PM-1043
STPC-DX2 133 with VGA

PCB Version 1.0

User Manual Version 1.0

May 20, 2003

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1. Introduction

Thank you for choosing PM-1043 STPC-DX2 133 with VGA CPU Board. PM-1043 board is an all-in-one CPU board equipped with PC/104 solution for limited-space application. It provides all functions a full-fledged computer needs.

In addition, the PM-1043 provides VGA display controller on board, which can supply CRT resolutions up to 1024x768@64K colors.

This board has a built-in DiskOnChip™ (DOC) Flash Disk Socket for embedded applications. The DOC Flash Disk is 100% software compatible with hard disk. Users can use any DOS command without any extra software utility. The DOC is currently available from 2MB to 144MB.

1.1 Specifications

CPU	Embedded SGS Thomson STPC-DX2 133
System bus connector	PC104 connector
System memory	Onboard SDRAM or one SO-DIMM socket, supports up to 128MB SDRAM
Enhanced IDE & CF Interface	Supports one EIDE devices and one CF card with BIOS auto-detect function
Floppy disk drive interface	Supports up to two floppy disk drives
Serial ports	Two RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be individually configured to COM1, COM2 or disabled.
Bi-directional parallel port	Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP.
IrDA port	Supports Infrared (IrDA) interface (Reserved for options).
Watch-dog timer	Can be set by 1-255 seconds intervals. Reset is generated when CPU does not periodically trigger the timer.
VGA display interface	Completes backward compatibility to VGA and SVGA, supports CRT resolution up to 1024 x 768 @ 64K colors.
Flash disk socket	The DiskOnChip™ compatible 32-pin dip socket is provided for Flash Disk (DiskOnChip™) applications, which will enable users to use the Flash Disk with DOS command without any extra software utility.
Keyboard / Mouse connector	Supports standard PC/AT keyboard and PS/2 mouse
Power consumption	+5V @ 1.2A
Operating temperature	0° - 60° C (CPU needs cooler)

1.2 Package Contents

PM-1043 package includes the following items:

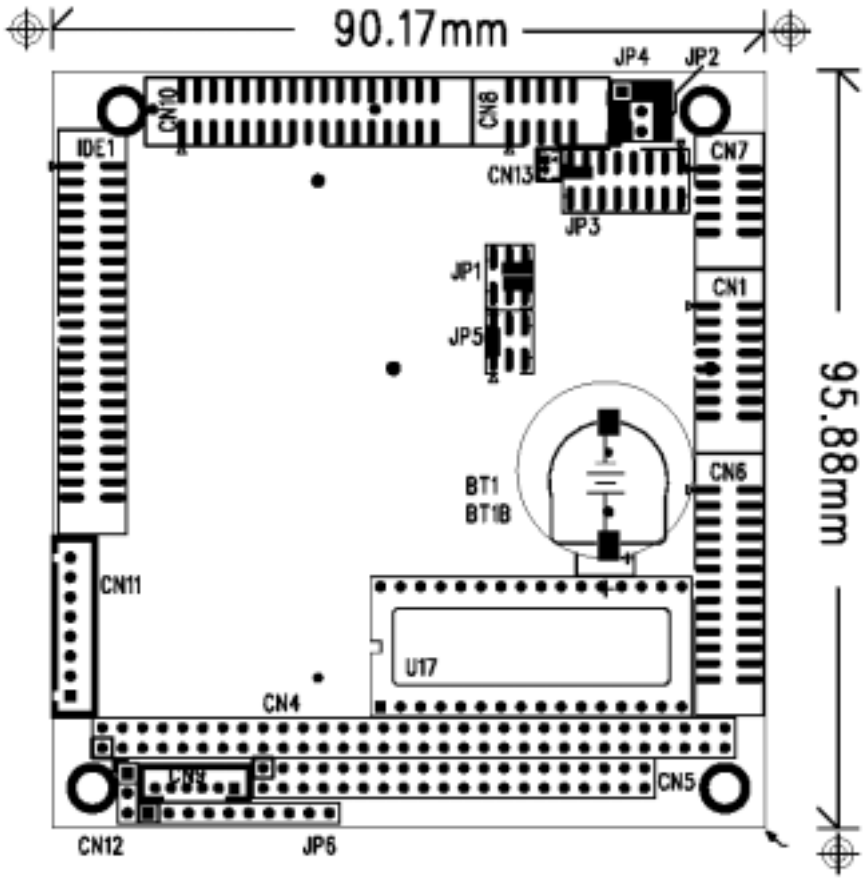
- PM-1043 CPU board
- CD-ROM Driver x 1
- RS-232 cable x 2 (Item number: 32200-000049)
- Printer cable x 1 (Item number: 32200-000050)
- FDD cable x 1 (Item number: 32200-000048)
- HDD cable x 1 (Item number: 32200-000037)
- Power cable x 1 (Item number: 32100-000191)
- KB/MS cable x 1
- VGA cable x 1 (With VGA model only. Item number 32200-000051)
- One 6-pin header converts to two 6-pin DIN cable for keyboard and mouse connection (Y Cable) x 1 (Item number: 32000-000138)
- User Manual x 1

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Keep the shipping materials and carton in case you want to ship or store the product in the future.

