FT48A-B7070

Service Engineer's Manual

PREFACE

Copyright

Version 1.0

Disclaimer

Information contained in this document is furnished by MiTAC Computer Corporation and has been reviewed for accuracy and reliability prior to printing. TYAN® assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TYAN® products including liability or warranties relating to fitness for a particular purpose or merchantability. TYAN® retains the right to make changes to produce descriptions and/or specifications at any time, without notice. In no event will TYAN® be held liable for any direct or indirect, incidental or consequential damage, loss of use, loss of data or other malady resulting from errors or inaccuracies of information contained in this document.

Trademark Recognition

All registered and unregistered trademarks and company names contained in this manual are property of their respective owners including, but not limited to the following.

TYAN® is a trademark of MiTAC Computer Corporation
Intel® is a trademark of Intel® Corporation.
AMI®, AMIBIOS® and combinations thereof are trademarks of AMI Technologies.
Microsoft®, Windows® are trademarks of Microsoft Corporation.
Winbond® is a trademark of Winbond Electronics Corporation.

FCC Declaration

Notice for the USA

Compliance Information Statement (Declaration of Conformity Procedure) DoC FCC Part 15: This device complies with part 15 of the FCC Rules

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- This device must not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesirable operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice for Canada

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

Notice for Europe (CE Mark)

This product is in conformity with the Council Directive 2004/108/EC..

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There will be danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.

About this Manual

This manual provides you with instructions on supporting your FT48A-B7070 barebones system. This manual is intended for experienced users and integrators with hardware knowledge of personal computers.

This manual consists of the following parts:

Chapter 1:	Provides an introduction to the FT48A-B7070, barebones,standard parts list, external components, list the key components of motherboard and provicd block diagram of the system .
Chapter 2:	A complete introduction of the procedures install the CPU,memory, HDDs, and expansion cards
Chapter 3:	A complete introduction of the removal and replacement precedures for the pre-installed components.
Appendix:	Reference lists for BIOS, cable connection table, FRU Parts table for system setup, and technical support in case a problem arise with your system.

Safety and Compliance Information

Before installing and using TYAN FT48A-B7070, take note of the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Do not block the slots and opening on the unit, which are provided for ventilation.
- Only use the power source indicated on the marking label. If you are not sure, contact the power company.
- The unit uses a three-wire ground cable, which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
- Do not place anything on the power cord. Place the power cord where it will not be in the way of foot traffic.
- Follow all warnings and cautions in this manual and on the unit case.
- Do not push objects in the ventilation slots as they may touch high voltage components and result in shock and damage to the components.
- When replacing parts, ensure that you use parts specified by the manufacturer.
- When service or repairs have been done, perform routine safety checks to verify that the system is operating correctly.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- Cover the unit when not in use.

Safety Information

Retain and follow all product safety and operating instructions provided with your equipment. In the event of a conflict between the instructions in this guide and the instructions in equipment documentation, follow the guidelines in the equipment documentation.

Observe all warnings on the product and in the operating instructions. To reduce the risk of bodily injury, electric shock, fire and damage to the equipment, observe all precautions included in this guide.

You must become familiar with the safety information in this guide before you install, operate, or service TYAN products.

Symbols on Equipment

	**Caution**. This symbol indicates a potential hazard. The potential for injury exists if cautions are not observed. Consult equipment documentation for specific details.
	**Caution.** Slide-mounted equipment is not to be used as a shelf or a work space.
	**Warning.** This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
	**Warning**. This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.
	WARNING Hazardous moving parts Keep away from moving fan blades

General Precautions

- Follow all caution and warning instructions marked on the equipment and explained in the accompanying equipment documentation.

Machine Room Environment

- Make sure that the area in which you install the system is properly ventilated and climate-controlled.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the electrical rating label of the equipment.
- Do not install the system in or near a plenum, air duct, radiator, or heat register.
- Never use the product in a wet location.

Equipment Chassis

- Do not block or cover the openings to the system.
- Never push objects of any kind through openings in the equipment. Dangerous voltages might be present.
- Conductive foreign objects can produce a short circuit and cause fire, electric shock, or damage to your equipment.
- Lift equipment using both hands and with your knees bent.

Equipment Racks

To avoid injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual materials handling.
- Do not attempt to move a rack by yourself; a minimum of two people are needed to move a rack.
- Do not attempt to move a fully loaded rack. Remove equipment from the rack before moving it.
- Do not attempt to move a rack on an incline that is greater than 10 degrees from the horizontal.

- Make sure the rack is properly secured to the floor or ceiling.
- Make sure the stabilizing feet are attached to the rack if it is a single-rack installation.
- Make sure racks are coupled together if it is a multiple-rack installation.
- Make sure the rack is level and stable before installing an appliance in the rack.
- Make sure the leveling jacks are extended to the floor.
- Make sure the full weight of the rack rests on the leveling jacks.
- Always load the rack from the bottom up. Load the heaviest component in the rack first.
- Make sure the rack is level and stable before pulling a component out of the rack.
- Make sure only one component is extended at a time. A rack might become unstable if more than one component is extended.

To avoid damage to the equipment:

- The rack width and depth must allow for proper serviceability and cable management.
- Ensure that there is adequate airflow in the rack. Improper installation or restricted airflow can damage the equipment.
- The rack cannot have solid or restricted airflow doors. You must use a mesh door on the front and back of the rack or remove the doors to ensure adequate air flow to the system.
- If you install the Model in a rack, do not place equipment on top of the unit. It will cause restricted airflow and might cause damage to the equipment.
- Make sure the product is properly matted with the rails. Products that are improperly matted with the rails might be unstable.
- Verify that the AC power supply branch circuit that provides power to the rack is not overloaded. This will reduce the risk of personal injury, fire, or damage to the equipment. The total rack load should not exceed 80 percent of the branch circuit rating. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

Equipment Power Cords

- Use only the power cords and power supply units provided with your system. The system might have one or more power cords.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- In all European electrical environments, you must ground the Green/Yellow tab on the power cord. If you do not ground the Green/Yellow tab, it can cause an electrical shock due to high leakage currents.
- Do not place objects on AC power cords or cables. Arrange them so that no one might accidentally step on or trip over them.
- Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.
- To reduce the risk of electrical shock, disconnect all power cords before servicing the appliance.

Equipment Batteries

- The system battery contains lithium manganese dioxide. If the battery pack is not handled properly, there is risk of fire and burns.
- Do not disassemble, crush, puncture, short external contacts, or dispose of the battery in fire or water.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- The system battery is not replaceable. If the battery is replaced by an incorrect type, there is danger of explosion. Replace the battery only with a spare designated for your product.
- Do not attempt to recharge the battery.
- Dispose of used batteries according to the instructions of the manufacturer. Do not dispose of batteries with the general household waste. To forward them to recycling or proper disposal, use the public collection system or return them to TYAN, your authorized TYAN partner, or their agents.

Equipment Modifications

- Do not make mechanical modifications to the system. TYAN is not responsible for the regulatory compliance of TYAN equipment that has been modified.

Equipment Repairs and Servicing

• The installation of internal options and routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy levels.

• Do not exceed the level of repair specified in the procedures in the product documentation. Improper repairs can create a safety hazard.

• Allow the product to cool before removing covers and touching internal components.

• Remove all watches, rings, or loose jewelry when working before removing covers and touching internal components.

• Do not use conductive tools that could bridge live parts.

• Use gloves when you remove or replace system components; they can become hot to the touch.

• If the product sustains damage requiring service, disconnect the product from the AC electrical outlet and refer servicing to an authorized service provider. Examples of damage requiring service include:

– The power cord, extension cord, or plug has been damaged.

– Liquid has been spilled on the product or an object has fallen into the product.

– The product has been exposed to rain or water.

– The product has been dropped or damaged.

– The product does not operate normally when you follow the operating instructions.

Table of Contents

Chapter 1: Overview 13
1.1 About the TYAN FT48A-B7070 13
1.2 Product Models 13
1.3 Features 14
1.4 Standard Parts List 19
1.4.1 Box Contents 19
1.4.2 Accessories 20
1.5 System Front View 21
1.5.3 LED Definitions 25
1.5.4 Motherboard (S7070) Layout 27
1.5.5 Jumpers/Connectors and Slots 28
1.5.6 Block Diagram 29
1.5.7 Internal View 30
Chapter 2: Setting Up 32
2.0.1 Before you Begin 32
2.0.2 Work Area 32
2.0.3 Tools 32
2.0.4 Precautions 33
2.1 Installing Motherboard Components 34
2.1.1 Removing the Chassis Cover 34
2.1.2 Opening the Chassis Front Bezel 36
2.1.3 Installing the CPU and Heat sink 37
2.1.4 Installing the Memory 40
2.1.5 Installing the PCI-E Cards 45
2.2 Installing Hard Drives 49
2.3 Installing DVD Drive 54
2.4 Rack Mounting 59
2.4.1 Installing the Server in a Rack 59
Chapter 3: Replace Pre-Installed Components 63
3.1 Introduction 63
3.2 Disassembly Flowchart 63
3.3 Removing the Cover 64
3.4 Replacing the System Fan 64
3.5 Replacing the Fan Board 65
3.5.1 M1801F77 Fan Board Features 67
3.5.2 Fan Board LED Definitions 67
3.5.3 M1801F77 Fan Board Connector Pin Definition 68
3.6 Replacing the M1237F48 SATA/SAS Backplane 69

3.6.1 M1237F48 SATA/SAS Backplane Features 70
3.7 Replacing the M1244G70-BP6-8 SATA/SAS Backplane 72
3.7.1 M1244G70-BP6-8-B7070 SATA/SAS Backplane Features 73
3.7.2 M1244G70-BP6-8-B7070 Connector Pin Definitions 75
3.8 Replacing the Front Panel Control Board 76
3.8.1 M1018 LED Control Board Features 78
3.8.2 M1018 LED Control Board Connector Pin Definition 79
3.9 Replacing Power Supply and M7025 PDB 80
3.9.1 Replacing Power Supply 80
3.9.2 Replacing M7025 Power Distribution Board 81
3.9.3 M7025 Power Distribution Board Features 84
3.9.4 M7025 PDB Connector Pin Definition 85
3.10 Replacing S7070 System Board 87
Appendix I: Cable Connection Tables 88
Appendix III: FRU Parts Table 96
Appendix IV: Technical Support 98

Chapter 1: Overview

1.1 About the TYAN FT48A-B7070

Congratulations on your purchase of the TYAN® FT48A-B7070, a highly optimized rack-mountable 4U barebones system. The FT48A-B7070 is designed to support dual Intel® Xeon E5-2600 v3 (Haswell-EP) Series processors, and up to 32GB RDIMM, 64GB LRDIMM and 128GB LRDIMM 3DS* DDR4 memory for each DIMM slot. There are 8 channels with 16 DDR4 DIMM slots, providing a rich feature set and incredible performance. Leveraging advanced technology from Intel®, the FT48A-B7070 server system is capable of offering scalable 32 and 64-bit computing, high-bandwidth memory design, and lightning-fast PCI-E Gen2 bus implementation.

The FT48A-B7070 not only empowers your company in today's demanding IT environment but also offers a smooth path for future application usage. The FT48A-B7070 uses TYAN®'s latest rack-mountable 4U chassis featuring a robust structure and a solid mechanical enclosure. All of this provides the FT48A-B7070 the power and flexibility to meet the needs of nearly any server application.

1.2 Product Models

Model	MB	HDDs
B7070F48AW16HR (Channel-W)	S7070WGM2NR	(8) 3.5" / 2.5" HDD trays + (8) 2.5" HDD trays
B7070F48AV4HR-N (Channel-W)	S7070GM2NR	(4) 3.5" / 2.5" HDD trays

1.3 Features

TYAN FT48AB7070 (B7070F48AW16HR)

System	Form Factor	4U Rackmount
	Gross Weight	50 kg
	Chassis Model	FT48A
	Dimension (D x W x H)	27.5" x 16.8" x 6.9" (700 x 427 x 176mm)
	Motherboard	S7070WGM2NR
	Board Dimension	EEB, 12"x13" (305x330mm)
Front Panel	Buttons	(1) PWR / (1) RST / (1) NMI / (1) ID
	LEDs	(1) PWR / (1) HDD / (2) LAN / (1) ID / (1) Warning
	I/O Ports	(2) USB ports
External Drive Bay	Type / Q'ty	3.5" Hot-Swap + 2.5" Hot-Swap / (8)+(8)
	HDD backplane support	SAS / SATA 6.0Gb/s
	Supported HDD Interface	(8) 3.5" HDDs w/SATA 6Gb/s / (8) 2.5" HDDs w/SAS 6Gb/s
System Cooling Configuration	FAN	(3+3) 12cm redundant fans
Power Supply	Type	ERP1U
	Efficiency	PFC / 80 plus Platinum
	Redundancy	2+1
	Input Range	100-127V AC / 200-240V AC
	Frequency	50-60 Hertz
	Output Watts	1,540W (2 x 770W)
Processor	Supported CPU Series	Intel Xeon Processor E5-2600 v3 series processors
	Socket Type / Q'ty	LGA2011 / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath Interconnect (QPI) support
Chipset	PCH	Intel C612
Memory	Supported DIMM Qty	(8)+(8) DIMM slots
	DIMM Type / Speed	RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity	Up to 512GB RDIMM/ 1,024GB LRDIMM/ 2,048GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel	4 Channels per CPU
	Memory voltage	1.2V
Expansion Slots	PCI-E	(2) PCI-E Gen3 x16 slots / (1) PCI-E Gen2 x8 slot / (1) PCI-E Gen3 x16 slots (w/ x8/16 link) / (1)

			PCI-E Gen3 x8 slots (w/ x8/0 link)
LAN	**Port Q'ty**		(2) GbE ports (1 port shared with IPMI)
	Controller		Intel I350-AM2
Storage	**SAS**	**Connector**	(2) Mini-SAS connectors (totally support 8 ports)
		Controller	LSI SAS2308
		Speed	6.0 Gb/s
		RAID	RAID 0/1/1E/10 (LSI Integrated RAID)
	SATA	**Connector**	(1) Mini-SAS (4-ports) + (2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel Matrix RAID)
	SSATA	**Connector**	(4) SATA-III
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST) only for 4 SATA devices
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2400
I/O Ports	**USB**		(6) ports (2 USB2.0 at front, 2 USB2.0 at rear, 2 USB3.0 at rear)
	VGA		(1) D-Sub 15-pin port
	RJ-45		(2) GbE ports (1 port shared with IPMI)
System Monitoring	**Chipset**		Aspeed AST2400
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Temperature		Monitors temperature for CPU & memory & system environment
	LED		Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2400
	AST2400 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash / USB 2.0 virtual hub
	AST2400 iKVM Feature		24-bit high quality video compression / 10/100 Mb/s MAC interface
	AST2300 iKVM Feature		10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**		AMI / 16MB
	Feature		User-configurable H/W monitoring / PXE boot support / SMBIOS 2.5/PnP/Wake on LAN / ACPI 3.0/ACPI sleeping states S4,S5

Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT48A-B7070 Barebone*systems will not display sensor information for the GPU/Coprocessor cards
	Manual	(1) Web User's manual
	Installation CD	(1) TYAN installation CD

TYAN FT48AB7070 (B7070F48AV4HR-N)

