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VS-2642 Socket 370 PIII / Celeron Half-size CPU Card User's Manual

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Chapter 1 Introducing the VS-2642 System Board

Overview

The VS-2642 is a Socket 370 all-in-one CPU card. This user's manual provides information on the physical features, installation, and BIOS setup of the VS-2642.

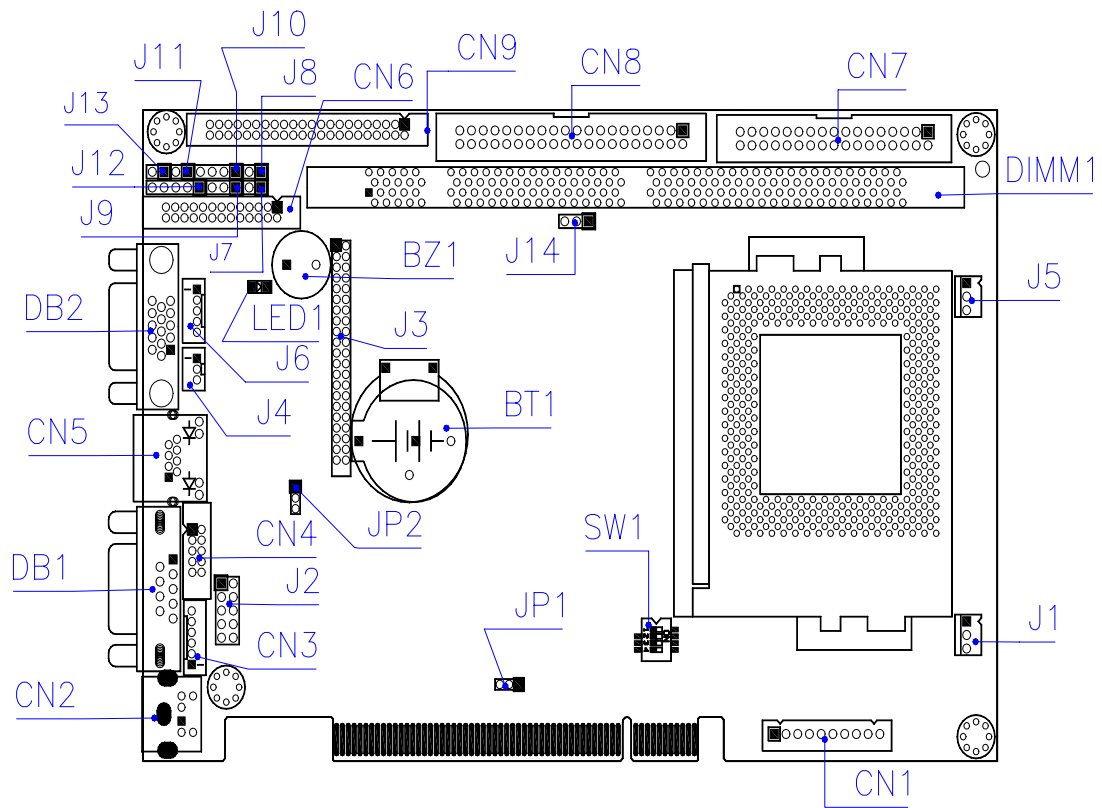
Built to unleash the total potential of the Pentium Processor, the VS-2642 is a single boards computer capable of handling today's demanding requirements. Able to support up to 1.3 MHz /Pentium-III/Tualatin/Celeron/Coppermine CPUs, this unit supports 10/100M interface network port, synchronous pipe line burst SDRAM up to 512MB, and on board VGA port uses the 815E chipset with UMA share memory with 4MB caching buffer.

Each VS-2642 has two ports for I/O communications. One RS-232C and one RS-232C /422/485/IrDA ports are available. There is also a watchdog timer that can be configured from software to automatically reset the system or generate an interrupt. And for easy configuration, AMI BIOS are available.

Power management is also featured to lower the rate of consumption. The unit supports doze mode, <Suspend Mode> and <Standby mode> as well as it adheres to the "Green Function" standard.

The VS-2642 is perfect for POS and POI applications, network systems, panel / MMI's, order entry kiosks and test equipment. The Compact size is only 185X122mm.

Layout



Specifications

- Supports 600Mhz~1.300 GHz PIII/Tualatin/Celeron/Coppermine CPU. (Socket 370 with 0.18 and 0.13 micron technology)
- Compact size slot card with PICMG PCI expansion bus.
- Intel chipset 815E, ICH2 and 128KB or above L2 cache inside the CPUs.
- Supports one 168-pin DIMM socket (PC-100/133 SDRAM), 512MB maximum.
- 100M/10M Ethernet with RJ-45 connector.
- Intel 815E chipset provides CRT use UMA share memory VRAM with 4MB caching buffer.
- Parallel port, floppy and two IDE channels supports four IDE devices with ultra DMA 33. In addition, channel one IDE supports ultra DMA 33/66/100.
- One RS-232 and one RS-232/RS-422/RS-485/IrDA.
- PS/2 compatible keyboard and mouse interface.
- E2KEY function for safe CMOS data keeping. (Option)
- On-board buzzer and LED indicator.
- Flash BIOS with easy upgrade utility.
- Software programmable watchdog timer.
- Two USB ports and hardware monitoring functions.
- Provides CPU & case cooling fan connector for monitoring.
- Provide one piggyback space for panel link, audio and Intel LAN. (Optional)
- EMI Considered on every output signals.
- Compact size, 185 mm x 122 mm.

Packing List

Upon receiving the package, verify the following things. Should any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the VS-2642 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the VS-2642 is not supplied from us, please make sure the specification of the cable(s) is compatible with the VS-2642 system board.

Note: after you install the VS-2642, it is recommended that you keep the diskette or CD that contains drivers and document files, document copies, and unused cables in the carton for future use.

The following lists the accessories that may be included in your VS-2642 package. Some accessories are optional items that are only shipped upon order.

- One VS-2642 system board
- One compact disc containing manual file in PDF format and necessary drivers and utilities
- One 40-pin hard disk drive interface cable
- One 34-pin floppy drive interface cable
- One serial port and parallel port interface cable with bracket
- One mouse port adapter cable with bracket
- One 5-page hard copy of Quick Installation Guide
- One 2-port USB adapter cable (Optional)

Chapter 2 Hardware Installation

To set up a VS-2642 system board, complete the description Chapter 2 and Chapter 3.

This chapter introduces the system board connectors, jumper settings and then guides you to apply them for field application.

Before Installation

Before you install the system board, make sure you follow the following descriptions.

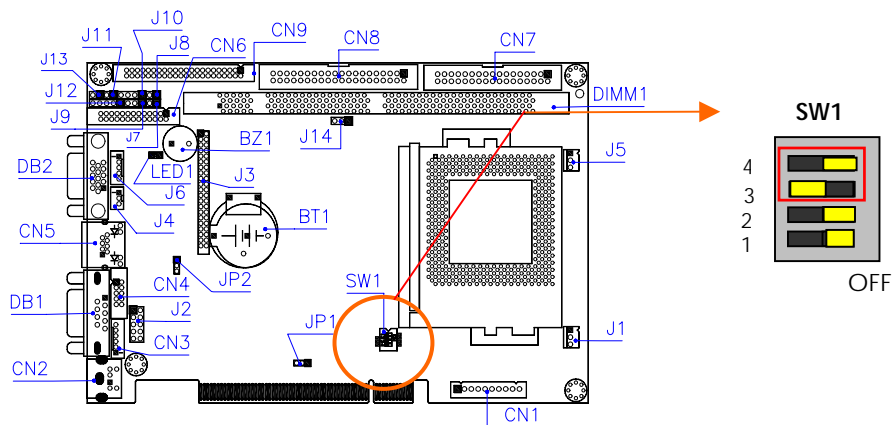
1. Before removing the board from its anti-static bag, wear an anti-static strap to prevent the generation of Electricity Static Discharge (ESD). The ESD may be created from human body that touches the board. It may do damage to the board circuit.
2. Install or unplug any connector, module, or add-on card, be sure that the power is disconnected from the system board. If not, this may damage the system board components, module, or the add-on-card.
3. Installing a heat sink and cooling fan is necessary for heat dissipation from your CPU. If heat sink or cooling fan is not mounted, this may cause the CPU fail due to over-heating problem.
4. When you connect the connectors and memory modules, be careful with the pin orientations.

Hardware Features

The following lists the connectors and jumpers to install the VS-2642.

| Item | Description |
|----------|--|
| CN1 | 9-pin power connector |
| CN2, CN3 | Keyboard and Mouse connector |
| CN4 | 10-pin RS-232 port 2 connector |
| CN5 | RJ45-Lan connector |
| CN6 | 26-pin 2.0mm parallel port connector |
| CN7 | 34-pin 2.54mm floppy connector |
| CN8 | 40-pin 2.54mm IDE 1 hard disk connector |
| CN9 | 44-pin 2.0mm IDE 2 hard disk connector |
| J1, J5 | 3-pin for case/CPU cooling fan |
| J2 | USB connector |
| J3 | External Bus for Piggyback place with Lam, audio, Panel Link |
| J4 | 3-pin RS232C touch screen header for serial port 2 |
| J6 | 5-pin for TTL I/O |
| J7 | 2-pin for external temperature sensor |
| J8 | 2-pin for external TX-LED with LAN |
| J9 | 3-pin for External power LED header |
| BZ1, J10 | Onboard Buzzer and external speaker header |
| J11 | 2-pin HDD LED Indicator header |
| J12 | 5-pin RS232C IrDA header for serial port 2 |
| J13 | 2-pin Reset header |
| JP1 | To clear CMOS data |
| JP2 | 3-pin Terminal Resistor of Serial port 2 |
| DB1 | RS232 9-pin D – type male connector |
| DB2 | CRT connector |
| LED1 | Power LED indicator |
| SW1 | To selects CPU base clock and RS232/RS422/RS485 |

□ **SW1 (3,4): Selecting CPU Base Clock and PCI Clock**

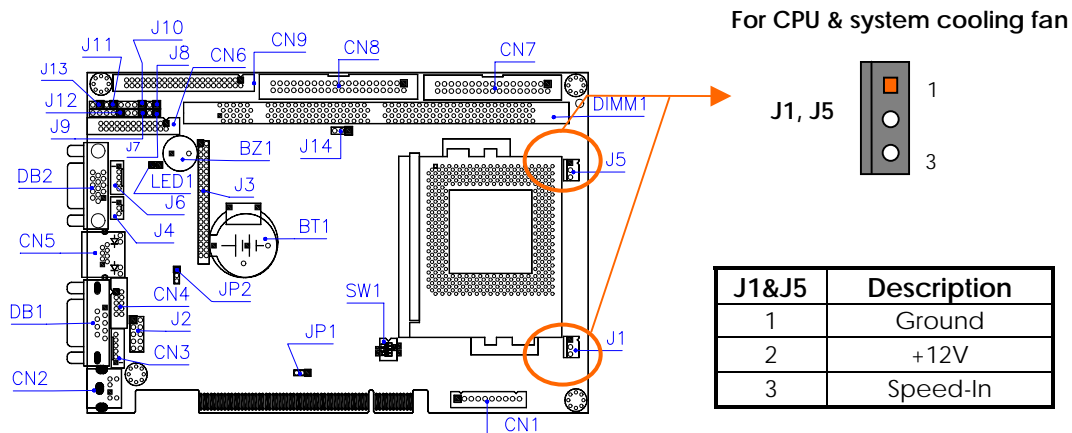


The following lists the switch settings of CPU Base Clock and PCI clock.

| SW1-3 | SW1-4 | CPU Base Clock | PCI Clock | Remark |
|-------|-------|----------------|-----------|-----------|
| Off | Off | 133 MHz | 33 MHz | Tualatlin |
| Off | On | Reserved | Reserved | |
| On | Off | 100Mhz | 33Mhz | Default |
| On | On | 66Mhz | 33Mhz | |

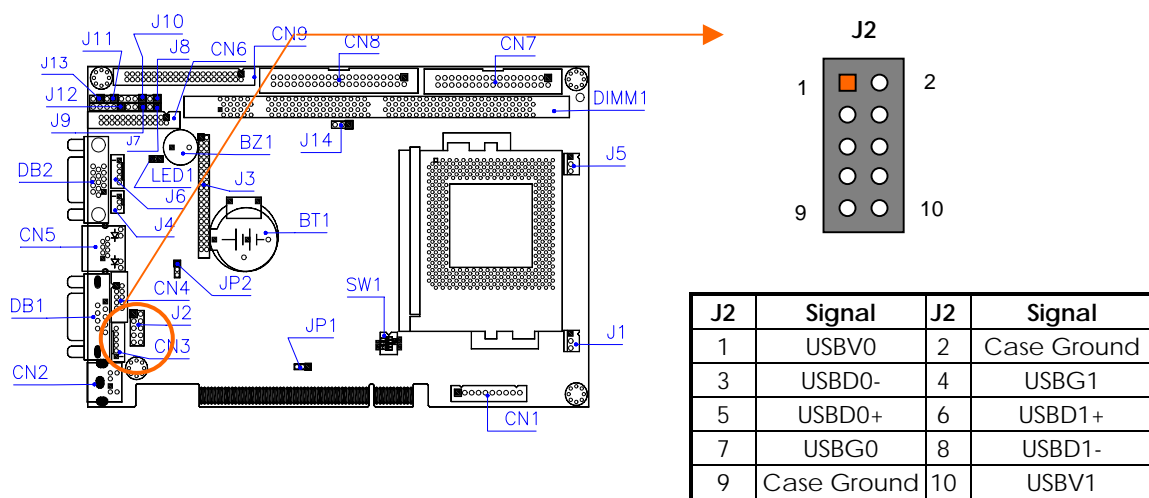
- ✧ Caution (*1): Avoid any of the following conditions that will directly destroy or severely cause damage to your CPU, or make your system unstable if you select an inappropriate base clock.
- ✧ Coppermine CPUs: Celeron over 66 MHz CPU base clock and PIII over 100/133 MHz CPU base clock
- ✧ Pentium III (Tualatlin) CPUs: Celeron over 100 MHz CPU base clock and PIII over 133 MHz CPU base clock

