

EM-660 Series

**VIA C3 Processor Embedded SBC
with SODIMM, VGA, LCD/LVDS,
CF II, Sound, LAN, PCI
and PC/104 expansion**

USER'S MANUAL

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Chapter 1 Introduction

1.1 Introduction

EM-660 offers two computing power options: VIA C3 533MHz and C3 800MHz. VIA C3 533MHz is designed especially for fan-less requirement to enable better MTBF. As an x86 architecture, the platform supports prevail operating systems such as Windows 95/98SE/XP/2000/NT and Linux. Your previous investment on these operating systems is, thus, protected in the following 4 years. With 192KB internal L1/L2 cache integrated in the CPU, your applications are able to benefit more execution speed from this mechanism.

VIA Twister-T chipset is the mid-end position of VIA chipsets. It supports 2D/3D Video Accelerator by integrating S3 Savage4. It also supports 36-bit TFT LCD and 2 channel (2 x 18-bit) LVDS. Using LCD 50-pin box header, EM-660 is able to compatible with the most coming bigger size industrial and commercial LCDs. By enabling VRAM, the system can further cut its cost and while maintains its speed. EM-660 uses SODIMM to limit its board height and supports PC 133/PC 100.

There are two storage options in EM-660 design. One is EIDE, and the other is CF II. EIDE supports two IDE devices. EM-660 offers 2 IDE box header options to fulfill flexible hard disk placement in system design. 40-pin box header focuses on 3.5" hard disk, 44-pin box header mainly couples itself with 2.5" hard disk. Regarding to CF II socket, system can further cut its whole size when using popular large volume CF II form factor SSD.

EM-660 embodies the following I/O: 1 x LAN, 1 x FDD, 4 x COM, 1 x LPT, Keyboard & Mouse, 2 x USB, 1 x IrDA and 4 x DIO. Expansion slots include PC/104 and PCI. Power supply complies with AT and ATX. Watchdog timer is 16-level.

As an industrial PC embedded card, EM-660's operating temperature is ranging from 0°C to 60°C. All these numerous features provide an ideal price/performance solution for commercial and industrial applications where stability and reliability are essential.

1.2 Features

- VIA C3 533MHz Fanless and C3 800MHz/ FSB 133MHz
- VIA VT8606 North Bridge and VT82C686B South Bridge
- Award BIOS
- S3 Savage 4 2D/3D Video Accelerator
- VGA, 36-bit TTL LCD and 2×18-bit LVDS
- LCD Brightness Control via GPIO
- AC 97 Audio
- Realtek RTL 8100B
- CF Type II Socket
- PCI and PC/104 expansion slots
- 1 x LAN, 1 x FDD, 4 x COM, 1 x LPT, Keyboard & Mouse, 2 x USB, 1 x IrDA and 4 x DIO
- Watchdog Timer
- AT/ATX Connector, ATX is default

1.3 Specification

EM-660 Series

- Processor : On board VIA C3 EPGA Ultra Low Power Processor, up to 133MHz, Intergrated 192 KB internal L1/L2
- Chipset : VIA VT8606 North Bridge & VT82C686B South Bridge, FSB 133MHz
- System Memory / RAM : One SODIMM socket supports up to 256MB SDRAM
: SDRAM PC 133/PC100
- VGA/LCD : VIA Twister Chip with Integrated S3 Savage 4 2D/3D Video Accelerator, Support up to 36-bit TTL LCD and 2 channel (2×18 bit) LVDS Reserved Design Option: LCD Brightness Control via GPIO
Support 8/16/32 MB Display Memory (Shared)
One DB-15 VGA connector and one 2x8x2.54 mm box-header
- Ethernet : One RJ-45 connector, Realtek RTL8100B, 10/100 Base-T interface
- BIOS : 256KB Award license BIOS
- RTC : Internal RTC with Li battery
- Flash Memory Disk : Type I/II CFC Socket supports up to 512 MB flash memory disk or IBM Micro Drive up to 1GB
- IDE Drive Interface : PIO mode 4 and Bus Master. Also supports Multi-word DMA and Ultra DMA 33/66/100, one 2x20x2.54 mm PCI IDE port and one 2×22×2.00mm, support up to four IDE devices.
- Floppy Interface : One 1x26x1.0 mm FDD port (support one floppy device)
- Serial Port : Four COM ports with ESD protect, COM1 RS-232/422/485 DB-9 connector, COM2 RS-232 DB-9 connector, COM3 RS-232 DB-9 connector, and COM4 RS-232 2x5x2.54mm Box-header
- Parallel Port : One multi-mode parallel port (SPP/EPP/ECP) DB-25 connector
- Keyboard/Mouse : One 6-pin mini-DIM PS/2 keyboard/mouse connector and one 6-pin 1x6x2.54 mm internal keyboard/mouse header (KBDAT, MSDAT, KMGND, KC-FUS, KBCLK, MSCLK)
- Universal Serial Bus : Support USB 1.1; 2 x external Connector, (Reserved design 2 x internal pin-header)
- IR Interface : Supports one IrDA header
- Expansion Bus : Built-in one PCI & PC/104 expansion slot
- Digital I/O : Digital-in*4 and digital-out*4
- Watchdog Timer : Software 16 level time-out intervals
- Health Monitoring : Integrated in 686B
- Power Connector : On-board power connector, with one ATX/AT co-design power connector optional and one HDD 4T connector
- Operating Temperature : 0°C ~ 60°C
- Storage Temperature : -20°C ~ 70°C
- Humidity : 5% ~ 95% RH, non-condensing
- Dimensions : 219x159 mm +/- 0.5mm
- Net Weight : 350 g (0.77 pounds)
- EMI/EMS : Meet CE and FCC class A regulation

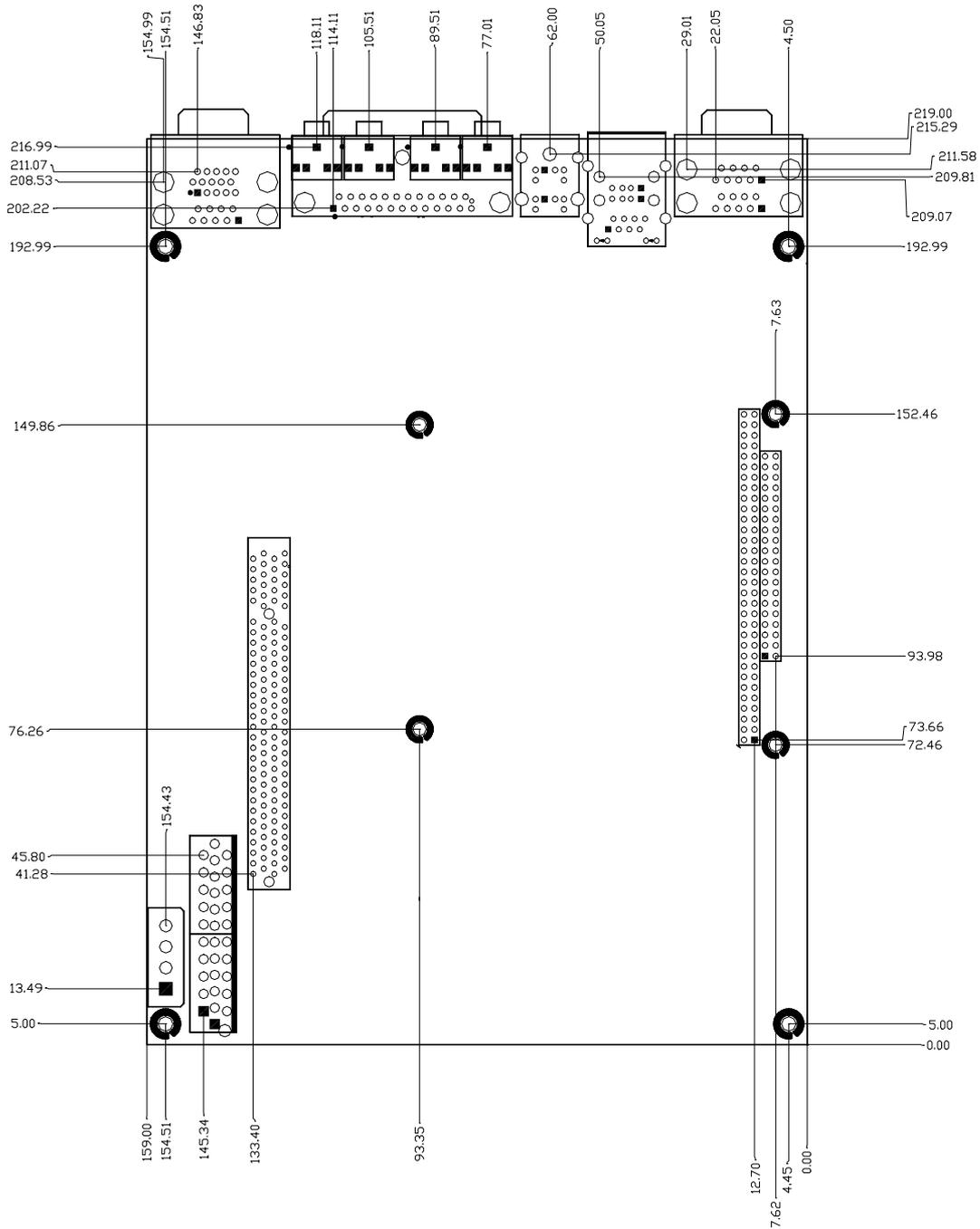
1.4 Unpack your EM-660 Series

Before you begin to install your card, please make sure that you received the following materials as listed below:

Standard Packing:

- | | |
|-------------------------------|-------------------------------------|
| ●EM-660 x 1 pc | Embedded Single Board Computer |
| ●Driver Utility CD-ROM x 1 pc | Drivers & Utilities |
| ●User's Manual x 1 pc | This User's Manual |
| ●Comport Cable x 1 pc | D-SUB 9P To 2×5P with Key 230mm EDI |
| ●Floppy Cable x 1 pc | 26P Flat 200mm (up contact) |
| ●Floppy Cable x 1 pc | 26P Flat 200mm (down contact) |
| ●ATA Cable x 1 pc | ATA100 40P IDE Impedence with Key |
| ●IDE Cable x 1 pc | 40P×2 to 44P P20 with Key EDI |
| ●Nut & Spacer x 4 sets | 15mm hex-spacer |

1.5 Board Layout



Chapter 2 Installation

2.1 System Memory Installation

Step 1: Insert the RAM module into the SODIMM socket



Step 2: Press Module down till clip hold.



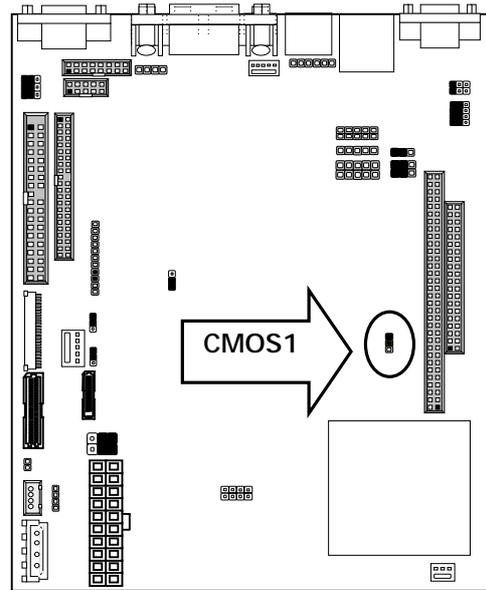
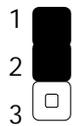
2.2.2 Jumper Settings Summary

LOCATION	FUNCTION
CMOS1	Clear CMOS Data
SC2T1/SC2T2	Select COM1 Type
SRIVB1/SRIVB2	Select COM1, COM2 port pin 9 Type
VLCD1	Select Panel Voltage
SBVA1	Select AT/ATX Power
SCF1	Master/Slave Select
SRIVB3/SRIVB4	Select COM3, COM4 Pin9 Type
SLCDA1	Select Panel Type

● CMOS1 : Clear CMOS Data

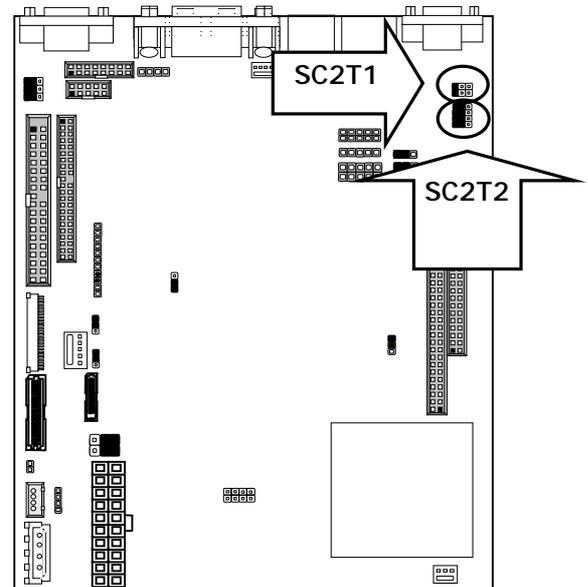
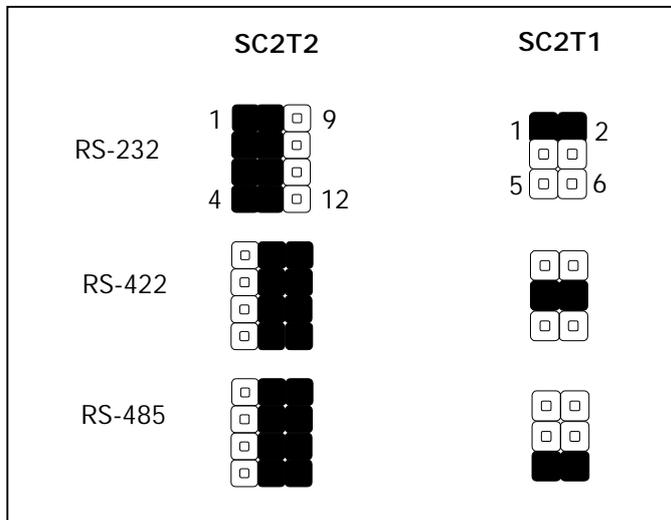
Description	CMOS1
Normal (Default)	1-2
Clear CMOS	2-3

