EP820 Series

Intel® Pentium® M All-In-One

EPIC SBC

With DualView Display and SATA

User's Manual

Disclaimers

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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MEMO

Chapter 1
Introduction

The **EP820 Series** is an Intel® Pentium® M/Celeron® M CPU equipped EP820 board with graphics, Fast Ethernet and audio interface. With the designing of space-limited application, the **EP820 Series** makes the finest embedded Pentium® M board in existence, using a newly standardized EPIC format, larger than a PC/104 module, yet smaller than an EBX board.

EP820 Series can be adapted for Intel® low power consumption Pentium® M microprocessors. To simplify the system integration, it provides users with super I/Os, XVGA, LCD, Ethernet and solid state disk that makes all on one single board. There comes with the unique embedded feature that two serial ports (1 x RS-232, 1 x RS-232/422/485) with +5V/12V power capability allow the adoption of an extensive array of PC peripherals. The industrial-grade construction of **EP820 Series** allows your system to endure the continuous operation in hostile environments where require most stability and reliability. The system dependability of **EP820 series** is highly enhanced by a special industrial feature of the built-in Watchdog Timer, which makes the board outstanding among others.

Designed for the professional embedded developers, the Pentium® M embedded board **EP820 Series** is virtually the ultimate one-step solution for embedded system applications.

1.1 Specifications

- **CPU: Socket 478 for Intel® Pentium® M/ Celeron® M processors**
- **System Chipset: Intel® 915GM and ICH*6M**
- **BIOS**
  - Phoenix-Award BIOS, Y2K compliant
  - 4Mbit Flash, DMI, Plug and Play
  - SmartView for multiple LCD type selection, display mode option and application extension features
  - RPL/PXE Ethernet Boot ROM
  - "Load Optimized Default" customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One x 200-pin DDR2-400 SODIMM socket
  - Maximum to 1GB DDR2 memory
- **L2 Cache:** integrated in CPU
- **Onboard IDE**
  - 2 channels up to 3 devices (1 parallel ATA-100 and serial ATA-150)
  - PATA-100 as PIO Mode 0-4, DMA Mode 0-2 and Ultra DMA-33/66/100
- **Onboard Serial ATA**
  - Independent DMA operation
  - Data transfer rate up to 150 Mbyte/s
- **CompactFlash Socket**
  - IDE1 support CompactFlash Type II Socket jumper selectable as Master or Slave and DMA mode supported

- Power is 5V (Optional) or 3.3V (Defaulted)

- **Onboard Multi-I/O**
  - One floppy (Optional) port supporting up to two devices
  - One SPP/EPP/ECP parallel port with 26-pin 2.0 pitch box-header that supports LS-120
  - Two 16550 UART-compatible serial ports with +5V/+12V power output in Pin 1 or Pin 9 via DIP jumper setting
    - 1 x RS-232
    - 1 x RS-232/422/485 and selectable via jumper setting and auto flow control supported
  - DIO: 4bits input & 4bits output

- **USB Interface**
  - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0

- **Watchdog Timer**
  - 255 levels as SMI and Reset from 0 ~ 255 seconds controlled by W83627HF

- **Bord Unique ID**
  - Dallas DS2401 board unique ID supported for customized application

- **Hardware Monitoring**
  - Integrate Winbond W83627HF Super I/O
  - Monitoring for CPU/System temperatures, System Voltage and CPU Fan speeds

- **Graphics/Streaming**
  - VGA On-chip Intel® 915GM
  - Supports up to 2048 x 1536 at 60 Hz resolution on non-interlaced CRT monitors
  - Optional Dual LVDS LCD via Chrontel CH7308 converter
  - LCD backlight control supported
  - 18Bits or 36Bits LVDS LCD interface

- **Ethernet**
  - Duel Ethernet

  - 1st via 32-bit PCI with co-layout Intel® 82551 QM 10/100M(Defaulted) or 82541PI 1000M (Optional) for Fast Ethernet (Support for Boot ROM)
  - 2nd via PHY or PCI-E with co-layout Intel® 82562 GZ 10/100M(Defaulted) for Fast Ethernet (No support for Boot ROM)
  - Equipped with RJ-45 interface
- **Audio**
  - Realtek ALC202A AC'97 codec audio
  - Amplification for speaker-out with 2.5W each channel
  - MIC-in, Line-out, Line-out/Speaker-out (jumper selectable)
- **Expansion Slots**
  - One 32-bit PCI104 connector for 3 Masters and 1 Slave expansion
- **Power Management**
  - **ACPI (Advanced Configuration and Power Interface)**
- **Form Factor:** EPIC form factor
- **Dimensions:** 115 x 165 mm

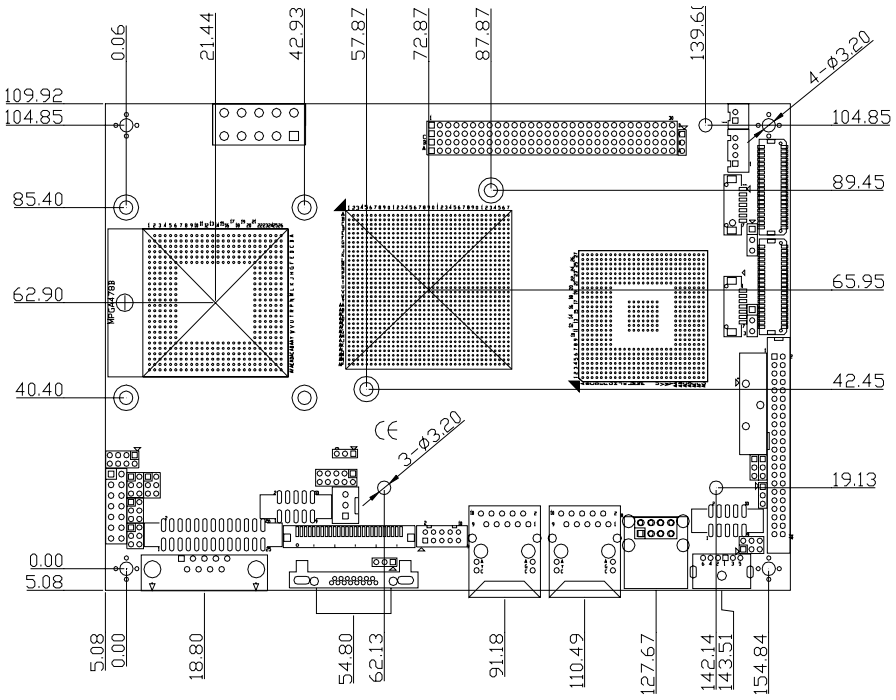
***NOTE**: All specifications and images are subject to change without notice.*

1.2 Utilities Supported

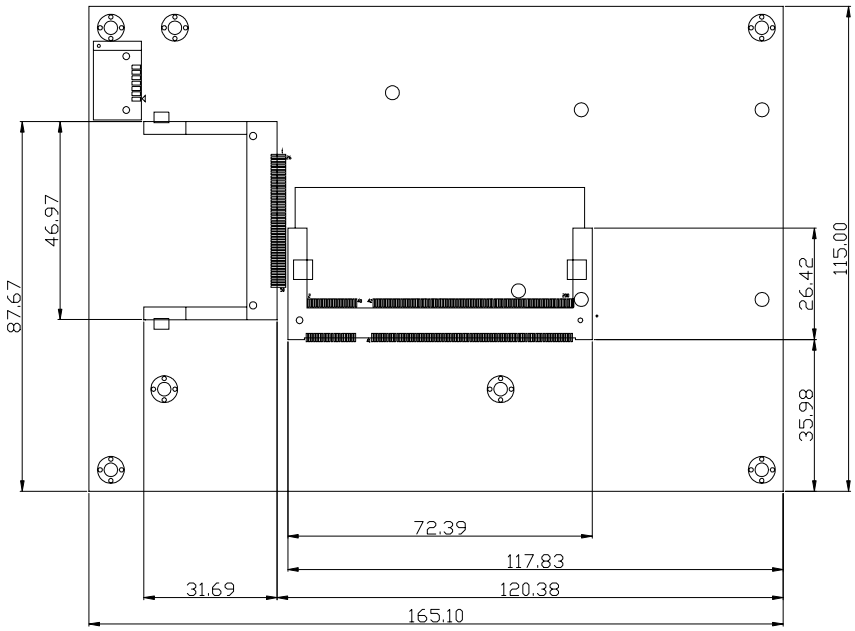
- Chipset Driver
- Ethernet Driver
- VGA Drivers
- Audio Drivers

