PCM-53E52

SC520 Half EBX PC

User Manual
Rev 1.1.1

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Contents

Introduction

The PCM-53E52 is a compact Half-EBX board with PC/104Plus, SSD, Ethernet, and four COM ports. Unlike other compact Half-EBX boards, the PCM-53E52 has an optional Analog and Digital I/O Daughter Board, allowing for data acquisition and greater flexibility.

The PCM-53E52 features a low power AMD® ELAN-SC520 133Mhz processor (no fan required, P120 equivalent). This compact Half-EBX board has on board, 16MB of SDRAM memory standard. A 32MB to 128MB memory upgrade option is also available as is a DiskOnChip® 2000 (DOC) solid state flash disk (no moving parts). The PCM-53E52 can be connected onto a network using the Realtek® RTL8139C 10/100Base-T Ethernet controller and onboard RJ-45 connector. In addition, the PC/104Plus connectors provide both ISA and PCI connectivity.

The PCM-53E52 offers three RS-232 serial ports, one RS-232/422/485 serial port, and a parallel port that supports SPP/EPP/ECP parallel modes. This board includes a mini-DIN keyboard/mouse connector, an onboard 34-pin FDD interface that supports two floppy disk drives, and an onboard 44-pin EIDE interface that supports two EIDE devices. The PCM-53E52 is 5.75" in length and 4" wide, making it a great fit for limited-space applications in harsh environments.

The optional Analog and Digital I/O Daughter Board adds micro-controller capability with the power of a PC. The I/O daughter board includes 16, General Purpose I/O lines and eight high current sink outputs on a standard I/O Rack compatible 50 pin header. This board also includes: 16 channels of A/D with 10 or 12-bit resolution, and four channels of D/A with 12-bit resolution. In addition, the I/O daughter board supports up to a 24-key keypad and is capable of driving up to a 40 x 4 character and graphic LCD displays.

Features

Single Board Computer

- Compact size (145 mm x 102 mm). Fits in the space of a 3 ½" HDD
- ISA and PCI bus expansion with onboard PC/104Plus connector
- Onboard ELAN SC520 133MHz embedded microprocessor
- Supports M-Systems' DiskOnChip® 2000 Flash memory
- Onboard 10/100 Base-T Ethernet interface
- Supports onboard 16MB SDRAM memory
- Onboard mini-DIN PS/2 keyboard/ mouse connector
- Built-in Enhanced IDE hard disk drive interface, floppy disk interface and parallel port
- Four serial ports: three RS-232 and one RS-422/485; on-board DB-9 connector is designated as COM1
- Single +5 V power supply
- Flexible OEM/ODM design

PCD-E12 I/O Daughter Board Option

- Motorola HS12 processor
- 16 Channels of 10 bit A/D, 0 to 5 volt.
- 24 Digital I/O lines in a standard 50 pin I/O Rack compatible header.
    - 8 are high current sink outputs which also have 8 bit resolution PWM capability.
    - 8 have 16 bit resolution PWM capability.
- 1 RS232 port.
- 1 CAN 2.0B port.
- 24 Key, Keypad interface for decoding 3x4, 4x4, 5x4 or 6x4 matrix keypads.
- 8 bit Character/Graphic LCD interface.
- Status LED.

PCD-E12 On-board Options

- 8 Channels of 12 bit A/D, 0 to 5 volt, for a total of 24 A/D inputs
- 4 Channels of 12 bit D/A, 0 to 5 volt.
- RS-422/485 serial port

For Further information on the PCD-E12 please see the PCD-E12 Manual.