CMOS1



● SC2T1/SC2T2: Select COM1 Type

COM1 TYPE	SC2T1	SC2T2
RS-232 (Default)	1-2	1-5,2-6,3-7,4-8
RS-422	3-4	5-9,6-10,7-11,8-12
RS-485	5-6	5-9,6-10,7-11,8-12



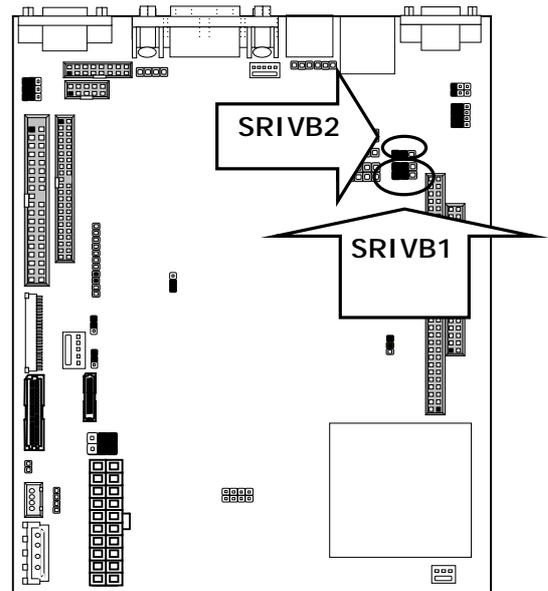
● SRIVB1, SRIVB2: Select COM1, COM2 port pin 9 Type

Pin 9 Type	SRIVB1		SRIVB2
	COM1	COM2	
RI (Default)	1-3	2-4	1-2
+5V	3-5	4-6	1-2
+12V	3-5	4-6	2-3

SRIVB1

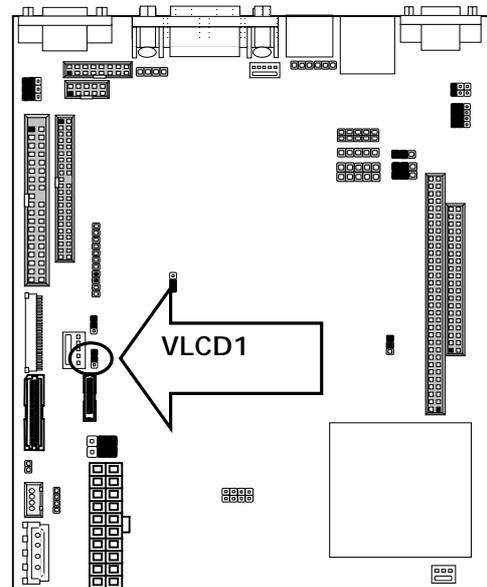
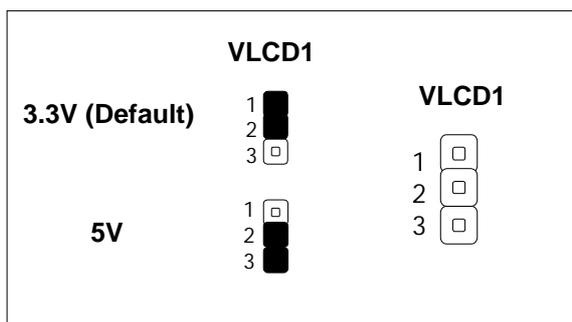
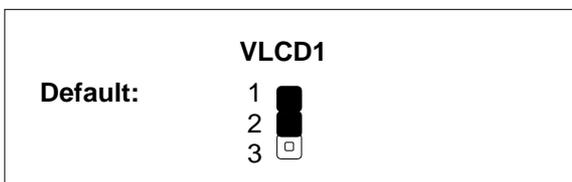


SRIVB2



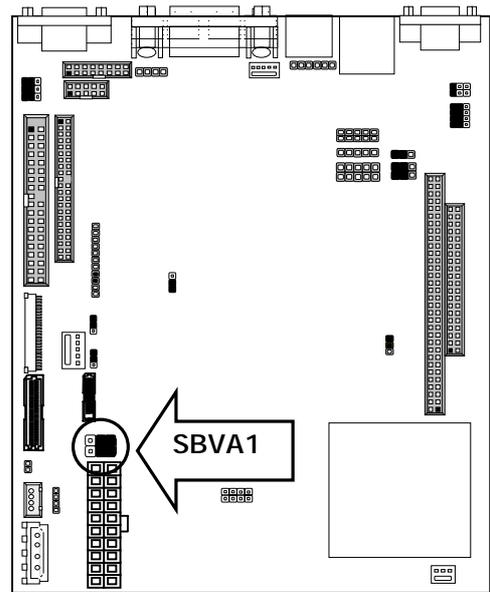
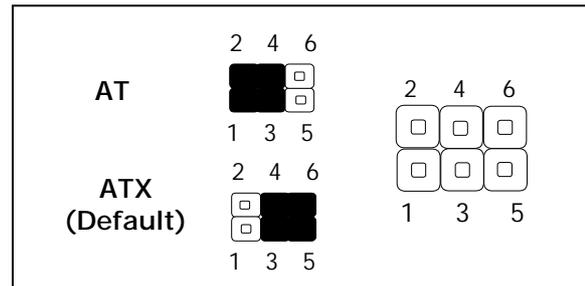
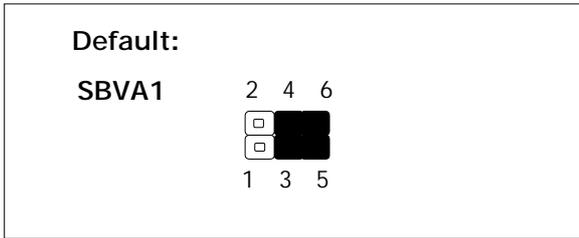
● VLCD1: Select Panel Voltage

Panel Voltage	VLCD1
+3.3V (Default)	1-2
+5V	2-3



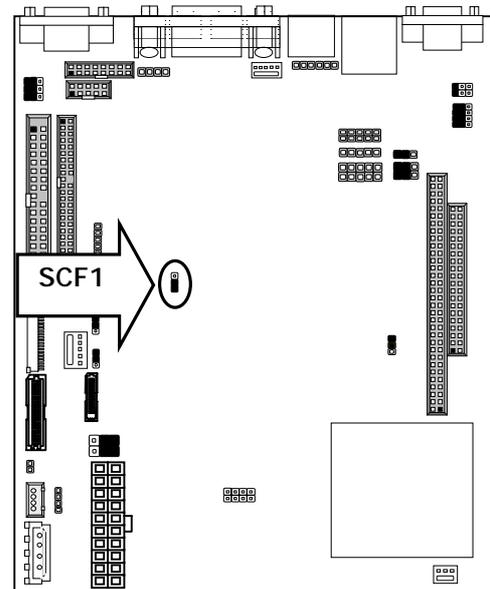
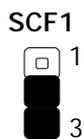
● **SBVA1: Select power supply Type**

Power Type	SBVA1
AT	1-3,2-4
ATX (Default)	3-5,4-6



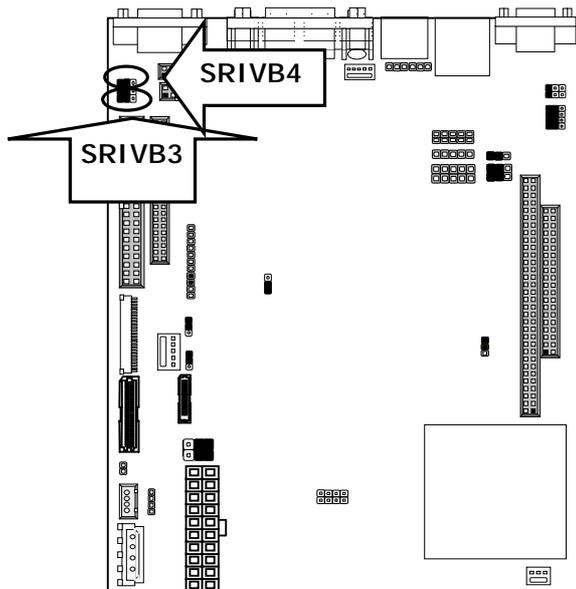
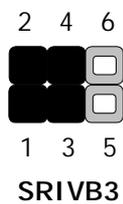
● **SCF1: Master/Slave Select**

Compact Flash Card	ATA Disk Chip	SCF1
Master	Slave	1-2
Slave	Master	2-3 (Default)



● SRIVB3,4:Select COM3,COM4 Pin9 Type

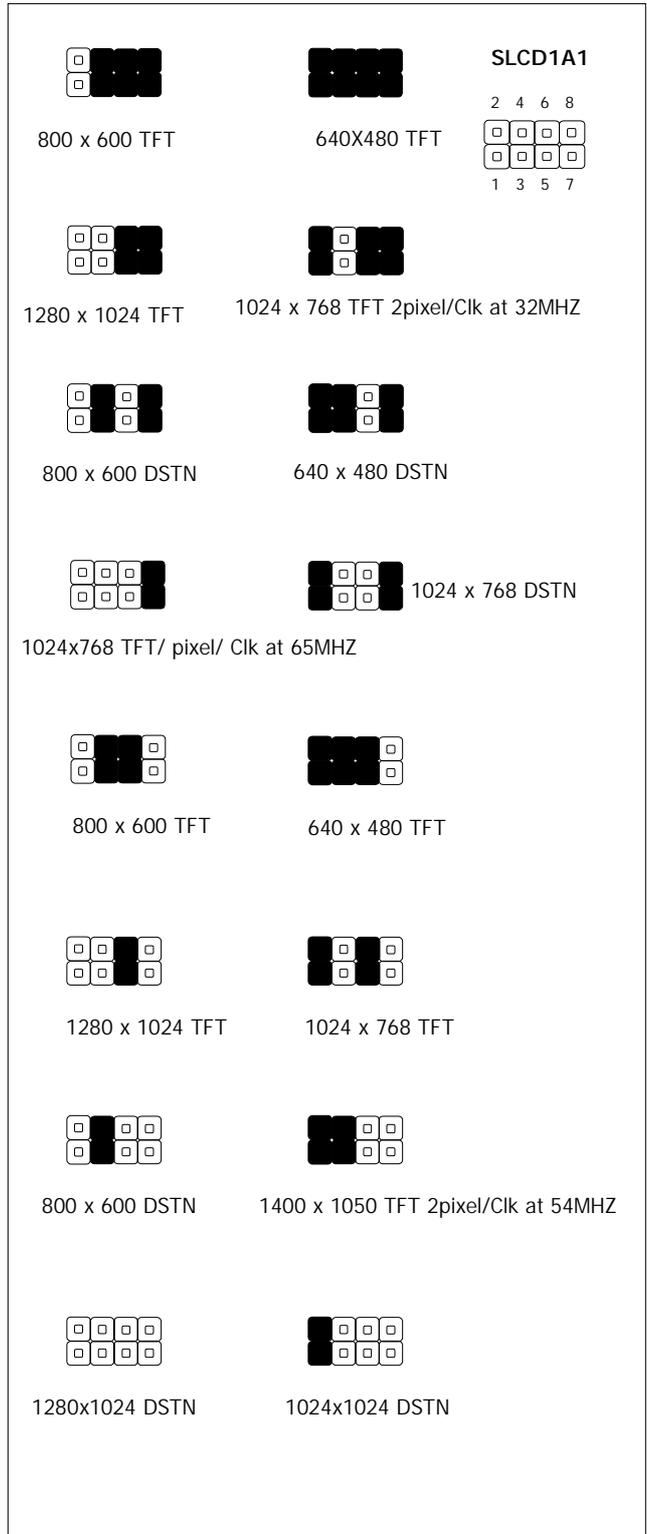
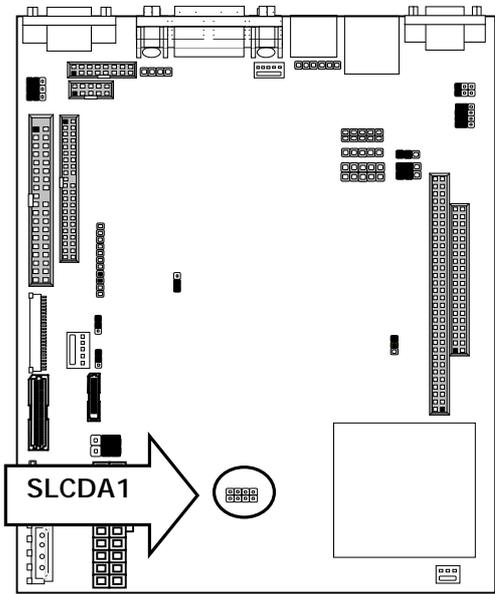
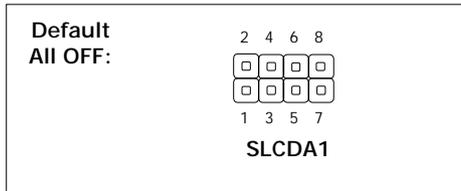
PIN 9 Type	SRIVB3		SRIVB4
	com3	com4	
RI (Default)	1-3	2-4	1-2
+5V	3-5	4-6	1-2
+12V	3-5	4-6	2-3



● SLCDA1:Select Panel Type (2x4 Pin)

Note: Different type of LCD panel with the same resolution will have different jumper setting for selection.

