PCM-3372

PC/104+ SBC w/VIA Eden + CX700, VGA, LCD, LAN, USB2.0 and CF

User Manual

Acknowledgements

For more information on this and other products, please visit our websites at: **http://www.emacinc.com**

For technical support and service, please visit our support website at: **http://www.emacinc.com/support**

This manual is for the PCM-3372.

Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 x PCM-3372 SBC
- 1 x USB cable w/ 6 ports, 16cm
- 1 x VGA cable, 15cm
- 1 x PS/2 KB & Mouse cable, 20cm
- 1 x Serial ATA cable, 100cm
- 1 x LPT cable, 25cm
- 1 x Ethernet RJ-45 Conn. conversion cable
- 1 x COM 1,2 cable, 22cm
- 1 x IDE cable
- 1 x RS-422/485 cable, 15cm
- 1 x MINI-DIN cable, 6cm
- 1 x AT power cable
- 1 x Audio cable
- 1 x ATX power cable

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Model No. List	Description
PCM-3372F-J	PC/104+ SBC w/VIA Eden 400MHz + CX700, VGA, LVDS, LAN, Audio, CF, Fanless
PCM-3372F-M	PC/104+ SBC w/VIA Eden 600MHz + CX700, VGA, LVDS, LAN, Audio, CF, Fanless
PCM-3372F-S	PC/104+ SBC w/VIA Eden ULV 1.0GHz + CX700, VGA, LVDS, LAN, Audio, CF, Fanless

Additional Information and Assistance

1. Visit our web site at **www.emacinc.com** where you can find the latest information about the product.
2. Contact your distributor, or sales representative for technical support if you need additional assistance.

Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

1.This device may not cause harmful interference, and

2.This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution!

Achtung!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer’s instructions

Contents

CHAPTER 1

General Information

This chapter gives background information on the PCM-3372.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

Chapter 1 Introduction

1.1 Introduction

The PCM-3372 is a fanless, best-cost, performance PC/104+ SBC (Single Board Computer) geared to satisfy the needs for various industrial computing equipment. PCM-3372 is ideal for communication, industrial and digital signage that require flat panel support using digital dual indenpdent displays with CRT and LVDS interfaces and single Ethernet ports. PCM-3372 uses an VIA Eden processor, support up to ULV1.0GHz with Fanless solution, in conjunction with DDR2 533 memory.
PCM-3372 offers convenient connector layout, easy assembly, multiple I/O, and includes single 10/100Mbps Ethernet, Six USB (Universal Serial Bus) 2.0 and two serial ports for easy system expansibility.
Dual independent dispaly and the SATA function are the key features for PCM-3372 series product.

1.2 Features

- VIA Eden (V4) processor, supports 400/600 MHz and ULV 1.0GHz with fanless solution VIA C7 2.0GHz processor, with FAN solution
- Supports DDR2 533/400 SDRAM
- Supports 1 x Dual-Channel/2 x 18/24 single-channel LVDS panel
- Supports CRT + LVDS, LVDS + LVDS dual independent display
- Supports 1 x 100Base-T Fast Ethernet
- Supports Six USB2.0 ports and two COM ports
- Supports two SATA
- PC/104+ expansion interface

1.3 Specifications

1.3.1 Standard PC/104 Biscuit SBC Functions

- **CPU:** VIA Eden processor, up to ULV1.0GHz
- **System Memory:** Supports Double Data Rate2 (DDR2) SDRAM, supports up to DDR533 SDRAM
- **2nd Cache Memory:** 128 KB on the processor
- **System Chipset:** VIA CX700
- **BIOS:** AWARD 4Mbit Flash BIOS
- **Watchdog timer:** 255 levels timer interval
- **Expansion Interface:** PC/104+
- **Battery:** Lithium 3V/196 mAH
- **Power management:** ACPI supported
- **Enhanced IDE interface:** One channel supports up to two EIDE devices. BIOS auto-detect, PIO Mode 3 or Mode 4, supports UDMA 33/66 mode
- **Serial ports:** Two serial RS-232 ports in one 20 pin connector (CN15: COM1&2). RS-422 and RS-485 in 4pin connector (CN16) with RS-422/485 cable (p/n:1703040157).
- **Parallel port:** One parallel port, supports SPP/EPP/ECP mode
- **Keyboard/mouse connector:** Supports one standard PC/AT keyboard and a PS/2 mouse
- **Audio:** Supports HD Audio stereo sound
- **USB:** Six USB 2.0 ports compliant universal serial bus ports
- **CF:** Solid State Disk (SSD) supports one 50-pin socket for CFC type I

1.3.2 VGA/LVDS Interface

- **Chipset:** VIA CX700
- **Memory Size:** Optimized Shared Memory Architecture, supports 64 MB frame buffer using system memory
- **Resolution:** CRT resolution: up to 1600 x 1200 x 16 bpp at 100 Hz and up to 1024 x 768 x 32 bpp at 60 Hz for TFT LCD
- **LCD Interface:** Supports 1 x Dual-Channel/2 x 18/24 single-channel LVDS panel
- **Dual Simultaneous Display:** CRT + LVDS, LVDS + LVDS (optional by the BIOS)

1.3.3 Ethernet Interface

- **Chipset supports:** 1 x 10/100 Mbps - Intel 82551ER
- **Interface:** 1 x internal box header
- Standard IEEE 802.3u (100 BASE-T) protocol compatible

1.3.4 Audio Function

- **Audio controller:** Realtek ALC888 chipset, supports HD 3D Audio stereo sound
- **Audio interface:** Microphone in, Line in, Line out

1.3.5 OS support

- This board supports Win XP, Win CE and Win XPe.
- For further information about OS support in your PCM-3372, visit the following web resource: www.emacinc.com or please contact technical support center

1.3.6 Mechanical and Environmental

- **Dimensions:** 96 x 115 mm (3.77"x 4.05")
  Mechanical Drawing (dxf file) is available.
- **Power Supply Type:** AT, ATX
- **Power Requirement:** +5 V ± 5%, +12 V ± 5% (Optional), (5V only, 12V optional for PC104 add on card and LCD inverter)
- **Power Consumption:**
  (VIA Eden 400Mhz, 512 MB DDR2 533)
  Max: +5 V@ 1.69A, +12 V@ 0.2 A
  Typical: +5 V@ 1.62 A, +12 V@ 0.19 A
- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F)
- **Operating Humidity:** 0% ~ 90% relative humidity, non-condensing
- **Weight:** 0.85 kg (reference weight of total package)

1.4 Board Layout: dimensions

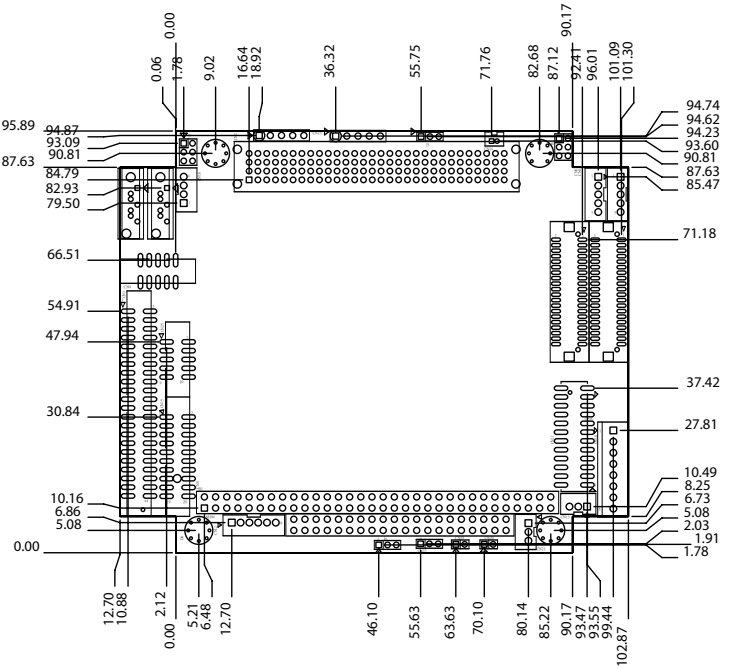


Figure 1.1: Board layout: Dimensions (Component Side)