Chapter 2
Jumpers and Connectors

2.1 Board Dimensions

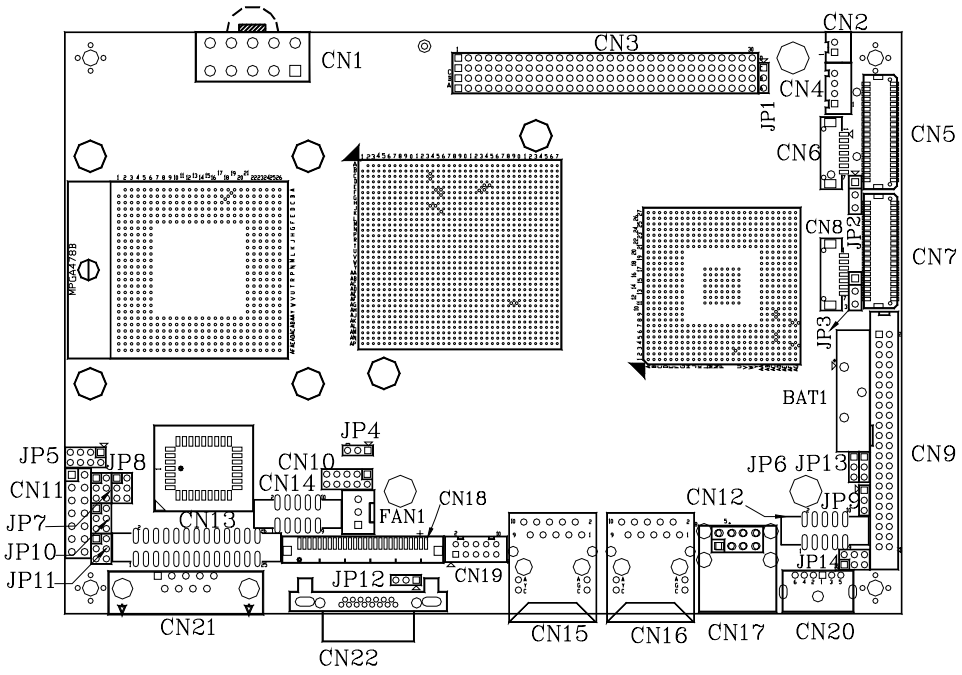


Component Side

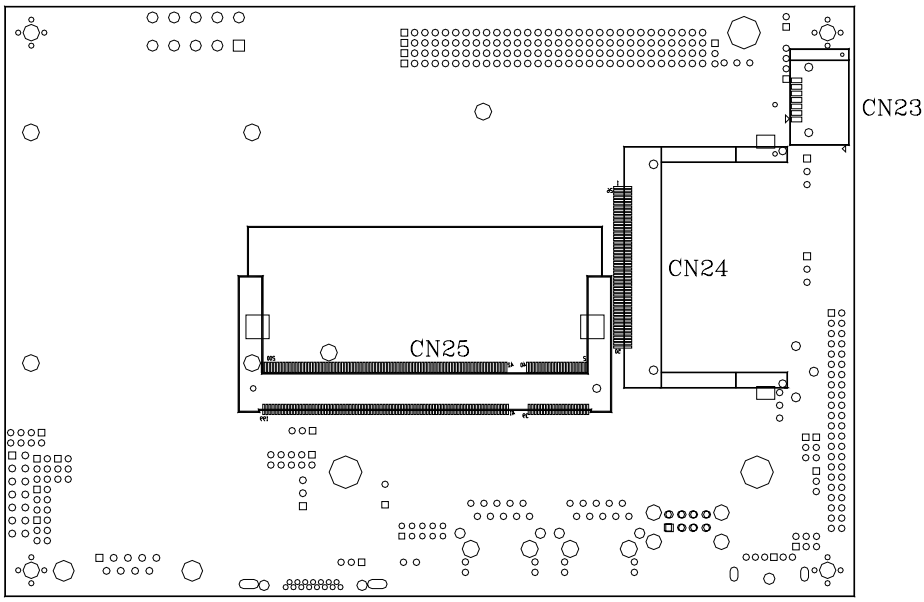


Solder Side

2.2 Board Layout and Fixing Holes



Component Side



Solder Side

2.3 Jumper Settings

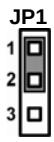
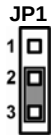
Proper jumer settings configure the **EP820** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

Here is a list of jumper settings：

Jumper	Default Setting		Jumper Setting
JP1	CPU Type Select : Dothan A		Short 1-2
JP2	LVDS1 Voltage select : 3.3V		Short 1-2
JP3	LVDS2 Voltage select : 3.3V		Short 1-2
JP4	CPU Voltage Select : Dothan (1.5V) **<Only Socket Version>**		Short 1-2
JP5	COM1 Mode Select: RS-232		Short 1-2
JP8	COM1 Mode Select: RS-232		Short 3-5, 4-6
JP11	COM1 Mode Select: RS-232		Short 3-5, 4-6
JP6	Compact Flash Power Select : 3.3V		Short 1-2
JP7	COM2 Mode Select	CN14 Pin 1: DCD	Short 3-5
		CN14 Pin 8: RI	Short 4-6
JP10	COM1 Mode Select	CN21 Pin 1: DCD	Short 3-5
		CN21 Pin 9: RI	Short 4-6
JP9	Compact Flash Select : Slave		Short 1-2
JP12	CPU Clock Select : Auto **<Only Socket Version>**		Short 1-2
JP13	Clear CMOS Setting : Normal		Short 1-2
JP14	Audio Line Out/Speaker Out: Line Out		Short 1-3, 2-4

2.3.1 CPU Type Select Jumper: JP1

Use this jumper to select the CPU type.

Description	Function	Jumper Setting
CPU Type Select	Dothan A (Default)	
	Dothan B/ Yonah	

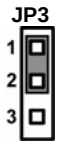
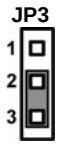
2.3.2 LVDS1 Voltage Selection Jumper: JP2

This jumper is to select the voltage for LVDS1 interface.

Description	Function	Jumper Setting
LVDS1 Voltage Select	3.3V (Default)	
	5V	

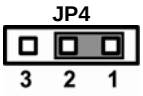
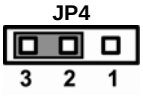
2.3.3 LVDS2 Voltage Selection Jumper: JP3

This jumper is to select the voltage for LVDS2 interface.

Description	Function	Jumper Setting
LVDS2 Voltage Select	3.3V (Default)	
	5V	

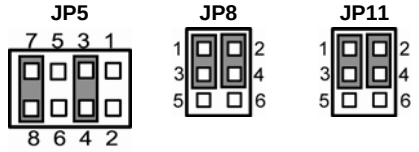
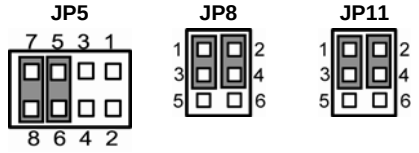
2.3.4 CPU Analog Voltage Select Jumper: JP4

Use this jumper to select the CPU analog voltage.

Description	Function	Jumper Setting
CPU Analog Voltage Select	Dothan(1.5V) (Default)	
	Banias(1.8V)	

2.3.5 COM1 Mode Select for RS-232/422/485 Jumpers: JP5, JP8, JP11

These jumpers select the COM1 port's communication mode to operate RS-232 or RS-422/485.

Description	Function	Jumper Setting
COM1	RS-232 (Default)	
	RS-422	
	RS-485	

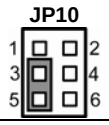
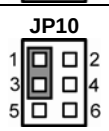
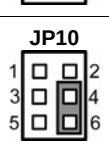
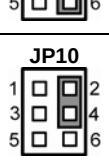
2.3.6 CompactFlash Power Selection Jumper: JP6

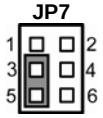
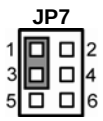
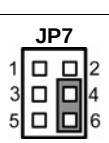
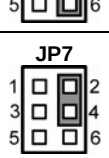
This jumper is to select the voltage for CompactFlash interface.

Description	Function	Jumper Setting
CompactFlash Power Selection	3.3V (Default)	
	5V	

2.3.7 COM1~2 Mode Selection Jumpers: JP10, JP7

These jumpers select the COM1 and COM2 ports' DCD and RI mode.

Description	Function	Jumper Setting
COM1 (JP10)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 9=RI (Default)	
	*Pin 9=+12V	

Description	Function	Jumper Setting
COM2 (JP7)	*Pin 1=DCD (Default)	
	*Pin 1=5V	
	*Pin 8=RI (Default)	
	*Pin 8=+12V	

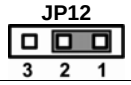
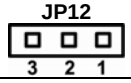
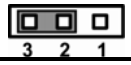
2.3.8 CompactFlash Selection Jumper: JP9

Use this jumper to set Master/Slave CompactFlash interface.

Description	Function	Jumper Setting
CompactFlash Selection	Slave (Default)	
	Master	

2.3.9 CPU Clock Select Jumper: JP12

This jumper helps you set the CPU colck.

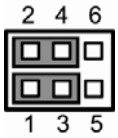
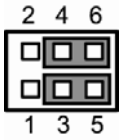
Description	Function	Jumper Setting
CPU Clock Select	Auto (Default)	
	100 MHz	
	133 MHz	

2.3.10 CMOS Clear Jumper: JP13

You may need to use this jumper is to clear the CMOS memory if incorrect settings in the Setup Utility.

Description	Function	Jumper Setting
CMOS Clear	Normal (Default)	JP13 
	Clear CMOS	JP13 

2.3.11 Audio Output Selection Jumper: JP14

Description	Function	Jumper Setting
Audio Output Selection	Line Out (Default)	JP14 
	Speak Out	JP14 

2.4 Connectors

Connectors connect the CPU card with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected.

Here is a summary table shows you all connectors on the **EP820 Series**.

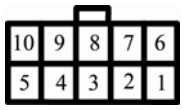
Connectors	Label
ATX Power Connector	CN1
Audio Connector	CN12
CPU FAN Connector	FAN1
Compact Flash Connector	CN24
Digital I/O Connector	CN10
DDRII SO-DIMM	CN25
Front Panel Bezel Connector	CN11
FDD Connector(Optional)	CN18
LAN1 Connector	CN16
LAN2 Connector	CN15
LVDS1 Connector	CN5
LVDS1 Voltage Connector	CN6
LVDS2 Connector	CN7
LVDS2 Voltage Connector	CN8
Printer Port Connector	CN13
PCI-104 SLOT	CN3
Parallel IDE Connector	CN9
SATA Connector	CN23
Serial Port1 Connector	CN21
Serial Port2 Connector	CN14
TV-OUT S-Video Connector	CN4
TV-OUT Component Connector	CN2
USB Port0 & Port1 Connector	CN17
USB Port2 & Port3 Connector	CN19
VGA Connector	CN22
6-Pin Mini Dim Keyboard/ Mouse Connector	CN20

2.4.1 ATX Power Connector: CN1

Steady and sufficient power can be supplied to all components on the board through the power connector. Please make sure all components and devices are properly installed before connecting the power connector.

Pin	Description	Pin	Description
1	PS_ON	2	GND
3	GND	4	12V
5	---	6	5VSB
7	5V	8	5V
9	-12V	10	GND

CN1

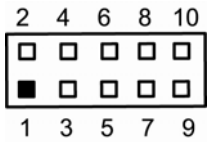


2.4.2 Audio Connector: CN12

CN12 is a 10-pin connector to support the audio interface.

Pin	Description	Pin	Description
1	MIC-IN	2	GND
3	Line In L	4	GND
5	Line In R	6	GND
7	Audio Out L	8	GND
9	Audio Out R	10	GND

CN12

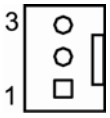


2.4.3 CPU Fan Connector: FAN1

A CPU fan is always needed for cooling CPU heat. **FAN1** is a fan connector for CPU and system that provides power to the CPU fan.

