# VTC820

Full-Size Socket 478 Pentium 4
Intel 845G CPU Card

# USER'S MANUAL

Version 1.0

## Acknowledgments

# Table of Contents

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# Introduction

## Product Description

The VTC820 Pentium 4 Full Size PICMG CPU Card incorporates the Intel® advanced 845G Chipset Memory Controller hub and supports 478-pin Intel Pentium 4 processors of 1.3GHz and up to 2.6GHz+ with FSB 533MHz/400MHz. VTC820 supports the Pentium 4 processor with 256-KB L2 cache and the Pentium 4 processor with 512-KB L2 cache on 0.13 micron process.

The I/O functions are on VTC820 integrated onto the ICH4. It supports either the integrated graphics device (IGD) on the GMCH or an external graphics device on AGP. The IGD has 3D, 2D, and video capabilities. The system memory size can be up to 2 GB, using the two DDR sockets on board. Six USB ports are supported with the USB 1.1/2.0 standard.

VTC820 optionally supports the ATI Mobility M7 graphics controller with 16MB or 32MB embedded memory. Interface supported are LVDS, TMDS and dual CRT. The VGA functionality offers unprecedented video quality and ***integrated MPEG-2 decode capability***. VTC820 also optionally comes with an Intel 82540 Gigabit LAN controller for faster networking access.

VTC820 supports a MicroPCI socket for MicroPCI daughter cards with VGA, VGA/LAN, Ethernet (LAN), SCSI, and IEEE 1394 functions.

This CPU card represents the perfect choice for those who want superior performance for rugged and demanding applications in industrial automation, image processing, multimedia and telecommunications.

# Checklist

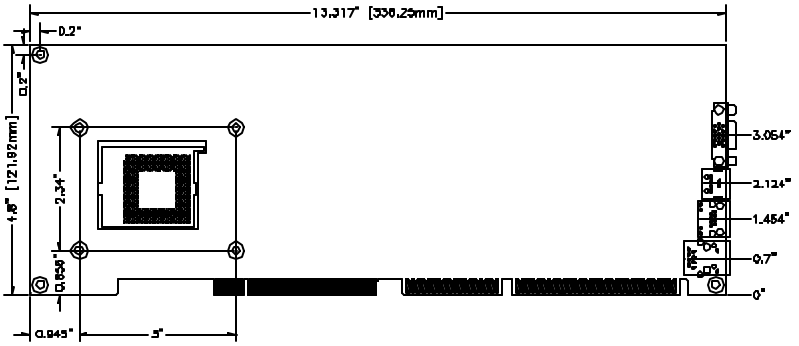
Your VTC820 package should include the items listed below.

- The VTC820 Industrial CPU Card
- This User' s Manual
- 1 IDE Ribbon Cable
- 1 Floppy Ribbon Connector
- 2 Serial Port Ribbon Cable and 1 Parallel Port Attached to a Mounting Bracket
- 1 Y-Cable supporting a PS/2 Keyboard and a PS/2 Mouse
- 1 CD containing the following:
  - Chipset Drivers
  - Flash Memory Utility
- Optional audio cable with bracket (Audio8K)
- Optional USB cable with bracket (USB2K)
- Optional Secondary CRT VGA cable with bracket (VGA4K)
- Optional TMDS/CRT cable with bracket (ID120P)