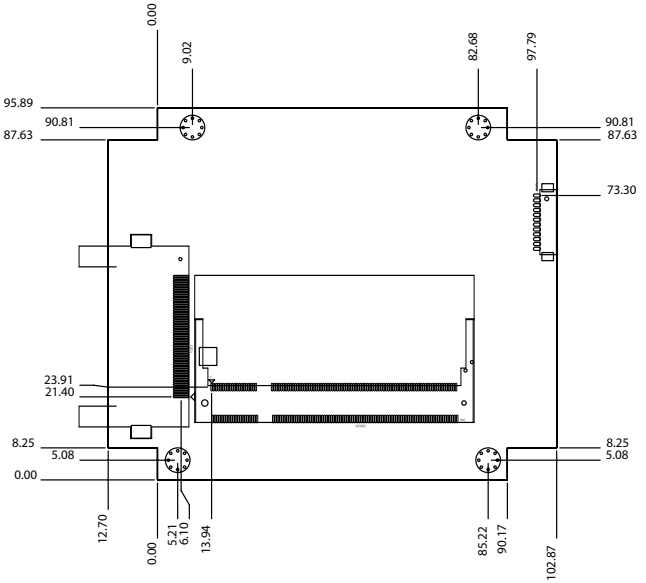


Figure 1.2: Board layout: Dimensions (Solder Side)

CHAPTER 2

Installation

This chapter explains the setup procedures of the PCM-3372 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

Chapter 2 Installation

2.1 Jumpers

The PCM-3372 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 2.1: Jumper/Switch Setting	
J3	PCIVIO power select
J4	Clear CMOS
J7	COM2 RS-232/422/485 Setting
J8	LVDS panel power select

2.2 Connectors

Onboard connectors link the PCM-3372 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

Table 2.2: Connector Table	
CN2	Digital Input commector
CN3	IDE connector
CN4	External LCD Backlight
CN5	External LVDS connector
CN6	Internal LCD Backlight
CN7	Internal LVDS connector
CN8	PC104+ connector
CN9	LAN commector
CN10	CRT connector
CN11	USB connector
CN12	KB/MS connector
CN13	CPU FAN connector
CN14	BATTERY connector
CN15	COM1/2 connector
CN16	RS422/458 connector
CN18	POWER connector
CN19	RESET connector
CN20	Power Switch
CN21	ATX Power connector
CN22	-12 V/-5 V Power commector
CN23	Digital Output connector
CN24	Compack Flash commector
CN25	AUDIO connector
SA1	SATA1 connector
SA2	SATA2 connector

2.3 Locating Connectors

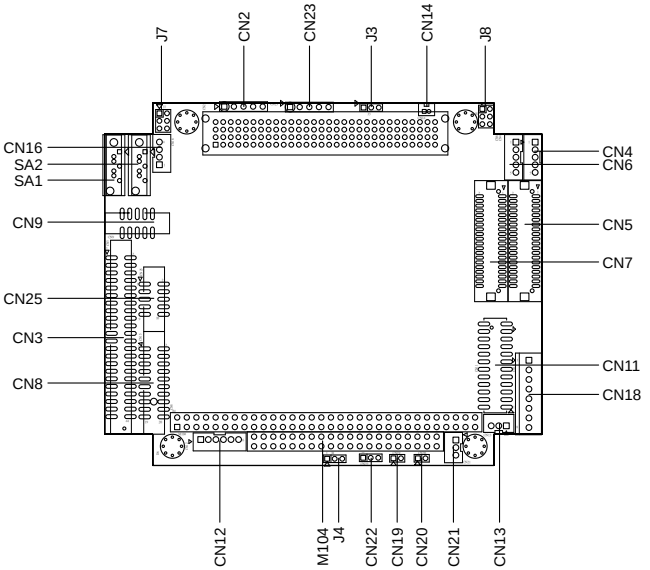


Figure 2.1: Connectors (component side)

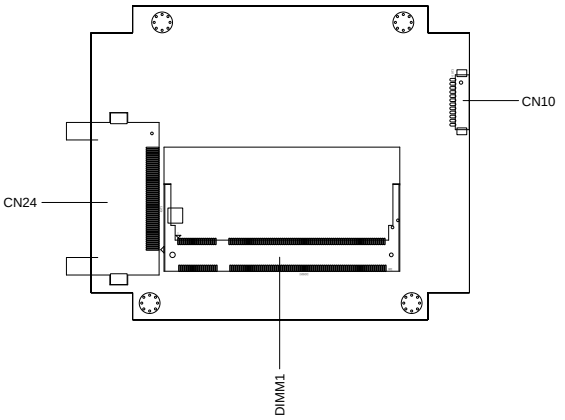
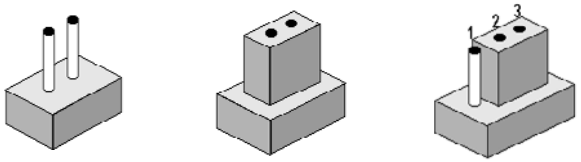


Figure 2.2: Connectors (solder side)

2.4 Setting Jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



open closed closed 2-3

The jumper settings are schematically depicted in this manual as follows:.

open closed closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.5 Installing SO-DIMMs

The procedures for installing SODIMMs are described below. Please follow these steps carefully. You can install SDRAM memory modules using 200-pin SODIMMs (Small Outline Dual In-line Memory Modules).

1. Ensure that all power supplies to the system are switched off.

2. Tilt the SODIMM card just above the board and slide it into the housing card slot.

3. Push the module into the socket until the module gently snaps in. There should only be a slight insertion force to engage the module into the contacts. Make sure that the module and the housing are aligned and locked in place.

2.6 IDE, CDROM Hard Drive Connector (CN3)

The board provides 1 IDE channel which you can attach up to two Enhanced Integrated Drive Electronics hard disk drives or CDROM to the board's internal controller. Its IDE controller uses a PCI interface. This advanced IDE controller supports faster data transfer, PIO mode 3, mode 4 and up to UDMA 33/66.

2.6.1 Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. This package includes One 44 PIN IDE cable that can connect to 1.8" and 2.5" drives.

1. Connect one end of the cable to Hard Drive connector. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive's documentation for the location of the connector.)

If desired, connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

2.7 Solid State Disk

The board provides a CompactFlash card type I socket.

2.7.1 Compact Flash (CN24)

The CompactFlash card shares a secondary IDE channel which can be enabled/disabled via the BIOS settings.

2.8 Keyboard and PS/2 Mouse Connector (CN12)

The board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. If the keyboard is not present, the standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset. The PCM 3372's BIOS standard setup menu allows you to select "All, But Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications, without the system halting under POST.

2.9 Power Connectors (CN20)

2.9.1 Main power connector, +5 V, +12 V (CN38)

Supplies main power +5V to the PCM-3372, and to devices that require +12 V.