Specifications

Standard SBC functions

- CPU: Onboard ELAN SC520 133MHz embedded microprocessor
- BIOS: General Software
- RAM: Onboard 16MB SDRAM standard and 32MB, 64MB, and 128MB options
- Enhanced IDE HDD interface: Supports up to two Enhanced IDE devices.
- FDD interface: Supports up to two FDDs
    - 5.25" (360KB and 1.2MB) and/or
    - 3.5" (720KB, 1.44MB, and 2.88MB)
- Parallel port: One parallel port supports SPP/EPP/ECP parallel modes
- Serial ports: Three RS-232 ports, one RS-422/485 port
- PC/104Plus expansion: 16-bit and 32-bit PC/104 module connectors
- Keyboard/mouse connector: Mini-DIN connector for keyboard and PS/2 mouse

Solid State Disk

- Supports DiskOnChip® 2000 with up to 1024 MB of Flash memory

Ethernet interface

- Ethernet chipset: Realtek RTL8139C
- Ethernet type: 10/100Base-T Ethernet controller
- Ethernet connection: On-board RJ-45 connector

PCD-E12 I/O Daughter Board

- 16 Channels of 10 bit A/D, 0 to 5 volt.
- 24 Digital I/O lines with 8 high drive outs.
- 1 RS232 port with handshake (1 in/1 out).
- 1 CAN 2.0B port.
- 24 Key, keypad interface (4x6 matrix).
- 8 bit Character/Graphic or 4 bit Character LCD interface.
- Status LED.
- Optional 8 Channels of 12 bit A/D, 0 to 5 volt, for a total of 24 A/D inputs
- Optional 4 Channels of 12 bit D/A, 0 to 5 volt.
- Optional RS-422/485 serial port

Mechanical and environmental

- Dimensions: 145mm x 102mm
- Weight: 0.17kg (0.37lbs)
- Power Supply Voltage: +5V (4.57 ~ 5.25V)
- Power Requirements: +5V @ 1.0 A (typical)
- Operating Temperature: 0 ~ 60° C (32 ~ 140° F)

Packing List

Packing List for standard PCM-53E52 SBC:

1   PCM-53E52 SBC Board
1   IDE cable – 18" 40 pin cable
2   Serial header Cables – 10 pin female header to male DB9
1   Parallel port cable – 26 pin female header to male DB25
1   Standard floppy cable – 34 pin cable with 3 connectors 34 pin connectors

The following cable is optional:
      Keyboard/Mouse PS/2 Y cable {This cable is required to have access to the PS/2 mouse port.}

This cable is available from EMAC, Inc. under the following part numbers:
      For AT Keyboards   CAB-50-001-1
      For PS/2 Keyboards   CAB-50-002-1

Packing List for standard PCD-E12 I/O daughter board

1   PCD-E12 I/O daughter board
1   Serial header Cables – 10 pin female header to male DB9
1   Can interface header – 10 pin female header to female DB9
1   Bag of mounting hardware

PCM-53E52 Configuration

Jumper & Connector Descriptions

The PCM-53E52 comes factory configured and ready to operate. In the event that jumpers need to be verified or modified this section provides the information required, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all the safety precautions before you begin any configuration procedure. See Appendix A for connector pin-outs and Appendix B for Jumper Settings.

Table 1 Jumpers

Label	Function
JP1	Processor Run Mode
JP2	AMD Debug Mode
JP3	CMOS Setup Clear Jumper & Real-Time Clock Reset
JP4	Com2 Mode (RS232 or RS422/485)

Table 2 Connectors

Label	Function
CN1	Com 1
CN2	Com 2

Table 3 Headers

Label	Function
HDR1	JTAG Interface
HDR2	40 Pin IDE header
HDR3	Printer Port
HDR4	Com 4
HDR5	Floppy drive connector
HDR6	Power
HDR7	Com 3

Table 4 Jacks

Label	Function
JK1	Ethernet interface
JK2	Keyboard/Mouse

Table 5 Sockets

Label	Function
SOK1	BIOS chip holder
SOK2	DOC Socket

Table 6 LEDs

Label	Function
LD1	Hard Drive Activity
LD2	Ethernet Link & Activity
LD3	Power LED

Determining Board Configuration

The board number can be used to determine what options are populated. For example:

PCM-53E52-010-1   is a Rev. 1 board with 32MB of ram, Ethernet, PC/104+, and all Cables.

This is found by decoding the 3 numbers after the board number designator.

How to decode the part numbers:

X0X is the standard 16MB of onboard memory
X1X is the upgrade to 32MB of onboard memory
X2X is the upgrade to 64MB of onboard memory
X3X is the upgrade to 128MB of onboard memory

0XX is used for OEM or Product Designator, 0 for Products (includes all cables and options), 1 for OEM
        boards sold as non standard parts many not include all of the cables or onboard features.

