S7002

Version 1.00

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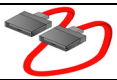
Contents

Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	**1x S7002 Motherboard**
	**6 x SATA Cable**
	**1 x S7002 User's manual**
	**1 x S7002 Quick reference guide**
	**1 x TYAN® Driver CD**
	**1 x I/O shield**

Chapter 1: Instruction

1.1 - Congratulations

You have purchased one of the most powerful server solutions based on the Intel® Tylersburg chipset. The TYAN® S7002 series motherboard is designed to support up to two Intel® Nehalem-EP 2S processors and up to 64GB DDR3-800/1066/1333 memory. Leveraging the advanced technology from Intel, the TYAN® S7002 series is capable of offering a scalable 32 and 64-bit computing environment with high-bandwidth memory design and lightning-fast PCI-E bus providing a rich feature set and incredible performance.

The TYAN S7002 series is designed around several different configurations which are detailed in the following 1.2 Hardware Specification section:

1.2 - Hardware Specifications

TYAN S7002-LE (S7002G2NR-LE)

Processor		**Supported CPU Series**	Intel Xeon 5500 series QC/DC processors
		Socket Type / QTY	LGA1366 / (2)
		Thermal Design Power (TDP) wattage	130W
		System Bus (MHz)	1333/1066/800
Chipset		**IOH / ICH**	Intel 5500 / ICH10R
		Super I/O	Winbond W83627
Memory		**Supported DIMM Qty**	(8) DIMM sockets
		DIMM Type / Speed	DDR3 800/1066/1333 RDIMM, UDIMM
		Capacity	Up to 64GB
		Memory channel	6 channels (3-channel per CPU)
		Memory voltage	1.5V
Expansion Slots		**PCI-E**	(1) PCI-E x16 slot (Gen 2) / (2) PCI-E x8 slots (w/ x4 link)
		Recommended TYAN Riser Card	M2083-RS, PCI-E x16 1U riser card (left)
LAN		**Port QTY**	(2)
		Controller	Intel 82574
Storage	**SATA**	**Connector**	(6)
		Controller	ICH10R
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,5,10 standard

Graphic	**Connector type**	D-Sub 15pin(Embedded VGA)
	Resolution	1600x1200@60Hz
	Chipset	Aspeed AST2050
Input /Output	**USB**	(8) USB2.0 ports (4 at rear, 4 via cable)
	COM	(2) ports (1 at rear, 1 via cable)
	SAS	(8) SAS connectors
	VGA	(1) D-Sub 15pin VGA port
	RJ-45	(2) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / EPS-12V
	Front Panel	(1) 2x12 pin SSI Front Panel header
	SATA	(6) SATAII connectors
System Monitoring	**Chipset**	Winbond W83793G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (5) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	LED	Fan fail LED indicator / Over temperature warning indicator
	Others	Chassis intrusion detection / Watch Dog timer support
BIOS	**Brand / ROM size**	16MB / AMI
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE Boot / ACPI 2.0 power management /Power on mode after power recovery / Auto-configurable of hard disk types / Multiple boot options
Form Factor	**Form Factor**	SSI CEB
	Board Dimension	12"x10.5" (305x267mm)
Operation System	**OS supported list**	Please refer to our OS supported list.
Regulation	**FCC (Doc)**	Class B
	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 Complaint**	Yes
Accessory list	**Motherboard**	(1) TYAN motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN Installation CD

	I/O Shield	(1) I/O Shield
	Cable	(6) SATA signal cables
Optional accessories for future upgrade	**Riser Card**	M2083-RS, PCI-E 1U riser card (left)
	Cable	(1) CCBL-0615, COM port cable / (1) CCBL-0311, SATA 1-to-2 power cable / (1) CCBL-035J, USB bracket cable

TYAN S7002 (S7002WGM2NR)

Processor	**Supported CPU Series**		Intel Xeon 5500 series QC/DC processors
	Socket Type / QTY		LGA1366 / (2)
	Thermal Design Power (TDP) wattage		130W
	System Bus (MHz)		Intel QuickPath Interconnect (QPI)
Chipset	**IOH / ICH**		Intel 5520 / ICH10R
	Super I/O		Winbond W83627
Memory	**Supported DIMM Qty**		(8) DIMM sockets
	DIMM Type / Speed		DDR3 800/1066/1333 RDIMM, UDIMM
	Capacity		Up to 64GB
	Memory channel		6 channels (3-channel per CPU)
	Memory voltage		1.5V
Expansion Slots	**PCI-E**		(1) PCI-E x8 slot (w/ x4 link) / (1) PCI-E x16 slot (Gen 2) / (2) PCI-E x8 slots (Gen 2)
	Recommended TYAN Riser Card		M2083-RS, PCI-E x16 1U riser card (left)
LAN	**Port QTY**		(2)
	Controller		Intel 82574
Storage	**SAS**	**Connector**	(8)
		Controller	LSI SAS1068E
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,1E standard
	SATA	**Connector**	(6)
		Controller	ICH10R
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,5,10 standard

Graphic	**Connector type**	D-Sub 15pin(Embedded VGA)
	Resolution	1600x1200@60Hz
	Chipset	Aspeed AST2050
Input /Output	**USB**	(8) USB2.0 ports (4 at rear, 4 via cable)
	COM	(2) ports (1 at rear, 1 via cable)
	PS/2	(1) PS/2 connector
	SAS	(8) SAS connectors
	VGA	(1) D-Sub 15pin VGA port
	RJ-45	(2) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / EPS 12V
	Front Panel	(1) 2x12 pin SSI Front Panel header
	SATA	(6) SATAII connectors
System Monitoring	**Chipset**	Winbond W83793G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (5) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	LED	Fan fail LED indicator / Over temperature warning indicator
	Others	Chassis intrusion detection / Watch Dog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2050
	AST2050 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash/ BIOS update / USB 2.0 virtual Hub
	AST2050 iKVM Feature	24bit High quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**	16MB / AMI
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE Boot / ACPI 2.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types / Multiple boot options

Form Factor	**Form Factor**	SSI CEB
	Board Dimension	12"x10.5" (305x267mm)
Operation System	**OS supported list**	Please refer to our OS supported list.
Regulation	**FCC (Doc)**	Class B
	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 Complaint**	Yes
Accessory list	**Motherboard**	(1) TYAN motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN Installation CD
	I/O Shield	(1) I/O Shield
	Cable	(6) SATA signal cables
Optional accessories for future upgrade	**Riser Card**	M2083-RS, PCI-E 1U riser card (left)
	Cable	(1) CCBL-0615, COM port cable / (1) SAS cable for S7002 / (1) CCBL-0311, SATA 1-to-2 power cable / (1) CCBL-035J, USB bracket cable

TYAN S7002-LE (S7002WGM2NR-LE)

Processor	**Supported CPU Series**	Intel Xeon 5500 series QC/DC processors
	Socket Type / QTY	LGA1366 / (2)
	Thermal Design Power (TDP) wattage	130W
	System Bus (MHz)	1333/1066/800
Chipset	**IOH / ICH**	Intel 5500 / ICH10R
	Super I/O	Winbond W83627
Memory	**Supported DIMM Qty**	(8) DIMM sockets

Memory	**DIMM Type / Speed**		DDR3 800/1066/1333 RDIMM, UDIMM
	Capacity		Up to 64GB
	Memory channel		6 channels (3-channel per CPU)
	Memory voltage		1.5V
Expansion Slots	**PCI-E**		(1) PCI-E x16 slot (Gen 2) / (2) PCI-E x8 slots (w/ x4 link)
	Recommended TYAN Riser Card		M2083-RS, PCI-E x16 1U riser card (left)
LAN	**Port QTY**		(2)
	Controller		Intel 82574
Storage	**SAS**	**Connector**	(8)
		Controller	LSI SAS1068E
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,1E standard
	SATA	**Connector**	(6)
		Controller	ICH10R
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,5,10 standard
Graphic	**Connector type**		D-Sub 15pin (Embedded VGA)
	Resolution		1600x1200@60Hz
	Chipset		Aspeed AST2050
Input /Output	**USB**		(8) USB2.0 ports (4 at rear, 4 via cable)
	COM		(2) ports (1 at rear, 1 via cable)
	SAS		(8) SAS connectors
	VGA		(1) D-Sub 15pin VGA port(Embedded VGA)
	RJ-45		(2) GbE ports
	Power		SSI 24-pin + 8-pin + 8-pin power connectors / EPS-12V
	Front Panel		(1) 2x12 pin SSI Front Panel header
	SATA		(6) SATAII connectors
System Monitoring	**Chipset**		Winbond W83793G
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (5) 4-pin headers

System Monitoring	**Temperature**	Monitors temperature for CPU & system environment
	LED	Fan fail LED indicator / Over temperature warning indicator
	Others	Chassis intrusion detection / Watch Dog timer support
Server Management	**Onboard Chipset**	Onboard Aspeed AST2050
	AST2050 IPMI Feature	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash/ BIOS update / USB 2.0 virtual Hub
	AST2050 iKVM Feature	24bit High quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**	16MB / AMI
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE Boot / ACPI 2.0 power management /Power on mode after power recovery / Auto-configurable of hard disk types / Multiple boot options
Form Factor	**Form Factor**	SSI CEB
	Board Dimension	12"x10.5" (305x267mm)
Operation System	**OS supported list**	Please refer to our OS supported list.
Regulation	**FCC (Doc)**	Class B
	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 Complaint**	Yes
Accessory list	**Motherboard**	(1) TYAN motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN Installation CD
	I/O Shield	(1) I/O Shield
	Cable	(6) SATA signal cables

Optional accessories for future upgrade	**Riser Card**	M2083-RS, PCI-E 1U riser card (left)
	Cable	(1) CCBL-0615, COM port cable / (1) SAS cable for S7002 / (1) CCBL-0311, SATA 1-to-2 power cable / (1) CCBL-035J, USB bracket cable

TYAN S7002-LE (S7002GM2NR-LE)

Processor	**Supported CPU Series**		Intel Xeon 5500 series QC/DC processors
	Socket Type / QTY		LGA1366 / (2)
	Thermal Design Power (TDP) wattage		130W
	System Bus (MHz)		1333/1066/800
Chipset	**IOH / ICH**		Intel 5500 / ICH10R
	Super I/O		Winbond W83627
Memory	**Supported DIMM Qty**		(8) DIMM sockets
	DIMM Type / Speed		DDR3 800/1066/1333 RDIMM, UDIMM
	Capacity		Up to 64GB
	Memory channel		6 channels (3-channel per CPU)
	Memory voltage		1.5V
Expansion Slots	**PCI-E**		(1) PCI-E x16 slot (Gen 2) / (2) PCI-E x8 slots (w/ x4 link)
	Recommended TYAN Riser Card		M2083-RS, PCI-E x16 1U riser card (left)
Recommended Barebone / Chassis	**1U Barebone**		GT20-B7002
LAN	**Port QTY**		(2)
	Controller		Intel 82574
Storage	**SATA**	**Connector**	(6)
		Controller	ICH10R
		Speed	3.0 Gb/s
		RAID	S/W RAID 0,1,5,10 standard

Graphic	**Connector type**	D-Sub 15pin
	Resolution	1600x1200@60Hz
	Chipset	Aspeed AST2050
Input /Output	**USB**	(8) USB2.0 ports (4 at rear, 4 via cable)
	COM	(2) ports (1 at rear, 1 via cable)
	VGA	(1) D-Sub 15pin VGA port
	RJ-45	(2) GbE ports
	Power	SSI 24-pin + 8-pin + 8-pin power connectors / EPS 12V
	Front Panel	(1) 2x12 pin SSI Front Panel header
	SATA	(6) SATAII connectors
System Monitoring	**Chipset**	Winbond W83793G
	Voltage	Monitors voltage for CPU, memory, chipset & power supply
	Fan	Total (5) 4-pin headers
	Temperature	Monitors temperature for CPU & system environment
	LED	Fan fail LED indicator / Over temperature warning indicator
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Server Management	**AST2050 IPMI Feature**	IPMI 2.0 compliant baseboard management controller (BMC) / Supports storage over IP and remote platform-flash/ BIOS update / USB 2.0 virtual Hub
	AST2050 iKVM Feature	24bit High quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**	16MB / AMI
	Feature	Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE Boot / ACPI 2.0 power management /Power on mode after power recovery / Auto-configurable of hard disk types / Multiple boot options
Form Factor	**Form Factor**	SSI CEB
	Board Dimension	12"x10.5" (305x267mm)

Operation System	**OS supported list**	Please refer to our OS supported list.
Regulation	**FCC (Doc)**	Class B
	CE (Doc)	Yes
Operating Environment	**Operating Temp**	10° C ~ 35° C (50° F~ 95° F)
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	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Complaint**	Yes
Accessory list	**Motherboard**	(1) TYAN motherboard
	Manual	(1) User's manual / (1) Quick Ref. Guide
	Installation CD	(1) TYAN Installation CD
	I/O Shield	(1) I/O Shield
	Cable	(6) SATA signal cables
Optional accessories for future upgrade	**Riser Card**	M2083-RS, PCI-E 1U riser card (left)
	Cable	(1) CCBL-0615, COM port cable / (1) CCBL-0311, SATA 1-to-2 power cable / (1) CCBL-035J, USB bracket cable

Note:

Instructions and images within this manual are represented S7002WAP2NR. For different SKUs some variations in detail are possible.

Remember to visit TYAN®'s Website at **http://www.TYAN.com**. There you can find information on all of TYAN®'s products with FAQs, online manuals and BIOS upgrades and more.

1.3 - Software Specifications

For OS (operation system) support, please check the TYAN® website for the latest information.

1.4 - AST2050 User Guide

Remember to visit TYAN®'s Website at http://www.TYAN.com for AST2050 updated user guide.