2.9.2 Power Reset button

Momentarily pressing the reset button will activate a reset. The switch should be rated for 10 mA, 5 V.

2.10 Audio Interfaces (CN25)

2.10.1 Audio connector Audio-out(CN35), Audio-in(CN34)

The board provides all major audio signals on a 10-pin cable connector, These audio signals include Microphone in (mono), Line in (stereo) and Line out (stereo).

2.11 COM Port Connector (CN15)

The board provides four serial ports: Two serial RS-232 ports in one Hirose 20 pin connector (CN15: COM1&2). It provides connections for serial devices or a communication network. You can find the pin assignments for the COM port connector in Appendix C.

2.11.1 Serial Port RS-422/485 (CN16)

Serial port can be configured to operate in RS-422 and RS-485 mode. RS-422 and RS-485 in one pinheader (CN16) with RS-422/485 cable (p/n:1703040157). RS-422.485 function can be configured via J7.

Table 2.3: Serial Port RS-422/485 (J7)

Setting	Function
1-2	RS-232
3-4	RS-485
5-6	RS-422

2.12 VGA/LCD Interface Connections

The board's PCI SVGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays.

2.12.1 CRT display connector (CN10)

The CRT display connector is a 12-pin D-SUB connector used for conventional CRT displays.

2.12.2 External LVDS Connector (CN5)

For PCM-3372 series, CN5 consists of a 40-pin connector which can support up to 48-bit LCD panel.

2.12.3 External LVDS Connector (CN7)

Four PCM-3372 series, the board supports 2 channel 36/48 bit LVDS LCD panel displays. as the dual LVDS display, need to use another BIOS (p/n:1420005293).

Note: The default is CRT + LVDS.

2.13 Ethernet Configuration

The board is equipped with one high performance 32-bit PCI-bus Ethernet interface which are fully compliant with IEEE 802.3U 10/100Mbps standards. They are supported by all major network operating systems.

2.13.1 100Base-T connector (CN9)

100Base-T connections are made via one internal 10-pin box header.

2.14 Watchdog Timer Configuration

An onboard watchdog timer reduces the chance of disruptions which EMP (electro-magnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications. Setup involves one jumper and running the control software (refer to Appendix A).

2.15 USB Connectors (CN11)

The board provides up to six USB (Universal Serial Bus) ports using Plug and Play. The USB interfaces comply with High Speed USB specification Rev. 2.0 which supports 480 Mbps transfer rate, and are fuse protected.

The USB interface is accessed through one 12 x 2-pin flat-cable connectors. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 12 x 2-pin connector on one end and a USB connector on the other.

The USB interfaces can be disabled in the system BIOS setup.

2.16 GPIO (General Purpose Input Output) (CN2/CN23)

The board supports 8-bit GPIO through GPIO connector. The 8 digital inputs and outputs can be programmed to read or control devices, with each input or output defined. The default setting is 4 bits input and 4 bits out.

2.17 SATA Connector (SA1, SA2)

PCM-3372 supports Serial ATA via two connectors (SA1, SA2). Data transfer rates up to 150 MB/s are possible, enabling very fast data and file transfer, and independent DMA operation on two ports.

CHAPTER 3

Award BIOS Setup

Chapter 3 Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed memory (CMOS RAM) so that it retains the setup information when the power is turned off.

3.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to Flash ROM. If operation in harsh industrial environments causes a software error, the BIOS will recheck the data in CMOS RAM and automatically restore the original data in Flash ROM to CMOS RAM for booting.

Note: *If you intend to change the CMOS setting without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..." message appears again and again, please check to see if you need to replace the battery in your system.*

3.2 Entering Setup

Turn on the computer and check for the “patch code”. If there is a number assigned to the patch code, it means that the BIOS supports your CPU.

If there is no number assigned to the patch code, please contact a support engineer to obtain an up-to-date patch code file. This will ensure that your CPU’s system status is valid. After ensuring that you have a number assigned to the patch code, press <Del> to allow you to enter the setup.

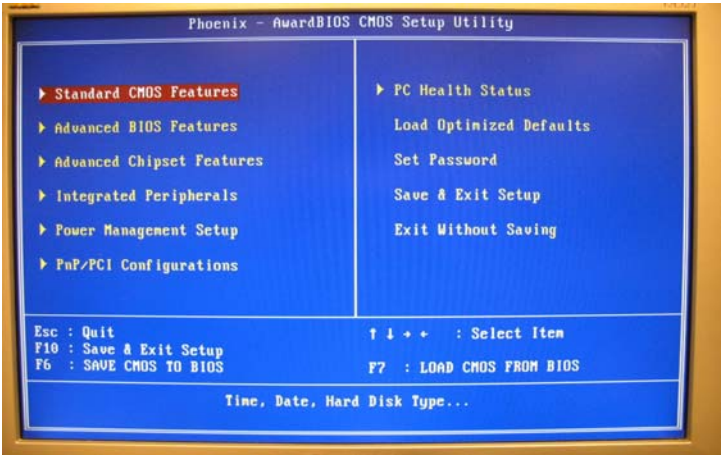


Figure 3.1: Award BIOS Setup initial screen

3.3 Standard CMOS Setup

Choose the “Standard CMOS Features” option from the “Initial Setup Screen” menu, and the screen below will be displayed. This menu allows users to configure system components such as date, time, hard disk drive, Video, Halt On, display, and memory.

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the board according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

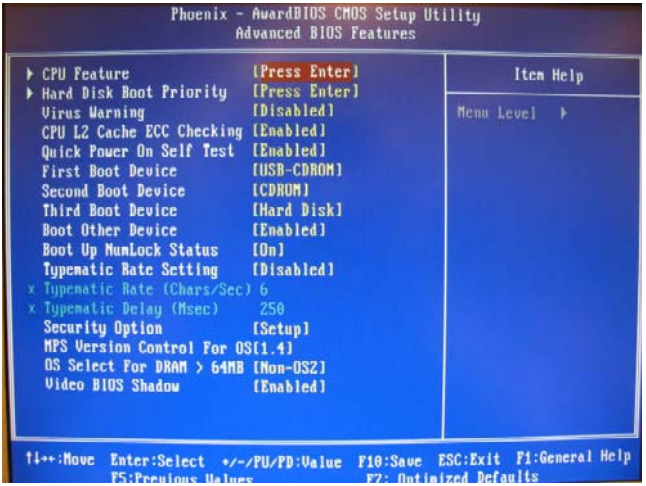


Figure 3.2: Advanced BIOS features screen

3.4.1 Virus Warning

If enabled, a warning message and alarm beep activates if someone attempts to write here. The commands are “Enabled” or “Disabled.”

3.4.2 First/Second/Third/Other Boot Device

The BIOS tries to load the OS with the devices in the sequence selected.

Choices are: HDD, CDROM, LAN, Disabled.

3.4.3 Boot Up NumLock Status

This feature selects the "power on" state for NumLock. The commands are "Enabled" or "Disabled."

3.4.4 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled." Enabling allows the typematic rate and delay to be selected.

3.4.5 Typematic Rate (Chars/Sec)

BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24, 30.

3.4.6 Typematic Delay (msec)

Typematic delay is the time interval between the appearance of two consecutive characters, when holding down a key. The input values for this category are: 250, 500, 750, 1000 (msec).

3.4.7 Security Option

This setting determines whether the system will boot up if the password is denied. Access to Setup is always limited.