Pin	Description
1	Ground
2	+12V
3	Sensor

FAN1

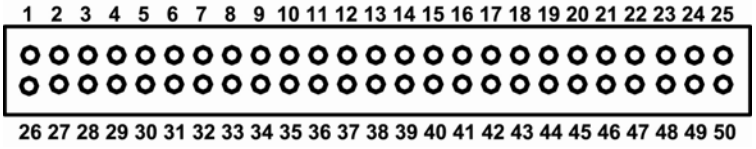


2.4.4 CompactFlash™ Socket: CN24

The board is equipped with a CompactFlashTM disk type-II socket on the solder side to support an IDE interface CompactFlashTM disk card with DMA mode supported. The socket is especially designed to avoid incorrect installation of the CompactFlashTM disk card. When installing or removing the CompactFlashTM disk card, please make sure the system power is off. The CompactFlashTM disk card is defaulted as the C: or D: disk drive in your PC system.

Pin	Description	Pin	Description
1	GND	26	CD1-
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	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC
14	Address 6	39	CSEL#
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY#
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10
25	CD2#	50	GND

CNS2

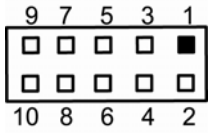


2.4.5 Digital I/O Port (DIO) Connector: CN10

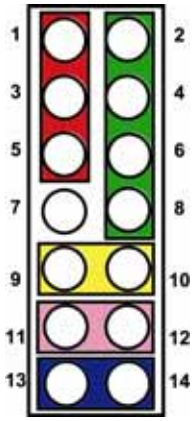
The board is equipped an 8-channel digital I/O connector **CN10** that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers, sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. The digital I/O is controlled via software programming.

Pin	Description	Pin	Description
1	Digital Input 1	2	Digital Output 1
3	Digital Input 2	4	Digital Output 2
5	Digital Input 3	6	Digital Output 3
7	Digital Input 4	8	Digital Output 4
9	GND	10	GND

CN10



2.4.6 Flat Panel Bezel Connector: CN11



- **Power LED**

This 3-pin connector named as Pin 1 and Pin 5 connect the system power LED indicator to such a switch on the case. Pin 1 is assigned as +, and Pin 5 as -. The Power LED lights up when the system is powered ON.

- **External Speaker and Internal Buzzer Connector**

Pin 2, 4, 6 and 8 can be connected to the case-mounted speaker unit or internal buzzer. While connecting the CPU card to an internal buzzer, please short pins 2-4; while connecting to an external speaker, you need to set pins 2-4 to Open and connect the speaker cable to pin 8 (+) and pin 2 (-).

- **ATX Power On/Off Button**

This 2-pin connector named as Pin 9 and 10 connect the front panel's ATX power button to the CPU card, which allows users to control ATX power supply to be power on/off.

- **System Reset Switch**

Pin 11 and 12 can be connected to the case-mounted reset switch that reboots your computer, not turns OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

- **HDD Activity LED**

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, Pin 13 assigned as -, and Pin 14 as +.

2.4.7 Floppy Disk Controller (Optional): CN18

The **EP820 Series** provides a 26-pin FCC Z.I.F. type connector **CN18** for support of floppy drives. The supported types of FDD drives are 3.5" 720KB or 1.44MB/2.88MB.

Please refer to next page for the pin assignment table.

CN18: FDD Connector Pin Assignment

Pin	Description	Pin	Description
1	+5V	14	STEP
2	INDEX	15	GND
3	+5V	16	WDATA
4	DRIVE0	17	GND
5	+5V	18	WGATE
6	DSKCHG	19	GND
7	No connector	20	TRK0
8	READY	21	GND
9	HDOUT	22	WPT
10	MOTOR ON	23	GND
11	No connector	24	RDATA
12	DIR	25	GND
13	HDSEL	26	SIDE0

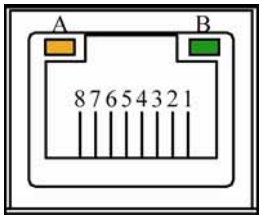
2.4.8 Ethernet RJ-45 Connector: CN15, CN16

The board is equipped with a RJ-45 Ethernet connector. To connect the board to a 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **CN15** and **CN16** connectors, and connect the other end (phone jack) to a 10-Base-T hub or 100-Base-T or 1000-Base-T hub.

CN15/CN16: RJ-45 connector Pin Assignment

Pin	Signal
1	TX+ (Data transmission positive)
2	TX- (Data transmission negative)
3	Rx+(Data reception positive)
4	RJ45 termination
5	RJ45 termination
6	Rx- (Data reception negative)
7	RJ45 termination
8	RJ45 termination
A	Active LED
B	100/1000 LAN LED

CN15/CN16

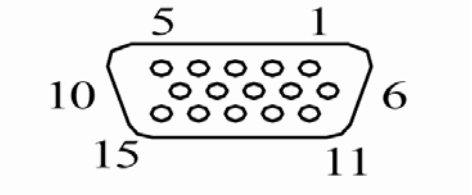


2.4.9 VGA/Flat Panel Connectors: CN22, CN5, CN6, CN7, CN8

The board has one 15-pin D-Sub connector **CN22** to support CRT/VGA display. **CN5** and **CN7** are JST SHDR-40V-S-B 40-pin connectors for LVDS Interface LCD, and **CN6** and **CN8** DF13-7S-1.25C 7 pin inverter connectors for LCD that supports the system LCD backlight control with OS and driver independent.

CN22: 15-pin CRT/VGA Connector

Pin	Description	Pin	Description	Pin	Description
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	AGND
7	AGND	8	AGND	9	N/A
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

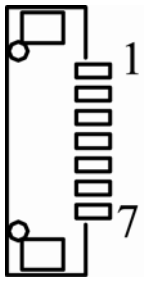


CN6/CN8: DF13-7S-1.25C 7 pin Connectors for Inverter

It is strongly recommended to use the DF13-7S-1.25C 7-pin connector for inverter on the board.

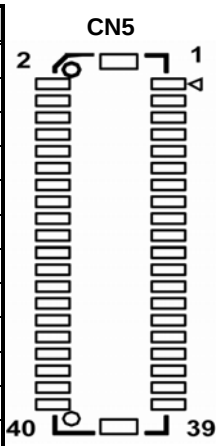
Pin	Description
1	12VM
2	12VM
3	5V
4	ENAB
5	GND
6	GND
7	GND

CN6/CN8



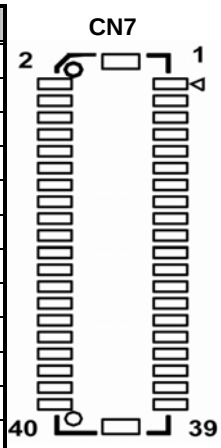
CN5: JSTConnector for LVDS Flat Panel

Pin	Description	Pin	Description
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	N.C.	12	Channel B D0-
13	N.C.	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	N.C.
31	Channel A D1+	32	N.C.
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND
1	VCCM	2	VCCM
3	VCCM	4	VCCM



CN7: JSTConnector for LVDS Flat Panel

Pin	Description	Pin	Description
1	VCCM	2	VCCM
3	VCCM	4	VCCM
5	VCCM	6	VCCM
7	N.C.	8	N.C.
9	GND	10	GND
11	Channel B D3-	12	Channel B D0-
13	Channel B D3+	14	Channel B D0+
15	GND	16	GND
17	Channel B CLK-	18	Channel B D1-
19	Channel B CLK+	20	Channel B D1+
21	GND	22	GND
23	Channel A D0-	24	Channel B D2-
25	Channel A D0+	26	Channel B D2+
27	GND	28	GND
29	Channel A D1-	30	Channel A D3-
31	Channel A D1+	32	Channel A D3+
33	GND	34	GND
35	Channel A D2-	36	Channel A CLK-
37	Channel A D2+	38	Channel A CLK+
39	GND	40	GND
1	VCCM	2	VCCM
3	VCCM	4	VCCM



2.4.10 Parallel Port or Floppy Connector: CN13

The board has a 26-pin header connector **CN13** to support one onboard port. The onboard PRN of the board is a multi-mode parallel port that supports the following modes:

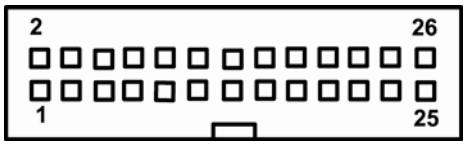
1. **Standard mode:**
   IBM PC/XT, PC/AT and PS/2™ compatible with bi-directional parallel port
2. **Enhanced mode:**
   Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)

3. **High speed mode:**
   Microsoft and Hewlett Packard extended capabilities port (ECP)
   IEEE 1284 compliant

The address selection of the onboard parallel port, LPT1 (378H) or disabled, can be configured within the BIOS CMOS setup utility.

Pin	Description	Pin	Description
1	Auto Form Feed#	2	Strobe#
3	Error#	4	Data 0
5	Initialize#	6	Data 1
7	Printer Select In#	8	Data 2
9	GND	10	Data 3
11	GND	12	Data 4
13	GND	14	Data 5
15	GND	16	Data 6
17	GND	18	Data 7
19	GND	20	Acknowledge#
21	GND	22	Busy
23	GND	24	Paper Empty#
25	NC	26	Printer Select

CN13



2.4.11 PCI 104 Connector: CN3

CN3: PCI104 Plus connector

Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name	Pin#	Pin Name
A1	N.C	B1	Reserved	C1	+5V	D1	AD0
A2	N.C	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	C/BE0#	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	N.C	C6	AD10	D6	M66EN
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	C/BE1#	C8	AD15	D8	+3.3V
A9	SERR#	B9	GND	C9	SB0#	D9	PAR
A10	GND	B10	PERR#	C10	+3.3V	D10	SDONE
A11	STOP*	B11	+3.3V	C11	LOCK#	D11	GND
A12	+3.3V	B12	TRDY#	C12	GND	D12	DEVSEL#
A13	FRAME#	B13	GND	C13	IRDY#	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	C/BE2#
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	C/BE3#	C19	N.C.	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0#	B23	GND	C23	REQ1#	D23	N.C.
A24	GND	B24	REQ2#	C24	+5V	D24	GNT0#
A25	GNT1#	B25	N.C	C25	GNT2#	D25	GND
A26	+5V	B26	CLK0	C26	GND	D26	CLK1
A27	CLK2	B27	+5V	C27	CLK3	D27	GND
A28	GND	B28	INTD#	C28	+5V	D28	RST#
A29	+12V	B29	INTA#	C29	INTB#	D29	INTC#
A30	-12V	B30	Reserved	C30	Reserved	D30	GND

-- The End of PCI 104 Plus Connector (CN3) Pin Assignment Table --

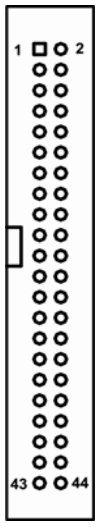
2.4.12 IDE Interface Connectors: CN9, CN23

The built-in 2 channels of IDE (1 parallel ATA-100 and 1 serial ATA-150) support up to 3 IDE devices. **CN9** is a 44-pin IDE interface connector for standard 2.5" IDE device. **CN23** and is the serial ATA-150 IDE interfaces currently support the hard disk drives.