System	**Form Factor**	4U Rackmount
	Gross Weight	50 kg
	Chassis Model	FT48A
	Dimension (D x W x H)	27.5" x 16.8" x 6.9" (700 x 427 x 176mm)
	Motherboard	S7070GM2NR
	Board Dimension	EEB, 12"x13" (305x330mm)
Front Panel	**Buttons**	(1) PWR / (1) RST / (1) NMI / (1) ID
	LEDs	(1) PWR / (1) HDD / (2) LAN / (1) ID / (1) Warning
	I/O Ports	(2) USB ports
External Drive Bay	**Type / Q'ty**	3.5" Hot-Swap / (4)
	HDD backplane support	SAS / SATA 6.0Gb/s
	Supported HDD Interface	(4) 3.5" HDDs w/SATA 6Gb/s
System Cooling Configuration	**FAN**	(3+3) 12cm redundant fans
Power Supply	**Type**	ERP1U
	Efficiency	PFC / 80 plus Platinum
	Redundancy	2+1
	Input Range	100-127V AC / 200-240V AC
	Frequency	50-60 Hertz
	Output Watts	1,540W (2 x 770W)
Processor	**Supported CPU Series**	Intel Xeon Processor E5-2600 v3 series processors
	Socket Type / Q'ty	LGA2011 / (2)
	Thermal Design Power (TDP) wattage	Max up to 160W
	System Bus	Up to 9.6/ 8.0/ 6.4 GT/s with Intel QuickPath

			Interconnect (QPI) support
Chipset	**PCH**		Intel C612
Memory	**Supported DIMM Qty**		(8)+(8) DIMM slots
	DIMM Type / Speed		RDIMM DDR4 2133/1866/1600 / LRDIMM DDR4 2133/1600 / LRDIMM 3DS DDR4 2133/1600
	Capacity		Up to 512GB RDIMM/ 1,024GB LRDIMM/ 2,048GB LRDIMM 3DS *Follow latest Intel DDR4 Memory POR
	Memory channel		4 Channels per CPU
	Memory voltage		1.2V
Expansion Slots	**PCI-E**		(2) PCI-E Gen3 x16 slots / (1) PCI-E Gen2 x8 slot / (1) PCI-E Gen3 x16 slots (w/ x8/16 link) / (1) PCI-E Gen3 x8 slots (w/ x8/0 link)
LAN	**Port Q'ty**		(2) GbE ports (1 port shared with IPMI)
	Controller		Intel I350-AM2
Storage	**SATA**	**Connector**	(1) Mini-SAS (4-ports) + (2) SATA (totally support 6 ports)
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel Matrix RAID)
	SSATA	**Connector**	(4) SATA-III
		Controller	Intel C612
		Speed	6.0 Gb/s
		RAID	RAID 0/1/10/5 (Intel RST) only for 4 SATA devices
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		Up to 1920x1200
	Chipset		Aspeed AST2400
I/O Ports	**USB**		(6) ports (2 USB2.0 at front, 2 USB2.0 at rear, 2 USB3.0 at rear)
	VGA		(1) D-Sub 15-pin port
	RJ-45		(2) GbE ports (1 port shared with IPMI)
System Monitoring	**Chipset**		Aspeed AST2400
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Temperature		Monitors temperature for CPU & memory & system environment
	LED		Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Watchdog timer support
Server Management	**Onboard Chipset**		Onboard Aspeed AST2400
	AST2400 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and

		remote platform-flash / USB 2.0 virtual hub
	AST2400 iKVM Feature	24-bit high quality video compression / 10/100 Mb/s MAC interface
	AST2300 iKVM Feature	10/100 Mb/s MAC interface
BIOS	**Brand / ROM size**	AMI / 16MB
	Feature	User-configurable H/W monitoring / PXE boot support / SMBIOS 2.5/PnP/Wake on LAN / ACPI 3.0/ACPI sleeping states S4,S5
Operating System	**OS supported list**	Please refer to our Intel OS supported list.
Regulation	**FCC (DoC)**	Class A
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Compliant**	Yes
Package Contains	**Barebone**	(1) FT48A-B7070 w/NV Tesla-aware FW Barebone
	Manual	(1) Web User's manual
	Installation CD	(1) TYAN installation CD

1.4 Standard Parts List

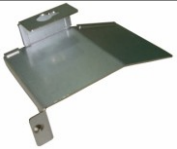
This section describes FT48A-B7070 package contents and accessories. Open the box carefully and ensure that all components are present and undamaged. The product should arrive packaged as illustrated below.

1.4.1 Box Contents

Component	Description
	4U Rackmount FT48A Chassis
	S7070 Motherboard
	(3) DELTA DPS-770GB C 770W Power Supply
	(6)120X120X38mm System FAN
	(1) M1018Control Board (Front Panel LED board)
	(2) M1237F48-BP6-4-7055,R01 Backplane Board
	(1) M1244G70-BP6-8-B7070 Backplane Board (Only for B7070F48AW16HR / B7070F48AV16HR)
	(1) M7025-PDB-NLS,R02 Power Distribution Board
	(1) M1801F77-FB-FT48,R03 Fan Board

1.4.2 Accessories

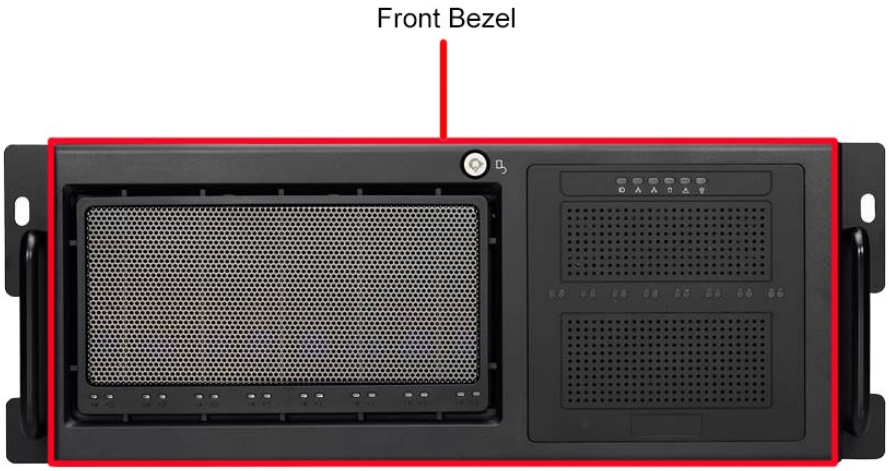
If any items are missing or appear damaged, contact your retailer or browse to TYAN's website for service: http://www.tyan.com
The web site also provides information of other TYAN® products, as well as FAQs, compatibility lists, BIOS settings, etc.

	
1 x TYAN® Motherboard Drive CD	Heatsink x 2
	
Screw Pack	GPU Power Cable x 2
	
AC Power Cord 125V (US) x 2	AC Power Cord 250V (Europe) x 2
	
Rail with Bracket	Mounting Ears & Screw Sack
	
Quick Installation Guide	Addendum for China Use Only
	
GPU Air Duct for Intel (Only for B7070F48AV4HR-N)	GPU bracket#2 x 3 (Only for B7070F48AV4HR-N)

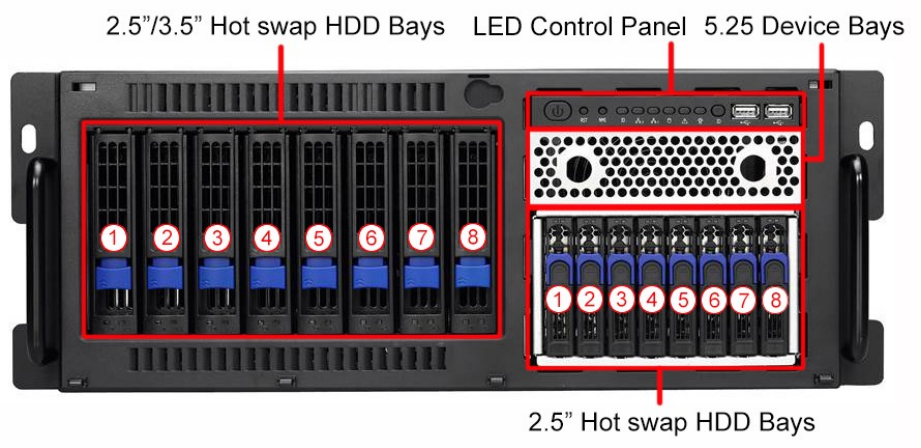
1.5 System Front View

The following views show you the product.

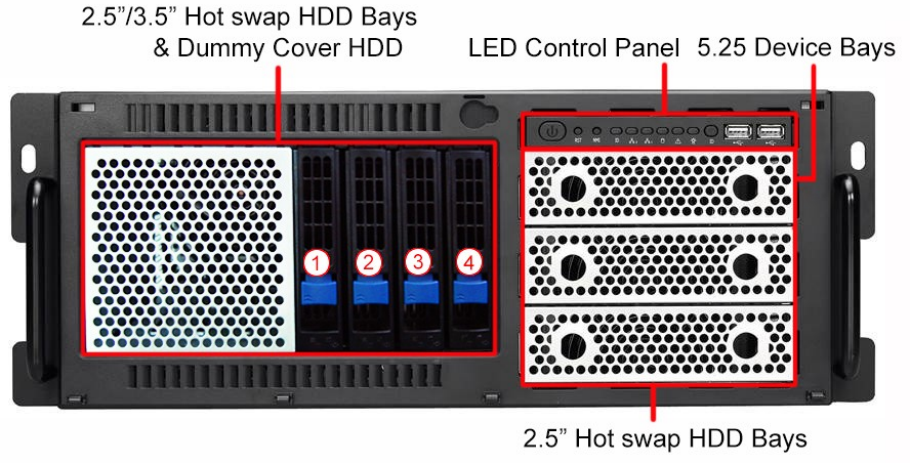
1.5.1 System Front View



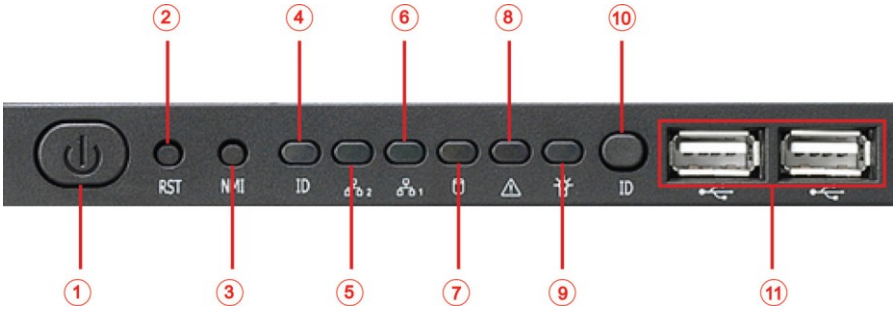
B7070F48AW16HR



B7070F48AV4HR-N

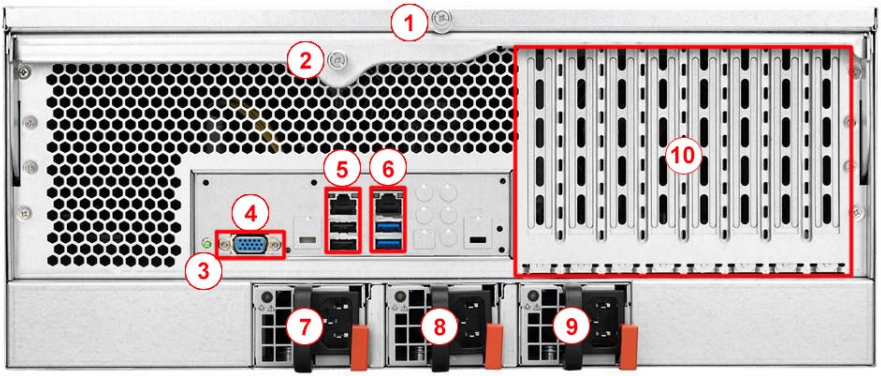


LED Control Panel



1	Power Button
2	Reset Button
3	NMI Button
4 I	ID LED
5	LAN2 LED
6	LAN1 LED
7	HDD LED
8	Warning LED
9	Power LED
10	ID Button
11	USB Ports

1.5.2 System Rear View



1	Thumb Screw for top Tray
2	Thumb Screw for MB cover
3	ID LED Button
4	VGA Port
5	LAN2 (shared with IPMI, i350)+ USB 2.0 Ports
6	LAN1 (i350)+ USB 3.0 Ports
7	Power Supply1
8	Power Supply2
9	Power Supply3
10	Expansion Slots

1.5.3 LED Definitions

Front Panel

LED	State	Description
Power LED	**Green**	Power on
ID LED	**Blue**	ID LED
LAN1/LAN2 Activity	**Green**	Link
	Green (Blinking)	Activity
HDD LED	**Amber** (Blinking)	Activity
Warning LED	**Green**	Normal Status
	Red	System Failed.fan, voltage, thermal Failed.

ID LED

LED	State	Color	Description
ID LED	On	**Blue**	System identified
	Off	Off	System not identified

NOTE: Press ID button when the system AC (Alternating Current) is on, then the ID LED will illuminate and the system is identified by a blue light. Users from remote site could also activate ID LED by interfacing with the IPMI. For further details on the IPMI software, please visit http://www.tyan.com for the latest AST2400 user guide.

HDD LED

State		
Activity LED	**Status LED**	**Description**
Solid On	Off	Drive present,No Activity
Green (Blinking)	Off	Drive present,With Activity
Don't care	SolidON **Orange**	HDD Fail
Don't care	**Orange** (Blinking@ 4 Hz)	Identify (Locate the HDD)
Don't care	**Orange** (Blinking 1 Hz)	SAS/SATA RAID Rebuild

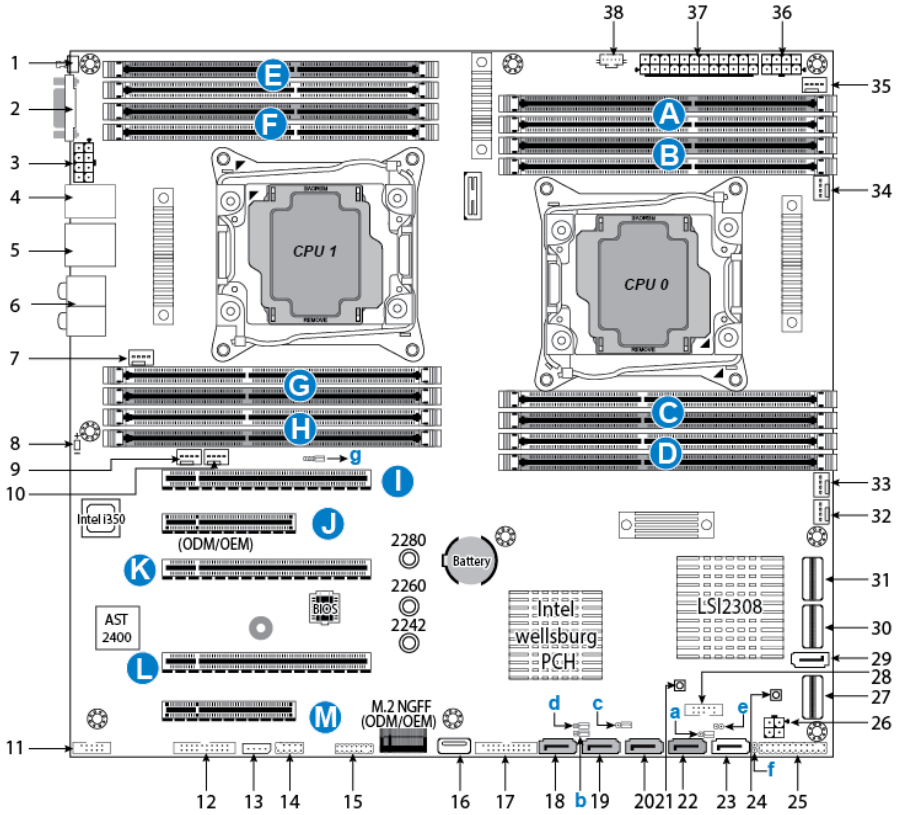
State		
Activity LED	**Fault LED**	**Drive State**
Solid On	OFF	Drive present, No Activity
Green Blinking	OFF	Drive present, With Activity
Don't care	SolidON **Orange**	HDD Fail
Don't care	**Orange** Blinking @1Hz	Identify (Locate the HDD)
Don't care	**Orange** Blinking @4Hz	SAS/SATA RAID Rebuilding

Rear I/O: Onboard LAN LED Color Definition

The three onboard Ethernet ports have green and Amber LEDs to indicate LAN status. The chart below illustrates the different LED states.