System The system will not boot, and access to Setup will be denied if the correct password is not entered at the prompt.

Setup The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select "PASSWORD SETTING" in the main menu. At this point, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot, and you can enter Setup freely.

3.5 Integrated Peripherals

3.5.1 IDE Master/Slave PIO/UDMA Mode,

IDE Master/Slave PIO/UDMA Mode (Auto) has a master and a slave, making two IDE devices possible. Because each IDE device may have a

different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting “Auto” will allow auto detection to ensure optimal performance.

3.5.2 Integrated peripherals screen

3.5.3 Onboard LAN Control

Options are Enable or Disable. Select Disable if user does not want to use onboard LAN controller1

3.5.4 IDE HDD Block Mode

You can enable the Primary IDE channel and/or the Secondary IDE channel. Any channel not enabled is disabled. This field is for systems with only SCSI drives.

3.5.5 Onboard Serial Port

For settings reference the Appendix for the serial resource allocation,

and Disabled for the on-board serial connector

3.6 Power Management Setup

The power management setup controls the CPU card's "green" features to save power. The following screen shows the manufacturer's defaults:

Figure 3.3: Power management setup screen

3.6.1 ACPI function

The choice: Enabled, Disabled.

3.6.2 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Suspend Mode

There are four selections for Power Management, three of which have fixed mode settings:

Min. Power Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

3.6.3 Video Off In Suspend

When system is in suspend, video will turn off.

3.6.4 Modem Use IRQ

This determines the IRQ which the MODEM can use. The choices: 3, 4, 5, 7, 9, 10, 11, NA.

3.6.5 HDD Power Down

You can choose to turn the HDD off after one of the time intervals listed, or when the system is in "suspend" mode. If the HDD is in a power saving mode, any access to it will wake it up.

3.6.6 PowerOn By Modem

When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state. The choices: Enabled, Disabled.

3.6.7 PowerOn By Alarm

When Enabled, your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode. The choices: Enabled, Disabled.

3.6.8 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) is active. The choices are: Enabled, Disabled.

3.6.9 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if FDD, COM port, or LPT port is active. The choice: Enabled, Disabled.

3.6.10 PCI PIRQ [A-D]#

When Enabled, the system will resume from suspend mode if an interrupt occurs. The choices are: Enabled, Disabled.

3.7 PnP/PCI Configurations

3.7.1 PnP OS Installed

Select Yes if you are using a plug and play capable operating system. Select No if you need the BIOS to configure non-boot device

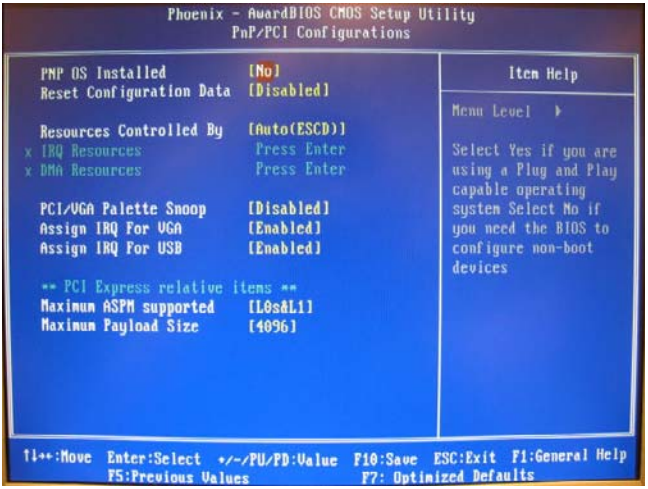


Figure 3.4: PnP/PCI configurations screen

3.7.2 Reset Configuration Data

Default is Disable. Select Enable to reset Extended System Configuration Data (ESCD) if you have installed a new add-on and system configuration has caused such a conflict that OS cannot boot.

3.7.3 Resources controlled by:

The commands here are “Auto” or “Manual.” Choosing “manual” requires you to choose resources from each following sub-menu. “Auto” automatically configures all of the boot and Plug and Play devices but you must be using Windows 95 or above.

3.7.4 PCI/VGA Palette Snoop

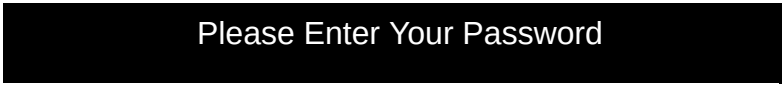
This is left at “Disabled.”

3.8 Password Setting

To change the password:

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>.

The screen will display the following message



Press <Enter>.

2. If the CMOS is good or if this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.

3.9 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprocessor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.10 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

CHAPTER 4

S/W Installation

This chapter gives details of software installation.

Chapter 4 S/W Installation

4.1 S/W Introduction

The mission of the manufacturer's Embedded Software Services is to enhance quality of life with the manufacturer's platforms and Microsoft Windows® embedded technology. We enable Windows® Embedded software products on the manufacturer's platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (Hardware suppliers, System integrators, Embedded OS distributor) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded.

4.2 Driver Installation

To install the drivers, insert the CD into CD-Rom, select the drivers that you want to install, then run the .exe (set up) file under each chipset folder. Follow the on-screen instructions to complete the installation.

4.3 SUSI Application Library

4.3.1 SUSI Introduction

To make hardware easier and more convenient to access for programmers, the manufacturer has released a suite of APIs (Application Programming Interface) in the form of a program library. The program library is called the Secured and Unified Smart Interface (SUSI) library.

In modern operating systems, user space applications cannot access hardware directly. Drivers are required to access hardware. User space applications access hardware through drivers. Different operating systems usually define different interfaces for drivers. This means that user space applications call different functions for hardware access in different operating systems. To provide a uniform interface for accessing hardware, an abstraction layer is built on top of the drivers and SUSI is such an abstraction layer. SUSI provides a uniform API for application programmers to access the hardware functions in different operating systems and on different hardware platforms.

Application programmers should invoke the functions exported by SUSI instead of calling the drivers directly. The benefit of using SUSI is portability. The same APIs can be used for different hardware platforms. Besides, the same set of APIs is implemented in different operating systems including Windows XP and Windows CE. This user manual describes some sample programs and the API in SUSI. The hardware functions currently supported by SUSI can be grouped into a few categories including Watchdog, I2C, SMBus, GPIO, and VGA control.

Each category of the API in SUSI is briefly described below.

4.3.2 SUSI Functions

The GPIO API

General Purpose Input/Output (GPIO) is a flexible parallel interface that allows a variety of custom connections. You can control cash drawers with GPIO.

The I2C API

I2C is a bidirectional two wire bus that was developed by Phillips for use in their televisions in the 1980s. It is used in various types of embedded systems nowadays. The strict timing requirements defined in the I2C protocol has been taken care of by SUSI. Instead of asking application programmers to figure out the strict timing requirements in the I2C protocol, the I2C API in SUSI can be used to control I2C devices just like invoking other function calls. Therefore, the development process of your products can be accelerated by using SUSI. Besides, SUSI provides a consistent programming interface for different boards. This means programs using SUSI are portable across different boards as long as the boards and SUSI provide the required functionalities.

The SMBus API

The System Management Bus (SMBus) is a two-wire interface defined by IntelR Corporation in 1995. It is based on the same principles of operation as I2C and is used in personal computers and servers for low-speed system management communications. It can be seen in many types of embedded systems. As with other APIs in SUSI, the SMBus API is available on many platforms including Windows XP and Windows CE.