Panel Type	SLCD1
640 x 480 TFT	1-2,3-4,5-6,7-8
800 x 600 TFT	3-4,5-6,7-8
1024 x 768 TFT 2pixel/Clk at 32MHZ	1-2,5-6,7-8
1280 x 1024 TFT	5-6,7-8
640 x 480 DSTN	1-2,3-4,7-8
800 x 600 DSTN	3-4,7-8
1024 x 768 DSTN	1-2,7-8
1024 x 768 TFT 1pixel/Clk at 65MHZ	7-8
640 x 480 TFT	1-2,3-4,5-6
800 x 600 TFT	3-4,5-6
1024 x 768 TFT	1-2,5-6
1280 x 1024 TFT	5-6
1400 x 1050 TFT 2pixel/Clk at 54MHZ	1-2,3-4
800 x 600 DSTN	3-4
1024 x 768 DSTN	1-2
1280 x 1024 DSTN	OFF



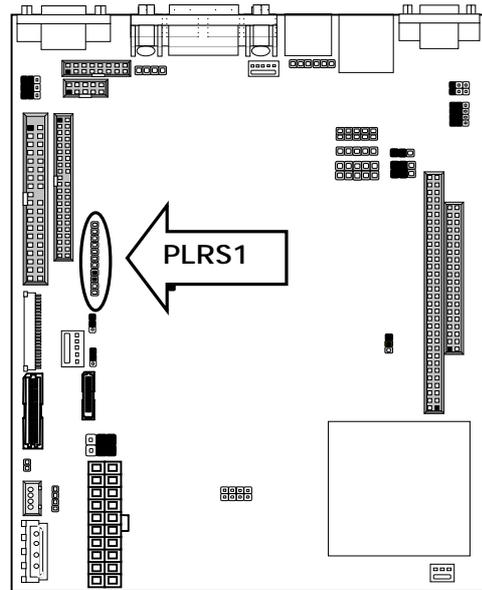
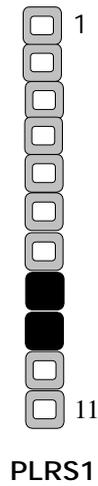
2.2.3 I/O Connectors Summary

LOCATION	FUNCTION
PLRS1	Power LED, HD, LED, Reset, Speaker Connector
IRDA1	IRDA Connector
USBA1	USB Port #3 & #4 Connector 2×5 Pin 2.54mm
LPTB1	Parallel Port Connector
LVDS1	LVDS Panel Connector 2×15P 1.0mm SMT
FDCB1	Slim Floppy Interface Connector
INVER1	LCD INVERTER Connector
LCD1	Panel LCD Connector
IDEA1	IDE Interface Connector (44 Pin 2.0mm Pitch Header)
IDEB1	IDE Interface Connector (40 Pin 2.54mm Pitch Header)
PS4W1	4-Pin Power Connector (WAFER 4P 2.00mm)
PSA1	20 Pin ATX Power Connector
DIOA1	Digital Input/ Digital Output Ports (2×5 Pin 2.54mm Header)
ATXC1	For ATX Function
PSW1	For ATX Power Button
CONA1 /CONB1	PC/104 Connector (8 bit/16 bit)
FAN1	3Pin FAN Connector
COMF1	Serial port #1 & #2 Connector, Double stack 9 Pin D-USB MALE
USBLN1	LAN & USB port #1 & #2 Connector Double stack 8 Pin RJ45+8 Pin USB
VGACM1	VGA & Serial port #3, Double stack 15 Pin D-SUB Female & 9 Pin D-SUB Male
PS4M1	4Pin Power Connector (Big-4P Male)
CF1	Compact Flash Connector
IKBM1	Internal Keyboard, Mouse Connector (6Pin 2.54mm Header)
KM1	Keyboard & Mouse Connector, Double stack 6 Pin mini DIN Female
VGAC1	Internal VGA Connector (2×8 Pin 2.54mm Pitch Header)
MIC1	MIC IN 5Pin-PHONE Jack
LNI1	Line IN 5Pin-PHONE Jack
CDIN1	CD_IN Connector
ISPKR1	Internal Speaker Connector
LNO1	Line out 5Pin-PHONE Jack
SPEAK1	Header phone connector 5Pin-PHONE Jack
COMB1	Serial Port #4 Connector (Header)

● **PLRS1: Power LED, HD LED, Reset, Speaker Connector (11 Pin 2.54mm)**

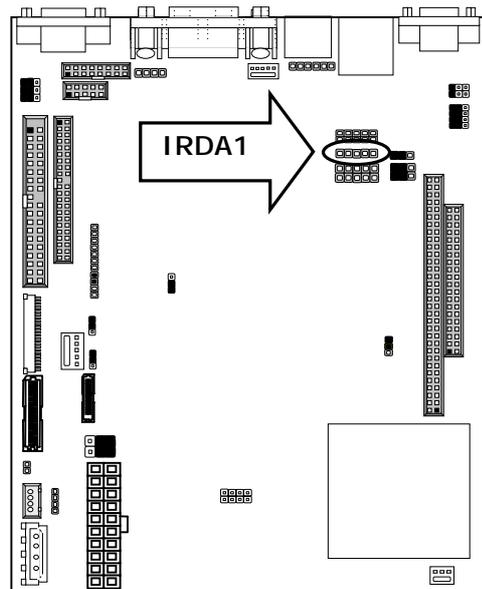
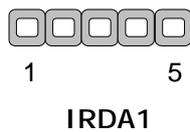
Pin No.	Description
1	Power LED +
2	Power LED +
3	GND
4	HDD LED +
5	HDD LED -
6	RESET SW +
7	RESET SW - (GND)
8	External Speaker -
9	Internal Buzzer -
10	NC
11	External Speaker +

Default :
8-9 (ON) Internal Buzzer



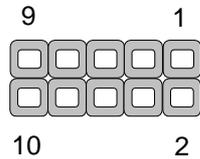
● **IRDA1: IRDA Connector**

Pin No.	Description
1	+3.3V
2	NC
3	IRRX
4	GND
5	IRTX

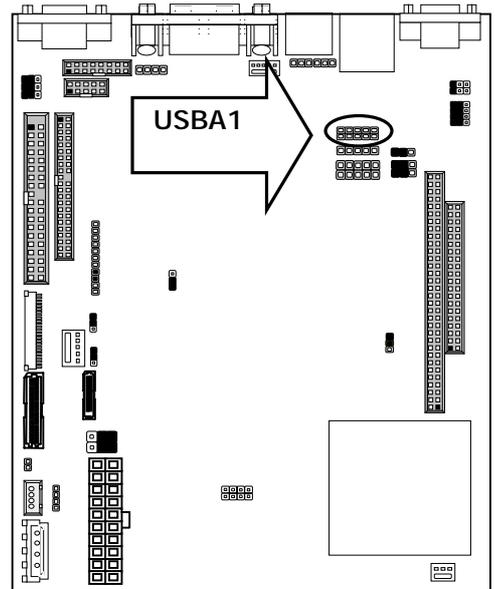


●USB A1: USB Port #3 & #4 Connector 2x5 Pin 2.54mm

Pin No.	Description	Pin No.	Description
1	+5VSB	2	+5VSB
3	USBD2-	4	USBD3-
5	USBD2+	6	USBD3+
7	Ground	8	Ground
9	USB Port #3Ground	10	USB Port #4Ground

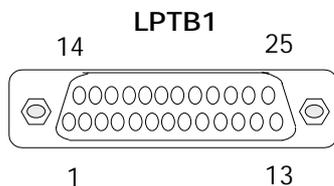


USB A1

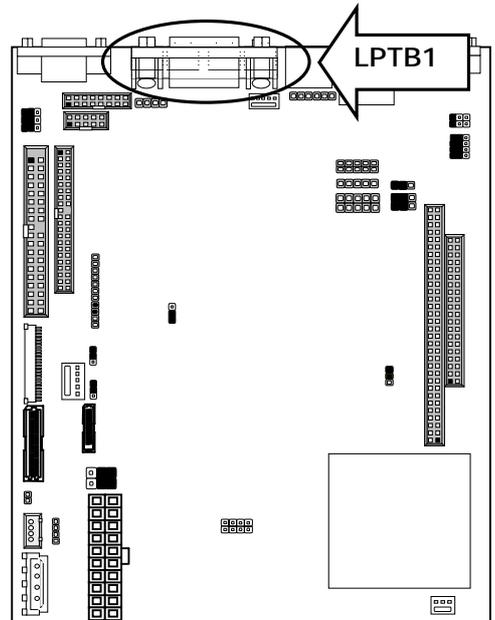


●LPT B1: Parallel Port Connector (25 Pin D-Sub)

Pin No.	Description	Pin No.	Description
1	Strobe #	14	Auto Form Feed #
2	Data0	15	Error #
3	Data1	16	Initialize #
4	Data2	17	Printer Select IN #
5	Data3	18	Ground
6	Data4	19	Ground
7	Data5	20	Ground
8	Data6	21	Ground
9	Data7	22	Ground
10	Acknowledge #	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select		

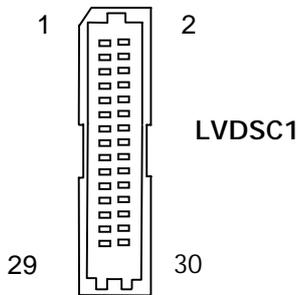
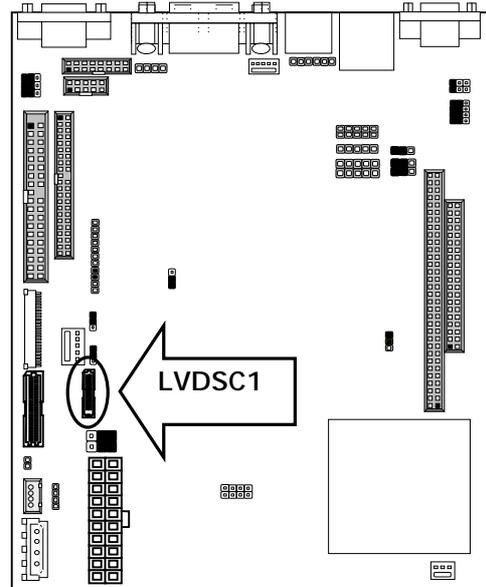


LPT B1



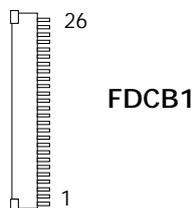
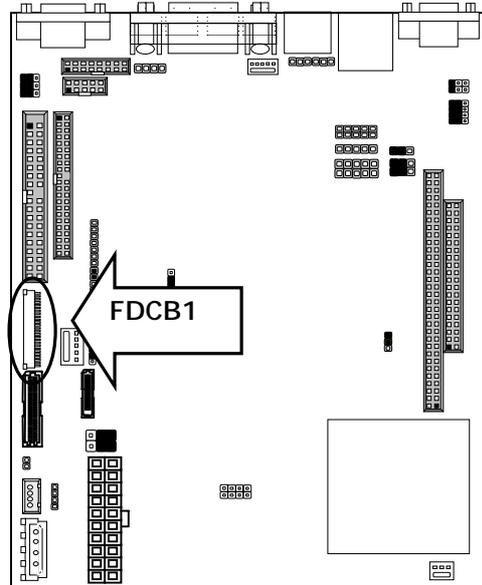
●LVDS1 ·· LVDS Panel Connector 2x15P 1.0mm SMT

Pin No.	Description	Pin No.	Description
1	FVCC	2	FVCC
3	GND	4	GND
5	NC	6	+12V
7	Y0M	8	Z0M
9	Y0P	10	Z0P
11	GND	12	GND
13	Y1M	14	Z1M
15	Y1P	16	Z1P
17	GND	18	GND
19	Y2M	20	Z2M
21	Y2P	22	Z2P
23	GND	24	GND
25	YCM	26	ZCM
27	YCP	28	ZCP
29	GND	30	GND



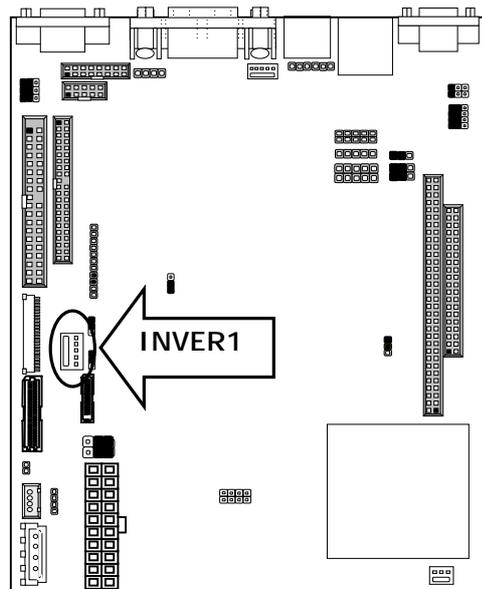
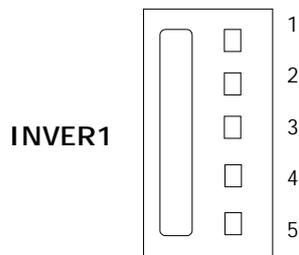
●FDCB1: Slim Floppy Interface Connector (26 Pin Header)

Pin No.	Description	Pin No.	Description
1	VCC	14	STEP-
2	INDEX-	15	GND
3	VCC	16	WD-
4	DSA-	17	GND
5	VCC	18	WE-
6	DSKCHG-	19	GND
7	NC	20	TRAK0-
8	NC	21	GND
9	NC	22	WP-
10	MOA-	23	GND
11	NC	24	RDATA-
12	DIR-	25	GND
13	NC	26	HEAD-



●INVER1: LCD INVERTER Connector

Pin No.	Description
1	GND
2	+5V
3	+12V
4	ENAVEE
5	Bright



※Regular pin 5 (bright) output is 1.8V. But output can be adjusted by below software tools.