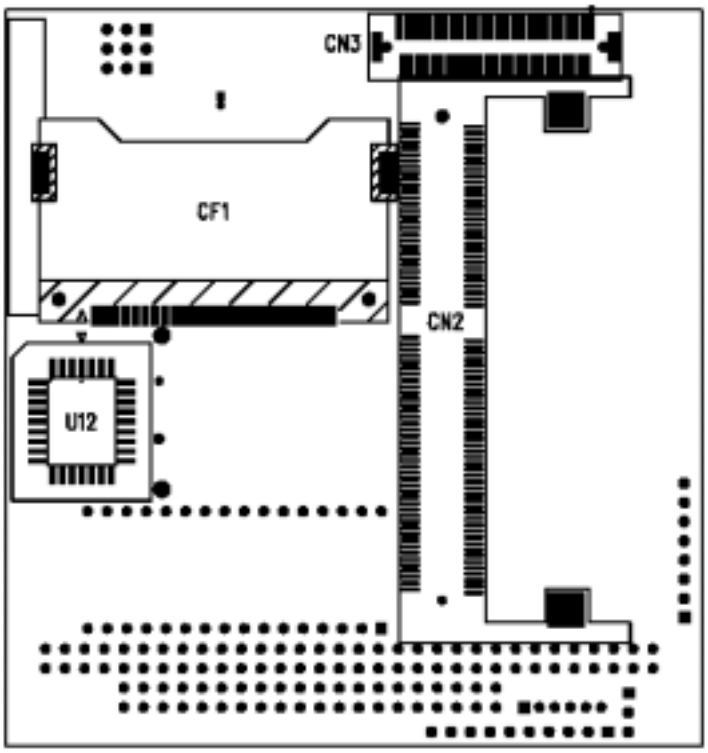
2. Jumper Setting

This chapter describes how to install the PM-1043. Read the unpacking information carefully and refer to the layout diagram of PM-1043 below whenever necessary.

2.1 Layout Diagram & Dimensions - Top Side



2.2 Layout Diagram & Dimensions - Bottom Side



2.3 Unpacking Precautions

Some components on PM-1043 SBC are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- ✓ Ground yourself to remove any static charge before touching PM-1043 SBC. You can do it by using a wrist strap connected to the ground or by frequently touching any conducting materials connected to the ground.
- ✓ Handle your PM-1043 SBC by its edges. Do not touch IC chips, leads or circuitry if unnecessary.
- ✓ Do not plug any connector or jumper when the power is on.

2.4 TFT LCD Setting (JP1)

JP1: TFT LCD type (5V / 3V & FPCLK / #FPCLK) Setting

JP1	DESCRIPTION
2 – 4	5V TFT LCD
4 – 6	3V TFT LCD
1 – 3	#FPCLK
3 – 5	FPCLK

2.5 DiskOnChip™ Flash Disk (JP2)

The DiskOnChip™ Flash Disk Chip (DOC) is produced by M-Systems. It is simple-to-use, reliable and 100% software compatible to hard disk and DOS. Users do not need any extra software utility and can simply plug and play to use DOC. Currently DOC is available from 2 MB to 144 MB. The DiskOnChip will only share 8KB memory address.

JP2: DiskOnChip Flash Disk Setup

DiskOnChip Memory Address Setting

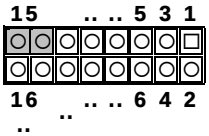
Address	JP2		
	1-2	3-4	5-6
C8000 – C9FFF	OPEN	CLOSE	CLOSE
D0000 – D1FFF	CLOSE	OPEN	CLOSE
D8000 – D9FFF	OPEN	OPEN	CLOSE

Note: C8000-C9FFF is VGA BIOS ROM AREA

2.6 External Switches and Indicators (JP3)

There are several external switches and indicators for monitoring and controlling your CPU board. All functions are in the JP3 connector.

JP3: Pin Assignment and Functions



FUNCTION	PIN	DESCRIPTION	
Ext. Battery	1	Battery +	
	3	GND	
RESET	5	GND	
	7	RESET	
HDD LED	9	+5V	
	11	IDE_LED -	
SPEAKER	13	Buzzer -	Jump for Buzzer
	15	SPK SIGNAL	
IrDA port (Reserve)	2	+5V	
	4	FIR-RX	
	6	IR-RX	
	8	GND	
	10	IR-TX	
	12	CIR-RX	
KEYLOCK	14	KEYLOCK	
	16	GND	

2.7 Clear CMOS Setup (JP4)

If you want to clear the CMOS Setup, e.g., if you forgot the password, you should clear the setup and reset the password, you should close the JP4 (1-2) for about 3 seconds, then open again. The password will be cleared from CMOS.

JP4: Clear CMOS Setup (Reserve Function)

JP4	DESCRIPTION
1-2	CLR CMOS
2-3	NORMAL

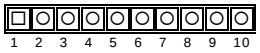
2.8 Compact Flash Master/Slave Mode Setting (JP5)

The Compact Flash socket is type II, and uses IDE1.

JP5: Master/Slave Mode Setting

JP5 (1-2)	DESCRIPTION
SHORT	MASTER
OPEN	SLAVE

2.9 Auxiliary External Switches and Indicators (JP6)



PIN	DESCRIPTION	PIN	DESCRIPTION
1	Speaker +	6	KBD CLOCK
2	GND	7	GND
3	Reset Switch	8	+5V
4	N/C	9	Battery +
5	KBD DATA	10	N/C

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the PM-1043 board.

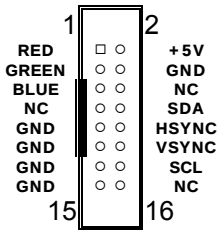
Table of Connectors

LABEL	FUNCTION
CN1	VGA Connector
CN2	SO-DIMM Socket Connector
CN3	LCD Panel Connector
CN4	PC/104-64 CON A
CN5	PC/104-40 CON B
CN6	Parallel Port Connector
CN7	COM1 Connector
CN8	COM2 Connector
CN9	PS/2 Mouse and Keyboard Connector
CN10	Floppy Disk Drive Connector
CN11	External Power Connector
CN12	5V & 12V Connector (for FAN etc.)
CN13	External Battery Connector
IDE1	IDE Disk Drive Connector
CF1	Compact Flash Card Connector

3.1 VGA Connector (CN1)

The built-in 16-pin VGA connector of PM-1043 can be directly connected to your CRT monitor via the attached VGA cable.