The VGA Control API

There are two kinds of VGA control API in SUSI: backlight on/off control and brightness control. Backlight on/off control can allow a developer to turn on or turn off the backlight. Our API allows a developer to turn on/off the backlight and to control brightness smoothly.

The Watchdog API

A watchdog timer (WDT) is a hardware device which triggers an action, e.g. rebooting the system, if the system does not reset the timer within a specific period of time. The WDT API in the SUSI provides developers with functions such as starting the timer, reset the timer, and set the time-out value if the hardware supports customized a time-out value.

The Hardware Monitor API

The hardware monitor (HWM) is a system health supervision function that uses an I/O chip along with sensors to monitor items such as fan speed, temperature and voltage.

Commercial hardware monitoring chips are not accurate, so the manufacturer has developed a unique scheme for hardware monitoring. This uses a dedicated microprocessor and algorithms specifically designed for providing accurate real-time data, to protect your system in a more reliable manner.

4.3.3 SUSI Installation

SUSI supports many different operating systems. Each subsection describes how to install SUSI and related software on a specific operating system. Please refer to the subsection matching your operating system.

Windows XP

In windows XP, you can install libraries, drivers and demo programs on to the platform easily by using the SUSI Library Installer. After the installer is executed, the SUSI Library and related files for Windows XP can be found in the target directory you choose during installation. The files are listed in the following table.

The following section of [Installation] illustrates all the process of installation.

Directory Contents

\Library Susi.lib: Library for developing applications on Windows XP.

Susi.dll: Dynamic library for SUSI on Windows XP.

\Demo SusiDemo.exe: Demo program on Windows XP.

Susi.dll: Dynamic library for SUSI on Windows XP.

\Demo\SRC Source code of the demo program on Windows XP.

Note the version shown on each SUSI Library

Installer screen may.

Installation:

1. Extract Susi.zip.

2. Double-click the "Setup.exe" file.

The installer searches for a previous installation of SUSI Library. If it locates one, a screen opens asking whether you want to modify, repair or remove the software. If a previous version is located, please see the section of [Maintenance Setup]. If it is not located, the following screen shot opens. Click Next.

Windows CE

In Windows CE, there are three ways to install SUSI Library. You can install it manually, use the CE-Builder to install the library or just copy the programs and the library into a CompactFlash card.

Express Installation:

To use the CE-Builder to help you include the library in the image:

1. Click the My Component tab.
2. Click the Add New Category button to add a new category, e.g. SUSI Library.
3. Add a new file in this category and upload the SUSI.dll for this category.

After doing these steps, you can just select the SUSI Library category you created for every project.

Manual Installation:

To add the SUSI Library to the image by editing a bib file:

1. Open project.bib in the platform builder.
2. Add this line to the MODULES section of project.bib Susi.dll $(_FLATRELEASEDIR)\Susi.dll NK SH
3. If you want to run the window-based demo, add following line: SusiTest.exe $(_FLATRELEASEDIR)\SusiTest.exe
4. If you want to run the console-based demo, add following lines:Watchdog.exe $(_FLATRELEASEDIR)\Watchdog.exe NK S GPIO.exe $(_FLATRELEASEDIR)\GPIO.exe NK S SMBUS.exe $(_FLATRELEASEDIR)\SMBUS.exe NK S
5. Place the three files into any files directory.
6. Build your new Windows CE operating system.

4.3.4 SUSI Sample Programs

Sample Programs

The sample programs demonstrate how to incorporate SUSI into your program. There are sample programs for Windows XP and Windows CE.

The sample programs run in graphics mode in Windows XP and Windows CE. The sample programs are described in the subsections below.

Windows Graphics Mode

There are sample programs in Windows graphics mode for Windows CE and Windows XP. Each demo application release package contains an executable file SusiDemo.exe, a shared library Susi.dll and source code.

The Windows CE and Windows XP files are not compatible with each other. SusiDemo.exe is an executable file that requires the shared library, Susi.dll, to demonstrate SUSI functions. The Windows CE source code of SusiDemo.exe must be compiled with Microsoft Embedded Visual C++ 4.0 on Windows CE and the Windows XP version must be compiled with Microsoft Visual C++ 6.0 on Windows XP. Developers must add the header file Susi.h and library Susi.lib to their own projects when they want to develop something with SUSI.

4.4 Further Information

For further information about the AGP/VGA installation of your PCM-3372, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

EMAC's website: *www.emacinc.com*

Appendix A

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

Appendix A Pin Assignments

A.1 Pin Assignments

Table A.1: Jumper Setting	
J3	PCIVIO POWER Select
J4	CLEAR CMOS
J7	COM2 RS232/422/485 Select
J8	LVDS PANEL POWER Select

Table A.2: Connector Table	
CN2	Digital Input commector
CN3	IDE connector
CN4	External LCD Backlight
CN5	External LVDS connector
CN6	Internal LCD Backlight
CN7	Internal LVDS connector
CN8	PC104+ connector
CN9	LAN commector
CN10	CRT connector
CN11	USB connector
CN12	KB/MS connector
CN13	CPU FAN connector
CN14	BATTERY connector
CN15	COM1/2 connector
CN16	RS422/458 connector
CN18.....	POWER connector
CN19	RESET connector
CN20	Power Switch
CN21	ATX Power connector
CN22	-12V/-5V Power commector
CN23	Digital Output connector
CN24	Compack Flash commector
CN25	AUDIO connector
SA1.....	SATA1 connector
SA2	SATA2 connector

Table A.3: PCI VI/O POWER Select (J3)	
J3	**PCI VI/O POWER Select**
Part Number	1653003101
Footprint	JH3X1V-2M
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb
Setting	Function
(1-2)	With +5V
(2-3)	With +3.3V

Table A.4: CLEAR CMOS (J4)	
J4	**CLEAR CMOS**
Part Number	1653003101
Footprint	JH3X1V-2M
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb
Setting	Function
(1-2)	NORMAL
(2-3)	CLEAR CMOS

Table A.5: COM2 RS232/422/485 Select (J7)	
J7	**COM2 RS232/422/485 Select**
Part Number	1653003201
Footprint	JH3X2V-2M
Description	PIN HEADER 3*2P 180D(M) 2.0mm DIP SQUARE WO/ Pb
Setting	Function
(1-2)	RS232
(3-4)	RS485
(5-6)	RS422

Table A.6: LVDS PANEL POWER Select (J8)	
J8	**LVDS PANEL POWER Select**
Part Number	1653003201
Footprint	JH3X2V-2M
Description	PIN HEADER 3*2P 180D(M) 2.0mm DIP SQUARE WO/ Pb
Setting	Function
(1-3)	5 V for Internal LVDS POWER Select
(3-5)	3.3 V for Internal LVDS POWER Select
(2-4)	5 V for External LVDS POWER Select
(4-6)	3.3 V for External LVDS POWER Select

Table A.7: Digital Input Connector (CN2)			
CN2	**Digital Input Connector**		
Part Number	1653005100		
Footprint	JH5X1V		
Description	PIN HEADER 5*1P 180D(M) 2.54mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+5 V	PWR	+5 V
2	DIOIN0	Input	+5 V
3	DIOIN1	Input	+5 V
4	DIOIN2	Input	+5 V
5	DIOIN3	Input	+5 V