XX0 is a reserved designator

-1 is the designator for the board Revision number

Determining How Much Memory is Onboard

The following information is to help assist in calculating how much ram your board has on it.

This information pertains to the onboard chips U4 and U5:

16meg system = 2pcs of (8mB) 4 Meg x 16 Quad bank, 3.3V-- MT48LC4M16A2TG-75
32meg system = 2pcs of (16mB) 8 Meg x 16 Quad bank, 3.3V-- MT48LC8M16A2TG-75
64meg system = 2pcs of (32mB) 16 Meg x 16 Quad bank, 3.3V-- MT48LC16M16A2TG-75
128meg system = 2pcs of (64mB) 32 Meg x 16 Quad bank, 3.3V-- MT48LC32M16A2TG-75

These part numbers are Micron Technology parts and may be substituted with equivalent chips by
another manufacturer.

If you have any questions about the configuration of the board you have please email:
support@emacinc.com

Powering Up the PCM-53E52

The PCM-53E52's power connector (CN1) is a standard floppy, four-pin type connector commonly found on most PC type power supplies. The PCM-53E52's logic only requires 5 volts DC. The 12v pin (HDR6 pin 4) is routed to the PC/104 connectors and may be used by some PC/104 expansion cards. The pin-out for the HDR6 power connector is as follows:

Pin	Signal
1	+5 V
2	GND
3	GND
4	+12 V

** Pin 1 is denoted on the board and is the pin closest to C1 on the topside of the board

Remember before powering-up the PCM-53E52 make sure the DOC is correctly orientated, firmly seated and check any cables to make sure that plugged on and correctly in relation to pin 1.

Note: The PCM-53E52 requires less than 2 amps which is not enough current to load the main switcher in some larger PC power supplies (this can be verified with a voltmeter measuring the 5-volt supply). If this is the case you can try to load the power supply by adding 5-volt devices, or order a compatible power supply from EMAC.

Ethernet

The PCM-53E52 utilizes the RTL 8139 10/100 BaseT full duplex Ethernet chip and terminates to a standard RJ-45 connector (JK1). It can be connected straight to a Hub, Switch or directly to another computer via a crossover Ethernet cable. Link and Activity (Rx/Tx) LEDs (LD2) are provided to monitor network activity.

Serial Ports

The PCM-53E52 is equipped with four serial ports. All four serial ports are standard X86, 16550, 16 byte FIFO UARTS. Using the BIOS setup screen each of the COM ports can be disabled. In addition COM ports 3 and 4 offer alternate I/O addresses and IRQs.

COM1 is set to be RS232 and is configured by default to 3F8H using IRQ 4. Availability is via the DB9 (CN1) connector on the edge of the board.

COM2 is jumper configurable to run RS232 or RS422/485 and is set by default to I/O address 2F8H using IRQ 3. This comport is available via a DB9 connector (CN2). The mode is switched using JP4, if the jumper is present it will run RS422/485. To transmit using RS422/485, RTS must be asserted, the receiver is always active. By default the RS422/485 port is set up for full duplex, 4 wire communication. To use half duplex, 2 wire communication, simple connect TX+ to RX+ and TX- to RX-. Using the RS422/485 port in this manner allows the user to monitor all outgoing data as its being transmitted. This can be very helpful in two wire RS485 networks. Note: no provision has been made on the PCM-53E52 for a termination resistor. If one is required soldering a resistor(s) across the necessary pins on the mating DB9 is advised.

COM3 and COM4 are both configured as RS232 ports. These are available to the user on connectors HDR7 & HDR5 respectively. The default I/O address and IRQ for COM3 is 3E8H using IRQ 5 and the default I/O address for COM4 is 2E8H using IRQ 10.

NOTE: COM4 DOES NOT OFFER HANDSHAKING AND IS LIMITED TO RXD AND TXD DUE TO PIN FUNCTION TRADEOFFS AT THE SUPER I/O CHIP.