□ J1 & J5: CPU Fan Connector & System Fan Connector



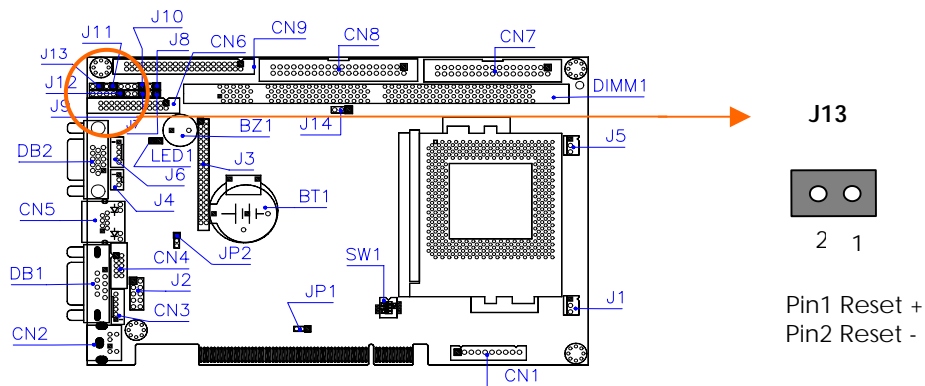
□ J2: USB Connector

J2 is a 10-pin connector. Use included adapter cable (Optional) for transferring to standard double port USB connector.

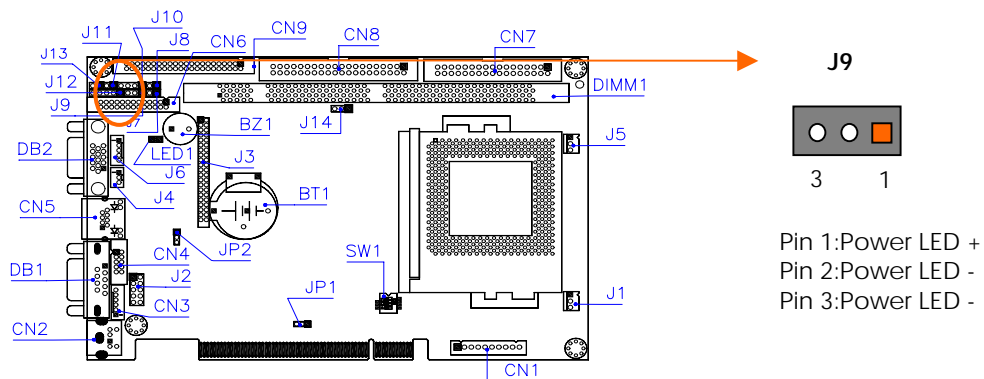


□ J13: Reset Header

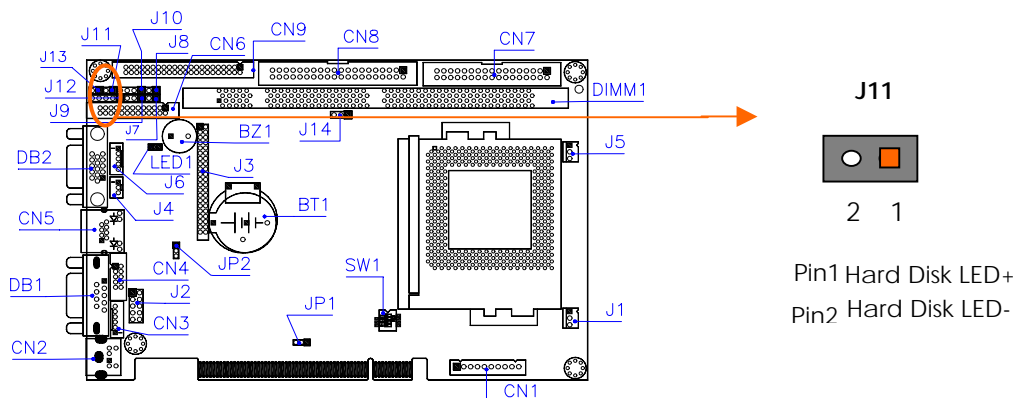
J13 is a 2-pin header for connecting to system reset bottom. Short-circuit these 2 pins to hardware reset VS-2642 as well as restart system. It is similar to power off the system and then power it on again.



□ J9: Power LED Header

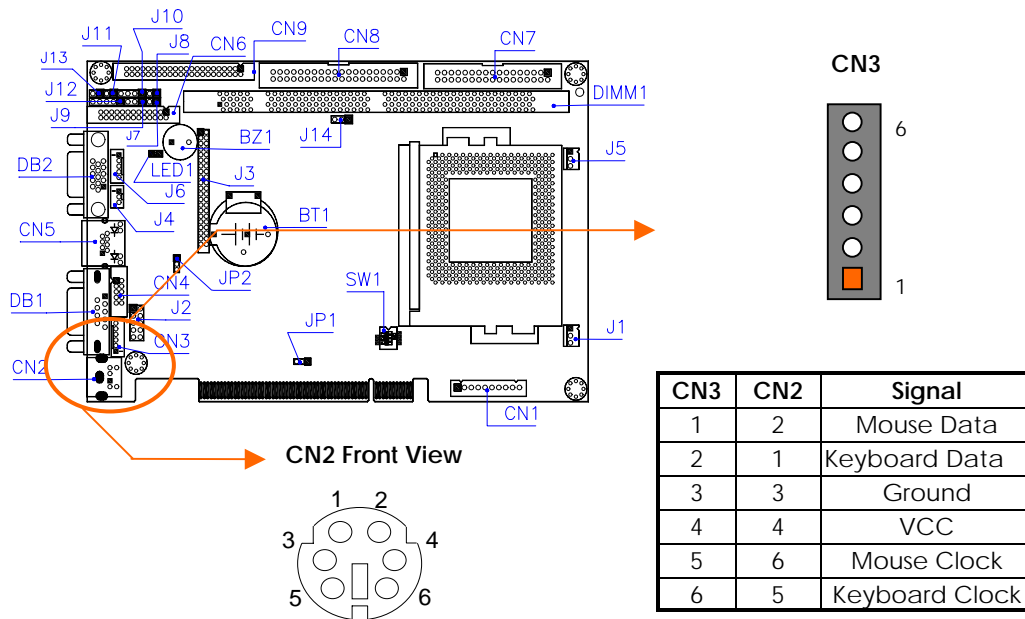


□ J11: HDD LED Header



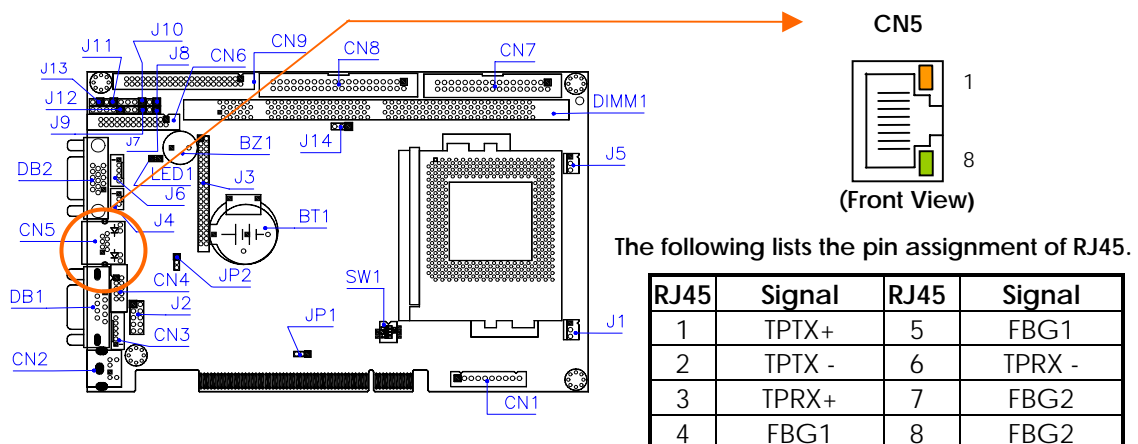
□ CN2, CN3: Keyboard/Mouse Connector

CN2 is a standard PS/2 type keyboard connector, so any PS/2 type keyboard can plug into CN2 directly without extra adapter cable. CN3 provides PS/2 mouse interface, use the included mouse adapter cable to connect between CN3 and standard PS/2 mouse.



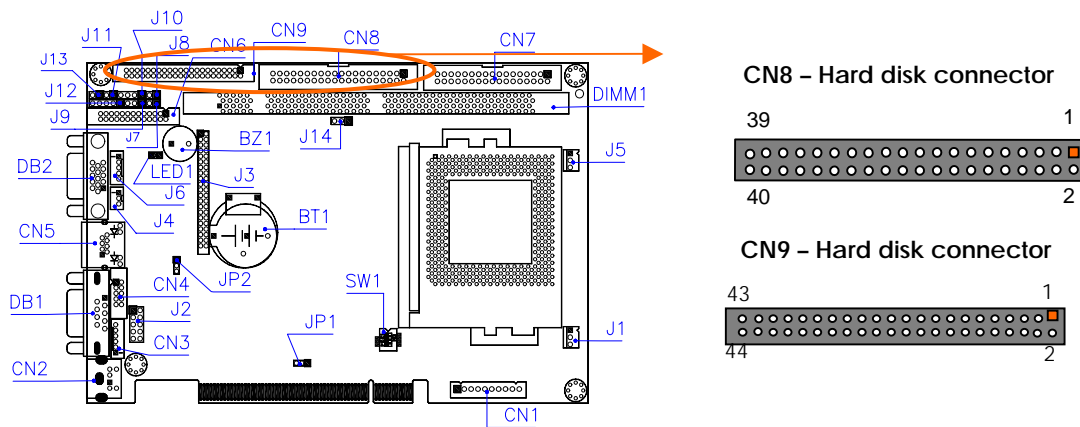
□ CN5: RJ45 LAN Connector

The CN5 contain LAN twist pair signals and LAN accesses indicator signal is RJ45 type connector with 2 LED indicators. The up side LED (orange) indicates data is accessing and the down side LED (green) indicates on-line status. (When lighted indicates on-line and off indicates off-line).



□ **CN8, CN9: IDE hard Disk Connector**

CN 8 is 40-pin 2.54mm IDE hard disk connector. CN9 is 44-pin 2.0mm IDC connectors. The included hard disk is able to attach up to four hard disk drives.

