

WAFER-4826EV Series

User Manual

Version 1.0

STPC-DX2 133 with LCD/CRT & Ethernet

PCB Version 1.0

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Chapter 1 Introduction

Thank you for choosing the WAFER-4826EV SERIES STPC-DX2 133 CPU Board. The WAFER-4826EV SERIES Board (denoted as WAFER-4826EV in other parts of the manual) is an all-in-one CPU board with PC/104 for space-limited applications. It provides all the functionalities of a full-fledged computer.

In addition, the WAFER-4826EV provides a VGA & LCD display controller on board, which can support CRT/LCD resolutions up to 1024x768@64K colors.

This board has a built-in Compact Flash Interface for embedded applications. The CF is a 100% software compatible hard disk. Users can use any DOS command without any additional software utilities.

1.1 Specifications

| | |
|-------------------------------------|--|
| CPU | Embedded SGS Thomson STPC-DX2 133 |
| System bus connector | PC/104 connector |
| System memory | Onboard SDRAM or one SO-DIMM socket, supports up to 128MB SDRAM |
| Enhanced IDE | Supports one EIDE devices with BIOS auto-detection capabilities |
| Floppy disk drive interface | Supports up to two floppy disk drives |
| Serial ports | Four RS-232 ports with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be independently configured as COM1 or COM2. |
| Bi-directional parallel port | Configurable to LPT1, LPT2, LPT3 or disabled. Supports EPP/ECP/SPP. |
| IrDA port | Supports Infrared (IrDA) interface (Reserved/optional) |
| Watch-dog timer | Can be set by 1-255 seconds intervals. Reset is triggered when CPU does not periodically trigger the timer. |
| VGA display interface | Complete backward compatibility to VGA and SVGA, supports resolution up to 1024 x 768 @ 64K colors. |
| CF Interface | One CF card with BIOS auto-detection capabilities. |
| Keyboard / Mouse connector | Supports standard PC/AT keyboards and PS/2 mice |
| Power consumption | +5V @ 2.6A |
| Operating temperature | 0° - 60° C (CPU requires a fan to use in environments above 60°C) |

1.2 Package Contents

The WAFER-4826EV package includes the following items:

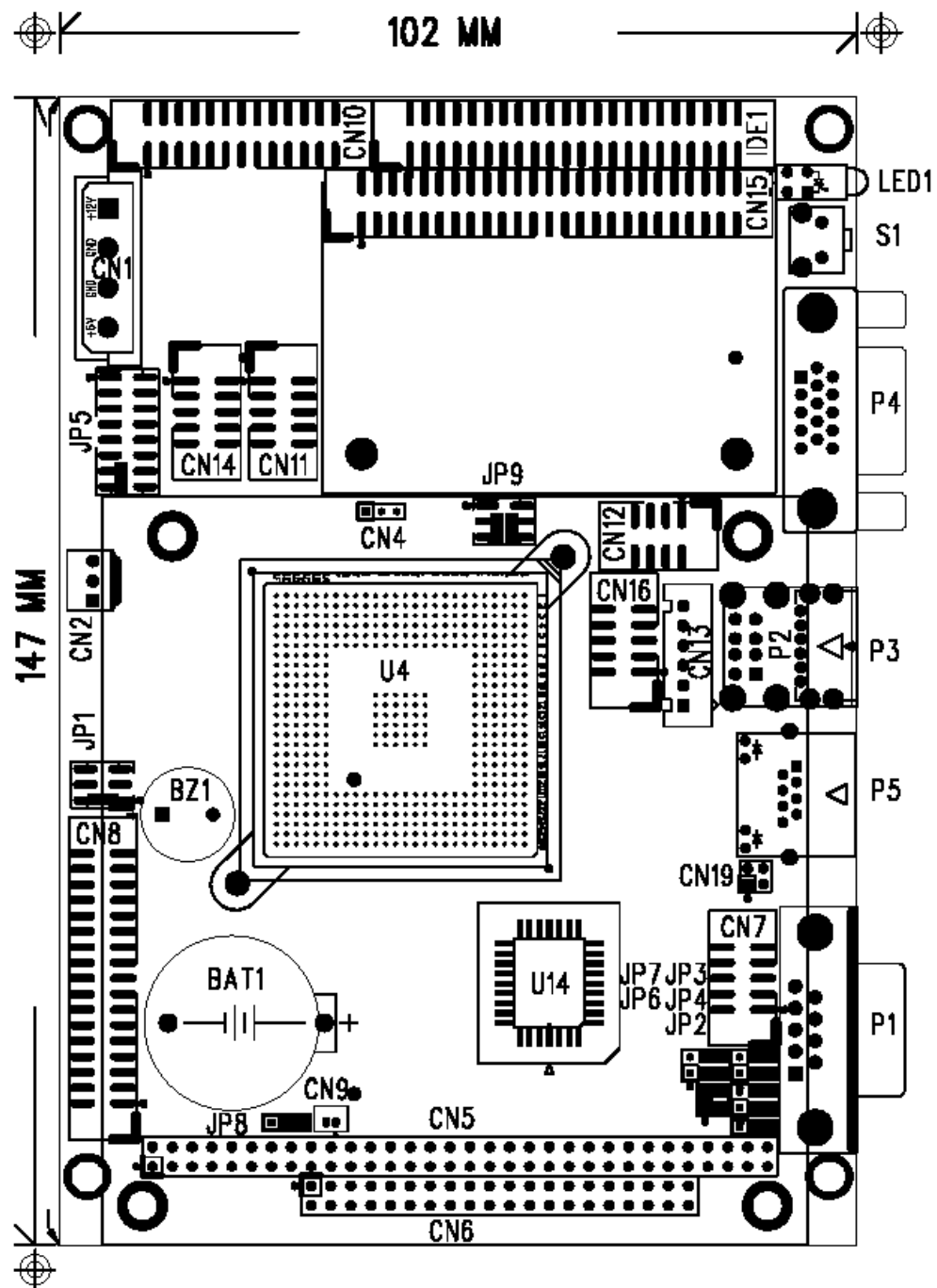
- WAFER-4826EV CPU board
- 1 Driver/Software CD
- 3 RS-2323 cables
- 1 Printer Cable
- 1 FDD cable
- 1 HDD cable
- One 6-pin head which converts to two 6-pin DIN cable for keyboard and mouse connection (Y Cable) x 1
- User Manual