Keyboard/Mouse

The PCM-53E52 is equipped with a keyboard and mouse interface. Both the keyboard and the mouse utilize the same PS/2 connector (JK1) through the use of the included Y cable. Though a standard PS/2 keyboard can be plugged directly into the connector, to be able to use both a keyboard and mouse you must use the Y adapter cable or a serial mouse.

Disk-On-Chip Flash Disk

The PCM-53E52 does not come with a DOC flash drive chip installed by default, but one can be ordered from EMAC and installed by the user or integrated at the time the PCM-53E52 is ordered.

The DOC is a solid state flash disk and as such is extremely rugged when compared to a conventional hard drive. The DOC is a paged memory device and is mapped at segment address D000 Hex by default, and by use of the device's firmware emulates a hard drive. Thus most operating systems will be able use the device similar to a hard drive. Using the BIOS setup screen an alternate DOC address can be selected if a conflict exists with an external device.

Warning: Be extremely careful when installing the DOC into its socket. Plugging it in backwards, and turning on power, or plugging the DOC in with power applied can *destroy* the DOC and *damage* the PCM-53E52 rendering both inoperable! Any information on the DOC will be unrecoverable at this point.

Always double-check the orientation of the DOC when it has been removed from the board and reinserted, prior to turning the power back on.

Parallel port

The PCM-53E52 comes with a Standard Parallel port interface, This is available to the user via a 26-pin header (HDR3) and included female DB25 cable. Using the BIOS setup screen the Parallel port can be disabled or an alternate I/O address/IRQ can be selected. Alternate Parallel port operating modes can be also selected.

IDE

The PCM-53E52 is equipped with a standard IDE interface available to the user via the standard 40-pin header (HDR2) on the board. A standard hard drive cable is included. By default the BIOS is set to boot from DOC then Floppy. In order to use a hard drive, the BIOS setup must be changed to reflect the type of hard drive being used.

Floppy Drive

The PCM-53E52 is equipped to operate a standard 3.5" 1.44Mb floppy drive via the standard 34-Pin header (HDR5). A standard floppy drive cable is included. The floppy drive is enabled by default in the BIOS setup screen. If a floppy drive is not connected an extended timeout period may delay the system boot process.

PCM-53E52 BIOS Defaults

The PCM-53E52 uses a General Software BIOS. To enter the CMOS you must press the <Del> key when prompted. The following CMOS screen shots indicate the CMOS options and the default factory values of each option. Note: These factory set options should not require changing.

```
+------------------------------------------------------------------------------+
|                                                                              |
|                   System Bios Setup - Utility v4.3                           |
|              (C) 2000 General Software, Inc. All rights reserved             |
+------------------------------------------------------------------------------+
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                      >Basic CMOS Configuration                               |
|                        Custom Configuration                                  |
|                        Shadow Configuration                                  |
|                   Reset CMOS to last known values                            |
|                   Reset CMOS to factory defaults                             |
|                       Write to CMOS and Exit                                 |
|                      Exit without changing CMOS                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
|                      <Esc> to continue (no save)                             |
|                        ^E/^X/<Tab> to select                                 |
```

```
+------------------------------------------------------------------------------+
|                                                                              |
|              System Bios Setup - Basic CMOS Configuration                    |
|              (C) 2000 General Software, Inc. All rights reserved             |
+--------------------------+--------------------+----------------------------+
| DRIVE ASSIGNMENT ORDER:  | Date:>Feb 08, 2003 | Typematic Delay  : 250 ms   |
| Drive A: Floppy 0        | Time: 22 : 35 : 46 | Typematic Rate   : 30 cps   |
| Drive B: (None)          | NumLock:  Disabled | Seek at Boot     : Floppy   |
| Drive C: (None)          +--------------------+ Show "Hit Del"   : Enabled  |
| Drive D: (None)          | BOOT ORDER:        | Config Box       : Disabled |
| Drive E: (None)          | Boot 1st: Drive C: | F1 Error Wait    : Disabled |
| Drive F: (None)          | Boot 2nd: Drive A: | Parity Checking  : (Unused) |
| Drive G: (None)          | Boot 3rd: (None)   | Memory Test Tick : Enabled  |
| Drive H: (None)          | Boot 4th: (None)   | Test Above 1 MB  : Enabled  |
| Drive I: (None)          | Boot 5th: (None)   | Debug Breakpoints: Disabled |
| Drive J: (None)          | Boot 6th: (None)   | Splash Screen    : (Unused) |
| Drive K: (None)          +--------------------+-----------------+-----------+
| Boot Method: Boot Sector | IDE DRIVE GEOMETRY:  Sect  Hds  Cyls | Memory    |
+--------------------------+ Ide 0: Not installed                 |  Base:    |
| FLOPPY DRIVE TYPES:      | Ide 1: Not installed                 |   640KB   |
| Floppy 0: 1.44 MB, 3.5"  | Ide 2: Not installed                 |  Ext:     |
| Floppy 1: 1.44 MB, 3.5"  | Ide 3: Not installed                 |   15MB    |
+--------------------------+--------------------------------------+-----------+
|                  ^E/^X/<Tab> to select or +/- to modify                      |
|                        <Esc> to return to main menu                          |
```

