integration with integrity

2807930 User's Manual

ATX Industrial Motherboard

Version 1.0

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Chapter 1

Introduction

1.2 About this User's Manual

This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this User's Manual, please consult your vendor before further handling.

1.3 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that came with the Single Board Computer, whenever components are separated from the system.

1.4 Replacing the lithium battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trashcan. It must be disposed of in accordance with local regulations concerning special waste.

1.6 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantibility and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.7 Packing List

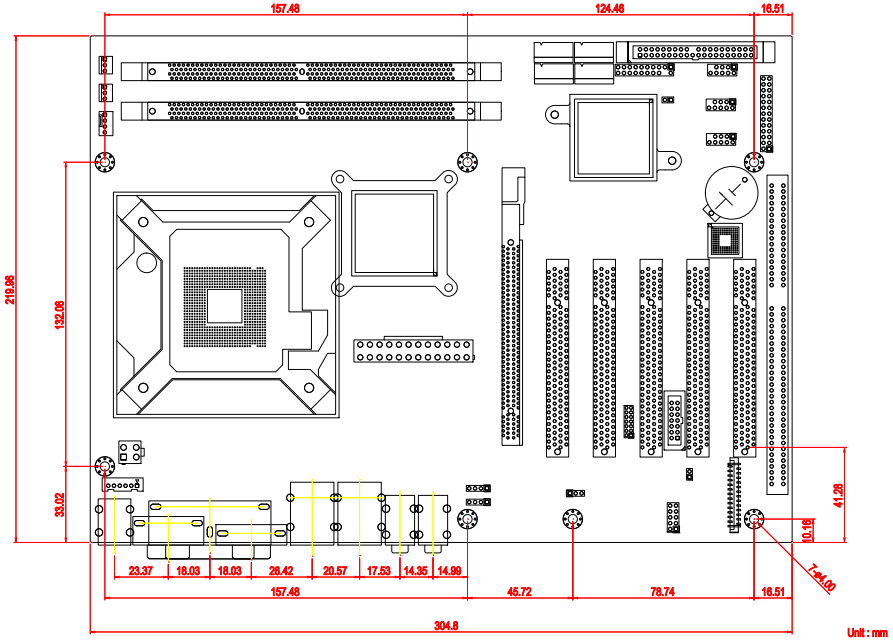
	1 x 2807930 ATX Industrial Motherboard
	1 x Driver CD
	1 x Quick Installation Guide
	COM Port Cable x 1 IDE Cable x 1 USB Cable x 1 SATA Cable x 2

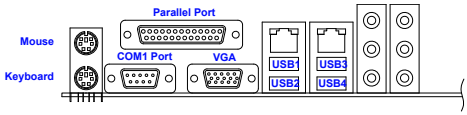
If any of the above items is damaged or missing, contact your vendor immediately.

1.9 Specifications

Form Factor	ATX Industrial Motherboard
Processor	Socket for Intel® Core™ 2 Duo/ Pentium® D/ Celeron® D/ Pentium® 4 processor, with 1066/800/533MHz FSB, w/ HT
Chipset	Intel® Q965 + Intel® ICH8R
System Memory	2 x 240-pin DIMM socket up to 4GB
VGA Controller	Intel® Graphics Media Accelerator (GMA) 3000 graphics core w/ CRT (Dual independent display)
Ethernet	2 x Realtek 8111B 10/100/1000 base-T Ethernet
I/O Chips	ITE-8718
BIOS	AMI PnP Flash BIOS
Audio	ALC888 HD Codec 7.1 channel/MIC-in/Line-in/Line-out
Serial ATA	4 x Serial ATA with 300MB/s HDD transfer rate
IDE Interface	1 x ATA 66/100, support 1 IDE device
Serial Port	2 x COM port (COM1: RS-232, COM2: RS-232/422/485)
Parallel Port	1 x SPP/EPP/ECP mode
FDD	1 x Slim type Floppy connector
KBMS	PS/2 Keyboard and Mouse
External KBMS	1 x 6-pin wafer connector
Universal Serial Bus	10 x USB 2.0 (6 ports by pin header)
Digital I/O	Onboard 8-bit Digital I/O Interface
Expansion Interface	1 x PCIe*16 slot, 5 x PCI slot, 1 x ISA slot
Hardware Monitor Chip	♦ CPU/System temperature and over heat Alarm ♦ 12V/5V/3.3V/Vcore/Vbat/5Vsb/3.3Vsb Voltage ♦ CPU/System Fan speed ♦ CPU over heat Protection
RTC	Real Time Clock
Power Input Connector	24-pin ATX power connector & +12V 4-pin ATX Power Connector
Operating Temp.	0ºC ~ 60ºC (-32ºF ~ 140ºF)
Watchdog Timer	255-level Reset
Dimension (L x W)	305 x 220mm (12” x 8.6”)