CN1: 16-PIN Female Connector

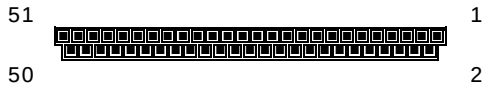


3.2 SO-DIMM Socket Connector (CN2)

PIN	Des.	PIN	Des.	PIN	Des.	PIN	Des.
1	GND	19	MD7	37	MD8	55	GND
2	GND	20	MD39	38	MD40	56	GND
3	MD0	21	GND	39	MD9	57	NC
4	MD32	22	GND	40	MD41	58	NC
5	MD1	23	DQ0	41	MD10	59	NC
6	MD33	24	DQ4	42	MD42	60	NC
7	MD2	25	DQ1	43	MD11	61	CLK0
8	MD34	26	DQ5	44	MD43	62	CKE0
9	MD3	27	3.3V	45	3.3V	63	3.3V
10	MD35	28	3.3V	46	3.3V	64	3.3V
11	3.3V	29	MA0	47	MD12	65	RAS#
12	3.3V	30	MA3	48	MD44	66	CAS#
13	MD4	31	MA1	49	MD13	67	WE#
14	MD36	32	MA4	50	MD45	68	CKE1
15	MD5	33	MA2	51	MD14	69	CSA#
16	MD37	34	MA5	52	MD46	70	NC
17	MD6	35	GND	53	MD15	71	CSB#
18	MD38	36	GND	54	MD47	72	NC

PIN	Des.	PIN	Des.	PIN	Des.	PIN	Des.
73	GND	91	GND	109	MA9	127	MD27
74	CLK1	92	GND	110	BA1	128	MD59
75	GND	93	MD20	111	MA10	129	3.3V
76	GND	94	MD52	112	MA11	130	3.3V
77	NC	95	MD21	113	3.3V	131	MD28
78	NC	96	MD53	114	3.3V	132	MD60
79	NC	97	MD22	115	DQ2	133	MD29
80	NC	98	MD54	116	DQ6	134	MD61
81	3.3V	99	MD23	117	DQ3	135	MD30
82	3.3V	100	MD55	118	DQ7	136	MD62
83	MD16	101	3.3V	119	GND	137	MD31
84	MD48	102	3.3V	120	GND	138	MD63
85	MD17	103	MA6	121	MD24	139	GND
86	MD49	104	MA7	122	MD56	140	GND
87	MD18	105	MA8	123	MD25	141	SDA
88	MD50	106	BA0	124	MD57	142	SCL
89	MD19	107	GND	125	MD26	143	3.3V
90	MD51	108	GND	126	MD58	144	3.3V

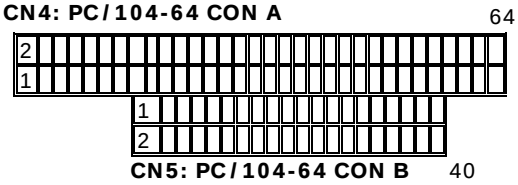
3.3 LCD Panel Connector DF9-51Pin (CN3)



PIN	DESCRIPTION	PIN	DESCRIPTION
1	PCLK	2	FPD33
3	FPD34	4	FPD31
5	FPD35	6	FPD32
7	FPD30	8	FPD28
9	FPD29	10	FPD27
11	FPD25	12	FPD26
13	FPD24	14	FPD21
15	FPD23	16	FPD22
17	FPD16	18	FPD20
19	FPD17	20	FPD18
21	FPD19	22	FPD14
23	FPD13	24	FPD12
25	FPD15	26	FPD11
27	FPD7	28	FPD10
29	+LCD	30	+LCD
31	FPD9	32	FPD8
33	FPD4	34	FPD6
35	FPD3	36	FPD5
37	FPD2	38	FPD1
39	FPDEN	40	FPD0
41	FPDCLK	42	ENABKL
43	ENVDD	44	FPDVS
45	ENVEE	46	FPDHS
47	GND	48	GND
49	+VBL	50	+VBL
51	NC		

3.4 PC/104 Connection Bus (CN4, CN5)

The PM-1043's PC/104 expansion bus lets you attach any kind of PC/104 modules. There are two PC/104 connectors on this board: PC/104-64 and PC/104-40.



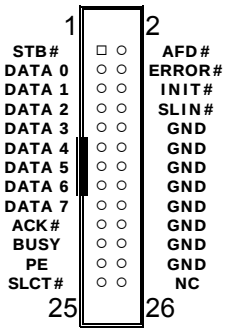
CN5: PC/104-64 CON B			
PIN	Des.	PIN	Des.
2	GND	1	GND
4	MCS16	3	SBHE#
6	IOCS16	5	LA23
8	IRQ10	7	LA22
10	IRQ11	9	LA21
12	IRQ12	11	LA20
14	IRQ15	13	LA19
16	IRQ14	15	LA18
18	DACK0#	17	LA17
20	DRQ0	19	MEMR#
22	DACK5#	21	MEMW#
24	DRQ5	23	SD8
26	DACK6#	25	SD9
28	DRQ6	27	SD10
30	DACK7#	29	SD11
32	DRQ7	31	SD12
34	+5V	33	SD13
36	MASTER#	35	SD14
38	GND	37	SD15
40	GND	39	NC