# Specifications

| | |
|---|---|
| ***CPU Socket*** | Socket 478 |
| ***CPU*** | Intel Pentium 4, 1.30GHz ~ 2.6GHz+ |
| ***CPU Front Side Bus*** | 533MHz / 400MHz |
| ***Chipset*** | Intel 845G Chipset |
| ***L2 Cache*** | 128K/256K/512K, CPU integrated |
| ***BIOS*** | Award BIOS, ACPI supported |
| ***System Memory*** | Two DDDR sockets, up to 2GB DDR SDRAM |
| ***Integrated VGA*** | Intel 845G integrated VGA<br>Supports CRT interface |
| ***Optional VGA*** | ATI Mobility M7 graphics controller<br>16MB/32MB embedded memory<br>Frame buffer (DDR, AGP4)<br>LVDS/TMDS/dual CRT interface |
| ***LAN*** | ICH4 integrated Ethernet controller<br>10Base-T / 100Base-TX Protocol<br>Optional Gigabit Ethernet solution |
| ***Audio*** | ICH4 integrated audio<br>Optional AC97 codec and audio cable |
| ***LPC I/O*** | W83627HF chipset supports IrDA x 1, Parallel x 1, COM1 (RS232), COM2 (RS232/422/485), FDC up to 2.88MB (3Mode support) Hardware Monitor (3 thermal inputs, 6 voltage monitor inputs, VID0-4, 3 fan headers) |
| ***IDE Interface*** | Built in ICH4; Two enhanced IDE supports 4 IDE devices including UDMA33/66/100, PIO mode 4 and bus master |
| ***FDD Interface*** | Supports up to two floppy disk drives: 3.5" and/or 5.25" drives; 3 Mode support |
| ***Parallel Port*** | One parallel port supports SPP/EPP/ECP |
| ***Serial Ports*** | One RS-232/422/485 and one RS-232 port |
| ***Watchdog Timer*** | Generates system reset; 256 levels |
| ***SSD Interface*** | Supports 2MB~144MB M-Systems DiskOnChip flash disk |
| ***Hardware Monitoring*** | Built in W83627HF; monitors system/CPU temperature and voltage status |
| ***USB*** | Supports 6 USB ports, USB 1.1/2.0 compliant |
| ***IrDA*** | Pin header |
| ***Keyboard and Mouse*** | PS/2 type connectors |
| ***Extra Features*** | ISA High Drive, PCI to ISA Bridge (ITE 8888)<br>One MicroPCI socket, ATX 12V power connector |
| ***Power Consumption*** | Pentium 4 1.8GHz with 512MB DDR SDRAM<br>+5V: 5.7A +12V: 8.5A<br>Pentium 4 2.2GHz with 512MB DDR SDRAM<br>+5V: 6.4A +12V: 6.3A |
| ***Form Factor*** | Full Size CPU Card |
| ***Dimensions*** | 338mm x 122mm (13.3” x 4.8”) |

# Board Dimensions



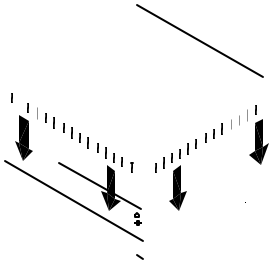
# Installations

This section provides information on how to use the jumpers and connectors on the VTC820 in order to set up a workable system. The topics covered are:

# Installing the CPU

The VTC820 CPU Card supports a Socket 478 processor socket for Intel Pentium 4 processors.

The Socket 478 processor socket comes with a lever to secure the processor. Raise this lever to about a 90° angle to allow the insertion of the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, return the lever to the lock position. Refer to the figures below.



After you have installed the processor into the socket, check if the jumpers for the CPU type and speed are correct.

***NOTE**: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

## ATX Power Installation

The system power is provided to the VTC820 CPU card with the J1 and J8 ATX power connectors. Please note that the J8 external ATX power connector should be connected to the backplane for VTC820 to function. J8 is a 3-pin power connector. J1 is a 4-pin 12V power connector. J1 is to be connected to the ATX power supply.

## MicroPCI Daughter Card Installation

To insert the MicroPCI daughter cards, position it at 30° to the PCB and gently push it into the MicroPCI connector (See Figure 1 below). The card will not fit when inserted at an angle of 45° or 15°. Once inserted, slowly press the card towards the PCB until it locks on both sides to the clips of the connector. Screw the card to the PCB to secure the installation. To remove the MicroPCI card, pull the ' clips' sideways as shown in Figure 2 below.

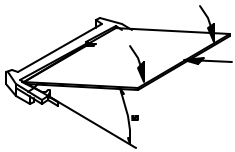


Figure 1.

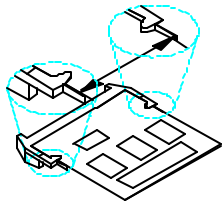


Figure 2.

# Installing the Memory

The VTC820 CPU Card supports two DDR memory sockets for a maximum total memory of 2GB in DDR memory type. The memory module capacities supported are 64MB, 128MB, 256MB, 512MB and 1GB. The following table lists the supported SDR DIMM configurations. Intel 845G supports configurations defined in the JEDEC DDR DIMM specification only (A,B,C). Non-JEDEC standard DIMMs such as double-sided x16 DDR SDRAM DIMMs are not supported.