CN9: 44-pin IDE interface connector

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 15
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND	41	Vcc	42	Vcc
43	GND	44	No connector		

CN9



CN23: 7-pin SATA connector

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

2.4.13 Serial Port Interface Connectors: CN21 (COM1), CN14 (COM2)

The board has two onboard serial ports COM1 RS-232/422/485 and COM2 RS-232 that can be jumper selectable with auto flow control features. All ports are capable of +5V/12V power on DCD and RI, depending on the jumper setting.

Serial Ports IRQ Selection

IRQ4 or IRQ3 are selected for IRQ of COM1 and COM2, both which can be enabled or disabled via BIOS setting.

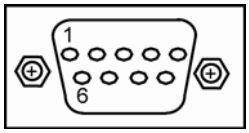
Serial Ports Power Selection

The two COM ports are capable of +5V power on DCD and of +12V power for RI, depending on the jumper setting. The RS-232 pin assignments are listed on the following table.

COM1 Port Connector Pin Assignment: CN21

Pin	Description
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

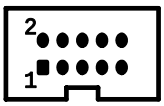
CN21



COM2 Port Connector Pin Assignments: CN14

Pin	Description	Pin	Description
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	NC

CN14



The RS-422/485 Pin Assignments for COM1 are listed below:

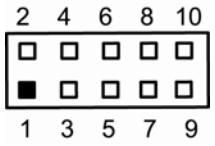
Pin #	Signal Name	
	R2-422	RS-485
1	TX-	DATA-
2	TX+	DATA+
3	RX+	No connector
4	RX-	No connector
5	GND	GND
6	No connector	No connector
7	No connector	No connector
8	No connector	No connector
9	No connector	No connector

2.4.14 USB Connectors: CN17, CN19

The board features four Universal Serial Bus (USB) connectors, USB 2.0 compliant (480Mbps), can be adapted to various USB peripherals, such as monitor, keyboard and mouse. There are one double deck USB connector **CN17** and one box-header connector **CN19**.

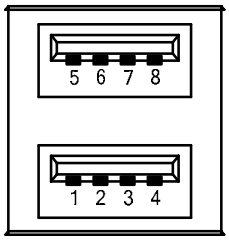
Pin	Description	Pin	Description
1	VCC	2	VCC
3	D0-	4	D1-
5	D0+	6	D1+
7	Ground (GND)	8	Ground (GND)
9	Ground (GND)	10	Ground (GND)

CN19



Pin	Description
1, 5	USB Vcc
2, 6	USB -
3, 7	USB +
4, 8	USB GND

CN17

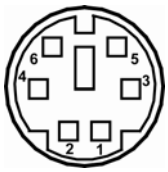


2.4.15 Keyboard and PS/2 Mouse Connector: CN20

The board provides a keyboard and Mouse interface. **CN20** is a DIM connector for PS/2 keyboard Connection VIA "Y" Cable.

Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	VCC
5	Keyboard Clock
6	Mouse Clock

CN20



Chapter 3
Hardware Description

3.1 Microprocessors

The **EP820 Series** supports Socket 478 for Intel® Pentium® M/Celeron® M processors at FSB400/533MHz, which make your system operated under Windows® 2000/XP and Linux environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

3.2 BIOS

The **EP820 Series** uses Award Plug and Play BIOS with a single 4Mbit Flash EPROM.

3.3 System Memory

The **EP820 Series** industrial CPU card supports one 200-pin DDR2 SODIMM socket for a maximum memory of 1GB DDR SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB and 1GB.

3.4 I/O Port Address Map

The Intel® Pentium® M/Celeron® M CPUs can communicate via I/O ports. There are total 1KB port addresses available for assignment to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-043	Timer
044-05F	Mother Board Resource
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0C0-0DF	DMA controller #2
0F0	Clear math coprocessor busy signal
0F1	Reset math coprocessor
0F8-0FF	Math processor
170-177	Secondary IDE Channel
1F0-1F7	Primary IDE Channe
2F8-2FF	Serial port #2 (COM2)
378-37F	Parallel Port #1 (LPT1)
3F0-3F5	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)

3.5 Interrupt Controller

The **EP820 Series** is a 100% PC compatible control board. It consists of 24 interrupt request lines. Four out of sixteen nterrupt request lines are programmable. The mapping list of these 16 interrupt request lines is shown as the following table.

NMI	Parity check error
IRQ0	System timer output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	Intel 82801FB/FBM SMBus Controller
IRQ6	Floppy disk controller
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Microsoft ACPI-Compliant System
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE Channel
IRQ16	Intel 82801FB/FBM USB UHC
IRQ16	Mobile Intel 915GM Express Chipset Family
IRQ17	Realtek AC97 Audio
IRQ18	Intel 82801FB/FBM USB UHC
IRQ19	Intel 82801FB/FBM USB UHC
IRQ20	Intel PRO/100 VE Network Connection
IRQ21	Intel PRO/100 M Network Connection
IRQ23	Intel 82801FB/FBM USB UHC
IRQ23	Intel 82801FB/FBM USB EHC

MEMO

Chapter 4
Award BIOS Utility

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the Setup information whenever the power is turned off.

4.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

4.2 Control Keys

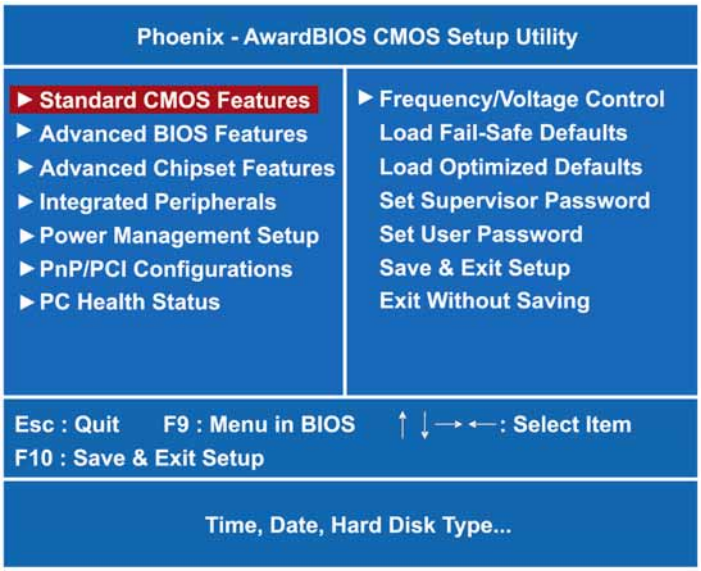
Up arrow	Move cursor to the previous item
Down arrow	Move cursor to the next item
Left arrow	Move cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+" key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Getting Help

- **Main Menu**
  The online description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop out a small Help window that provides the description of using appropriate keys and possible selections for highlighted items. Press <F1> or <Esc> to exit the Help Window.

4.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.

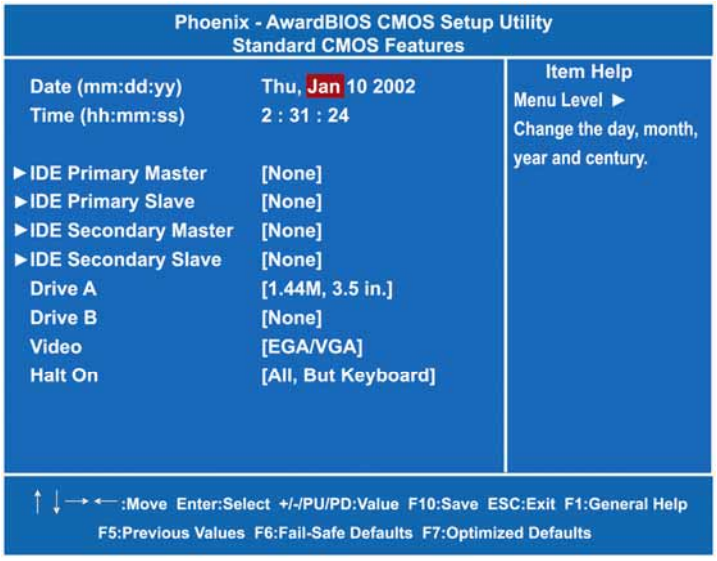


NOTE: *If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.5 Standard CMOS Setup Menu

The Standard CMOS Setup Menu displays basic information about your system. Use arrow keys to highlight each item, and use <PgUp> or <PgDn> key to select the value you want in each item.



- **Date**
  The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	It is determined by the BIOS and read only, from Sunday to Saturday.
date	It can be keyed with the numerical/ function key, from 1 to 31.
month	It is from January to December.
year	It shows the current year of BIOS.

- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- **IDE Primary Master/IDE Primary Slave/IDE Secondary Master/IDE Secondary Slave**
  These items identify the types of each IDE channel installed in the computer. There are 45 predefined types (Type 1 to Type 45) and 2 user's definable types (Type User) for Enhanced IDE BIOS. Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type, or directly type the number and press <Enter>. Please be noted your drive's specifications must match the drive table. The hard disk will not work properly if you enter improper information. If your hard disk drive type does not match or is not listed, you can use Type User to manually define your own drive type.
  If selecting Type User, you will be asked to enter related information in the following items. Directly key in the information and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.
  oIf the HDD interface controller supports ESDI, select "Type 1".
  If the HDD interface controller supports SCSI, select "None".
  If the HDD interface controller supports CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

If there is no hard disk drive installed, select NONE and press <Enter>.

- **Dive A type/Drive B type**
  The item identifies the types of floppy disk installed in the computer, as drive A or drive B.