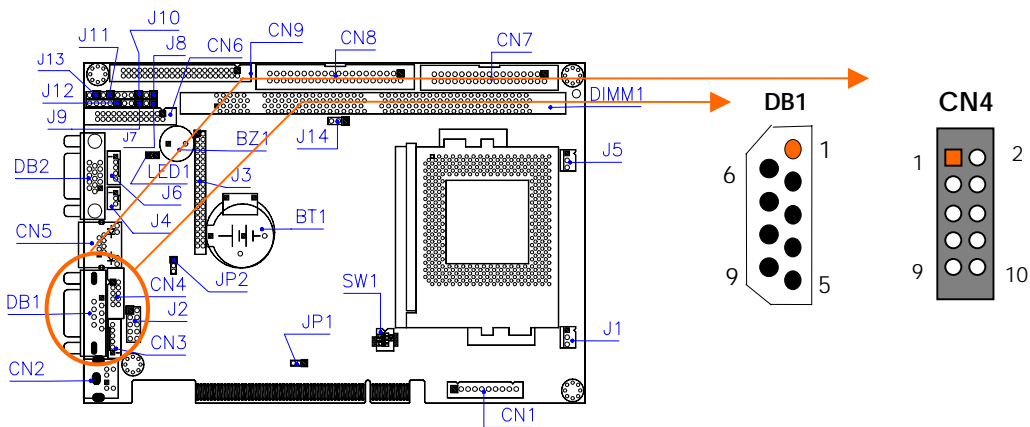


The following table lists the pin description of CN8, CN9.

| Pin | Signal | Pin | Signal |
|----------|-----------|----------|----------|
| 1 | -RESET | 2 | GROUND |
| 3 | DATA 7 | 4 | DATA 8 |
| 5 | DATA 6 | 6 | DATA 9 |
| 7 | DATA 5 | 8 | DATA 10 |
| 9 | DATA 4 | 10 | DATA 11 |
| 11 | DATA 3 | 12 | DATA 12 |
| 13 | DATA 2 | 14 | DATA 13 |
| 15 | DATA 1 | 16 | DATA 14 |
| 17 | DATA 0 | 18 | DATA 15 |
| 19 | GROUND | 20 | NOT USED |
| 21 | IDEDREQ | 22 | GROUND |
| 23 | -IOW | 24 | GROUND |
| 25 | -IOR | 26 | GROUND |
| 27 | IDEIORDYA | 28 | GROUND |
| 29 | -DACKA | 30 | GROUND |
| 31 | AINI | 32 | GROUND |
| 33 | SA 1 | 34 | Not Used |
| 35 | SA 0 | 36 | SA 2 |
| 37 | CS 0 | 38 | CS 1 |
| 39 | HD LED A | 40 | GROUND |
| 41 (CN9) | VCC | 42 (CN9) | VCC |
| 43 (CN9) | GROUND | 44 (CN9) | Not Used |

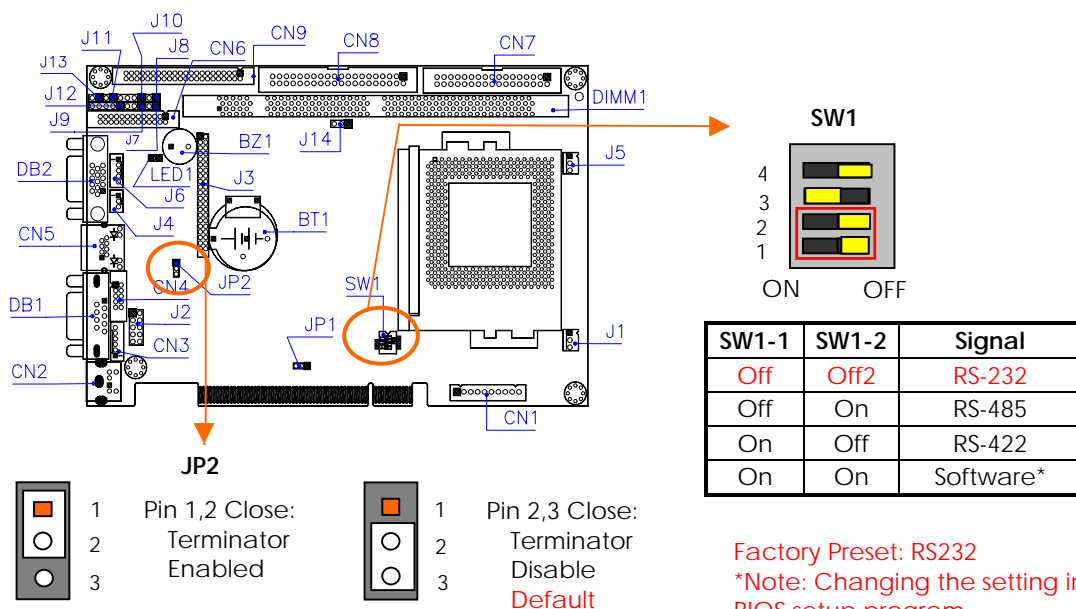
□ DB1 & CN4: RS232 Serial Ports 1,2 Connectors and Jumpers

The DB1 connector on bracket is 9-pin D-type male connector the serial port 2 adapter cables are used to transfer 10-pin IDC connector into standard DB9 connectors.



□ Serial Port 2 (CN4, SW1, J12, J4, JP2)

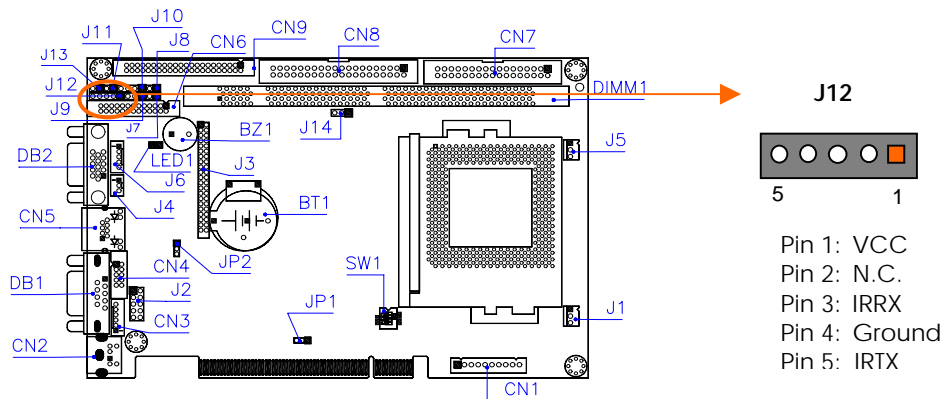
Serial port 2 is designed for multiple proposes. It could be RS-232C, RS-422 or RS-485 by selecting SW1 or changing the setting in BIOS setup program. And JP2 is use to enable or disable terminator if RS-485 mode is selected. Serial port 2 also could be configured as Infra (IrDA) interface by changing the setting in BIOS setup program. J12 is use to interface with Infra module. When touch screen module is used, you could connect J4 to touch screen controller directly and internally instead of connect from CN4 connector.



| CN4 | Signal | RS422 | RS485 | DB9 |
|-----|-------------|-------|-------|-----|
| 1 | -DCD2 | | | 1 |
| 2 | -DSR2 | | | 6 |
| 3 | RXD2 | RX- | 485- | 2 |
| 4 | -RTS2 | TX- | | 7 |
| 5 | TXD2 | RX+ | 485+ | 3 |
| 6 | -CTS2 | TX+ | | 8 |
| 7 | -DTR2 | | | 4 |
| 8 | -RI2 | | | 9 |
| 9 | GROUND | | | 5 |
| 10 | CASE GROUND | | | |

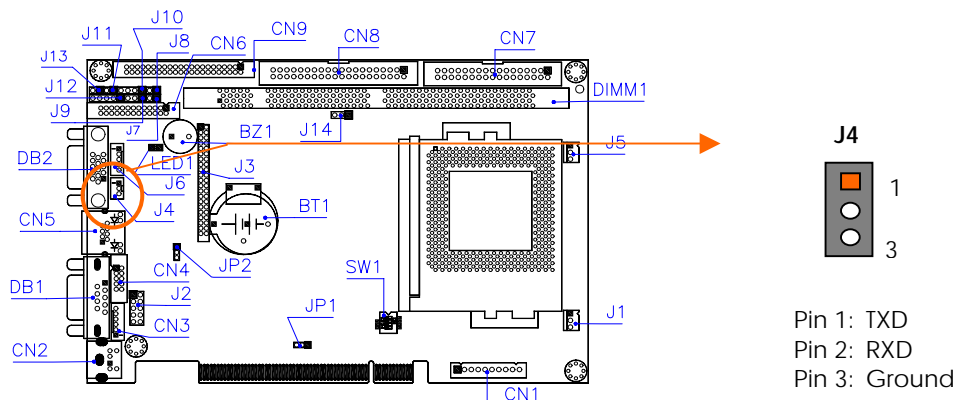
❑ J12: 5-pin Infrared Header

J12 provides infrared signals of serial port 2. The infrared signal is used to interface with Infrared modules.



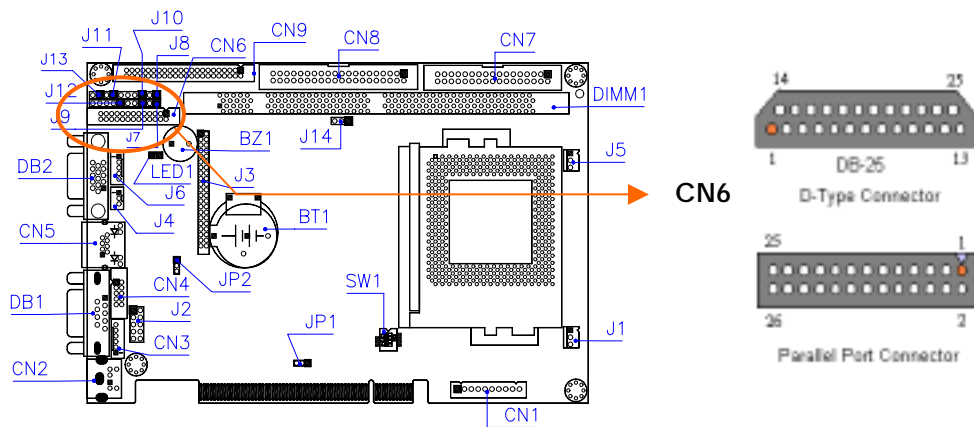
❑ J4: Touch Screen Header

J4 provide basic RS-232C signals of serial port 2 respectively. The basic RS-232C signal is used to interface with touch screen controller internally.



□ CN6: 26-pin Parallel Port Connector

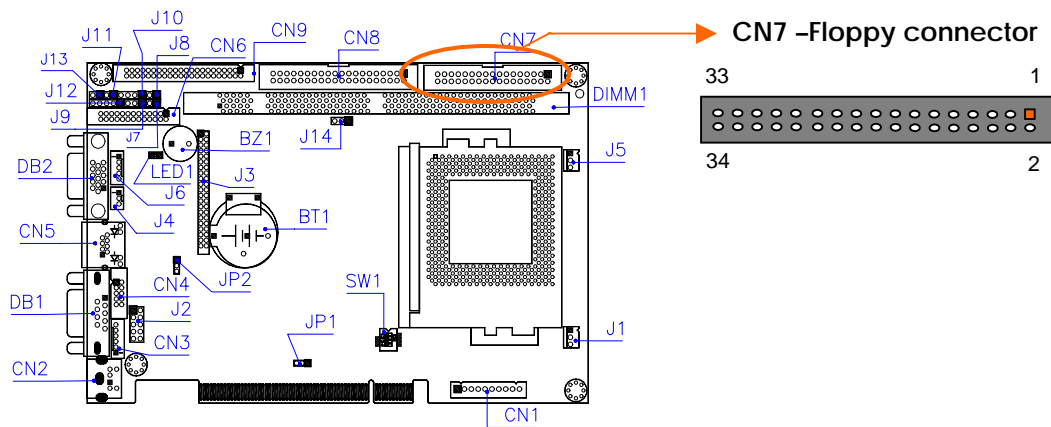
The included printer interface cable is used to transfer 26-pin connector into standard DB25 connector.



| CN6 | DB-25 | Signal | CN6 | DB-25 | Signal |
|-----|-------|----------------|-----|-------|--------------------|
| 1 | 1 | -STROBE | 2 | 14 | -AUTO FORM FEED |
| 3 | 2 | DATA 0 | 4 | 15 | -ERROR |
| 5 | 3 | DATA 1 | 6 | 16 | -INITIALIZE |
| 7 | 4 | DATA 2 | 8 | 17 | -PRINTER SELECT IN |
| 9 | 5 | DATA 3 | 10 | 18 | Ground |
| 11 | 6 | DATA 4 | 12 | 19 | Ground |
| 13 | 7 | DATA 5 | 14 | 20 | Ground |
| 15 | 8 | DATA 6 | 16 | 21 | Ground |
| 17 | 9 | DATA 7 | 18 | 22 | Ground |
| 19 | 10 | -ACKNOWLEDGE | 20 | 23 | Ground |
| 21 | 11 | BUSY | 22 | 24 | Ground |
| 23 | 12 | PAPER | 24 | 25 | Ground |
| 25 | 13 | PRINTER SELECT | 26 | -- | No Used |

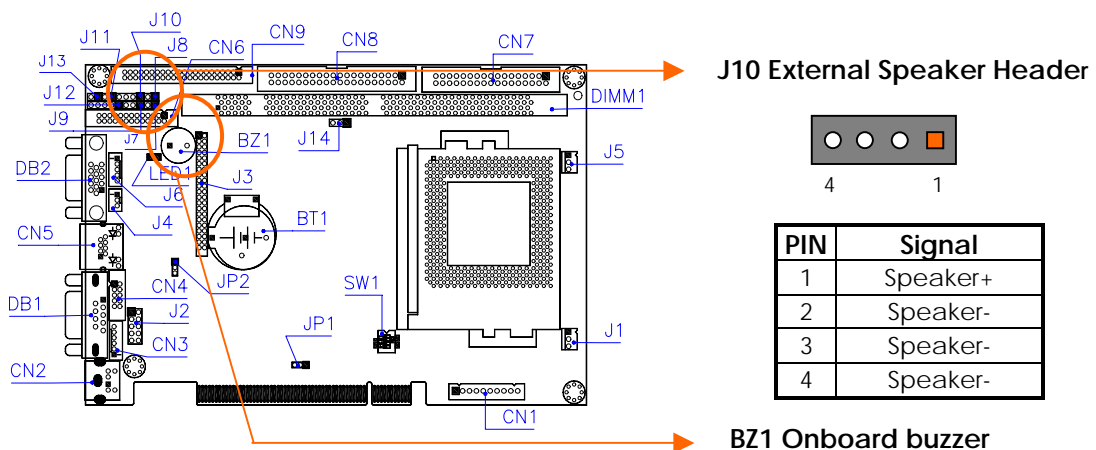
□ CN7: Floppy Connector

The included floppy drive interface cable is used standard 34-pin connector. The following table shows signal connections 34-pin connectors.