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right… the first time

The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

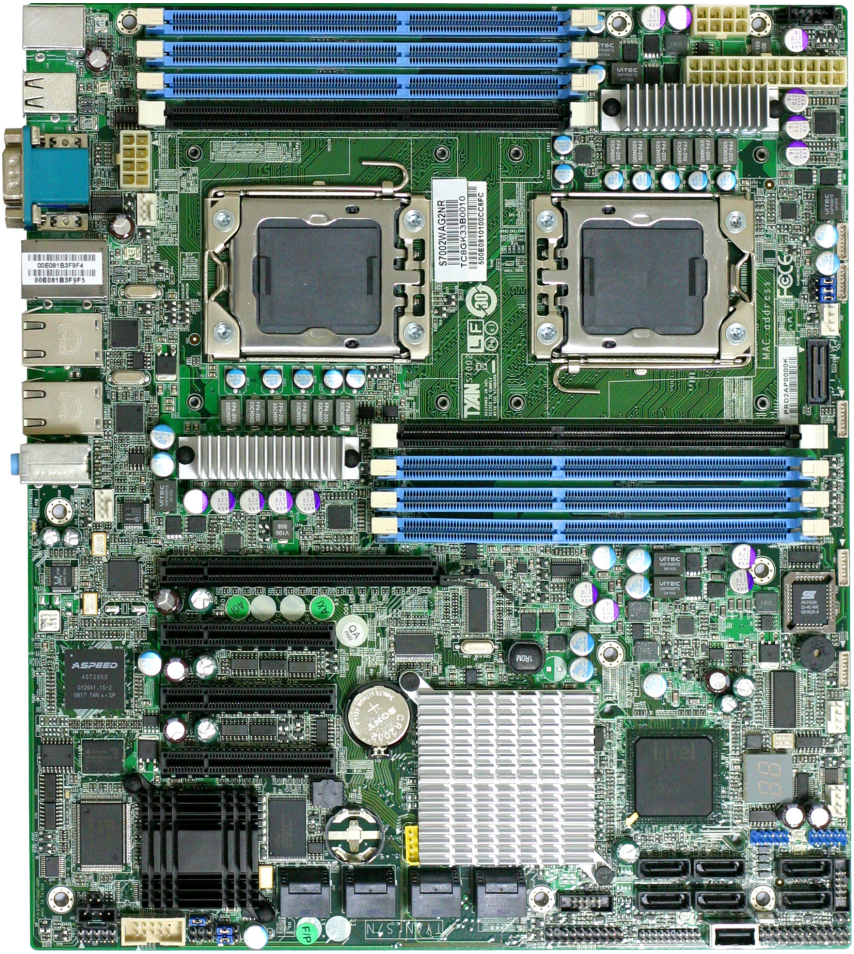
(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN® recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

Note:

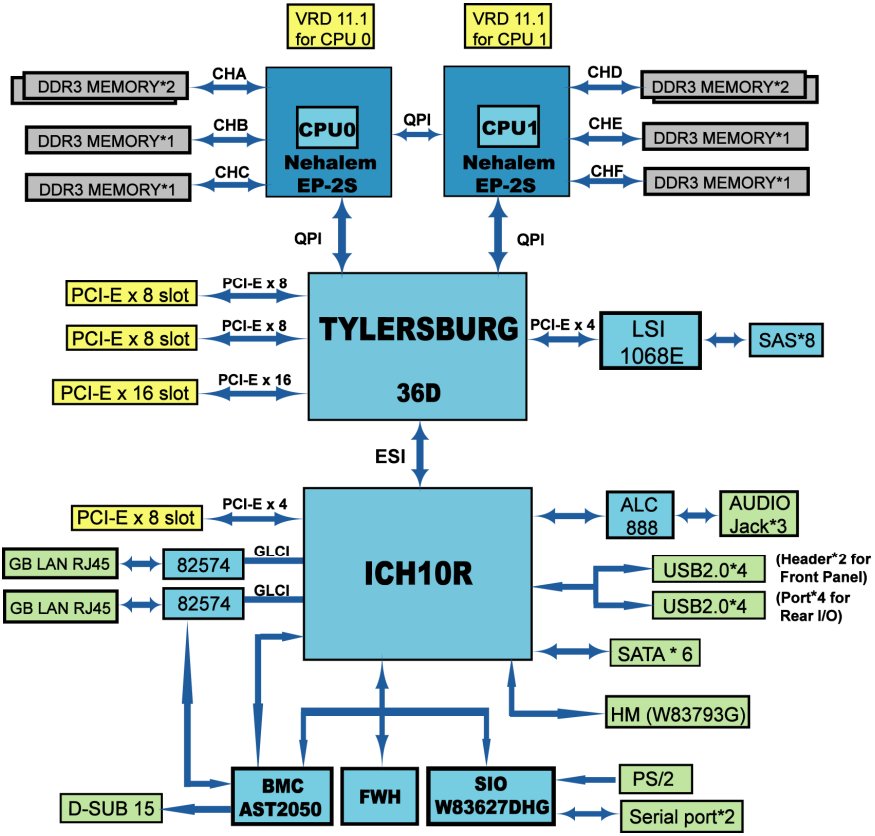
DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

2.1 - Board Image



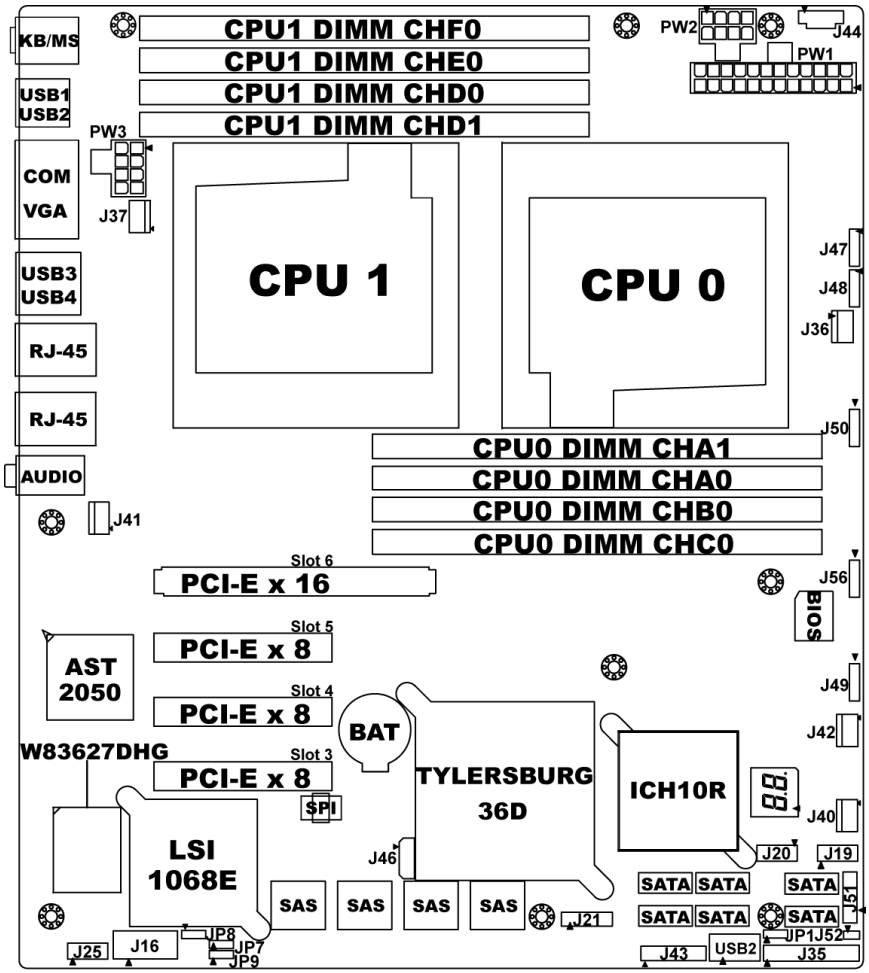
This diagram is representative of the latest motherboard (S7002WAP2NR) revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

2.2 - Block Diagram



S7002 Block Diagram (Represents all SKUs)

2.3 - Board Parts, Jumpers and Connectors



This diagram is representative of the latest board revision (S7002WAP2NR) available at the time of publishing. The board you receive may not look exactly like the above diagram.

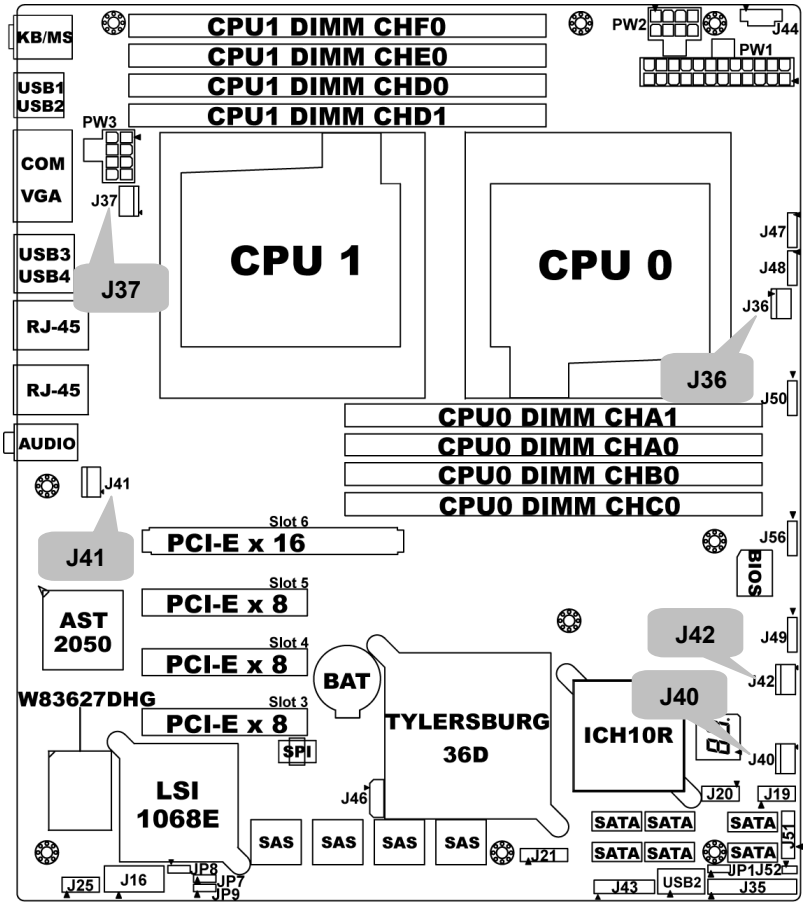
Jumpers & Connectors

Jumper/Connector	Function
J36/J37/J40/J41/J42/J47/J48/J49/J50/J56	Fan connectors
J16	COM2 Header
J19/J20	Front USB Header
J25	Front Panel Audio
J35	Front Panel Header
J43	Clear CMOS
J44	PSMI Connector
J46	IPMB Pin Header
J21/J51	SAS SGPIO Header
J52	BMC RST Button
JP1	Clear CMOS
JP7	On Board SAS LSI1068E EN/DIS
JP8/JP9	COM2 Select

Jumper Legend

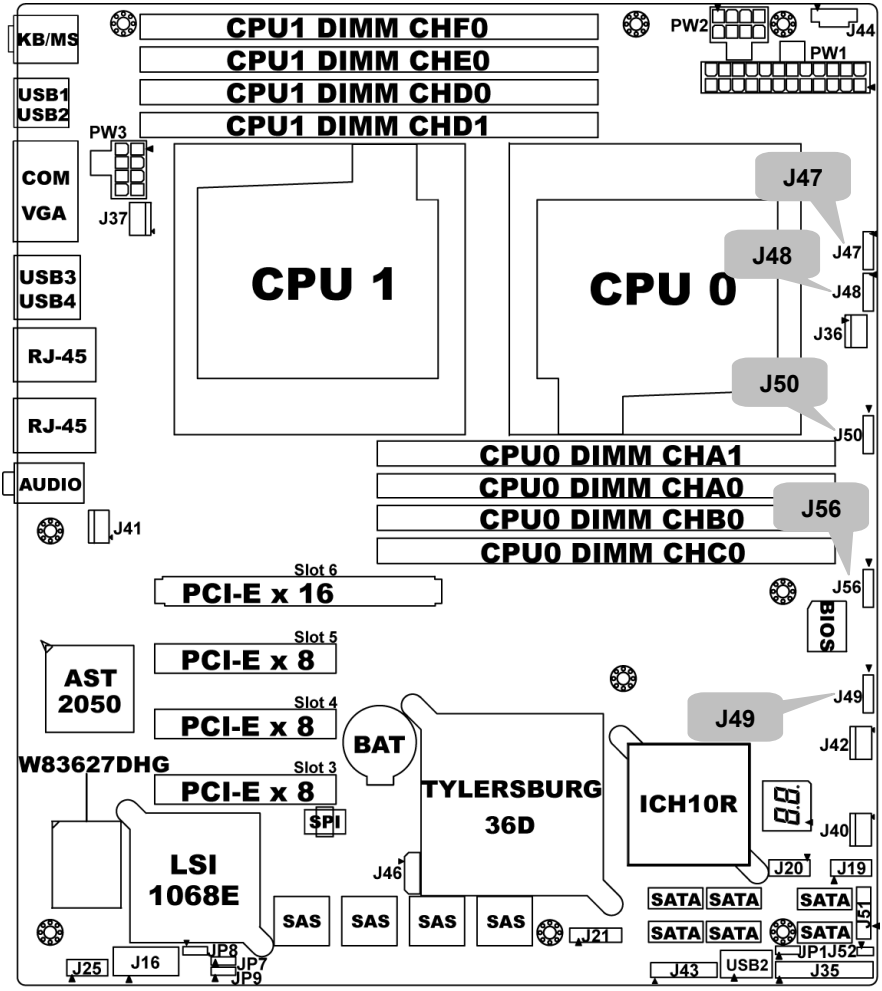
	**OPEN - Jumper OFF**	Without jumper cover
	**CLOSED - Jumper ON**	With jumper cover

Jumper Placement



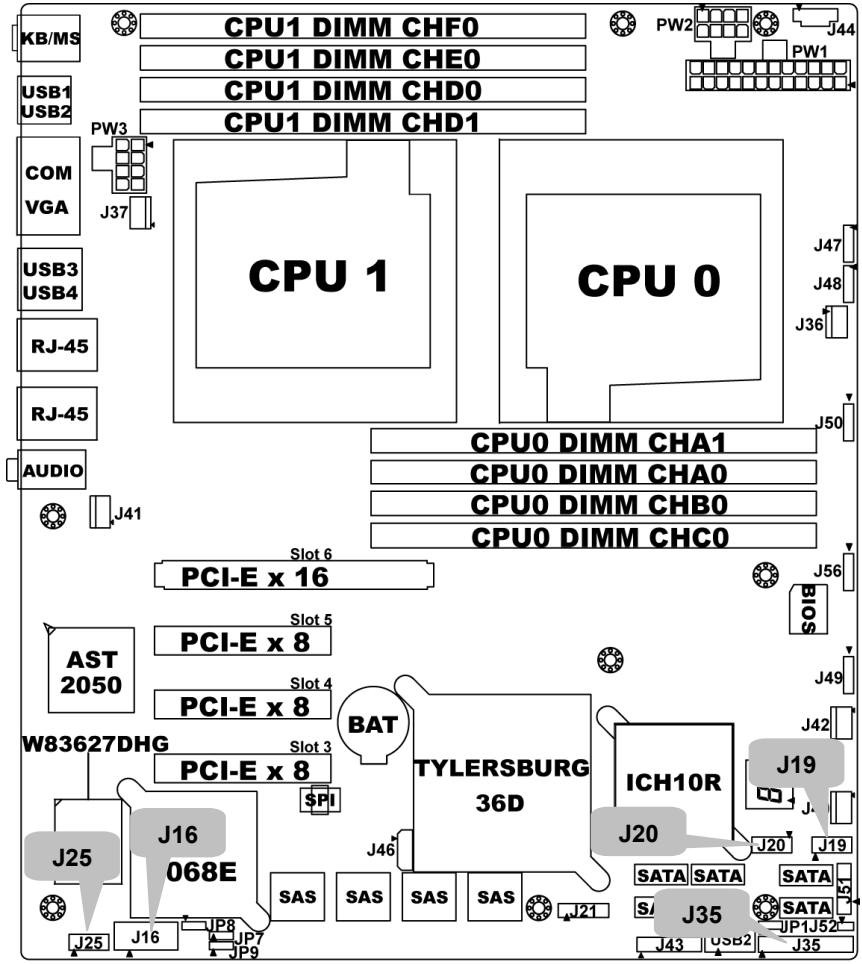
J36/J37/J40/J41/J42: 4-Pin FAN Connector

	Pin	1	2	3	4
Pin_1	**Signal**	GND	+12V	FAN_TACH	FAN_PWM

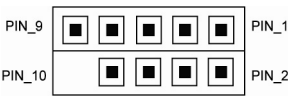


J47/J48/J49/J50/J56: 8-Pin FAN Connector

	Pin	1	2	3	4
Pin_1	Signal	PWM	VDD_12_RUN	TACHIN	GND
	Pin	5	6	7	8
	Signal	GND	TACHIN	VDD_12_RUN	PWM