None	No floppy drive installed
360K, 3.5 in	3.5 inch PC-type standard drive; 360Kb Mini ITXcity
1.2M, 3.5 in	3.5 inch AT-type high-density drive; 1.2MB Mini ITXcity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb Mini ITXcity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB Mini ITXcity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB Mini ITXcity

- **Video**
  Select the display adapter type for your system.

- **Halt On**

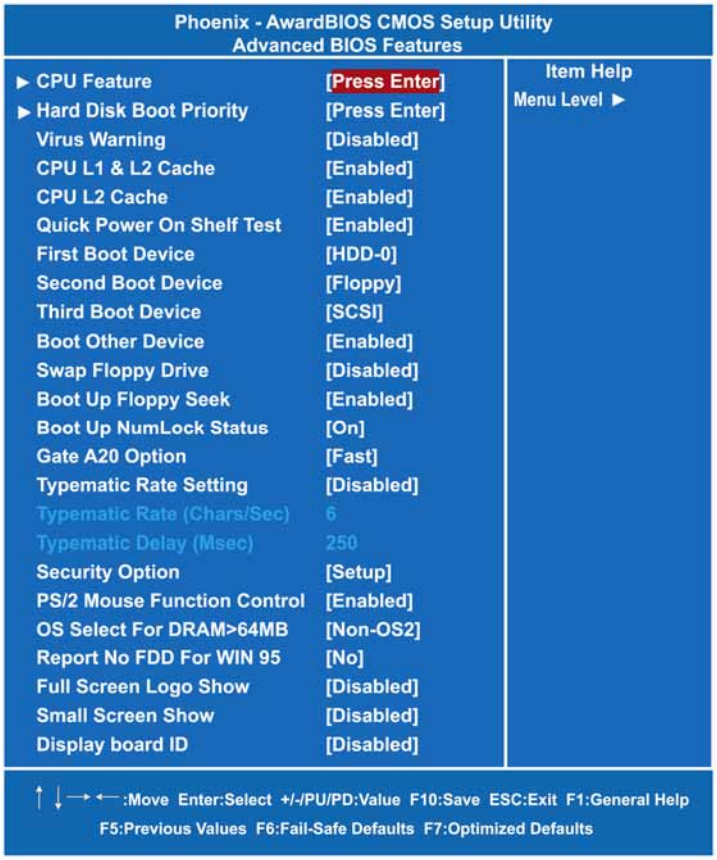
This item determines whether the system will halt or not, if an error is detected while powering up.

No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.
All, But Diskette	The system booting will not stop for a disk error; it will stop for other errors.
All, But Disk/Key	The system booting will not stop for a keyboard or disk error; it will stop for other errors.

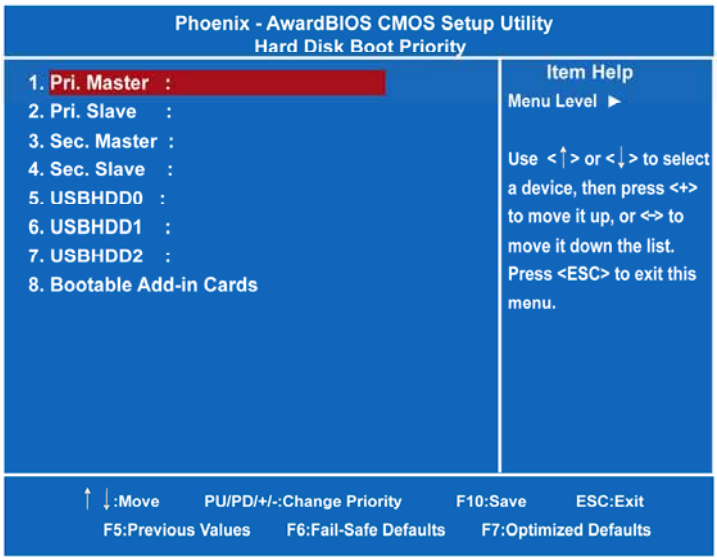
Press <Esc> to return to the Main Menu page.

4.6 Advanced BIOS Features

This section allows you to configure and improve your system, to set up some system features according to your preference.



- **Hard Disk Boot Priority**
  Scroll to this item and press <Enter> to view the sub menu to decide the disk boot priority.



Press <Esc> to return to the Advanced BIOS Features page.

- **Virus Warning**
  This option flashes on the screen. During and after the system boot up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system with the following message. You can run an anti-virus program to locate the problem. The default setting is "Disabled".

> ***! WARNING !***
> *Disk boot sector is to be modified*
> *Type "Y" to accept write or "N" to abort write*
> *Award Software, Inc.*

Enabled	It automatically activates while the system boots up and a warning message appears for an attempt to access the boot sector or hard disk partition table.
Disabled	No warning message will appear for attempts to access the boot sector or hard disk partition table.

***NOTE**: This function is only available with DOS and other operating systems that do not trap INT13.*

- **CPU L1 & L2 Cache**
  These two options speed up memory access. However, it depends on the CPU/chipset design. The default setting is "Enabled". CPUs without built-in internal cache will not provide the "CPU Internal Cache" item on the menu.

Enabled	Enable cache
Disabled	Disable cache

- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is "Enabled".

Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.

- **Boot Other Device**
  This item allows users to enable or disable the boot device not listed in the First/Second/Third boot devices option above. The default setting is "Enabled".

- **Swap Floppy Drive**
  This item allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swap floppy drive assignment makes Drive A become Drive B, and vice versa. The

default setting is "Disabled".

- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks. The 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is "Enabled".

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Please be noted BIOS can not differentiate 720K, 1.2M or 1.44M drive type as they all are 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the installed drive is 360K.

- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is "On".

- **Gate A20 Option**
  The default value is "Fast".

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate Setting**
  This item determines the typematic rate of the keyboard. The default value is "Disabled".

Enabled	Enable typematic rate and typematic delay programming.
Disabled	Disable typematic rate and typematic delay programming. The system BIOS will use default value of these 2 items, controlled by keyboard.

- **Typematic Rate (Chars/Sec)**
  This option refers to character numbers typed per second by the keyboard. The default value is "6".

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second

15	15 characters per second
20	20 characters per second
24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option defines how many milliseconds must elapse before a held-down key begins generating repeat characters. The default value is "250".

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is "Setup".

System	If a wrong password is entered at the prompt, the system will not boot, the access to Setup will be denied, either.
Setup	If a wrong password is entered at the prompt, the system will boot, but the access to Setup will be denied.

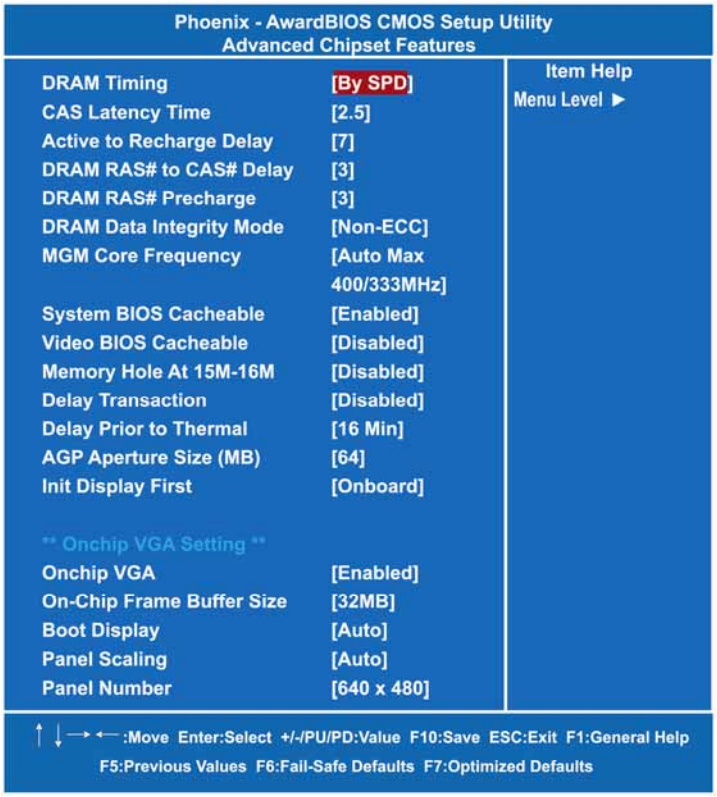
NOTE: *To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **PS/2 Mouse Function Control**
  Use this item to set the use of PS/2 mouse or not. If there is a PS/2 mouse connected to your system, please enable this item.
- **OS Select For DRAM > 64MB**
  This item allows you to access the memory over 64MB in OS/2.
- **Report No FDD For WIN 95**
  Select Yes to release an IRQ when the system doesn't have any floppy drive, for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen, select Disabled for the Onboard FDC Controller field.

Press <Esc> to return to the Main Menu page.

4.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.



- **DRAM Timing**
  Use this item to enable or disable the SDRAM timing, which can be defined by Serial Presence Detect.
- **DRAM RAS# to CAS# Delay**
  When DRAM is refreshed, both rows and columns are addressed separately. This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed.

- **DRAM RAS# Precharge**
  The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the DRAM may fail to retain data.

- **DRAM Data Integrity Mode**
  Use this item to set data integrity mode of the DRAM installed in the system. The default setting is "Non-ECC".

- **MGM Core Frequency**
  Use this item to set the clock ratio of CPU and system.

- **System BIOS Cacheable**
  Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. The default value is "Disabled".

- **Video BIOS Cacheable**
  This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

- **Memory Hole At 15M-16M**
  You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

- **Delayed Transaction**
  The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select "Enabled" to support PCI specification version 2.1. The options available are "Enabled" and "Disabled".

- **AGP Aperture Size (MB)**
  Use this item to set aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The options available are "4M"," 8M", "16M", "32M", "64M", "128M" and "256M".

- **Init Display First**
  This item allows you to decide whether PCI Slot or AGP to be the

first primary display card.