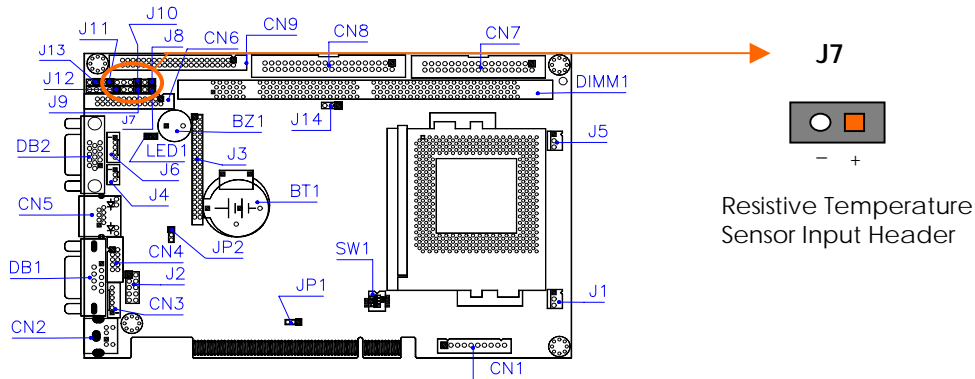
| 34-pin | Signal | 34-pin | Signal |
|--------|----------------|--------|----------------|
| 2 | Drive Enable A | 23 | Ground |
| 8 | -Index | 24 | -Write Enable |
| 12 | -Select A | 26 | -Track 0 |
| 11 | Ground | 28 | -Write Protect |
| 16 | -Motor A | 29 | Ground |
| 14 | - Select B | 30 | -Read Data |
| 10 | -Motor B | 31 | Ground |
| 9 | Ground | 32 | -Head |
| 18 | -Direction | 33 | NC |
| 20 | -Step | 34 | -Disk Change |
| 22 | -Write Data | Others | No Connection |

□ BZ1 & J10: On-Board Buzzer & External Speaker Header



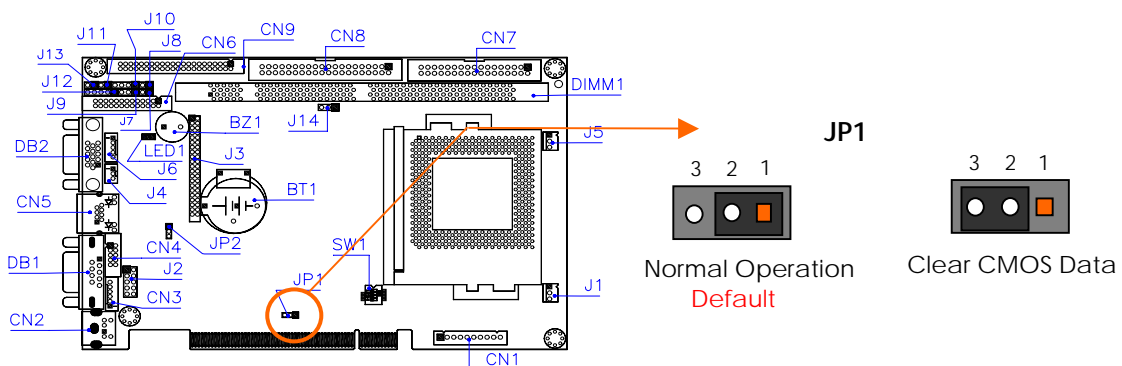
| PIN | Signal |
|-----|----------|
| 1 | Speaker+ |
| 2 | Speaker- |
| 3 | Speaker- |
| 4 | Speaker- |

□ J7: Temperature Sensor Header



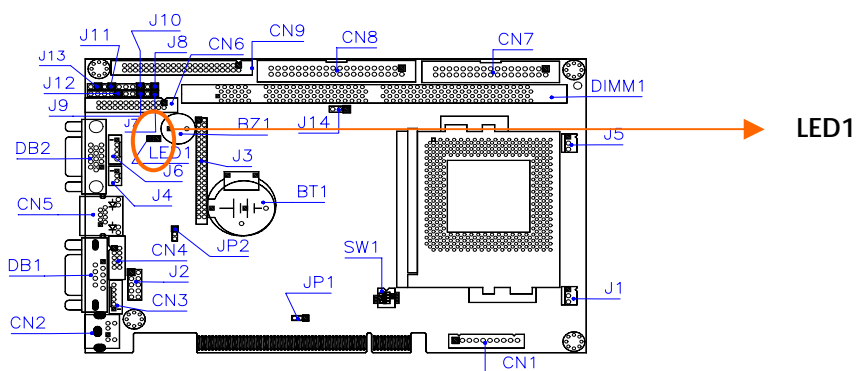
□ JP1: CMOS Data Clear Jumper

You can use JP1 to clear CMOS data. The CMOS store information like system date, time, boot up device, password, IRQ... that are set up with the BIOS. To clear the CMOS, set JP1 to 2-3 and then return to 1-2. The default setting is 1-2.

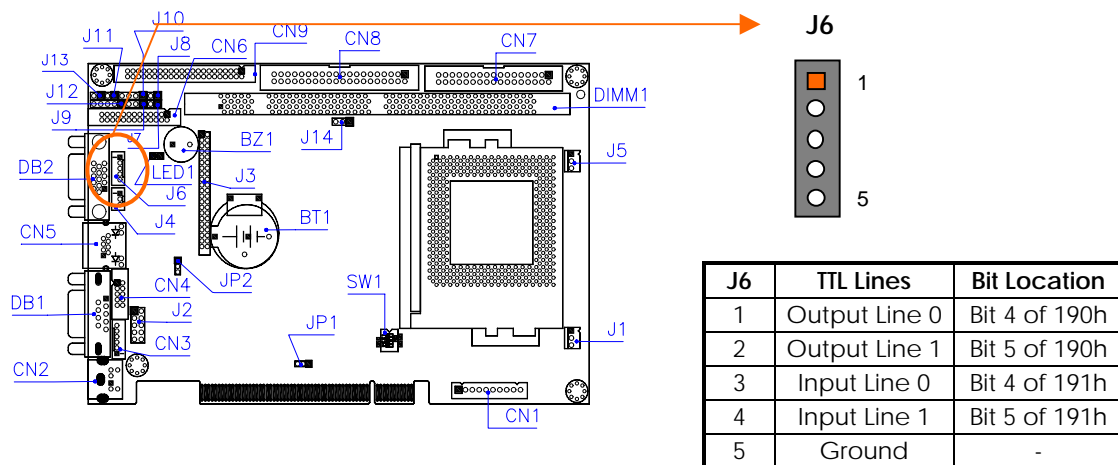


□ LED1: On-Board Power LED

LED1 indicates power is active when it lights.

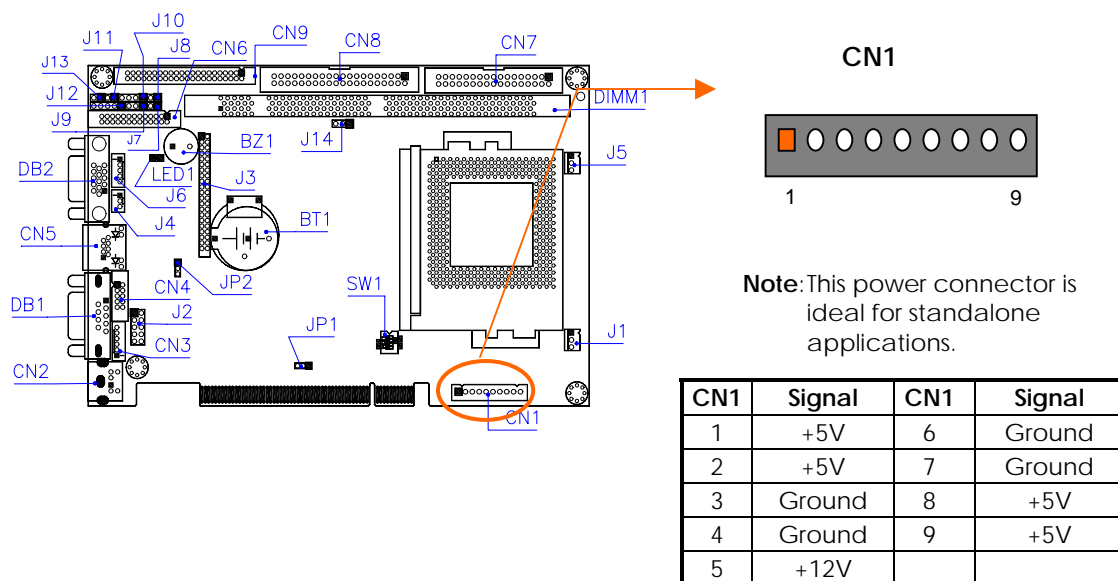


□ **J6: TTL I/O Connector**



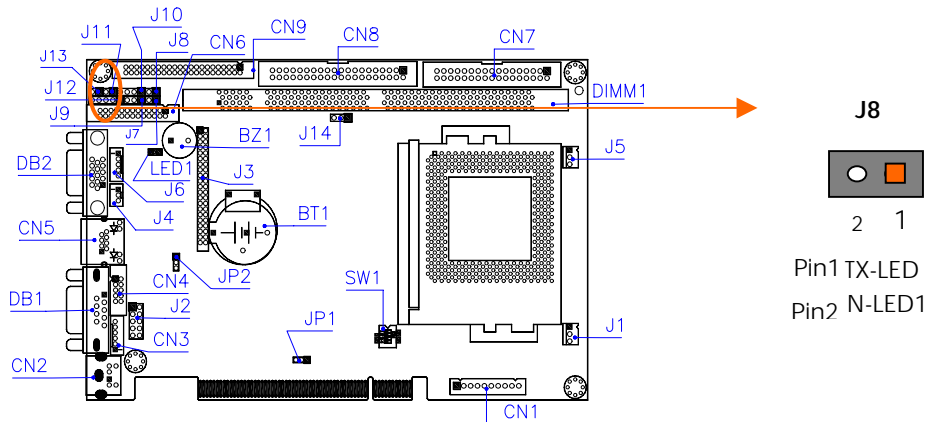
□ **CN1: Power Connector (9-pin 2.54mm JST)**

CN1 is the power connector for VS-2642 is used with stand-alone applications.



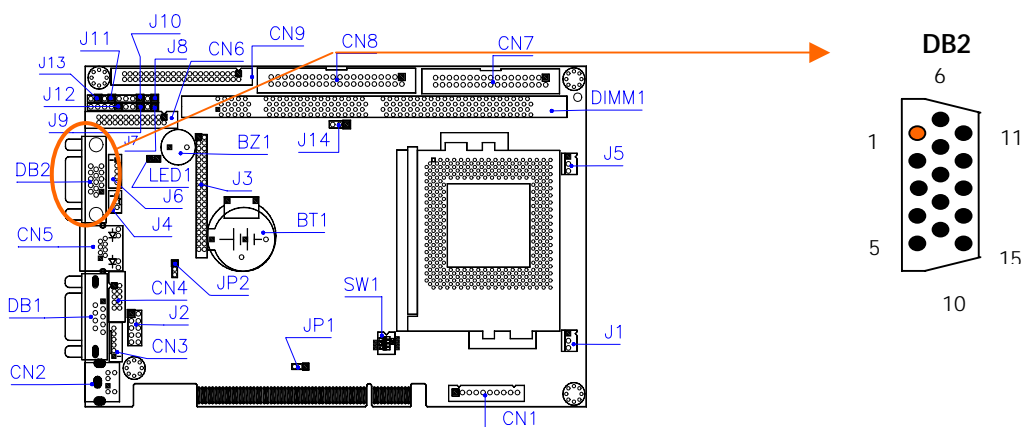
□ J8: External TX-LED with LAN LED Header

The J8 is LAN accesses indicator with LED indicators. The LED (FLASH) indicates data is accessing and LED (LIGHT) indicates on-line status. (When lighted indicates on-line and off indicates off-line).



□ DB2: CRT connector

The FB2642 supports a CRT colored monitor. It can be connected to create a compact video solution for the industrial environment. The VGA control in the 815E chipset and supports AGP, the VGA memory is UMA memory with 4MB caching buffer allows a maximum CRT resolution of 1280X1024 with 24bpp colors. The CRT is use to a standard CRT connector (DB2).



| DB15 | Signal | DB15 | Signal |
|------|--------|-------|----------------|
| 1 | RED | Case | Case Ground |
| 2 | GREEN | 5,10 | Digital Ground |
| 3 | BLUE | 6,7,8 | Analog Ground |
| 14 | VSYNC | 15 | DDC Clock |
| 13 | HSYNC | 12 | DDC Data |

Chapter 3 BIOS Setup

This chapter describes the BIOS setup.

Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, the ISA bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

Note: Change the parameters when you fully understand their functions and subsequence.



BIOS Functions

On the menu, you can perform the following functions

1. Standard CMOS Setup
2. Advanced CMOS Setup
3. Advanced Chipset Setup
4. Power Management Setup
5. PCI/ Plug and Play Setup
6. Peripheral Setup
7. Hardware Monitor Setup
8. Auto-Detect Hard Disks
9. Change User Password
10. Change Supervisor Password
11. Auto Configuration with Optimal Settings: to auto configure the system according to optimal setting with pre-defined values. This is also the factory default setting of the system when you receive the board.
12. Auto Configuration with Fail Safe Settings: to configure the system in fail-safe mode with predefined values.
13. Save Settings and Exit: perform this function when you change the setting and exit the BIOS Setup program.
14. Exit without saving: perform this function when you want to exit the program and do not save the change.

Keyboard Convention

On the BIOS, the following keys can be used to operate and manage the menu:

| Item | Function |
|--------------------|--|
| ESC | To exit the current menu or message |
| Page Up/Page Down | To select a parameter |
| F1 | To display the help menu if you do not know the purpose or function of the item you are going to configure |
| F2/F3 | To change the color of the menu display. F2 is to go forward and F3 is to go backward. |
| UP/Down Arrow Keys | To go upward or downward to the desired item |

STANDARD CMOS SETUP

This section describes basic system hardware configuration, system clock setup and error handling. If the CPU board is already installed in a working system, you will not need to select this option anymore.

| AMIBIOS SETUP - STANDARD CMOS SETUP | | | | | | | | | | | | |
|---|------|------|------|------|-------|---------------------|----------|----------|----------|------------|--|--|
| (C)2001 American Megatrends, Inc. All Rights Reserved | | | | | | | | | | | | |
| Date (mm/dd/yyyy): Tue <u>Dec</u> 03, 2002 | | | | | | Base Memory: 0 KB | | | | | | |
| Time (hh/mm/ss) : 08:33:02 | | | | | | Extd Memory: 0 MB | | | | | | |
| Floppy Drive A: 1.44 MB 3½ | | | | | | | | | | | | |
| Floppy Drive B: Not Installed | | | | | | | | | | | | |
| | Type | Size | Cyln | Head | HPcom | Sec | LBA Mode | BIk Mode | P10 Mode | 32Bit Mode | | |
| Pri Master: | Auto | | | | | | | | | Off | | |
| Pri Slave : | Auto | | | | | | | | | Off | | |
| Sec Master: | Auto | | | | | | | | | Off | | |
| Sec Slave : | Auto | | | | | | | | | Off | | |
| Boot Sector Virus Protection | | | | | | Disabled | | | | | | |
| Month: Jan - Dec | | | | | | ESC:Exit ↑↓:Sel | | | | | | |
| Day: 01 - 31 | | | | | | PgUp/PgDn:Modify | | | | | | |
| Year: 1980 - 2099 | | | | | | F1:Help F2/F3:Color | | | | | | |

□ Date & Time Setup

Highlight the <Date> field and then press the [Page Up] /[Page Down] or [+]/[-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [Page Up] /[Page Down] or [+]/[-] keys to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

□ Floppy Setup

The <Standard CMOS Setup> option records the types of floppy disk drives installed in the system.

To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left-or right-arrow key.

□ Hard Disk Setup

The BIOS supports various types for user settings, The BIOS supports <Pri Master>, <Pri Slave>, <Sec Master> and <Sec Slave> so the user can install up to four hard disks. For

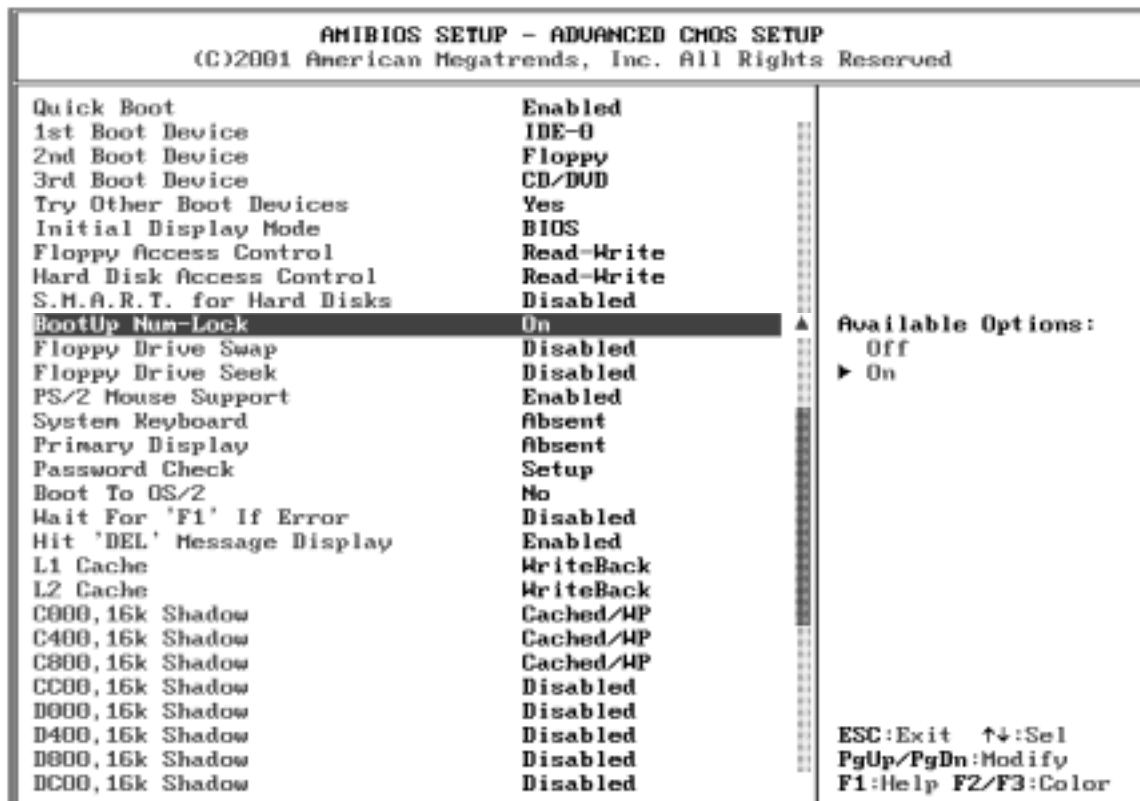
the master and slave jumpers, please refer to the hard disk's installation descriptions and the hard disk jumper settings.

You can select <AUTO> under the <TYPE> and <MODE> fields. This will enable auto detection of your IDE drives during boot up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

❑ **Boot Sector Virus Protection**

This option protects the boot sector and partition table of your hard disk against accidental modifications. Any attempt to write to them will cause the system to halt and display a warning message. If this occurs, you can either allow the operation to continue or use a bootable virus-free floppy disk to reboot and investigate your system. The default setting is <*Disabled*>. This setting is recommended because it conflicts with new operating systems. Installation of new operating system requires that you disable this to prevent write errors.

ADVANCED CMOS SETUP



This section describes the configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries here are required by the CPU board's design to remain in their default settings.

❑ Quick Boot

This field is used to activate the quick boot function of the system. When set to Enabled,

1. BIOS will not wait for up to 40 seconds if a Ready signal is not received from the IDE drive, and will not configure its drive.
2. BIOS will not wait for 0.5 seconds after sending a RESET signal to the IDE drive.
3. You cannot run BIOS Setup at system boot since there is no delay for the Hit, Del. To run Setup message.

Available Options: Disabled, Enabled

Default setting: Enabled

☐ **1st –3rd Boot Device**

These fields determine where the system attempts to look for the boot drive priority for an operating system. The default procedure is to check the hard disk, and then the floppy drive, and last the CDROM.

Available options: Disabled, IDE0-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CD/DVD, USB-FLOPPY, USB-CDROM, USB-HDD and SCSI, Network

Default setting: IDE-0 for 1st Boot device; Floppy for 2nd Boot Device; CDROM for 3rd Boot Device

☐ **Try Other Boot Device**

If all 3 1st –3rd boot devices specified by CMOS setup are not available to boot, BIOS will try to boot other available devices in following order if this question is set to "Enabled".

☐ **Initial Display Mode**

This field specifies can set Normal POST screen (BIOS) or Boot with logo, no POST messages (Client).

☐ **Floppy Access Control**

This field specifies the read/write access when booting from a floppy drive.

Available options: Normal, Read-only

Default setting: Normal

☐ **Hard Disk Access Control**

This field specifies the read/write access when booting from a HDD drive.

Available options: Normal, Read-only

Default setting: Normal

☐ **S.M.A.R.T for Hard Disk**

This field is used to activate the S.M.A.R.T (System Management and Reporting Technologies) function for S.M.A.R.T HDD drives. This function requires an application that can give S.M.A.R.T message.

Available options: Disabled, Enabled

Default: Disabled

☐ **Boot Up Num-lock**

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

Available options: On, Off

Default setting: On

☐ **Floppy Drive Swap**

The field reverses the drive letter assignments of your floppy disk drives in the Swap A, B setting, otherwise leave on the default setting of **Disabled** (No Swap). This works separately from the BIOS Features floppy disk swap feature. It is functionally the same as physically interchanging the connectors of the floppy disk drives. When the function's setting is **<Enabled>**, the BIOS swapped floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A under DOS.

Available options: Disabled, Enabled

Default setting: Disabled

☐ **Floppy Drive Seek**

This field is used to set if the BIOS will seek the floppy <A> drive upon boot.

Available Options: Disabled, Enabled

Default setting: Disabled

☐ **PS/2 Mouse Support**

The setting of **Enabled** allows the system to detect a PS/2 mouse on boot up. If detected, IRQ12 will be used for the PS/2 mouse. IRQ 12 will be reserved for expansion cards if a PS/2 mouse is not detected. **Disabled** will reserve IRQ12 for expansion cards and therefore the PS/2 mouse will not function.

Available options: Disabled, Enabled

Default setting: Enable

☐ **System Keyboard**

This field specifies if an error message should be prompted when a keyboard is not attached.

Available options: Absent, Present

Default setting: Absent

☐ **Primary Display**

The field specifies the type of monitor installed in the system.

Available options: Absent, VGA/EGA, CGA40x25, CGA80x25, and Mono

Default setting: Absent

☐ **Password Check**

This field enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If ***Always*** is chosen, a user password prompt appears every time and the BIOS Setup Program executes and the computer is turned on. If ***Setup*** is chosen, the password prompt appears if the BIOS executed.

Available options: Setup, Always

Default setting: Setup

☐ **Boot To OS2**

If OS2 operating system is used, and the system RAM is over 64MB, please select yes. Otherwise, select No.

Available options: Yes, No

Default setting: No

☐ **Wait for 'F1' If Error**

AMIBIOS POST error messages are followed by:

Press <F1> to continue

If this field is set to ***Disabled***, the AMIBIOS does not wait for you to press the <F1> key after an error message.

Available options: Disabled, Enabled

Default setting: Disabled

☐ **Hit 'DEL' Message Display**

Set this field to ***Disabled*** to prevent the message as follows:

Hit 'DEL' if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots.

Available options: Disabled, Enabled

Default setting: Enabled

❑ **C000, 32k Shadow - E800, 32k shadow**

These fields control the location of the contents of the 32KB of ROM beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. The settings are:

1. **Disabled:** The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.
2. **Enabled:** The contents of C000h - C7FFFh are written to the same address in system memory (RAM) for faster execution.
3. **Cached/WP:** The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adapter ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.

Available options: Disabled, Enabled, Cached

Default setting: Disabled

Default setting: Disable

ADVANCED CHIPSET SETUP

This section describes the configuration of the board's chipset features.

| AMIBIOS SETUP - ADVANCED CHIPSET SETUP (C)2001 American Megatrends, Inc. All Rights Reserved | | |
|---|--------------|--|
| SDRAM Timing by SPD | Disabled | Available Options: ► Disabled Enabled |
| DRAM Refresh | 15.6/11.7 uS | |
| DRAM Cycle time (SCLKs) | 7/9 | |
| CAS# Latency (SCLKs) | 3 | |
| RAS to CAS delay (SCLKs) | 3 | |
| SDRAM RAS# Precharge (SCLKs) | 3 | |
| Internal Graphics Mode Select | 1MB | |
| AGP Aperture Window | 64MB | |
| CPU Latency Timer | Disabled | |
| USB Function | Enabled | |
| USB Device Legacy Support | All Device | |
| | | ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color |

❑ SDRAM Timing by SPD

SPD represents Serial Presence Detect. It is an 8-bit, 2048 bits EEPROM, built on the SDRAM for 100 MHz frequencies. If the installed SDRAM supports SPD function, select SPD. If not, you can select based on other access time of the SDRAM.

Available Options: Disabled, Enabled

Default setting: Disabled

❑ DRAM Refresh

This specifies the DRAM refresh rate.

Available Options: 15.6/11.7 us, 7.8/5.85 us and 1.28/0.96 us

Default setting: 15.6/11.7 us

❑ DRAM Cycle Time (SCLKs)

This field specifies control the number of DRAM for an access cycles.

