256 KB 4096 KB 2 Care(s) / 4 Threa 00000082 30 (D0 Stepping) / SKU 9.0.1105 12.0.71.1681 / CORP [16:54:361] [12/22/2022]	d(s) CNL PCH-LP (U) Premium ि	
	Select Item Select Item	F5/F6 Change Values Enter Select > SubMenu	F9 Setup Defaults F10 Save and Exit

# **Advanced Settings**

Select the **Advanced** tab in the BIOS setup utility to open the advanced features screen.

Main Advanced Sec	urity Domer	Boot Evit	InsydeH20 Setup Utility	Rev. 5.0
Hain Advanced Sect ►Boot Configuration ►SATA Configuration ►CPU Configuration ►Video Configuration ►Chipset Configuration ►S10 118786E		Boot Exit		Configures Boot Settings.
			K	
F1 Help Esc Exit		/l Select item /4 Select item	F5/F6 Change Values Enter Select ≻ SubHenu	F9 Setup Defaults F10 Save and Exit

# **Boot Configuration**

This item allows users to configure the default value of Numlock.

Options: On (default), Off.

Ins	ydeH20 Setup Utility	Rev. 5.
	s	elects Power-on state for Numlock
<0n>		
1/1 Select Item +/+ Select Item	F5/F6 Change Values Enter Select ▶ SubHenu	F9 Setup Defaults F10 Save and Exit
	<0rr>	<0n>

# **SATA Configuration**

The host drive controller can be configured for AHCI (default) or Intel RST Premium mode.

Advanced		Insyde	eH2O Setup Utility		Rev.	5.0
SATA Configuration SATA Mode Selection SATA Speed Limited PSerial ATA Port 0	[Not Installed]	<ahc 1=""> <auto></auto></ahc>		ternines how SATA controller(s) erate.		
Pserial ATA Port U Hot Plug PSerial ATA Port 1 Hot Plug	[Not installed]	<di led="" sab=""> <enab led=""></enab></di>				
F1 Help Esc Exit	1/↓ Select +/+ Select		F5/F6 Change Enter Select	F9 Setup Defaults F10 Save and Exit		

### SATA Speed

Options: Gen 1, Gen 2, Gen 3 (default)

### **Serial ATA Port**

This setting displays information on the drives installed on your computer.

### SATA Port—Hot Plug

This item allows you to enable/disable hot-plugging capabilities (the ability to remove the drive while the computer is running) for the storage drives installed.

 

 Advanced
 Insydel/20 Setup Utility
 Rev. 5.0

 SATA Configuration
 Sata Configuration
 Determines how SATA controller(s) operate.

 SATA Hode Selection
 <Intel RST Premium With Intel Optane System Acceleration>
 Determines how SATA controller(s)

 \*Serial ATA Port 0
 [Not Installed]

 Determines how SATA controller(s)

 \*Serial ATA Port 1
 [2.5" SATA SSO 3HE 1

 Hot Plug

 Second Point Premium With Intel Optane

 \*Serial ATA Port 1
 [2.5" SATA SSO 3HE 1

 Hot Plug

 \*Hot Plug

 \*Hot Plug

 Hot Plug

 Hot Plug

 Interview

 Sectial ATA Port 1

 </td

Options: Disabled (default for Port 0), Enabled (default for Port 1)

# Intel Rapid Storage Technology

This option allows users to configure the Intel® Rapid Storage Technology. To configure the Intel Rapid Storage Technology settings, select the **Device Management** option when setting the Intel RST Premium mode, or saving changes and rebooting the computer.