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

Chapter 2 Installation

This chapter describes how to install the WAFER-4826EV. Read the unpacking information carefully and refer to the layout diagram of WAFER-4826EV below whenever necessary.

2.1 Board Layout & Dimensions



2.2 Unpacking Precautions

Some components on WAFER-4826EV SBC are very sensitive to static and can be damaged by a sudden power surge. To protect it from unintentional damage, please be sure to follow these precautions:

- Ground yourself to remove any static charge before touching WAFER-4826EV SBC. You can do it by using an anti-static wrist strap connected to the ground or by frequently touching any grounded conducting materials.
- Handle your WAFER-4826EV SBC by its edges. Do not touch IC chips, leads or circuitry as far as possible.
- Do not plug in any connectors or set any jumpers when the power is on.

2.3 Compact Flash Mode Setting (JP1)

The Compact Flash on the WAFER-4826EV is Type II, and it uses IDE2.

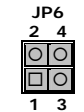
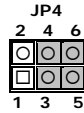
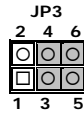
- **JP1: Master/Slave Mode Settings**



| JP1 (1-2) | DESCRIPTION |
|-----------|-------------|
| SHORT | MASTER |
| OPEN | SLAVE |

2.4 COM2 Mode setting (JP2, JP3, JP4, JP6)

- JP2, JP3, JP4, JP6: COM2 RS-232 or RS-422/485 Mode Selections



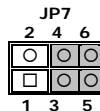
| JP2 | JP3 & JP4 | DESCRIPTION |
|-------------|-----------------|-------------|
| 1-2 short | 1-3 & 2-4 short | RS-422/485 |
| 2-3 short * | 3-5 & 4-6 short | RS-232 |

| JP6 | DESCRIPTION |
|-------------------|-------------|
| OPEN | RS-422 |
| 1-3 & 2-4 short * | RS-485 |

Note: If using RS422/485, the COM2 on the main board will be disabled.

2.5 COM2 Pin 8 RI Settings (JP7)

- JP7: Pin 8 RI Settings

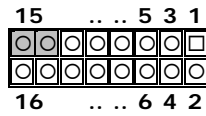


| JP7 | CN7 PIN 8 |
|------------------|-----------|
| 3-5, 4-6 Short * | RI |
| 3-5, 2-4 Short | +5V |
| 1-3, 2-4 Short | +12V |

2.6 External Switches and Indicators (JP5)

There are several external switches and indicators for monitoring and controlling your CPU board. All functions are contained in the JP5 connector.

- **JP5: 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 - |
| | 15 | SPK SIGNAL |
| Reserved (IrDA port) | 2 | +5V |
| | 4 | Rev. (FIR-RX) |
| | 6 | IR-RX |
| | 8 | GND |
| | 10 | IR-TX |
| | 12 | CIR-RX |
| Reserved (KEYLOCK) | 14 | Rev. (KEYLOCK) |
| | 16 | GND |

2.7 Clear CMOS Setup (JP8)

If you want to clear the CMOS, for example, you forgot the your password, you should clear the CMOS and reset the password, you should short JP8 (1-2) for about 3 seconds. The password will be cleared from the CMOS.

- **JP8: Clear CMOS Setup (Reserved Function)**



| JP8 | DESCRIPTION |
|-----|-------------|
| 2-3 | NORMAL |
| 1-2 | CLEAR CMOS |

2.8 TFT LCD Settings (JP9)

- **JP9: TFT LCD type (5V / 3V & FPCLK / #FPCLK) Settings**



| JP9 | DESCRIPTION |
|-------|-------------|
| 2 - 4 | 5V TFT LCD |
| 4 - 6 | 3V TFT LCD |
| 1 - 3 | #FPCLK |
| 3 - 5 | FPCLK |

Chapter 3 Connectors

This chapter describes how to connect peripherals, switches and indicators to the WAFER-4826EV board.