Available Options: 5/7 and 7/9

Default setting: 7/9

☐ **CAS# Latency (SCLKs)**

This field specifies the latency for the Synchronous DRAM system memory signals.

Available Options: 3, 2

Default setting: 3

☐ **RAS# to CAS# delay (SCLKs)**

This field specifies the length of the delay inserted between RAS and CAS signals of the Synchronous DRAM system access cycle when SDRAM is installed.

Available Options: 3, 2

Default setting: 3

☐ **SDRAM RAS# Precharge (SCLKs)**

This field specifies the length of the RAS precharge part of the Synchronous DRAM access cycle when SDRAM is installed.

Available Options: 3, 2

Default setting: 3

☐ **Internal Graphics Mode Select**

This field Enable/Disable the internal graphics device and selects the amount of main memory that is dedicated to support the internal graphics device in VGA (non-linear) mode only.

Available Options: 512kB, 1MB and Disable

Default setting: 1 MB

☐ **Graphics Aperture Size**

This field specifies the system memory size that can be used by the Accelerated Graphics Port (AGP).

Available Options: 32MB, 64MB

Default setting: 64 MB

☐ **CPU Latency Timer**

This field specifies the latency for the Synchronous DRAM system memory signals.

Available Options: 3, 2

Default setting: 3

☐ **USB Function**

Select Enabled if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

Available Options: Disabled, Enabled

Default setting: Enabled

☐ **USB Device Legacy Support**

Select All Device if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

Available Options: Disabled, Mice and All Devices

Default setting: All Devices

POWER MANAGEMENT

| AMIBIOS SETUP - POWER MANAGEMENT SETUP | | |
|---|----------|--|
| (C)2001 American Megatrends, Inc. All Rights Reserved | | |
| ACPI Aware O/S | No | Available Options: ► No Yes |
| Power Management/APM | Enabled | |
| Video Power Down Mode | Disabled | |
| Hard Disk Power Down Mode | Disabled | |
| Standby Time Out | Disabled | |
| Suspend Time Out | Disabled | |
| | | ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color |

☐ ACPI Aware O/S

This field specifies allow you enable Advanced Configuration and Power Management. When you use Windows/OS standby mode can set to enable.

Available Options: Disabled, Enabled

Default setting: Disable

☐ Power Management /APM

Select Enabled to activate the chipset Power Management and APM (Advanced Power Management) features.

Available Options: Disabled, Enabled

Default setting: Enabled

☐ Video Power Down Mode

This field specifies the power conserving state that video subsystem enters after the specified period of display inactivity has expired.

Available Options: Disabled, Standby, Suspend

Default setting: Disabled

☐ **Hard Disk Power Down Mode**

This field specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired.

Available Options: Disabled, Standby, Suspend

Default setting: Disabled

☐ **Standby Time Out (Minute)**

This field specifies the length of a period of system inactivity (like hard disk or video) while in full power on state. When this length of time expires, the system enters Standby power state.

Available Options: Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute

Default setting: Disabled

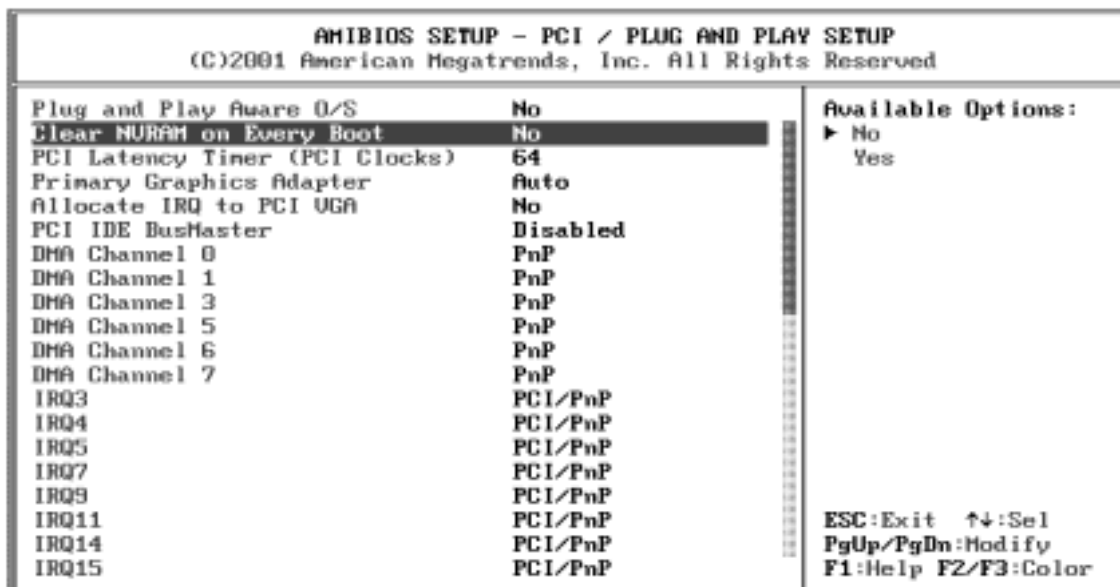
☐ **Suspend Time Out (Minute)**

This field specifies the length of a period of system inactivity (like hard disk or video) while in Standby state. When this length of time expires, the system enters Suspend power state.

Available Options: Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute, up to 60 Minute.

Default setting: Disabled

PCI/PLUG AND PLAY



☐ Plug and Plug Aware O/S

Set to Yes to inform BIOS that the operating system can handle Plug and Play (PnP) devices.

Available Options: Yes, No

Default setting: No

☐ PCI Latency Timer

This field specifies the latency timings (in PCI clock) PCI devices installed in the PCI expansion bus.

Available Options: 32, 64, 96, 128, 160, 192, 224, and 248

Default setting: 64

☐ Primary Graphics Adapter

This field specifies which VGA display will be used when the system is boot. You can select either the onboard AGP or the VGA card installed on the PCI bus.

Available Options: AGP, PCI

Default setting: PCI

☐ **PCI VGA Palette Snoop**

When Enabled is selected, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit. (0 is disabled).

Available Options:

Disabled: Data read and written by the CPU is only directed to the PCI VGA devices palette registers.

Enabled: Data read and written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

Default setting: Disable

☐ **Allocate IRQ to PCI AGP**

When a PCI or AGP VGA device is installed, you can assign an IRQ to this device. Selecting Yes, BIOS will auto-assign IRQ to the device. Selecting No, no IRQ will be assigned to the VGA device.

Available Options: Yes, No

Default setting: No

☐ **PCI IDE BusMaster**

This option is to specify that the IDE controller on the PCI local bus have bus-mastering capability.

Available Options: Enable, Disable

Default setting: Disable

☐ **DMA Channel 0 – 7**

When I/O resources are controlled manually, you can assign each system DMA as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

Available Options: PnP, ISA/EISA

Default setting: PnP

❑ **IRQ 3 –15**

When I/O resources are controlled manually, you can assign each system interrupt as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

PERIPHERAL SETUP

This section describes the function of peripheral features.

| AMIBIOS SETUP - PERIPHERAL SETUP | | |
|---|----------|---|
| (C)2001 American Megatrends, Inc. All Rights Reserved | | |
| OnBoard FDC | Auto | Available Options: ► Auto Disabled Enabled |
| OnBoard Serial Port1 | Auto | |
| OnBoard Serial Port2 | Auto | |
| OnBoard Parallel Port | Auto | |
| Parallel Port Mode | Normal | |
| Parallel Port IRQ | Auto | |
| Parallel Port DMA Channel | N/A | |
| Read Com Port Mode of Status | Hardware | |
| Com Port Mode Selection | RS-232 | |
| On-Chip IDE | Both | |
| | | ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color |

❑ OnBoard FDC

This field enables the floppy drive controller on the VS-2642.

Available Options: Disabled, Enabled and Auto

Default setting: Auto

❑ OnBoard Serial Port 1

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

Available Options: Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

Default setting: Auto

❑ OnBoard Serial Port 2

These fields select the I/O port address for each Serial port. Refer to Table 2-2.

Available Options: Auto, Disabled, 3F8H/COM1, 2F8H/COM2, and 3E8H/COM3, 2E8H/COM4.

Default setting: Auto

☐ **OnBoard Parallel Port**

This field selects the I/O port address for parallel port.

Available Options: Auto, Disabled, 378, 278, and 3BCH

Default setting: Auto

☐ **Parallel Port Mode**

This field specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications.

Available Options: N/A, Normal, Bi-Dir, EPP, and ECP

Default setting: Normal

☐ **Parallel Port IRQ**

This field specifies the IRQ for the parallel port.

Available Options: Auto, N/A, 5, 7

Default setting: Auto

☐ **Parallel Port DMA Channel**

This option is only available if the setting for the parallel Port Mode option is ECP.

Available Options: N/A, 0,1,3

Default setting: N/A

☐ **Read Com Port Mode State**

These fields are auto detected SW1-4 Setting, that can set use BIOS or adjust SW1.

Available Options: Software, Hardware

Default setting: Hardware

☐ **Com Port Mode Selection**

These fields item can select RS-232, RS-422, and RS-485 of Serial port 2.

Available Options: RS-232, RS-422 and RS-485

Default setting: RS-232

❑ **On-Chip IDE**

This field specifies the IDE channel that can be applied when using CN3 IDE hard disk connector.

Available Options: Disabled, Primary, and Secondary, Both

Default setting: Both

Hardware Monitor Setup

On the Hardware Monitor Setup screen, you can set up or monitor the system temperature, CPU voltage, and CPU fan speed...

| AMIBIOS SETUP - HARDWARE MONITOR SETUP | | |
|---|----------|--|
| (C)2001 American Megatrends, Inc. All Rights Reserved | | |
| Current CPU Temperature | 0°C/32°F | |
| Current System Temperature | 0°C/32°F | |
| Current Ext. Temperature | 0°C/32°F | |
| Fan1 Speed | 0 RPM | |
| Fan2 Speed | 0 RPM | |
| CPU1 VCORE | +1.793V | |
| CPU2 VCORE | +1.499V | |
| + 1.800V | +1.798V | |
| + 2.500V | +2.494V | |
| + 3.300V | +3.284V | |
| + 5.000V | +4.977V | |
| + 12.00V | +11.997V | |
| - 12.00V | -12.420V | |
| VBAT | +3.284V | |
| | | ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color |

❑ System Hardware Monitor

In this field, you can monitor or detect the followings items. These items are view-only and cannot be changed.

- Current CPU Temperature
- Current System Temperature
- Current Ext. Temperature
- Fan1 Speed
- Fan2 Speed
- CPU1 VCORE
- CPU2 VCORE
- +1.800V
- +2.500V
- +3.300V
- +5.000V
- +12.00V
- -12.00V
- VBAT (On board Battery)

Password Setup

There are two security passwords: Supervisor and User. Supervisor is a privileged person that can change the User password from the BIOS.

According to the default setting, both access passwords are not set up and are only valid after you set the password from the BIOS.

To set the password, please complete the following steps.

1. Select **Change Supervisor Password**.
2. Type the desired password (up to 8 character length) when you see the message, "Enter New Supervisor Password."
3. Then you can go on to set a user password (up to 8 character length) if required. Note that you cannot configure the User password until the Supervisor password is set up.
4. Enter Advanced CMOS Setup screen and point to the Password Checkup field.
5. Select Always or Setup.
 - ✧ **Always:** a visitor who attempts to enter BIOS or operating system will be prompted for password.
 - ✧ **Setup:** a visitor who attempts to the operating system will be prompted for user password. You can enter either User password or Supervisor password.
6. Point to **Save Settings and Exit** and press Enter.
7. Press Y when you see the message, "Save Current Settings and Exit (Y/N)?"

Note: it is suggested that you write down the password in a safe place to avoid that password may be forgotten or missing.

To set the password, please complete the following steps.

1. Select **Change Supervisor Password**.
2. Press Enter instead of entering any character when you see the message, "Enter New Supervisor Password."
3. Thus you can disable the password.

Chapter 4 Driver and Utility

The enclosed diskette includes VS-2642 VGA driver and LAN driver.

VGA Driver for WIN98/WIN95

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA>I815e>WIN98. If your system is not equipped with a CD ROM device, copy the VGA driver from the CD ROM to a 1.44" diskette.

Step 2: Execute WIN9Xe67.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

Step 5: In the WINDOWS98/ME, you can find the <DISPLAYL> icon located in the {CONTROL PANEL} group.

Step 6: Adjust the <Refresh Rate>, and <Resolution>.

Note: In the VGA>INTEL>I815e NT4.0, 2000 or XP directory, a Readme_xxx.txt file is included to provide installation information or Visit to <http://developer.intel.com/design/software/drivers/platform/inf.htm>

BIOS Flash Utility

In the <UTILITY> directory, there is the FLASH835.EXE file.

Step 1: Use the FLASH835.EXE program to update the BIOS setting.

Step 2: And then refer to the chapter "BIOS Setup", as the steps to modify BIOS.