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```
+------------------------------------------------------------------------------+
|                                                                              |
|              System BIOS Setup - Custom Configuration                        |
|           (C) 2000 General Software, Inc. All rights reserved                |
+---------------------------------------+--------------------------------------+
| ECC Memory               :>Disabled   | SDRAM Device Timing    : Slow        |
| Write Buffer             : Disabled   | Cache Mode             : Write-Through|
| CPU speed                : 133 MHz    | Lpt Address/IRQ        : 378h/7      |
| Disk On Chip Address     : D000:0000  | Lpt Mode               : Printer     |
| Com1 setting             : 3F8h/4     | Com2 setting           : 2F8h/3      |
| Com3 setting             : 3E8/5      | Com4 setting           : 2E8/10      |
| Bios Version             : 7.6        | 64K Memory hole        : Disabled    |
|                                       |                                      |
|                                       |                                      |
|                                       |                                      |
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|                                       |                                      |
|                                       |                                      |
+---------------------------------------+--------------------------------------+
|            ^E/^X/<Tab> to select or +/- to modify                            |
|                  <Esc> to return to main menu                                |
```

```
+------------------------------------------------------------------------------+
|                                                                              |
|             System BIOS Setup - Shadow/Cache Configuration                   |
|           (C) 2000 General Software, Inc. All rights reserved                |
+---------------------------------------+--------------------------------------+
| Shadowing                :>Chipset    | Shadow 16KB ROM at C000 : Enabled    |
| Shadow 16KB ROM at C400 : Enabled     | Shadow 16KB ROM at C800 : Enabled    |
| Shadow 16KB ROM at CC00 : Enabled     | Shadow 16KB ROM at D000 : Disabled   |
| Shadow 16KB ROM at D400 : Disabled    | Shadow 16KB ROM at D800 : Disabled   |
| Shadow 16KB ROM at DC00 : Disabled    | Shadow 16KB ROM at E000 : Enabled    |
| Shadow 16KB ROM at E400 : Enabled     | Shadow 16KB ROM at E800 : Enabled    |
| Shadow 16KB ROM at EC00 : Enabled     | Shadow 64KB ROM at F000 : Enabled    |
|                                       |                                      |
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|                                       |                                      |
|                                       |                                      |
+---------------------------------------+--------------------------------------+
|            ^E/^X/<Tab> to select or +/- to modify                            |
|                  <Esc> to return to main menu                                |
```

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Changing the CMOS