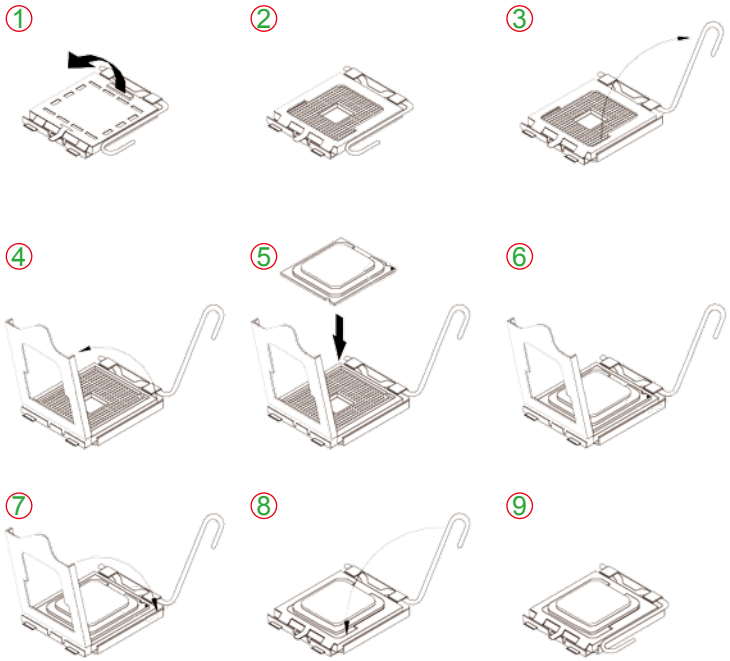
1.10 Board Dimensions





1.11 Installing the CPU

The LGA775 processor socket comes with a lever to secure the processor. Please refer to the pictures step by step as below. Please note that the cover of the LGA775 socket must always be installed during transport to avoid damage to the socket.

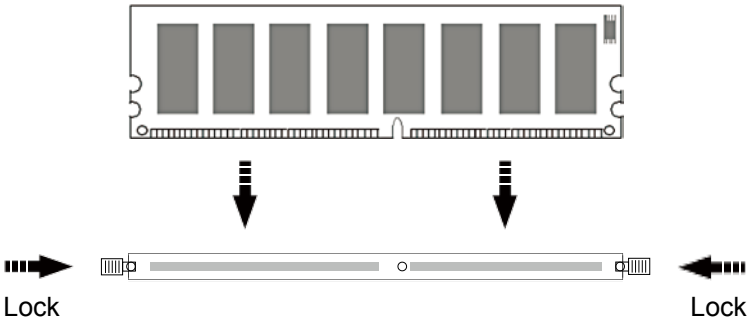


Make sure that heat sink of the CPU top surface is in complete contact to avoid the CPU overheating problem.
If not, it would cause your system or CPU to be hanged, unstable, damaged.

1.12 Installing the Memory

To install the Memory module, locate the Memory DIMM slot on the board and perform as below:

1. Hold the Memory module so that the key of the Memory module align with those on the Memory DIMM slot.
2. Gently push the Memory module in an upright position and a right way until the clips of the DIMM slot close to lock the Memory module in place, when the Memory module touches the bottom of the DIMM slot.
3. To remove the Memory module, just pressing the clips of DIMM slot with both hands.