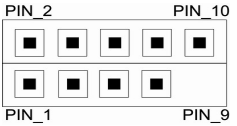


J16: Com2 Header



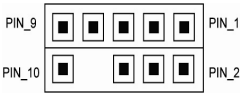
Signal	Pin	Pin	Signal
DCD	1	2	DSR
RXD	3	4	RTS
TXD	5	6	CTS
DTR	7	8	RI
GND	9	10	Key

J19/J20: Front USB Header



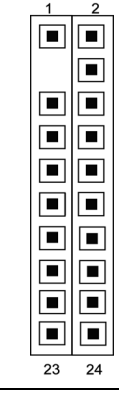
Signal	Pin	Pin	Signal
+5V	1	2	+5V
USB DATA1-	3	4	USB DATA2-
USBDATA1+	5	6	USBDATA2+
GND	7	8	GND
Key	9	10	GND

J25: Front Panel Audio

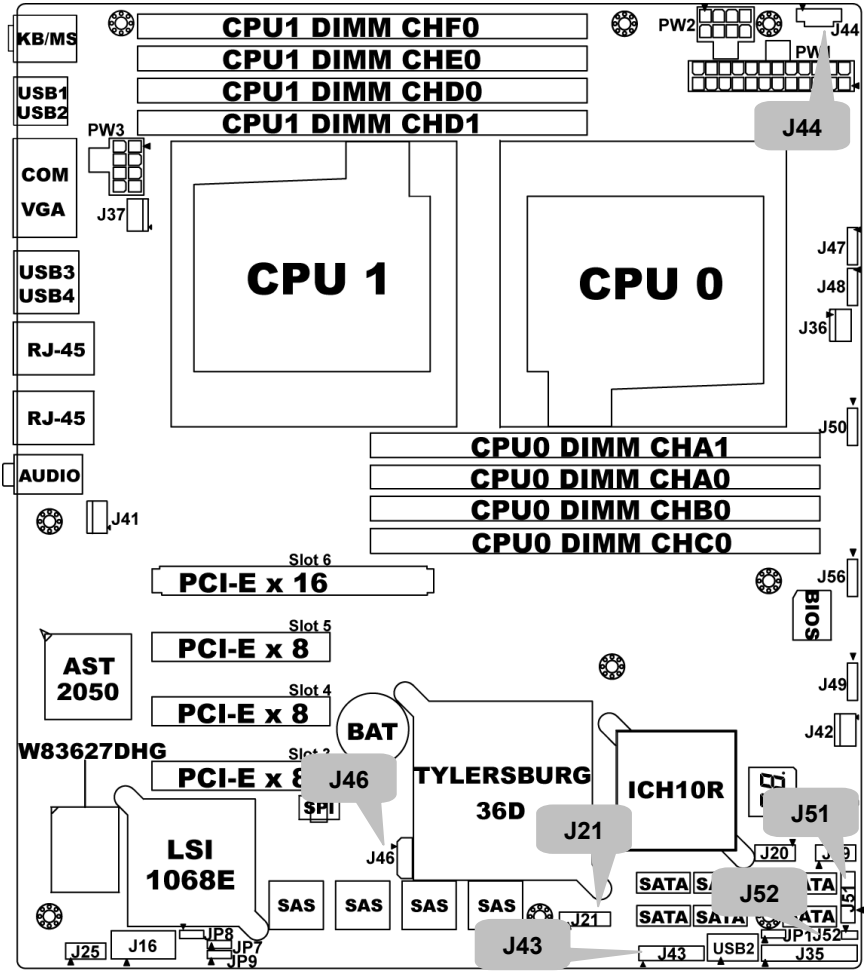


Signal	Pin	Pin	Signal
MIC2-L	1	2	GND
MIC2-R	3	4	FP_Present
LINE2-R	5	6	MIC2-JD
FP IO Sense	7	8	Key
LINE2-R	9	10	LINE2-JD

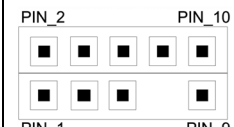
J35: Front Panel Header



Signal	Pin	Pin	Signal
PW_LED+	1	2	FP_PWER(3.3V)
KEY	3	4	ID_ LED+
PW_LED-	5	6	ID_ LED-
HD_ LED+	7	8	FAULT_ LED-
HD_ LED-	9	10	FAULT_ LED-
PW_SW#	11	12	LAN1_ACTLE+
GND	13	14	LAN1_ACTLE-
RST_SW#	15	16	SDA
GND	17	18	SCL
SYS_ID_SW#	19	20	INTRUDER#
GND	21	22	LAN2_ACTLED+
NMI_SW#	23	24	LAN2_ACTLED-

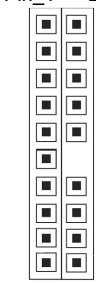


J21/J51 SAS SGPIO Header



Signal	Pin	Pin	Signal
SCL	1	2	SDATA IN
SDA	3	4	SDATA OUT-
GND	5	6	SLOAD
KEY	7	8	SCLOCK
NC	9	10	HD_ERROR_LED

J43: Fan Connector for Barebones Systems



Signal	Pin	Pin	Signal
TACH1	1	2	TACH6
TACH2	3	4	TACH7
TACH3	5	6	TACH8
TACH4	7	8	TACH9
TACH5	9	10	TACH10
GND	11	12	KEY PIN
PWM2	13	14	PWM1
TACH11	15	16	TACH13
TACH12	17	18	TACH14
NC	19	20	PWM3

J44: PSMI Connector

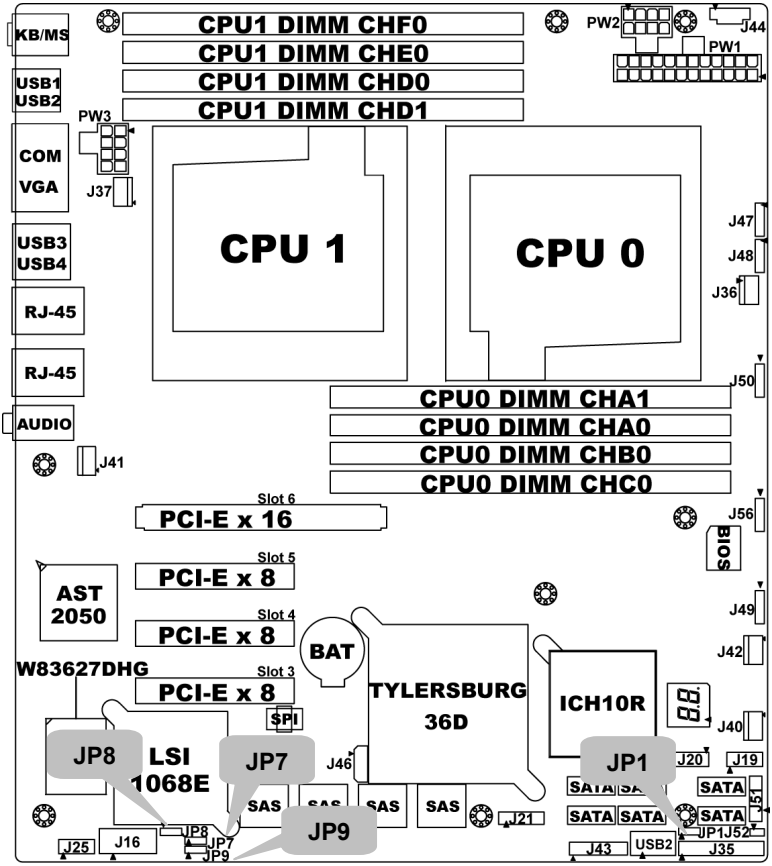
Pin	Signal
1	SMB_CLK
2	SMB_DAT
3	PSU_SMBALERT_N
4	GND
5	V3.3

J46: IPMB Connector

Pin	1	2	3	4
Signal	IPMB DATA	GND	IPMB CLK	NC

J52 BMC RST Button

Pin	1	2
Signal	RST#	GND



JP1: Clear CMOS

Pin_3 Pin_1 **Normal (Default)**	You can reset the CMOS settings by using this jumper if you have forgotten your system/setup password or need to clear system BIOS setting. - Power off system and **disconnect both power connectors from the motherboard** - Put jumper cap back to Pin_1 and Pin_2 (default setting) - Use jumper cap to close Pin_2 and Pin_3 for several seconds to Clear CMOS Reconnect power & power on system
Pin_3 Pin_1 **Clear CMOS**	

JP7 On Board SAS LSI1068E Enabled/Disabled

	**Pin**	**1**	**2**	**3**
	**Signal**	PLTRST#	SAS_RST#	GND

Note: Pin1-2: Enable onboard SAS chip;
Pin2-3: Disable onboard SAS chip

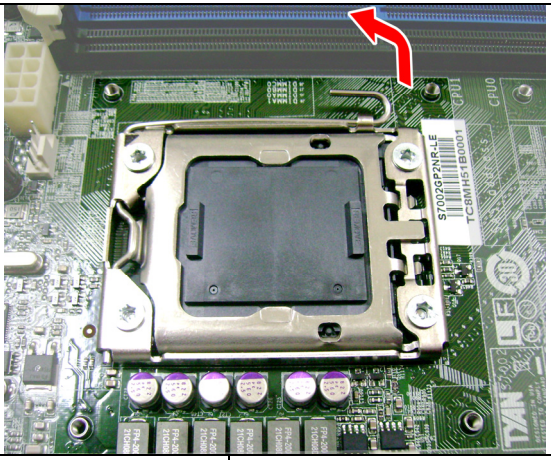
JP8/JP9: COM2 Select

	**Pin**	**1**	**2**	**3**
	**Signal**	SIO RX	COM2_RX	BMC RX

Note: Pin1-2: **<Default>**SIO to COM2;
Pin2-3: BMC UART2 to COM2

2.4 - Installing the Processor

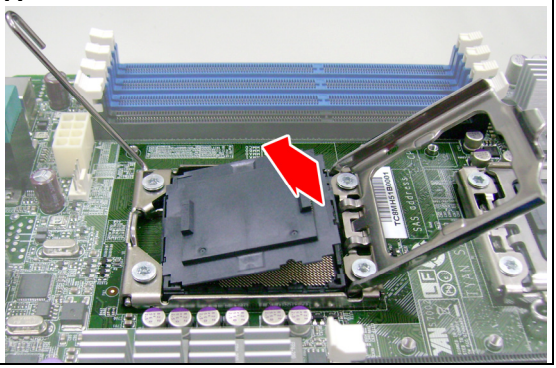
Your brand new S7002 supports the latest Tylersburg platform from Intel®. Only Intel® "Nehalem-EP 2S" processors are certified and supported with this motherboard.
Check our website for latest processor support. **http://www.TYAN.com**
TYAN® is not liable for damage as a result of operating an unsupp--orted configuration.

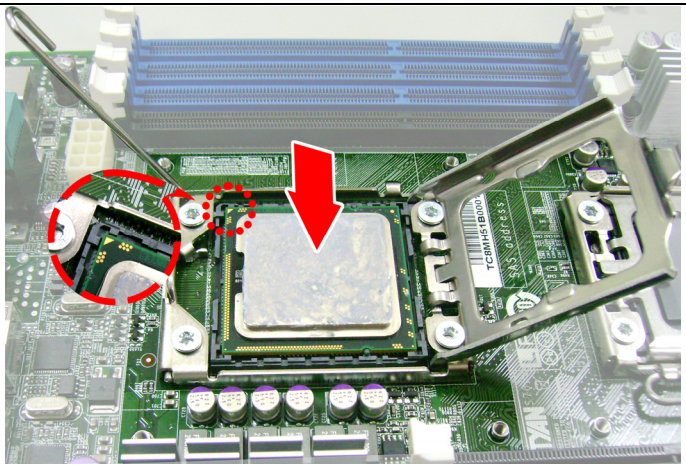


Step1:
Press the lever and unlock the CPU socket.

Step2:
Lift the CPU protection cap up and lay the CPU into the socket(A), ensuring pin1 is correctly located(B).

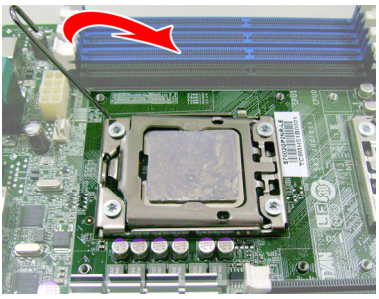
A

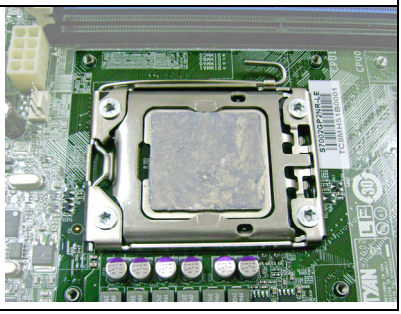




B

Step3:
Close the socket cover and press the CPU lever down to secure the CPU.



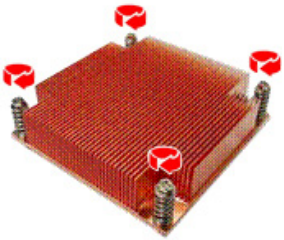


2.5 - Heat sink Installation

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

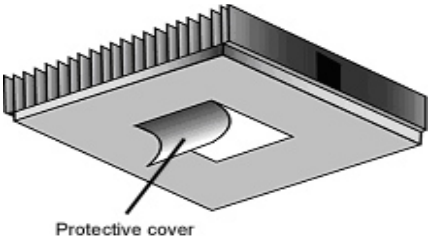
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by Intel®.
Please refer to Intel'®s website at **www.Intel.com**

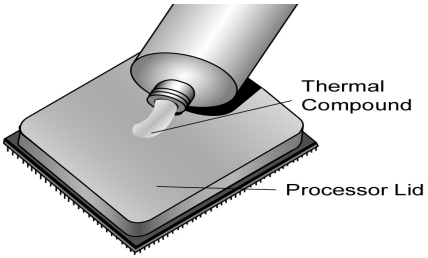
The following diagram illustrates how to install heat sink onto the CPU of S7002.



Place the heat sink on top of the CPU and secure it to the motherboard using four screws clockwise.

2.6 - Thermal Interface Material





There are two types of thermal interface materials designed for use with the processors.