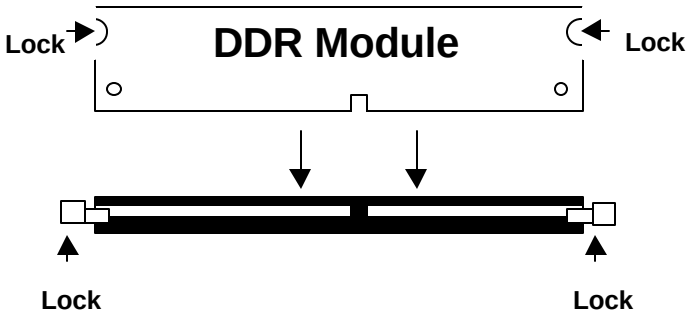
**Supported DDRM DIMM Configurations.**

| Density | 64 Mbit | | 128Mbit | | 256Mbit | | 512Mbit | |
|---|---|---|---|---|---|---|---|---|
| Device Width | X8 | X16 | X8 | X16 | X8 | X16 | X8 | X16 |
| Single/ Double | SS/DS | SS/DS | SS/DS | SS/DS | SS/DS | SS/DS | SS/DS | SS/DS |
| 184-pin DDR | 64/128MB | 32MB/NA | 128/256MB | 64MB/NA | 256/512MB | 128MB/NA | 512/1024M | 256MB/NA |

**Installing and Removing Memory Modules**

To install the DDR modules, locate the memory slot on the CPU card and perform the following steps:

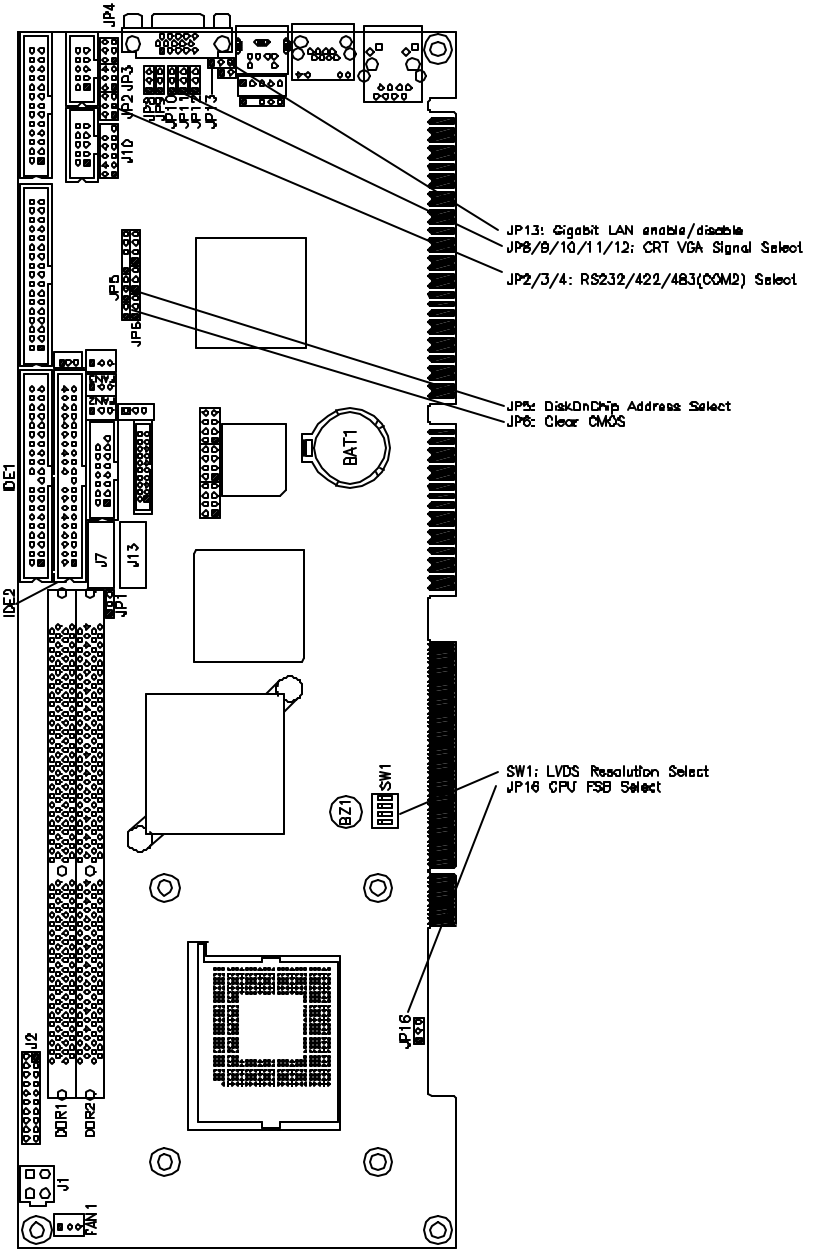
1. Hold the DDR module so that the key of the DDR module align with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.