1Gbps LAN Link/Activity LED Scheme			
		**Left LED (Link/Activity)**	**Right LED (Speed)**
No Link		OFF	OFF
10 Mbps	**Link**	Green	OFF
	Active	Blinking Green	OFF
100 Mbps	**Link**	Green	Solid Green
	Active	Blinking Green	Solid Green
1Gbps	**Link**	Green	Solid Amber
	Active	Blinking Green	Solid Amber

1.5.4 Motherboard (S7070) Layout



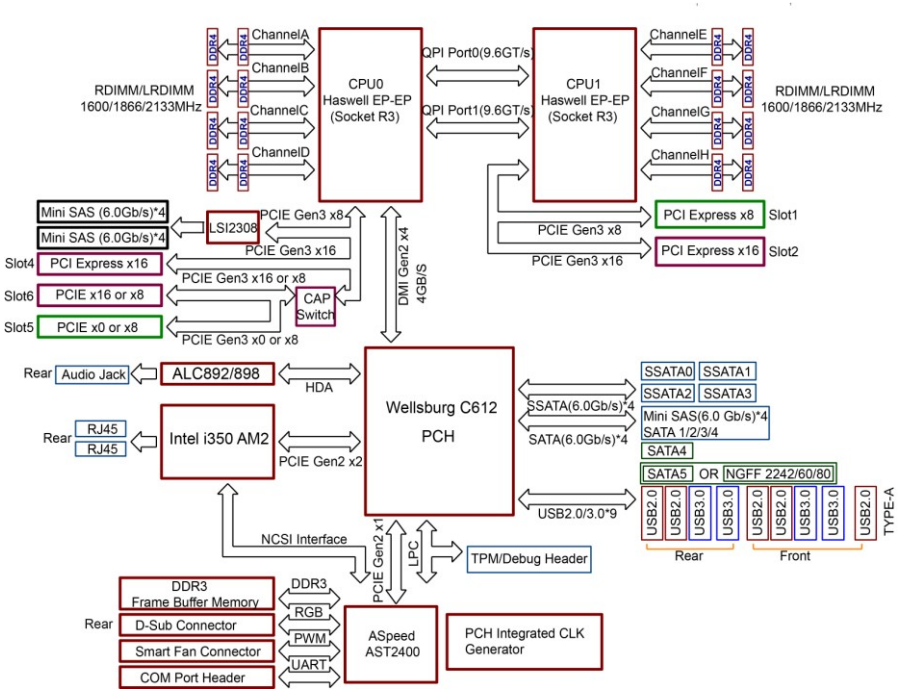
This diagram is representative of the latest board revision available at the time of publishing. The board you receive may not look exactly like the above diagram. The DIMM slot numbers shown above can be used as a reference when reviewing the DIMM population guidelines shown later in the manual. For the latest board revision, please visit our web site at **http://www.tyan.com**.

NOTE: FOR S7070GM2NR SKU, without SAS LSI2308 chip

1.5.5 Jumpers/Connectors and Slots

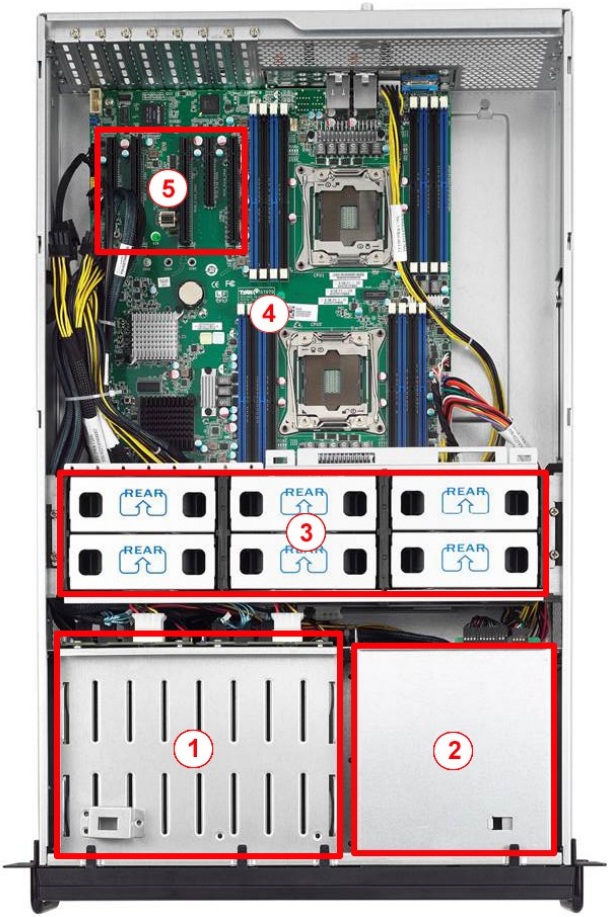
Connectors	
1. ID LED Button(SW1)	20. SSATA 3.0 Connector(SSATA1)
2. VGA Port	21. Clear CMOS Button
3. 8-pin Power Connector(PW3)	22. SSATA 3 0 Connector(SSATA0)
4. USB2.0 ports and LAN Port #2(LAN2)	23. SATA3.0 Connector(SATA5)
5. USB3.0 ports and LAN Port #1(LAN1)	24. Power Button
6. Audio Jack with S/PDIF	25. Front Panel Header(FPIO1)
7. 4-pin Fan Connector(CPU1_FAN)	26. 4-pin Power Connector (PW4)
8. ID LED	27. 4 in 1Mini SAS Connector(SATA0-3)
9. 4-pin Fan Connector (SYS_FAN5)	28. SGPIO Header(SGPIO2,SSATA0-3)
10. 4-pin Fan Connector (SYS_FAN4)	29. SATA3.0 Connector(SATA4)
11. COM Header (COM1)	30. 4 in 1 Mini SAS Connector(SAS4-7)
12. Front Fan Connector (FAN_HDR1)	31. 4 in 1 Mini SAS Connector(SAS0-3)
13. IPMB Connector (IPMB1)	32. 4-pin Fan Connector(SYS_FAN3)
14. Front 2.0 USB Header(USB2_2)	33. 4-pin Fan Connector(SYS_FAN2)
15. TYAN Module Header	34. 4-pin Fan Connector (CPU0_FAN)
16. TYPE_A USB Header(A_USB1)	35. 4-pin Fan Connector (SYS_FAN1)
17. Front 3.0 USB Header(USB3_2)	36. 8-pin Power Connector(PW2)
18. SSATA3.0 Connector(SSATA3)	37. 24-pin Power Connector(PW1)
19. SSATA3.0 Connector(SSATA2)	38. PSMI Connector
Memory Slots/PCIE Slots	
A.CPU0 DIMM A0/CPU0 DIMM A1	H.CPU1 DIMM A0/CPU1 DIMM A1
B.CPU0 DIMM B0/CPU0 DIMM B1	I.PCI-E G3x16 slot(x8 or x16 link) (f/CPU0)
C.CPU0 DIMM D0/CPU0 DIMM D1	J.PCI-E G3 x8 slot (x8 or x 0 link) (f/CPU0)
D.CPU0 DIMM C0/CPU0 DIMM C1	K.PCI-E G3 x16 slot (x16 link) (f/CPU0)
E.CPU1 DIMM C0/CPU1 DIMM C1	L.PCI-E G3x16 slot (x16 link) (f/CPU1)
F.CPU1 DIMM D0/CPU1 DIMM D1	M.PCI-E G3x8 slot (x8 link) (f/CPU1)
G.CPU1 DIMM B0/CPU1 DIMM B1	
Headers/Jumpers	
a. PSU_Alert Enable Jumper (3PHD_10)	e. Chassis Intrusion Header (2PHD_1)
b. Flash Security Override Jumper (3PHD_8)	f. ID_LED Button Header (2PHD_2)
c. ME Recovery Mode Jumper(3PHD_4)	g. Buzzer Disable Jumper(4PHD_12)
d. LAN2 Disable Jumper (3PHD_1)	h. Intel MIC Jumper (3PHD_2)

1.5.6 Block Diagram



S7070 Block Diagram

1.5.7 Internal View



①	(8)3.5” HDD trays with (2) M1237F48-BP6-4-7055 SAS backplane (Pre-installed)
②	M1018 Front Panel Board and (1) 5.25 inch media bays (8)2.5” HDD trays with M1244G70-BP6-8-B7070
③	System Fan Module (6) 12038 hot-swap fan as pre-installed
④	System Main Board
⑤	(5) Expansion slots

NOTE

2.0.1 Before you Begin

This chapter explains how to install the CPUs, CPU heatsinks, memory modules, and hard drives. Instructions on inserting add on cards are also given.

2.0.2 Work Area

Make sure you have a stable, clean working environment. Dust and dirt can get into components and cause malfunctions. Use containers to keep small components separated. Putting all small components in separate containers prevents them from becoming lost. Adequate lighting and proper tools can prevent you from accidentally damaging the internal components.

2.0.3 Tools

The following procedures require only a few tools, including the following:

- A cross head (Phillips) screwdriver
- A grounding strap or an anti-static pad

Most of the electrical and mechanical connections can be disconnected with your hands. It is recommended that you do not use pliers to remove connectors as it may damage the soft metal or plastic parts of the connectors.

Caution!

1. To avoid damaging the motherboard and associated components, do not use torque force greater than 7kgf/cm (6.09 lb/in) on each mounting screw for motherboard installation.
2. Do not apply power to the board if it has been damaged.

2.0.4 Precautions

Components and electronic circuit boards can be damaged by discharges of static electricity. Working on a system that is connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to FT48A-B7070 or injury to yourself.

- Ground yourself properly before removing the top cover of the system. Unplug the power from the power supply and then touch a safely grounded object to release static charge (i.e. power supply case). If available, wear a grounded wrist strap. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Avoid touching motherboard components, IC chips, connectors, memory modules, and leads.
- The motherboard is pre-installed in the system. When removing the motherboard, always place it on a grounded anti-static surface until you are ready to reinstall it.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress circuit boards.
- Leave all components inside the static-proof packaging that they ship with until they are ready for installation.
- After replacing optional devices, make sure all screws, springs, or other small parts are in place and are not left loose inside the case. Metallic parts or metal flakes can cause electrical shorts.

Caution!
Please note that the following illustrations may not look exactly like the rackmount server you purchased. Therefore, the illustrations should be held for your reference only.

2.1 Installing Motherboard Components

This section describes how to install components on to the motherboard, including CPUs, memory modules and add on cards.

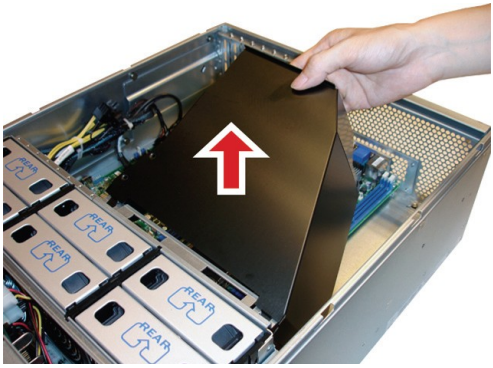
2.1.1 Removing the Chassis Cover

Follow these instructions to remove FT48A-B7070 chassis cover.

1. Press the button on the front top cover and slide the cover off.

2. Unscrew the thumb screw securing the rear cover then slide the rear top cover off.

3. Remove the air duct from the chassis.



2.1.2 Opening the Chassis Front Bezel

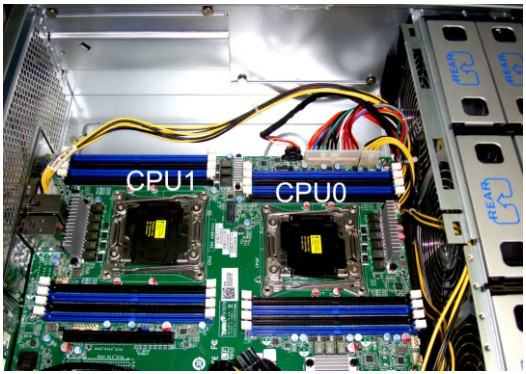
1. Insert the front bezel key (packed in a bag in the accessory box) and rotate the key 90 degrees counterclockwise to unlock the front bezel.

2. Open the front bezel.

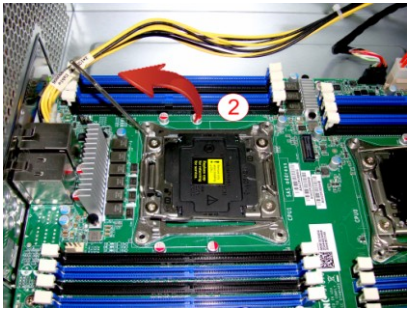
2.1.3 Installing the CPU and Heat sink

Follow the steps below on installing CPUs and CPU heatsinks.

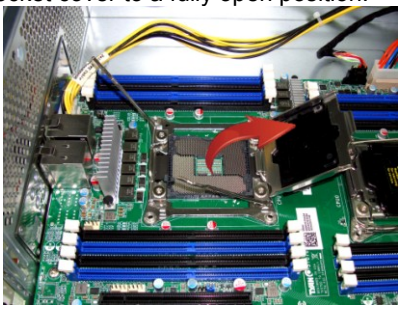
1. Locate the CPU0 and CPU1 sockets. .



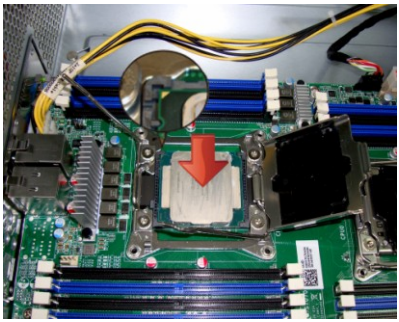
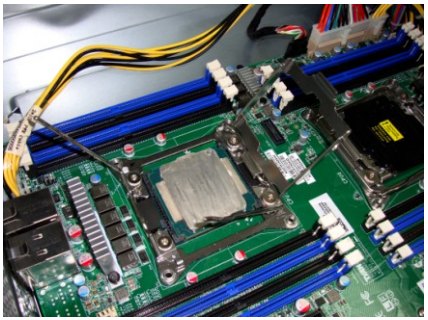
2. Pull the first and second levers slightly away from the socket and then push them to a fully open position.



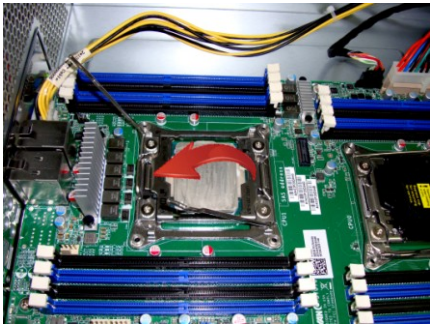
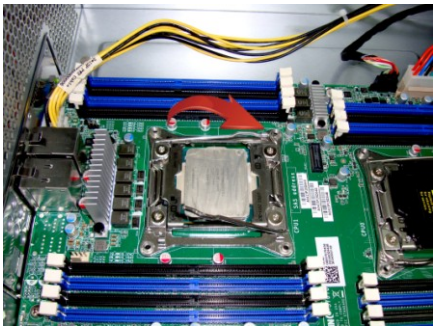
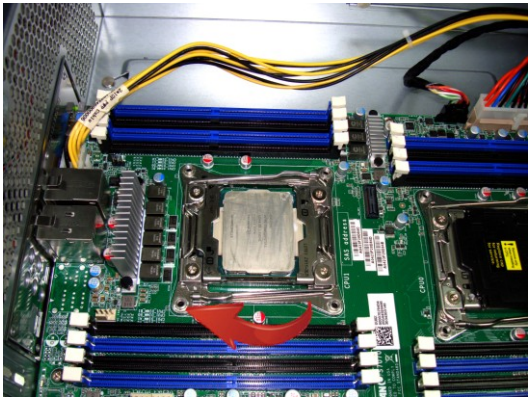
3. Push the CPU socket cover to a fully open position.