Table of Connectors

| LABEL | FUNCTION |
|-------|---|
| P1 | COM1 Connector |
| P2 | External USB Connector (rev) |
| P3 | PS/2 Mouse and Keyboard Connector |
| P4 | VGA Connector |
| P5 | Ethernet Connector |
| CN1 | External Power Connector |
| CN2 | 12V or 5V(rev) Connector (for FAN etc.) |
| CN3 | SO-DIMM Socket Connector |
| CN4 | I2C Connector (rev) |
| CN5 | PC/104-64 CON A |
| CN6 | PC/104-40 CON B |
| CN7 | COM2 Connector (RS-232/422/485) |
| CN8 | Floppy Disk Drive Connector |
| CN9 | External Battery Connector |
| CN10 | Parallel Port Connector |
| CN11 | COM3 Connector |
| CN12 | USB Connector |
| CN13 | External Keyboard Connector |
| CN14 | COM4 Connector |
| CN15 | LCD Panel Connector |
| CN16 | DIO Connector |
| CN17 | COM5 Connector |
| CN18 | COM6 Connector |
| CN19 | LAN LED Connector |
| IDE1 | IDE Disk Drive Connector |
| CF1 | Compact Flash Card Connector |

3.1 VGA Connector (P4)

The built-in DB15 VGA connector of WAFER-4826EV can be directly connected to your CRT monitor via the attached VGA cable.

- **P4: DB15 VGA Connector**

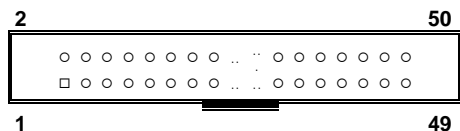
| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | NC |
| 5 | GROUND | 6 | GROUND |
| 7 | GROUND | 8 | GROUND |
| 9 | 5V | 10 | GROUND |
| 11 | NC | 12 | SDA |
| 13 | HSYNC | 14 | VSYNC |
| 15 | SCL | | |

3.2 SO-DIMM Socket Connector (CN3)

| 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 2.0mm 50Pin (CN15)



| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | NC | 2 | NC |
| 3 | NC | 4 | NC |
| 5 | NC | 6 | NC |
| 7 | NC | 8 | NC |
| 9 | NC | 10 | NC |
| 11 | NC | 12 | NC |
| 13 | NC | 14 | FPD_R3 |
| 15 | FPD_R5 | 16 | FPD_R4 |
| 17 | NC | 18 | FPD_R2 |
| 19 | NC | 20 | FPD_R0 |
| 21 | FPD_R1 | 22 | FPD_G4 |
| 23 | FPD_G3 | 24 | FPD_G2 |
| 25 | FPD_G5 | 26 | FPD_G1 |
| 27 | FPD_B5 | 28 | FPD_G0 |
| 29 | +LCD | 30 | +LCD |
| 31 | NC | 32 | NC |
| 33 | FPD_B2 | 34 | FPD_B4 |
| 35 | FPD_B1 | 36 | FPD_B3 |
| 37 | FPD_B0 | 38 | NC |
| 39 | FPD_EN | 40 | NC |
| 41 | FPD_CK | 42 | EN_BKL |
| 43 | EN_VDD | 44 | FPD_VS |
| 45 | EN_VEE | 46 | FPD_HS |
| 47 | GND | 48 | GND |
| 49 | +VBL | 50 | +VBL |

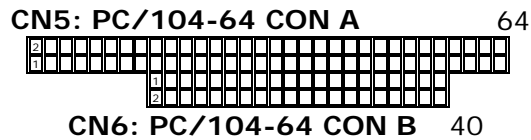
3.4 I2C Connection (CN4)



| CN4 | DESCRIPTION |
|-----|-------------|
| 1 | DATA |
| 2 | CLOCK |
| 3 | GND |

3.5 PC/104 Connection Bus (CN5, CN6)

The WAFER-4826EV's PC/104 expansion bus lets you attach any PC/104 module. There are two PC/104 connectors on this board: PC/104-64 and PC/104-40.



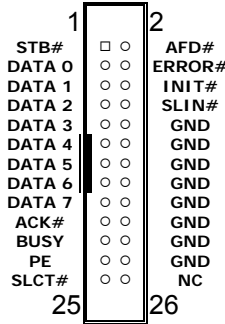
| CN5: PC/104-64 CON A | | | |
|-----------------------------|-------------|------------|-------------|
| PIN | DES. | PIN | DES. |
| 1 | IOCHCK# | 2 | GND |
| 3 | SD7 | 4 | RSTDRV |
| 5 | SD6 | 6 | +5V |
| 7 | SD5 | 8 | IRQ9 |
| 9 | SD4 | 10 | -5V |
| 11 | SD3 | 12 | DRQ2 |
| 13 | SD2 | 14 | -12V |
| 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 |

| CN6: 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 |

3.6 Parallel Port Connector (CN10)

This port is usually connected to a printer. WAFER-4826EV includes an on-board parallel port to be accessed through a 26-pin mini-pitched flat-cable connector CN10.

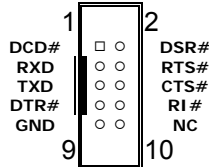
- **CN10: 26-PIN Female Connector**



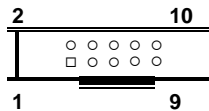
3.7 Serial Port Connectors (CN7, CN11, CN14)

The WAFER-4826EV offers two high-speed NS16C550 compatible 16-byte serial Read/Receive UART FIFO ports.