The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

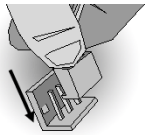
The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

Note:

Always check with the manufacturer of the heat sink & processor to ensure the thermal Interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.7 - Finishing Installing the Heat sink

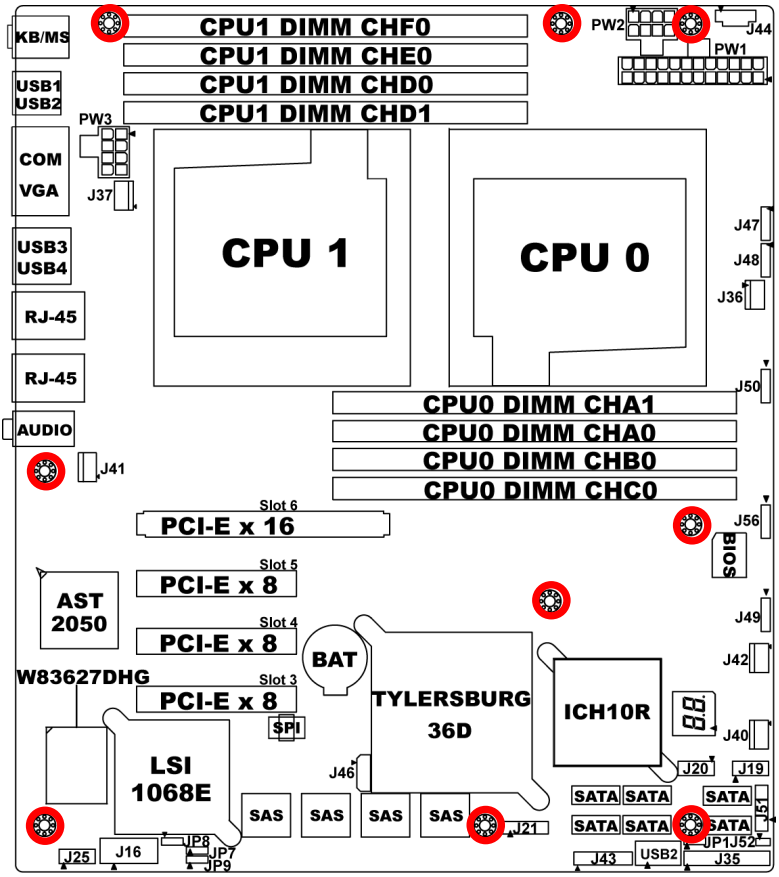
After you have finished installing the heat sink onto the processor and socket, attach the end wire of the fan (which should already be attached to the heat sink) to the motherboard. The following diagram illustrates how to connect fans onto the motherboard.



Once you have finished installing all the fans you can connect your drives (hard drives, CD-ROM drives, etc.) to your motherboard.

2.8 - Tips on Installing Motherboard in Chassis

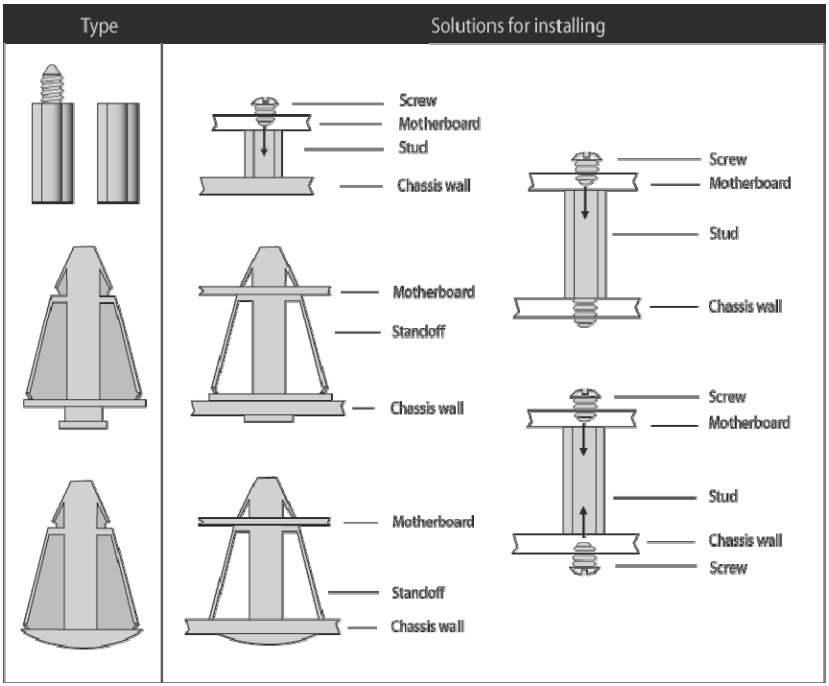
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN® recommends using metal studs with screws that will fasten the motherboard more securely in place.

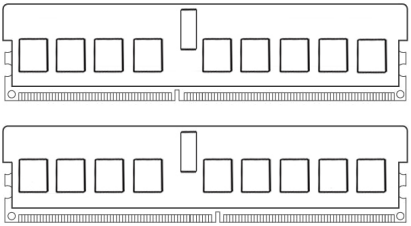
Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard



2.9 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor.
Check the TYAN® Web site at: **www.TYAN.com** for details of the type of memory recommended for your motherboard.
The following diagram shows common types of DDR3 memory modules.



- TYAN® S7002 series support up to 64GB DDR3 memory.
- DDR3 800/1066/1333 RDIMM, UDIMM are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.

Note:

1). For the DIMM number please refer to the motherboard placement in "2.3 - Board Parts, Jumpers and Connectors" for memory installation.

2). Refer to the memory population option table for recommended memory installation instruction.

Memory Population Option Table

To achieve the best performance, TYAN® strongly recommended memory installation configuration as listed below:

1. Single CPU installed (CPU0 Only)

Quantity of memory / DIMM Slot	1	2	3	4
CPU0 DIMM CHA1				√
CPU0 DIMM CHA0	√	√	√	√
CPU0 DIMM CHB0		√	√	√
CPU0 DIMM CHC0			√	√
CPU1 DIMM CHD1				
CPU1 DIMM CHD0				
CPU1 DIMM CHE0				
CPU1 DIMM CHF0				

2. Single CPU installed (CPU1 Only)

Quantity of memory / DIMM Slot	1	2	3	4
CPU0 DIMM CHA1				
CPU0 DIMM CHA0				
CPU0 DIMM CHB0				
CPU0 DIMM CHC0				
CPU1 DIMM CHD1				√
CPU1 DIMM CHD0	√	√	√	√
CPU1 DIMM CHE0		√	√	√
CPU1 DIMM CHF0			√	√

3. Dual CPU installed (CPU0 & CPU1)

Quantity of memory / DIMM Slot	1	2	3	4	5	6	7	8
CPU0 DIMM CHA1							√	√
CPU0 DIMM CHA0	√	√	√	√	√	√	√	√
CPU0 DIMM CHB0			√	√	√	√	√	√
CPU0 DIMM CHC0					√	√	√	√
CPU1 DIMM CHD1								√
CPU1 DIMM CHD0		√	√	√	√	√	√	√
CPU1 DIMM CHE0				√	√	√	√	√
CPU1 DIMM CHF0						√	√	√

Note:

1). " √ **"** indicates a populated DIMM slot.

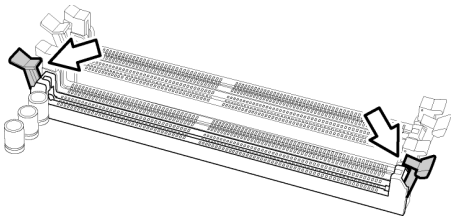
2). If installing only **one** processor, you can choose either CPU0 or CPU1.

3). For **two slots per channel** configuration, it requires population to start with the DIMM slots furthest away from the processor.

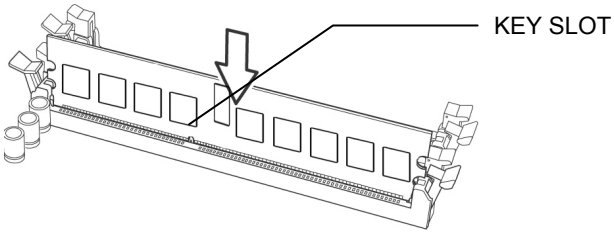
Memory Installation Procedure

Follow these instructions to install memory modules into the S7002.

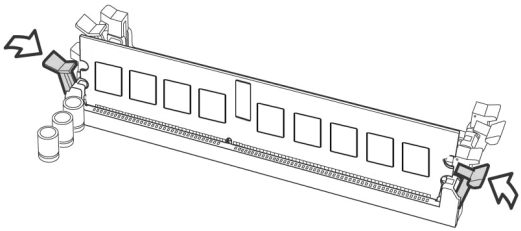
1. Press the locking levers in the direction shown in the following illustration.



2. Align the memory module with the socket. The memory module is keyed to fit only one way in the socket.



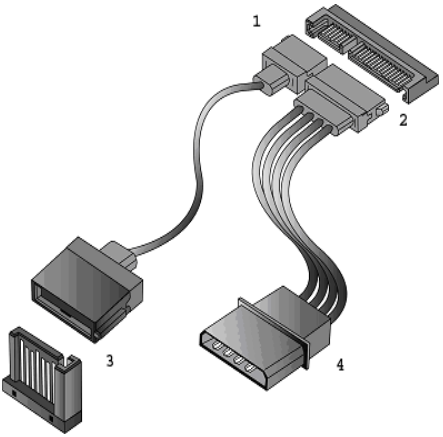
3. Seat the module firmly into the socket by gently pressing down until it sits flush with the socket. The locking levers pop up into place.



2.10 - Attaching Drive Cables

Attaching Serial ATA Cables
S7002 is equipped with **6** Serial ATA (SATA) channels. Connections for the drives are very simple.
There is no need to set Master/Slave jumpers on SATA drives.
If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



1. SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

2.11 - Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

PCI-E x 16 slot

PCI-E x 8 slot

Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

TIP: It's good practice to install add-in cards in a staggered manner rather than making them directly adjacent to each other. Doing so allows air to circulate within the chassis more easily, thus improving cooling for all installed devices.

Note:

YOU MUST ALWAYS unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.12 - Installing I/O Shield

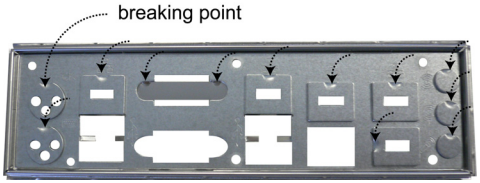
Before you connect external devices, check your motherboard package and take out the I/O shield. Follow the instructions below to install the I/O shield to your rear panel.

Preparation

Flat-head screw driver x 1
Long nose pliers x 1
Protective gloves x 1
I/O shield x 1

Caution

To avoid the risk of personal injury, always wear gloves when handling the I/O shield. Each optional covered section has a breaking point, which will allow for the safe removal of the cover. Use the pliers to grasp and twist the covers back and forth to reach that breaking point and safely remove that section for use.

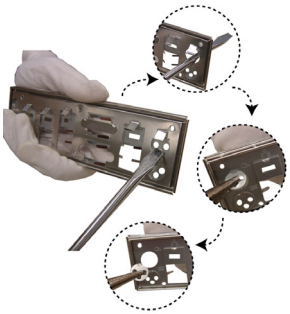


Installation

Step 1
Use the screw driver to push open the I/O port cap.

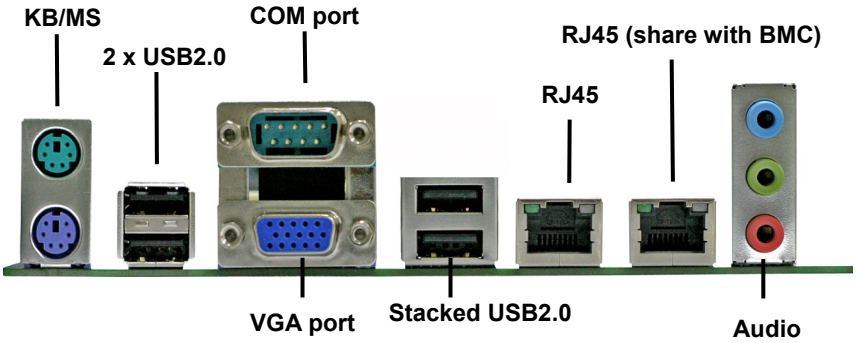
Step 2
Use the pliers to grasp and twist the I/O port cap off the shield.

Step 3
Repeat Step 1 and 2 as needed to remove the I/O caps to match your specific SKU's rear I/O configuration and then attach the I/O shield to the rear panel.



2.13 - Connecting External Devices

Your motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



Note:

Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

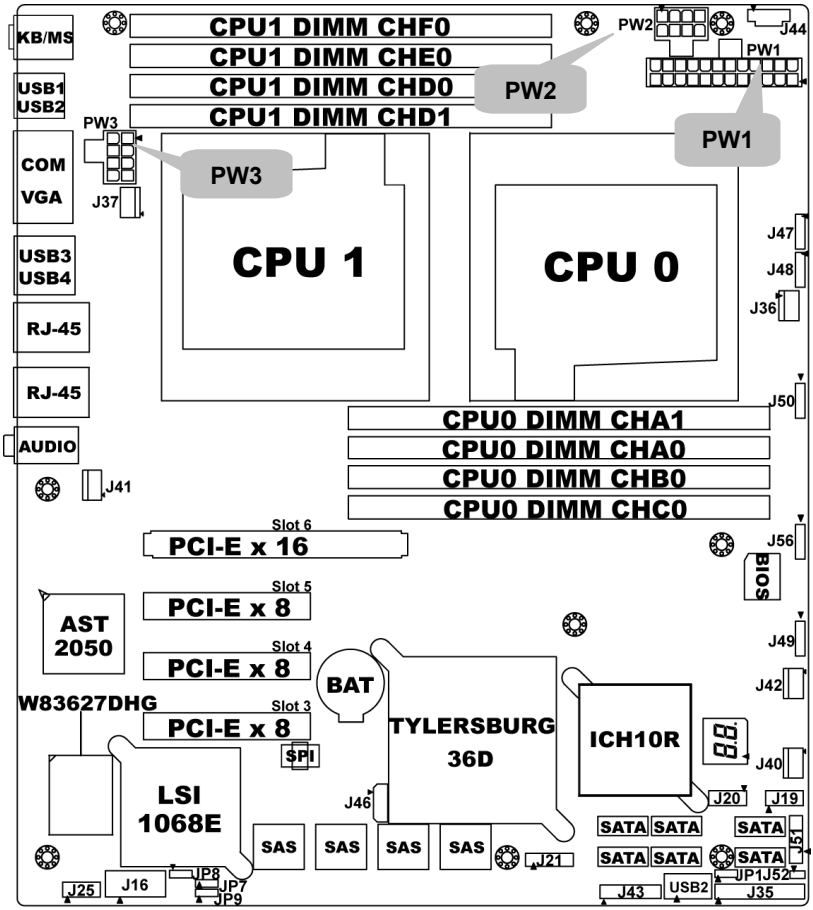
Onboard LAN LED Color Definition

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

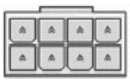
10/100/1000 Mbps LAN Link/Activity LED Scheme			
		**Left LED**	**Right LED**
10 Mbps	**Link**	Green	Off
	Active	Blinking Green	Off
100 Mbps	**Link**	Green	Green
	Active	Blinking Green	Green
1000 Mbps	**Link**	Green	Yellow
	Active	Blinking Green	Yellow
No Link		Off	Off

2.14 - Installing the Power Supply

There are **three** power connectors on your S7002.The S7002 supports EPS-12V/SSI power supplies.



PWR2/3: 8-Pin EPS 12V PWR Connector



Signal	Pin	Pin	Signal
GND	1	5	+12V2
GND	2	6	+12V2
GND	3	7	+12V3b
GND	4	8	+12V3b

PW1: 24-Pin EPS 12V PWR main Connector

Signal	Pin	Pin	Signal
+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
PWRGD	8	20	Reset
5VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3.3V	12	24	GND

We suggest using a 1000W or higher power supply. A 1000W is sufficient for most common system configurations, however a higher wattage solution may be needed if the system is fully loaded. Look to the **www.TYAN.com** website for further information.

Note:

YOU MUST unplug the power supply before plugging the power cables to motherboard connectors.