Table A.8: IDE connector (CN3)			
CN3	**IDE connector**		
Part Number	1653222262		
Footprint	BH22X2SV		
Description	BOX HEADER SMD 22*2P 180D(M) 2.0mm IDIOT-PROOF		
Pin	Pin Name	Signal Type	Signal Level
1	IDE0_RSE#	Out	+5 V
2	GND	GND	
3	IDE0_D7	I/O	+5 V
4	IDE0_D8	I/O	+3.3 V
5	IDE0_D6	I/O	+5 V
6	IDE0_D9	I/O	+5 V
7	IDE0_D5	I/O	+5 V
8	IDE0_D10	I/O	+5 V
9	IDE0_D4	I/O	+5 V
10	IDE0_D11	I/O	+5 V
11	IDE0_D3	I/O	+5 V
12	IDE0_D12	I/O	+5 V
13	IDE0_D2	I/O	+5 V
14	IDE0_D13	I/O	+5 V
15	IDE0_D1	I/O	+5 V
16	IDE0_D14	I/O	+5 V
17	IDE0_D0	I/O	+5 V
18	IDE0_D15	I/O	+5 V
19	GND	GND	
21	IDE0_DREQ	Out	+5 V
22	GND	GND	
23	IDE0_IOW#	Out	+5 V
24	GND	GND	
25	IDE0_IOR#	Out	+5 V
26	GND	GND	

Table A.8: IDE connector (CN3)			
CN3	**IDE connector**		
Part Number	1653222262		
Footprint	BH22X2SV		
Description	BOX HEADER SMD 22*2P 180D(M) 2.0mm IDIOT-PROOF		
27	IDE0_IORDY	Out	+5 V
28	IDE0_CSEL	Out	+5 V
29	IDE0_DACK#	Out	+5 V
30	GND	GND	
31	IDE0_IRQ15	In	+5 V
32	NC		+5 V
33	IDE0_A1	In	+5 V
34	IDE0_D66DET#	In	+5 V
35	IDE0_A0	In	+5 V
36	IDE0_A2	In	+5 V
37	IDE0_CS#1	Out	+5 V
38	IDE0_CS#3	Out	+5 V
39	IDE0_ASP#	Out	+5 V
40	GND	GND	
41	+5 V	PWR	+5 V
42	+5 V	PWR	+5 V
43	GND	GND	
44	NC		

Table A.9: External LCD Backlight (CN4)			
CN4	**External LCD Backlight**		
Part Number	1655305020		
Footprint	WHL5V-2M		
Description	WAFER BOX 2.0mm 5P 180D MALE W/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	+12 V	PWR	+12 V
2	GND	GND	
3	LVDS2_ENABKL	OUT	+3.3 V
4	LVDS2_VBR	OD	+3.3 V
5	+5 V	PWR	+5 V

Table A.10: External LVDS Connector (CN5)			
CN5	**External LVDS Connector**		
Part Number	1653920200		
Footprint	SPH20X2		
Description	*CONN. DF13-40DP-1.25V		
Pin	Pin Name	Signal Type	Signal Level
1	+VLVDS2_PANEL	PWR	+5 V/+3.3 V
2	+VLVDS2_PANEL	PWR	+5 V/+3.3 V
3	GND		
4	GND		+
5	+VLVDS2_PANEL	PWR	+5 V/+3.3 V
6	+VLVDS2_PANEL	PWR	+5 V/+3.3 V
7	LVDS2_D0-	OUT	LVDS
8	LVDS3_D0-	OUT	LVDS
9	LVDS2_D0+	OUT	LVDS
10	LVDS3_D0+	OUT	LVDS
11	GND		
12	GND		
13	LVDS2_D1-	OUT	LVDS
14	LVDS3_D1-	OUT	LVDS
15	LVDS2_D+-	OUT	LVDS
16	LVDS3_D1+	OUT	LVDS
17	GND		
18	GND		
19	LVDS2_D2-	OUT	LVDS
20	LVDS3_D2-	OUT	LVDS
21	LVDS2_D2+	OUT	LVDS
22	LVDS3_D2+	OUT	LVDS
23	GND		
24	GND		
25	LVDS2_CLK	OUT	LVDS
26	LVDS3_CLK-	OUT	LVDS

Table A.10: External LVDS Connector (CN5)			
CN5	**External LVDS Connector**		
Part Number	1653920200		
Footprint	SPH20X2		
Description	*CONN. DF13-40DP-1.25V		
27	LVDS2_CLK+	OUT	LVDS
28	LVDS3_CLK+	OUT	LVDS
29	GND		
30	GND		
31	LVDS2_SPCLK	I/O	+5 V/+3.3 V
32	LVDS2_SPDAT	I/O	+5 V/+3.3 V
33	GND		
34	GND		
35	LVDS2_D3-	OUT	LVDS
36	LVDS3_D3-	OUT	LVDS
37	LVDS2_D3+	OUT	LVDS
38	LVDS3_D3+	OUT	LVDS
39	NC		
40	LVDS2_VCON	OUT	LVDS

Table A.11: Internal LCD Backlight (CN6)			
CN6	**Internal LCD Backlight**		
Part Number	1655305020		
Footprint	WHL5V-2M		
Description	WAFER BOX 2.0mm 5P 180D MALE W/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	+12 V	PWR	+12 V
2	GND	GND	
3	LVDS0_ENABKL	OUT	+3.3 V
4	LVDS0_VBR	OD	+3.3 V
5	+5 V	PWR	+5 V

Table A.12: Internal LVDS Connector (CN7)			
CN7	**Internal LVDS Connector**		
Part Number	1653920200		
Footprint	SPH20X2	Footprint	SPH20X2
Description	*CONN. DF13-40DP-1.25V	Description	*CONN. DF13-40DP-1.25V
Pin	Pin Name	Signal Type	Signal Level
1	+VLVDS_PANEL	PWR	+5 V/+3.3 V
2	+VLVDS_PANEL	PWR	+5 V/+3.3 V
3	GND		
4	GND		+
5	+VLVDS_PANEL	PWR	+5 V/+3.3 V
6	+VLVDS_PANEL	PWR	+5 V/+3.3 V
7	LVDS0_D0-	OUT	LVDS
8	LVDS1_D0-	OUT	LVDS
9	LVDS0_D0+	OUT	LVDS
10	LVDS1_D0+	OUT	LVDS
11	GND		
12	GND		
13	LVDS0_D1-	OUT	LVDS
14	LVDS1_D1-	OUT	LVDS
15	LVDS0_D+-	OUT	LVDS
16	LVDS1_D1+	OUT	LVDS
17	GND		
18	GND		
19	LVDS0_D2-	OUT	LVDS
20	LVDS1_D2-	OUT	LVDS
21	LVDS0_D2+	OUT	LVDS
22	LVDS1_D2+	OUT	LVDS
23	GND		
24	GND		
25	LVDS0_CLK	OUT	LVDS

Table A.12: Internal LVDS Connector (CN7)			
CN7	**Internal LVDS Connector**		
Part Number	1653920200		
Footprint	SPH20X2	Footprint	SPH20X2
Description	*CONN. DF13-40DP-1.25V	Description	*CONN. DF13-40DP-1.25V
Pin	Pin Name	Signal Type	Signal Level
26	LVDS1_CLK-	OUT	LVDS
27	LVDS0_CLK+	OUT	LVDS
28	LVDS1_CLK+	OUT	LVDS
29	GND		
30	GND		
31	LVDS0_SPCLK	I/O	+5 V/+3.3 V
32	LVDS0_SPDAT	I/O	+5 V/+3.3 V
33	GND		
34	GND		
35	LVDS0_D3-	OUT	LVDS
36	LVDS1_D3-	OUT	LVDS
37	LVDS0_D3+	OUT	LVDS
38	LVDS1_D3+	OUT	LVDS
39	NC		
40	LVDS0_VCON	OUT	LVDS