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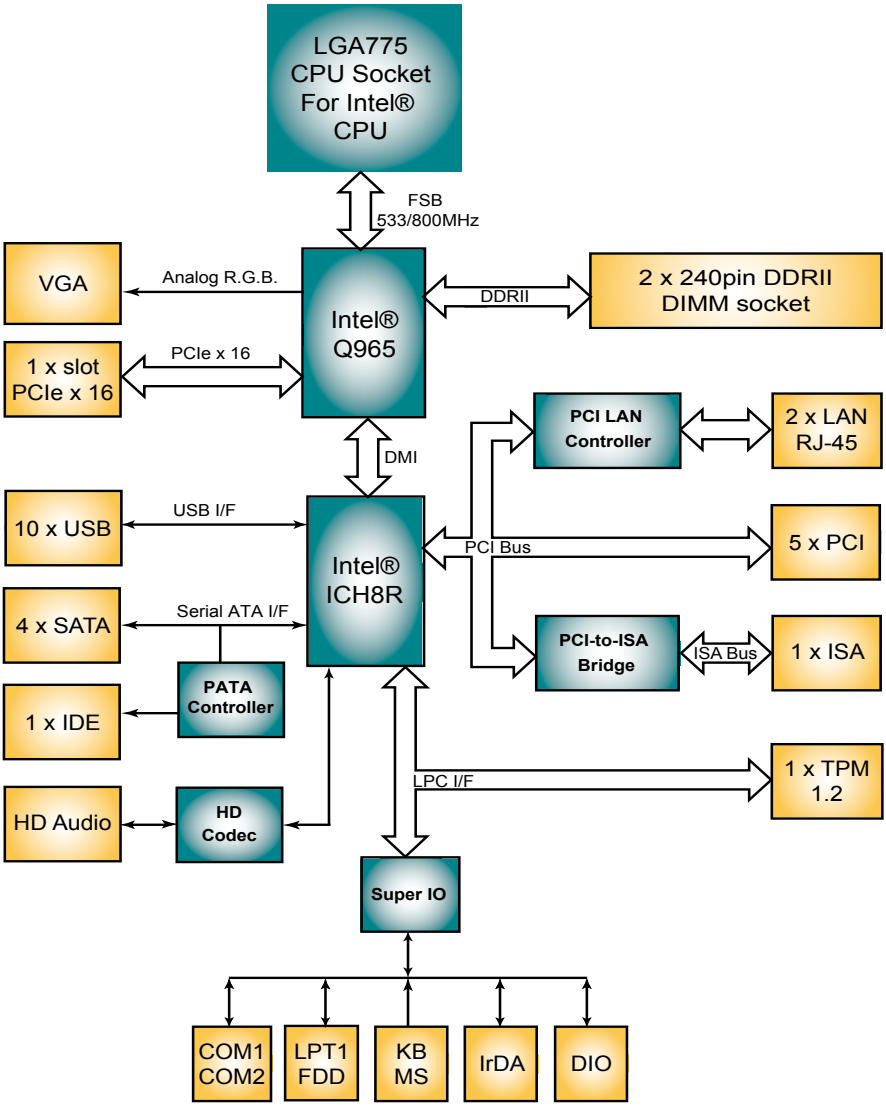