CN4: PC/104-64 CON A			
PIN	Des.	PIN	Des.
1	IOCHCK#	2	GND
3	SD7	4	RSTDRV
5	SD6	6	+5V
7	SD5	8	IRQ9
9	SD4	10	-5V
11	SD3	12	DRQ2
13	SD2	14	-12V
15	SD1	16	ZWS
17	SD0	18	+12V
19	IOCHRDY	20	GND
21	AEN	22	SMEMW#
23	LA19	24	SMEMR#
25	LA18	26	IOW#
27	LA17	28	IOR#
29	SA16	30	DACK3#
31	SA15	32	DRQ3
33	SA14	34	DACK1#
35	SA13	36	DRQ1
37	SA12	38	REFRESH#
39	SA11	40	SYSCLK
41	SA10	42	IRQ7
43	SA9	44	IRQ6
45	SA8	46	IRQ5
47	SA7	48	IRQ4
49	SA6	50	IRQ3
51	SA5	52	DACK2
53	SA4	54	TC
55	SA3	56	ALE
57	SA2	58	+5V
59	SA1	60	OSC
61	SA0	62	GND
63	GND	64	GND

3.5 Parallel Port Connector (CN6)

This port is usually connected to a printer. PM-1043 includes an on-board parallel port to be accessed through a 26-pin mini-pitched flat-cable connector CN6.

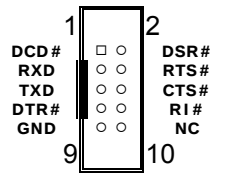
CN6: 26-PIN Female Connector



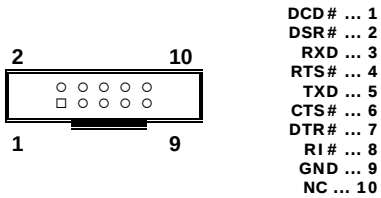
3.6 Serial Port Connector (CN7, CN8)

PM-1043 offers two high-speed NS16C550 compatible with UARTs Read/Receive 16-byte FIFO serial ports.

CN7: (COM1) 10-PIN Female Connector



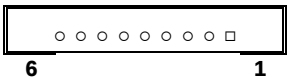
CN8: (COM2) 10-PIN Female Connector



3.7 PS/2 Mouse and Keyboard Connector (CN9)

The attached 6-pin header converting to two 6-pin DIN cables for keyboard and mouse connection enables users to connect both PS/2 mouse and keyboard. Connect keyboard and mouse with the attached cable and they will function properly.

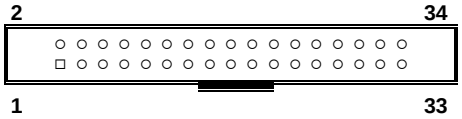
CN9: PS/2 Mouse and Keyboard Connector



KEYBOARD DATA ... 1
MOUSE DATA ... 2
GND ... 3
+5V ... 4
DEYBOARD CLOCK ... 5
MOUSE CLOCK ... 6

3.8 Floppy Disk Drive Connector (CN10)

The PM-1043 board is equipped with a 34-pin daisy-chain drive connector cable which supports up to two floppy drives. The detailed pin assignment of the connector is described as below:

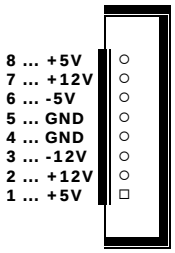


GND ...	1	2	... REDUCE WRITE
GND ...	3	4	... NC
GND ...	5	6	... NC
NC ...	7	8	... INDEX#
GND ...	9	10	... MOTOR ENABLE A#
GND ...	11	12	... DRIVE SELECT B#
NC ...	13	14	... DRIVE SELECT A#
GND ...	15	16	... MOTOR ENABLE B#
GND ...	17	18	... DIRECTION#
GND ...	19	20	... STEP#
GND ...	21	22	... WRITE DATA#
GND ...	23	24	... WRITE GATE#
GND ...	25	26	... TRACK 0#
GND ...	27	28	... WRITE PROTECT#
NC ...	29	30	... READ DATA#
GND ...	31	32	... SIDE 1 SELECT#
NC ...	33	34	... DISK CHANGE#

3.9 External Power Connector (CN11)

PM-1043 has an on-board external power connector CN11. The PM-1043 is only powered by VCC (+5), which should come from pin 1 and pin 8 of the external power connector CN11, and power GND from pin 4 and pin 5. The extra power supply like ±12VDC and -5VDC provided by CN11 will be passed to CN4 and CN5 and only for PC104 slot use.

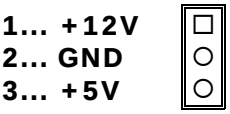
CN11: External Power Connector



3.10 5V & 12V Connector (CN12)

PM-1043 provides an optional fan power connector, which works only when +12V power is supplied to CN11. Please note that a heat sink has already been installed in STPC chip of PM-1043. However, when running PM-1043 under temperature of above 60℃, users will have to add an additional CPU cooling fan.

CN12: 5V & 12V (for FAN etc.) Connector



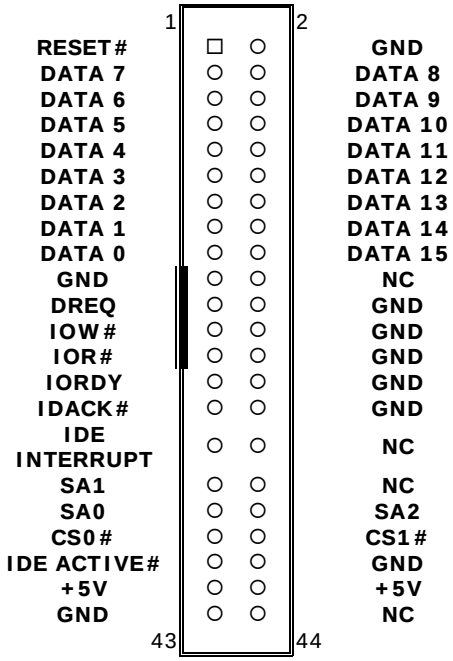
3.11 External Battery Connector

The PM-1043 provides an (Molex 1.25mm 2pin) optional battery connector.