# Setting the Jumpers

Jumpers are used on VTC820 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on VTC820 and their respective functions.

## Jumper Locations on VTC820



### Configuring the CPU Frequency

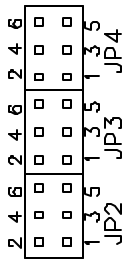
The VTC820 CPU card does not provide DIP switches to configure the processor speed (CPU frequency). However, JP16 can be used to select the Front Side Bus of the processor.

### JP16: CPU Front Side Bus Select

| JP16 | Front Side Bus |
|---|---|
|   | Auto (Default) |
|   | 100Mhz |
|   | 133Mhz |

### JP2, JP3, JP4: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.




| COM2 Function | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| Jumper Setting (pin closed) | JP2: 1-2<br>JP3: 3-5 & 4-6<br>JP4: 3-5 & 4-6 | JP2: 3-4<br>JP3: 1-3 & 2-4<br>JP4: 1-3 & 2-4 | JP2: 5-6<br>JP3: 1-3 & 2-4<br>JP4: 1-3 & 2-4 |

### JP5: DiskOnChip Address Select

| JP5 | Address |
|---|---|
|   | D0000-D7FFF |
|   | D8000-DFFFF (default) |

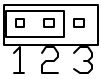
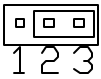
### JP6: Clear CMOS Contents

Use JP6, a 3-pin header, to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the CPU card before clearing CMOS.*

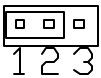
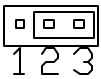
| JP6 | Setting | Function |
|---|---|---|
|  | Pin 1-2<br>Short/Closed | Normal |
|  | Pin 2-3<br>Short/Closed | Clear CMOS |

### JP8, JP9, JP10, JP11, JP12: CRT VGA Signal Select

Use JP8, JP9, JP10, JP11, and JP12 to select the CRT VGA signal, either from the on board VGA or from an optional MicroPCI VGA.

| JP8/9/10/11/12 | Function |
|---|---|
|  | On Board VGA |
|  | MicroPCI VGA |

### JP13: Gigabit LAN Enable/Disable

| JP13 | Function |
|---|---|
|  | Enable Gigabit LAN |
|  | Disable Gigabit LAN |

* Note: Use this jumper only when your CPU card has the Gigabit LAN function.

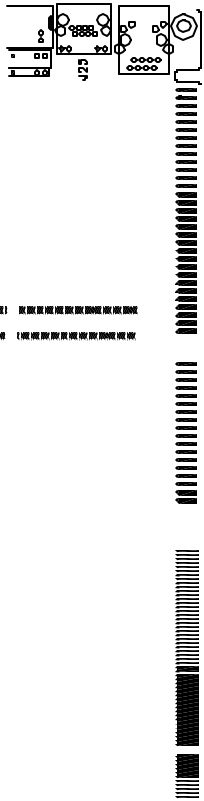
### SW1: LVDS Resolution Select

| SW1-1 | SW1-2 | SW1-3 | Resolution |
|---|---|---|---|
| OFF | ON | ON | 800x600 18 bit |
| ON | OFF | ON | 1024x768 18bit |
| OFF | OFF | ON | 1024x768 24 bit |

# Connectors on VTC820

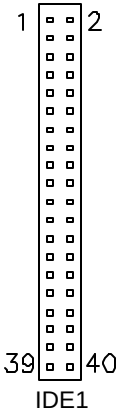
The connectors onVTC820 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on VTC820 and their respective functions.

## Connector Locations on VTC820



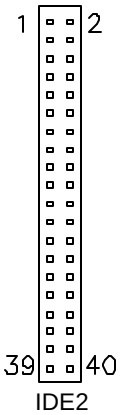
IDE1, IDE2: EIDE Connectors
FDD1: Floppy Drive Connector
J1: ATX 12V/+12V Power Connector
FAN1: CPU Fan Power Connector
FAN2: System Fan Power Connector
FAN3: Auxiliary Fan Power Connector
J2: System Function Connector
J3: Parallel Port Connector
J5, J6: COM1 and COM2 Serial Ports
J7, J13: LVDS Connectors
J8: External ATX Power Connector
J9: CRT2 / TV-Out Connector
J10: External Audio Connector
J12: IrDA Connector
J15: CD-In Audio Connector
J16: TMDS Panel Connector (on ID120)
J17: VGA CRT Connector
J18, J19, J20: USB Connectors
J21, J22: External PS/2 KB and Mouse
J23: PS/2 Keyboard and Mouse
J25: Gigabit LAN RJ45 Connector (option)
J26: Primary RJ45 Connector