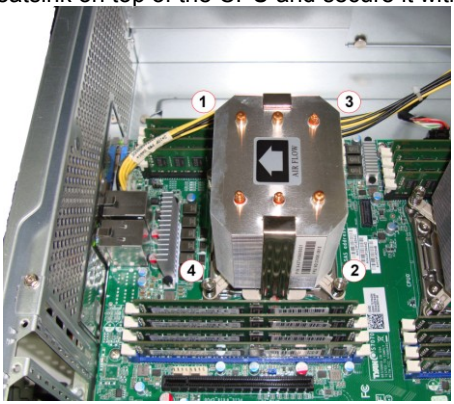
4. Place the CPU into the socket and make sure that the gold arrow is located in the right direction. Take out the protection cap after installing the CPU.

5. Close the CPU socket cover and press the levers down to secure the CPU.

6. Position the heatsink on top of the CPU and secure it with 4 screws.



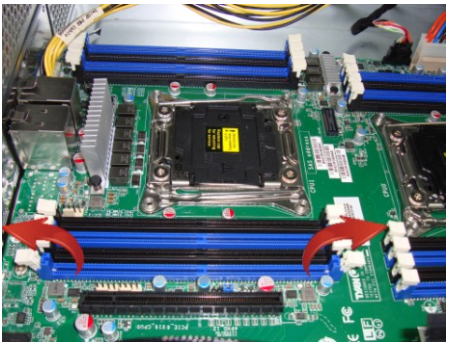
7. Repeat the procedures mentioned earlier to install the second CPU and heatsink.

2.1.4 Installing the Memory

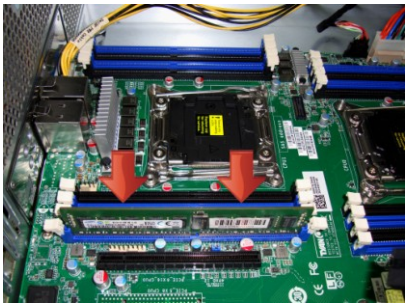
Follow these instructions to install the memory modules onto the motherboard.

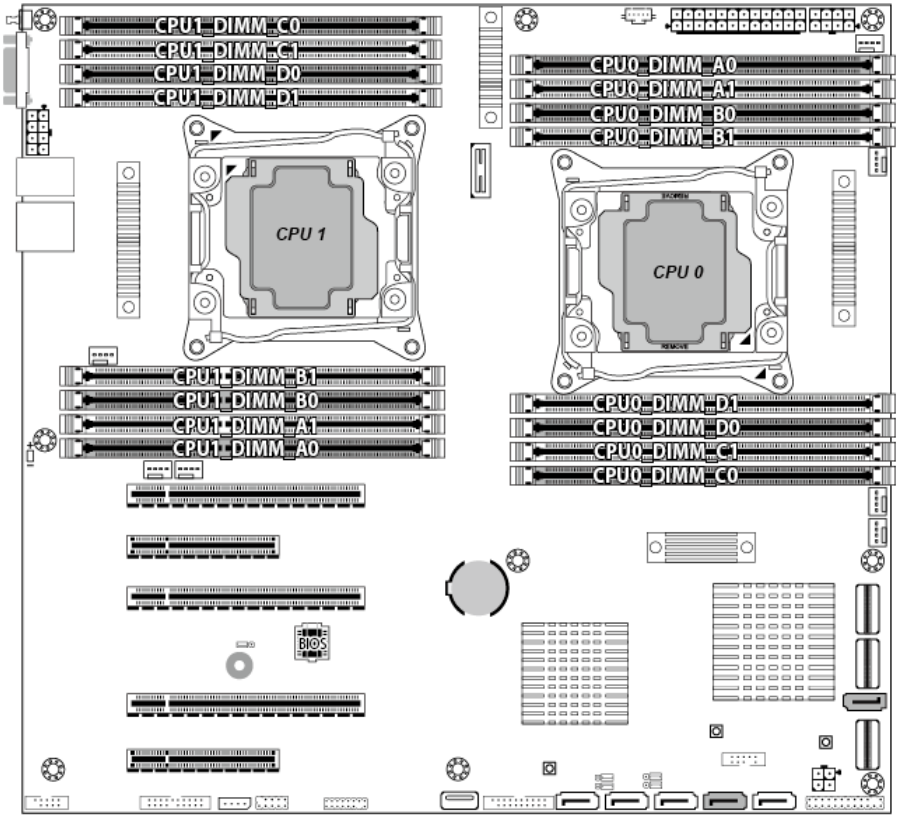
1. Locate the memory slots on the motherboard.

2. Press the memory slot locking levers in the direction of the arrows as shown in the following illustration.



3. Align the memory module with the slot. When inserted properly, the memory slot locking levers lock automatically onto the indentations at the ends of the module. Follow the recommended memory population table to install the other memory modules.




CPU1_DIMM_C0
CPU1_DIMM_C1
CPU1_DIMM_D0
CPU1_DIMM_D1
CPU 1
CPU1_DIMM_B1
CPU1_DIMM_B0
CPU1_DIMM_A1
CPU1_DIMM_A0
CPU0_DIMM_A0
CPU0_DIMM_A1
CPU0_DIMM_B0
CPU0_DIMM_B1
CPU 0
CPU0_DIMM_D1
CPU0_DIMM_D0
CPU0_DIMM_C1
CPU0_DIMM_C0
BIOS

Recommended Memory Population Table (Single CPU)

	Single CPU Installed (CPU0 only)							
Quantity of memory installed	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√
CPU0_DIMM_A1					√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√
CPU0_DIMM_B1						√	√	√
CPU0_DIMM_C0			√	√	√	√	√	√
CPU0_DIMM_C1							√	√
CPU0_DIMM_D0				√	√	√	√	√
CPU0_DIMM_D1								√

NOTE:

1. √ indicates a populated DIMM slot.
2. Install memory in sets of fours for maximum performance. This ensures that all four memory channels are properly utilized, providing maximum memory bandwidth.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.

Recommended Memory Population Table (Dual CPU)

	Dual CPU installed (CPU0 and CPU1)										
Quantity of memory installed	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**12**	**14**	**16**
CPU0_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_A1								√	√	√	√
CPU0_DIMM_B0		√	√	√	√	√	√	√	√	√	√
CPU0_DIMM_B1									√	√	√
CPU0_DIMM_C0				√	√	√	√	√	√	√	√
CPU0_DIMM_C1									√	√	√
CPU0_DIMM_D0						√	√	√	√	√	√
CPU0_DIMM_D1											√
CPU1_DIMM_A0	√	√	√	√	√	√	√	√	√	√	√
CPU1_DIMM_A1								√	√	√	√
CPU1_DIMM_B0			√	√	√	√	√	√	√	√	√
CPU1_DIMM_B1										√	√
CPU1_DIMM_C0					√	√	√	√	√	√	√
CPU1_DIMM_C1										√	√
CPU1_DIMM_D0							√	√	√	√	√
CPU1_DIMM_D1											√

NOTE:

1. √ indicates a populated DIMM slot.
2. Install memory in sets of fours for maximum performance. This ensures that all four memory channels are properly utilized, providing maximum memory bandwidth.
3. Populate the same DIMM type in each channel, specifically
   - Use the same DIMM size
   - Use the same # of ranks per DIMM
4. Dual-rank DIMMs are recommended over single-rank DIMMs.

Intel® Xeon® processor E5-2600v3 product families Support

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)					
				1 Slot Per Channel	2 Slots Per Channel		3 Slots Per Channel		
				1DPC	1DPC	2DPC	1DPC	2DPC	3DPC
		4Gb	8Gb	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2133	2133	1866	2133	1866	1600
RDIMM	SRx8	4GB	8GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx8	8GB	16GB	2133	2133	1866	2133	1866	1600
RDIMM	DRx4	16GB	32GB	2133	2133	1866	2133	1866	1600
LRDIMM	QRx4	32GB	64GB	2133	2133	2133	2133	2133	1600
LRDIMM 3DS†	8Rx4	64GB	128GB	2133	2133	2133	2133	2133	1600

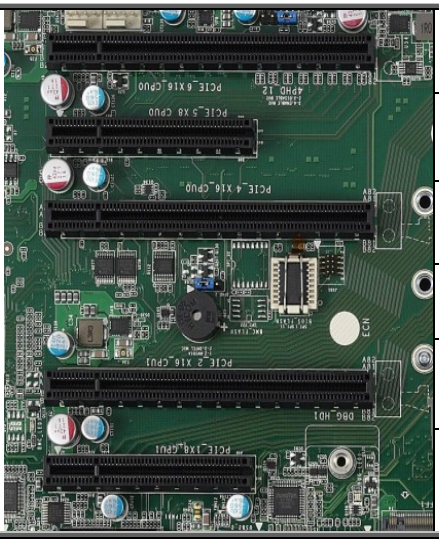
NOTE 1: 1DPC => One dimm per channel

NOTE 2: 2DPC => Two dimm per channel

- Physical Ranks are used to calculate DIMM Capacity.
- Supported DRAM Densities are 4Gb, 8Gb.

2.1.5 Installing the PCI-E Cards

FT48A-B7070 has five expansion slots. Only the PCI-E Gen.3 x16 slots can support **GPU (Graphic Processing Unit) cards.**



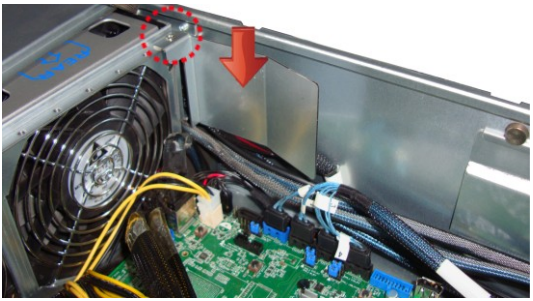
1.Slot #6: PCI-E G3x16 slot (x8 or x16 link) (f/ CPU0)
2.Slot #5: PCI-E G3x8 slot (x8 or x0 link) (f/ CPU0) ODM/OEM
3.Slot #4: PCI-E G3 x16 slot (x16 link) (f/ CPU0)
4.Slot #2: PCI-E G3x16 slot (x16 link) (f/ CPU1)
5.Slot #1: PCI-E G3 x8 slot (x8 link) (f/ CPU1)open-end type

The FT48A-B7070 supports **NVIDIA®** **K40/K80** GPU cards.
Follow these instructions was the example to install K80 GPU cards.

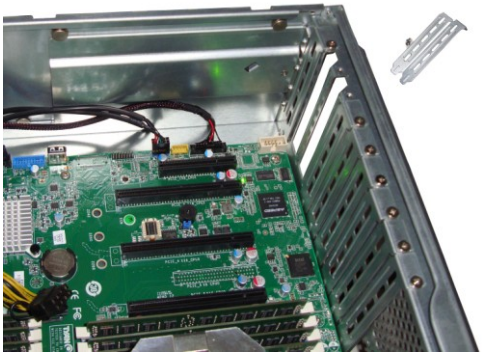
Caution!

The GPU power cable must avoid to be routed through the air inlet, because air inlet block will lead to GPU module overheated. This image illustrates the right power cable routing.

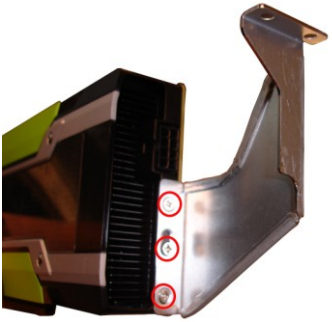
1. Install the GPU Air Duct and secure with 1 screw.



2. Unscrew to take out the PCI brackets.



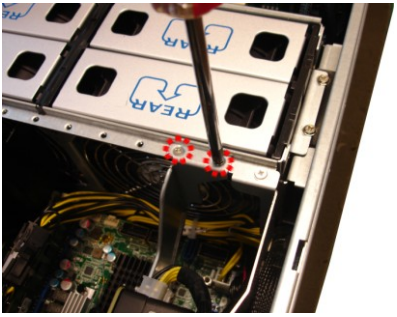
3. Use 3 screws to secure the GPU bracket to the Nvidia K80 GPU Card.



4. Insert the GPU card into the PCIE slot.

5. Connect the GPU power cable to the Nvidia K80 GPU Card.

6. Screw the GPU card to the chassis.

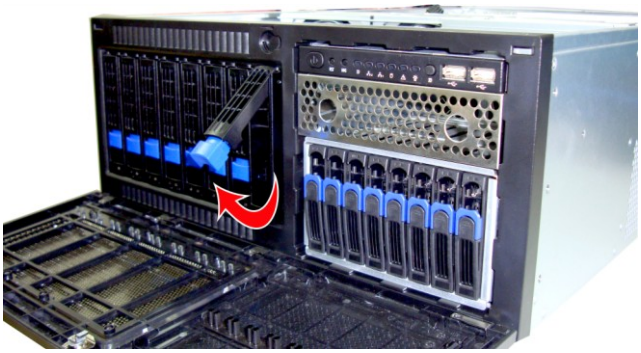


2.2 Installing Hard Drives

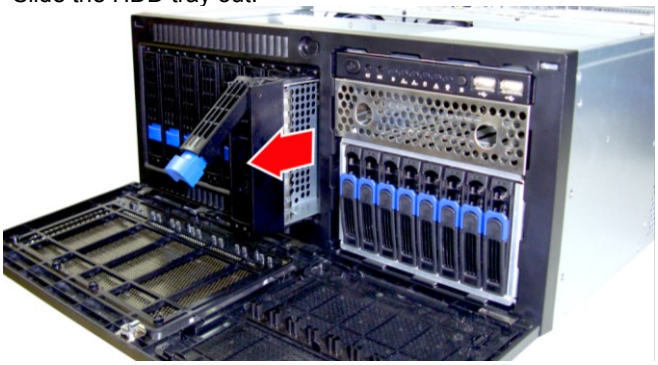
The FT48A-B7070 supports up to eight 3.5” or 2.5” hard drives. Follow these instructions to install a hard drive.

Install 3.5”or 2.5” HDD

1. Press the locking lever latch and pull the locking lever open.

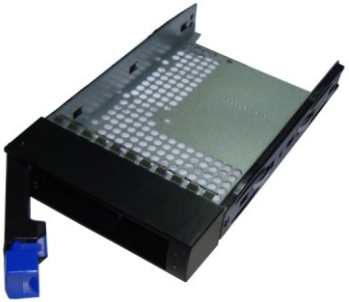


2. Slide the HDD tray out.



Option A: for 2.5” hard drives

1. Located at the 3.5”/ 2.5” HDD tray.

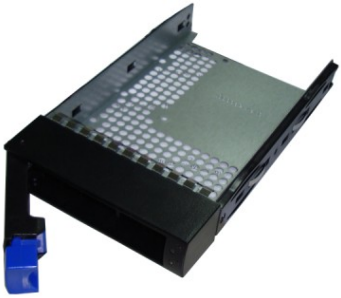


2. Place a 2.5” hard drive into the HDD tray.

3. Use 4 screws to secure the HDD.

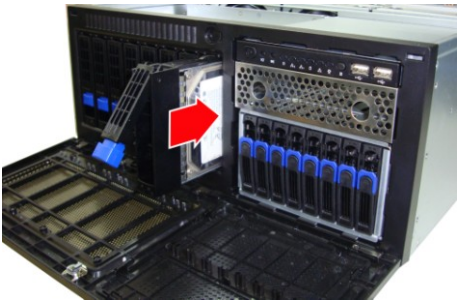
Option B: for 3.5" hard drives

1. Located at the 3.5"/ 2.5" HDD tray.



2. Place a 3.5" hard drive into the drive tray and use 4 screws to secure the HDD.

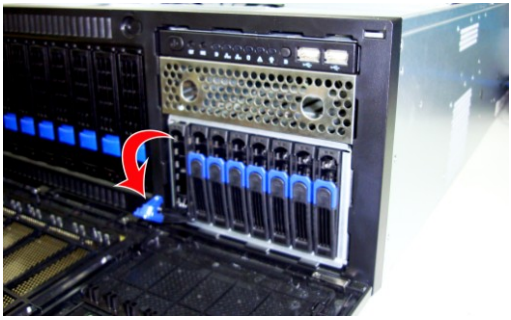
3. Reinsert the HDD tray into the chassis and press the locking lever to secure the tray.