Step 3: Now the CPU board's BIOS loaded with is the newest program; user can use it to modify BIOS function in the future, when the BIOS add some functions.

LAN Utility

Step 1: To install the LAN utility OR driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8139C>DIAG. If your system is not equipped with a CD ROM device, copy the LAN VGA driver from the CD ROM to a 1.44" diskette.

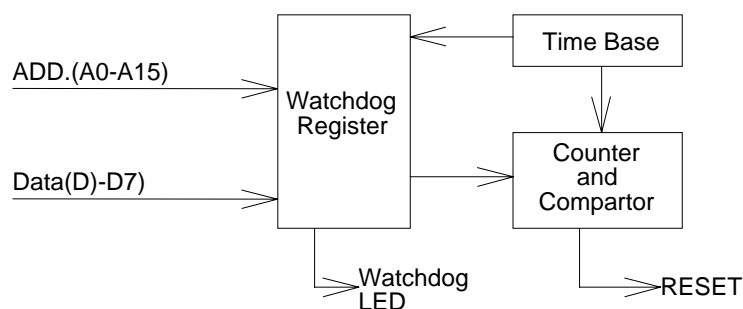
Step 2 Execute install.exe file.

| |
|---|
| <p>Note: In the LAN directory, a HELPME.EXE file is included to provide installation information</p> |
|---|

Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The VS-2642 is equipped with a programmable time-out period watchdog timer. You can use your own program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 255 seconds or minutes.



The CD -ROM includes a Watch Dog demo file. In the file, there are 3 execution programs written in different forms. The sub-directories of the file are:

1. WATCHDOG/ASSEMBLE: Library and Test Program written in Assembly Language
2. WATCHDOG/TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

Note: In the WATCHDOG directory, README.TXT file is included to provide demo program information.

Watchdog Timer Setting

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 seconds. The period for the watchdog timer time-out is between 1 to FF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

| Time Factor | Time-Out Period (Seconds) | Time-Out Period (Minutes) |
|-------------|------------------------------|------------------------------|
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| " | " | " |
| " | " | " |
| " | " | " |
| FF | FF | FF |

Watchdog Timer Enable & Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in the next trigger. Below is a Turbo C++ program, which demonstrates how to trigger the watchdog timer:

```
#include "stdio.H"
#include "WDLIB.H"

main()
{
char WD_TIME=0x6;

InitWD(equWdUnitS);
printf ("Enable watchdog");
//Trigger watchdog Timer Output is 6 seconds
EnWD(WD_TIME);
}
```

Watchdog Timer Disabled

To disable the watchdog timer, simply write DisWD() function.

```
#include "stdio.H"
#include "WDLIB.H"

main()
{
    InitWD(equWdUnitS);
    printf ("Disable Watch Dog");
    //Disable watch dog
    DisWD( );
}
```

Programming RS-485

The majority communicative operation of the RS-485 is in the same of the RS-232. When the RS-485 precedes the transmission, which needs control the TXC signal, and the installing, steps are as follows:

Step 1: Enable TXC

Step 2: Send out data

Step 3: Waiting for data empty

Step 4: Disable TXC

Note: Please refer to the section of the "Serial Ports" in the Chapter "Technical Reference" for the detail description of the COM port's register.

❑ **Initialize COM port**

Step 1: Initialize COM port in the receiver interrupt mode, and /or transmitter interrupt mode. (All of the communication protocol buses of the RS-485 are in the same.)

Step 2: Disable TXC (transmitter control), the bit 0 of the address of offset+4 just sets "0".

NOTE: Control the VS-2642 CPU card's DTR signal to the RS-485' s TXC communication.

❑ **Send out one character (Transmit)**

Step 1: Enable TXC signal, and the bit 0 of the address of offset+4 just sets "1".

Step 2: Send out the data. (Write this character to the offset+0 of the current COM port address)

Step 3: Wait for the buffer's data empty. Check transmitter holding register (THRE, bit 5 of the address of offset+5), and transmitter shift register (TSRE, bit 6 of the address of offset+5) are all sets must be "0".

Step 4: Disabled TXC signal, and the bit 0 of the address of offset+4 sets "0"

❑ **Send out one block data (Transmit – the data more than two characters)**

Step 1: Enable TXC signal, and the bit 0 of the address of offset+4 just sets "1".

Step 2: Send out the data. (Write all data to the offset+0 of the current COM port address)

Step 3: Wait for the buffer's data empty. Check transmitter holding register (THRE, bit 5 of the address of offset+5), and transmitter shift register (TSRE, bit 6 of the address of offset+5) are all sets must be "0".

Step 4: Disabled TXC signal, and the bit 0 of the address of offset+4 sets "0"

❑ **Receive data**

The RS-485's operation of receiving data is in the same of the RS-232's.

❑ **Basic Language Example**

a. Initial 86C450 UART

```
10      OPEN "COM1:9600,m,8,1" AS #1 LEN=1
20      REM Reset DTR
30      OUT &H3FC, (INP(%H3FC) AND &HFA)
40      RETURN
```

b. Send out one character to COM1

```
10      REM Enable transmitter by setting DTR ON
20      OUT &H3FC, (INP(&H3FC) OR &H01)
30      REM Send out one character
40      PRINT #1, OUTCHR$
50      REM Check transmitter holding register and shift register
60      IF ((INP(&H3FD) AND &H60) >0) THEN 60
70      REM Disable transmitter by resetting DTR
80      OUT &H3FC, (INP(&H3FC) AND &HEF)
90      RETURN
```

❑ **c. Receive one character from COM1**

```
10      REM Check COM1: receiver buffer
20      IF LOF(1)<256 THEN 70
30      REM Receiver buffer is empty
40      INPSTR$"
```

```
50      RETURN
60      REM Read one character from COM1: buffer
70      INPSTR$=INPUT$(1,#1)
80      RETURN
```

NOTE: The example of the above program is based on COM1 (I/O Address 3F8h).
The RS-422/RS-485 of the VS-2642 uses COM2. If you want to program it, please
refer to the BIOS Setup for COM2 address setup.

Chapter 5 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Trouble Shooting for Error Messages
- Technical Reference

Trouble Shooting for Error Messages

The following information informs the error messages and troubleshooting. Please adjust your systems according to the messages below. Make sure all the components and connectors are in proper position and firmly attached. If the errors still exist, please contact with your distributor for maintenance.

❑ POST BEEP

Currently there are two kinds of beep codes in BIOS setup.

- One indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps.
- The other indicates that an error has occurred in your DRAM. This beep code consists of a constant single long beep.

❑ CMOS BATTERY FAILURE

When the CMOS battery is out of work or has run out, the user has to replace it with a new battery.

❑ **CMOS CHECKSUM ERROR**

This error informs that the CMOS has corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

❑ **DISPLAY SWITCH IS SET INCORRECTLY**

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in BIOS Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter BIOS Setup and change the video selection.

❑ **DISK BOOT FAILURE**

When you can't find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, and also make sure the disk is formatted. Then reboot the system.

❑ **DISKETTE DRIVES OR TYPES MISMATCH ERROR**

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

❑ **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

When you can't initialize the hard drive, ensure the following things:

1. The adapter is installed correctly
2. All cables are correctly and firmly attached
3. The correct hard drive type is selected in BIOS Setup

❑ **ERROR INITIALIZING HARD DISK CONTROLLER**

When this error occurs, ensure the following things:

1. The cord is exactly installed in the bus.
2. The correct hard drive type is selected in BIOS Setup
3. Whether all of the jumpers are set correctly in the hard drive

❑ **FLOPPY DISK CONTROLLER ERROR OR NO CONTROLLER PRESENT**

When you cannot find or initialize the floppy drive controller, please ensure the controller is in proper BIOS Setup. If there is no floppy drive installed, ensure the Diskette Drive selection in Setup is set to NONE.

❑ **KEYBOARD ERROR OR NO KEYBOARD PRESENT**

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in BIOS Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot procedure.

❑ **MEMORY ADDRESS ERROR**

When the memory address indicates error. You can use this location along with the memory map for your system to find and replace the bad memory chips.

❑ **MEMORY SIZE HAS CHANGED**

Memory has been added or removed since last boot. In EISA mode, use Configuration Utility to re-configure the memory configuration. In ISA mode enter BIOS Setup and enter the new memory size in the memory fields.

❑ **MEMORY VERIFYING ERROR**

It indicates an error verifying a value is already written to memory. Use the location along with your system's memory map to locate the bad chip.

❑ **OFFENDING ADDRESS MISSING**

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

❑ **REBOOT ERROR**

When this error occurs that requires you to reboot. Press any key and the system will reboot.

❑ **SYSTEM HALTED**

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Technical Reference

Real-Time Clock and Non-Volatile RAM

The VS-2642 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

| Address | Description |
|---------|---|
| 00 | Seconds |
| 01 | Second alarm |
| 02 | Minutes |
| 03 | Minute alarm |
| 04 | Hours |
| 05 | Hour alarm |
| 06 | Day of week |
| 07 | Date of month |
| 08 | Month |
| 09 | Year |
| 0A | Status register A |
| 0B | Status register B |
| 0C | Status register C |
| 0D | Status register D |
| 0E | Diagnostic status byte |
| 0F | Shutdown status byte |
| 10 | Diskette drive type byte, drive A and B |
| 11 | Fixed disk type byte, drive C |
| 12 | Fixed disk type byte, drive D |
| 13 | Reserved |
| 14 | Equipment byte |
| 15 | Low base memory byte |
| 16 | High base memory byte |

| Address | Description |
|---------|---|
| 17 | Low expansion memory byte |
| 18 | High expansion memory byte |
| 19-2D | Reserved |
| 2E-2F | 2-byte CMOS checksum |
| 30 | Low actual expansion memory byte |
| 31 | High actual expansion memory byte |
| 32 | Date century byte |
| 33 | Information flags (set during power on) |
| 34-7F | Reserved for system BIOS |

CMOS RAM Map

| Register | Description |
|-----------|---|
| 00h -10h | Standard AT-compatible RTC and Status and Status Register data definitions |
| 11h – 13h | Varies |
| 14h | <p>Equipment</p> <p>Bits 7-6 Number of Floppy Drives</p> <p>00 1 Drive</p> <p>01 2 Drives</p> <p>Bits 5-4 Monitor Type</p> <p>00 Not CGA or MDA 01 40x25 CGA</p> <p>01 2 Drives 80x25 CGA</p> <p>Bits 3 Display Enabled</p> <p>0 Disabled</p> <p>1 Enabled</p> <p>Bit 2 Keyboard Enabled</p> <p>00 Not CGA or MDA 01 40x25 CGA</p> <p>01 2 Drives 80x25 CGA</p> <p>Bit 1 Math Coprocessor Installed</p> <p>0 Absent</p> <p>1 Present</p> <p>Bit 0 Floppy Drive Installed</p> <p>0 Disabled</p> <p>1 Enabled</p> |
| 15h | Base Memory (in 1KB increments), Low Byte |
| 16h | Base Memory (in 1KB increments), High Byte |
| 17h | IBM-compatible memory (in 1KB increments), Low Byte |
| 18h | IBM-compatible memory (in 1KB increments), High Byte (max 15 MB) |
| 19h-2Dh | Varies |
| 2Eh | Standard CMOS RAM checksum, high byte |
| 2Fh | Standard CMOS RAM checksum, low byte |
| 30h | IBM-compatible Extended Memory, Low Byte (POST) in KB |
| 31h | IBM-compatible Extended Memory, High Byte (POST) in KB |
| 32h | Century Byte |
| 33h | Reserved. Do not use |
| 34h | Reserved. Do not use |
| 35h | Low byte of extended memory (POST) in 64 KB |
| 36h | High byte of extended memory (POST) in 64 KB |
| 37h-3Dh | Varies |
| 3Eh | Extended CMOS Checksum, Low Byte (including 34h-3Dh) |
| 3Fh | Extended CMOS Checksum, High Byte (including 34h-3Dh) |

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. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

| Address | Device Description |
|-------------|------------------------------------|
| 000h - 00Fh | DMA Controller #1 |
| 020h - 021h | Interrupt Controller #1 |
| 040h - 043h | Timer |
| 060h - 064h | Keyboard Controller |
| 070h - 071h | Real Time Clock, NMI |
| 080h - 09Fh | DMA Page Register |
| 0A0h - 0A1h | Interrupt Controller #2 |
| 0C0h - 0DFh | DMA Controller #2 |
| 0F0h | Clear Math Coprocessor Busy Signal |
| 0F1h | Reset Math Coprocessor |
| 1F0h - 1F7h | IDE Interface |
| 278 - 27F | Parallel Port #2(LPT2) |
| 2F8h - 2FFh | Serial Port #2(COM2) |
| 378h - 3FFh | Parallel Port #1(LPT1) |
| 360 - 36F | Network Ports |
| 3B0 - 3BF | Monochrome & Printer adapter |
| 3C0 - 3CF | EGA adapter |
| 3D0 - 3DF | CGA adapter |
| 3F0h - 3F7h | Floppy Disk Controller |
| 3F8h - 3FFh | Serial Port #1(COM1) |
| 540h-54Eh | SMBUS Controller |
| C000h-CFFFh | PCI-PCI Bridge |
| DF00h-DFEEh | USB Controller |
| FF00h-FF0Eh | IDE Controller |

Interrupt Request Lines (IRQ)

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

| Level | Function |
|-------|------------------------|
| IRQ0 | System Timer Output |
| IRQ1 | Keyboard |
| IRQ2 | Interrupt Cascade |
| IRQ3 | Serial Port #2 |
| IRQ4 | Serial Port #1 |
| IRQ5 | Ethernet |
| IRQ6 | Floppy Disk Controller |
| IRQ7 | Parallel Port #1 |
| IRQ8 | Real Time Clock |
| IRQ9 | Reserved |
| IRQ10 | SMBus |
| IRQ11 | USB |
| IRQ12 | PS2 Mouse |
| IRQ13 | Math coprocessor |
| IRQ14 | Primary IDE |
| IRQ15 | Secondary IDE |

DMA Channel Map

The equivalent of two 8237A DMA controllers are implemented in the VS-2650 board. Each controller is a four-channel DMA device that will generate the memory addresses and control signals necessary to transfer information directly between a peripheral device and memory. This allows high speeding information transfer with less CPU intervention. The two DMA controllers are internally cascaded to provide four DMA channels for transfers to 8-bit peripherals (DMA1) and three channels for transfers to 16-bit peripherals (DMA2). DMA2 channel 0 provides the cascade interconnection between the two DMA devices, thereby maintaining IBM PC/AT compatibility.