	Device Manager
Devices List ⊧Intel(R) Rapid Storage Technology	This formset allows the user to manage RAID volumes on the Intel(R) RAID Controller
Press ESC to exit.	
R	
F1 Help	1/1 Select Item
Esc Exit	Enter Select ► SubHenu
Intel(R) Rapid Storage Technology	R) Rapid Storage Technology
Intel(R) Rapid Storage Technology	R) Rapid Storage Technology This page allows you to create a RAID volume
Intel(R) Rapid Storage Technology	This page allows you to create a RAID
Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver PCreate RAID Volume Non-RAID Physical Disks:	This page allows you to create a RAID volume
Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver Create RAID Volume Non-RAID Physical Disks: >SATA 0.3, HGST HTS545050A7E680 TH8514GL1A6AJP, 465.	This page allows you to create a RAID volume
Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver Create RAID Volume Non-RAID Physical Disks: *SATA 0.3, HGST HTS545050A7E680 TH8514GL1A6AJP, 465.	This page allows you to create a RAID volume
Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver Create RAID Volume Non-RAID Physical Disks: *SATA 0.3, HGST HTS545050A7E680 TH8514GL1A6AJP, 465.	This page allows you to create a RAID volume
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Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver PCreate RAID Volume Non-RAID Physical Disks: PSATA 0.3, HGST HTS545050A7E680 TH8514GL1A6AJP, 465.	This page allows you to create a RAID volume
Intel(R) Rapid Storage Technology	This page allows you to create a RAID volume
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Intel(R) Rapid Storage Technology Intel(R) RST 15.8.0.3010 RAID Driver PCreate RAID Volume Non-RAID Physical Disks: ▶SATA 0.3, HoST HTS545050A7E680 TH8514GL1A6AJP, 465.	This page allows you to create a RAID volume

# **CPU Configuration**

Advanced	Insyd	eH2O Setup Utility	Rev. 5.0
CPU Configuration			Number of cores to enable in each processor package.
Active Processor Cores Hyper-Threading Turbo Mode	<al i=""> <enabled> <enabled></enabled></enabled></al>		
		K	
F1 Help Esc Exit	1/1 Select Item +/+ Select Item	F5/F6 Change Values Enter Select ► SubHenu	F9 Setup Defaults F10 Save and Exit

#### **Active Processor Cores**

This item indicates the number of cores that can be enabled in each processor package.

### **Hyper-Threading**

This feature makes the processor resources work more efficiently, enabling multiple threads to run on each core. It also increases processor throughput, improving overall performance on threaded software.

Options: Disabled, Enabled (default)

#### **Turbo Mode**

Enable/Disable processor Turbo Mode.

Options: Disabled, Enabled (default)

### **Video Configuration**

Advanced	Ins	ydeH20 Setup Utility	Rev.
Video Configuration			elect DVMT 5.0 Pre-Allocated (Fixed) raphics Memory size used by the
DVMT Pre-Allocated DVMT Total Gfx Mem	<32H> <256H>		nternal Graphics Device.
		R	
1 Help sc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ▶ SubHenu	F9 Setup Defaults F10 Save and Exit

#### **DVMT Pre-Allocated**

Selecting this option allows you to configure pre-allocated memory capacity for the IGD. Pre-allocated graphics memory is invisible to the operating system.

Options: 12M, 24M, 32M (default), 40M, 48M, 56M, 64M

**DVMT:** The amount of video memory your computer has is dependent on the amount of pre-allocated memory set for your system plus the Dynamic Video Memory Technology (DVMT). DVMT dynamically allocates system memory for use as video memory creating the most efficient use of available resources for maximum 2D/3D graphics performance.

#### **DVMT Total Gfx Mem**

This option allows you to configure the maximum amount of memory DVMT will use when allocating additional memory for the internal graphics device.

Options: 256 MB (default), 128 MB, Max.

# **Chipset Configuration**

This option allows you to configure the chipset settings.

Advanced	InsydeH20 Setup Utility	Rev. 5.
Chipset Configuration		This item allows you to enable/disable the computer from automatically powering
Power ON after Power Failure Load Default After Cleaning RTC Battery	<0n> <enabled></enabled>	up after a system crash. Options: ON (default), OFF, Last State
DO-O Level DO-1 Level	<high> <high></high></high>	
	19	
F1 Help 1/1 Selec Esc Exit +/+ Selec		

#### **Power ON after Power Failure**

This option allows you to enable/disable the computer from automatically powering up after system power is re-enabled.