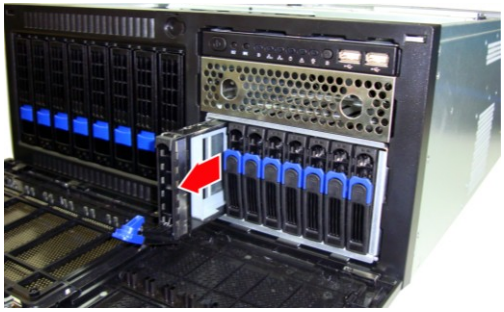
Install 2.5” HDD

The FT48A-B7070 system is supporting (8) 2.5” hard drives. Follow these instructions to install a hard drive.
NOTE: Only **B7070F48AW16HR**, **B7070F48AV16HR** has 2.5” HDD cage GPU SKU--**B7070F48AV4HR-N** without 2.5"HDD Cage

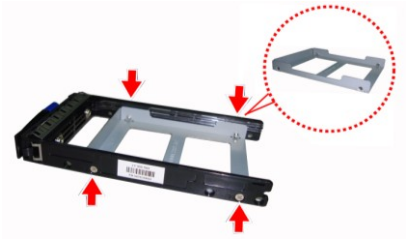
1. Press the locking lever latch and pull the latch open in the direction of arrow.



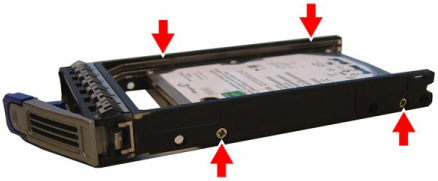
2. Slide the drive tray out.



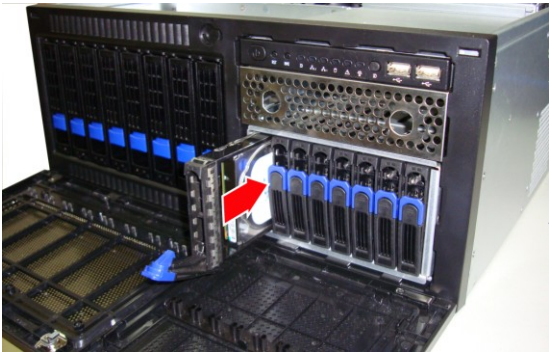
3. Remove the 4 screws to detach HDD tray bracket.



4. Place a hard drive into the drive tray. Use four screws to secure the HDD.



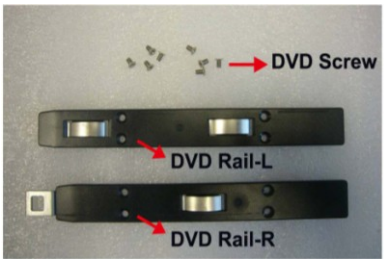
5. Reinsert the HDD tray into the chassis.

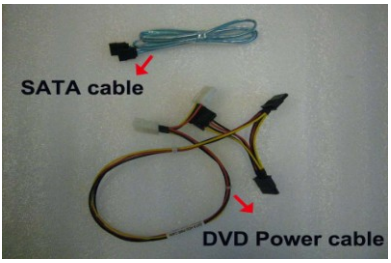


6. Press the locking lever to secure the hard drive. Repeat the same procedures to install other HDD trays.

2.3 Installing DVD Drive

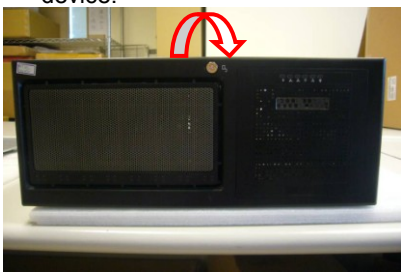
1. prepare DVD kit material

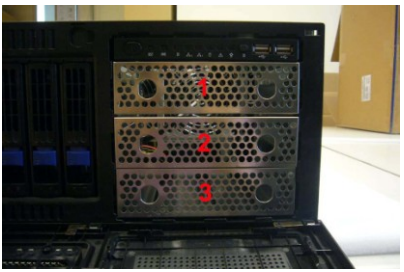




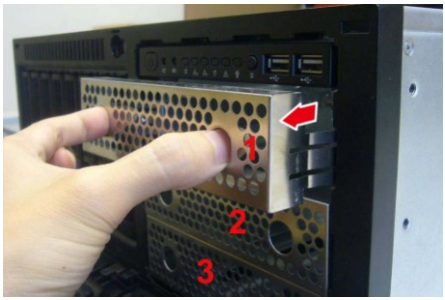
2. Install the DVD Rail-L and Rail-R to the DVD device and secure with the packaged screws.

3. Open the chassis front bezel, and check the location to insert the DVD device.

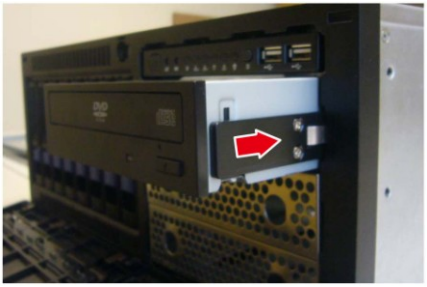




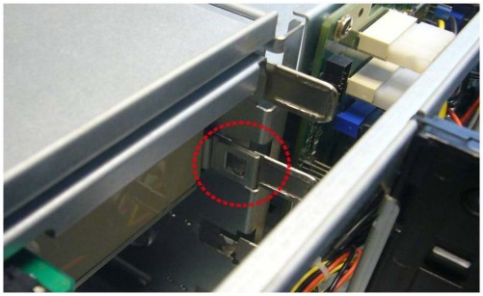
4. Remove the DVD cover BKT.



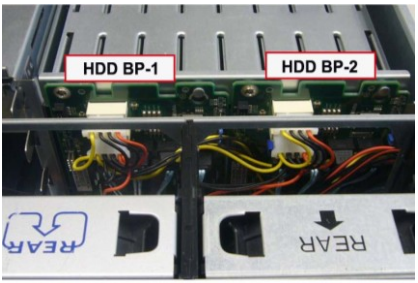
5. Install the DVD device into DVD location.

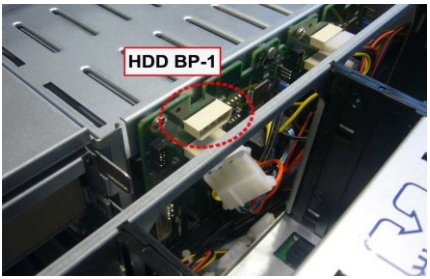


6. DVD rail-R needs to be locked with the chassis hook.



7. Remove the J36 connector cable from the HDD BP-1.

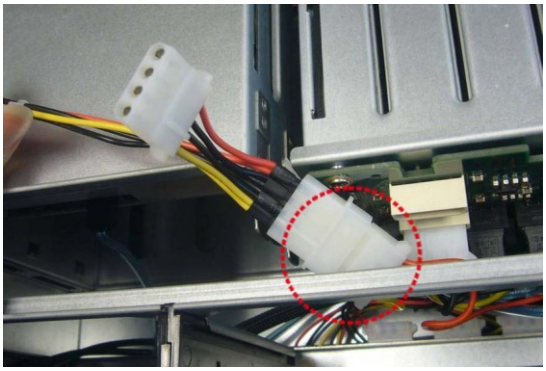




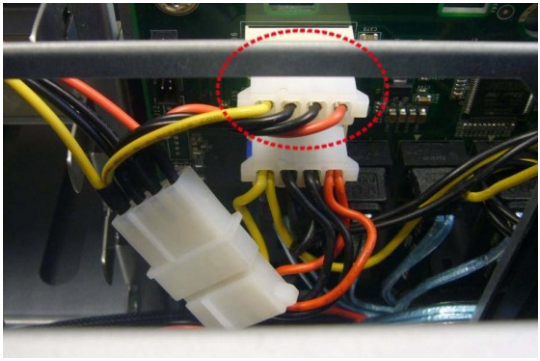
8. Insert the SATA cable on the motherboard J50 and route the cable along the side of the chassis.

9. Connect the SATA cable to the DVD device.

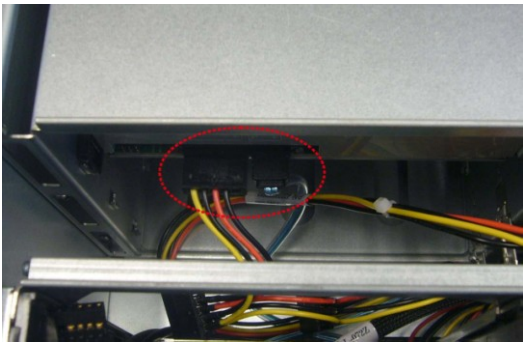
10. Connect the DVD power Y cable to the HDD PWR cable.



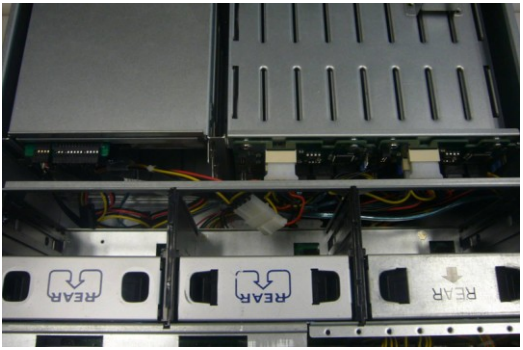
11. Insert DVD power cable Y to the HDD BP-1 connector J36.



12. Connect the DVD PWR cable to the DVD device.



13. The DVD device has been successfully installed.



2.4 Rack Mounting

After installing the necessary components, the FT48A-B7070 can be mounted in a rack using the supplied rack mounting kit.

Rack mounting kit

Rail with Bracket x 2

Mounting Ears x 2

Screw Sack x 1

2.4.1 Installing the Server in a Rack

Follow these instructions to mount the FT48A-B7070 into an industry standard 19" rack.

NOTE: Before mounting FT48A-B7070 in a rack, be sure that all internal components have been installed and the unit has been fully tested. Maintenance can be performed on the unit while in a rack but it is preferable to install the device in a fully operational condition.

Screw Sack Including:

A: Bracket for M6 screw--10 pcs

B: M 6--10 pcs

C: M 4-L5--16 pcs

A **B** **C**

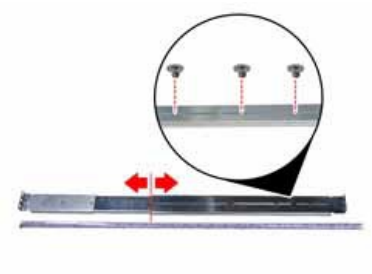
Installing the Inner Rails to the Unit

Step1: Screw the mounting ears to each side of the FT48A-B7070 as shown using three M4-L5 screws (C) from the supplied screws kit.

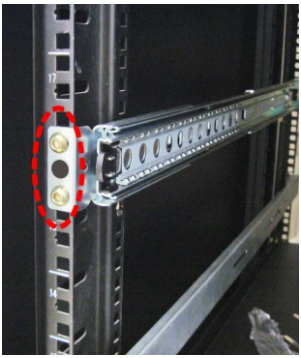
Step2: Draw out the inner rails from each rail assembly. Install the inner sliding rails to each side of the server using five M4-L5 screws (C).

Installing the Outer Rails to the Unit

Step1: Adjust the outer rails to fit the length of the rack. The sliding brackets have long slits to allow them to be fixed to the other part of the rails in various positions.



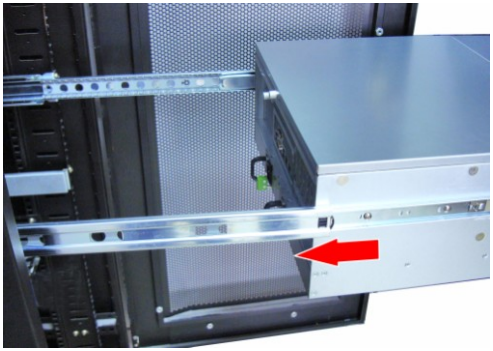
Step2: Secure the outer rails to the Server rack using 4 M6 screws (B) for each side. Secure the mounting brackets from the outside, not the inside of the server rack.



Rack Mounting the Server

Step1: Draw out the middle rail to the latch position.

Step2: Lift the unit and then insert the inner slide rails into the middle rails.



Step3: Press the latch key and push the whole system in.

Step4: Secure the mounting ears of the unit to the rack using two small brackets (A) and M6 screws (B).

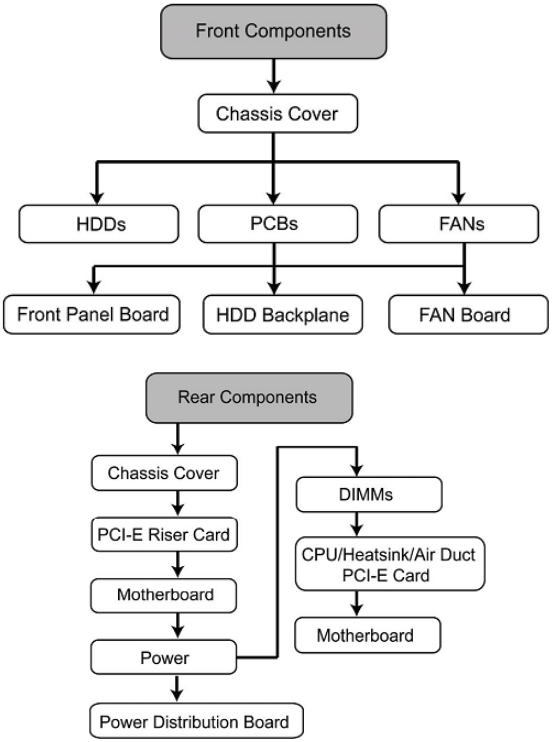
Chapter 3: Replace Pre-Installed Components

3.1 Introduction

This chapter explains how to replace the pre-installed components in the FT48AB7070 server chassis, including the Motherboard, five small boards (M1018 Front Panel Board, M1237F48-BP6-4-7055 and M1244G70-BP6-8-B7070 HDD Backplane, M1801F77-FB-FT48 Fan Board, M7025-PDB-NLS Power Distribution Board) System fan, ODD drive, PSU and etc.

3.2 Disassembly Flowchart

The following flowchart outlines the disassembly procedure.



3.3 Removing the Cover

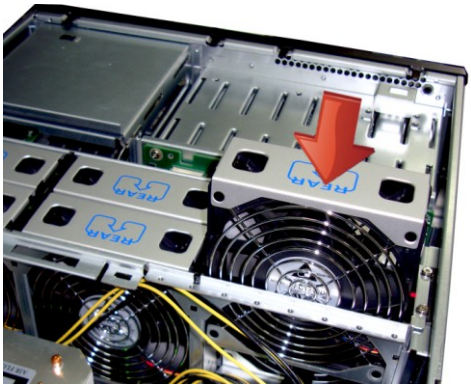
Before replacing any parts you must remove the chassis cover. Follow Chapter 2.1.1 to remove the cover of the FT48A-B7070.