EM60SAWD.EXE for output: 0 ~ 1.8V

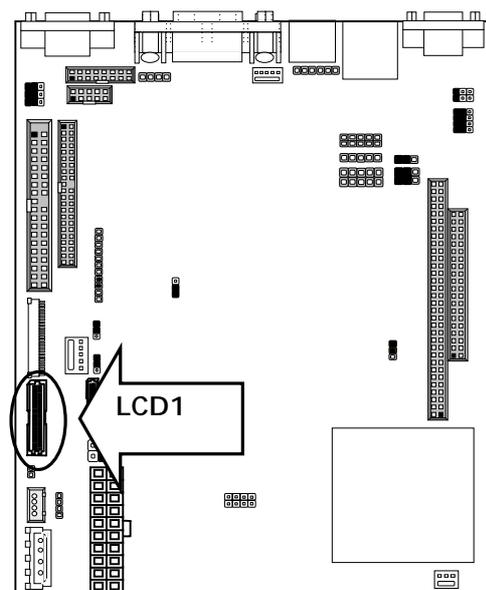
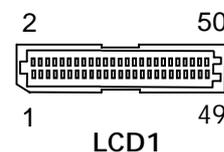
EM60LAWD.EXE for output: 0 ~ 3.3V

Brightness Adjust Operation:

Power-on by DOS booting disk, execute software tool and push "+" bottom to increase voltage or push "-" bottom to decrease voltage.

●LCD1: Panel LCD Connector (50Pin 1.0mm JST Header)

Pin No.	Signal	Pin No.	Signal
1	FVCC	2	FVCC
3	LP	4	FLM
5	M/DE	6	NC
7	ENAVEE	8	ENAVDD
9	SHFCLK	10	+12V
11	GND	12	GND
13	P0	14	P1
15	P2	16	P3
17	P4	18	P5
19	P6	20	P7
21	P8	22	P9
23	P10	24	P11
25	P12	26	P13
27	P14	28	P15
29	GND	30	P16
31	P17	32	P18
33	P19	34	P20
35	P21	36	P22
37	P23	38	GND
39	P24	40	P25
41	P26	42	P27
43	P28	44	P29
45	P30	46	P31
47	P32	48	P33
49	P34	50	P35



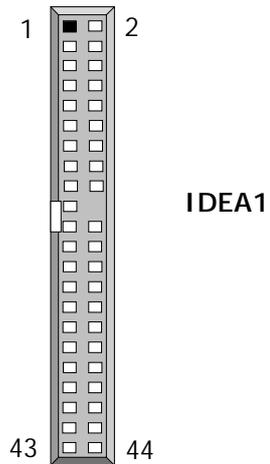
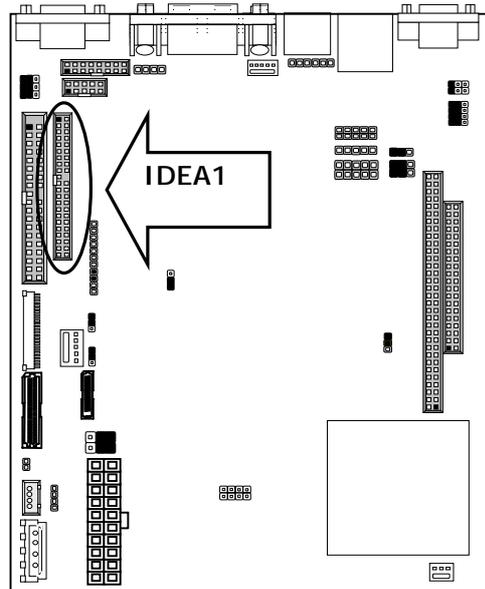
- Flat Panel Interface Pins listing for DSTN and color TFT LCD

SR7D[3]	0	0	0	0	0	0
SR70[0]	1	1	1	0	0	0
SR79[1-0]	10	10	10	10	10	10
SR7D[2-0]	001	000	010	010	000	010
Pin Name	STN8	STN16	ATN24	DSTN8	DSTN16	DSTN24
FPD0	R0	R0	R0	LR0	LR0	LR0
FPD1	G0	G0	G0			LR3
FPD2	B0	B0	B0	LG0	LG0	LG0
FPD3	R1	R1	R1			
FPD4	G1	G1	G1	LB0	LB0	LB0
FPD5	B1	B1	B1			
FPD6	R2	R2	R2	LR1	LR1	LR1
FPD7	G2	G2	G2			LG3
FPD8		B2	B2		LG1	LG1
FPD9		R3	R3			
FPD10		G3	G3		LB1	LB1
FPD11		B3	B3			
FPD12		R4	R4		LR2	LR2
FPD13		G4	G4			LB3
FPD14		B4	B4		LG2	LG2
FPD15		R5	R5			
FPD16			G5			LB2
FPD17			B5			
FPD18			R6	UR0	UR0	UR0
FPD19			G6			UR3
FPD20			B6	UG0	UG0	UG0
FPD21			R7			
FPD22			G7	UB0	UB0	UB0
FPD23			B7			
FPD24				UR1	UR1	UR1
FPD25						UG3
FPD26					UG1	UG1
FPD27						
FPD28					UB1	UB1
FPD29						UB3
FPD30					UR2	UR2
FPD31						UB3
FPD32					UG2	UG2
FPD33						
FPD34						UB2
FPD35						

SR7D[3]	0	0	0	0	0	0	0	0	0
SR70[0]	1	1	1	1	1	1	1	1	1
SR79[1-0]	00	00	00	00	00	00	00	00	00
SR7D[2-0]	000	010	000	010	000	010	000	010	001
Pin Name	TFT9	TFT2×9	TFT12	TFT2×12	TFT15	TFT2×15	TFT18	TFT2×18	TFT24
FPD0							R0	R00	R2
FPD1								R10	R0
FPD2					R0	R00	R1	R01	R3
FPD3						R10		R11	
FPD4			R0	R00	R1	R01	R2	R02	R4
FPD5				R10		R11		R12	
FPD6	R0	R00	R1	R01	R2	R02	R3	R03	R5
FPD7		R10		R11		R12		R13	R1
FPD8	R1	R01	R2	R02	R3	R03	R4	R04	R6
FPD9		R11		R12		R13		R14	
FPD10	R2	R02	R3	R03	R4	R04	R5	R05	R7
FPD11		R12		R13		R14		R15	
FPD12							G0	G00	G2
FPD13								G10	G0
FPD14					G0	G00	G1	G01	G3
FPD15						G10		G11	
FPD16			G0	G00	G1	G01	G2	G02	G4
FPD17				G10		G11		G12	
FPD18	G0	G00	G1	G01	G2	G02	G3	G03	G5
FPD19		G10		G11		G12		G13	G1
FPD20	G1	G01	G2	G02	G3	G03	G4	G04	G6
FPD21		G11		G12		G13		G14	
FPD22	G2	G02	G3	G03	G4	G04	G5	G05	G7
FPD23		G12		G13		G14		G15	
FPD24							B0	B00	B2
FPD25								B10	B0
FPD26					B0	B00	B1	B01	B3
FPD27						B10		B11	
FPD28			B0	B00	B1	B01	B2	B02	B4
FPD29				B10		B11		B12	
FPD30	B0	B00	B1	B01	B2	B02	B3	B03	B5
FPD31		B10		B11		B12		B13	B1
FPD32	B1	B01	B2	B02	B3	B03	B4	B04	B6
FPD33		B11		B12		B13		B14	
FPD34	B2	B02	B3	B03	B4	B04	B5	B05	B7
FPD35		B12		B13		B14		B15	

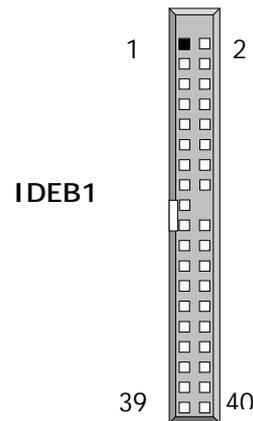
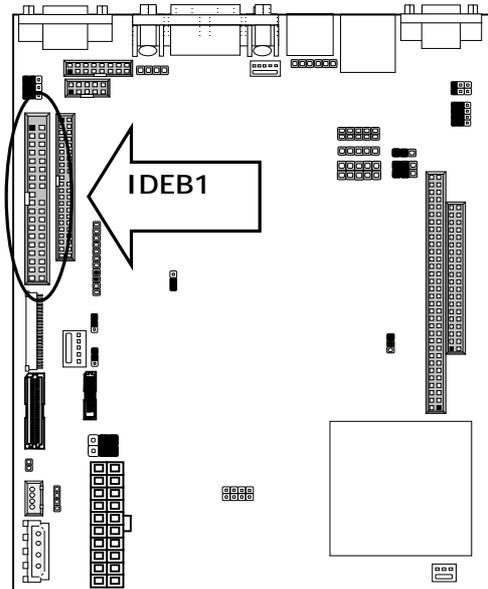
●IDEA1: IDE Interface Connector (44Pin 2.0mm Pitch Header)

Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
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	Ground	20	Key
21	DMA REQ #	22	Ground
23	IOW #	24	Ground
25	IOR #	26	Ground
27	IOCHRDY	28	Ground
29	DMA ACK #	30	Ground
31	Interrupt	32	NC
33	SA 1	34	NC
35	SA 0	36	SA 2
37	HDC CS 0#	38	HDC CS 1#
39	HDD Active	40	Ground
41	VCC	42	VCC
43	Ground	44	NC



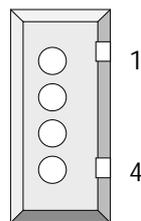
●IDEB1: IDE Interface Connector (40Pin 2.54mm Pitch Header)

Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
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	Ground	20	Key
21	DMA REQ#	22	Ground
23	IOW #	24	Ground
25	IOR #	26	Ground
27	IOCHRDY	28	Ground
29	DMA ACK #	30	Ground
31	Interrupt	32	NC
33	SA1	34	PD80P
35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #
39	HDD Active LED #	40	Ground

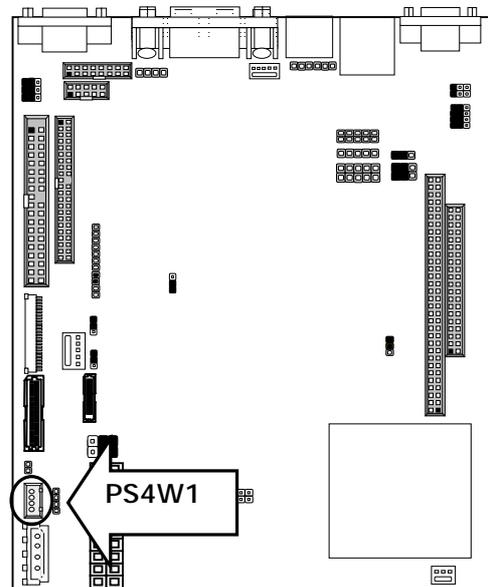


●PS4W1: 4-Pin Power Connector (WAFER 4P 2.00mm)

Pin No.	Description
1	GND
2	-5V
3	GND
4	-12V

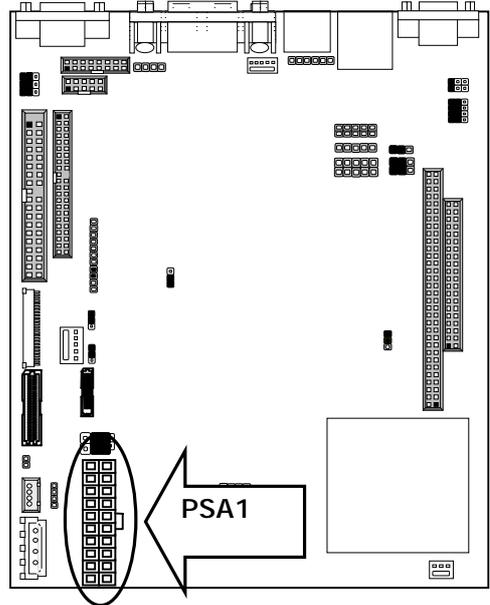
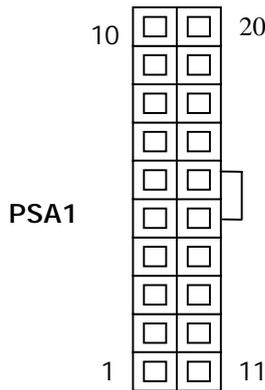