## IDE1, IDE2: EIDE Connectors




**IDE1: Primary IDE Connector**

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Reset IDE | 1 | 2 | Ground |
| Host data 7 | 3 | 4 | Host data 8 |
| Host data 6 | 5 | 6 | Host data 9 |
| Host data 5 | 7 | 8 | Host data 10 |
| Host data 4 | 9 | 10 | Host data 11 |
| Host data 3 | 11 | 12 | Host data 12 |
| Host data 2 | 13 | 14 | Host data 13 |
| Host data 1 | 15 | 16 | Host data 14 |
| Host data 0 | 17 | 18 | Host data 15 |
| Ground | 19 | 20 | Protect pin |
| DRQ0 | 21 | 22 | Ground |
| Host IOW | 23 | 24 | Ground |
| Host IOR | 25 | 26 | Ground |
| IOCHRDY | 27 | 28 | Host ALE |
| DACK0 | 29 | 30 | Ground |
| IRQ14 | 31 | 32 | No connect |
| Address 1 | 33 | 34 | No connect |
| Address 0 | 35 | 36 | Address 2 |
| Chip select 0 | 37 | 38 | Chip select 1 |
| Activity | 39 | 40 | Ground |

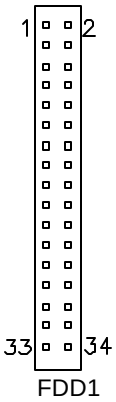



**IDE2: Secondary IDE Connector**

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Reset IDE | 1 | 2 | Ground |
| Host data 7 | 3 | 4 | Host data 8 |
| Host data 6 | 5 | 6 | Host data 9 |
| Host data 5 | 7 | 8 | Host data 10 |
| Host data 4 | 9 | 10 | Host data 11 |
| Host data 3 | 11 | 12 | Host data 12 |
| Host data 2 | 13 | 14 | Host data 13 |
| Host data 1 | 15 | 16 | Host data 14 |
| Host data 0 | 17 | 18 | Host data 15 |
| Ground | 19 | 20 | Protect pin |
| DRQ1 | 21 | 22 | Ground |
| Host IOW | 23 | 24 | Ground |
| Host IOR | 25 | 26 | Ground |
| IOCHRDY | 27 | 28 | Host ALE |
| DACK1 | 29 | 30 | Ground |
| IRQ15 | 31 | 32 | No connect |
| Address 1 | 33 | 34 | No connect |
| Address 0 | 35 | 36 | Address 2 |
| Chip select 0 | 37 | 38 | Chip select 1 |
| Activity | 39 | 40 | Ground |

### FDD1: Floppy Drive Connector

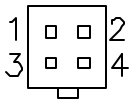
FDD1 is a 34-pin header and will support up to 2.88MB floppy drives.



FDD1

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Ground | 1 | 2 | RM/LC |
| Ground | 3 | 4 | No connect |
| Ground | 5 | 6 | No connect |
| Ground | 7 | 8 | Index |
| Ground | 9 | 10 | Motor enable 0 |
| Ground | 11 | 12 | Drive select 1 |
| Ground | 13 | 14 | Drive select 0 |
| Ground | 15 | 16 | Motor enable 1 |
| Ground | 17 | 18 | Direction |
| Ground | 19 | 20 | Step |
| Ground | 21 | 22 | Write data |
| Ground | 23 | 24 | Write gate |
| Ground | 25 | 26 | Track 00 |
| Ground | 27 | 28 | Write protect |
| Ground | 29 | 30 | Read data |
| Ground | 31 | 32 | Side 1 select |
| Ground | 33 | 34 | Diskette change |

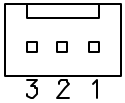
### J1: ATX 12V/+12V Power Connector




| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | Ground |
| 3 | +12V |
| 4 | +12V |

### FAN1: CPU Fan Power Connector

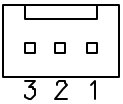
FAN1 is a 3-pin header for the CPU fan. The fan must be a 12V fan.




| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |

### FAN2: System Fan Power Connector

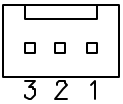
FAN2 is a 3-pin header for the system fan. The fan must be a 12V fan.




| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |

### FAN3: Auxiliary Fan Power Connector

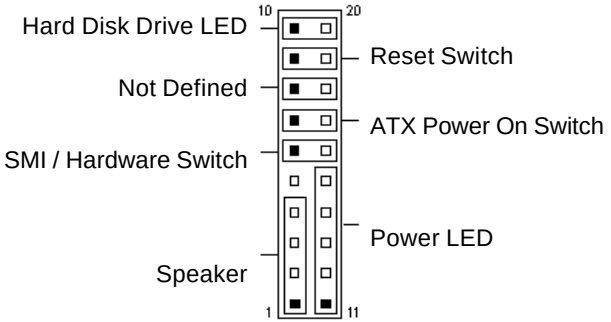
FAN3 is a 3-pin header for a 12V fan.




| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |

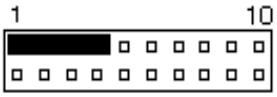
### J2: System Function Connector

J2 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J2 is a 20-pin header that provides interfaces for the following functions.




**Speaker: Pins 1 - 4**

This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.




| Pin # | Signal Name |
|---|---|
| 1 | Speaker out |
| 2 | No connect |
| 3 | Ground |
| 4 | +5V |

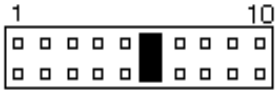
**Power LED: Pins 11 - 15**

The power LED indicates the status of the main power switch.


| Pin # | Signal Name |
|---|---|
| 11 | Power LED |
| 12 | No connect |
| 13 | Ground |
| 14 | No connect |
| 15 | Ground |

**SMI/Hardware Switch: Pins 6 and 16**

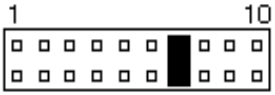
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.




| Pin # | Signal Name |
|---|---|
| 6 | SMI |
| 16 | Ground |

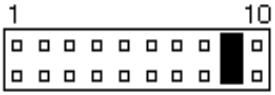
**ATX Power ON Switch: Pins 7 and 17**

This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

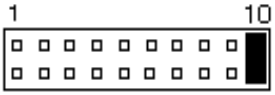



**Reset Switch: Pins 9 and 19**

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



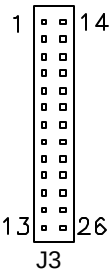
**Hard Disk Drive LED Connector: Pins 10 and 20**
This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.




| Pin # | Signal Name |
|---|---|
| 10 | HDD Active |
| 20 | 5V |

### J3: Parallel Port Connector

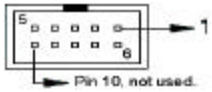
The following table describes the pin out assignments of this connector.




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Line printer strobe | 1 | 14 | AutoFeed |
| PD0, parallel data 0 | 2 | 15 | Error |
| PD1, parallel data 1 | 3 | 16 | Initialize |
| PD2, parallel data 2 | 4 | 17 | Select |
| PD3, parallel data 3 | 5 | 18 | Ground |
| PD4, parallel data 4 | 6 | 19 | Ground |
| PD5, parallel data 5 | 7 | 20 | Ground |
| PD6, parallel data 6 | 8 | 21 | Ground |
| PD7, parallel data 7 | 9 | 22 | Ground |
| ACK, acknowledge | 10 | 23 | Ground |
| Busy | 11 | 24 | Ground |
| Paper empty | 12 | 25 | Ground |
| Select | 13 | N/A | N/A |

### J5, J6: COM1 and COM2 Serial Ports Connector

J5 and J6 both 10-pin headers, are the onboard serial port connectors.



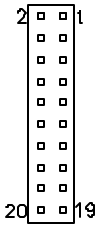

J5
Fixed as RS-232

J6
Configurable as RS-232/ RS-422/485 with jumpers JP2/JP3/JP4

| Pin # | Signal Name | | |
|---|---|---|---|
| | **RS-232** | **RS-422** | **RS-485** |
| 1 | DCD | TX- | DATA- |
| 2 | RX | TX+ | DATA+ |
| 3 | TX | RX+ | NC |
| 4 | DTR | RX- | NC |
| 5 | GND | GND | GND |
| 6 | DSR | RTS- | NC |
| 7 | RTS | RTS+ | NC |
| 8 | CTS | CTS+ | NC |
| 9 | RI | CTS- | NC |
| 10 | NC | NC | NC |

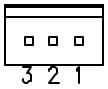
### J7, J13: LVDS Connectors (2nd channel, 1st channel)

The LVDS connectors are composed of the first channel (J13) and second channel (J7) to support 24-bit or 48-bit.