If standard PC video is available, the BIOS will automatically detect its presence. The BIOS in this case can be configured simply by hitting the <Del> key when prompted. All input comes from the connected keyboard and all output is displayed on the connected monitor.

When running the board (Headless) without video, to enter the CMOS configuration you will need to plug in a PS/2 keyboard into the 53E52 board, and a null modem serial cable to COM1. The null modem cable then needs to be connected to a terminal or a PC running a terminal emulation program (e.g. HyperTerminal). The PS/2 keyboard is used only to enter the BIOS (this acts somewhat as a security feature). Once in the BIOS, the keyboard that accompanies the terminal is used.

The CMOS Setup configuration is redirected to the COM1 comport after pressing the <Del> key on the PS/2 keyboard. Since there is no video pressing the <Del> key at the right time can be tricky. To simplify this process, the Setup Memory Tick option in the BIOS is enabled by default. When Cold (i.e. power-up or reset) booting the board, hit the <Del> key when the Memory Tick sound is heard. Note: The Memory Tick option extends the boot time. If the Memory Tick option is disabled however, it can be very difficult to get into the BIOS without a video source.

The CMOS configuration will be sent out COM1 at 9600 baud, 8 bits, no parity, one stop bit (9600-8-N-1).

Changes then can be made via HyperTerminal or any other serial terminal program.

Needed commands are:

CTRL-e	Move Up
CTRL-x	Move Down
TAB	Move Right
+	Toggle Selection Up
-	Toggle Selection Down
ENTER	Goto Selected Menu
ESC	Return to Main Menu/ Exit Without Saving

If a video card is present, hitting the delete key will take you directly into the BIOS setup screen and no serial port redirection will take place.

Optimizing the BIOS for Faster Boot Times

There are several things that can affect the POST time of the board.

TEST ABOVE 1 MB — Disabling this option will give you 1-2 seconds faster boot depending on memory size

BOOT ORDER — Setting the drive you primarily want to boot off of as the first drive will speed up the boot process

DRIVE ASSIGNMENT — This should be set to the correct information for the drives, for a Disk-On-Chip the hard drive does not need to be set, as the Disk-On-Chip's firmware will setup the drive as the last hard drive in the system. So to boot from the Disk-On-Chip with a Hard disk installed, set the hard drive to Drive D:

IDE DRIVE GEOMETRY — Without a Hard disk installed in the system, this option should be set to none. This keeps the BIOS from looking for a drive that is not installed.

Using Memory Mapped I/O

When using a PC/104 card that utilizes memory mapped I/O (e.g. PCM-36E81 CAN board), a memory hole must be available in order to map the card. If video is present, one can usually map the card at the end of the video area. However, if video is not available then there is no memory hole available. In this case the BIOS setup has provision to add a memory hole at C0000 through D0000 if required. This hole is disabled by default. Remember to disable the associated Shadowed memory area when using this memory hole.

Using the Debugger

The General Software BIOS provided with the PCM-53E52 has Debug capability. Entering the debugger requires a slightly different procedure depending on whether video is available or not