PS4W1



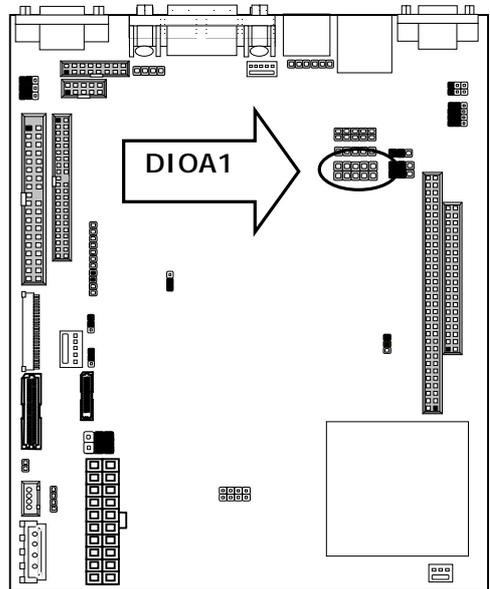
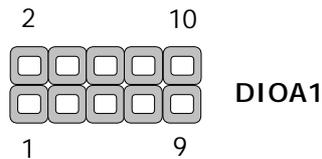
●PSA1: 20 Pin ATX Power Connector

Pin No.	Description	Pin No.	Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power Good	18	-5V
9	Stand-By 5V	19	+5V
10	+12V	20	+5V



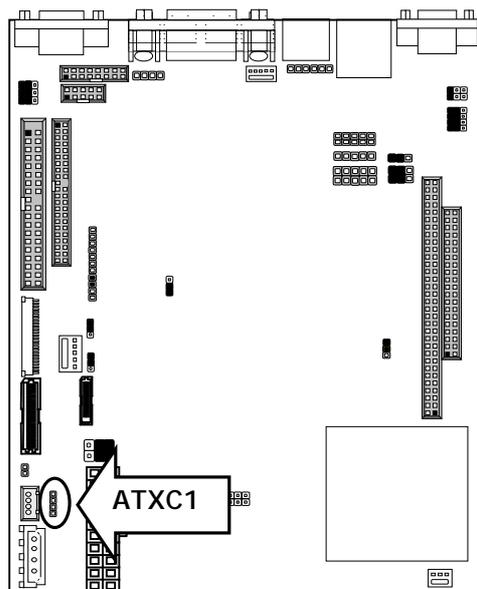
●DIOA1: Digital Input/ Digital Output Ports(2x5 Pin 2.54mm Header)

Pin No.	Description	Pin No.	Description
1	IN0	2	OUT0
3	IN1	4	OUT1
5	IN2	6	OUT2
7	IN3	8	OUT3
9	Ground	10	Ground



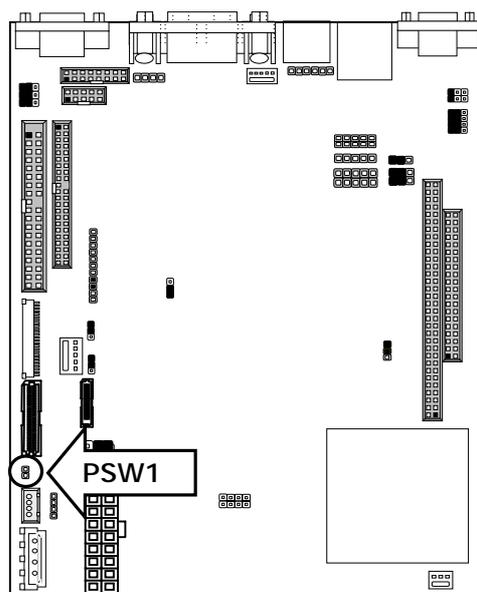
●ATXC1: For ATX Function

Pin No.	Description
1	GND
2	+5V STANDBY
3	GND
4	PSON



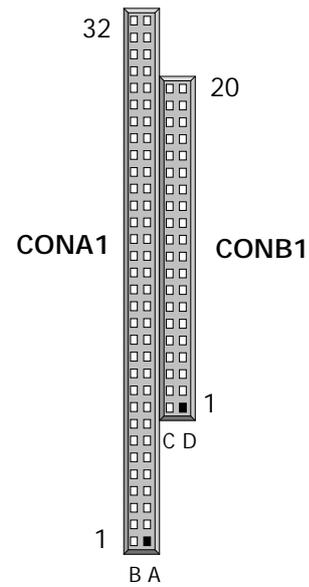
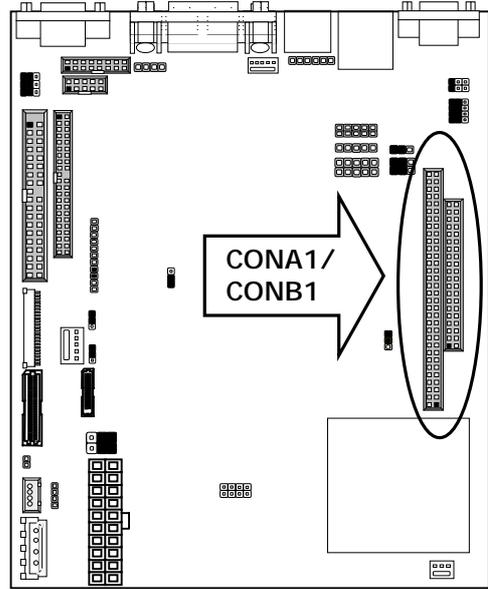
●PSW1: For ATX Power Button

Pin No.	Description
1	PANSW
2	GND



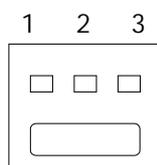
- CONA1:PC/104 Connector (8 bit)
- CONB1:PC/104 Connector (16 bit)

Pin No.	Description			
	CONA1		CONB1	
	Row A	Row B	Row C Ground	Row D Ground
1	IOCHCK#	Ground	SBHE#	MEMCS16#
2	SD7	RSTDRV	LA23	IOCS16#
3	SD6	+5V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12V	LA18	IRQ14
8	SD1	0 WS#	LA17	DACK0#
9	SD0	+12V	MEMR#	DRQ0
10	IOCHRDY	NC	MEMW#	DACK5#
11	AEN	SMEMW#	SD8	DRQ5
12	SA19	SMEMR#	SD9	DACK6#
13	SA18	IOW#	SD10	DRQ6
14	SA17	IOR#	SD11	DACK7#
15	SA16	DACK3#	SD12	DRQ7
16	SA15	DRQ3	SD13	+5V
17	SA14	DACK1#	SD14	MASTER#
18	SA13	DRQ1	SD15	Ground
19	SA12	REFRESH#	NC	Ground
20	SA11	SYSCLK	---	---
21	SA10	IRQ7	---	---
22	SA9	IRQ6	---	---
23	SA8	IRQ5	---	---
24	SA7	IRQ4	---	---
25	SA6	IRQ3	---	---
26	SA5	DACK2#	---	---
27	SA4	TC	---	---
28	SA3	BALE	---	---
29	SA2	+5V	---	---
30	SA1	OSC	---	---
31	SA0	Ground	---	---
32	Ground	Ground	---	---

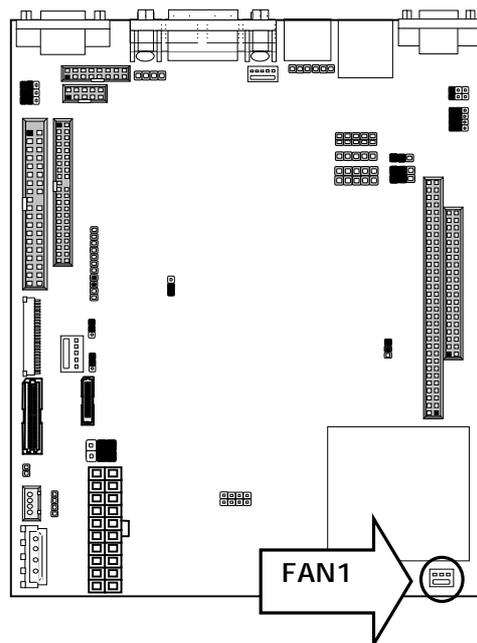


● FAN1: 3-Pin FAN Connector (For EM-660B only)

Pin No.	Description
1	Ground
2	+5V
3	FAN Status



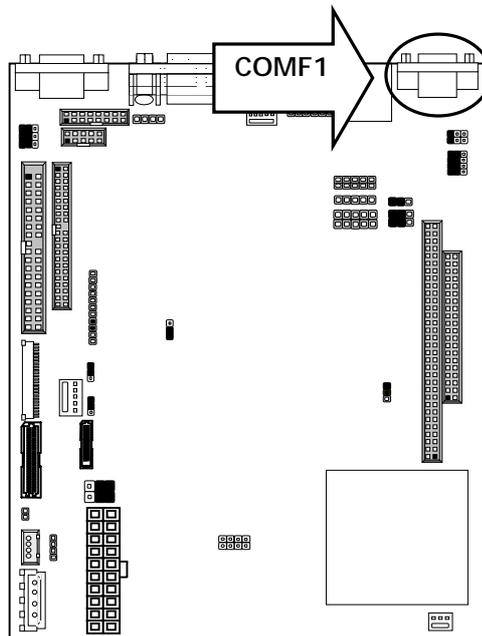
FAN1



●COMF1 ·· Serial port#1 Connector

Double stack 9 Pin D-SUB MALE (Up: COM2; Down: COM1)

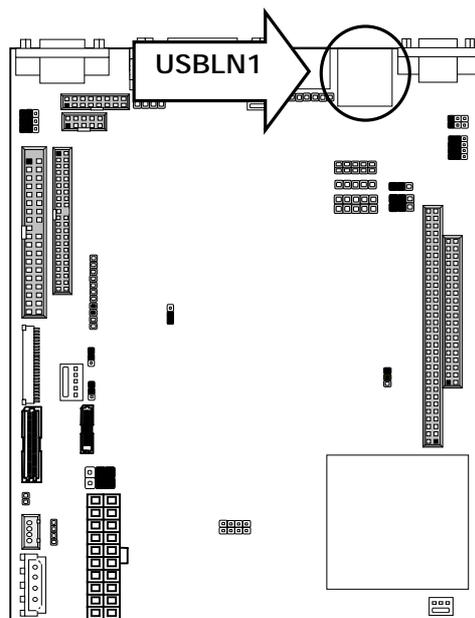
Pin No.	Description		
	RS-232	RS-422	RS-485
1	Data Carrier Detect (DCD1) #	Transmit Data- (TXD-)	Data-
2	Receive Data (RXD1)	Transmit Data+ (TXD+)	Data+
3	Transmit Data (TXD1)	Receive Data+ (RXD+)	NC
4	Data Terminal Ready (DTR1#)	Receive Data- (RXD-)	NC
5	Ground	NC	NC
6	Data set Ready (DSR1#)	NC	NC
7	Request To Send (RTS1#)	NC	NC
8	Clear To Send (CTS1#)	NC	NC
9	Type Select1	NC	NC
10	DCD2#		
11	RXD2		
12	TXD2		
13	DTR2#		
14	GND		
15	DSR2#		
16	RTS2#		
17	CTS2#		
18	Type Select2		



●USBLN1: LAN&USB port#1 Connector

Double stack 8 Pin USB+8 Pin RJ45

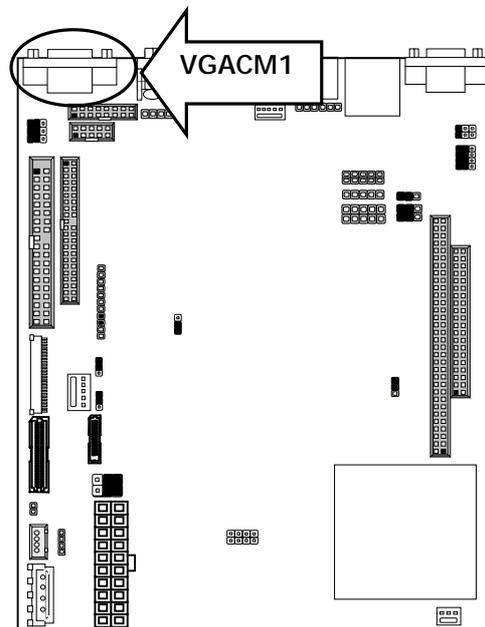
Pin No.	Description	Pin No.	Description
1	ATX+	2	ATX-
3	ARX+	4	T45
5	T45	6	ARX-
7	T78	8	T78
9	-LALINK	10	+LALINK
11	-LAACK	12	+LAACK
13	LGND	14	LGND
15	USB0 VCC	16	USB DT0-
17	USBDT0+	18	USB-GND
19	USB1 VCC	20	USBDT1-
21	USBDT1+	22	USB-GND



●VGACM1: VGA & Serial port#3

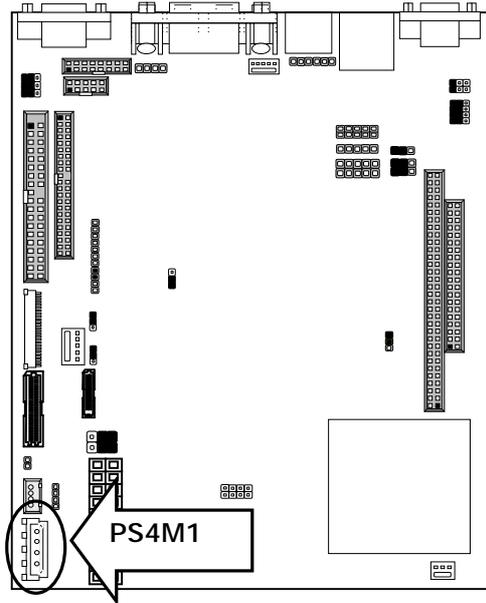
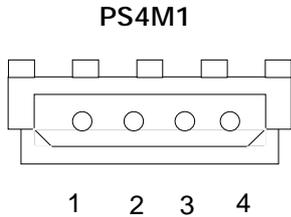
Double stack 15 Pin D-SUB Female & 9 Pin D-SUB Male