2.15 - Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspects of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly. In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by **calling your vendor's support line.**

Chapter 3: BIOS Setup

3.1 - About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <Del> during POST (<Tab> on remote console) to start the BIOS setup utility.

3.2 - BIOS Menu Bar

The menu bar at the top of the windows lists these selections:

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
PCI/PnP	To configure legacy Plug & Play or PCI settings
Boot	To configure system boot order
Security	To configure user and supervisor passwords
Chipset	To configure chipset management features
Exit	To exit setup utility

3.3 - Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<F1>	General help window
<ESC>	Exit current menu
← → arrow keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> / <Shift-Tab>	Cycle cursor up/down
<Home> / <End>	Move cursor to top/bottom of the window
<PgUp> / <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F9>	Load the Optimal default configuration values of the menu
<F10>	Save and exit
<Enter>	Execute command or select submenu

3.4 - Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**].

3.5 - In Case of Problems

If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by TYAN® or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

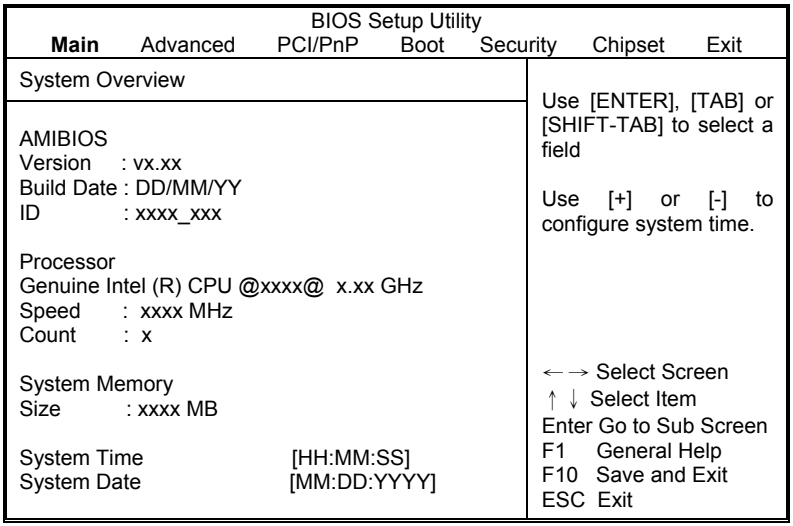
Note:

The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated when this manual is written. Please visit TYAN®'s website at http://www.TYAN.com for the information of BIOS updating.

3.6 - BIOS Main Menu

The Main BIOS Menu is the first screen that you can navigate. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured, options in blue can be changed.

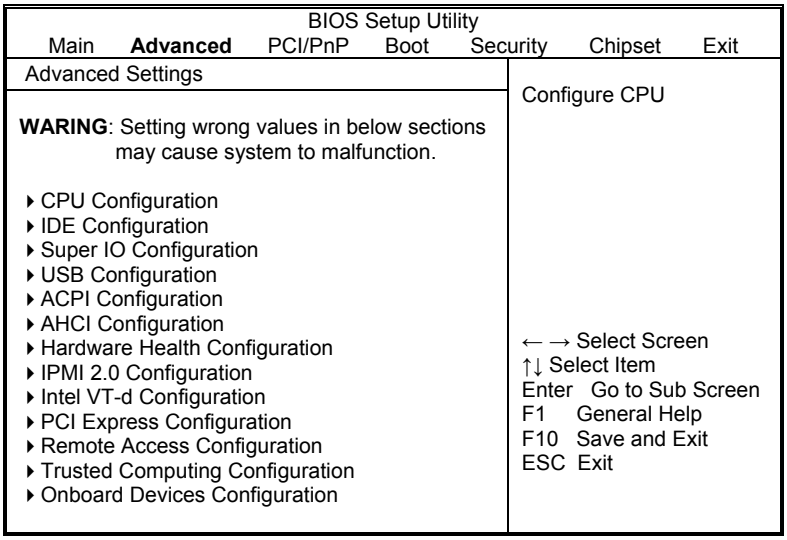
The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.



Feature	Option	Description
Main		
System Time	HH : MM : SS	Set the system time
System Date	MM : DD : YYYY	Set the system date

3.7 - BIOS Advanced Menu

You can select any of the items in the left frame of the screen, such as Super I/O Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



Feature	Option	Description
Advanced Settings		
CPU Configuration	Menu Item	Configure CPU
IDE Configuration	Menu Item	Configure the IDE device(s)
Super IO Configuration	Menu Item	Configures Super IO Chipset Win627DHG
USB Configuration	Menu Item	Configure the USB support
ACPI Configuration	Menu Item	Section for Advanced ACPI Configuration
AHCI Configuration	Menu Item	Section for AHCI Configuration
Hardware Health Configuration	Menu Item	Configure/monitor the Hardware Health
IPMI 2.0 Configuration	Menu Item	IPMI configuration including server monitoring and event log
Intel VT-d Configuration	Menu Item	Configure Intel® Virtualization Technology for Directed I/O (VT-d) support
PCI Express Configuration	Menu Item	Configure PCI Express Support

Feature	Option	Description
Advanced Settings		
Remote Access Configuration	Menu Item	Configure Remote Access
Trusted Computing Configuration	Menu Item	Configure settings related to Trusted Computing Information
On board Devices Configuration	Menu Item	Onboard Devices and PCI Add-On cards Enable/Disable

3.7.1 - CPU Configuration

You can use this screen to view CPU Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Configure advanced CPU settings
Module Version : XX.XX

Sets the ratio between CPU Core Clock and the FSB Frequency.

Manufacturer : Intel
Genuine Intel(R) CPU @ xxxx @xxxGHz
Frequency :xxxGHz
BCLK Speed :xxxMHz
Cache L1 : xxxKB
Cache L2 :XXXXKB
Ratio Status : Unlocked (Min:12,Max:18)
Ratio Actual Value :18

C1E Support	[Enabled]
Hardware Prefetcher	[Enabled]
Adjacent Cache Line Prefetch	[Enabled]
Max CPUID Value Limit	[Disabled]
Intel(R) Virtualization Tech	[Enabled]
Execute-Disable Bit Capability	[Enabled]
Intel(R) HT Technology	[Enabled]
Active Processor Cores	[All]
A20M	[Disabled]
Intel® SpeedStep™ Tech	[Enabled]
Intel® TurboMode Tech	[Enabled]
Intel® C-STATE Tech	[Enabled]
C State package limit setting	[Auto]
C1 Auto Demotion	[Enabled]
C3 Auto Demotion	[Enabled]

← → Select Screen
↑↓ Select Item
+/- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Feature	Option	Description
CPU Configuration		
Manufacturer	Read only	Displays information about CPU
Frequency		
BCLK Speed		
Cache L1		
Cache L2		
Ratio Status		
Ratio Actual Value		
C1E Support	**Enabled**	This should be enabled in order to enable or disable the “Enhanced Halt State”
	Disabled	
Hardware Prefetcher	**Enabled**	For UP platforms, leave it enabled. For DP/MP severs, it may use to time performance to the specific application.
	Disabled	
Adjacent Cache Line Prefetch	**Enabled**	For UP platforms, leave it enabled. For DP/MP severs, it may use to time performance to the specific application.
	Disabled	
Max CPUID Value Limit	Enabled	Disabled for Windows XP
	Disabled	
Intel (R) Virtualization Tech	**Enabled**	When enabled, a VMM can utilize the additional HW Caps. Provided by Intel(R) Virtualization Tech. Note: A full reset is required to change the setting.
	Disabled	
Execute-Disable Bit Capability	**Enabled**	When disabled, force the XD feature flag to always return 0.
	Disabled	
Intel (R) HT Technology	**Enabled**	When ’Disabled’ only one thread per enabled core is enabled.
	Disabled	
Active Processor Cores	[All]	Number of cores to enable in each processor package.
A20M	**Disabled**	Legacy OSes and APs may need A20M enabled.
	Enabled	
Intel®SpeedStep™ Tech	**Enabled**	Enable (GV3)
	Disabled	Disable (GV3)
Intel® TurboMode Tech	**Enabled**	Turbo mode allows processor cores to run faster than marked frequency in specific condition.
	Disabled	
Intel® C-STATE Tech	**Enabled**	C-State: CPU idle is set to C2/C3/C4
	Disabled	

Feature	Option	Description
C State package limit setting	**Auto**	Selected option will program into C state package limit register.
	C1	
	C3	
	C6	
	C7	
C1 Auto Demotion	**Enabled**	When enabled, CPU will conditionally demote C3/C6/C7 requests to C1 based on uncore auto-demote information.
	Disabled	
C3 Auto Demotion	**Enabled**	When enabled, CPU will conditionally demote C6/C7 requests to C3 based on uncore auto-demote information.
	Disabled	

3.7.2 - IDE Configuration Sub-Menu

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> Keys to select an item. Use the <Plus> and <Minus> Keys to change the value of the selection options.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

IDE Configuration		Options
SATA#1 Configuration	[Compatible]	Disabled Compatible Enhanced
Configure SATA#1 as	[IDE]	
▸ Primary IDE Master	[Not Detected]	
▸ Primary IDE Slave	[Not Detected]	
▸ Secondary IDE Master	[Not Detected]	
▸ Secondary IDE Slave	[Not Detected]	
▸ Third IDE Master	[Not Detected]	
▸ Fourth IDE Master	[Not Detected]	← → Select Screen ↑↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
Hard Disk Write Protect	[Disabled]	
IDE Detect Time Out (Sec)	[35]	

Feature	Option	Description
IDE Configuration		
SATA Configuration	Disabled	Configure SATA devices
	Compatible	
	Enhanced	
Configure SATA as	**IDE**	Select legacy IDE, RAID or AHCI as the SATA interface.
	RAID	
	AHCI	
Hard Disk Write Protect	**Disabled**	Enable/Disable device write protection. This will be effective only if device is accessed through BIOS.
	Enabled	
IDE Detect Time Out (Sec)	**0~35** (at 5 interval)	Select the time out value for detecting ATA/ATAPI device(s).

3.7.3 - Super I/O Configuration Sub- Menu

You can use this screen to select options for the Super I/O settings. Use the up and down arrow (/) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Configure Win627DHG Super IO Chipset

Allows BIOS to Select Serial Port1 Base Addresses.

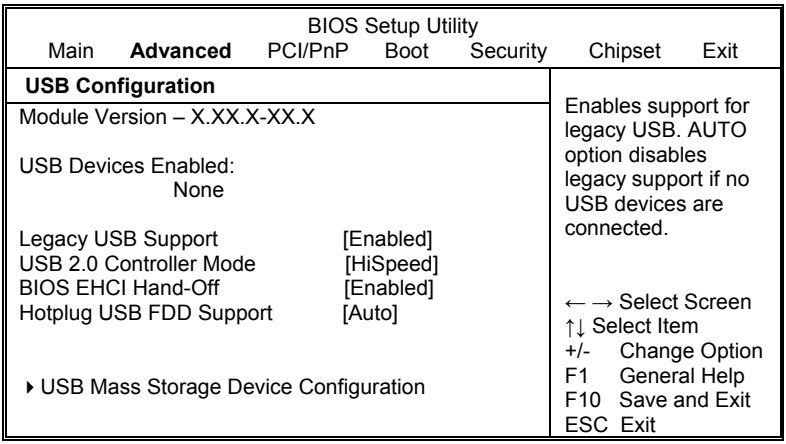
Serial Port1 Address [3F8/IRQ4]
Serial Port2 Address [2F8/IRQ3]
Watchdog Mode [Disabled]
Chassis intrusion detection [Disabled]

← → Select Screen
↑↓ Select Item
+/- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Feature	Option	Description
Configure Win627 Super I/O Chipset		
Serial Port1 Address	**3F8 IRQ4**	Allow BIOS to select Serial Port1 Base Addresses.
	3E8 IRQ4	
	2E8 IRQ3	
	Disabled	
Serial Port2 Address	3F8 IRQ4	Allow BIOS to select Serial Port2 Base Addresses.
	3E8 IRQ4	
	2E8 IRQ3	
	2F8 IRQ3	
	Disabled	
Chassis Intrusion Detect	**Disabled**	Enable/Disable the function of chassis intrusion detection. When chassis open event is detected, BIOS will record the event and issue a warning Beep.
	Enabled	
Watchdog Mode	**Disabled**	POST: BIOS POST Watchdog timer counting, start at PowerOn stop at OS boot. OS: OS boot watchdog, start at OS boot. PowerOn: Start at PowerOn
	POST	
	OS	
	Power ON	

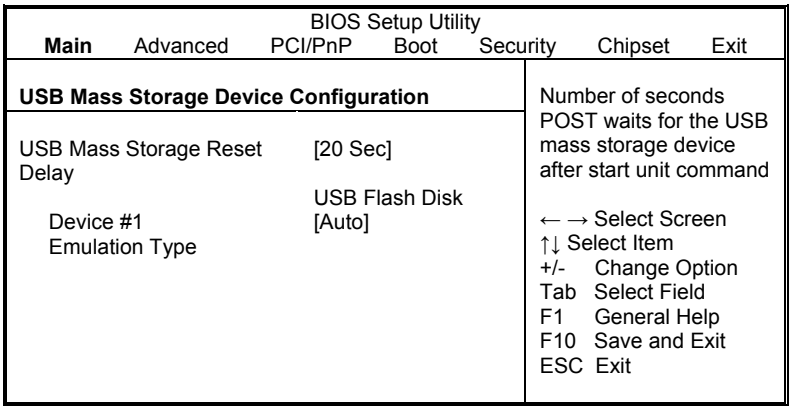
3.7.4 - USB Configuration Sub- Menu

You can use this screen to view the USB Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
USB Configuration		
Legacy USB Support	Disabled	Enables support for legacy USB.AUTO option disables legacy support if no USB devices are connected.
	Enabled	
	AUTO	
USB 2.0 Controller Mode	**Hi Speed**	Configure the USB 2.0 controller in Hi Speed (480Mbps) or Full Speed (12Mbps).
	Full Speed	
BIOS EHCI Hand-Off	**Enabled**	This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
	Disabled	
Hotplug USB FDD Support	Disabled	Enable or disable hotplug USB floppy support. A dummy FDD device is created that will be associated with the hotplugged FDD later. AUTO option creates this dummy device only if there is no USB FDD present.
	Enabled	
	AUTO	

3.7.4.1 – USB Mass Storage Device Configuration Sub-Menu



Feature	Option	Description
USB Mass Storage Device Configuration		
USB Mass Storage Reset Delay	10 Sec	Number of seconds POST waits for the USB mass storage device after the start unit command
	20 Sec	
	30 Sec	
	40 Sec	
Device #1	Read only	
Emulation Type	**Auto**	If Auto, USB devices less than 530 MB will be emulated as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD (Ex. ZIP drive).
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	

3.7.5 - ACPI Configuration Sub-Menu

Use this screen to select options for ACPI. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit	
ACPI Settings	Advanced ACPI Configuration settings Use this selection to configure additional ACPI options. ← → Select Screen ↑↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
▸ Advanced ACPI Configuration ▸ Chipset ACPI Configuration	

3.7.5.1 - Advanced ACPI Configuration sub-menu

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit		
Advanced ACPI Configuration		Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some. ← → Select Screen ↑↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
ACPI Version Features	[ACPI v3.0]	
ACPI APIC Support	[Enabled]	
AMI OEMB table	[Enabled]	
Headless mode	[Disabled]	