- **CN11, CN14: (COM3, COM4) 10-PIN Female Connector**

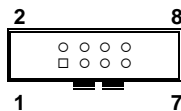


- **CN7: (COM2) 10-PIN Female Connector**



| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | TX- / DCD# | 2 | DSR# |
| 3 | TX+ / RXD | 4 | RTS# |
| 5 | RX+ / TXD | 6 | CTS# |
| 7 | RX- / DTR# | 8 | RI#/5V/12V |
| 9 | GND | 10 | NC |

3.8 USB Port Connector (CN12)

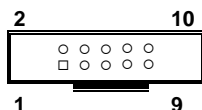


| CN12 | DESCRIPTION |
|------|-------------|
| 1 | +5V |
| 2 | GND |
| 3 | POD- |
| 4 | P1D+ |
| 5 | POD+ |
| 6 | P1D- |
| 7 | GND |
| 8 | +5V |

3.9 DIO Port Connector (CN16)

This port is connected to DIO 0 to 7; all pins can be set as input or output.

| IO port | DESCRIPTION |
|-----------|--|
| 320 (hex) | Direction Register DIO 0 (bit0) ~ DIO 7 (bit7) 1=input; 0=Output |
| 326 (hex) | DIO Port DIO 0 (bit0) ~ DIO 7 (bit7) |



| CN16 | DESCRIPTION |
|------|-------------|
| 1 | GND |
| 2 | +5V |
| 3 | DIO 7 |
| 4 | DIO 6 |
| 5 | DIO 5 |
| 6 | DIO 4 |
| 7 | DIO 3 |
| 8 | DIO 2 |
| 9 | DIO 1 |
| 10 | DIO 0 |

3.10 LAN LED Connector (CN19)

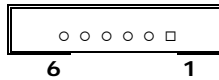


| CN19 | DESCRIPTION |
|------|-------------|
| 1 | LINK- |
| 2 | LINK+ |
| 3 | ACT- |
| 4 | ACT+ |

3.11 External Keyboard Connector (CN13)

The included 5 or 6-pin plug will convert to two 6-pin DIN cables for keyboard (mouse) connection enables users to connect PS/2 keyboard (and mouse). Simply connect your keyboards and mice to the attached cable to use them as you normally would.

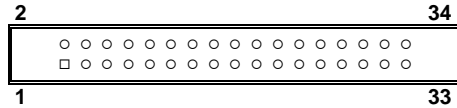
- **CN13 : PS/2 Keyboard (mouse/rev) Connector**



| CN13 | DESCRIPTION |
|------|------------------------|
| 1 | KEYBOARD CLOCK |
| 2 | KEYBOARD DATA |
| 3 | NC. (Rev. MOUSE CLOCK) |
| 4 | GND |
| 5 | SV |
| 6 | NC. (Rev. MOUSE DATA) |

3.12 Floppy Disk Drive Connector (CN8)

The WAFER-4826EV board is equipped with a 34-pin daisy-chain drive connector cable which supports up to two floppy drives. The detailed pin assignments of the connector is described as below:

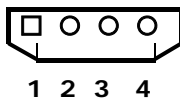


| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-----------------|
| 1 | GND | 2 | REDUCE WRITE |
| 3 | GND | 4 | NC |
| 5 | GND | 6 | NC |
| 7 | NC | 8 | INDEX# |
| 9 | GND | 10 | MOTOR ENABLE A# |
| 11 | GND | 12 | DRIVE SELECT B# |
| 13 | NC | 14 | DRIVE SELECT A# |
| 15 | GND | 16 | MOTOR ENABLE B# |
| 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 | NC | 30 | READ DATA# |
| 31 | GND | 32 | SIDE 1 SELECT# |
| 33 | NC | 34 | DISK CHANGE# |

3.13 External Power Connector (CN1)

The WAFER-4826EV has an on-board external power connector CN1. The WAFER-4826EV is only powered by VCC (5V), which is conducted through pin 4 of the external power connector CN1, and power GND from pin 2 and pin 3. The extra power supply +12V provided by CN1 will be passed to CN5 and CN6 for PC104 slot use only.

- **CN1: External Power Connector**

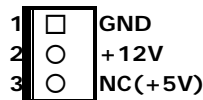


| PIN | DESCRIPTION |
|-----|-------------|
| 1 | +12V |
| 2 | GND |
| 3 | GND |
| 4 | +5V |

3.14 12V or 5V Connector (CN2)

The WAFER-4826EV provides an optional fan power connector, which works only when +12V power is supplied to CN1. Please note that a heat sink has already been installed in STPC chip of the WAFER-4826EV. However, when running WAFER-4826EV under a temperature of above 60 , users will have to add an additional CPU cooling fan.

- **CN2: 12V or 5V for FAN etc. connector**



3.15 External Battery Connector (CN9)

The WAFER-4826EV provides an (Molex 1.25mm 2pin) optional battery connector.