Pin No.	Description	Pin No.	Description
1	R	2	G
3	B	4	NC
5	VGAGND	6	VGAGND
7	VGAGND	8	VGAGND
9	NC	10	VGAGND
11	NC	12	D2DATA
13	HSYNC	14	VSYSN
15	D2CLK	16	NDCD3
17	NSIN3	18	NSOUT3
19	NDTR3	20	C3GND
21	NDSR3	22	NRTS3
23	NCTS3	24	Type Select3



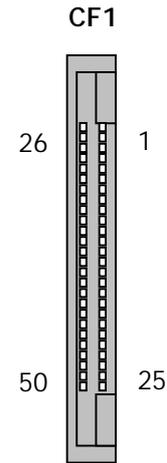
●PS4M1: 4 Pin Power Connector (Big-4P Male)

Pin No.	Description
1	+12V
2	Ground
3	Ground
4	+5V



●CF1: Compact Flash Connector (on solder side)

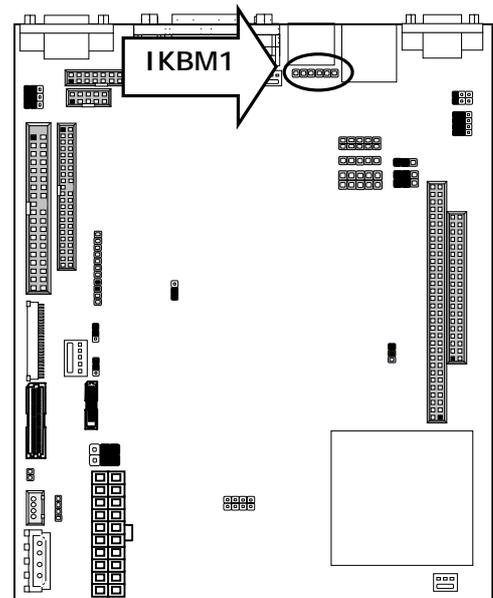
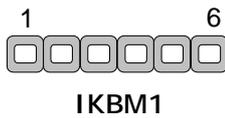
Pin No.	Description	Pin No.	Description
1	GND	26	CD1-
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	CE1#	32	CE2#
8	GND	33	VS1#
9	OE#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	NC
13	CFVCC3	38	CFVCC3
14	GND	39	CSEL
15	GND	40	VS2#
16	GND	41	RESET
17	GND	42	IOCARDY
18	A2	43	NC
19	A1	44	REG#
20	A0	45	DASP#
21	DATA0	46	DIAG#
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	WP	49	DATA10
25	CD2-	50	GND



* CF1 is on the solder side

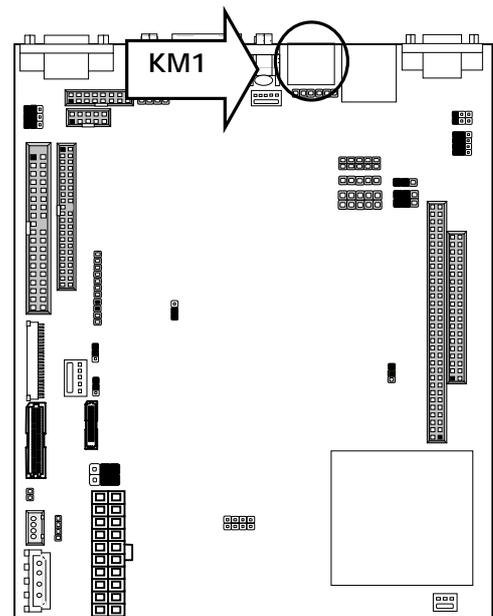
- **IKBM1: Internal Keyboard, Mouse Connector**

Pin No.	Description
1	PS/2 Keyboard Data
2	PS/2 Mouse Data
3	Ground
4	+5V
5	PS/2 Keyboard Clock
6	PS/2 Mouse Clock



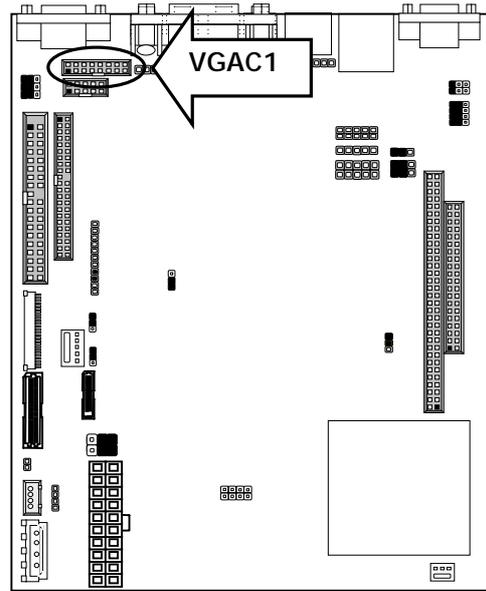
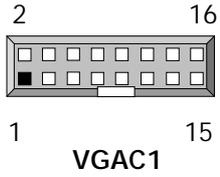
- **KM1: Keyboard & Mouse Connector, Double stack 6 Pin mini DIN Female**

Pin No.	Description
1	KBDATA
2	NC
3	GND
4	+5V
5	KBCLK
6	NC
7	MSDATA
8	NC
9	GND
10	+5V
11	MSCLK
12	NC



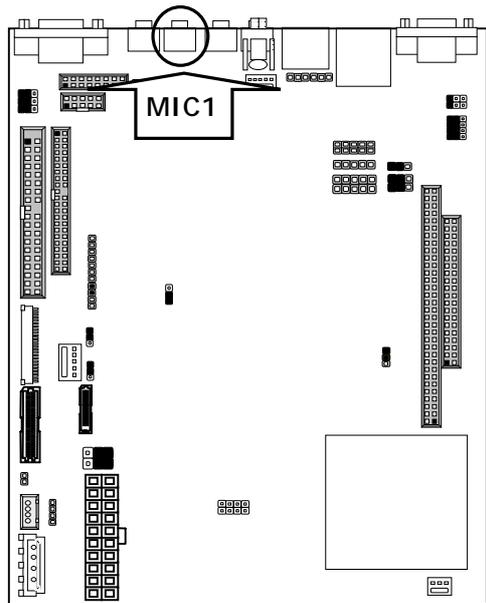
● **VGAC1: Internal VGA Connector (2X8 Pin 2.54mm Pitch Header)**

Pin No.	Description	Pin No.	Description
1	R	2	GND
3	G	4	GND
5	B	6	GND
7	GND	8	GND
9	GND	10	HSYNC
11	GND	12	VSYNC
13	GND	14	D2 DATA
15	GND	16	D2 CLK



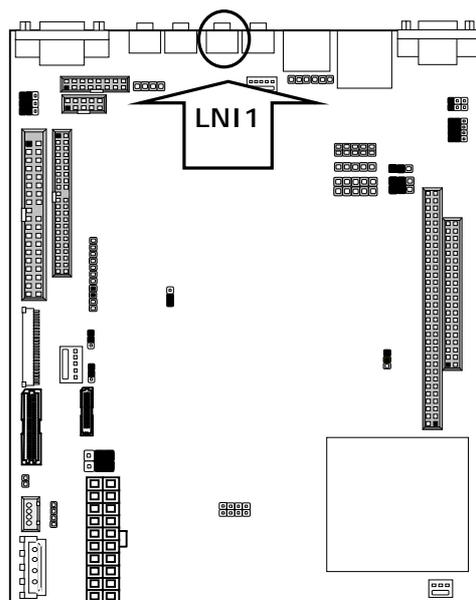
● **MIC1: MIC IN 5Pin-PHONE Jack**

Pin No.	Description
1	CO_GND
2	MIC_IN
3	CO_GND
4	CO_GND
5	Pull High



- LNI1: Line IN 5Pin-PHONE Jack

Pin No.	Description
1	CO_GND
2	LIN-L
3	CO_GND
4	CO_GND
5	LIN-R

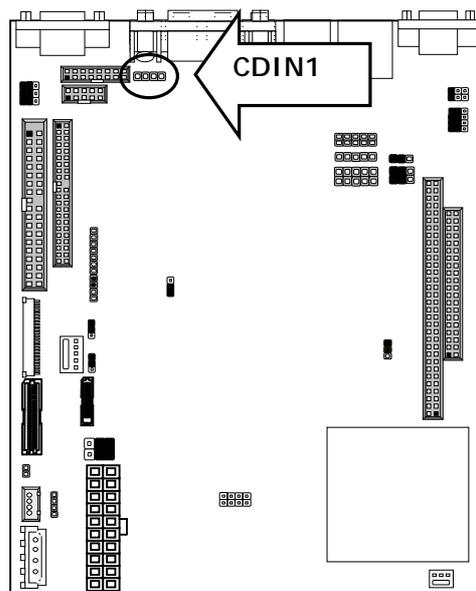


- CDIN1: CD_IN Connector

Pin No.	Description
1	CDL
2	CD_GND
3	CD_GND
4	CDR

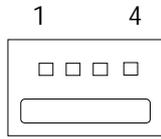


CDIN1

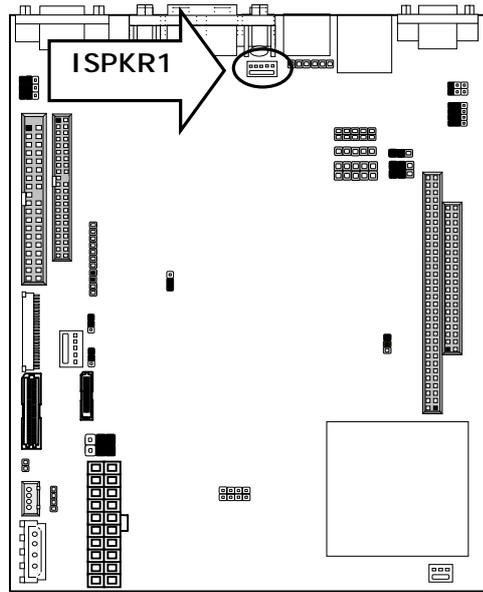


● **ISPKR1: Internal speaker connector (Wafer 1x4 2.54mm)**

Pin No.	Description
1	South-L
2	GND
3	GND
4	Sout-R

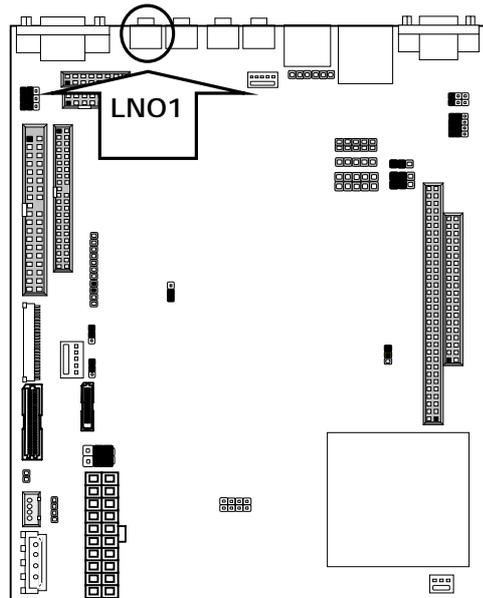


ISPKR1



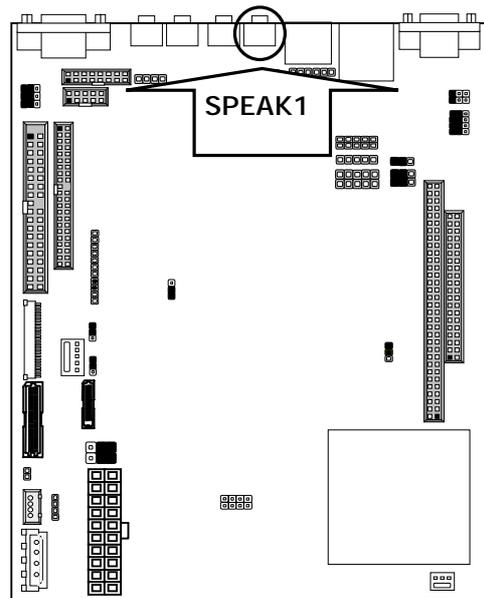
● **LNO1: Line out 5Pin-PHONE Jack**

Pin No.	Description
1	CO_GND
2	LOT_L
3	NC
4	NC
5	LOT_R



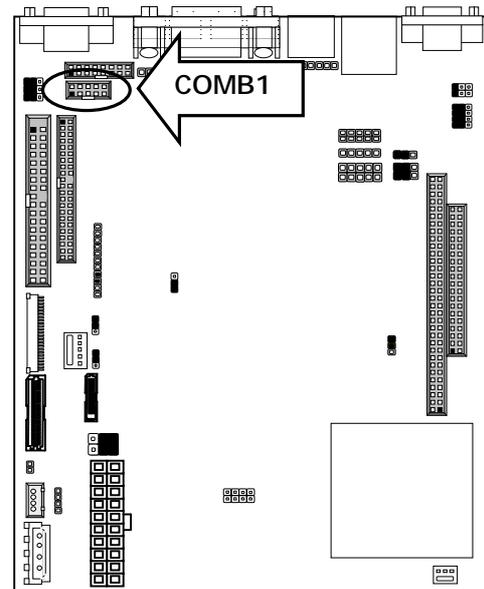
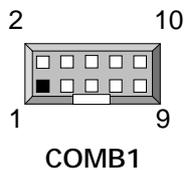
● **SPEAK1: Header phone connector 5Pin-PHONE Jack**

Pin No.	Description
1	CO_GND
2	AUD-L
3	NC
4	NC
5	AUD-R



● **COMB1: Serial Port #4 Connector (Header)**

Pin No.	Description
	RS-232
1	Data Carrier detect (DCD4#)
2	Data Set Ready (DSR4#)
3	Receive Data (RXD4)
4	Request To Send (RTS4#)
5	Transmit Data (TXD4)
6	Clear To Send (CTS4#)
7	Data Terminal Ready (DTR4)
8	Type Select4
9	Ground
10	Key



Chapter 3 BIOS Setup

Award's ROM BIOS provides a built-in Setup program that allows users to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that this data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM remains unchanged unless there is a configuration change in the system, such as hard drive replacement or new equipment installment.