Feature	Option	Description
Advanced ACPI Configuration		
ACPI Version Features	ACPI v1.0	Choose ACPI version
	ACPI v2.0	
	ACPI v3.0	
ACPI APIC Support	Disabled	Include ACPI APIC table pointer to RSDT pointer list.
	Enabled	
AMI OEMB table	Disabled	Include OEMB table pointer to R(X) SDT pointer lists.
	Enabled	
Headless mode	**Disabled**	Enable/Disable Headless operation mode through ACPI.
	Enabled	

3.7.5.2 - Chipset ACPI Configuration sub-menu

BIOS Setup Utility

Main **Advanced** PCI/PnP Boot Security Chipset Exit

Chipset ACPI Configuration

Energy Lake Feature	[Disabled]
APIC ACPI SCI IRQ	[Disabled]
High Performance Event Timer	[Enabled]
HPET Memory Address	[FED00000h]

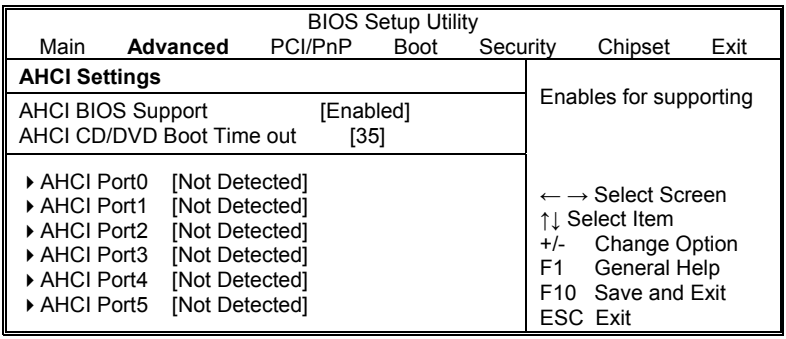
← → Select Screen
↑↓ Select Item
+/- Change Option
F1 General Help
F10 Save and Exit
ESC Exit

Feature	Option	Description
Chipset ACPI Configuration		
Energy Lake Feature	**Disabled**	Allow you to configure Intel's Energy Lake power management technology. If you are running a Media Center you can install the Intel VIIV software to get the correct driver; otherwise disable the Energy Lake feature in BIOS (it relates purely to Intel's Quick Resume feature, which is generally useless).
	Enabled	
APIC ACPI SCI IRQ	**Disabled**	Enable/Disable APIC ACPI SCI IRQ.
	Enabled	
USB Device Wakeup from S3/S4	Disabled	Enable/Disable USB Device Wakeup From S3/S4.
	Enabled	
High Performance Event Timer	Disabled	Enable/Disable High Performance Event Timer
	Enabled	

Feature	Option	Description
HPET Memory Address	FED00000h	Choose HPET Memory Address
	FED01000h	
	FED02000h	
	FED03000h	

3.7.6 - AHCI Configuration Sub- Menu

You can use this screen to view the AHCI Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
AHCI Configuration		
AHCI BIOS Support	Disabled	Enable for supporting AHCI.
	Enabled	
AHCI CD/DVD Boot Time out	0	Some SATA CD/DVD in AHCI mode need to wait ready longer.
	5	
	10	
	15	
	20	
	25	
	30	
	35	

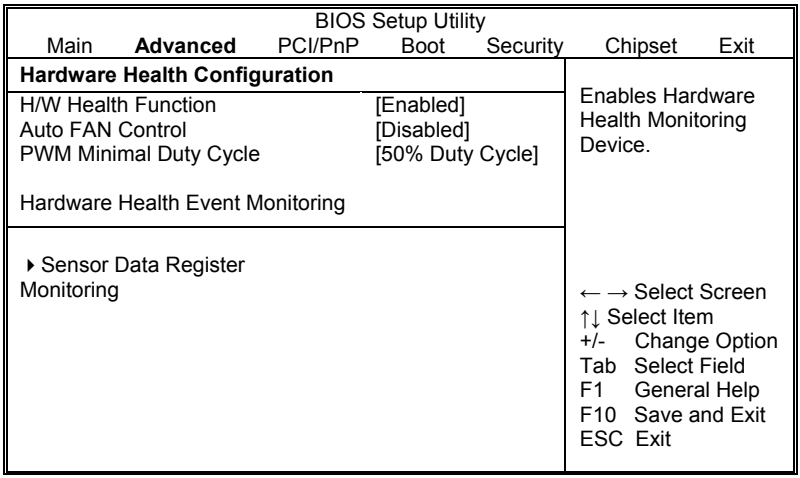
3.7.6.1 - AHCI Port Sub- Menu

BIOS Setup Utility Main **Advanced** PCI/PnP Boot Security Chipset Exit		
AHCI PORT X		Select the type of device connected to the system. ← → Select Screen ↑↓ Select Item +/- Change Option F1 General Help F10 Save and Exit ESC Exit
Device : Not Detected		
SATA Port X S.M.A.R.T.	[AUTO] [Enabled]	

Feature	Option	Description
AHCI Port X		
SATA Port X	**AUTO**	Select the type of device connected to the system.
	Not Installed	
S.M.A.R.T.	Disabled	S.M.A.R.T. stands for Self-Monitoring, Analysis and Reporting Technology.
	Enabled	

3.7.7 - Hardware Health Configuration Sub-Menu

You can use this screen to view the Hardware Health Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Hardware Health Configuration		
Auto FAN Control	**Disabled**	FAN power duty cycle is auto dynamic programmed in selected temperature range. Disabled: Fan Power On Enabled: Fan Power Duty Cycle is controlled by Tcontrol.
	Enabled	
PWM Minimal Duty Cycle	**50% Duty Cycle**	Duty Cycle control range: 50%-100% 40%-100% 30%-100% 0%-100%
	40% Duty Cycle	
	30% Duty Cycle	
	0% Duty Cycle	

3.7.7.1 Sensor Data Register Monitoring Sub-Menu

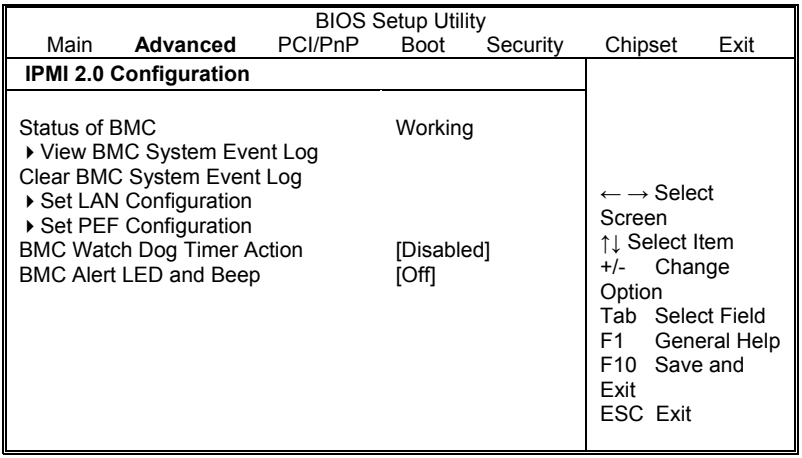
BIOS Setup Utility						
Main	**Advanced**	PCI/PnP	Boot	Security	Chipset	Exit

CPU0 Below Tmax	: xx°C	
CPU1 Below Tmax	: xx°C	
IOH Temp	: xx°C	
ICH Temp	: xx°C	
CPU0 VCORE	: x.xxx V	
CPU1 VCORE	: x.xxx V	
3.3V	: x.xxx V	
+12V	: x.xxx V	
VBAT	: x.xxxvV	
CPU FAN0	: xxxx RPM	
CPU FAN1	: xxxx RPM	
FAN1	: xxxx RPM	
FAN2	: xxxx RPM	← → Select Screen
FAN3	: xxxx RPM	↑↓ Select Item
FAN4	: xxxx RPM	+/- Change Option
FAN5	: xxxx RPM	Tab Select Field
FAN6	: xxxx RPM	F1 General Help
FAN7	: xxxx RPM	F10 Save and Exit
FAN8	: xxxx RPM	ESC Exit
FAN9	: xxxx RPM	
FAN10	: xxxx RPM	

Read only. It can not be modified in user mode.

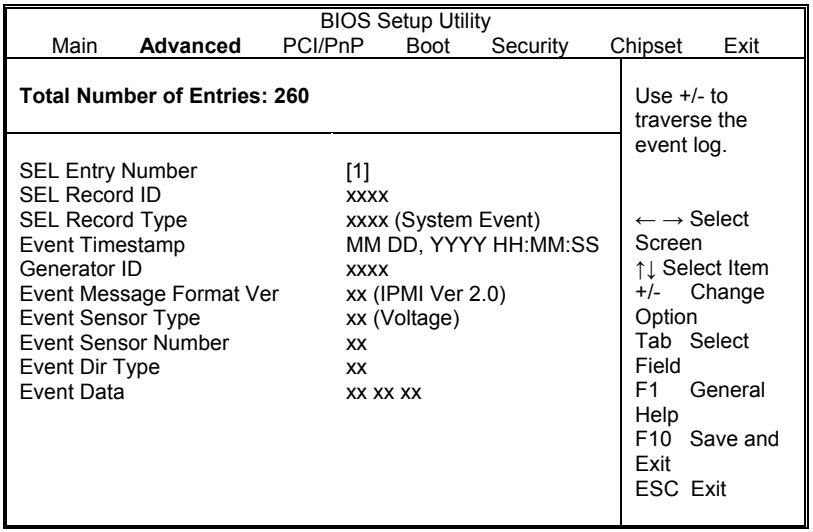
3.7.8 IPMI 2.0 Configuration Sub-Menu

You can use this screen to view the IPMI 2.0 Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



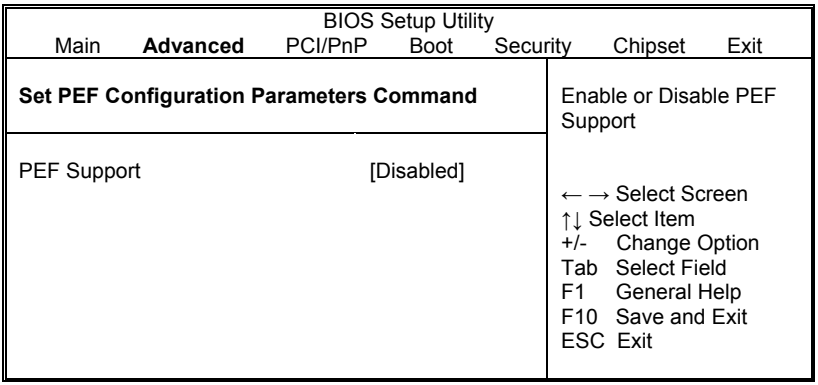
Feature	Option	Description
IPMI 2.0 Configuration		
Status of BMC	Read only	Display BMC status
Clear BMC System Event Log	[Enter]	Clear all events in BMC System Event Log.
BMC Watch Dog Timer Action	**Disabled**	Allows the BMC to reset or power down the system if the operating system crashes or hangs.
	Reset System	
	Power Down	
	Power Cycle	
BMC Alert LED and Beep	**Off**	BMC Alert LED and Beep On/Off
	On	

3.7.8.1 View BMC System Event Log Sub-Menu



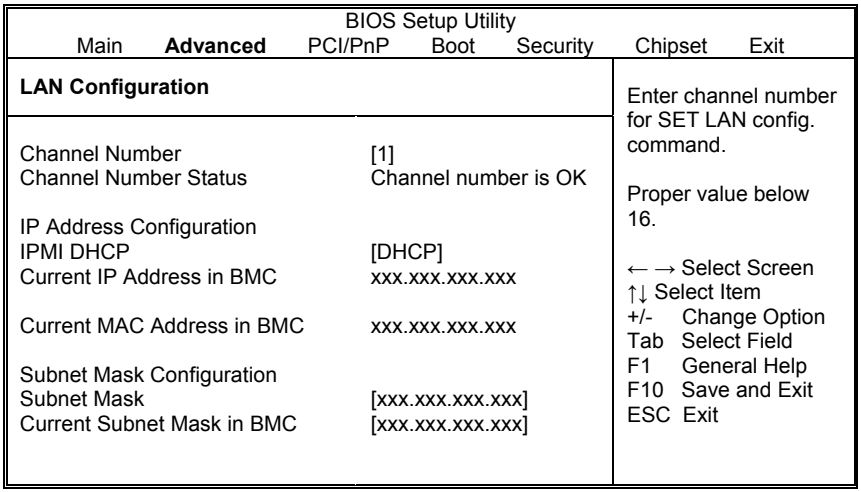
Read only. It can not be modified in user mode.

3.7.8.2 Set PEF Configuration Sub-Menu



Feature	Option	Description
Set PEF Configuration Parameters Command		
PEF Support	**Disabled**	Enable or Disable PEF Support
	Enabled	

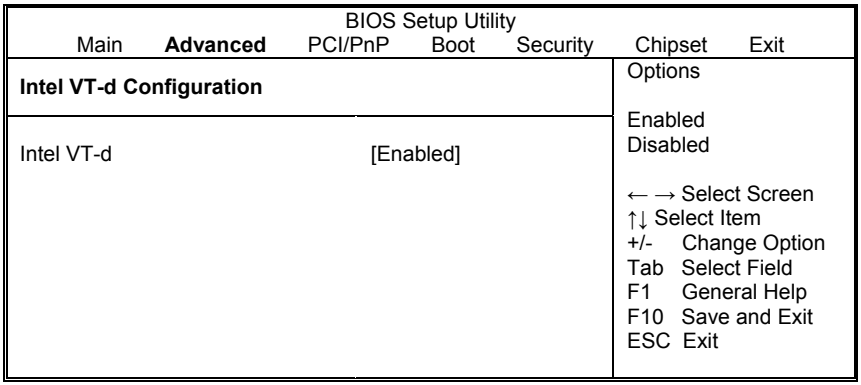
3.7.8.3 LAN Configuration Sub-Menu



Feature	Option	Description
LAN Configuration		
Channel Number	[Enter]	Enter channel number for SET LAN config. Command. Proper value below 16.
Channel Number Status	Read only	Channel Number is OK.
IPMI DHCP	**DHCP**	IPMI IP Source STATIC/DHCP
	STATIC	
Current IP Address in BMC	Read only	
Current MAC Address in BMC	Read only	
Subnet Mask	[xxx.xxx.xxx.xxx]	Enter Subnet Mask in decimal in the form of xxx.xxx.xxx.xxx. (xxx less than 256 and in decimal only)
Current Subnet Mask in BMC	Read only	

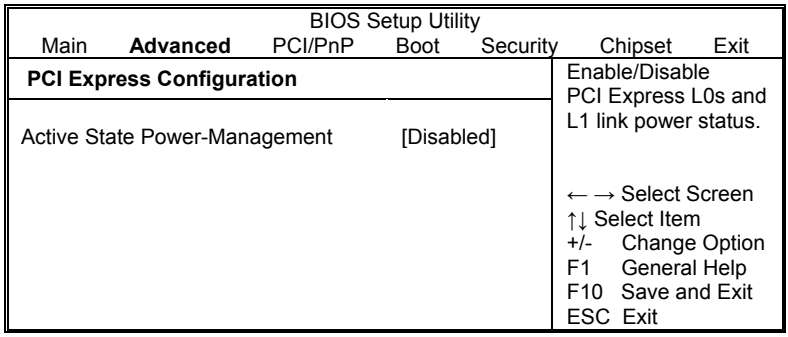
3.7.9 Intel VT-d Configuration Sub-Menu

You can use this screen to view the Intel VT-d Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Intel VT-d Configuration		
Intel VT-d	**Enabled**	Enable or disable Intel® Virtualization Technology for Directed I/O (VT-d) support. VT-d support on Intel platforms provides the capability to ensure improved isolation of I/O resources for greater reliability, security, and availability.
	Disabled	