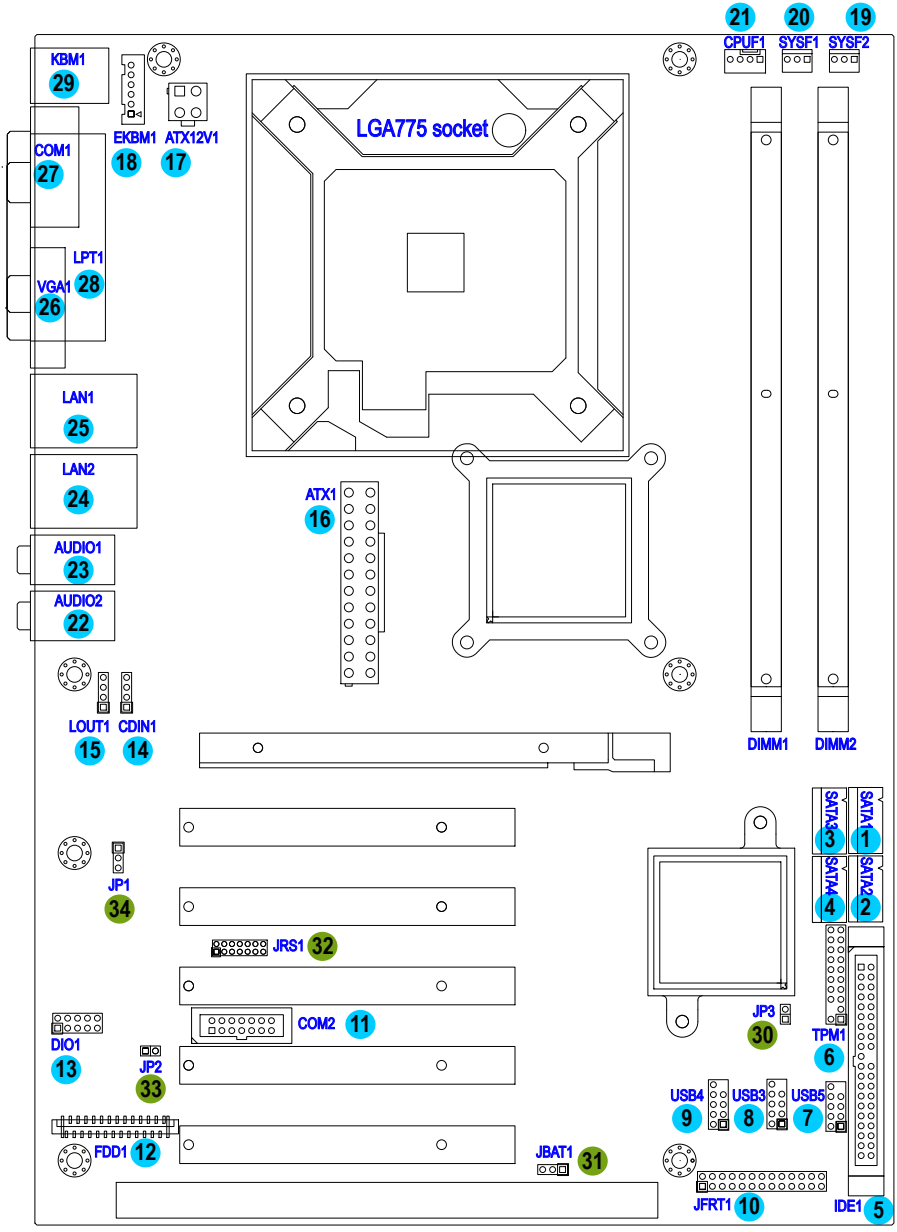
Chapter 2 Installation