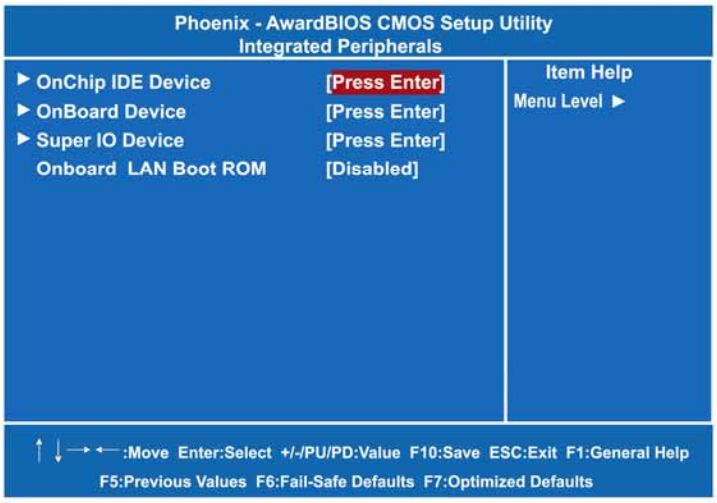
***** VGA Setting *****

- **Onchip VGA**
  Use this item to choose the primary display card.
- **On-Chip Frame Buffer Size**
  Use this item to set the VGA frame buffer size.
- **Boot Display**
  This item is for Intel define ADD card only.

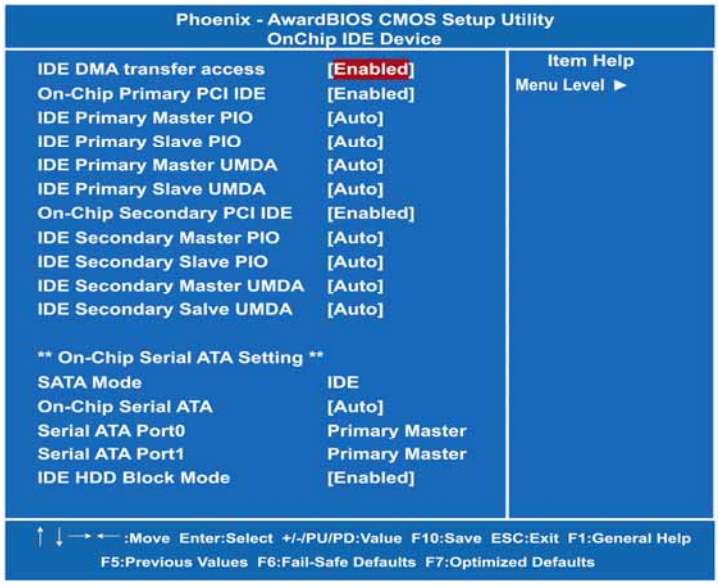
Press <Esc> to return to the Main Menu page.

4.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.



- **OnChip IDE Device**
  Scroll to this item and press <Enter> to view the sub menu OnChip IDE Device.



- **IDE DMA transfer access**
  Automatic data transfer between system memory and IDE device with minimum CPU intervention. This improves data throughput and frees CPU to perform other tasks.
- **On-Chip Primary/Secondary PCI IDE**
  The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately. The default value is *"Enabled"*.

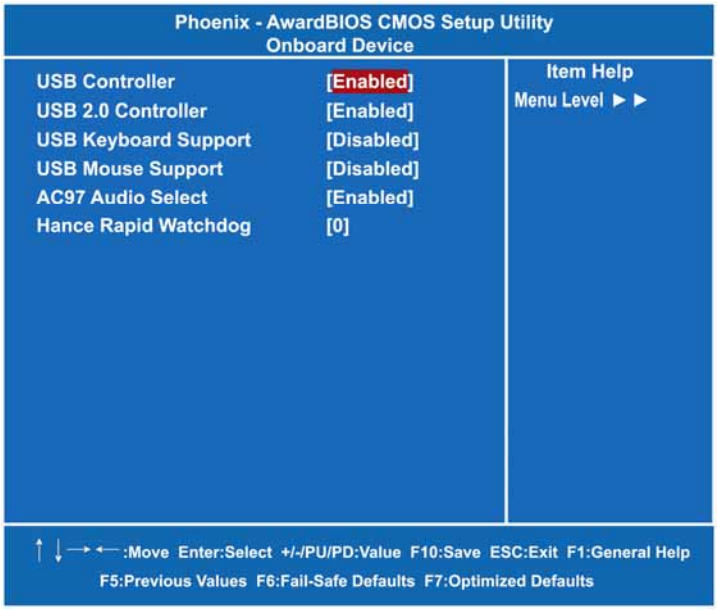
  
  ***NOTE**: Choosing Disabled for these options will automatically remove the IDE Primary Master/ Slave PIO and/or IDE Secondary Master/Slave PIO items on the menu.*
- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 to 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
- **IDE Primary/Secondary Master/Slave UDMA**
  Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.

***** On-Chip Serial ATA Setting *****

- **SATA Mode**
  There are these options for you to set up SATA mode: IDE, RAID or AHCI.
- **On-Chip Serial ATA**
  Use this item to enable or disable the built-in on-chip serial ATA.
- **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.

Press <Esc> to return to the Integrated Peripherals page.

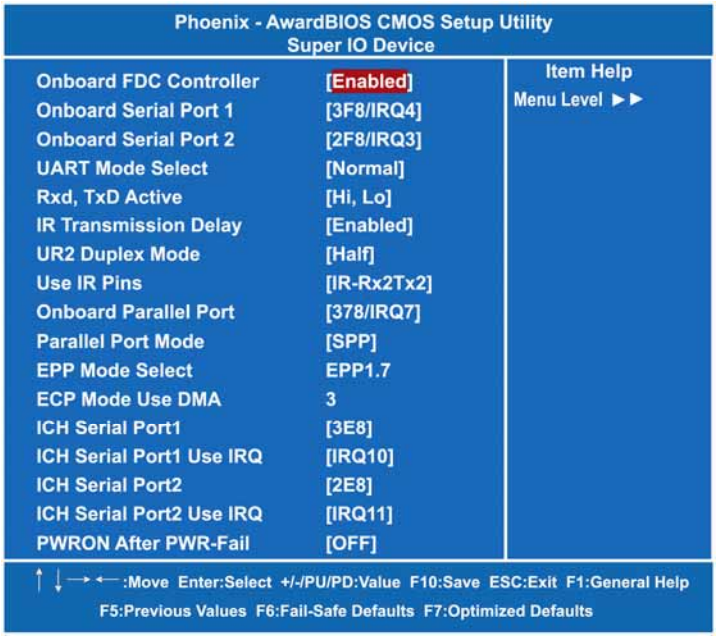
- **Onboard Device**
  Scroll to this item and press <Enter> to view the sub menu Onboard Device.



  - **USB Controller**
    Enable this item if you are using the USB in the system. You should disable this item if a higher-level controller is added.
  - **USB 2.0 Controller**
    Enable this item if you are using the EHCI (USB2.0) controller in the system.
  - **USB Keyboard Support**
    Enable this item if the system has a Universal Serial Bus (USB) controller, and you have a USB keyboard.
  - **USB Mouse Support**
    Enable this item to boot the hard drive by a USB mouse.
  - **AC'97 Audio Select**
    Use this item to enable or disable the onboard AC'97 Audio function.

Press <Esc> to return to the Integrated Peripherals page.

- **Super IO Device**
  Scroll to this item and press <Enter> to view the sub menu Super IO Device.



  - **Onboard FDC Controller**
    Select Enabled, if your system has a floppy disk controller (FDC) installed on the system board and you want to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Options: *Enabled* and *Disabled*.
  - **Onboard Serial Port 1/2**
    Select an address and corresponding interrupt for the serial port. Options: *3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ10, 2E8/IRQ11, 338/IRQ5, 238/IRQ7, Auto* and *Disabled*.
  - **URAT Mode Select**
    When UART Mode Select is set as ASKIR or IrDA, the options RxD, TxD Active and IR Transmittion delay will appear.
  - **URAT 2 Mode**
    Use this item to select UART Mode.
  - **RxD, TxD Active**

When the IR transmission is enabled, you can set up speeds of reception (RxD) and transmission (TxD).

- **IR Transmission Delay**
  Enable or disable this item to decide if the IR transmission delay function will be set or not while transferring to the reception mode.
- **UAR2 Duplex Mode**
  The second serial port offers these infrared interface modes:
  1. IrDA
  2. ASKIR IrDA-compliant serial infrared port
  3. Normalo (default value)

NOTE: *The UART Mode Select will not appear on the menu once you disable the setting of Onboard Serial Port 2.*

- **Use IR Pins**
  Use this item to set up IR devices based on the IR pin definitions.
- **Onboard Paralellel Port**
  This item allows you to determine the I/O address for onboard parallel port. Options: *378/IRQ7, 278/IRQ5, 3BC/IRQ7* and *Disabled*.
- **Parallel Port Mode**
  Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field.
- **EPP Mode Select**
  Select EPP port type 1.7 or 1.9.
- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port while using the ECP mode.
- **PWRON After PWR-Fail**
  This item enables your computer to automatically restart or return to its operating status.

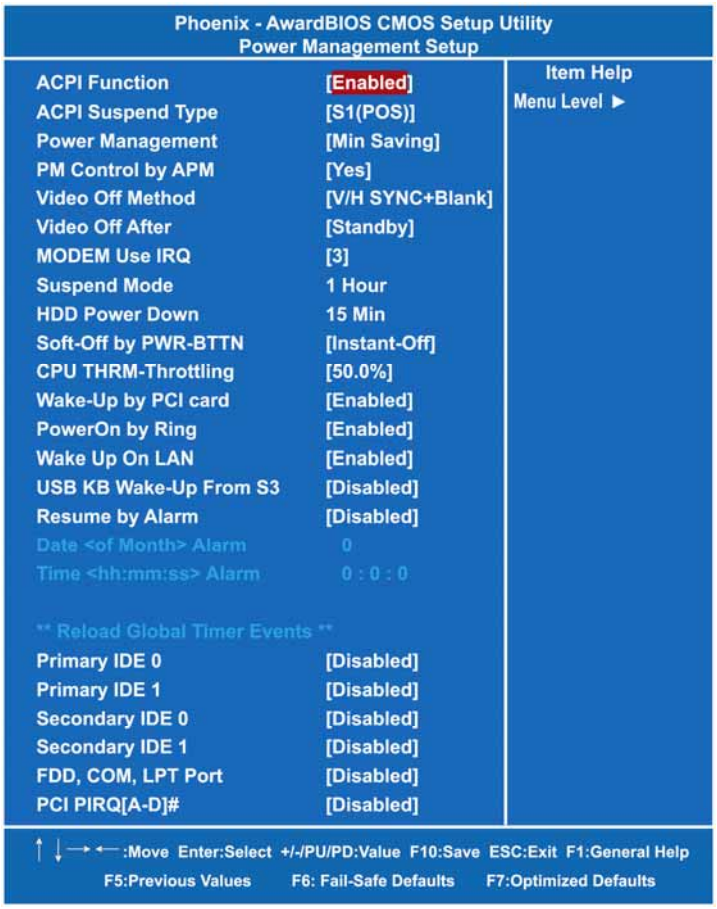
Press <Esc> to return to the Integrated Peripherals page.