3.1 Running AWARD BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message will appear to give you an opportunity to call up the Setup Utility while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in one of two ways, a series of short beeps or an error message on the screen. There are two kinds of errors, fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

" Press <F1> to RESUME "

Write down the message and press the F1 key to continue the boot up sequence. After the POST routines are completed, the following message appears:

" Press DEL to enter SETUP "

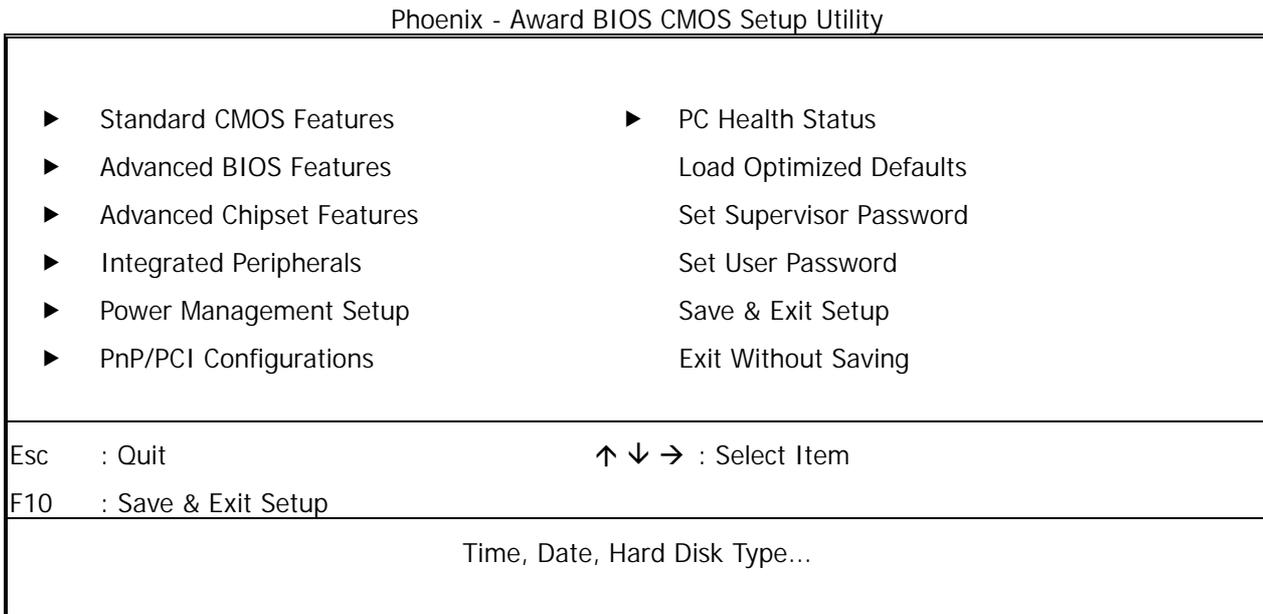
Entering Setup

Turn on the power of the computer system and press immediately. If you don't have the chance to respond, reset the system by simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the ' Reset ' button on the system cabinet. You can also restart by turning the system OFF then ON.

3.2 CMOS Setup Utility

To access the AWARD BIOS SETUP program, press the key. The screen display will appear as shown below:

Main Program Screen



This screen provides access to the utility's various functions.

Listed below is explanation of the keys displayed at the bottom of the screen:

<ESC>: Exit the utility.

<↑ ↓ → ←>: Use arrow keys ↑ ↓ → ← to move cursor to your desired selection.

<F1> : General Help

<F10>: Saves all changes made to Setup and exits program.

Standard CMOS Setup: Use this menu for basic system configurations.

Advanced BIOS Features: Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features: Use this menu to change the values in the chipset registers and optimizes your system's performance.

Integrated Peripherals: Use this menu to specify your settings for integrated peripherals.

Power Management Setup: Use this Menu to specify your settings for power management.

PnP/PCI Configurations: This entry appears if your system supports PnP/PCI.

PC Health Status: This entry shows your PC health status. If Hardware Monitor Chipset is installed.

Load Optimized Defaults: Use this menu to load the BIOS default values that are factory settings for optimal performance system operations.

Set Supervisor Password: Use this menu to set Supervisor Passwords.

Set User Password: Use this menu to set User Passwords.

Save & Exit Setup: Save CMOS value changes to CMOS and exit setup.

Exit Without Saving: Abandon all CMOS value changes and exit setup.

3.3 Standard CMOS Setup

When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appear as:

Standard CMOS Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Standard CMOS Features

Date (mm:dd:yy)	Mon, Feb 17, 2003	Item Help
Time (hh:mm:ss)	13 : 25 : 38	Menu Level ►
► IDE Primary Master	[IBM-DPTA-372050]	Change the day, month, year and century
► IDE Primary Slave	[None]	
► IDE Secondary Master	[IDE/ATAPI CD-ROM 50X]	
► IDE Secondary Slave	[None]	
Drive A	[1.44M, 3.5 in.]	
Drive B	[None]	
Halt On	[All Errors]	
Base Memory	640K	
Extended Memory	228352K	
Total Memory	229376K	
↑ ↓ → Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F7: Optimized Defaults		

The Standard CMOS Setup utility is used to configure the following components such as date, time, hard disk drive, floppy drive, display and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

Set Date: Month, Date, and Year.

Set Time: Hour, Minute and Second. Use 24-hour clock format (for p.m. time, add 12 to the hour number, e.g. you would enter 4:30 p.m. as 16:30). When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appear as:

Primary Master / Primary Slave

Secondary Master / Secondary Slave: Press PgUp / <+> or PgDn / <-> to select Manual, None, Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually.

If you select Manual, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is SCSI, the selection shall be "None"

If the controller of HDD interface is CD-ROM, the selection shall be "None"

Here is a brief explanation of drive specifications:

- **Access Mode:** The settings are Auto, Normal, Large, and LBA.
- **Cylinder:** Number of cylinders
- **Head:** Number of heads
- **Precomp:** Write precom
- **Landing Zone:** Landing Zone
- **Sector:** Number of sectors

Drive A and Drive B: Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5in	3 1-2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3 1-2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3 1-2 inch double-sided drive; 2.88 megabyte capacity

- Note:
1. Not Installed could be used as an option for diskless workstations.
 2. Highlight the listing after each drive name and select the appropriate entry.

Halt On: During the power-on-self-test (POST), the computer stops if the BIOS detect a hardware error. You can tell the BIOS to ignore certain errors POST and continue the boot-up process. These are the selections:

No errors	Whenever the BIOS detects a non-fatal error the system will not be stopped and you will be prompted
All errors	The system boot will be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all Other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other Errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

3.4 BIOS Features Setup

When you select the "BIOS FEATURES SETUP" on the main program, the screen display will appear as:

BIOS Features Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Advanced BIOS Features

<table style="width: 100%; border-collapse: collapse;"> <tr><td>Virus Warning</td><td>[Disabled]</td></tr> <tr><td>Quick Power On Self Test</td><td>[Enabled]</td></tr> <tr><td>First Boot Device</td><td>[Floppy]</td></tr> <tr><td>Second Boot Device</td><td>[HDD-0]</td></tr> <tr><td>Third Boot Device</td><td>[CDROM]</td></tr> <tr><td>Boot Other Device</td><td>[Enabled]</td></tr> <tr><td>Swap Floppy Drive</td><td>[Disabled]</td></tr> <tr><td>Hard Disk Write Protect</td><td>[Disabled]</td></tr> <tr><td>Floppy Disk Access Control</td><td>[R/W]</td></tr> <tr><td>Boot Up NumLock Status</td><td>[On]</td></tr> <tr><td>Security Option</td><td>[Setup]</td></tr> <tr><td>PS/2 Mouse Support</td><td>[Enabled]</td></tr> <tr><td>HDD S.M.A.R.T Capability</td><td>[Enabled]</td></tr> <tr><td>Video BIOS Shadow</td><td>[Enabled]</td></tr> <tr><td>C8000 - CBFFF Shadow</td><td>[Disabled]</td></tr> <tr><td>CC000 - CFFFF Shadow</td><td>[Disabled]</td></tr> <tr><td>D0000 - D3FFF Shadow</td><td>[Disabled]</td></tr> <tr><td>D4000 - D7FFF Shadow</td><td>[Disabled]</td></tr> <tr><td>D8000 - DBFFF Shadow</td><td>[Disabled]</td></tr> <tr><td>DC000 - DFFFF Shadow</td><td>[Disabled]</td></tr> <tr><td>Full Screen LOGO Show</td><td>[Disabled]</td></tr> </table>	Virus Warning	[Disabled]	Quick Power On Self Test	[Enabled]	First Boot Device	[Floppy]	Second Boot Device	[HDD-0]	Third Boot Device	[CDROM]	Boot Other Device	[Enabled]	Swap Floppy Drive	[Disabled]	Hard Disk Write Protect	[Disabled]	Floppy Disk Access Control	[R/W]	Boot Up NumLock Status	[On]	Security Option	[Setup]	PS/2 Mouse Support	[Enabled]	HDD S.M.A.R.T Capability	[Enabled]	Video BIOS Shadow	[Enabled]	C8000 - CBFFF Shadow	[Disabled]	CC000 - CFFFF Shadow	[Disabled]	D0000 - D3FFF Shadow	[Disabled]	D4000 - D7FFF Shadow	[Disabled]	D8000 - DBFFF Shadow	[Disabled]	DC000 - DFFFF Shadow	[Disabled]	Full Screen LOGO Show	[Disabled]	<table style="width: 100%; border-collapse: collapse;"> <tr><th style="text-align: center;">Item Help</th></tr> <tr><td>Menu Level ►</td></tr> <tr><td>Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep</td></tr> </table>	Item Help	Menu Level ►	Allow you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Virus Warning	[Disabled]																																													
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↑ ↓ → Move Enter: Select +/-/PU/PD: ValueF10: Save Esc: Exit F1: General Help
 F5: Previous Values F7: Optimized Defaults

The following explains the options for each of the features as listed in the above menu:

Virus Warning: The default setting of Virus Warning is "Disabled". When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot, to clean and to investigate your system.

Quick Power On Self-Test: The default setting is "Enabled". This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed up the booting process.

First / Second / Third / Other Boot Device: The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The settings are Floppy, LS/ZIP, HDD-0/HDD-1/HDD-2/HDD-3, SCSI, CDROM, LAN, and Disabled.

Swap Floppy Drive: The default setting is "Disabled". This setting gives you an option to swap A and B floppy disks. Normally, the floppy drive A is the one at the end of the cable and drive B is at the other end. If you set this option to "Enabled", the Drive A will function as Drive B, and vice-versa under the DOS.

Hard Disk Write Protect: This option specifies the write protect function of Hard Disk Drive.

Floppy Disk Access Control: This option specifies the read/write access that is set when booting from a floppy drive.

Boot Up NumLock Status: The default setting is "On". If it set "Off" the cursor controls will function on the numeric keypad.

Security Option: This setting controls the password in the main screen. The options are "Setup" and "System". Select "Setup" and it will protect the Setup Utility settings from being tampered with. Select "System" if you want to use password feature every time the system boots up. The default setting is "Setup". You can create your password by using the "SUPERVISOR/USER PASSWORD" utility on the main program screen.

PS/2 Mouse Support: This option enable Award BIOS support for a PS/2-type mouse.

HDD S.M.A.R.T Capability: SMART (Self-Monitoring, Analysis, and Reporting Technology) is a technology developed to manage disk drive reliability by predicting device failures. Award BIOS can warn of possible device failure, allowing time for backups or drive replacement.

Video BIOS Shadow: The default setting is "Enabled" which will copy the VGA display card BIOS into system DRAM to improve performance.

C8000-CBFFF Shadow to DC000-DFFFF Shadow: The default setting for the shadow feature is "Disabled". When enabled, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system. After you have made your selection in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.5 Chipset Features Setup

When you select the "CHIPSET FEATURES SETUP" on the main program, the screen display will appear as:

Chipset Features Setup Screen

Phoenix - Award BIOS CMOS Setup Utility

Advanced Chipset Features

Spread Spectrum	[Disabled]	Item Help
DRAM Timing By SPD	[Enabled]	Menu Level ►
Memory Hole	[Disabled]	
P2C/C2P Concurrency	[Enabled]	
System BIOS Cacheable	[Enabled]	
Video RAM Cacheable	[Enabled]	
Frame Buffer Size	[8M]	
AGP Aperture Size	[64M]	
AGP-4X Mode	[Enabled]	
AGP Driving Control	[Auto]	
X AGP Driving Value	[DA]	
Panel Type	[1024×768 TFT 65Mhz]	
CPU to PCI Write Buffer	[Enabled]	
PCI Dynamic Bursting	[Enabled]	
PCI Master 0 WS Write	[Enabled]	
PCI Delay Transaction	[Disabled]	
PCI#2 Access #1 Retry	[Enabled]	
AGP Master 1 WS Write	[Disabled]	
AGP Master 1 WS Read	[Disabled]	

↑ ↓ → Move Enter: Select +/-/PU/PD: ValueF10: Save Esc: Exit F1: General Help
 F5: Previous Values F7: Optimized Defaults

Spread Spectrum: When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

DRAM Timing By SPD: This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs.