3.12 IDE Disk Drive Connector (IDE1)

You can attach four IDE (Integrated Device Electronics) hard disk drives to PM-1043 IDE controller.

IDE1: HDD Connector



3.13 Compact Flash Card Connector (CF1)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	26	NC
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	CS0#	32	CS1#
8	NC	33	NC
9	GND	34	IOR#
10	NC	35	IOW#
11	NC	36	+5V
12	NC	37	CF INTERRUPT
13	+5V	38	+5V
14	NC	39	SEL
15	NC	40	NC
16	NC	41	RESET#
17	NC	42	IORDY
18	SA2	43	NC
19	SA1	44	+5V
20	SA0	45	CF ACTIVE#
21	DATA 0	46	NC
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	NC	49	DATA 10
25	NC	50	GND

Appendix A: Watchdog Timer

The Watchdog Timer is a device to ensure that standalone systems can always recover from abnormal conditions that cause the system to crash. These conditions may result from an external EMI or a software bug. When the system stops working, hardware on the board will perform hardware reset (cold boot) to bring the system back to a known state.

Three I/O ports control the operation of Watchdog Timer.

443 (hex)	Write	Set Watchdog Time period.
443 (hex)	Read	Enable the refresh the Watchdog Timer.
043/843 (hex)	Read	Disable the Watchdog Timer.

Prior to enabling the Watchdog Timer, set the time-out period. The range of the timer is 1 to 255 sec, set in increments of 1 second. Send the time-out value to the I/O port – 443H, and then enable it by reading data from the same I/O port. This will activate the timer, which will eventually time out and check and monitor the CPU board. This must be done within the time-out period that is set by the software. For additional help, please refer to the example program. Finally, disable the Watchdog timer by reading the I/O port -843H or 043H, otherwise the system will reset unconditionally.

A tolerance of at least 5% must be maintained to avoid unknown routines in the operating system (DOS), such as disk I/O that can be very time-consuming. Therefore if the time-out period is set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Example assembly program:

```
TIMER_PORT   =  443H
TIMER_START  =  443H
TIMER_STOP   =  843H

;;Initial Timer Counter
MOV DX, TIMER_PORT
MOV AL, 8     ;;8 seconds
OUT DX, AL
MOV DX, TIMER_START
IN AL, DX.    ;;Start counter

W_LOOP:
MOV DX, TIMER_STOP
IN AL, DX
MOV DX, TIMER_START
IN AL, DX       ;;Restart counter

;;Add Your Application Here

CMP EXIT_AP, 0
JNE W_LOOP
MOV DX, TIMER_STOP
IN AL, DX
;;Exit AP
```

Appendix B: E^2 Key™ Function

PM-1043 provides an outstanding E^{2}KEY™ function for system integrators. Based on the E^{2}KEY™, ID Code, Passwords or Critical Data can be stored in the 1Kbit EEPROM. Because the EEPROM is non-volatile memory, you don't have to worry about losing important data.
The E^{2}KEY™ is based on a 1Kbit EEPROM, which is configured to 64 words (from 0 to 63). The user can access (read or write) each word at any time.
When you start to use PM-1043, E^{2}KEY™ the utility is already in the package. The software utility will include the following four files:

README.DOC
E2KEY.OBJ
EKEYDEMO.C
EKEYDEMO.EXE

The E2KEY.OBJ provides two library functions **(read_e2key and write_e2key)** for users to integrate in to their application with E^{2}KEY™ function. These library functions are written and compiled in C language. Please check the following statement to implement it:

unsigned int read_e2key(unsigned int address)
/* This function will return the data of E^{2}KEY™ at address. The address range is from 0 to 63. Return data is one word, 16 bits. */

void write_e2key(unsigned int address, unsigned data)
/* This function will write the given data to the E^{2}KEY™ at a certain address. The address range is from 0 to 63. The data value is from 0 to 0xffff. */

To start using the function, please refer to the included EKEYDEMO.C code.

Appendix C: I/O Information

IO Address Map

I/O Address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
040-05F	8254 timer
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI (non-maskable interrupt) Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F2	Core logic programming configuration
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
200-207	Game I/O
278-27F	Parallel Printer Port 2 (LPT3)
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1
443	Watch-dog timer enable
843 or 043	Watch-dog timer disable

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-C7FFF	VGA BIOS
*D6000-DDFFF	DOC 2000
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC Clock
IRQ1	Keyboard	IRQ9	Unused
IRQ2	Cascade to IRQ Controller	IRQ10	Unused
IRQ3	COM2	IRQ11	Unused
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Unused	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Compact Flash

DMA Channel Assignments

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

Appendix D: AWARD BIOS Setup

This appendix discusses the Setup program built into the BIOS. The Setup program enables users to configure the system. This configuration is then stored in battery-backed CMOS RAM so that it retains the Setup information while the power is off.

Starting Setup

The BIOS is immediately active when you turn on the computer. While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or

2. By pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

   Press DEL to enter SETUP.