- **Onboard Lan Boot ROM**
  Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

Press <Esc> to return to the Main Menu page.

4.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.



- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always "Enabled".
- **ACPI Suspend Type**

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 98SE, Windows ME and Windows 2000, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

[S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

- **Power Management**
  This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. The table below describes each power management mode:

Max Saving	It is maximum power savings, only available for SL CPUs. The inactivity period is 1 minute in each mode.
User Define	It sets each mode. Select time-out periods in the PM Timers section.
Min Saving	It is minimum power savings. The inactivity period is 1 hour in each mode (except the hard drive).
Disabled	Default value

- **PM Control by APM**
  If Advanced Power Management (APM) is installed in your system, the selection of *Yes* will give better power savings. The default value is "*Yes*".

No	System BIOS will ignore APM when power is managing the system
Yes	The System BIOS will wait for APM's prompt before it enters any PM mode (i.e., DOZE, STANDBY or SUSPEND). ***Note**: If APM is installed or there is a task running, even when the timer has timed out, the APM will not prompt the BIOS to put the system into any power saving mode!*

 ***NOTE**: If APM is not installed, this option doesn't work.*

- **Video Off Method**
  This setting determines the manner in which the monitor is blanked.

V/H SYNC+Blank	It turns OFF vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the supplied software for your video subsystem to select video power management values.
Blank Screen	The System only writes blanks to the video buffer.

- **Video Off After**
  As the system changes from lesser to greater power-saving mode, select the mode in which you want the monitor to blank off. The default value is "*Standby*".

NA	The System BIOS will never turn off the screen.
Suspend	The screen will be off when the system is in SUSPEND mode.
Standby	The screen will be off when the system is in STANDBY mode.
Doze	The screen will be off when the system is in DOZE mode.

***NOTE**: Green monitoring detects the V/H SYNC signals to turn off its electron gun.*

- **Moden Use IRQ**
  If you want an incoming call on a modem to automatically resume the system from a powersaving mode, use this item to specify the interrupt request line (IRQ) used by the modem. You might have to connect the fax/modem to the board Wake On Modem connector for working this feature.

- **Suspend Mode**
  After a selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	The System will never enter the SUSPEND mode.

1/2/4/6/8/10/20/30/40 Min/1 Hr	It defines continuous idle time before the system entering the SUSPEND mode. If any item defined in (J) is enabled and active, the SUSPEND timer will be reloaded.

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.
- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows users to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

Instant-Off	This option follows the conventional manner of system performance when turning the power to OFF. Instant-Off is a software power OFF sequence requiring the power supply button is switched to OFF.
Delay 4 Sec.	Upon the system's turning OFF through the power switch, this option will delay the complete system power OFF sequence approximately 4 seconds. Within this delay period, the system will temporarily enter into the Suspend Mode enabling you to restart the system at once.

- **CPU THRM-Throttling**
  This item allows you to set up the CPU thermal throttling rate that you can reduce the CPU speed when it reaches the preset highest temperature.
- **Wake-Up by PCI card**
  If enable this item, the system can automatically resume when the PCI Modem or PCI LAN card receives an incoming call.
- **PowerOn by Ring**
  This option allows the system to resume or wake up upon detecting any ring signals coming from an installed modem. The default value is *"Enabled"*.
- **Wake Up On LAN**
  When this option is enabled, a wake up event will awaken the system from the power-down state.

- **USB KB Wake-Up From S3**
  When this item is set Auto, the system will run VGA BIOS if it is reaumed from the S3 state.
- **Resume by Alarm**
  If enable this item, the system can automatically resume after a fixed time in accordance with the system's RTC (realtime clock).

**** Reload Global Timer Events ****

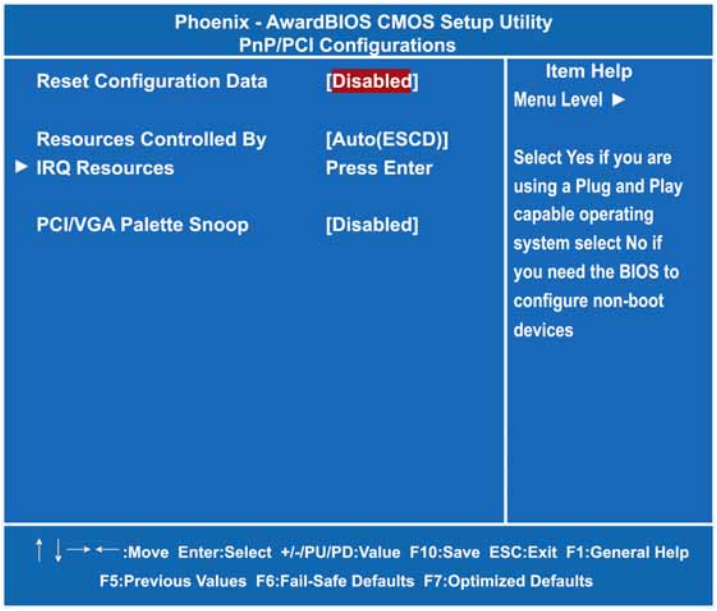
Global Timer (power management) events can prevent the system from entering a power saving mode or can awaken the system from such a mode.

- **Primary/Secondary IDE 0/1**
  Use this item to configure the IDE devices monitored by the system.
- **FDD, COM, LPT Port**
  Use this item to configure the FDD, COM and LPT ports monitored by the system.
- **PCI PIRQ[A-D]#**
  This item can be used to detect PCI device activities; if no activity, the system will enter the sleep mode.

Press <Esc> to return to the Main Menu page.

4.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.



- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options: Enabled, Disabled.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:

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

whether designed for PCI or ISA bus architecture.

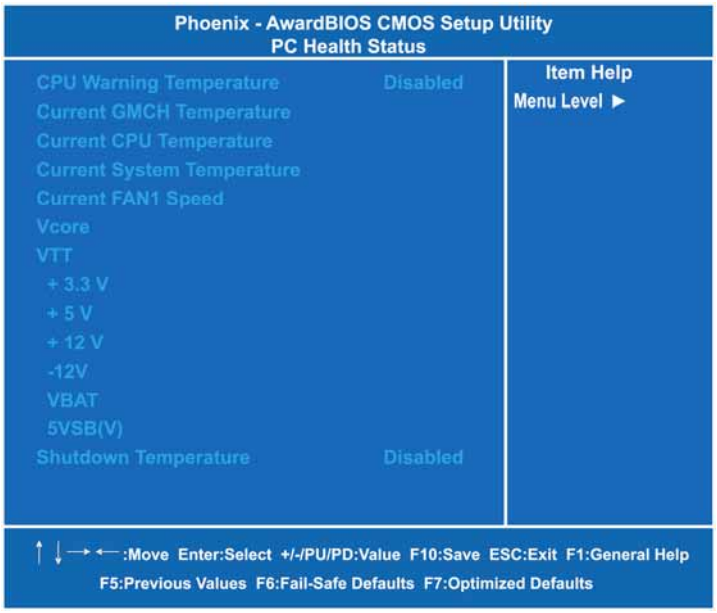
The default value is *"PCI/ISA PnP"*.

- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

Press <Esc> to return to the Main Menu page.

4.11 PC Health Status

This section supports hardware monitering that lets you monitor those parameters for critical voltages, temperatures and fan speed of the board.



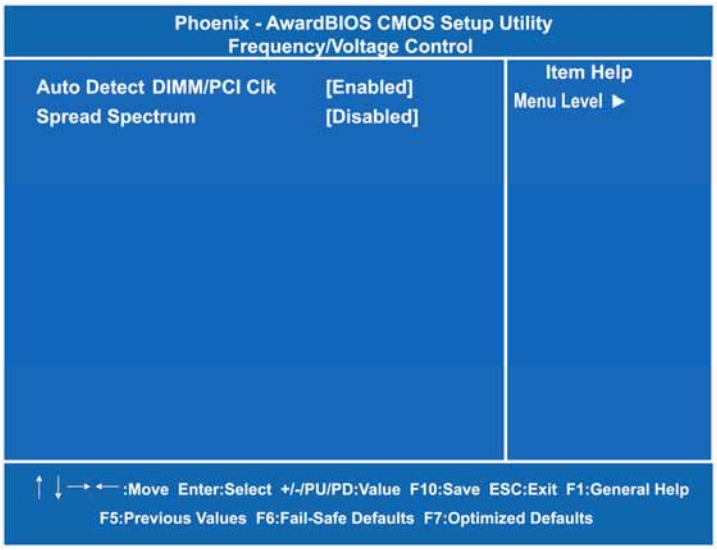
- **CPU Warning Temperature**
  It helps you set the CPU warning temperature before powering down.

- **Current GMCH Temperature**
  The current GMCH temperature will be automatically detected by the system.
- **Current CPU Temperature**
  The current system CPU temperature will be automatically detected by the system.
- **Current SYSTEM Temperature**
  Show you the current system temperature.
- **Current CPU FAN1 Speed**
  These optional and read-only items show current speeds in RPM (Revolution Per Minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.
- **Vcore 3.3V/5V/+12V/-12V/VBAT(V)/5VSB(V)**
  Show you the voltage of 1.8V/3.3V/+12V/VBAT/5VSB.
- **Shutdown Temperature**
  It helps you set the maximum temperature they system can reach before powering down.

Press <Esc> to return to the Main Menu page.

4.12 Frequency/Voltage Control

This section is to control the CPU frequency and Supply Voltage, DIMM OverVoltage and AGP voltage.