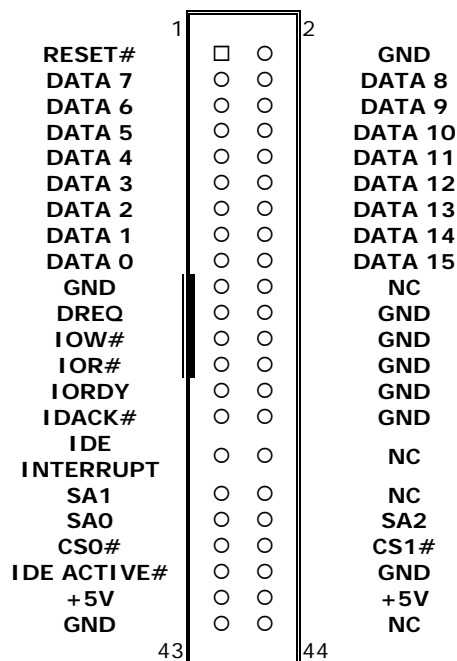
Note: If external battery is to be used, please remove the on board battery.



3.16 IDE Disk Drive Connector (IDE 1)

You can attach four IDE (Integrated Device Electronics) hard disk drives to the WAFER-4826EV IDE controller.

- **IDE1: HDD Connector**



3.17 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 |

Chapter 4 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.

4.1 Getting Started

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

1. By pressing immediately after switching the system on, or
2. By pressing the 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

In general, you can use the arrow keys to highlight items, press <Enter> to select, use the Page Up and Page Down keys to change entries, press <F1> for help and press <Esc> to quit. The table on the next page 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 |
| Page Up key | Increase the numeric value or make changes |
| Page Down 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 |

4.2 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.

| Phoenix - AwardBIOS CMOS Setup Utility | |
|---|--|
| <ul style="list-style-type: none"> ▶ Standard CMOS Features ▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations | <ul style="list-style-type: none"> ▶ Load Fail-Safe Defaults ▶ Load Optimized Defaults ▶ Set Password ▶ Save & Exit Setup ▶ Exit Without Saving |
| Esc : Quit F9 : Menu in BIOS ↑ ↓ ← → : Select Item F10 : Save & Exit Setup | |
| Time, Date, Hard Disk Type... | |

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

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

- **Standard CMOS Features**
Select this item for basic system configuration. See Section 4.3 for the details.
- **Advanced BIOS Features**
Select this item menu to set the Advanced Features available on your system. See Section 4.4 for the details.
- **Advanced Chipset Features**
Select this item to change the values in the chipset registers and optimize your system's performance. See section 4.5 for the details.
- **Integrated Peripherals**
Select this item to specify your settings for integrated peripherals. See section 4.6 for the details.
- **Power Management Setup**
Select this item to specify your settings for power management. See section 4.7 for the details
- **PnP / PCI Configurations**
This entry appears if your system supports PnP / PCI. See section 4.8 for the details.
- **Load Fail-Safe Defaults**
Select this item to load the BIOS default values for the minimal/stable performance for your system to operate. See section 4.9 for the details.
- **Load Optimized Defaults**
Select this item 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 4.10 for the details.
- **Set Password**
Select this item to set Passwords. See section 4.11 for the detail.
- **Save & Exit Setup**
Saves CMOS value changes to CMOS and exit setup. See section 4.12 for the details.
- **Exit Without Save**
Abandons all CMOS changes and exit setup. See section 4.13 for the details.

4.3 Standard CMOS Features

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes zero, one or more setup items. Use the arrow keys to highlight the item and then use the <Page Up> or <Page Down> keys to select the value for each item.

| Phoenix - AwardBIOS CMOS Setup Utility | | Item Help |
|---|----------------------|---|
| Standard CMOS Features | | |
| Date (mm:dd:yy) | Tue, Feb 25 2003 | Menu Level ► Change the day, month, year and century |
| Time (hh:mm:ss) | 17 : 20 : 10 | |
| ► IDE Primary Master | | |
| ► IDE Primary Slave | | |
| ► 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 Slave | 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. A separate sub menu is used to configure each hard disk drive.

The IDE primary master sub menu is displayed like the following:

| Phoenix - AwardBIOS CMOS Setup Utility | | Item Help |
|---|---------------|---|
| IDE Primary Slave | | |
| IDE HDD Auto-Detection | [Press Enter] | Menu Level ► |
| IDE Primary Slave | [Auto] | Change the day, month, year and century |
| Access Mode | [Auto] | |
| 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 keys shown at the bottom of the screen to navigate the options and to exit to the main menu. Refer to the table below to configure the hard disks.

| 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 no hard disk! |
| 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 are available 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 |

4.4 Advanced BIOS Features

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

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

| | | Item Help |
|--|------------|---|
| Virus Warning | [Disabled] | Menu Level ► 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. |
| CPU Internal Cache | [Enabled] | |
| Quick Power On Self Test | [Enabled] | |
| First Boot Device | [Floppy] | |
| 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] | |
| Typematic 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

| | | Item Help |
|--|------------|--------------|
| CC000-CFFFF Shadow | [Disabled] | Menu Level ► |
| D0000-D3FFF Shadow | [Disabled] | |
| 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 the IDE Hard Disk boot sector protection. When this function is enabled and when a write is attempted in the hard disk boot sector, BIOS will show a warning message on the screen and the alarm will beep. The options are listed below:

| OPTION | DESCRIPTION |
|----------|---|
| 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**

This attempts to speed up memory access. The amount of speedup is dependant on the CPU/chipset design.

Options: Enabled, Disabled.

- **Quick Power On Self-Test**

This category speeds up the Power On Self Test (POST) after you turn on the computer. If it is enabled, the BIOS will shorten or skip some tests during POST.