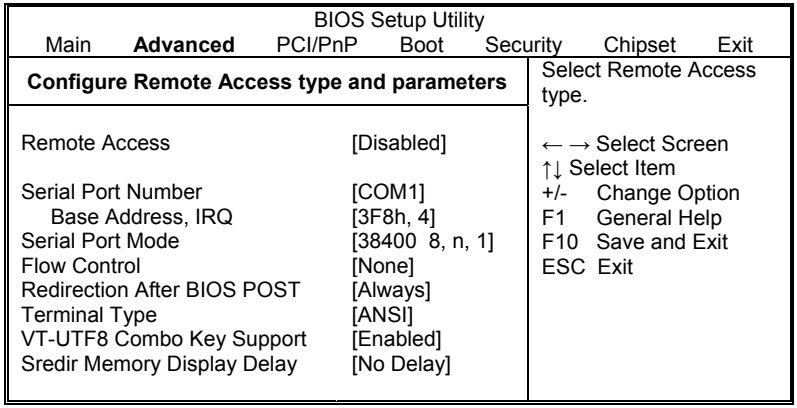
3.7.10 - PCI Express Configuration Sub-Menu



Feature	Option	Description
PCI Express Configuration		
Active State Power-Management	**Disabled**	Enables/Disable PCI Express L0s and L1 link power states.
	Enabled	

3.7.11 - Remote Access Configuration Sub-Menu

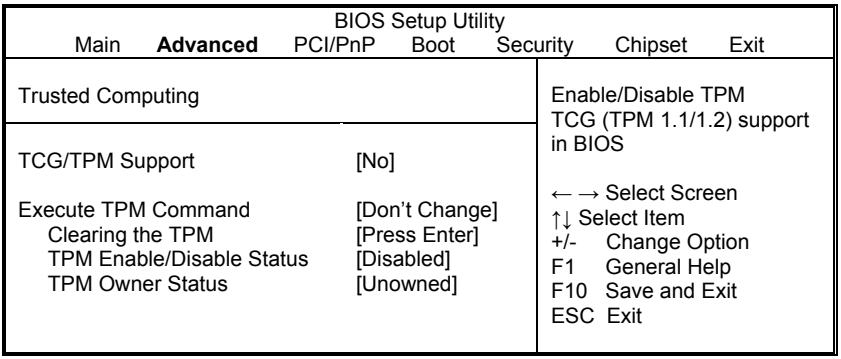
You can use this screen to view the Remote Access Configuration Menu. This feature allows access to the Server remotely via serial port. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



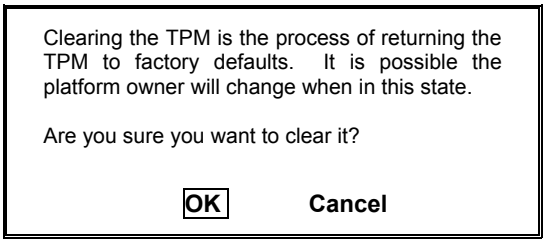
Feature	Option	Description
Configure Remote Access type and parameters		
Remote Access	Enabled	Enables remote access to system through serial port.
	Disabled	
NOTE: The items listed below will appear when **Remote Access** is set to [Enabled].		
Serial Port Number	**COM1**	Select Serial Port for console redirection. Make sure the selected port is enabled.
	COM2	
Base Address, IRQ	Read only	
Serial Port Mode	115200 8,n,1	Select Serial Port settings.
	57600 8,n,1	
	38400 8, n, 1	
	19200 8,n,1	
	9600 8,n,1	
Flow Control	**None**	Select Flow Control for console redirection.
	Hardware	
	Software	
	Option	
Redirection After BIOS POST	Disabled	Disable: Turns off the redirection after POST Boot Loader: Redirection is active during POST and during Boot Loader. Always: Redirection is always active. <Some OSs may not work if set to Always>
	Boot Loader	
	Always	
Terminal Type	**ANSI**	Select the target terminal type.
	VT100	
	VT-UTF8	
VT-UTF8 Combo Key Support	**Enabled**	Enable VT-UTF8 Combination key Support for ANSI/VT100 terminals.
	Disabled	
Sredir Memory Display Delay	**No Delay**	Gives the delay in seconds to display memory information
	Delay 1 Sec	
	Delay 2 Sec	
	Delay 4 Sec	

3.7.12 - On board Devices Configuration Sub-Menu

You can use this screen to view the Trusted Computing Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Trusted Computing		
TCG/TPM Support	**No**	Enable/Disable TPM TCG (TPM 1.1/1.2) support in BIOS
	Yes	
NOTE: The items listed below will appear when **TCG/TPM Support** is set to [Yes].		
Execute TPM Command	**Don't Change**	Enable (Activate) / Disable (Deactivate) command to TPM
	Disabled	
	Enabled	
Clearing the TPM	[Press Enter] See dialog box below	Select [OK] to clear the TPM or [Cancel] to exit.
TPM Enable/Disable Status	read only	Report TPM Enable/Disable status
TPM Owner Status	read only	Report TPM Owner status



3.7.13 - On board Devices Configuration Sub-Menu

You can use this screen to view the Onboard Devices Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.

BIOS Setup Utility

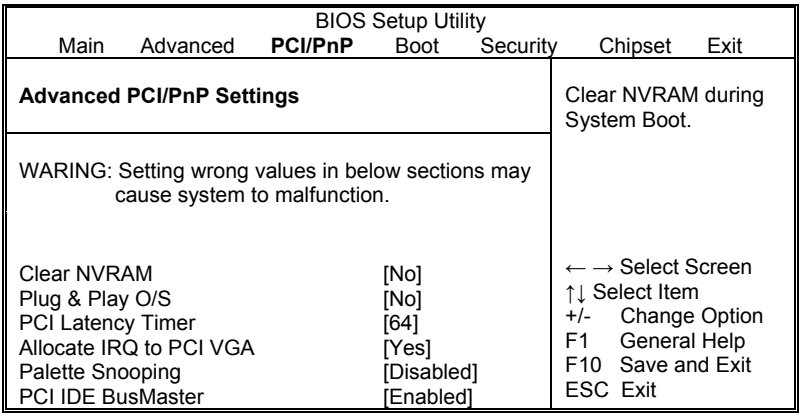
Main **Advanced** PCI/PnP Boot Security Chipset Exit

Onboard Device and PCI Slots Configuration		Select Remote Access type.
Boots Graphic Adapter Priority	[Auto]	
Marvell Chip	[Enabled]	
Lan1	[Auto]	← → Select Screen
Lan1 OP-ROM	[Disabled]	↑↓ Select Item
Lan2	[Auto]	+/- Change Option
Lan2 OP-ROM	[Disabled]	F1 General Help
		F10 Save and Exit
		ESC Exit

Feature	Option	Description
Onboard Device and PCI Slots Configuration		
Boots Graphic Adapter Priority	**Auto**	Select which graphics controller to use as the primary boot device.
	Onboard VGA	
Marvell Chip	**Enabled**	Enable/Disable onboard VGA chip. Note: Do not disable if you have not other VGA card attachment.
	Disabled	
Lan1	**Auto**	Enable/disable Lan controller
	Enabled	
	Disabled	
Lan1 OP-ROM	Enabled	Executed Lan OPROM or Not
	Disabled	
Lan2	**Auto**	Enable/disable Lan controller
	Enabled	
	Disabled	
Lan2 OP-ROM	Enabled	Executed Lan OPROM or Not
	Disabled	

3.8 - PCI PnP Menu

You can use this screen to view PnP (Plug & Play) BIOS Configuration Menu. This menu allows the user to configure how the BIOS assigns resources & resolves conflicts. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Advanced PCI/PnP Settings		
Clear NVRAM	**No**	Clears NVRAM during system Boot.
	Yes	
Plug & Play OS	Yes	No: lets the BIOS configure all the devices in the system. Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
	No	
PCI Latency Timer	32	This setting controls how many PCI clocks each PCI device can hold the bus before another PCI device takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. Values in units of PCI clocks for PCI device latency timer register.
	64	
	96	
	128	
	160	
	192	
	224	
	248	

Feature	Option	Description
Allocate IRQ to PCI VGA	**Yes**	Yes: assigns IRQ to PCI VGA card if card requests IRQ.
	No	
Palette Snooping	**Disabled**	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled. Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
	Enabled	
PCI IDE BusMaster	Disabled	Enabled: BIOS uses PCI bus mastering for reading / writing to IDE drives.
	Enabled	
	Reserved	

3.9 - Boot Menu

You can display Boot Setup option by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility Main Advanced PCI/PnP **Boot** Security Chipset Exit	
Boot Settings	Configures settings during System Boot.
▸ Boot Settings Configuration ▸ Boot Device Priority ▸ Hard Disk Drives	← → Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

3.9.1 - Boot Settings Configuration Sub-Menu

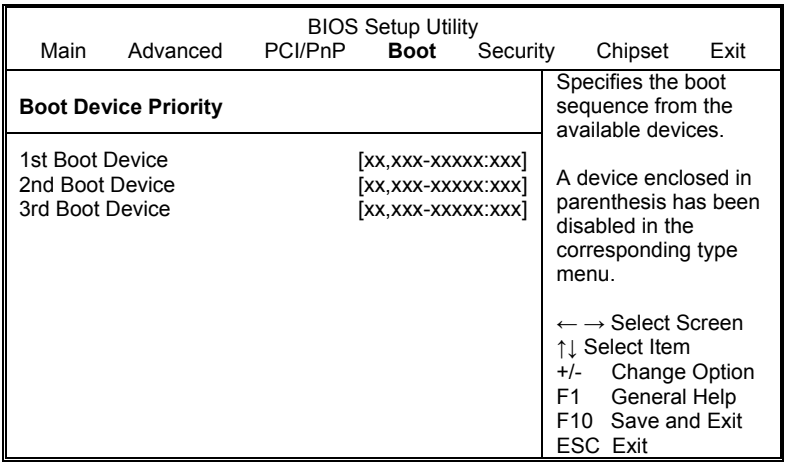
Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.

BIOS Setup Utility Main Advanced PCI/PnP **Boot** Security Chipset Exit		
Boot Settings Configuration		Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Quick Boot	[Disabled]	
Quiet Boot	[Disabled]	
Add On ROM Display Mode	[Force BIOS]	
Boot up Num-Lock	[On]	
PS/2 Mouse Support	[Auto]	
Wait for 'F1' if Error	[Enabled]	
Hit 'DEL' Message Display	[Enabled]	
Interrupt 19 Capture	[Enabled]	← → Select Screen ↑↓ Select Item
Endless Boot	[Disabled]	+/- Change Option F1 General Help F10 Save and Exit ESC Exit

Feature	Option	Description
Boot Settings Configuration		
Quick Boot	Enabled	This option allows user bypass BIOS self test during POST.
	Disabled	
Quiet Boot	**Disabled**	Disabled: displays normal POST messages. Enabled: displays OEM log instead of POST messages.
	Enabled	
Add On ROM Display Mode	**Force BIOS**	Allows user to force BIOS/Option ROM of add-on cards to be displayed during quiet boot.
	Keep Current	
Boot up Num-Lock	**On**	Selects Power-on state for Numlock.
	Off	
PS/2 Mouse Support	Enabled	Selects support for PS/2 Mouse.
	Disabled	
	Auto	
Wait for 'F1' If Error	**Enabled**	Waits for F1 key to be present if error occurs.
	Disabled	
Hit 'DEL' Message Display	**Enabled**	Displays "Press DEL to run Setup" in POST.
	Disabled	
PXE feature	Enabled	Enable/Disable PXE Oprm Scan
	Disabled	
Interrupt 19 Capture	**Enabled**	Enabled: allows option ROMs to trap interrupt 19.
	Disabled	
Endless Boot	**Disabled**	Enable/Disable endless loop boot from BBS table.
	Enabled	

3.9.2 - Boot Device Priority

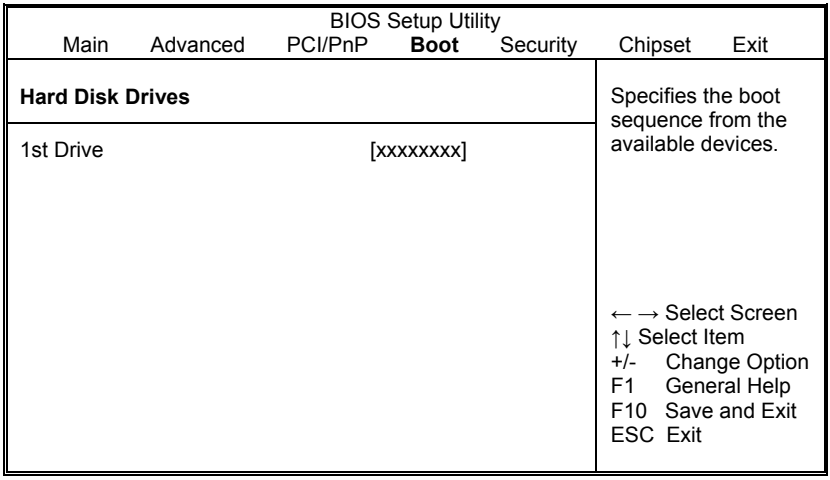
Use this screen to select options for the Boot Device Priority. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Boot Device Priority		
1st Boot Device 2nd Boot Device 3rd Boot Device	**xx,xxx-xxxxx:xxx**	Settings for boot priority. These can be customized depending on your preference.
	xx,xxx-xxxxx:xxx	
	Disabled	

3.9.3 - Hard Disk Drives

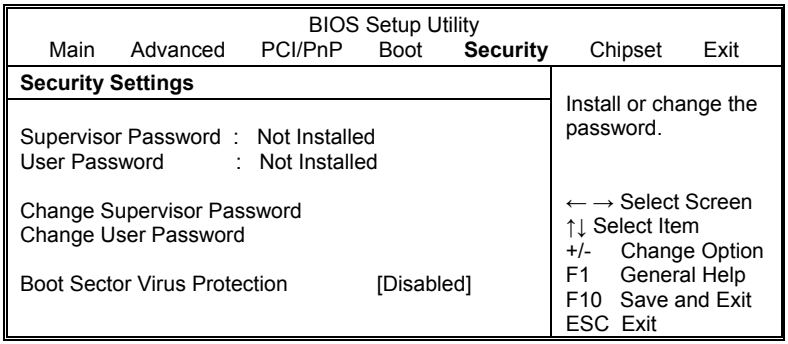
Use this screen to select options for the Hard Disk Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Hard Disk Drives		
1st Drive	**xx,xxx-xxxxx:xxx**	Specifies the boot sequence from the available devices.
	Disabled	

3.10 - Security Menu

The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure.



Feature	Option	Description
Security Settings		
Supervisor Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
User Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
Change Supervisor Password	—	Selects this option to change or install Supervisor Password.
Change User Password	—	Selects this option to change or install User Password.
Boot Sector Virus Protection	**Disabled**	When it is set to [Enabled], BIOS will issue a virus warning message and beep if a write to the boot sector or the partition table of the HDD is attempted.
	Enabled	

3.11 - Chipset Menu

This menu allows the user to customize functions of the Intel Chipsets. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.