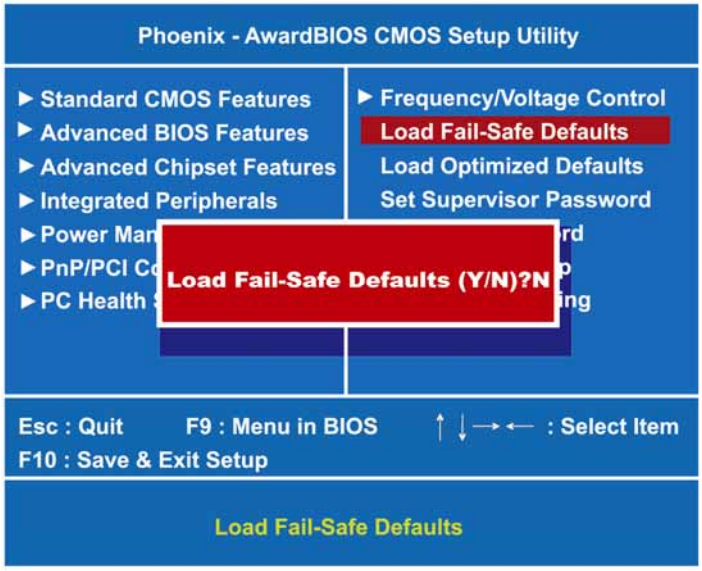


- **Auto Detect PCI Clk**
  The enabled item can automatically disable the clock source for a PCI slot without a module, to reduce EMI (ElectroMagnetic Interference).
- **Spread Spectrum**
  If spread spectrum is enabled, EMI (ElectroMagnetic Interference) generated by the system can be significantly reduced.

Press <Esc> to return to the Main Menu page.

4.13 Load Fail-Safe Defaults

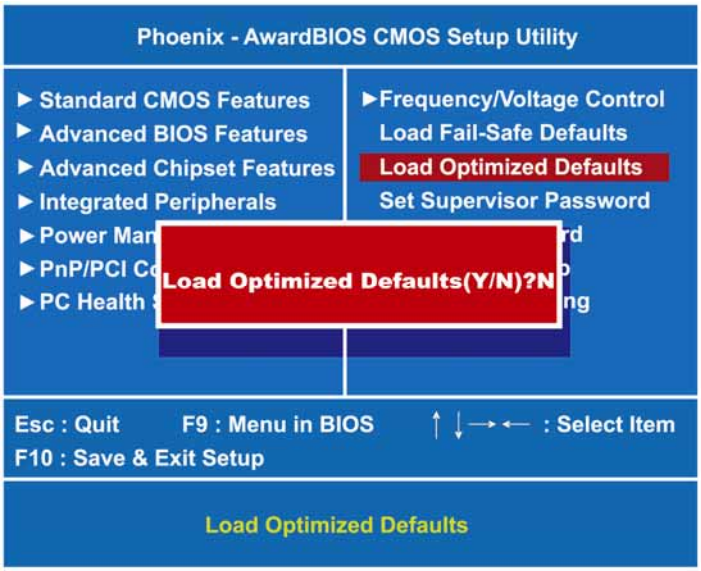
When you press <Enter> on this item, a confirmation dialog box pops out to show you such a message:



Please press "Y" to load default values that will be factory settings for accomplishing the optimal performance of system operations.

4.14 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

4.15 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1. **Supervisor password:** You can enter and change the options on the setup menu.
2. **User password:** You can just enter, but have no right to change the options on the setup menu.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

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

PASSWORD DISABLED

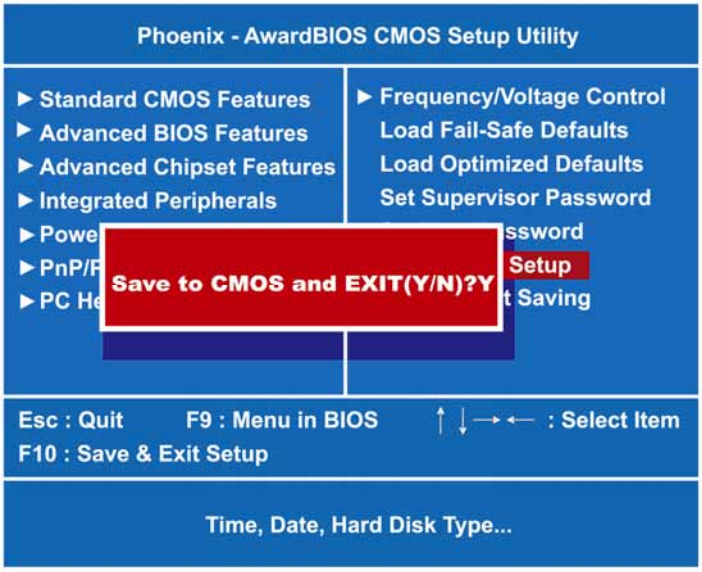
When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

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

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

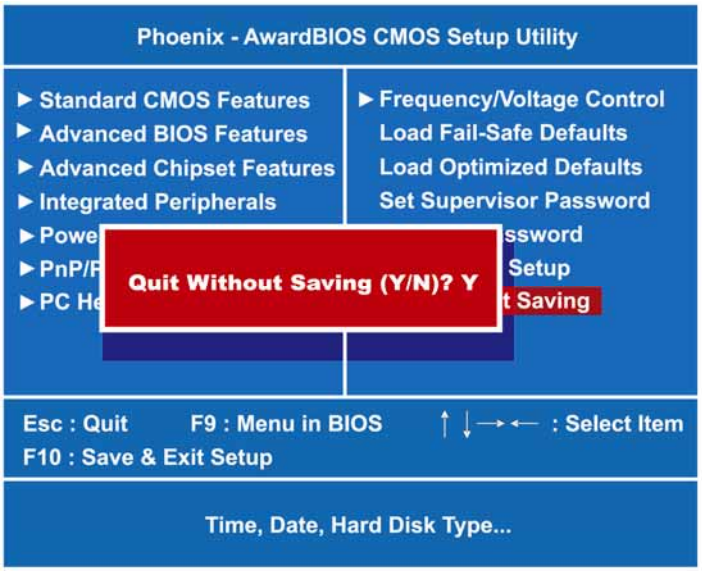
4.16 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Setup utility.



4.17 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications. Type "N" to return to the Setup utility.



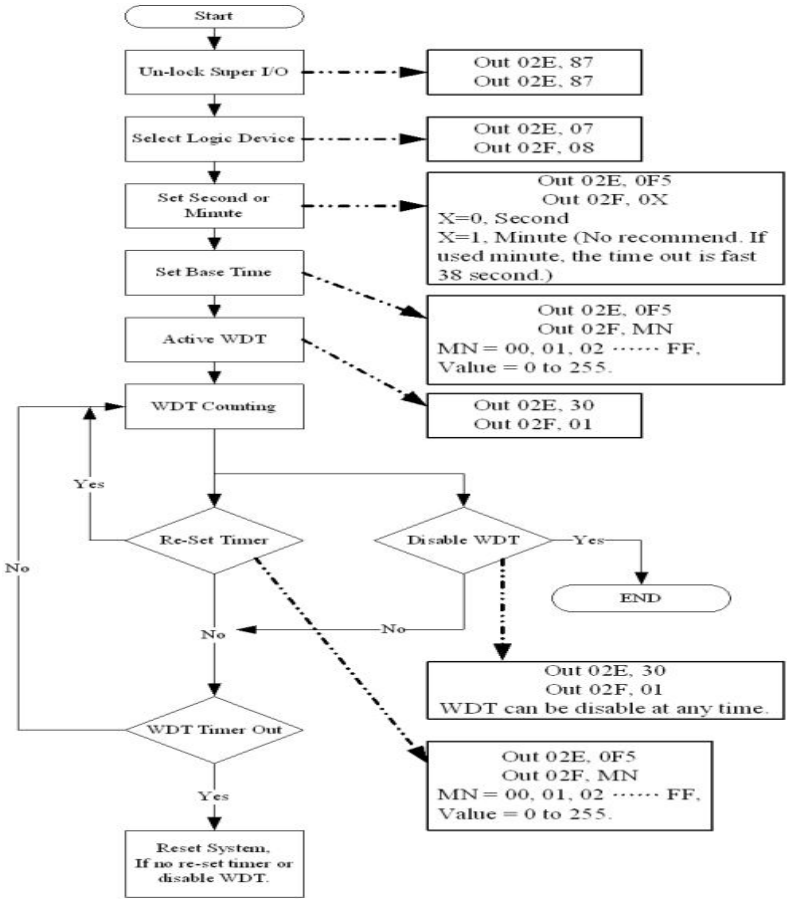
MEMO

A p p e n d i x A
Watchdog Timer

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Please follow the below WDT process for setup the WDT function.



MEMO

A p p e n d i x B
Digital I/O

Using the Digital Input Function

Start
↓
Un-Lock Superl /O:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
SelectMultiplexed pin to GPIO Function:
O 2E 2A
O 2F FF
↓
Select Logic device:
O 2E 07
O 2F 07
↓
Activate Logic Device:
O 2E 30
O 2F 01
↓
Select GPI Function:
O 2E F0
O 2F F0 ; for 4IN / 4OUT

(When set to a '1', respective GPIO port is programmed as an input port. When set to a '0', respective GPIO port is programmed as an output port.)

↓
Read Data:
O 2E F1
I 2F
XX (XX is input Data;
if no input source,the value is FF)

Using the Digital Output Function

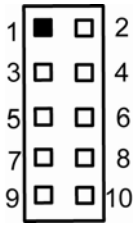
Start
↓
Un-Lock Superl /O:
O 2E 87 ; Un-lock super I/O
O 2E 87 ; Un-lock super I/O
↓
SelectMultiplexed pin to GPIO Function:
O 2E 2A
O 2F FF
↓
Select Logic device:
O 2E 07
O 2F 07
↓
Activate Logic Device:
O 2E 30
O 2F 01
↓
Select GPO Function:
O 2E F0
O 2F F0 ; for 4IN / 4OUT

(When set to a '1', respective GPIO port is programmed as an input port. When set to a '0', respective GPIO port is programmed as an output port.)

↓
Output Data:
O 2E F1
O 2F XX=00,01,02,…FF(XX is Output Data)

Pin	Description	Pin	Description
1	Digital Input 1(BIT7)	2	DigitalOutput 1(BIT3)
3	Digital Input 2(BIT6)	4	DigitalOutput 2(BIT2)
5	Digital Input 3(BIT5)	6	DigitalOutput 3(BIT1)
7	Digital Input 4(BIT4)	8	DigitalOutput 4(BIT0)
9	GND	10	GND

CN10



MEMO