Table A.13: PC104+ Connector (CN8)			
CN8	**PC104+ Connector**		
Part Number	1653130421,1654000041,165312022B,165313222B		
Footprint	PC104-PLUS		
Description			
Pin	Pin Name	Signal Type	Signal Level

Table A.14: LAN CONNECTOR (CN9)			
CN9	**LAN CONNECTOR**		
Part Number	1653205260		
Footprint	BH5X2SV		
Description	BOX HEADER SMD 5*2 180D (M) 2.0mm		
Pin	Pin Name	Signal Type	Signal Level
1	+3.3_LAN0	PWR	+3.3 V
2	LAN0_ACTLED	OUT	Analog
3	RX+1	I/O	Analog
4	RX-1	I/O	Analog
5	LAN0_LILED	OUT	Analog
6	CCGND1	GND	
7	NC		
8	CCGND2	GND	
9	TX+1	I/O	Analog
10	TX-1	I/O	Analog

Table A.15: CRT connector (CN10)			
CN10	**CRT connector**		
Part Number	1655912120		
Footprint	SP-12SMH		
Description	Wafer Box 1.25mm 12P 90D(M) SMD 85204-1200		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	VGA_R	OUT	Analog
3	VGA_G	OUT	Analog
4	VGA_B	OUT	Analog
5	LAN0_LILED	GND	
6	+5V_VGA	PWR	+5 V
7	VGA_DDAT	OUT	Analog
8	VGA_DCLK	OUT	+2.5 V
9	GND	GND	
10	VGA_HS	OUT	+2.5 V
11	VGA_VS	OUT	+2.5 V
12	GND	GND	

Table A.16: USB connector (CN11)			
CN11	**USB connector**		
Part Number	1653000350		
Footprint	JH12X2S-2M		
Description	PIN HEADER 12*2P 180D(M)2.0mm SMD		
Pin	Pin Name	Signal Type	Signal Level
1	+5V_USB0	PWR	+5 V
2	+5V_USB0	PWR	+5 V
3	USB0_P-	I/O	USB
4	USB1_P-	I/O	USB
5	USB0_P+	I/O	USB
6	USB1_P+	I/O	USB
7	VGA_DDAT	GND	
8	VGA_DCLK	GND	
9	+5V_USB1	PWR	+5 V
10	+5V_USB1	PWR	+5 V
11	USB2_P-	I/O	USB
12	USB3_P-	I/O	USB
13	USB2_P-	I/O	USB
14	USB3_P-	I/O	USB
15	GND	GND	
16	GND	GND	
17	+5V_USB2	PWR	+5 V
18	+5V_USB2	PWR	+5 V
19	USB4_P-	I/O	USB
20	USB5_P-	I/O	USB
21	USB4_P-	I/O	USB
22	USB5_P-	I/O	USB
23	GND	GND	
24	GND	GND	

Table A.17: CPU FAN connector (CN13)			
CN13	**CPU FAN connector**		
Part Number	1655303020		
Footprint	VHL3V-2M		
Description	WAFER BOX 2.0mm 3P 180D w/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	+5 V	PWR	+5 V
3	FAN0_IO	OUT	

Table A.18: BATTERY connector (CN14)			
CN14	**BATTERY connector**		
Part Number	1655902032		
Footprint	WHL2V-125		
Description	WAFER 2P 180D(M) 1.25mm 53047-0210		
Pin	Pin Name	Signal Type	Signal Level
1	+VBAT	PWR	+3.3 V
2	GND	GND	

Table A.19: COM1/2 connector (CN15)			
CN15	**COM1/2 connector**		
Part Number	1653210260		
Footprint	BH10X2SV		
Description	BOX HEADER SMD10*2P 180D(M) 2.0mm		
Pin	Pin Name	Signal Type	Signal Level
1	COM0_DCD#	IN	+5 V
2	COM0_DSR#	IN	+5 V
3	COM0_RXD	IN	+5 V
4	COM0_RTS#	I/O	+5 V
5	COM0_TXD	OUT	+5 V
6	COM0_CTS	IN	+5 V
7	COM0_DTR#	I/O	+5 V
8	COM0_RI#	IN	+5 V
9	GND	GND	
10	GND	GND	
11	COM1_DCD#	IN	+5 V
12	COM1_DSR#	IN	+5 V
13	COM1_RXD	IN	+5 V
14	COM1_RTS#	I/O	+5 V
15	COM1_TXD	OUT	+5 V
16	COM1_CTS	IN	+5 V
17	COM1_DTR#	I/O	+5 V
18	COM1_RI#	IN	+5 V
19	GND	GND	
20	GND	GND	

Table A.20: RS422/485 connector (CN16)			
CN16	**RS422/485 connector**		
Part Number	1655902032		
Footprint	WHL2V-125		
Description	WAFER BOX 2.0mm 4P 180D MALE W/LOCK 2001-WS-4		
Pin	Pin Name	Signal Type	Signal Level
1	422_RXD-	I/O	+5 V
2	422_RXD+	I/O	+5 V
3	485-422_TXD+	I/O	USB
4	485-422_TXD-	I/O	USB

Table A.21: POWER Connector (CN18)			
CN18	**POWER Connector**		
Part Number	1657254008		
Footprint	PWR-KPV		
Description	WAFER BOX 2.54mm 8P 180D(M) 2542-WS-8		
Pin	Pin Name	Signal Type	Signal Level
1	+5 V	PWR	+5 V
2	+5 V	PWR	+5 V
3	+5 V	PWR	+5 V
4	GND	GND	
5	GND	GND	
6	GND	GND	
7	GND	GND	
8	+12 V	PWR	+12 V

Table A.22: RESET connector (CN19)			
CN19	**RESET connector**		
Part Number	1653002101		
Footprint	JH2X1V-2M		
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	V2.5_LAN1	INPUT	+5 V
2	GND	GND	

Table A.23: Power Switch (CN20)			
CN20	**Power Switch**		
Part Number	1653002101		
Footprint	JH2X1V-2M		
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+5 VSB	PWR	+5 V
2	FP_PSIN	OUT	0 V

Table A.24: ATX Power connector (CN21)			
CN21	**ATX Power connector**		
Part Number	1655303020		
Footprint	WHL3V-2M		
Description	WAFER BOX 2.0mm 3P 180D w/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	+5 VSB	PWR	+5 V
2	GND	GND	
3	SIO_PSON#	OUT	+5 V

Table A.25: -12 V/-5 V Power connector (CN22)			
CN22	**-12 V/-5 V Power connector**		
Part Number	1655303020		
Footprint	WHL3V-2M		
Description	WAFER BOX 2.0mm 3P 180D w/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	-5 V	PWR	-5 V
2	GND	GND	
3	-12 V	PWR	-12 V

Table A.26: Digital Output connector (CN23)			
CN23	**Digital Output connector**		
Part Number	1653005100		
Footprint	JH5X1V		
Description	PIN HEADER 5*1P 180D(M) 2.54mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	DIOOUT0	OUTPUT	+5 V
2	DIOOUT1	OUTPUT	+5 V
3	DIOOUT2	OUTPUT	+5 V
4	DIOOUT3	OUTPUT	+5 V
5	GND	GND	