Options: ON (default), OFF, Last State

#### Load Default After Cleaning RTC Battery

System will load the default when RTC battery loss is detected.

Options: Disabled, Enabled (default)

#### **DO-0** Level

This option allows users to set the DO-0 level. Options: High (default), Low

#### **DO-1** Level

This option allows users to set the DO-1 level. Options: High (default), Low

## **SIO ITE8786E**

This option allows users to configure serial port settings.

Advanced	Insyc	deH2O Setup Utility	Rev. 5.0
18786E Chip 1  /O Configuration Port ≻Hardware Monitor	2Eh/2Fh		onitor all hardware sensors like oltage/temperature/fan speed
		×	
F1 Help Esc Exit	1/1 Select Iten +/+ Select Iten	F5/F6 Change Values Enter Select ► SubHenu	F9 Setup Defaults F10 Save and Exit

#### **Hardware Monitor**

This option allows users to view stats on the computer such as CPU and system temperature, voltage levels, and other chipset information.

Advanced	Insyd	eH2O Setup Utility	Rev. 5.0
Hardware Monitor			
Voltage 3.3V 5V Temperature System1 System2 CPU	3. 270 v 5. 035 v 37. 0 °C/ 98. 42. 0 °C/ 107. 50. 0 °C/ 122.	6 °F	
		R	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

# **Security Settings**

The **Security** page includes security-related settings. You will require the supervisor password and user password.

Main Advanced Security Power		Setup Utility	Rev. 5.1
nam Auvanceu Security Puwei	BUULEXIL		
Current TPM Device TPM State Clear TPM	<tpm (dtpm)="" 2.0=""> All Hierarchies Ena [ ]</tpm>		Clear TPH. Removes all TPH context associated with a specific Owner.
Supervisor Password	Not Installed		
Set Supervisor Password			
	74 Select Item 7+ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

### **Current TPM Device**

This item indicates if the system has a TPM module configured and provides information on its type.

### **TPM State**

This item allows users to view the current TPM settings.

### **Clear TPM**

This item allows users to remove all TPM context associated with a specific owner.

### Set Supervisor Password

This item allows you to set the supervisor password. To set the password, select the **Set Supervisor Password** option, enter the password, and re-confirm the password.

To delete the password, select the **Set Supervisor Password** option and enter the old password; leave the new password fields blank, and then press enter.

		deH20 Setup Utility	Rev. 5.0
Main Advanced Security Po	wer Boot Exit		
Current TPH Device TPH State Clear TPH	[X]	1)>	Install or Change the password and the length of password must be greater than one character.
Supervisor Password	Not Installed		
Set Supervisor Password	Enter New 1	Supervisor Password Password: Password Again:	
F1 Help	1/4 Select Item	F5/F6 Change Values	F9 Setup Defaults
Esc Exit	+/→ Select Item	Enter Select 🕨 SubMenu	F10 Save and Exit

After setting the supervisor password, users can choose when the input password screen will pop up.

		nsydeH20 Setup Utility	Rev. 5.0
Main Advanced Security Pow	wer Boot Exit		
Current TPH Device TPH State Clear TPH Supervisor Password	<tph (<br="" 2.0="">All Hierar []] Installed</tph>	DTPM)> chies Enabled, Owned	Enable:System will ask input password on post time. Disable:System will ask input password when go to Setup Utility. Config-Only:System will ask input password when user press F2 into Frontpage
Set Supervisor Password Power on Password	<d i="" led="" sab=""></d>	Power on Password Enabled Disabled Config-Only	
F1 Help Esc Exit	1/↓ Select Item +/+ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

*Enable*: System will ask input password during post time.

Disable: System will ask for the password to go to the setup utility.

Config Only: System will only ask for the password when you select the config (F2) option

# **Power Settings**

The Power page allows users to configure the power settings of the computer.