2.1 Block Diagram



2.2 Jumpers and Connectors



Jumpers

JP3: PATA IDE Select (30)

Connector type: 2.54mm pitch 1x2 pin header.

Pin 1-2	Function Select	
Short	Disable	
Open	Enable (Default)	

JBAT1: CMOS Setup (31)

If the board refuses to boot due to inappropriate CMOS settings here is how to proceed to clear (reset) the CMOS to its default values.

Connector type: 2.54mm pitch 1x3 pin header

Pin	Mode	
1-2	Keep CMOS (Default)	
2-3	Clear CMOS	

You may need to clear the CMOS if your system cannot boot up because you forgot your password, the CPU clock setup is incorrect, or the CMOS settings need to be reset to default values after the system BIOS has been updated.

Refer to the following solutions to reset your CMOS setting:

Solution A:

1. Power off the system and disconnect the power cable.
2. Place a shunt to short pin 1 and pin 2 of JBAT1 for five seconds.
3. Place the shunt back to pin 2 and pin 3 of JBAT1.
4. Power on the system.

Solution B:

If the CPU Clock setup is incorrect, you may not be able to boot up. In this case, follow these instructions:

1. Turn the system off, then on again. The CPU will automatically boot up using standard parameters.
2. As the system boots, enter BIOS and set up the CPU clock.

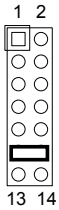
Note:

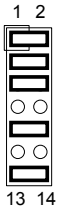
If you are unable to enter BIOS setup, turn the system on and off a few times.

JRS1: COM2 RS-232/RS-422/RS-485 Mode Select (32)

Connector type: 2.00 mm pitch 2x7 pin header

Mode	RS-232 (Default)	RS-422	RS-485
1-2	Off	On	On
3-4	Off	On	On
5-6	Off	Off	On
7-8	Off	On	Off
9-10	Off	On	On
11-12	On	Off	Off
13-14	Off	Off	On





JP2: AT/ATX Power Mode Select (33)

The power mode jumper selects the power mode for the system.
Connector type: 2.54mm pitch 1x2 pin header.

Pin 1-2	Mode	
Short	AT Mode	
Open	ATX Mode (Default)	

JP1: BIOS Write protect (34)

Connector type: 2.54mm pitch 1x3 pin header.

Pin	Mode	
1-2	Write protect (default)	
2-3	Write Enable	

Connectors

SATA1~4: Serial ATA Connectors (1), (2), (3), (4)

There are on board supports four SATA II connectors, second generation SATA drives transfer data at speeds as high as 300MB/s, twice the transfer speed of first generation SATA drives. The SATA drives can be configured in a RAID 0, RAID 1 or RAID 10 configuration.

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

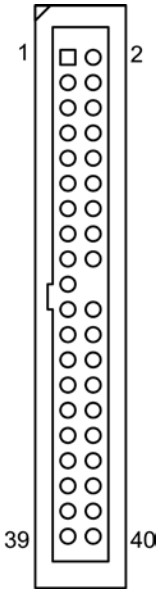
IDE1: Primary IDE Connector (5)

An IDE drive ribbon cable has two connectors to support two IDE devices. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive.

Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1 (color) edge of the cable corresponds to pin 1 of the IDE connector.

Connector type: 2.54mm pitch 2x20 box header

Pin	Description	Pin	Description
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N/C (Key)
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	IDESEL
29	DACK	30	GND
31	IRQ14	32	N/C
33	ADDR1	34	ATA66 DETECT
35	ADDR0	36	ADDR2
37	CS0#	38	CS1# (HDSELET1)
39	IDEACTP	40	GND

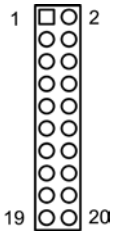


TPM1: Trusted Platform Module Connector (6)

The TPM connector is interfaced to the Intel ICH9 south bridge through the LPC bus. The ICH9 supports TPM version 1.2 devices for enhanced security.

Connector type: 2.54mm pitch 2x10 pin header

Pin	Description	Pin	Description
1	CLK	2	GND
3	LFRAME	4	N/C
5	LRESET	6	N/C
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	N/C	14	N/C
15	+3.3V_SB	16	SERIRQ
17	GND	18	CLKRUN
19	PD	20	N/C

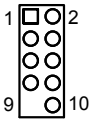


USB1/ USB2/ USB3: USB Connectors (7), (8), (9)

On board supports three headers USB1, USB2, and USB3 that can connect up to six high-speed (Data transfers at 480MB/s), full-speed (Data transfers at 12MB/s) or low-speed (Data transfers at 1.5MB/s) USB devices.

Connector type: 2.54mm 2x5 pin header

Pin	Description	Pin	Description
1	+5V	2	+5V
3	USBD-	4	USBD-
5	USBD+	6	USBD+
7	GND	8	GND
9	N/C (Key)	10	N/C

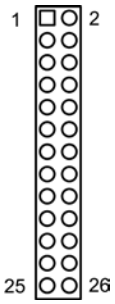


JFRT1: Switches and Indicators (10)

It provides connectors for system indicators that provides light indication of the computer activities and switches to change the computer status.