3.4 Replacing the System Fan

Follow these instructions to replace the cooling fans in your system.

1. Take out the failed fan.

2. Prepare a new fan and insert it into the fan cage



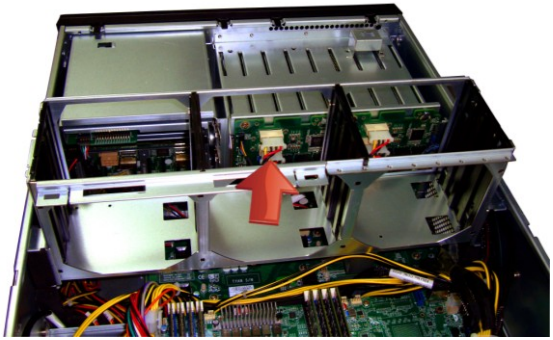
3.5 Replacing the Fan Board

Follow these instructions to replace the fan board

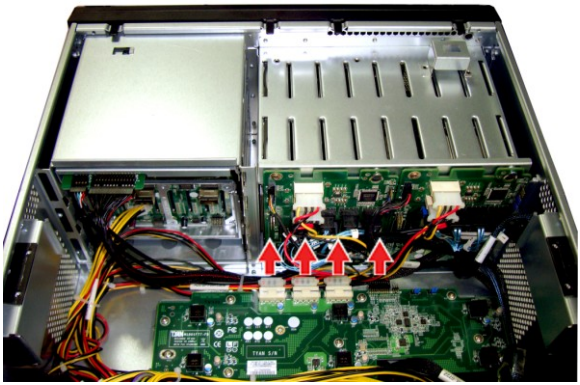
1. Remove all system fans from the fan cage

2. Unscrew the fan cage from the chassis.

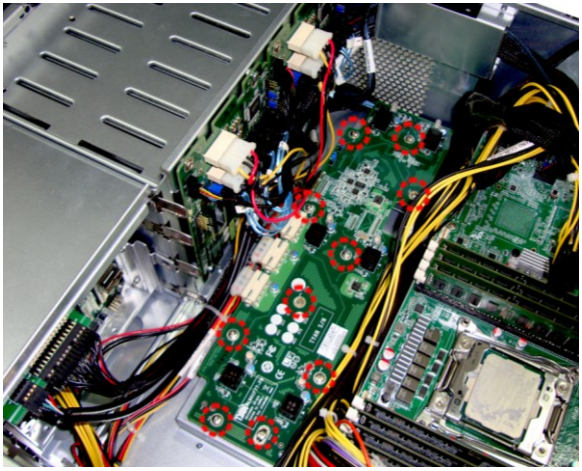
3. Take out the fan cage from the chassis.



4. Disconnect all cables from the fan board.

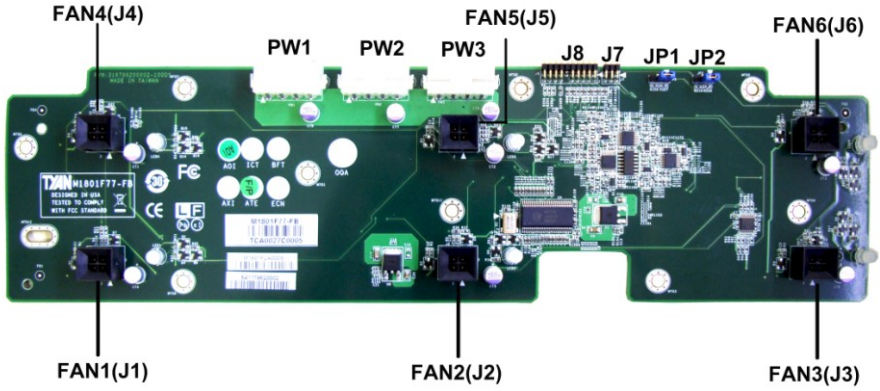


5. Unscrew the fan board to replace a new one



6. Assemble the fan cage and system fans back into the chassis following the steps described earlier in reverse.

3.5.1 M1801F77 Fan Board Features



Fan Sequence

Front side(facing HDD)

FAN1	FAN2	FAN3
FAN4	FAN5	FAN6

Rear side(facing Mainboard)

Form Factor	314.3mm x 84.9mm x 1.6mm
Specifications	(6) hot- swappable FAN CON (6) dual color LED (FAN Speed RPM ok is green, fail is red) (3) 1 x 4-pin PWR CON (connected to M7025-PDB) (1) 2 x 10-pin FAN Header, reserved for channel standard product (1) 2 x 3-pin FAN Header, special for S7070 as FAN control

3.5.2 Fan Board LED Definitions

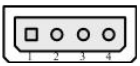
FAN Status	Green LED	Red LED
With Fan Speed RPM OK On Off	On	Off
Fan Failed or Without Fan Off On	Off	On

3.5.3 M1801F77 Fan Board Connector Pin Definition

J1~J6: 4 pin Fan connector

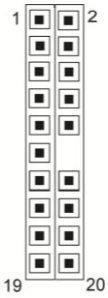
Definition	Pin	Pin	Definition
GND	1	2	VDD+12V
CLOCK	3	4	PWM

PW1/PW2/PW3: Big 4 pin Power connector



Definition	Pin	Pin	Definition
VDD+12V	**1**	**2**	GND
GND	**3**	**4**	VCC+5V

J8: fan control header



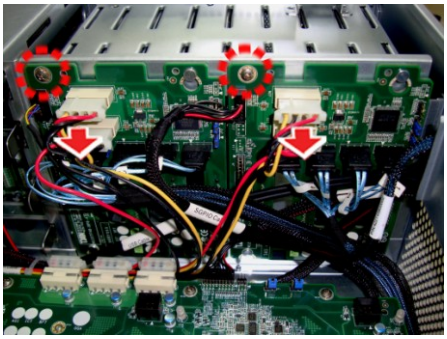
Definition	Pin	Pin	Definition
TACH1	**1**	**2**	TACH6
TACH2	**3**	**4**	NC
TACH3	**5**	**6**	NC
TACH4	**7**	**8**	NC
TACH5	**9**	**10**	NC
GND	**11**	**12**	KEY
PWM1	**13**	**14**	PWM2
NC	**15**	**16**	NC
NC	**17**	**18**	NC
NC	**19**	**20**	PWM3

3.6 Replacing the M1237F48 SATA/SAS Backplane

To replace the SAS/SATA backplane, you need to remove all the fans and the fan holder first. Refer to the steps given in Chapter 3.4/3.5, then, follow these instructions to replace SATA/SAS backplane.

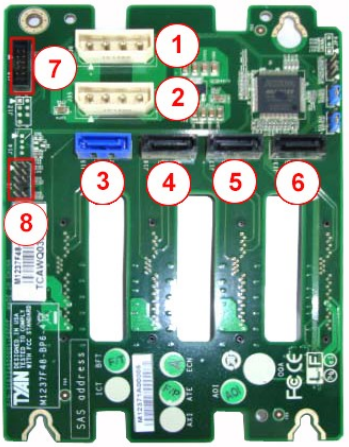
1. Remove the HDD trays corresponding to the SAS/SATA backplane to be replaced from the FT48A-B7070 chassis.

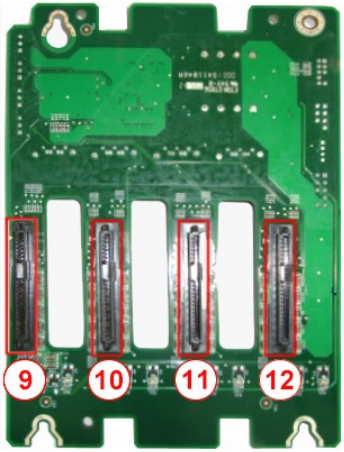
2. Disconnect all cables from the M1801F77-FB-FT48 to be replaced and remove the screw securing it.



3. Renew the backplane and secure it following the steps above in reverse.

3.6.1 M1237F48 SATA/SAS Backplane Features

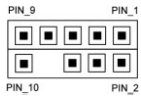
Front 

Rear 

NO.	Name
1.	4-pin Power connector(J36)
2.	4-pin Power connector(J35)
3.	HDD Connector(J15) SAS only
4.	HDD Connector(J16) SAS only
5.	HDD Connector(J17) SAS only
6.	HDD Connector(J13) SAS only
7.	SGPIO Header(J18)
8.	FW Flash Header(J6)
9.	29-pin SAS Connector(J1)
10.	29-pin SAS Connector(J2)
11.	29-pin SAS Connector(J4)
12.	29-pin SAS Connector(J5)

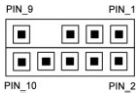
3.6.2 M1237 F48 Connector Pin Definition

J6: Burning FW header



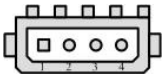
Definition	Pin	Pin	Definition
CPLD_JTAG_TCK	1	2	GND
CPLD_JTAG_TDO	3	4	VDD_3P3_RUN
CPLD_JTAG_TMS	5	6	dummy pin
dummy pin	7	8	key pin
CPLD_JTAG_TDI	9	10	GND

J18: SGPIO header



Definition	Pin	Pin	Definition
FPIO_SCL	1	2	SDATAIN
FPIO_SDA	3	4	SDATAOUT
GND	5	6	SAS_SIO_END_A
Key pin	7	8	SAS_SIO_CLK_A
dummy pin	9	10	HD_ERR_LED

J35/J36: Big 4 pin Power connector

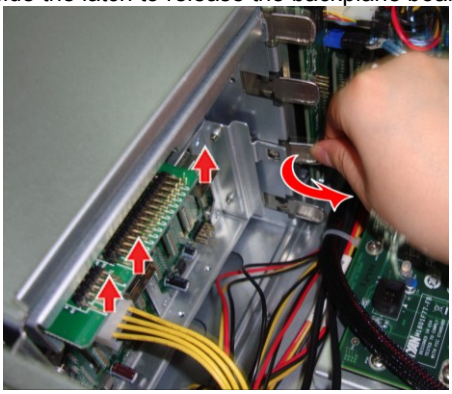


Definition	Pin	Pin	Definition
VDD+12V	1	2	GND
GND	3	4	VCC+5V

3.7 Replacing the M1244G70-BP6-8 SATA/SAS Backplane

Follow these instructions to replace the M1244G70-BP6-8 Backplane board.

1. Disconnect the power cable and SAS cable from backplane board. Then push aside the latch to release the backplane board unit.

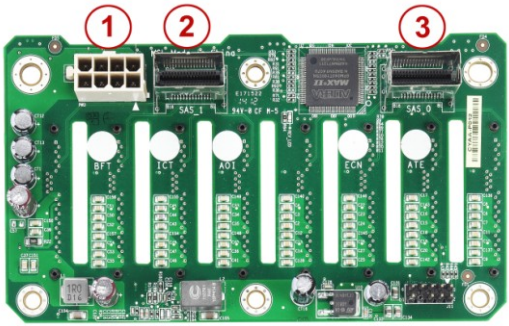


2. Slide the backplane unit out of the chassis.

3. Remove six screws securing the LED control board to the bracket.

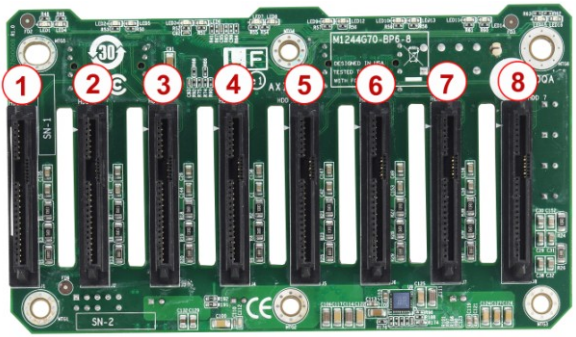
3.7.1 M1244G70-BP6-8-B7070 SATA/SAS Backplane Features

Front View



Form Factor	➢ 8-Layer PCB
Integrated I/O	➢ (1) To S7027GM3NR-LNV mini-SAS connector ➢ (1) To add-on card mini-SAS connector ➢ (1) 4x2 pin Power connector ➢ (1) 5x2 K8 pin JTAG connector

Rear View



Form Factor	➢ 8-Layer PCB
Integrated I/O	➢ (8) SAS HDD Connectors

3.7.2 M1244G70-BP6-8-B7070 Connector Pin Definitions

PW2

Definition	Pin	Pin	Definition
GND	1	2	GND
GND	3	4	GND
+12V	5	6	+12V
+12V	7	8	+12V

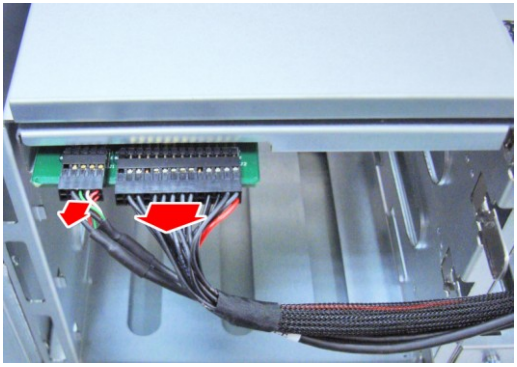
J11 (CN8)

Definition	Pin	Pin	Definition
CPLD_JTAG_TCK	1	2	GND
CPLD_JTAG_TDO	3	4	VDD_3P3_RUN
CPLD_JTAG_TMS	5	6	NC
NC	7	8	KEY
CPLD_JTAG_TDI	9	10	GND

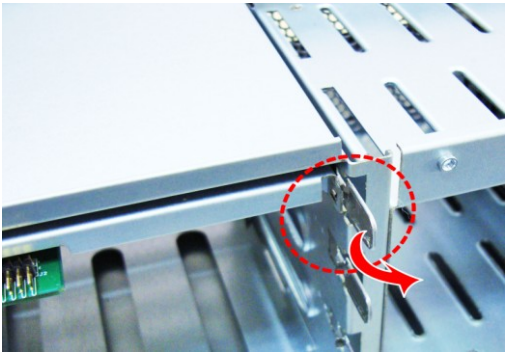
3.8 Replacing the Front Panel Control Board

Follow these instructions to replace the M1018 LED control board.

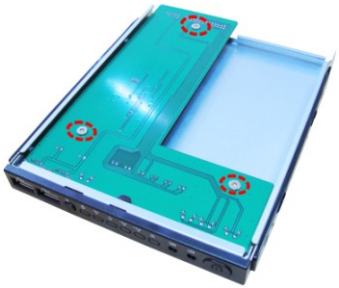
1. Disconnect the power cable and data cable from M1018.



2. Push aside the latch and slide the LED control board unit out of the chassis.

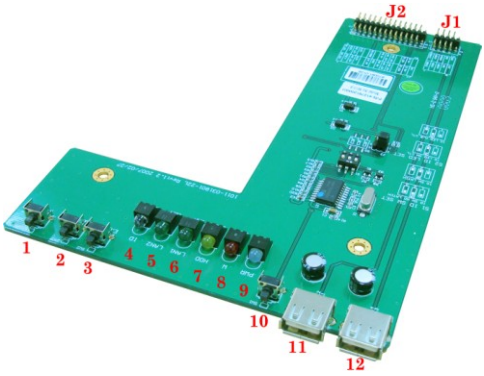


3. Remove three screws securing the LED control board to the bracket.



4. Lift the LED control board free from the chassis. After replacement, insert the unit into the chassis following the above procedures in reverse.