Main Advanced	InsydeH20 Security Power Boot Exit	Setup Utility	Rev. 5.0
Wake on LAN Auto Wake on S5	<enabled> <disabled></disabled></enabled>		Determines the action taken when the system power is off and a PCI Power Hanagement Enable wake up event occurs.
		R	
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

### Wake on LAN

Enable this feature if you want to wake up the system by a LAN device from a remote host.

Options: Enabled (default), Disabled

### Auto Wake on S5

This option allows you to configure the computer to wake from S5 status. S5 stands for Soft Off, where the PSU remains engaged but power to all other parts of the system is cut. Auto wake on S5 schedules a soft-reboot at certain periodic times that may be specified in the BIOS.

Options: Disabled (default); By Every Day (user specifies a regular daily time when the computer will power up); By Day of Month (user specifies a regular day each month when the computer will power up)

# **Boot Settings**

The **Boot** page includes configuration settings for the boot-up process.

Main Advanced Security	Power Boot Exit	eH20 Setup Utility		Rev. 5
Network Stack PXE Boot capability USB Boot Timeout	<enabled> <disabled> <enabled> [0]</enabled></disabled></enabled>		etwork Stack Support: UEF1 IPv4/IPv6 PXE	
Boot Order ▶EFI				
		R		
F1 Help Esc Exit	1/↓ Select Item +/→ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit	

#### NOTE

If you have not added any storage to your computer, you will not see the EFI option.

### **Network Stack**

This option is used to deploy an Internet Protocol (IP) stack. The IP stack provides an application library to open/close connections to remote devices and send/receive data between the remote devices.

Options: Disabled (default), Enabled

### **PXE Boot capability**

PXE Booting is booting a system over a network. This option allows users to start PXE over IPv4 or IPv6 Options: Disabled (default), UEFI: IPv4, UEFI: IPv6, UEFI: IPv4/IPv6

### **USB Boot**

Used to enable or disable boot-up from USB devices. Options: Enabled (default), Disabled

### Timeout

This option allows users to set the number of seconds that the firmware will wait before booting the system with the default boot selection.

### EFI

This option allows users to select the boot order. Use F5 (move down) or F6 (move up) to change the value.

# **Exit Settings**

The **Exit** page includes options to exit the BIOS environment.

Main Advanced Security Po	ower Boot Exit	InsydeH20 Setup Utility	Rev. 5.0
Exit Saving Changes Save Change Without Exit Exit Discarding Changes Load Optimal Defaults Load Custon Defaults Save Custom Defaults Discard Changes			Exit system setup and save your changes.
F1 Help Esc Exit	1/↓ Select Item +/+ Select Item	F5/F6 Change Values Enter Select ► SubMenu	F9 Setup Defaults F10 Save and Exit

### **Exit Saving Changes**

This option allows you to exit the BIOS environment and save the values you have just configured. Options: Yes (default), No

### Save Change Without Exit

This option allows you to save changes without exiting the BIOS environment. Options: Yes (default), No

### **Exit Discarding Changes**

This option allows you to exit without saving any changes that might have been made to the BIOS. Options: Yes (default), No

### **Load Optimal Defaults**

This option allows you to revert to the factory default BIOS values. Options: Yes (default), No

## Load Custom Defaults

This option allows you to load custom default values for the BIOS settings.

Options: Yes (default), No

### **Save Custom Defaults**

This option allows you to save the current BIOS values as a custom default that may be reverted to at any time by using the **Load Custom Defaults** option.

Options: Yes (default), No

### **Discard Changes**

This option allows you to discard all settings you have just configured.

Options: Yes (default), No

# **Upgrading the BIOS**

This section describes how to upgrade the BIOS on your computer.



### ΝΟΤΕ

Incorrect BIOS updates may permanently damage the computer. We strongly recommend that you contact the Moxa technical support team for assistance to obtain all the necessary tools and the most current information before attempting to upgrade the BIOS on any Moxa device.

#### Step 1: Create a Bootable USB Disk

Before upgrading the BIOS, you must create a bootable USB drive for the system.