Connector type: 2.54mm pitch 2x13 pin header

Pin	Description	Pin	Description
1	+5V	2	RESET+
3	N/C	4	RESET-
5	IRRX	6	N/C
7	GND	8	SPKR
9	IRTX	10	BUZZ
11	N/C	12	GND
13	HDD_LED+	14	+5V
15	HDD_LED-	16	N/C
17	TB_LED+	18	POWER_LED+
19	TB_LED-	20	N/C
21	N/C	22	POWER_LED-
23	PWRBTN+	24	KBLOCK
25	PWRBTN-	26	GND



IrDA: Infrared connector, pin 1, 3, 5, 7, 9

HLED: HDD LED Connector, pin 13-15.

This 2-pin connector connects to the case-mounted HDD LED to indicate hard disk activity.

RES: Reset Button, pin 2-4.

This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.

TB_LED: pin 17-19

PWRBTN: ATX soft power switch, pin 23-25.

This 2-pin connector connects to the case-mounted Power button.

PLED: Power LED Connector, pin 18, 20, 22.

This 3-pin connector connects to the case-mounted power LED. Power LED can be indicated when the CPU card is on or off. And keyboard lock can be used to disable the keyboard function so the PC will not respond by any input.

SPK: External Speaker, pin 8, 10, 12, 14.

This 4-pin connector connects to the case-mounted speaker.

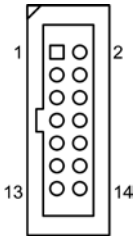
KBLOCK: Keyboard Lock, pin 24-26.

COM2: RS-232/422/485 Connector (11)

The onboard COM2 port can be configured to operate in RS-422 or RS-485 modes. RS-422 modes differ in the way RX/TX is being handled. Jumper JRS1 switches between RS-232 or RS-422/485 mode. All of the RS-422/485 are available on COM2.

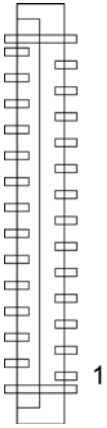
Connector type: 2.54mm pitch 2x7 box header.

Pin	Description	Pin	Description
1	DCD2#	2	DSR2#
3	RXD2	4	RTS2#
5	TXD2	6	CTS2#
7	DTR2#	8	RI2#
9	GND	10	GND
11	TX+	12	TX-
13	RX+	14	RX-



FDD1: FDD Connector (12)

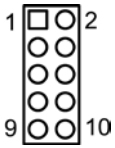
Pin	Description	Pin	Description
1	+5V	2	INDEX#
3	+5V	4	DRIVER SELECT A#
5	+5V	6	DISK CHANGE#
7	N/C	8	N/C
9	N/C	10	MOTOR ENABLE A#
11	N/C	12	DIRECTION#
13	DRIVE DENSITY SELECT 0	14	STEP#
15	GND	16	WRITE DATA#
17	GND	18	WRITE GATE#
19	GND	20	TRACK0#
21	GND	22	WRITE PROTECT#
23	GND	24	READ DATA#
25	GND	26	HEAD SELECT#



DIO1: Digital I/O Connector (13)

DIO1 is a 8-bit DIO connector that supports 4-bit In/ 4-bit Out.
Connector type: 2.54mm pitch 2x5 pin header

Pin	Description	Pin	Description
1	OUTPUT1	2	INPUT1
3	OUTPUT2	4	INPUT2
5	OUTPUT3	6	INPUT3
7	OUTPUT4	8	INPUT4
9	+5V	10	GND



CDIN1: Audio CD IN Connector (14)

Connector type: 2.54mm pitch 1x4 pin header.

Pin	Description
1	CD-L
2	GND
3	GND
4	CD-R

LOUT1: Audio Line Out Connector (15)

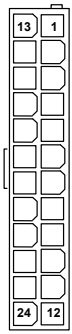
Connector type: 2.54mm pitch 1x4 pin header.