If standard PC video is available, the BIOS will automatically detect its presence. The Debugger in this case can be invoked simply by hitting the <Ctrl> & <Shift> keys at the same time when the memory test is being performed. All input comes from the connected keyboard and all output is displayed on the connected monitor.

When running the board (Headless) without video, to enter the Debugger you will need to plug in a PS/2 keyboard into the 53E52 board, and a null modem serial cable to COM1. The null modem cable then needs to be connected to a terminal or a PC running a terminal emulation program (e.g. HyperTerminal). The PS/2 keyboard is used only to enter the BIOS (this acts somewhat as a security feature). Once in the Debugger, the keyboard that accompanies the terminal is used.

The Debugger I/O is redirected to the COM1 comport after pressing the <Ctrl> & <Shift> keys at the same time on the PS/2 keyboard. Since there is no video pressing the <Ctrl> & <Shift> keys at the right time can be tricky. To simplify this process, the Setup Memory Tick option in the BIOS is enabled by default. When Cold (i.e. power-up or reset) booting the board, hit the <Ctrl> & <Shift> keys at the same time when the Memory Tick sound is heard. Note: The Memory Tick option extends the boot time. If the Memory Tick option is disabled however, it can be very difficult to get into the Debugger without a video source.

The Debugger I/O will be sent out COM1 at 9600 baud, 8 bits, no parity, one stop bit (9600-8-N-1).

Changes then can be made via HyperTerminal or any other serial terminal program.

The debugger has many commands. A few of the more useful commands are listed below.

D   The D command allows the user to display memory at the specified address.

      Syntax: D   Address

E   The E command allows the user to change the 8-bit memory contents at the specified address.

      Syntax: E   Address   Byte_Value

HELP   The HELP command allows the user to display a summary of commands supported by the debugger.

      Syntax: HELP

I   The I command allows the user to issue a Read from a byte-wide specified I/O Port.

      Syntax: I   I/O_Port_Address

O   The O command allows the user to issue a Write to a byte-wide specified I/O Port.

      Syntax: O   I/O_Port_Address   Byte_Value

Appendix A

Connector Pinouts

Com 1 DB9 Connector (CN1)

Pin	DB9 Description
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Com 2 DB9 Connector (CN2)

(RS232 Mode)			**(RS422/485)**	
Pin	DB9 Description		Pin	
1	DCD		1	TX-
2	RxD		2	TX+
3	TxD		3	RX+
4	DTR		4	RX-
5	GND			
6	DSR			
7	RTS			
8	CTS			
9	RI			

Note: See the section on Serial Ports for additional RS422/485 information.

Header Pinouts

JTAG Interface (HDR1)

Pin	Signal	Pin	Signal
1	GND	2	PWR GOOD
3	JTAG_TCK	4	CMDACK
5	JTAG_TMS	6	BR/TC
7	JTAG_TDI_1	8	STOP/TX
9	JTAG_TDO_MPU	10	TRIG/TRACE
11	-SRESET	12	N.C.

IDE Connector (HDR2)

Pin	Signal	Pin	Signal
1	Reset	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	N.C.
21	N.C.	22	GND
23	I OW	24	GND
25	IOR	26	GND
27	IORDY	28	BALE
29	N.C.	30	GND
31	IRQ 14	32	-I/O CS16
33	A1	34	N.C.
35	A0	36	A2
37	CS0	38	CS1
39	-ACT	40	GND

Printer Port (HDR3)

Pin	Signal	Pin	Signal
1	\STROBE	2	\AUTOFD
3	D0	4	ERR
5	D1	6	\INIT
7	D2	8	\SLCTINI
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	\ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N/C

COM4 (HDR4)

Pin	Signal	DB9 Description
1	NC	-