1. Search for "format" and select Create and format hard disk partitions.

All	Apps	Documents	Settings	Photos	١
Best	match				
1	Create a partition Control p		rd disk	$\rightarrow$	
Com	mand				
	format			>	
Setti	ngs				
-	See the cu formats	rrent date and	l time	>	
$\oplus$	Region set	tings		>	
$\oplus$	Set regiona	al format		>	
Ģ	Emphasize	formatted tex	xt	>	
$\oplus$	Change th	e date and tim	e formats	>	

#### 𝒫 format

2. Right click on the USB disk and select Format.

Volume	Layout	Type	File System	Status	Capacity	Free Spa	% Free	
(D:)	Simple	Basic	NTFS	Healthy (P	7.14 GB	7.07 GB	99 %	
(Disk 0 partition)		Basic		Healthy (E		100 MB	100 %	
Recovery	Simple	Basic	NTFS	Healthy (	500 MB	190 MB	38 %	
Windows (C:)	Simple	Basic	NTFS	Healthy (B	25,21 00	15.66 GE	3 54 %	
							Open	
							Explore	
							Mark Partition a	s Active
								s Active atter and Paths
Disk 0							Change Drive Le	etter and Paths
	Recovery				Windows (C:)	-	Change Drive Le Format	etter and Paths
Basic 29.80 GB	Recovery 500 MB NTFS		100 MB		29.21 GB NTFS		Change Drive Le Format Extend Volume Shrink Volume	etter and Paths
29.80 GB		Partition)		FI System Pa		ge Fil	Change Drive Le Format Extend Volume	etter and Paths
Basic 29.80 GB	500 MB NTFS	Partition)		Fl System Pa	29.21 GB NTFS	ge Fil	Change Drive Le Format Extend Volume Shrink Volume Add Mirror	etter and Paths
Basic 29.80 GB Online	500 MB NTFS			FI System Pa	29.21 GB NTFS	ge Fil	Change Drive Le Format Extend Volume Shrink Volume Add Mirror Delete Volume	etter and Paths

3. Select FAT32 for the File System and click OK to start formatting the USB disk.

Volume label:	New Volume	
File system:	NTFS	~
Allocation unit size:	NTFS FAT32 exFAT	
Perform a quick for		
Enable file and fold	er compression	
	OK	Cancel

#### Step 2: Prepare the Upgrade File

You must use the BIOS upgrade installation file to upgrade the BIOS. Contact Moxa's technical department for assistance.

- 1. Get the BIOS upgrade file (includes an **efi** folder and an **xxxx.efi** file)
- 2. Copy the **efi** folder and **xxxx.efi** file to the bootable USB disk.

#### Step 3: Run the Upgrade Program on the Computer

 Reboot the computer from the USB device and press F2 while it is booting up to go to the Boot Manager.

If the BIOS does not recognize the USB device as the boot device, the USB device may not have a partition table. Use the Windows command line tool **diskpart** to rebuild the partition table.

2. Select the USB disk to boot from.



3. In the SHELL environment console, type **fs0**:, then go to the directory where the upgrade file is located and type **xxxxxx.efi** (the name of the file is based on the upgrade file you get from Moxa).

Device ma	pping table			
fs0	:Removable HardDisk - Alias hd24s0b blk0			
	PciRoot(0x0)/Pci(0x14, 0x0)/USB(0x12, 0x0)/HD(1, MBR, 0x00DD3D80, 0x3F, 0xEB5FC1)			
b1k0	:Removable HardDisk - <mark>Alias hd24sOb fsO</mark>			
	PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)			
blk1	:Removable BlockDevice - Alias (null)			
	PciRoot(0x0)/Pci(0x14, 0x0)/USB(0x12, 0x0)			
hd24s0b	) :Removable HardDisk - <mark>Alias fsO</mark> b <mark>lkO</mark>			
	PciRoot(0x0)/Pci(0x14,0x0)/USB(0x12,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)			
Shell> fs	0:			
fs0:\> xxxxxxx.efi				

4. The upgrade program will run automatically. Wait for the process to complete.



5. When the upgrade is finished, the computer will automatically reboot. You can check the BIOS version on the Main page

					I	nsy
Main	Advanced	Security	Power	Boot	Exit	
Drojec	t Name				DA-620	_
BIOS V	ersion				V1. 0. 0S04	

If the system has more than one boot device, you will see more than one fsx (x represents the number of devices).