Options: Enabled, Disabled.

- **First/Second/Third/Other Boot Device**

The BIOS will attempt to load the operating system from the devices in the sequence selected in these items.

Options: 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.

Options: Enabled, Disabled.

- **Boot Up Floppy Seek**

Checks the floppy disk drives for an operating system during boot up.

Disabling this option speeds the startup of the computer.

Options: Enabled, Disabled.

- **Boot Up NumLock Status**

Choose whether to engage NumLock upon turning the computer on.

Options: On, Off.

- **Gate A20 Option**

Choose whether the chipset or the keyboard controller should control GateA20.

| OPTION | DESCRIPTION |
|--------|--|
| Normal | A pin in the keyboard controller controls GateA20 |
| Fast | Allows the chipset to take over control of the GateA20 |

- **Typematic Rate Setting**

Keystrokes repeat (typematic) at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

Options: Enabled, Disabled.

- **Typematic Rate (Chars/Sec)**

Sets the number of times a second to repeat a keystroke when you hold the key down.

Options: 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.

Options: 250, 500, 750, and 1000.

- **Security Option**

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

| OPTION | DESCRIPTION |
|--------|---|
| 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 a password. Do not type anything and Press <Enter> to disable security. Once the security is disabled, you can start up the system and enter BIOS setup without using a password.

- **OS Select For DRAM > 64MB**

If the system has more than 64MB of RAM, select OS2 if OS/2 is used on the computer. Otherwise, select Non-OS2.

Options: Non-OS2, OS2.

- **Video BIOS Cacheable**

Enabling this option will enable 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.

Options: Enabled, Disabled.

4.5 Advanced Chipset Features

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

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

| | | Item Help |
|--|-------------|--------------|
| Memory Hole (15M -16M) | [Disabled] | Menu Level ► |
| ISA Clcck | [14.3MHz/2] | |
| 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 | | |

4.6 Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

| | | Item Help |
|---|------------|--------------|
| On-Chip Local Bus IDE | [Enabled] | Menu Level ► |
| IDE Buffer for DOS & Win | [Enabled] | |
| 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 enable the primary IDE interface. Select "Disabled" to disable this interface

Options: 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 optimal mode for each device.

Options: 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.

Options: 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.

Options: Enabled, Disabled.

- **Onboard Serial Port 1/Port 2**

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

Options: 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.

Options: 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.

Options: Normal, EPP, ECP, and ECP/EPP

- **ECP Mode Use DMA**

Select a DMA channel for the parallel port for use during ECP mode.

Options: 3, 1.

- **Parallel Port EPP Type**

Select EPP port type 1.7 or 1.9.

Options: EPP1.7, EPP1.9

4.7 Power Management Setup

This allows you to configure your system in a way such that you can use the computer as you normally would, while making the most efficient use of energy

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

| | | Item Help |
|---|--------------------|--------------|
| Power Management | [User Define] | Menu Level ► |
| PM Control by APM | [Yes] | |
| 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 amount) of power saving and is directly related to the following modes:

- ✓ **HDD Power Down**

When enabled, the hard disk drive will power down after a specified time of system inactivity.

- ✓ **Doze Mode**

When enabled, the CPU clock will run at a lower frequency after a specified time of system inactivity.

- ✓ **Suspend Mode**

When enabled, every component on the computer, except the CPU, will be powered down after a specified time of system inactivity.

There are four selections for Power Management, three of which have pre-defined settings for Doze, Standby, Suspend Modes and HDD Power Down.

| OPTION | DESCRIPTION |
|-------------------|---|
| Disable (default) | No power management. Disables all power saving 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 | Allow the individual settings of Doze, Standby, Suspend Modes (between 1 min. and 1 hr. of inactivity) and the HDD Power Down (between 1 min. to 15 min). Each setting may also be individually disabled. |

- **PM Control by APM**

When enabled, an Advanced Power Management device will be used 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*.

Options: Yes, No.

- **Video Off Option**

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

| OPTION | DESCRIPTION |
|-------------------|---|
| 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. Please see the table below for details on each option.

| OPTION | DESCRIPTION |
|----------------|--|
| 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 settings. |

4.8 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 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 | Default is Disabled. |
| DMA Resources | Press Enter | 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.

Options: 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 “✓”).

Options: 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**

The user may assign the each of the listed interrupts to a specific type of device here, namely Legacy ISA devices and PCI/ISA PnP devices. The Legacy ISA Devices are those that are compliant with the original PC AT bus specification and requires a specific interrupt (such as IRQ4 for serial port 1). PCI and ISA PnP Devices are compliant with the Plug and Play standard.

Options: 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**

The user may assign each of the listed DMA channels to a specific type of device here, namely the Legacy ISA devices and the PnP PCI/ISA devices.

The Legacy ISA Devices are those that are compliant with the original PC AT bus specification and requires a specific interrupt (such as IRQ4 for serial port 1). PCI and ISA PnP Devices are compliant with the Plug and Play standard.

Options: PCI/ISA PnP, Legacy ISA.

- **PCI/VGA Palette Snoop**

Please leave this set as *Disabled* and please do **not** modify this setting.

Options: Enabled, Disabled.