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

PRESS F1 TO CONTINUE, DEL TO ENTER SETUP

Using Setup

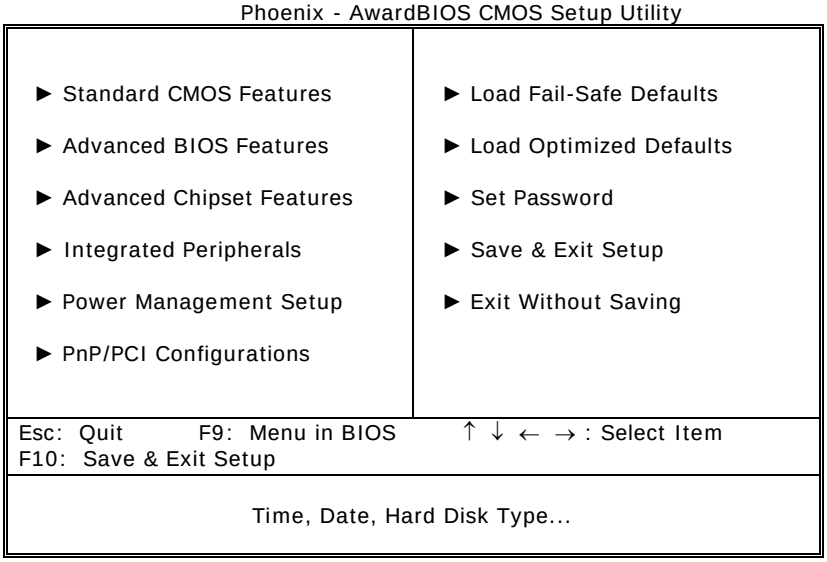
In general, you can use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more details about how to navigate in the Setup program using the keyboard.

Key	Function
Up Arrow	Move to the previous item
Down Arrow	Move to the next item
Left Arrow	Move to the item on the left (menu bar)
Right Arrow	Move to the item on the right (menu bar)
Esc	Main Menu: Quit without saving changes Submenus: Exit Current page to the next higher level menu
Move Enter	Move to the item you desired
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
Esc key	Main Menu- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu- Exit current page and return to Main Menu
F1 key	General help on Setup navigation keys

F5 key	Load previous values from CMOS
F6 key	Load the fail-safe defaults from BIOS default table
F7 key	Load the optimized defaults
F10 key	Save all the CMOS changes and exit

D.1 Main Menu

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.



Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration. See Section D.2 for the details.

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system. See Section D.3 for the details.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance. See section D.4 for the details.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. See section D.5 for the details.

Power Management Setup

Use this menu to specify your settings for power management. See section D.6 for the details.

PnP / PCI Configurations

This entry appears if your system supports PnP / PCI. See section D.7 for the details.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. See section D.8 for the details.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs. See section D.9 for the details.

Set Password

Use this menu to set Passwords. See section D.10 for the detail.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup. See section D.11 for the details.

Exit Without Save

Abandon all CMOS value changes and exit setup. See section D.12 for the details.

D.2 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value for each item.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tue, Feb 25 2003	Item Help
Time (hh:mm:ss)	17 : 20 : 10	Menu Level ►
► IDE Primary Master		
► IDE Primary Slave		Change the day, month, year and century
► IDE Primary Master		
► IDE Primary Slave		
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
LCD&CRT	[Both]	
Panel Type	[640x480 18-TFT]	
Halt On	[All , But Keyboard]	
Base Memory	640K	
Extended Memory	64512K	
Total Memory	65536K	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10:Save ESE: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Main Menu Selections

Item	Options	Description
Date	MM DD YYYY	Set the system date.
Time	HH : MM : SS	Set the system time
IDE Primary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
CRT&LCD	BOTH LCD CRT	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.

The IDE primary master sub menu.

Phoenix - AwardBIOS CMOS Setup Utility
IDE Primary Slave

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Primary Slave	[Auto]	Menu Level ►
Access Mode	[Auto]	Change the day, month, year and century
Capacity		
Cylinder	0 MB	
Head	0	
Precomp	0	
Landing Zone	0	
Sector	0	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Use the legend keys to navigate through this menu and exit to the main menu. Use the Table to configure the hard disk.

Item	Options	Description
IDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE!
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk-checking program.
Access Mode	CHS LBA Large Auto	Choose the access mode for this hard disk.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual':		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads.
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk.
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track.

D.3 Advanced BIOS Features

Advanced BIOS features enable the configuration of the basic system operation with the options to select system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	[Disabled]	Item Help
CPU Internal Cache	[Enabled]	Menu Level ►
Quick Power On Self Test	[Enabled]	
First Boot Device	[Floppy]	Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and the alarm will beep.
Second Boot Device	[SCSI]	
Third Boot Device	[HDD-0]	
Boot Other Device	[Enabled]	
Swap Floppy Drive	[Disabled]	
Boot Up Floppy Seek	[Enabled]	
Boot Up NumLock Status	[On]	
Boot Up System Speed	[High]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
Typemtaic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	[Setup]	
OS Select For DRAM > 64MB	[Non-OS2]	
Video BIOS Shadow	[Enabled]	
C8000-CBFFF Shadow	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7: Optimized Defaults

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CC000-CFFFF Shadow	[Disabled]	Item Help
D0000-D3FFF Shadow	[Disabled]	Menu Level ►
D4C00-D7FFF Shadow	[Disabled]	
D8000-DBFFF Shadow	[Disabled]	
DC000-DFFFF Shadow	[Disabled]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7: Optimized Defaults

Virus Warning

Enables the selection of VIRUS Warning feature for IDE Hard Disk boot sector protection. When this function is enabled and someone attempts to write data into this area, BIOS will show a warning message on screen and the alarm will beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU Internal Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.
The choice: Enabled, Disabled.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you turn on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.
The choice: Enabled, Disabled.

First / Second / Third / Other Boot Device

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
The Choice: Floppy, LS120, HDD0-3, SCSI, CDROM, ZIP100, LAN, and Disabled.

Swap Floppy Drive

If the system has two floppy drives, you can swap the logical drive name assignments.
The choice: Enabled, Disabled.

Boot Up Floppy Seek

Seeks disk drives during boot up. Disabling speeds boot up.
The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.
The choice: On/Off.

Gate A20 Option

Select if chipset or keyboard controller should control GateA20.

Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20

Typematic Rate Setting

Keystrokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.
The choice: Enabled, Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a keystroke when you hold the key down.
The choice: 6, 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.
The choice: 250, 500, 750, and 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

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 at Main Menu and you will be asked to enter password. Do not type anything Press <Enter> to disable security. Once the security is disabled, the system will be booted and you can enter Setup freely.

OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system.
The choice: Non-OS2, OS2.

Video BIOS Cacheable

Select Enabled enables caching of the video BIOS, which results in better system performance. However, if any program writes to this memory area, a system error may result.
The Choice: Enabled, Disabled.

D.4 Advanced Chipset Features

Use this menu to specify your settings for ISA/SDRAM frequency control.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

Memory Hole (15M –16M)	[Disabled]	Item Help
ISA Clcck	[14.3MHz/2]	Menu Level ►
SDRAM Clock	[66MHz]	
DRAM_Write_Posting	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7: Optimized Defaults

D.5 Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

On-Chip Local Bus IDE	[Enabled]	Item Help
IDE Buffer for DOS & Win	[Enabled]	Menu Level ►
The 2nd channel IDE	[Enabled]	
IDE Primary Master PIO	[Auto]	
IDE Primary Slave PIO	[Auto]	
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE HDD Block Mode	[Enabled]	
KBC input clock	[8 MHz]	
Onboard FDC Controller	[Enabled]	
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard Serial Port 2	[2F8/IRQ3]	
Onboard IR Controller		
IR Address Select	[3E0H]	
IR Mode		
IR Transmission delay	[Enabled]	
IR IRQ Select	[IRQ10]	
IR Mode Use DMA	[Disabled]	
Onboard Parallel Port		

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7: Optimized Defaults

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

ECP Mode Use DMA	[3]	Item Help
EPP Mode Select	[EPP1.9]	Menu Level ►
Watch Dog Timer Select	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

On-Chip Local Bus IDE

The chipset contains a Local Bus IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface
The choice: Enabled, Disabled.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance.

In Auto mode, the system automatically determines the best mode for each device.

The Choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
The choice: Enabled, Disabled.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.
The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

Onboard Parallel Port

This item allows you to determine onboard parallel port controller I/O address setting.
The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7, and Disabled.

Parallel Port Mode

Select an operating mode for the onboard parallel (printer) port. Select *Normal, Compatible,* or *SPP* unless you are certain your hardware and software both support one of the other available modes.
The choice: Normal, EPP, ECP, and ECP/EPP.

ECP Mode Use DMA

Select a DMA channel for the parallel port for use during ECP mode.
The choice: 3, 1.

Parallel Port EPP Type

Select EPP port type 1.7 or 1.9.
The choice: EPP1.7, EPP1.9.

D.6 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

Power Management	[User Define]	Item Help
PM Control by APM	[Yes]	Menu Level ►
Video Off Option	[Susp,Stby -> Off]	
Video Off Method	[V/H SYNC+Blank]	
** PM Timers **		
HDD Power Down	[Disable]	
Doze Time-Out	[Disable]	
Standby Time-Out	[Disable]	
Suspend Time-Out	[Disable]	
** PM Events **		
DMA Request (DRQ)	[Disable]	
PCI master device (PCIM)	[Disable]	
Parallel I/O (PIO)	[Disable]	
Serial I/O (SIO)	[Disable]	
Keyboard (KBD)	[Enable]	
Floppy Disk Controller	[Disable]	
Hard Disk Controller	[Disable]	
IRQ 15 - 1 Detection	[Enable]	
IRQ 0 Detection	[Disable]	
NMI Detection	[Disable]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1: General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

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 :** When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
2. **Doze Mode:** When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
3. **Suspend Mode:** When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

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

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges is from 1 min. to 1 hr. except for HDD Power Down that ranges from 1 min. to 15 min. and disable.

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting Yes gives better power savings.
If the Max. Power Saving is not enabled, this will be preset to *No*.
The choice: Yes, No.

Video Off Option

When enabled, this feature allows the VGA adapter to operate in a power saving mode.

Always On	Monitor will remain on during power saving modes.
Suspend --> Off	Monitor blanked when the systems enters the Suspend mode.
All Modes --> Off	Monitor blanked when the system enters any power saving mode.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

D.7 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system, which allows I/O devices to operate at speeds nearing the speed the CPU itself, uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Reset Configuration Data	[Disabled]	Item Help
Resources Controlled By	[Auto(ESCD)]	Menu Level ►
IRQ Resources	Press Enter	
DMA Resources	Press Enter	Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
PCI/VGA Palette Snoop	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESE: Exit
F1:General Help F5: Previous Values F6: Fail-Safe Defaults
F7:Optimized Defaults

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.
The choice: Enabled, Disabled.

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "➢").
The choice: Auto (ESCD), Manual.

IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

IRQ3/4/5/7/9/10/11/12/14/15 assigned to

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1). PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.
The Choice: PCI/ISA PnP, Legacy ISA.

DMA Resource

When resources are controlled manually, assign each system DMA channel a type, depending on the type of device using the DMA channel.

DMA 0/1/3/5/6/7 assigned to

Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
The Choice: Legacy ISA and PCI/ISA PnP.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.
The Choice: Enabled, Disabled.