	I version 2.50 [22281.4149]
	running mode 1.1.2
	napping table
fs0	:HardDisk - Alias hd33e0a2 blk0
	PciRoot(0x0)/Pci(0x17, 0x0)/Sata(0x4, 0x0, 0x0)/HD(2, GPT, 0AC3B829-99B0-4FDE-844D-8A10C1D55C6C, 0xFA000, 0x32000)
fs1	:Removable HardDisk - Alias hd25r0b blk1
	PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
fs2	:Removable BlockDevice - Alias f25s0 blk2
	PciRoot(0x0)/Pci(0x14, 0x0)/USB(0x12, 0x0)
b1k0	:HardDisk - Alias hd33e0a2 fs0
	PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(2,GPT,0AC3B829-99B0-4FDE-844D-8A10C1D55C6C,0xFA000,0x32000)
blk1	:Removable HardDisk - Alias hd25r0b fs1
	PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x00DD3D80,0x3F,0xEB5FC1)
b1k2	:Removable BlockDevice - Alias f25s0 fs2
	PciRoot(0x0)/Pci(0x14, 0x0)/USB(0x12, 0x0)
blk3	:HardDisk - Alias (null)
	PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)/HD(1,GPT,5796BAEF-EC3F-447F-B4F1-21EB08DC5D57,0x800,0xF9800)
blk4	:HardDisk - Alias (null)
	PciRoot(0x0)/Pci(0x17, 0x0)/Sata(0x4, 0x0, 0x0)/HD(3, GPT, 7C8FF3C6-53E8-4CF9-8141-65DF7EF04399, 0x12C000, 0x8000)
b1k5	:HardDisk - Alias (null)
	PciRoot(0x0)/Pci(0x17, 0x0)/Sata(0x4, 0x0, 0x0)/HD(4, GPT, 1AABAECE-BE17-4C27-AF60-E6C69977AC02, 0x134000, 0x3A6E800)
blk6	:BlockDevice - Alias (null)
	PciRoot(0x0)/Pci(0x17,0x0)/Sata(0x4,0x0,0x0)
blk7	:Removable BlockDevice - Alias (null)
	PciRoot(0x0)/Pci(0x14, 0x0)/USB(0x11, 0x0)

6. Access each device path **fsx** (x is the device index), then type **Is** to view the content of the boot device until you located the upgrade file and run it.

fs0:\> fs1:		
fs1:\> cd B10\$		
fs1:\BIOS> Is Directory of: fs1:\BIOS		
12/22/22 06:09p <dir> 12/22/22 06:09p <dir> 10/05/22 02:09p 1 File(s) 34,4 2 Dir(s)</dir></dir>	4,096 0 34,487,824 87,824 bytes	 BIOS.efi
fs1:\BI0\$>		



### ATTENTION

Do NOT switch off the power supply to the computer during the BIOS upgrade, since doing so may cause the system to crash.

# A. Safety Installation Instructions

#### A. RTC Battery Warning



### ATTENTION

There is a risk of explosion if the wrong type of battery is used. To avoid this potential danger, always be sure to use the correct type of battery. Contact the Moxa RMA service team if you need to replace your battery.

#### Caution

There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to the instructions on the battery.

#### **B. Fuse Warning**

CAUTION: For continued protection against fire, replace only with the same type and rating of fuse.

#### C. Rack-mounting Warning

The following or similar rack-mounting instructions are included with the installation instructions:

(1) Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

(2) Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

(3) Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

(4) **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

**(5) Reliable Grounding:** Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., by using power strips).