4.9 Load Fail-Safe Defaults

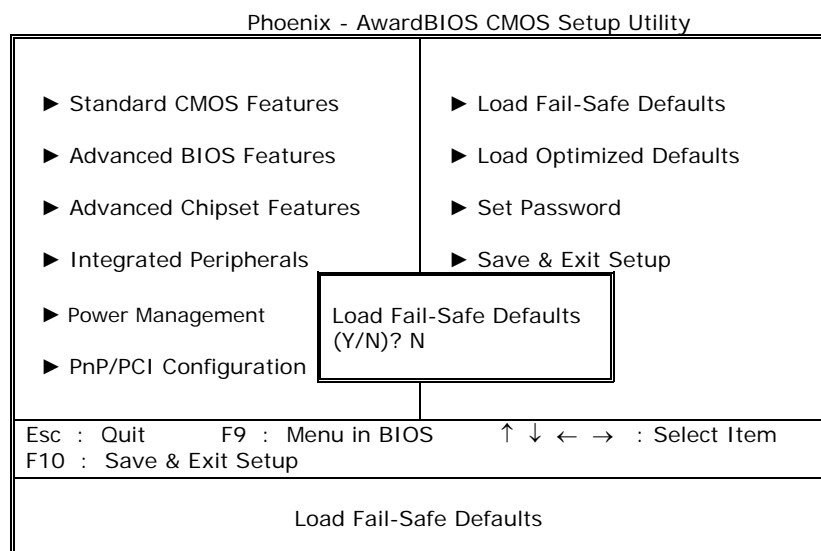
There are two options labeled with the word “Defaults” here, namely “Load Fail-Safe Defaults” and “Load Optimized Defaults”, the “Load Fail-Safe Defaults” are described in this section while the “Load Optimized Defaults are described in D.9.

- **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.

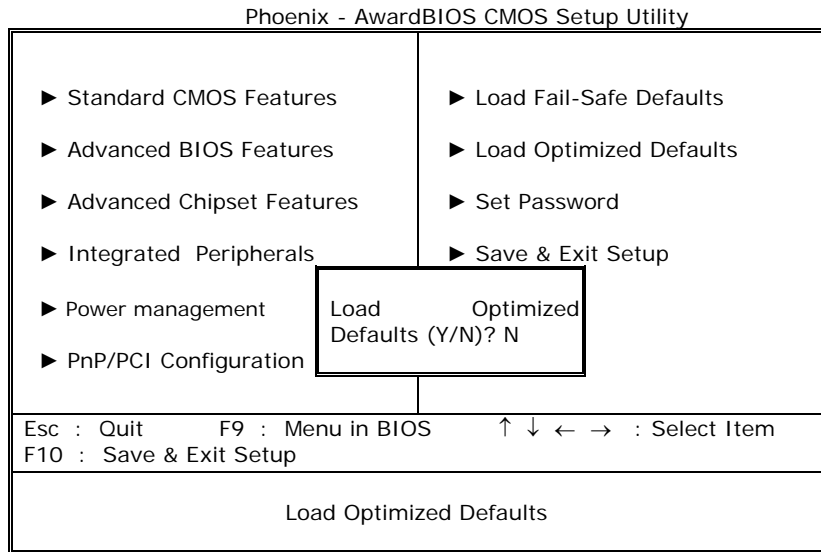


4.10 Load Optimized Defaults

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.



4.11 Set Password

You can set either the setup or the system password. Upon selecting this option, you will see:

ENTER PASSWORD:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will replace any 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 the password protection, just press <Enter> when you are prompted to enter the password. A message, like the one shown below, will confirm the disabling of the password.

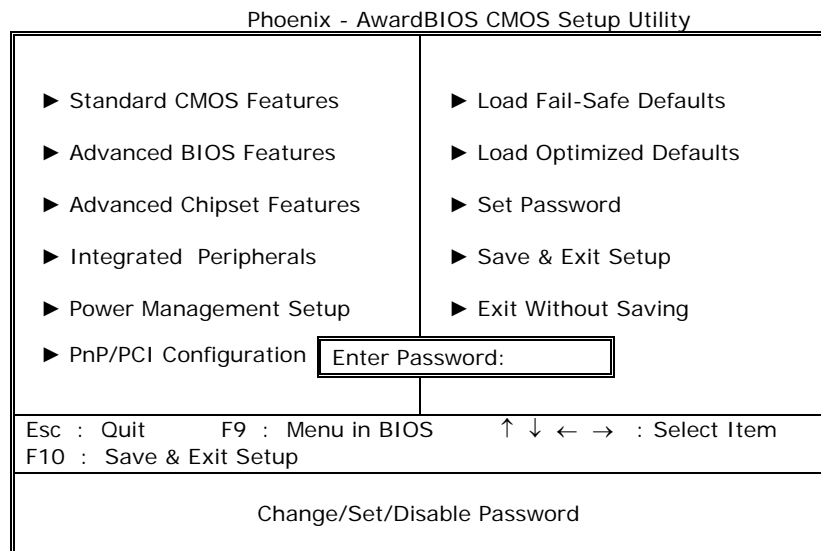
PASSWORD DISABLED.

Once the password is disabled, the system will reboot and you can enter Setup freely.

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.

In addition, you can set the BIOS to prompt for a password every time the system is started or restarted. This prevents the unauthorized use of your computer. This can be set in the Security option in the BIOS Features Setup Menu. In the Security option, if it is set to "System", the password will be required for both startup and CMOS Setup. If it is set to "Setup", the password is only required when entering the CMOS Setup.