| Signal Name | Pin # | Pin # | **Signal Name** |
|---|---|---|---|
| TX0- | 2 | 1 | TX0+ |
| Ground | 4 | 3 | Ground |
| TX1- | 6 | 5 | TX1+ |
| 5V/3.3V | 8 | 7 | Ground |
| TX3- | 10 | 9 | TX3+ |
| TX2- | 12 | 11 | TX2+ |
| Ground | 14 | 13 | Ground |
| TXC- | 16 | 15 | TXC+ |
| 5V/3.3V | 18 | 17 | ENABKL |
| +12V | 20 | 19 | +12V |

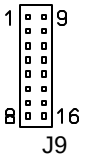
### J8: External ATX Power Connector




| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | PS-ON (soft on/off) |
| 3 | 5VSB (Standby +5V) |

### J9: CRT2 / TV-Out Connector

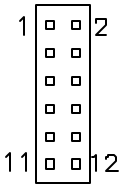
This connector allows you to connect to a second CRT monitor or use with a TV output device.




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Red / C | 1 | 9 | +5V |
| Green / Y | 2 | 10 | Ground |
| Blue / COMP | 3 | 11 | N. C. |
| N.C. | 4 | 12 | CRT2 DDCDAT |
| Ground | 5 | 13 | HSYNC |
| Ground | 6 | 14 | VSYNC |
| Ground | 7 | 15 | CRT2 DDCCLK |
| Ground | 8 | 16 | N.C. |

### J10: External Audio Connector

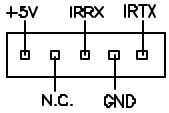
J10 is a 12-pin header that is used to connect to the ID120 daughter card that integrates jacks for Line In, Line Out and Speaker.




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| LINEOUT_R | 1 | 2 | LINEOUT_L |
| Ground | 3 | 4 | Ground |
| LINEIN_R | 5 | 6 | LINEIN L |
| Ground | 7 | 8 | Ground |
| Mic-In | 9 | 10 | VREFOUT |
| Ground | 11 | 12 | Protect pin |

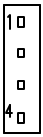
### J12: IrDA Connector

J12 is used for an optional IrDA connector for wireless communication.




| Pin # | Signal Name |
|---|---|
| 1 | +5V |
| 2 | No connect |
| 3 | Ir RX |
| 4 | Ground |
| 5 | Ir TX |

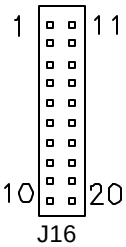
### J15: CD-In Audio Connector




| Pin # | Signal Name |
|---|---|
| 1 | CD Audio R |
| 2 | Ground |
| 3 | Ground |
| 4 | CD Audio L |

### J16: TMDS Panel Connector (on ID120)

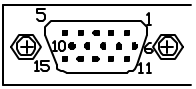
TMDS stands Transition Minimized Differential Signaling. J16 TMDS panel connector is to be connected to the optional ID120 daughter card.




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| TX1P | 1 | 11 | TX2P |
| TXIN | 2 | 12 | TX2N |
| GND | 3 | 13 | GND |
| GND | 4 | 14 | GND |
| TXCP | 5 | 15 | TX0P |
| TXCN | 6 | 16 | TX0N |
| GND | 7 | 17 | NC |
| +5v | 8 | 18 | NC |
| HTPG | 9 | 19 | DDCDATA |
| NC | 10 | 20 | DDCCLK |

### J17: VGA CRT Connector

The pin assignments of the J17 VGA CRT connector are as follows:

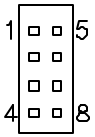



J26

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Red | 1 | 2 | Green |
| Blue | 3 | 4 | N.C. |
| GND | 5 | 6 | GND |
| GND | 7 | 8 | GND |
| N.C. | 9 | 10 | GND |
| N.C. | 11 | 12 | N.C. |
| HSYNC | 13 | 14 | VSYNC |
| NC | 15 | | |

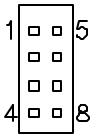
### J18, J19, J20: USB Connectors

The following table shows the pin outs of the USB pin headers connectors. Overall, the two pin headers support four USB ports.