Pin	Description
1	LOUT-L
2	GND
3	LOUT_JD
4	LOUT-R

ATX1: ATX Power Supply Connector (16)

The ATX power supply has a single lead connector with a clip on one side of the plastic housing. There is only one way to plug the lead into the ATX power connector. Press the lead connector down until the clip snaps into place and secures the lead onto the connector.

Pin	Description	Pin	Description
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	GND	3	GND
16	PS-ON	4	+5V
17	GND	5	GND
18	GND	6	+5V
19	GND	7	GND
20	-5V	8	PW-OK
21	+5V	9	+5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	GND	12	+3.3V

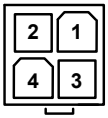


Warning

Incorrect installation of the power supply could result in serious damage to the mainboard and connected peripherals. Make sure the power supply is unplugged from the AC outlet before connecting the leads from the power supply.

ATX12V1: ATX +12V Connector (17)

Pin	Description	Pin	Description
2	GND	1	GND
4	+12V	3	+12V

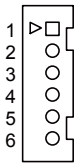


ATX12V1 supplies the CPU operation ATX +12V (Vcore).

EKBM1: External keyboard and Mouse Connector (18)

Connector type: 2.50mm pitch 1x6-pin box wafer connector

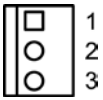
Pin	Description
1	KB_Data
2	GND
3	MS_Data
4	KB_Clock
5	+5V
6	MS_Clock



SYSF1/SYSF2: System Fan Power Connectors (19), (20)

SYSF1 and SYSF2 are 3-pin header for the system fan. The fan must be a +12V fan.

Pin	Description
1	GND
2	+12V
3	FAN_Detect

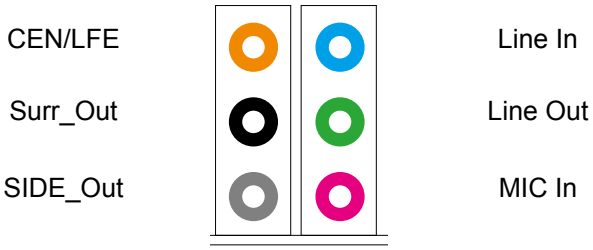


CPUF1: CPU Fan Power Connector (21)

CPUF1 is a 4-pin header for the CPU fan. The fan must be a +12V fan.

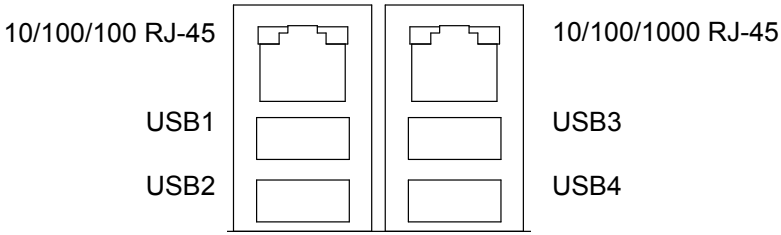
Pin	Description
1	GND
2	+12V
3	Fan_ Detect
4	Fan Speed Control

Audio1/ Audio2: HD Audio Phone Jacks (22), (23)



LAN1/LAN2: RJ-45 & double stack USB Connectors (24), (25)

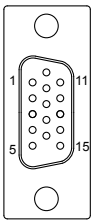
LAN1/ LAN2 each one supports one 10/100/1000 Mbps fast Ethernet and two USB 2.0 connectors w/ 480MB/s.



VGA1: CRT Connector (26)

Connector type: D-Sub 15-pin female.

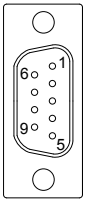
Pin	Description	Pin	Description
1	RED	9	+5V
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	VDDAT
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	VDCLK
8	GND		



COM1: RS-232 Connector (27)

Connector type: D-Sub 9-pin male.