Please see below for an illustration of the Password protection in use for the CMOS Setup screen.

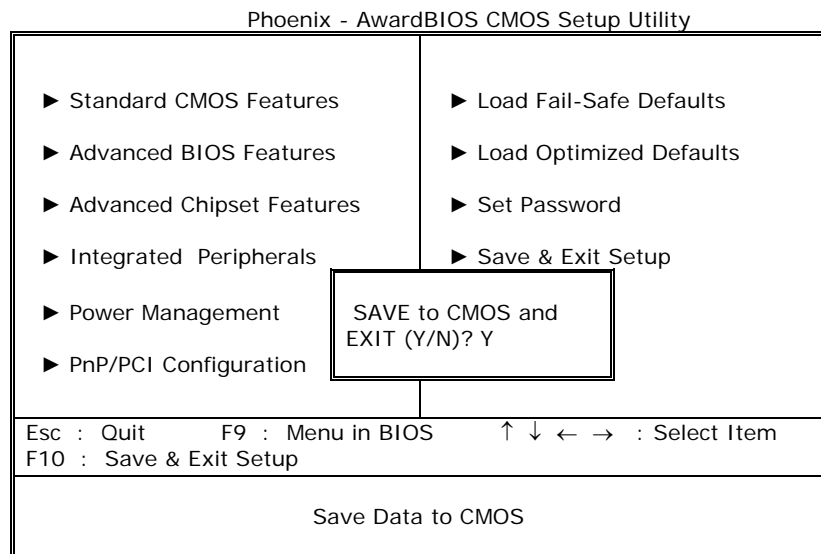


4.12 Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

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

Pressing "Y" saves the changes 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.

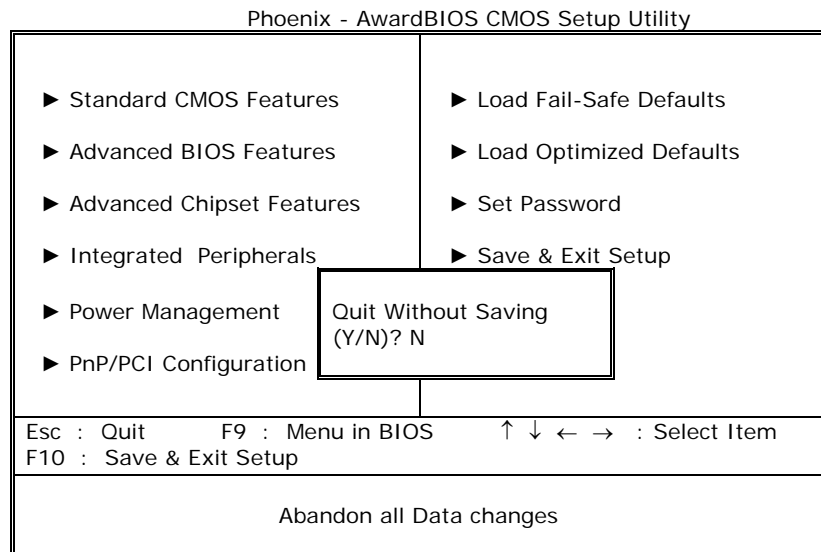


4.13 Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit without saving (Y/N)? Y

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



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 have resulted from an external EMI or a software bug. When the system stops working, hardware on the board will perform a hardware reset (cold boot) to bring the system back to a known state.

Three I/O ports control the operation of Watchdog Timer, which is described in the following table.

| I/O PORT | ACTION | DESCRIPTION |
|---------------|--------|--|
| 443 (hex) | Write | Set time-out period |
| 443 (hex) | Read | Enable the refreshing of 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. Please refer to the sample assembly program on the next page for more details.

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

Sample assembly program:

TIMER_PORT = 443H

TIMER_START = 443H

TIMER_STOP = 843H

;; Initialize Timer

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/Implementation Here

CMP EXIT_AP, 0

JNE W_LOOP

MOV DX, TIMER_STOP

IN AL, DX

;;Exit the application

Appendix B. The E² Key™ Function

The WAFER-4826EV provides an outstanding E²KEY™ function for system integrators. Based on the E²KEY™, ID Code, Passwords or Critical Data can be stored in the 1Kbit EEPROM (memory module). The loss of these important data is prevented, as EEPROM is non-volatile.

The E²KEY™ 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 WAFER-4826, the E²KEY™ utility is already in the package. The software utility will contain 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 their applications with E²KEY™. These compiled library functions are written in the C programming language. Please check the following statements to for using and implementing the library functions:

unsigned int read_e2key(unsigned int address)

/* This function will return the data of E²KEY™ at the specified address. The address ranges from 0 to 63. Return data is one word, 16 bits in length. */

void write_e2key(unsigned int address, unsigned int data)

/* This function will write the given data to the E²KEY™ at a certain address. The address ranges from 0 to 63. The data value is from 0 to 0xffff. */

To use these functions, please refer to the included EKEYDEMO.C sample program for further information.

Appendix C. I/O Information

- **IO Address Mappings**

| 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**

| IRQ | FUNCTION | IRQ | FUNCTION |
|------------|---------------------------|------------|-----------------|
| 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**

| 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 |