Table A.27: Digital Output connector (CN23)			
CN23	**Digital Output connector**		
Part Number	1653005100		
Footprint	JH5X1V		
Description	PIN HEADER 5*1P 180D(M) 2.54mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	IDE0_D3	I/O	+5 V
3	IDE0_D4	I/O	+5 V
4	IDE0_D5	I/O	+5 V
5	IDE0_D6	I/O	+5 V
6	IDE0_D7	I/O	+5 V
7	IDE0_CS#1	OUT	+5 V
8	GND	GND	
9	GND	GND	
10	GND	GND	
11	GND	GND	
12	GND	GND	
13	+5 V	PWR	+5 V
14	GND	GND	
15	GND	GND	
16	GND	GND	
17	GND	GND	
18	IDE0_A2	IN	+5 V
19	IDE0_A1	IN	+5 V
20	IDE0_A0	IN	+5 V
21	IDE0_D0	I/O	+5 V
22	IDE0_D1	I/O	+5 V
23	IDE0_D2	I/O	+5 V
24	NC		
25	CF_CD#2	GND	
26	CF_CD#1	GND	

Table A.27: Digital Output connector (CN23)			
CN23	**Digital Output connector**		
Part Number	1653005100		
Footprint	JH5X1V		
Description	PIN HEADER 5*1P 180D(M) 2.54mm DIP WO/Pb		
27	IDE0_D11	I/O	+5 V
28	IDE0_D12	I/O	+5 V
29	IDE0_D13	I/O	+5 V
30	IDE0_D14	I/O	+5 V
31	IDE0_D15	I/O	+5 V
32	IDE0_CS#3	OUT	+5 V
33	NC		
34	IDE0_IOR#	OUT	+5 V
35	IDE0_IOW#	OUT	+5 V
36	IDE0_WE#	OUT	+5 V
37	IDE0_IRQ15	IN	+5 V
38	+5 V	PWR	+5 V
39	CF_CSEL#	OUT	+5 V
40	NC		
41	IDE0_RST#	OUT	+5 V
42	IDE0_IORDY	OUT	+5 V
43	IDE0_DREQ	OUT	+5 V
44	IDE0_DACK#	OUT	+5 V
45	CF_ASP#	I/O	+5 V
46	CF_S66DET#	IN	+5 V
47	IDE0_D8	I/O	+5 V
48	IDE0_D9	I/O	+5 V
49	IDE0_D10	I/O	+5 V
50			

Table A.28: AUDIO connector (CN24)			
CN24	**AUDIO connector**		
Part Number	1653205260		
Footprint	BH5X2SV		
Description	BOX HEADER SMD 5*2 180D (M) 2.0mm		
Pin	Pin Name	Signal Type	Signal Level
1	LINEOUT_R	OUT	Analog
2	LINEINR	IN	Analog
3	GND_AUD	GND	
4	GND_AUD	GND	
5	LINEOUT_L	OUT	Analog
6	LINEINL	IN	Analog
7	GND_AUD	GND	
8	GND_AUD	GND	
9	MIC1_R	IN	Analog
10	MIC1_L	IN	Analog

Table A.29: SATA1 connector (SA1)			
SA1	**SATA1 connector**		
Part Number	1654907000		
Footprint	SATA		
Description	CONN Serial ATA DIP 7P 180D(M) 1.27mm		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA0_TX+	I/O	Analog
3	SATA0_TX-	I/O	Analog
4	GND	GND	
5	SATA0_RX-	I/O	Analog
6	SATA0_RX+	I/O	Analog
7	GND	GND	

Table A.30: SATA2 connector (SA2)			
SA2	**SATA2 connector**		
Part Number	1654907000		
Footprint	SATA		
Description	CONN Serial ATA DIP 7P 180D(M) 1.27mm		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA1_TX+	I/O	Analog
3	SATA1_TX-	I/O	Analog
4	GND	GND	
5	SATA1_RX-	I/O	Analog
6	SATA1_RX+	I/O	Analog
7	GND	GND	

Appendix B

System Assignments

This appendix contains information of a detailed nature. It includes:

- System I/O ports
- 1st MB memory map
- DMA channel assignments
- Interrupt assignments

Appendix B System Assignments

B.1 System I/O Ports

Table B.1: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Reserved (Game I/O)
278-27F	Reserved (Parallel port 2,LTP3)
2E8-2EF	Reserved (Series port 4)
2F8-2FF	Serial port 2
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT 2)
380-38F	SDLC, bisynchronous 2
3A0-3AF	Bisynchronous 1
3B0-3BF	Monochrome display and printer adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3E8-3EF	Reserved (Series port 3)
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1

* PNP audio I/O map range from 220 ~ 250H (16 bytes)
  MPU-401 select from 300 ~ 330H (2 bytes)

B.2 1st MB memory map

Table B.2: 1st MB memory map

Addr. range (Hex)	Device
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

* If Ethernet boot ROM is disabled (Ethernet ROM occupies about 16 KB)

* E0000 - EFFFF is reserved for BIOS POST

B.3 DMA channel assignments

Table B.3: DMA channel assignments

Channel	Function
0	Available
1	Available (audio)
2	Floppy disk (8-bit transfer)
3	Available (parallel port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 1, 3, or 5

** Parallel port DMA select 1 (LPT2) or 3 (LPT1)

B.4 Interrupt assignments

Table B.4: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Reserved
IRQ 6	Reserved
IRQ 7	Reserved
IRQ 8	RTC
IRQ 9	Reserved
IRQ 10	Reserved
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE for CFC

* Ethernet interface IRQ select: 9, 11, 15
* PNP audio IRQ select: 9, 11, 15
* PNP USB IRQ select: 9, 11, 15
* PNP ACPI IRQ select: 9, 11, 15

Appendix C

Mechanical Drawings

Appendix C Mechanical Drawings

C.1 Mechanical Drawings

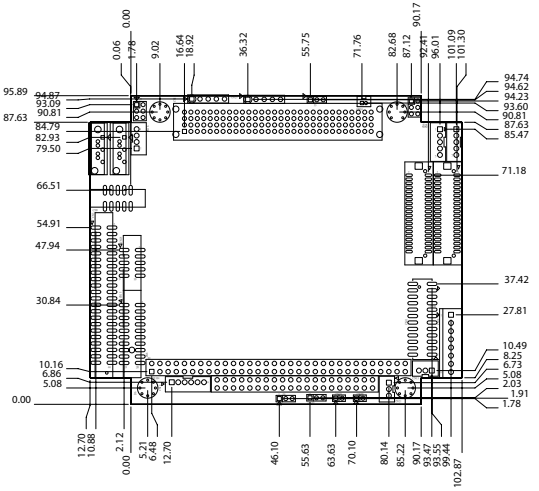


Figure C.1: PCM-3372 Mech Drawing (Comp Side)

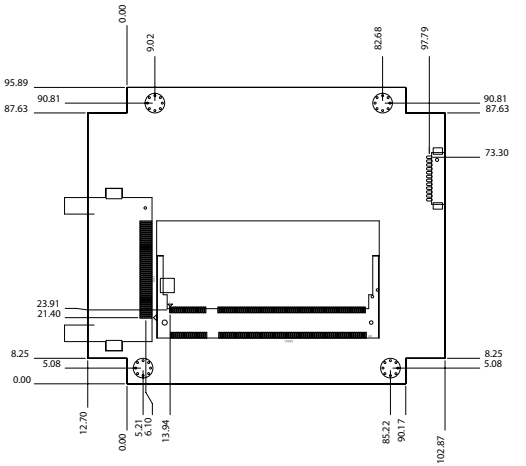


Figure C.2: PCM-3372 Mech Drawing (Sol Side)