3.8.1 M1018 LED Control Board Features



1	Power Switch	**8**	Warning LED
2	Reset Switch	**9**	Power LED
3	NMI Switch	**10**	ID Switch
4	ID LED	**11**	USB 2
5	LAN2 LED	**12**	USB 1
6	LAN1 LED	**J2**	2x14 pin header
7	HDD LED	**J1**	2x5 pin USB header

3.8.2 M1018 LED Control Board Connector Pin Definition

J1: 2x5 pin USB header

Definition	Pin	Pin	Definition
VCC+5V	1	2	VCC+5V
USB1-	3	4	USB0-
USB1+	5	6	USB0+
GND	7	8	GND
Key	9	10	GND

J2: 2x14 pin header

Definition	Pin	Pin	Definition
HD_LED+	1	2	HD_LED-
RESET+	3	4	RESET-
Power LED+	5	6	Power LED-
WLED+	7	8	WLED-
Reserved	9	10	Reserved
EXT INT	11	12	Voltages
V5SB	13	14	Reserved
Power SW+	15	16	Power SW-
LAN1 LED+	17	18	LAN1 LED+
LAN2 LED+	19	20	LAN2 LED+
Reserved	21	22	Reserved
ID LED-IN+	23	24	ID LED-IN-
ID SW+	25	26	ID SW-
KEY	27	28	Reserved

3.9 Replacing Power Supply and M7025 PDB

3.9.1 Replacing Power Supply

You need to disconnect the power supply first before replacing the power distribution board.

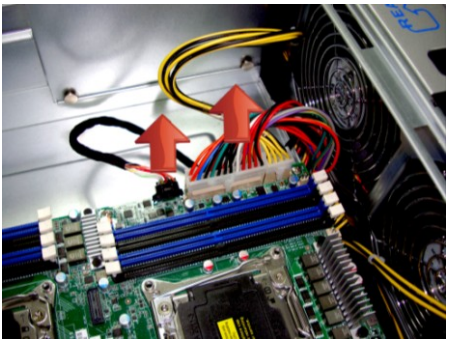
1. Press the red button on the power supply and slide it out.

2. After replacement new ones, insert the power supply back into the chassis.

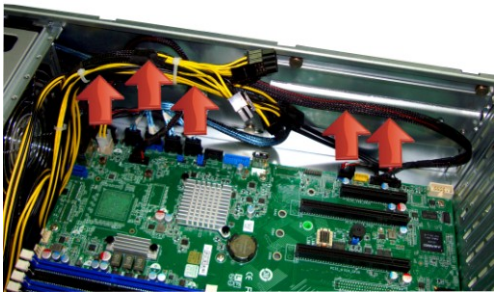
3.9.2 Replacing M7025 Power Distribution Board

Before replacing the power distribution board, make sure to remove all cables connected to the board. Follow these instructions to replace the M7025-PDB Power Distribution Board.

1. Disconnect the 8-pin power cable, PSMI cable on the motherboard.

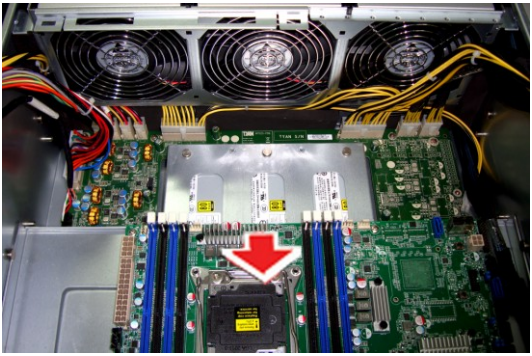


2. Disconnect the 4-pin power, PSMI, SGPIO, Front Panel, Mini SAS Fan Control and USB Cables.

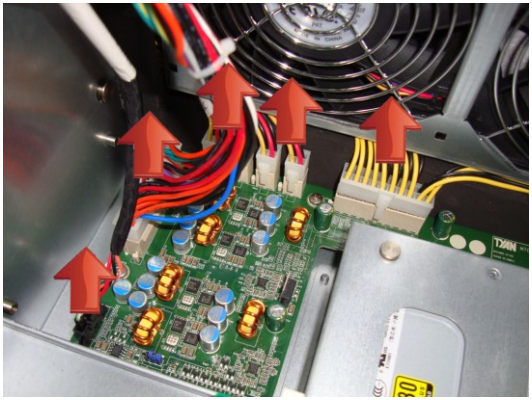


3. Loosen the thumb screw and the screws on both sides of the chassis. And then pull down the bar.

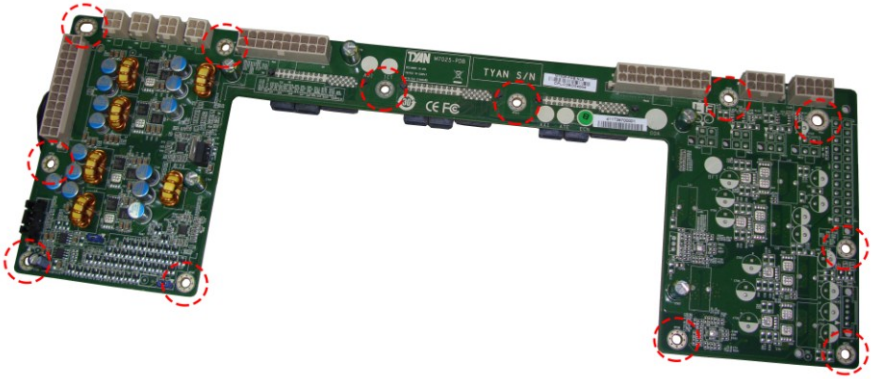
4. Pull down the bar to slide the motherboard tray out. You can find the power distribution board underneath the motherboard tray



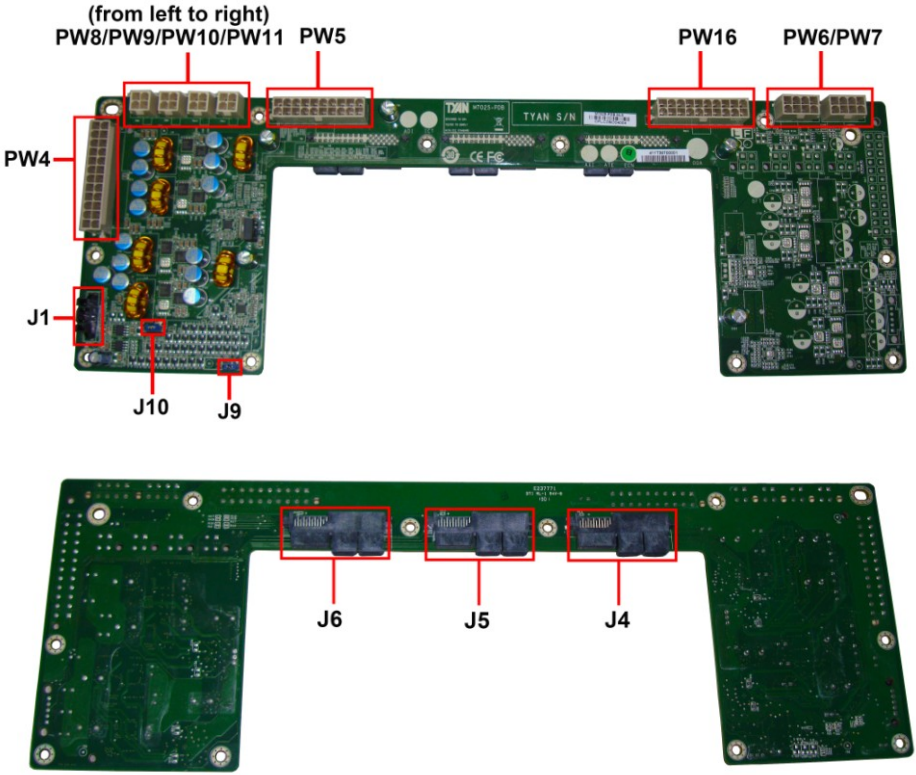
5. Disconnect the cables on the PDB.



6. Locate the 12 screws on the PDB, then you can renew the board and fix it back follow the steps above in reverse.



3.9.3 M7025 Power Distribution Board Features



Form Factor	➢ 384MM*130MM, 10-Layer PCB
Connectors	➢ (3) Power Input Connectors ➢ (2) ATX 24-pin Power Connectors ➢ (2) 2 x 10-pin Power Connectors ➢ (2) 2 x 4-pin Power Connectors ➢ (8) 2 x 2-pin Power Connectors ➢ (2) 1 x 5-pin Jumper for SMBus ➢ (2) 1 x 3-pin Jumper
Regulation	➢ FCC Class B (DoC) ➢ European Community CE (DoC)

3.9.4 M7025 PDB Connector Pin Definition

PW6/7: 2×4-Pin Power Connector

Definition	Pin	Pin	Definition
GND	1	5	+12V
GND	2	6	+12V
GND	3	7	+12V
GND	4	8	+12V

PW8/9/10/11/12/13/14/15: 2×2-Pin Power Connector for Fan Board / HDD BP Board

Definition	Pin	Pin	Definition
GND	1	3	+12V
GND	2	4	+5V

PW5/16: 2×10-Pin Power Connector

Definition	Pin	Pin	Definition
GND	1	11	+12V
GND	2	12	+12V
GND	3	13	+12V
GND	4	14	+12V
GND	5	15	+12V
GND	6	16	+12V
GND	7	17	+12V
GND	8	18	+12V
GND	9	19	+12V
GND	10	20	+12V

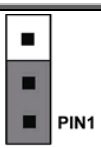
PW4/17: ATX 2×12-Pin Power Connector

Definition	Pin	Pin	Definition
+3.3V	1	13	+3.3V
+3.3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWR Good	8	20	Reset
5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

J1:1x5 Pin Header

Definition	Pin	Pin	Definition
SMBCLK	1	2	SMBDAT
SMB_ALERT	3	4	GND
VDD3.3V	5		

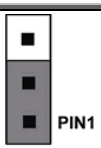
J9: Power Redundancy Select Jumper



Pin	Definition
1	GND
2	Single_PSU
3	RSVD

NOTE:
Pin 1-2 closed for PSU 2+0 or 2+1 **(Default)**
Pin 2-3 closed for PSU 1+0 or 1+1

J10: PS_ON Enable/Disable Jumper



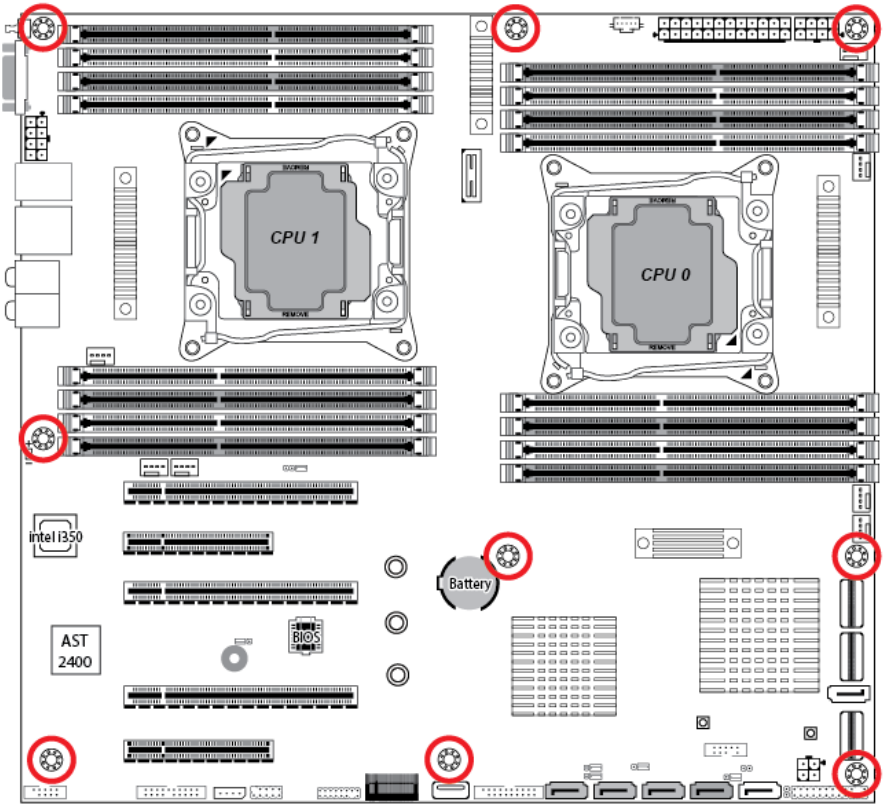
Pin	Definition
1	RSVD
2	PSON_EN
3	GND

NOTE:
Pin 1-2 closed **(Default)**

3.10 Replacing S7070 System Board

Follow these instructions to replace the S7070 Motherboard.

1. Refer to Section ***3.9.2 Replacing the Power Distribution Board*** (p. ***75***) to take out the motherboard tray. Make sure you have disconnected all cables.
2. Unscrew the motherboard.



3. Carefully lift the motherboard from the tray.
4. Prepare a new motherboard and follow the steps described earlier in reverse order to reinstall the motherboard into the chassis.

Appendix I: Cable Connection Tables

1. Fan ctrl cable

Fan BP to S7070 MB			
	Fan BP	**Connect to**	**S7070 MB**
Fan ctrl Cable P/N: 422794600007	J8	→	FAN_HDR1

2. Mini-SAS, SATA & SGPIO Cable

	SATA/SAS BP Board	**Connect to**	**S7070 MB**
SATA Cable P/N: 422T45900002	3.5" HDD BP-1 J13	→	SATA0
	3.5" HDD BP-1 J17	→	SATA1
	3.5" HDD BP-1 J16	→	SATA2
	3.5" HDD BP-1 J15	→	SATA3
SGPIO Cable P/N: 422T35900001	3.5" HDD BP-1 J18	→	SGPIO2
Mini-SAS Cable P/N: 422794600005	3.5" HDD BP-2 J13	→	SATA0-3
	3.5" HDD BP-2 J17	→	
	3.5" HDD BP-2 J16	→	
	3.5" HDD BP-2 J15	→	
	3.5" HDD BP-2 J18	→	
Mini-SAS Cable-1 P/N: 422797000003	2.5"HDD BP SAS0	→	SAS0_3
Mini-SAS Cable-2 P/N: 422797000003	2.5"HDD BP SAS1	→	SAS4_7

3. Fan BP PWR Cable

FAN BP to PDB			
	FAN BP	**Connect to**	**PDB**
Fan BP PWR Cable P/N: 422794600006	PW1,PW2,PW3	→	PW8,PW9

4. HDD BP PWR Cable

SATA/SAS BP Board to PDB			
	SATA/SAS BP Board	**Connect to**	**PDB**
HDD BP PWR Cable-1 P/N: 422790900010	3.5" HDD BP1 J35,J36	→	PW10
HDD BP PWR Cable-2 P/N: 422790900010	3.5" HDD BP2 J35,J36	→	PW11
HDD BP PWR Cable-3 P/N: 422T45900008	2.5" HDD BP PW3	→	PW16

5. FP Ctrl and USB Cable

Front Panel Board (FPB) to S7070 MB			
	FPB	**Connect to**	**S7070 MB**
Control Cable P/N: 422790900001	J2	→	FPIO1
USB Cable P/N: 422790900002	J1	→	USB2_2