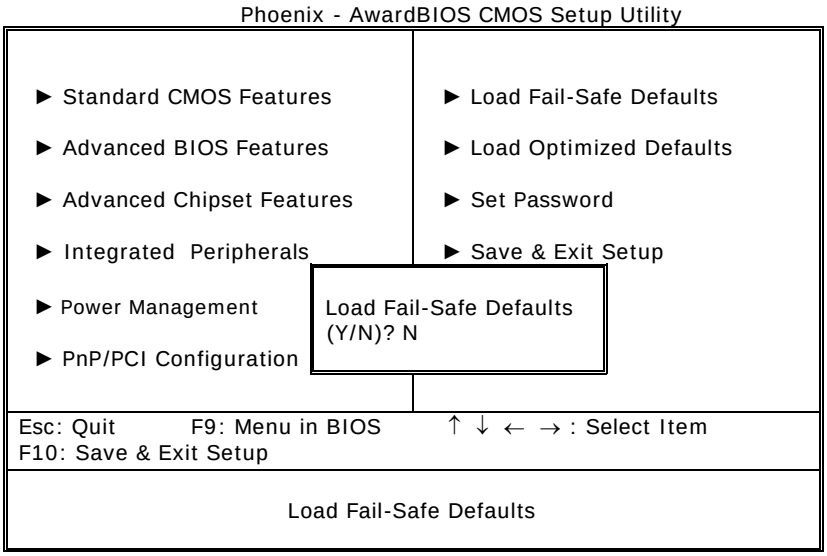
D.8 Load Fail-Safe Defaults

Selecting “Defaults” from the main menu shows you two options that are described below:

Load Fail-Safe Defaults
When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N)? N

Pressing ‘Y’ loads the BIOS default values for the most stable, minimal-performance system operations.

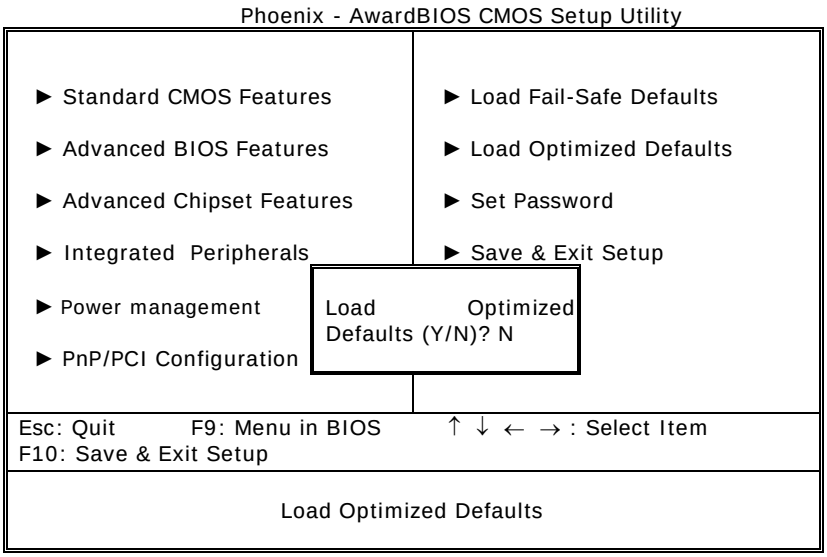


D.9 Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.



D.10 Set Password

You can set either setup or system password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

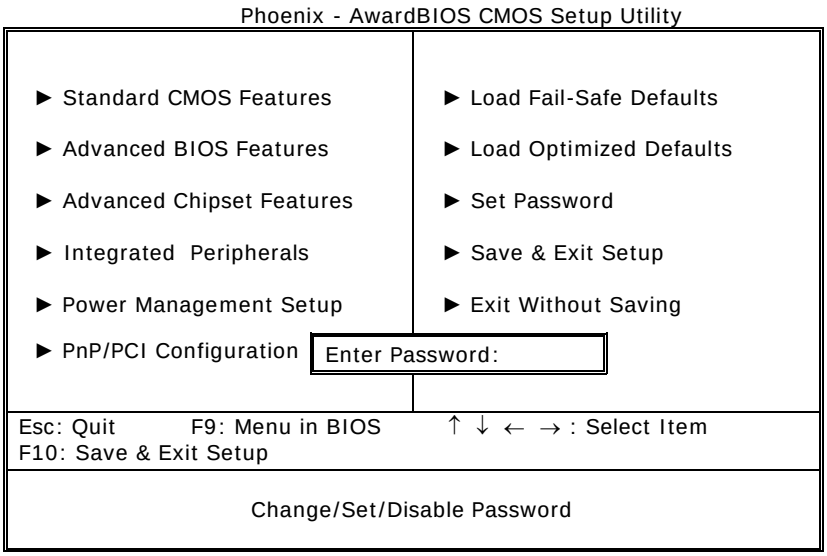
To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to password will be required both at boot and at entry to Setup. If set to “Setup”, prompting only occurs when trying to enter Setup.

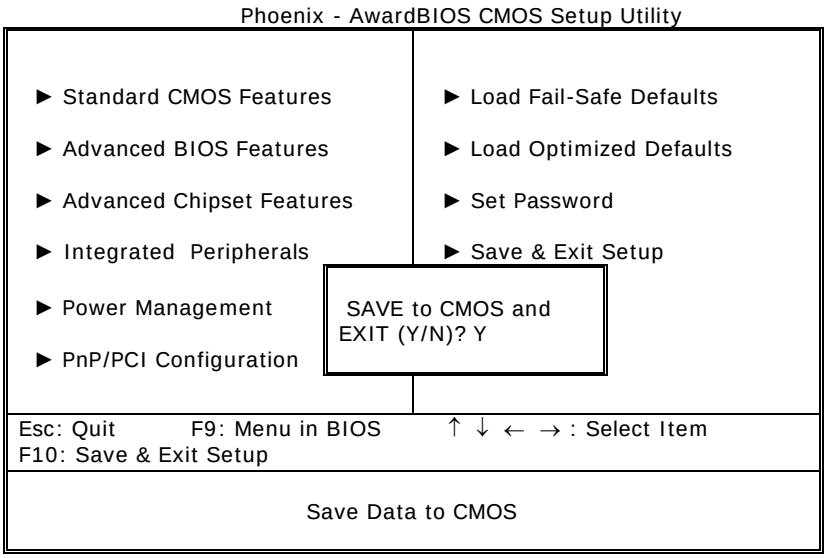


D.11 Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.



D.12 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.