The following is the system information of DMA channels:

| DMA Controller 1 | DMA Controller 2 |
|----------------------------------|-------------------------------------|
| Channel 0: Spare | Channel 4: Cascade for controller 1 |
| Channel 1: Reserved for IBM SDLC | Channel 5: Spare |
| Channel 2: Diskette adapter | Channel 6: Spare |
| Channel 3: Spare | Channel 7: Spare |

Serial Ports

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. Also included in the ACE is a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

| DLAB | Port Address | Register |
|------|--------------|--|
| 0 | Base + 0 | Receiver buffer (read) |
| | | Transmitter holding register (write) |
| 0 | Base + 1 | Interrupt enable |
| X | Base + 2 | Interrupt identification (read only) |
| X | Base + 3 | Line control |
| X | Base + 4 | MODEM control |
| X | Base + 5 | Line status |
| X | Base + 6 | MODEM status |
| X | Base + 7 | Scratched register |
| 1 | Base + 0 | Divisor latch (least significant byte) |
| 1 | Base + 1 | Divisor latch (most significant byte) |

❑ Receiver Buffer Register (RBR)

Bit 0-7: Received data byte (Read Only)

❑ Transmitter Holding Register (THR)

Bit 0-7: Transmitter holding data byte (Write Only)

❑ Interrupt Enable Register (IER)

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

❑ **Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

❑ **Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

| WLS1 | WLS0 | Word Length |
|------|------|-------------|
| 0 | 0 | 5 Bits |
| 0 | 1 | 6 Bits |
| 1 | 0 | 7 Bits |
| 1 | 1 | 8 Bits |

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

❑ **MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

❑ **Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

❑ **MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

□ **Divisor Latch (LS, MS)**

| | LS | MS |
|--------|-------|--------|
| Bit 0: | Bit 0 | Bit 8 |
| Bit 1: | Bit 1 | Bit 9 |
| Bit 2: | Bit 2 | Bit 10 |
| Bit 3: | Bit 3 | Bit 11 |
| Bit 4: | Bit 4 | Bit 12 |
| Bit 5: | Bit 5 | Bit 13 |
| Bit 6: | Bit 6 | Bit 14 |
| Bit 7: | Bit 7 | Bit 15 |

| Desired Baud Rate | Divisor Used to Generate 16x Clock |
|-------------------|------------------------------------|
| 300 | 384 |
| 600 | 192 |
| 1200 | 96 |
| 1800 | 64 |
| 2400 | 48 |
| 3600 | 32 |
| 4800 | 24 |
| 9600 | 12 |
| 14400 | 8 |
| 19200 | 6 |
| 28800 | 4 |
| 38400 | 3 |
| 57600 | 2 |
| 115200 | 1 |

Parallel Ports

❑ Register Address

| Port Address | Read/Write | Register |
|--------------|------------|-----------------------|
| Base + 0 | Write | Output data |
| Base + 0 | Read | Input data |
| Base + 1 | Read | Printer status buffer |
| Base + 2 | Write | Printer control latch |

❑ Printer Interface Logic

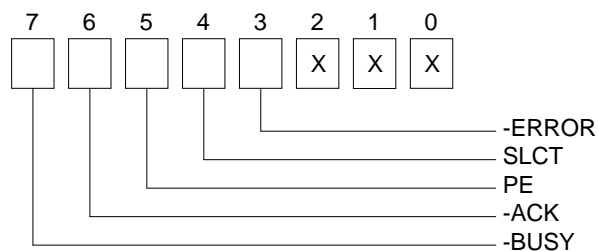
The parallel portion of the SMC37C669 makes the attachment of various devices that accept eight bits of parallel data at standard TTL level.

❑ Data Swapper

The system microprocessor can read the contents of the printer's Data Latch through the Data Swapper by reading the Data Swapper address

❑ Printer Status Buffer

The system microprocessor can read the printer status by reading the address of the Printer Status Buffer. The bit definitions are described below:

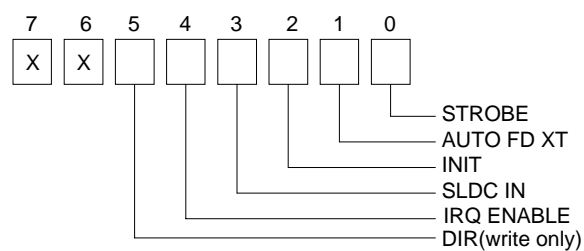


NOTE: X represents not used.

-
-
- Bit 7: This signal may become active during data entry, when the printer is off-line during printing, or when the print head is changing position or in an error state. When Bit 7 is active, the printer is busy and cannot accept data.
- Bit 6: This bit represents the current state of the printer's ACK signal. A 0 means the printer has received the character and is ready to accept another. Normally, this signal will be active for approximately 5 microseconds before receiving a BUSY message stops.
- Bit 5: A 1 means the printer has detected the end of the paper.
- Bit 4: A 1 means the printer is selected.
- Bit 3: A 0 means the printer has encountered an error condition.

□ Printer Control Latch & Printer Control Swapper

The system microprocessor can read the contents of the printer control latch by reading the address of printer control swapper. Bit definitions are as follows:

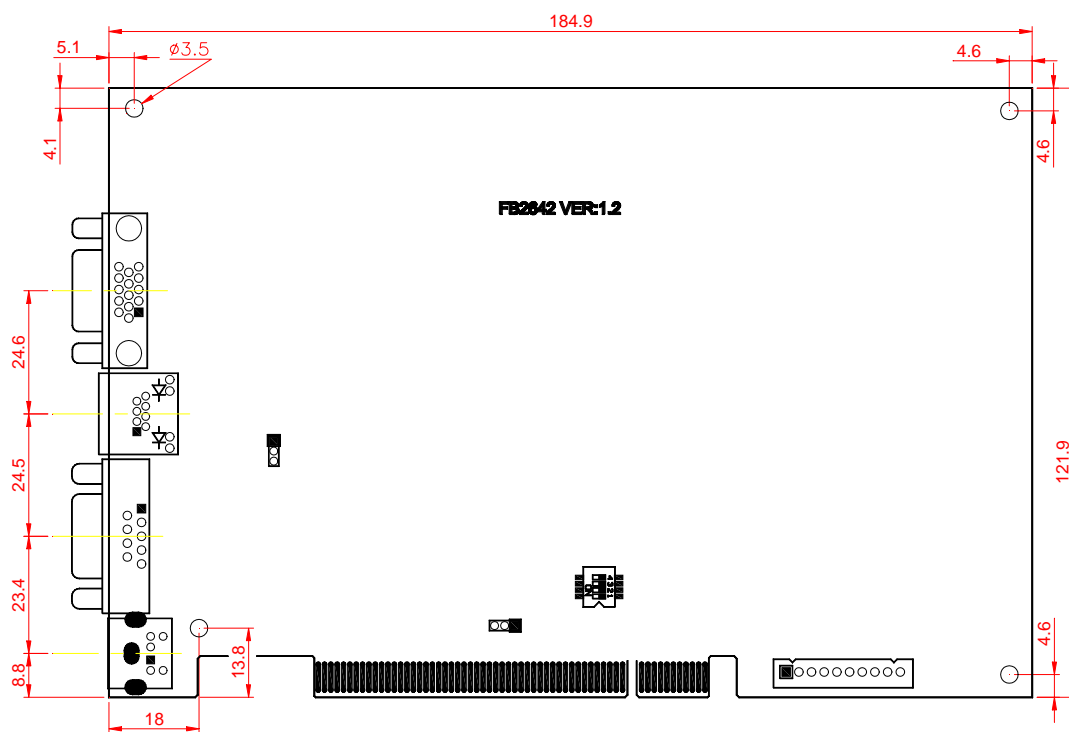


NOTE: X represents not used.

-
-
- Bit 5: Direction control bit. When logic 1, the output buffers in the parallel port are disabled allowing data driven from external sources to be read; when logic 0, they work as a printer port. This bit is write-only.
- Bit 4: A 1 in this position allows an interrupt to occur when ACK changes from low state to high state.
- Bit 3: A 1 in this bit position selects the printer.
- Bit 2: A 0 starts the printer (50 microseconds pulse, minimum).
- Bit 1: A 1 causes the printer to line-feed after a line is printed.
- Bit 0: A 0.5 microsecond minimum highly active pulse clocks data into the printer. Valid data must be present for a minimum of 0.5 microseconds before and after the strobe pulse.

Appendix

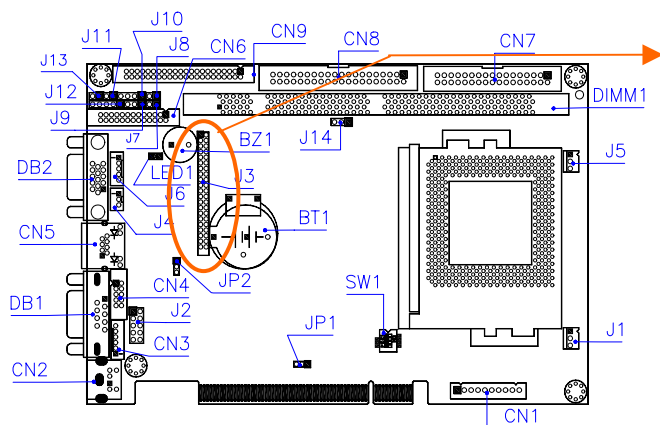
Dimension



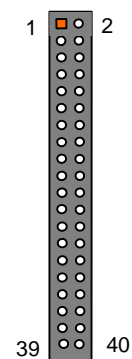
Special Features

J3: Feature Connector (J3: 44-pin 2.0mm IDC)

J3 is a multi-function connector which supports signals for AC97 audio, Panel Link, and Intel LAN solution. All of these functions consist in VS-4642 adapter board (optional). Use the 44-pin 2.0mm cable (VS-4642 included) connect J3 with VS-4642, you can have audio I/O, panel link interface for LCD, and dual LAN in one system with Intel LAN chipset.



J3 - Feature connector



The following table lists the pin description of J3.

| Pin | J3 | G | Pin | J3 | G |
|-----|--------|---|-----|--------|---|
| 1 | +5V | P | 2 | +5V | P |
| 3 | CLK0 | V | 4 | CLK1 | V |
| 5 | VSYNC | V | 6 | HSYNC | V |
| 7 | LTVD0 | V | 8 | LTVD1 | V |
| 9 | LTVD2 | V | 10 | LTVD3 | V |
| 11 | LTVD4 | V | 12 | LTVD5 | V |
| 13 | LTVD6 | V | 14 | LTVD7 | V |
| 15 | LTVD8 | V | 16 | LTVD9 | V |
| 17 | LTVD10 | V | 18 | LTVD11 | V |
| 19 | FTBLNK | V | 20 | STALL | V |
| 21 | FTSCL | V | 22 | FTSDA | V |
| 23 | -ACRST | A | 24 | BITCLK | A |
| 25 | SYNC | A | 26 | SDOUT | A |
| 27 | SDIN0 | A | 28 | SDIN1 | A |
| 29 | LTXD0 | L | 30 | LTXD1 | L |
| 31 | SYNC | L | 32 | LTXD2 | L |
| 33 | LRXD1 | L | 34 | LRXD0 | L |
| 35 | LCLK | L | 36 | LRXD2 | L |
| 37 | EED1 | L | 38 | EECK | L |
| 39 | EED0 | L | 40 | +3.3V | P |
| 41 | EECS | L | 42 | +3.3V | P |
| 43 | Ground | P | 44 | Ground | P |

Note 1:"P" in G column main Power signals.

Note 2:"V" in G column main Video signals for panel link.

Note 3:"A" in G column main AC97 signals for audio.

Note 4:"L" in G column main LAN signals for Intel PHY.