6. GPU PWR Cable

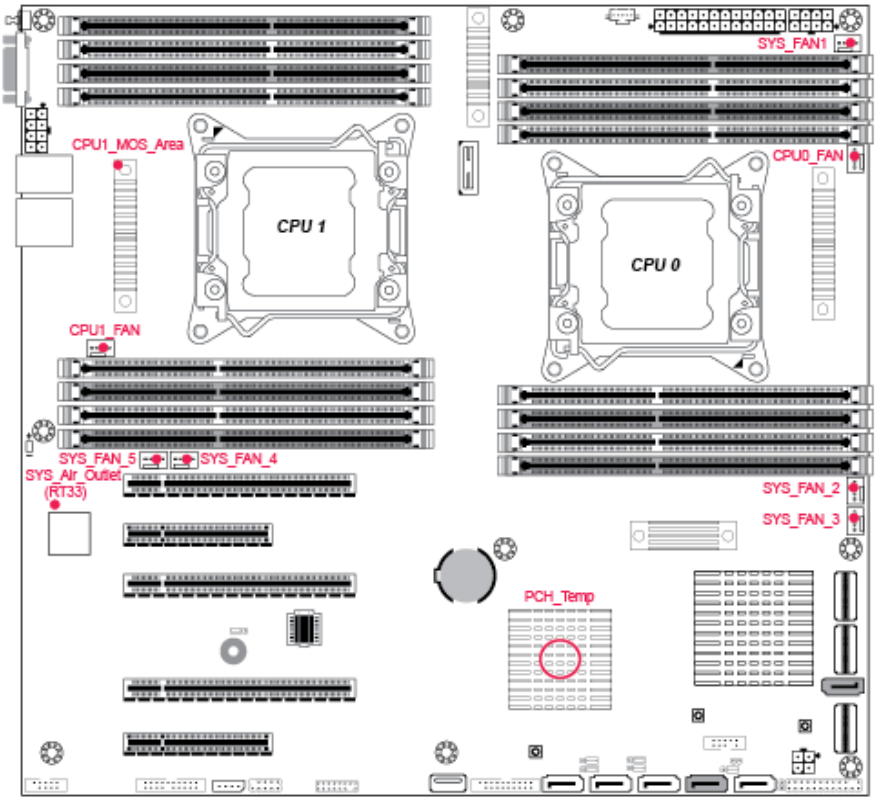
PDB Board to GPU Card			
	PDB Board	**Connect to**	**GPU card**
GPU PWR Cable-1 P/N: 422T45900007	PW6	→	GPU card
GPU PWR Cable-2 P/N: 422T45900007	PW7	→	GPU card
GPU PWR Cable-3 P/N: 422T45900008	PW16	→	GPU card

7. 2x12P, 2x10P PWR & PSMI Cable

PDB Board to S7070 MB			
	PDB Board	**Connect to**	**S7070 MB**
2x12P PWR Cable P/N: 422T45900005	PW4	→	PW1
2x10P PWR Cable P/N: 422T45900006	PW5	→	PW2,PW3,PWR_BTN1
PSMI Cable P/N: 422788200004	J1	→	PSIMI1

Appendix II: Fan and Temp Sensors

This section aims to help readers identify the locations of some specific FAN and Temp Sensors on the motherboard. A table of BIOS Temp sensor name explanation is also included for readers' reference

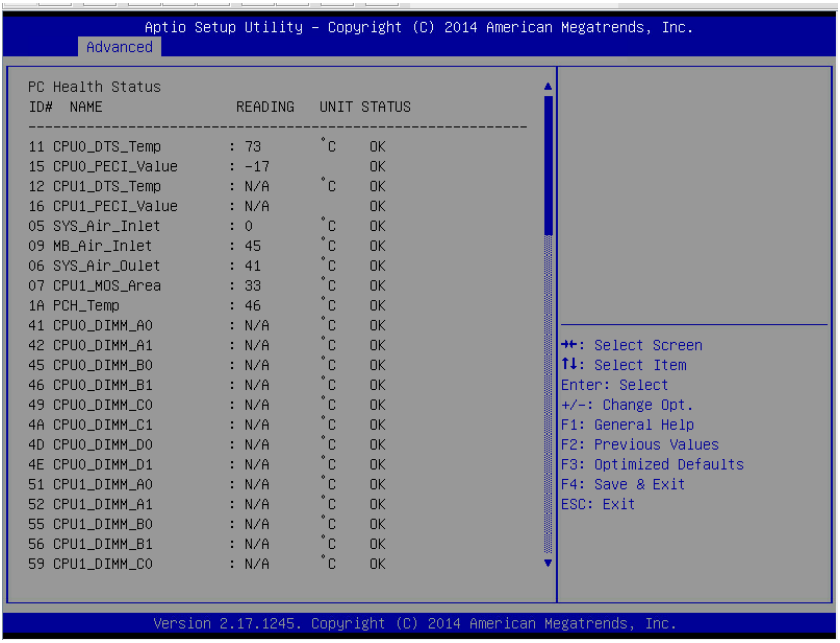


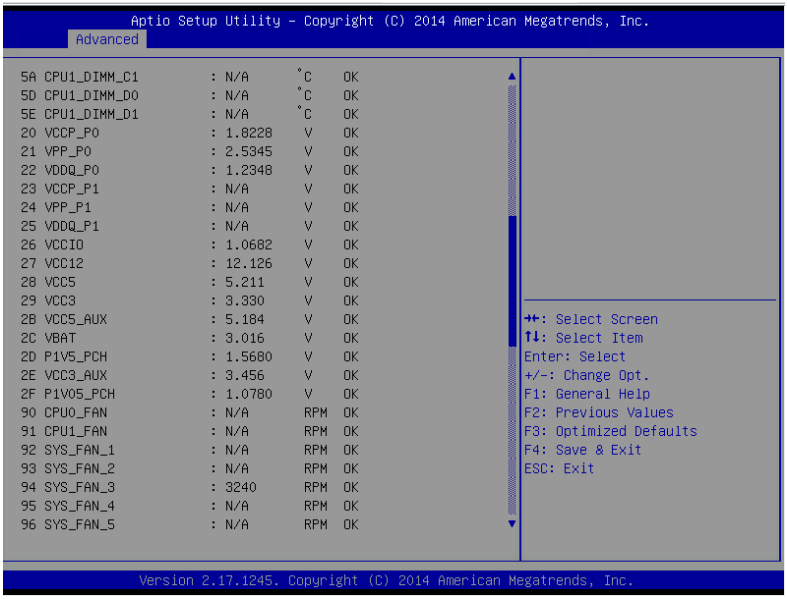
NOTE: The red dot indicates the sensor.

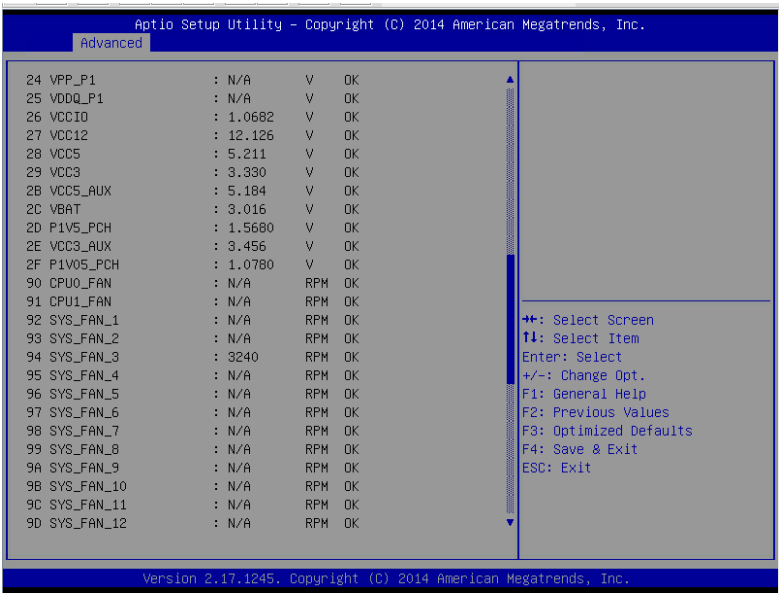
Fan and Temp Sensor Location:

1. Fan Sensor: It is located in the third pin of the fan connector, which detects the fan speed (rpm)
2. Temp Sensor: PCH_Area_Temp, CPU1_MOS_Temp (RT31) and CPU0_MOS_Temp(RT33). They detect the system temperature around.
   NOTE: The system temperature is measured in a scale defined by **Intel**, not in Fahrenheit or Celsius.

BIOS Temp Sensor Name Explanation:




Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
5A CPU1_DIMM_C1 : N/A °C OK
5D CPU1_DIMM_D0 : N/A °C OK
5E CPU1_DIMM_D1 : N/A °C OK
20 VCCP_P0 : 1.8228 V OK
21 VPP_P0 : 2.5345 V OK
22 VDDQ_P0 : 1.2348 V OK
23 VCCP_P1 : N/A V OK
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.


Aptio Setup Utility – Copyright (C) 2014 American Megatrends, Inc.
Advanced
24 VPP_P1 : N/A V OK
25 VDDQ_P1 : N/A V OK
26 VCCIO : 1.0682 V OK
27 VCC12 : 12.126 V OK
28 VCC5 : 5.211 V OK
29 VCC3 : 3.330 V OK
2B VCC5_AUX : 5.184 V OK
2C VBAT : 3.016 V OK
2D P1V5_PCH : 1.5680 V OK
2E VCC3_AUX : 3.456 V OK
2F P1V05_PCH : 1.0780 V OK
90 CPU0_FAN : N/A RPM OK
91 CPU1_FAN : N/A RPM OK
92 SYS_FAN_1 : N/A RPM OK
93 SYS_FAN_2 : N/A RPM OK
94 SYS_FAN_3 : 3240 RPM OK
95 SYS_FAN_4 : N/A RPM OK
96 SYS_FAN_5 : N/A RPM OK
97 SYS_FAN_6 : N/A RPM OK
98 SYS_FAN_7 : N/A RPM OK
99 SYS_FAN_8 : N/A RPM OK
9A SYS_FAN_9 : N/A RPM OK
9B SYS_FAN_10 : N/A RPM OK
9C SYS_FAN_11 : N/A RPM OK
9D SYS_FAN_12 : N/A RPM OK
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.17.1245. Copyright (C) 2014 American Megatrends, Inc.

BIOS Temp Sensor	Name Explanation
CPU0_DTS_Temp	Temperature of the CPU0 Digital Temperature Sensor
CPU1_DTS_Temp	Temperature of the CPU1 Digital Temperature Sensor
CPU0_PECI_Temp	Temperature of the CPU0 Platform Environment Control Interface
CPU1_PECI_Temp	Temperature of the CPU1 Platform Environment Control Interface
CPU0_MOS_Temp	Temperature of the CPU0_MOS_ Area
CPU1_MOS_Temp	Temperature of the CPU1_MOS_ Area
PCH_Area_Temp	Temperature of the PCH Area
System Air_Inlet	Temperature of the System_Air_Inlet Area
CPU0_DIMM_A0	Temperature of CPU0 DIMM A0 Slot
CPU0_DIMM_A1	Temperature of CPU0 DIMM A1 Slot
CPU0_DIMM_B0	Temperature of CPU0 DIMM B0 Slot
CPU0_DIMM_B1	Temperature of CPU0 DIMM B1 Slot
CPU0_DIMM_C0	Temperature of CPU0 DIMM C0 Slot
CPU0_DIMM_C1	Temperature of CPU0 DIMM C1 Slot
CPU0_DIMM_D0	Temperature of CPU0 DIMM D0 Slot
CPU0_DIMM_D1	Temperature of CPU0 DIMM D1 Slot
CPU1_DIMM_A0	Temperature of CPU1 DIMM A0 Slot
CPU1_DIMM_A1	Temperature of CPU1 DIMM A1 Slot
CPU1_DIMM_B0	Temperature of CPU1 DIMM B0 Slot
CPU1_DIMM_B1	Temperature of CPU1 DIMM B1 Slot
CPU1_DIMM_C0	Temperature of CPU1 DIMM C0 Slot
CPU1_DIMM_C1	Temperature of CPU1 DIMM C1 Slot
CPU1_DIMM_D0	Temperature of CPU1 DIMM D0 Slot
CPU1_DIMM_D1	Temperature of CPU1 DIMM D1 Slot
BIOS FAN Sensor	**Name Explanation**
CPU0_FAN	Fan speed of CPU0_FAN
CPU1_FAN	Fan speed of CPU1_FAN

SYS_FAN_1	Fan speed of SYS_FAN_1
SYS_FAN_2	Fan speed of SYS_FAN_2
SYS_FAN_3	Fan speed of SYS_FAN_3
SYS_FAN_4	Fan speed of SYS_FAN_4
SYS_FAN_5	Fan speed of SYS_FAN_5
SYS_FAN_6	Fan speed of SYS_FAN_6
SYS_FAN_7	Fan speed of SYS_FAN_7
SYS_FAN_8	Fan speed of SYS_FAN_8
SYS_FAN_9	Fan speed of SYS_FAN_9
SYS_FAN_10	Fan speed of SYS_FAN_10
SYS_FAN_11	Fan speed of SYS_FAN_11
SYS_FAN_12	Fan speed of SYS_FAN_12

Appendix III: FRU Parts Table

FT48A-B7070 FRU Parts

Item	Model Number	Part Number	Picture	Description
3.5'' to 2 HDD Tra	FRU-SO-0080	340T45900003		3.5''to 2.5'' External HDD Tray
2.5''HDD Tray	FRU-SO-0060	340T46600001		TF-2.5" HDD TRAY ASSY;SBU,TYAN BLUE,KTN70A
PSU Ki	FRU-PS-0100	471100000247		TF-POWER SUPPLY;SBU,770 W, DELTA,DPS-770GB C,(S0F),1U MODULE,REV.S0F
FAN Ki	CFAN-0410	541379090002		FRU;FAN ASSY, FAN *3 with top/base cover and lock
Heatsink & Cooler	FRU-TH-0050	343T45900001		HF-HEATSINK;SBU,AL/CU,+PIPE,SOLDERLI NG, 2011-3U-PASSIVE-HEATSINK, SS41400002, 90X90X99MM, SCREW,FT48-B7055
3.5'' to 2.5'' Storage Kit	FRU-SO-0100	5411T5320002		1x M1237 HDD backplane board 1x Mini-SAS cable (to S8812 MB) 1x power cable (for backplane) 4x 3.5'' to 2.5'' hot-swap HDD trays
2.5'' HDD Tray Kit	FRU-SO-0090	5411T5320001		1X 2.5" HDD Cage,FT48A-B7070 8X 2.5'' HDD Tray 1X M1244G70-BP6-8-B7070 1X M1244 BP BKT 12X Screw
Rail ASSY	CRAL-0070	340746600010		26'' RAIL ASSY

Cable	FRU-CS-0330	332810000514		TF-POWER CORD;SBU,US,125 V,16 AWG(1.31mm²),1800mm,AC PWR CORD
	CCBL-0300	332810000281		PWR Cord; EU, 250V, H05VV-FX3C, 10A, 0.75MM
	CCBL-032S	422794600005		TF-CABLE ASSY;SBU,SAS CABLE,SHORT MINI-SAS 36P/SATA 7PX4 180°,L=550MM,FT48-B8812
	FRU-CS-0340	422T45900002		TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,650 mm,SATA CABLE,SATA 7P*4/SATA 7P*4,FT48-B7055
	CCBL-0688	422797000003		TF-CABLE ASSY;SBU,MINI-SAS CABLE,SHORT MINI-SAS 36P/ SHORT MINI-SAS 36P,L=800MM,TN70-B7016-X2
	FRU-CS-0200	422T51400002		TF-CABLE ASSY;SAS INTERNAL,SBU,30 AWG,800 mm,MINI-SAS HD CABLE, SHORT MINI-SAS HD 36P/SHORT MINI-SAS 36P,GT62B-B7076

Appendix IV: Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN Computer Corporation can help. Besides designing innovative and quality products for over a decade, Tyan has continuously offered customers service beyond their expectations. TYAN's website (**www.tyan.com**) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general"

- Anandtech.com

You can contact TYAN Technical Support by using our Online Support System:

http://12.230.196.231/helpstar/hsPages/login.aspx?ReturnUrl=%2fhelpstar%2fhsPages%2fDefault.aspx

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN website for FAQ's, bulletins, driver updates, and other information: **http://www.tyan.com**
3. Contact your dealer for help BEFORE calling TYAN.
4. Check the TYAN user group: **alt.comp.periphs.mainboard.TYAN**

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

NOTE: A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number. The RMA number should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN will pay to have the board shipped back to you

TYAN® FT48A-B7070 User's Manual V1.0

Document No.: D2312 -100