BIOS Setup Utility Main Advanced PCI/PnP Boot Security **Chipset** Exit	
Advanced Chipset Settings WARNING: Setting wrong values in below sections may cause system to malfunction. ▸ CPU Bridge Configuration ▸ Northbridge Configuration ▸ Southbridge Configuration	Configure CPU Bridge features. ← → Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit

3.11.1 - CPU Bridge Configuration Sub- Menu

BIOS Setup Utility

Main Advanced PCI/PnP Boot Security **Chipset** Exit

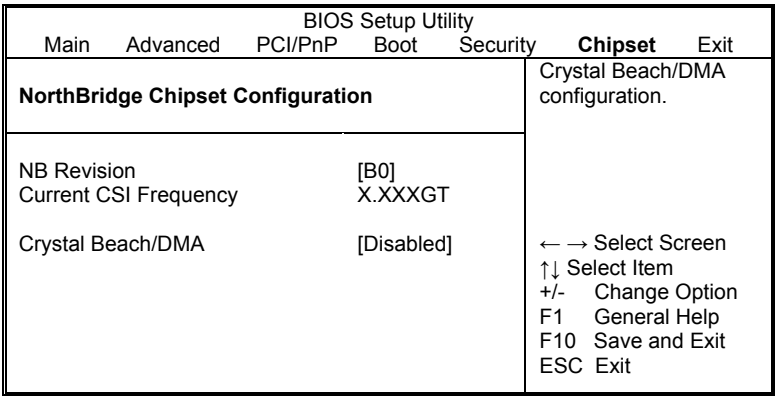
CPU Bridge Chipset Configuration		Transition the links to the specified speed when transitioning the links to full-speed.(if supported by all components)
CPU Revision :B0 Current QPI Frequency :x.xxxGT Current Memory Frequency : xxxxMHz		
QPI Frequency	[Auto]	
Memory Frequency	[Auto]	
Memory Mode	[Independent]	
Demand Scrubbing	[Disabled]	
Patrol Scrubbing	[Disabled]	
Throttling-Closed Loop	[Enabled]	
Hyster temp	[X.X°C]	
Guardhand temp	[xxx]	
Inlet temp	[xxx]	
Temp Rise	[xxx]	
Air Flow	[xxxx]	
Altitude	[Sea Level or below]	
DIMM Pitch	[xxx]	
Throttling-Open Loop	[Enabled]	← → Select Screen
Inlet temp	[070]	↑↓ Select Item
Temp Rise	[020]	Enter Go to Sub Screen
Air Flow	[1500]	F1 General Help
Altitude	[Sea level or below]	F10 Save and Exit
DIMM Pitch	[400]	ESC Exit
Serial DEBUG Message Level	[None]	

Feature	Option	Description
CPU Bridge Chipset Configuration		
QPI Frequency	**Auto**	Transition the links to the specified speed when transitioning the links to full-speed.(if supported by all components)
	4.800GT	
	5.866GT	
	6.400GT	
Memory Frequency	**Auto**	Forces a DDR3 frequency slower than the common tCk detected via SPD.
	Force DDR-800	
	Force DDR-1066	
	Force DDR-1333	
Memory Mode	Independent	Independent: Independent channel. Mirroring: Mirrors channel space between channel. Lockstep: lockstep between channel 0 and 1. Spare: Sparing mode.
	Channel Mirroring	
	Lockstep	
	Sparing	
Demand Scrubbing	**Disabled**	ECC Demand scrub enable/disable
	Enabled	
Patrol Scrubbing	**Disabled**	ECC patrol scrub enable/disable
	Enabled	
Throttling-Closed Loop	Disabled	BIOS to program Closed Loop throttling for memory compents.
	Enabled	
Hyster temp	Disabled	Temperature Hysteresis.
	1.5°C	
	3°C	
	6°C	
Guardhand temp		Temperature guardband to apply to DIMM temp sensor Threshold. (in 0.5°C units)
Inlet temp		Temperature at the chassis inlet. (in 0.5°C units)
Temp Rise		Temperature rise to the DIMM thermal zone. (in 0.5°C units)
Air Flow		Air speed to the DIMMs. (in units of mm/sec)

Feature	Option	Description
Altitude	Sea Level or Below	The system altitude above sea level(in meters)
	1~300	
	301~600	
	601~900	
	901~1200	
	1201~1500	
	1501~1800	
	1801~2100	
	2101~2400	
	2401~2700	
	2701~3000	
DIMM Pitch		The pitch between DIMMs.(in units of 1/1000 inch)
Throttling-Open Loop	**Enabled**	BIOS to program Open Loop throttling for memory compents.
	Disabled	
Inlet temp	[070]	Temperature at the chassis inlet.(in 0.5℃ units)
Temp Rise	[020]	Temperature rise to the DIMM thermal zone. (in 0.5°C units)
Air Flow	[1500]	Air speed to the DIMMs. (in units of mm/sec)
Altitude	Sea Level or Below	The system altitude above sea level(in meters)
	1~300	
	301~600	
	601~900	
	901~1200	
	1201~1500	
	1501~1800	
	1801~2100	
	2101~2400	
	2401~2700	
	2701~3000	
DIMM Pitch	[400]	The pitch between DIMMs.(in units of 1/1000 inch)
Serial Debug message level	NONE	Specifies what level of debug messages to display.
	MIN	
	MAX	
	TEST	

3.11.2 - Northbridge Configuration Sub-Menu

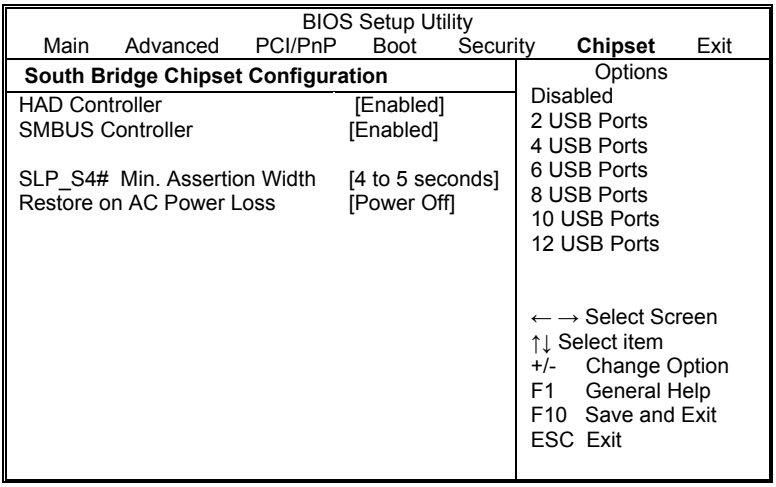
This menu gives options for northbridge devices settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



Feature	Option	Description
NorthBridge Chipset Configuration		
Crystal Beach/DMA	Enabled	Crystal Beach/DMA configuration.
	Disabled	

3.11.3 - Southbridge Configuration Sub-Menu

This menu gives options for southbridge devices settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



Feature	Option	Description
South Bridge Chipset Configuration		
HAD Controller	**Enabled**	Enabled/Disabled SMBUS HAD Controller
	Disabled	
SMBUS Controller	Disabled	Enabled/Disabled SMBUS Controller
	Enabled	
SLP_S4# Min. Assertion Width	**4 to 5 seconds**	Set SLP_S4# Min. Assertion Width.
	3 to 4 seconds	
	2 to 3 seconds	
	1 to 2 seconds	
Restore on AC Power Loss	**Power Off**	System state after Restore on AC Power Loss.
	Power On	
	Last State	

3.12 - Exit Menu

You can display an Exit BIOS Setup option by highlighting it Arrow (↑/↓) keys and pressing Enter.

BIOS Setup Utility Main Advanced PCI/PnP Boot Security Chipset **Exit**	
Exit Options	Exit system setup after saving the changes. F10 key can be used for this operation. ← → Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Save Changes and Exit Discard Changes and Exit Discard Charges Load Optimal Defaults Load Failsafe Defaults	

Save Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are stored into CMOS.
System will use the new settings to boot up.

Discard Changes and Exit
Use this option to exit setup utility and re-boot.
All new selections you have made are not stored into CMOS.
System will use the old settings to boot up.

Discard Changes
Use this option to restore all new setup values that you have made but not saved into CMOS.

Load Optimal Defaults
Use this option to load default performance setup values.
Use this option when system CMOS values have been corrupted or modified incorrectly.

Load Failsafe Defaults
Use this option to load all default failsafe setup values.
Use this option when troubleshooting.

Chapter 4: Diagnostics

If you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN® website at: http://**www.TYAN.com**.

4.1 - Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.

- A single long beep followed by two short beeps: It indicates that a Video error has occurred.
- A single long beep repeatedly: It indicates that a DRAM error has occurred.The most common type of error is a memory error.

Before contacting your vendor or TYAN® Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

4.2 - Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN® web site:

http://www.TYAN.com/

Note:

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN® does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN® be held responsible for damages done by the end user.

4.3 - AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

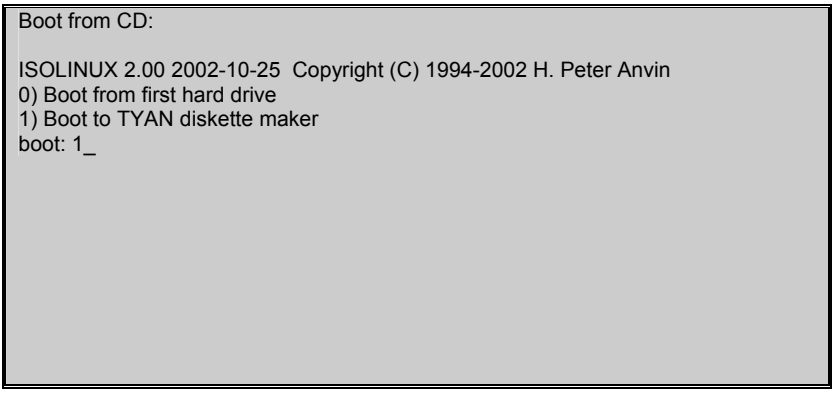
Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

Checkpoint	Description
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

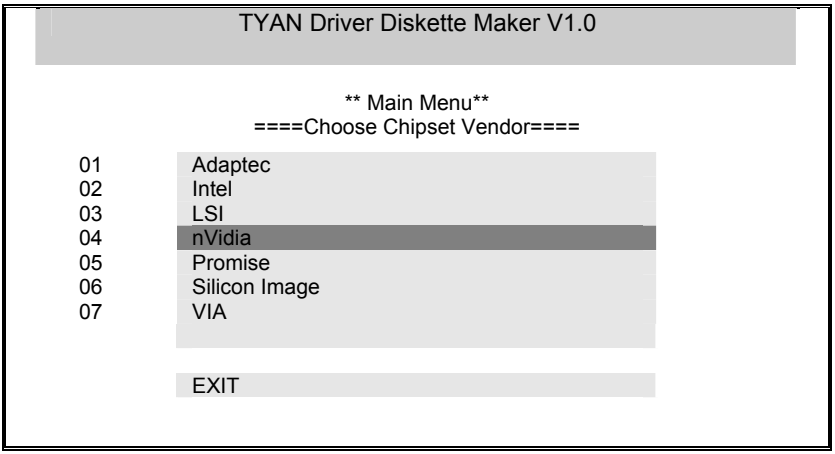
Appendix: How to Make a Driver Diskette

Follow the steps below to make a driver diskette from the TYAN® driver CD provided.

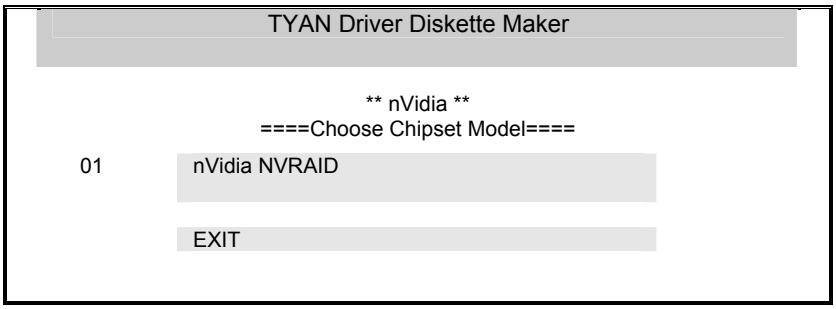
1. Start the system and insert the TYAN® CD into the CD-ROM drive to boot from CD. You will see the following menu. Then press [1] and [Enter] to boot the system to TYAN® diskette maker. (If you would like to boot from hard disk, press 0 and Enter or just wait for 10 seconds to boot automatically from hard disk.).



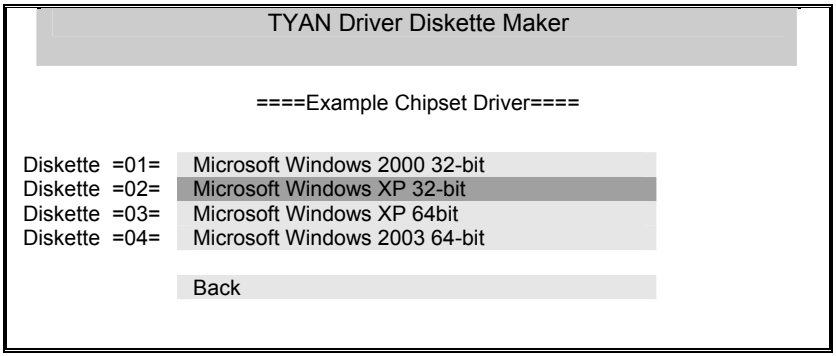
2. Choose the chipset vender which you need from the main menu.



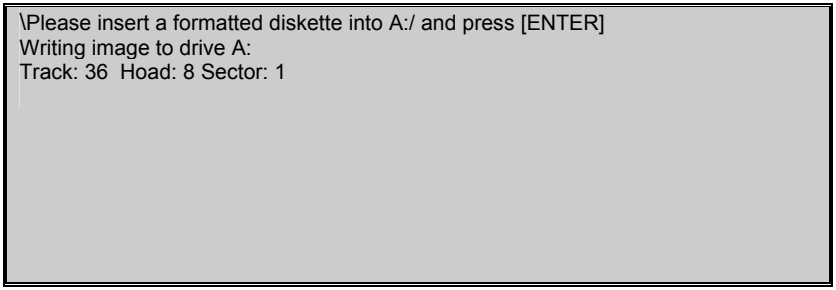
3. The following picture pops up after selecting the chipset model.



4. After selecting the chipset model, select the OS to start the diskette making.



5. Follow the instruction on menu to insert a diskette and press [ENTER].



6. Using "ESC" key to quit the TYAN® diskette maker. The system will automatically restart.

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of

losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.TYAN.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was

designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes

advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

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

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.

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

Operation is subject to the following conditions:

This device may not cause harmful interference, and this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Plug the equipment into an outlet on a circuit different from that of the receiver.

Consult the dealer on an experienced radio/television technician for help.

Notice for Canada

This apparatus complies with the Class B limits for radio interference as specified in the Canadian Department of Communications Radio Interference Regulations. (Cet appareil est conforme aux norms de Classe B d'interference radio tel que specifie par le Ministere Canadien des Communications dans les reglements d'ineteference radio.)

Notice for Europe (CE Mark)

This product is in conformity with the Council Directive 2004/108/EC, 92/31/EEC (EMC).

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. 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.

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