2	NC	RxD
3	RxD	TxD
4	NC	-
5	TxD	GND
6	NC	-
7	NC	-
8	NC	-
9	GND	-
10	NC	--

Floppy drive (HDR5)

Pin	Signal	Pin	Signal
1	GND	2	DENSITY SELECT
3	GND	4	N/C
5	GND	6	N/C
7	GND	8	INDEX
9	GND	10	MOTOR 0
11	GND	12	DRIVE SELECT 1
13	GND	14	DRIVE SELECT 0
15	GND	16	MOTOR 1
17	GND	18	DIRECTION
19	GND	20	STEP
21	GND	22	WRITE DATA
23	GND	24	WRITE GATE
25	GND	26	TRACK 0
27	GND	28	WRITE PROTECT
29	GND	30	READ DATA
31	GND	32	HEAD SELECT
33	GND	34	DISK CHANGE

Power Connector (HDR6)

Pin	Signal
1	+5 V
2	GND
3	GND
4	+12 V

Com 3 (HDR7)

Pin	Signal	DB9 Description
1	DCD	DCD
2	DSR	RxD
3	RxD	TxD
4	RTS	DTR
5	TxD	GND
6	CTS	DSR
7	DTR	RTS
8	NC	CTS
9	GND	--
10	NC	--

Jack Pinouts

Ethernet (JK1)

Pin	Signal
1	XMT+
2	XMT-
3	RCV+
4	N/C
5	N/C
6	RCV-
7	N/C
8	N/C

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Keyboard/Mouse (JK2)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

Appendix B

Jumpers:

JP1 – Manufacturing Test
For normal operation there should be 2 jumpers at positions A & B on JP1. Changing this jumper configuration will place the board in ELAN BIOS Safe mode and the system will no longer boot, this mode is for manufacturing processor testing.

JP2 - DEBUG ENTER
This jumper is used for Manufacturing debug mode and should not be installed.

JP3 - CMOS Clear & Real-Time Clock Reset
This jumper should be in the N or Z position for proper board operation. Placing the jumper in the O position will CLEAR the CMOS settings and RESET the Real-Time clock. Leaving this jumper placed in the O position will keep the board from booting because the Real-Time Clock will be held in RESET.

JP4 – RS422/485 Enable
If this jumper is present, COM2 will be set to RS422/485. To transmit using RS422/485, RTS must be asserted, the receiver is always active. See the section on Serial Ports for additional RS422/485 information.
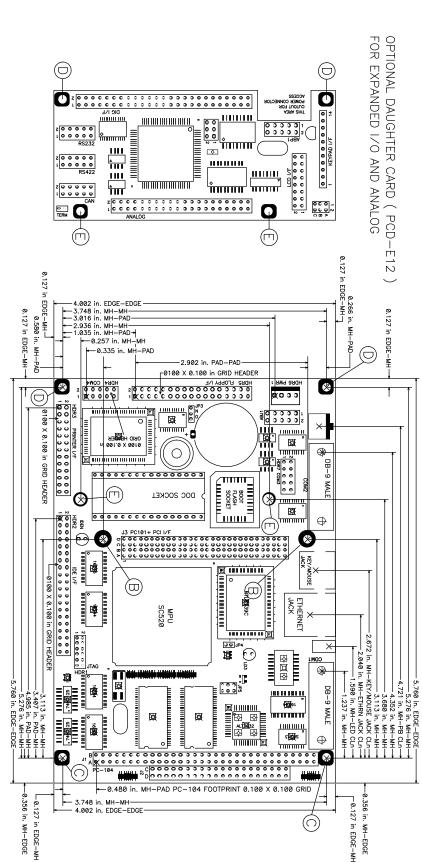
Appendix C

Standard IRQ and IO listing for PCM-53E52

IRQ#	Device
0	Timer
1	Keyboard
2	Cascade to 9
3	Com 2
4	Com 1
5	Com 3
6	Floppy
7	LPT
8	RTC
9	PCD-E12 (if installed)
10	Com 4
11	Ethernet/External PCI devices
12	Mouse (currently always assigned to PS/2 mouse)
13	FPU
14	IDE
15	Not Available

I/O Range	Device
0000-001F	DMA1
0020-003F	PIC1
0040-005F	Timer
0060-006F	Keyboard
0070-007F	RTC
0080-008F	DMA Page REG
00A0-00BF	PIC2
00C0-00DF	DMA2
00F0-00FF	FPU
01F0-01F7	IDE0
02E8-02Ef	Serial COM4
02F8-02FF	Serial COM2
0378-037F	LPT
03E8-03EF	Serial COM3
03F0-03F5	floppy0
03F6-03F6	IDE0
03F7-03F7	floppy0
03F8-03FF	Serial COM1
FC00-FC7F	Ethernet

Appendix D

Dimensional Drawing

NOTES:

1. PADS MARKED WITH THE LETTER 'B' HAVE 126 mil HOLES AND ARE USED TO MOUNT PC-104 ACCESSORY CARDS TO THE BOARD.
2. PADS MARKED WITH THE LETTER 'C' HAVE 126 mil HOLES AND ARE SHARED HOLES USED TO MOUNT THE PCB TO THE CHASSIS, AND ANY PC-104 CAR
3. PADS MARKED WITH THE LETTER 'D' HAVE 126 mil HOLES AND ARE SHARED TO MOUNT THE BOARD TO THE CHASSIS, AND THE OPTIONAL DAUGHTER CA
4. PADS MARKED WITH THE LETTER 'E' HAVE 126 mil HOLES AND ARE USED TO MOUNT THE OPTIONAL DAUGHTER CARD TO THE BOARD.
5. HIGHEST TOPSIDE PROFILE PART IS 1.125 in. AVERAGE HEIGHT IS 0.75 in EXCLUDING ANY PC-104 CARDS.
6. MINIMUM REQUIRED BOTTOM SIDE CLEARANCE IS 0.250 in.
7. MINIMUM REQUIRED TOP SIDE CLEARANCE IS 0.550 in. WITHOUT ACCESSORY OR DAUGHTER CARDS.
8. DIMENSIONS ROUNDED UP / DOWN TO NEAREST 1/1000 TH. MAY NOT ALWAYS ADD UP EXACTLY.