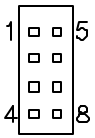

J18

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Vcc | 1 | 5 | Ground |
| USB0- | 2 | 6 | USB1+ |
| USB0+ | 3 | 7 | USB1- |
| Ground | 4 | 8 | Vcc |




J19

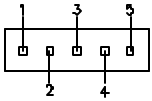
| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Vcc | 1 | 5 | Ground |
| USB2- | 2 | 6 | USB3+ |
| USB2+ | 3 | 7 | USB3- |
| Ground | 4 | 8 | Vcc |




J20

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Vcc | 1 | 5 | Ground |
| USB4- | 2 | 6 | USB5+ |
| USB4+ | 3 | 7 | USB5- |
| Ground | 4 | 8 | Vcc |

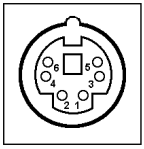
### J21, J22: External PS/2 Keyboard and Mouse Connector




| Pin # | J21 | J22 |
|---|---|---|
| 1 | Mouse data | KB clock |
| 2 | N.C. | KB data |
| 3 | Ground | N.C. |
| 4 | Vcc | Ground |
| 5 | Mouse clock | Vcc |

### J23: PS/2 Keyboard and Mouse Connector

J23 uses a Y-cable with dual D-connectors for a PS/2 keyboard and a PS/2 mouse.

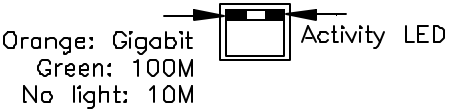



J23

| Pin # | Signal Name |
|---|---|
| 1 | Mouse data |
| 2 | Keyboard data |
| 3 | Ground |
| 4 | Vcc |
| 5 | Mouse Clock |
| 6 | Keyboard Clock |

### J25: Gigabit LAN RJ45 Connector

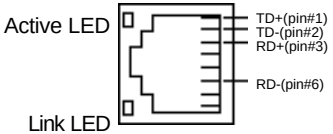
J25 is the Gigabit LAN RJ45 connector.




* Note: This connector is only present when your CPU card has the Gigabit LAN function.

### J26: Primary RJ45 Connector

J26 is the primary RJ-45 connector based on the chipset integrated LAN. The figure below shows the pin out assignments of the connector and its corresponding input jack.




RJ-45

# Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]=============================================
; Name   : Enable_And_Set_Watchdog
; IN     : AL - 1sec ~ 255sec
; OUT    : None
;[]=============================================
Enable_And_Set_Watchdog   Proc      Near
          push     ax             ;save time interval
          call  Unlock_Chip

          mov      cl, 2Bh
          call  Read_Reg
          and      al, NOT 10h
          call  Write_Reg         ;set GP24 as WDTO

          mov      cl, 07h
          mov      al, 08h
          call  Write_Reg         ;switch to LD8
```

```
        mov     cl, 0F5h
        call  Read_Reg
        and     al, NOT 08h
        call  Write_Reg         ;set count mode as second

        pop ax
        mov     cl, 0F6h
        call  Write_Reg         ;set watchdog timer

        mov     al, 01h
        mov     cl, 30h
        call  Write_Reg         ;watchdog enabled

        call  Lock_Chip
        ret
Enable_And_Set_Watchdog   Endp
;[]=============================================
; Name   : Disable_Watchdog
; IN     : None
; OUT    : None
;[]=============================================
Disable_Watchdog    Proc    Near
        call  Unlock_Chip

        mov     cl, 07h
        mov     al, 08h
        call  Write_Reg         ;switch to LD8

        xor  al, al
        mov     cl, 0F6h
        call  Write_Reg         ;clear watchdog timer

        xor  al, al
        mov     cl, 30h
        call  Write_Reg         ;watchdog disabled

        call  Lock_Chip
        ret
Disable_Watchdog    Endp
;[]=============================================
```

```
; Name   : Unlock_Chip
; IN : None
; OUT    : None
;[]=============================================
Unlock_Chip Proc       Near
            mov        dx, 2Eh
            mov        al, 87h
            out  dx, al
            out  dx, al
            ret
Unlock_Chip Endp
;[]=============================================
; Name   : Lock_Chip
; IN : None
; OUT    : None
;[]=============================================
Unlock_Chip Proc       Near
            mov        dx, 2Eh
            mov        al, 0AAh
            out  dx, al
            ret
Unlock_Chip Endp
;[]=============================================
; Name   : Write_Reg
; IN : CL - register index
;       AL - Value to write
; OUT    : None
;[]=============================================
Write_Reg    Proc       Near
            push       ax
            mov        dx, 2Eh
            mov        al,cl
            out  dx,al
            pop ax
            inc  dx
            out  dx,al
            ret
Write_Reg    Endp
;[]=============================================
```

```
; Name    : Read_Reg
; IN : CL - register index
; OUT     : AL - Value to read
;[]=================================================
Read_Reg     Proc       Near
             mov        al, cl
             mov        dx, 2Eh
             out  dx, al
             inc  dx
             in     al, dx
             ret
Read_Reg     Endp
;[]=================================================
```

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