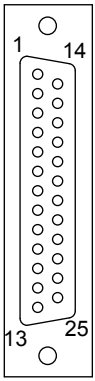
Pin	Description	Pin	Description
1	DCD#	6	DSR#
2	RXD	7	RTS#
3	TXD	8	CTS#
4	DTR#	9	RI#
5	GND		



LPT1: Parallel Port Connector (28)

Connector type: D-Sub 25-pin female.

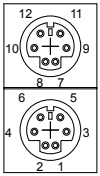
Pin	Description	Pin	Description
1	STROBE	14	AFD
2	PTD0	15	ERROR
3	PTD1	16	INIT
4	PTD2	17	SLIN
5	PTD3	18	GND
6	PTD4	19	GND
7	PTD5	20	GND
8	PTD6	21	GND
9	PTD7	22	GND
10	ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT	26	N/C



KBM1: PS/2 Keyboard & Mouse (29)

Standard Mini-DIN PS/2 Keyboard & Mouse connector

Pin	Description
1	KB Data
2	N/C
3	GND
4	+5V
5	KB Clock
6	N/C
7	MS Data
8	N/C
9	GND
10	+5V
11	MS Clock
12	N/C



Mouse (Green)

Keyboard (Purple)

2.3 The Installation Paths of CD Driver

Driver	Path
AUDIO	\AUDIO\REALTEK_HD\WINDOWS_R178
CHIPSET	\CHIPSET\INTEL\INF 8.1
LAN	\ETHERNET\REALTEK\8111B_WIN5640
VGA	\GRAPHICS\INTEL_2K_XP_32\1431 \GRAPHICS\INTEL_VISTA_32\1561

Chapter 3

Appendix

I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.
The following table lists the I/O port addresses used.

Address	Device Description
00000000 - 0000000F	DMA Controller
00000080 - 0000009F	DMA Controller
000000C0 - 000000DF	DMA Controller
00000020 - 00000021	Programmable Interrupt Controller
000000A0 - 000000A1	Programmable Interrupt Controller
00000040 - 00000043	System Timer
00000044 - 00000047	System Timer
00000060 - 00000064	Keyboard Controller
00000070 - 00000073	System CMOS/Real Time Clock
000000F0 - 000000FF	Math Co-processor
00000274 - 00000277	ISAPNP Read Data Port
00000279 - 00000279	ISAPNP Configuration
000002F8 - 000002FF	Communications Port (COM2, If use)
00000378 - 0000037A	Parallel Port (If use)
000003B0 - 000003BF	MDA/MGA
000003C0 - 000003CF	EGA/VGA
000003D4 - 000003D9	CGA CRT register
000003F0 - 000003F7	Floppy Diskette
000003F8 - 000003FF	Communications Port (COM1, If use)
00000400 - 0000041F	South Bridge SMB
00000480 - 000004BF	South Bridge GPIO
000004D0 - 000004D1	IRQ Edge/Level Control Ports
00000800 - 0000087F	ACPI
00000A00 - 00000A07	PME
00000A10 - 00000A17	Hardware Monitor
00000A20 - 00000A27	Digital I/O

00000A30 - 00000A37	SFIF
00000CF8	PCI Configuration Address
00000CFC	PCI Configuration Data
00004700 - 0000470B	TPM (If use)

Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 0	System Timer
IRQ 1	Keyboard Controller
IRQ 2	VGA and Link to Secondary PIC
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	PCI Device
IRQ 6	Standard Floppy Disk Controller
IRQ 7	Parallel Port
IRQ 8	System CMOS/real time clock
IRQ 9	Microsoft ACPI-Compliant System
IRQ 10	PCI Device
IRQ 11	PCI Device
IRQ 12	PS/2 Compatible Mouse
IRQ 13	FPU Exception
IRQ 14	PCI Device
IRQ 15	PCI Device

BIOS memory mapping

Address	Device Description
00000h - 9FFFFh	DOS Kernel Area
A0000h, BFFFFh	EGA and VGA Video Buffer (128KB)
C00000h - CFFFFh	EGA/VGA ROM
D0000h - DFFFFh	Adaptor ROM
E00000h - FFFFFh	System BIOS
EFD40000h - FED44FFFFh	TPM (If use)