Memory Hole: In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

Enabled	Memory hole supported
Disabled (default)	Memory hole not supported

P2C / C2P Concurrency: This item allows you to Enable or Disable the PCI to CPU, CPU to PCI concurrency. The default setting is "Enabled".

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 settings are "Enabled" and "Disabled".

Video RAM cacheable: The choices: Enabled, Disabled (Default).

Frame Buffer Size: The choices: 2M, 4M, 8M(Default), 16M, and 32M.

AGP Aperture Size: Select the size of the Accelerated Graphics Port (AGP) aperture. 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.

AGP-4X Mode: Setting AGP rate to 4X or 2X.

AGP Driving Control: This item allows you to adjust the AGP driving force. Choose Manual to key in an AGP Driving Value in the next selection. This field is recommended to set in "Auto" for avoiding any error in your system. The default setting is "Auto".

AGP Driving Value: This item allows you to adjust the AGP driving force.

Panel Type: Please select the type of panel you are incorporating with our single board computer. Consult your panel manual for detail information.

CPU to PCI Write Buffer: When this field is "Enabled", writes from the CPU to the PCI bus is buffered, to compensate for the differences between the CPU and the PCI bus. When disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another cycle. The default setting is "Enabled".

PCI Dynamic Bursting: This item allows you to enable or disable the PCI dynamic bursting function. The settings are "Enabled" or "Disabled".

PCI Master 0 WS Write: When enabled, writes to the PCI bus and are executed with zero wait states. The settings are "Enabled" or "Disabled".

PCI Delay Transaction: The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select "Enabled" to support compliance with PCI specification version 2.1. The settings are "Enabled" or "Disabled".

PCI#2 Access #1 Retry: When disabled, PCI#2 will not be disconnected until access finishes. When enabled, PCI#2 will be disconnected if max retries are attempted without success. The default setting is "Enabled".

AGP Master 1 WS Write: Implements a single delay when writing from the AGP Bus. Normally, two wait states are used, allowing for greater stability, but check with your motherboard manufacturer to see if they have already implemented a Master latency of zero, in which case the lowest writing here of 1 will reduce performance.

AGP Master 1 WS Read: Implements a single delay when reading from the AGP Bus. Normally, two wait states are used, allowing for greater stability, but check with your motherboard manufacturer to see if they have already implemented a Master latency of zero, in which case the lowest reading here of 1 will reduce performance.

3.6 Integrated Peripherals

When you select the "INTEGRATED PERIPHERALS" on the main program, the screen display will appear as:

Integrated Peripherals Setup Screen

Phoenix – Award BIOS CMOS Setup Utility

Integrated Peripherals

On-Chip Primary PCI IDE	[Enabled]	▲ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ ▼	Item Help
On-Chip Secondary PCI IDE	[Enabled]		Menu Level ▶
USB Controller	[Enabled]		
USB Keyboard Support	[Disabled]		
AC97 Audio	[Auto]		
Init Display First	[Add-On Card]		
Onboard FDD Controller	[Enabled]		
Onboard Serial Port 1	[3F8/IRQ4]		
Onboard Serial Port 2	[2F8/IRQ3]		
UART 2 Mode	[Standard]		
X IR Function Duplex	Half		
X TX, RX inverting enable	No, Yes		
Onboard Parallel Port	[378/IRQ7]		
Parallel Port Mode	[Normal]		
X ECP Mode Use DMA	3		
X Parallel Port EPP Type	Epp1.9		
Onboard Serial Port 3	[3E8H]		
Serial Port 3 Use IRQ	[IRQ4]		
Onboard Serial Port 4	[2E8H]		
Serial Port 4 Use IRQ	[IRQ3]		
Onboard Legacy Audio	[Enabled]		
X Sound Blaster	[Enabled]		

↑ ↓ → Move Enter: Select +/-/PU/PD: ValueF10: Save Esc: Exit F1: General Help

F5: Previous Values

F7: Optimized Defaults

On-Chip Primary PCI IDE: The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary IDE interface. Select Disabled to deactivate this interface. The settings are "Enabled" and "Disabled".

On-Chip Secondary PCI IDE: The chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the secondary IDE interface. Select Disabled to deactivate this interface. The settings are "Enabled" and "Disabled".

USB Controller: Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals

USB Keyboard Support: Set this option to "Enabled" or "Disabled" the USB keyboard/ mouse support. The default setting is "Disabled".

AC97 Audio: This option sets the AC97 Audio.

Init Display First: This item allows you to decide to active whether PCI Slot of VGA card or AGP first. The settings are "PCI Slot" and "AGP Slot".

Onboard FDD 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 add-in FDC or the system has no floppy drive, select Disabled in this field. The settings are "Enabled" and "Disabled".

Onboard Serial Port 1 / Port 2: Select an address and corresponding interrupt for the first and second serial ports. The settings are "3F8/IRQ4", "2E8/IRQ3", "3E8/IRQ4", "2F8/IRQ3", "Disabled", "Auto".

UART 2 Mode: This item allows you to select which mode for the Onboard Serial Port 2. The settings are "Standard", "HPSIR", and "ASKIR".

IR Function Duplex: This item allows you to select the IR half/full duplex function.

TX, RX inverting enable: This item allows you to enable the TX, RX inverting which depends on different H/W requirement. This field is not recommended to change its default setting for avoiding any error in your system.

Onboard Parallel Port: This item allows you to determine onboard parallel port controller I/O address setting. The settings are "378H/IRQ7", "278H/IRQ5", "3BC/IRQ7", and "Disabled".

Parallel Port Mode: There are four options "Normal" (default), "ECP", "ECP/EPP" and "EPP/SPP". Change the mode from "Normal" to the enhanced mode only if your peripheral device can support it. When it is set to ECP mode, the printer port always uses DMA3.

ECP Mode Use DMA: Select a DMA channel for the parallel port for use during ECP mode. The settings are "3" and "1".

Parallel Port EPP Type: Select EPP port type 1.7 or 1.9.

Onboard Serial Port 3: The choices: Disabled (Default), 3F8, 2F8, 3E8, and 2E8.

Serial Port 3 Use IRQ: The choices: IRQ10, IRQ11, IRQ4, IRQ3.

Onboard Serial Port 4: The choices: Disabled (Default), 3F8, 2F8, 3E8, and 2E8.

Serial Port 4 Use IRQ: The choices: IRQ10, IRQ11, IRQ4, IRQ3.

Onboard Legacy Audio: This option let you enable or disable the onboard Legacy Audio function.

Sound Blaster: This option let you enable or disable the onboard Sound Blaster function.

3.7 Power Management Setup

The "Power Management Setup" controls the CPU card's "Green" features. When you select the "POWER MANAGEMENT SETUP" on the main program, the screen display will appear as:

Power Management Setup Screen

Phoenix – Award BIOS CMOS Setup Utility

Power Management Setup

		Item Help
ACPI function	[Disabled]	
Power Management	[Min Saving]	Menu Level ►
Video Off Option	[Suspend -> Off]	
Video Off Method	[V/H SYNC + Blank]	
Suspend Mode	1 Hour	
HDD Power Down	[Disabled]	
LPT & COM	[Disabled]	
Power On by LAN/Ring	[Disabled]	
Power On by RTC Alarm	[Disabled]	
X Date (of Month)	0	
X Resume Time (hh:mm:ss)	0 : 0 : 0	
PwrOn After AC Power Loss	[On]	

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

ACPI Function: This item allows you to enable or disable the Advanced Configuration and Power Management (ACPI). The settings are "Enabled" and "Disabled".

Power Management:

Min. Power Saving	Minimum power management. Doze Mode=1hr. Standby Mode =1hr., Suspend Mode=1hr., and HDD Power Down=15min.
Max. Power Saving	Maximum power management. –Only available for SL CPU's. Doze Mode=1min., Standby Mode=1min., Suspend Mode=1min., and HDD Power Down=1min.
User Defined	Allow you to set each mode individually. When not disabled, each of the ranges is from 1 min. to 1 hr. except for HDD Power Down, which ranges from 1 min. to 15 min. and disabled.

Video Off Option: This option is for choosing the setting in which the monitor will turn off. The default setting is "Suspend".

Always On	Always turn on.
Suspend	During Suspend mode, the monitor will be turned off.
All Modes	During All Modes mode, the monitor will be turned off.

Video Off Method: This determines the manner in which the monitor is blanked. The default setting is "V/H SYNC+Blank".

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blank to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Suspend Mode: Power saving by suspends mode setting.

HDD Power Down: Options are from "1 Min". to "15 Min". and "Disable". The IDE hard drive will spin down if it is not accessed within a specified length of time.

LPT & COM: Print Port and COM Port turn on/off.

Power On by LAN/Ring: When Enabled, an input signal on the serial LAN/Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

Power On by RTC Alarm: Power-on interval by RTC setting.

PwrOn After AC Power Loss: This option specifies the Power ON/OFF Status after AC power loss.

3.8 PnP/PCI Configuration

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility; otherwise the motherboard will not work properly.

PnP/PCI Configuration Setup Screen

Phoenix – Award BIOS CMOS Setup Utility

PnP/PCI Configurations

		Item Help
PNP OS Installed	[No]	Menu Level ► Select Yes if you are using a Plug and Play capable operating system. Select No if you need the BIOS to configure non-boot devices.
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Manual]	
► IRQ Resources	[Press Enter]	
► DMA Resources	[Press Enter]	
► Memory Resources	[Press Enter]	
PCI/VGA Palette Snoop	[Disabled]	
PCI Latency Timer (CLK)	[32]	
INT Pin 1 Assignment	[Auto]	
INT Pin 2 Assignment	[Auto]	
INT Pin 3 Assignment	[Auto]	
INT Pin 4 Assignment	[Auto]	

↑ ↓ → Move Enter: Select +/-/PU/PD: ValueF10: Save Esc: Exit F1: General Help
F5: Previous Values F7: Optimized Defaults

PNP OS Installed: When set to "Yes", BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95 or 98. When set to "No", BIOS will initialize all the PnP cards. So, for non-PnP operating system (DOS, Netware®), this option must set to "Yes".

Reset Configuration Data: Normally, you leave this field "Disabled", Select "Enabled" to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot. The settings are: "Enabled and 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®98. If you set this field to "Manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a " "). The settings are "Auto (ESCD)", "Manual".

IRQ Resources: When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt.

			Item Help
IRQ-3	assigned to	[Legacy ISA]	Menu Level Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
IRQ-4	assigned to	[Legacy ISA]	
IRQ-5	assigned to	[PCI /ISA PNP]	
IRQ-7	assigned to	[Legacy ISA]	
IRQ-9	assigned to	[PCI /ISA PNP]	
IRQ-10	assigned to	[PCI /ISA PNP]	
IRQ-11	assigned to	[PCI /ISA PNP]	
IRQ-12	assigned to	[PCI /ISA PNP]	
IRQ-14	assigned to	[PCI /ISA PNP]	
IRQ-15	assigned to	[PCI /ISA PNP]	

DMA Resources: The sub menu can let you control the DMA resource.

			Item Help
DMA-0	assigned to	[PCI /ISA PnP]	Menu Level Legacy ISA for devices compliant with the original PC AT bus specification, PCI/ISA PnP for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.
DMA-1	assigned to	[PCI /ISA PnP]	
DMA-3	assigned to	[PCI /ISA PnP]	
DMA-5	assigned to	[PCI /ISA PnP]	
DMA-6	assigned to	[PCI /ISA PnP]	
DMA-7	assigned to	[PCI /ISA PnP]	

Memory Resources: This option specifies the size of the memory area reserved for legacy ISA adapter cards.

PCI/VGA Palette Snoop: Leave this field at "Disabled". The settings are "Enabled", "Disabled".

PCI Latency Timer (CLK): This option specifies the latency timings (in PCI clocks) for PCI devices installed in the PCI expansion slots.

The Latency Timer limits the time that device can hold the PCI bus. The timer starts when the device gains bus ownership, and counts down at the rate of the PCI clock. When the counter reaches zero, the device is required to release the bus.

INT Pin 1/2/3/4 Assignment: These options specify the IRQ priority for PCI devices installed in the PCI expansion slots.

3.9 PC Health Status (Optional)

This section helps you to get more information about your system including CPU temperature, FAN speed and voltages. It is recommended that you contact your motherboard supplier to get proper value about your setting of the CPU temperature.

Phoenix – Award BIOS CMOS Setup Utility

PC Health Status

CPU Temperature.	51°C / 123°F	Item Help
System Temperature	30°C / 86°F	Menu Level ►
FAN1	0 RPM	
Vcore	1.17 V	
+2.5V	2.47 V	
+3.3V	3.25 V	
+5V	5.02 V	

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

CPU Temperature: This item shows the CPU temperature.

System Temperature: This item displays the value of system temperature.

FAN1: This item displays the value of FAN1 speed.

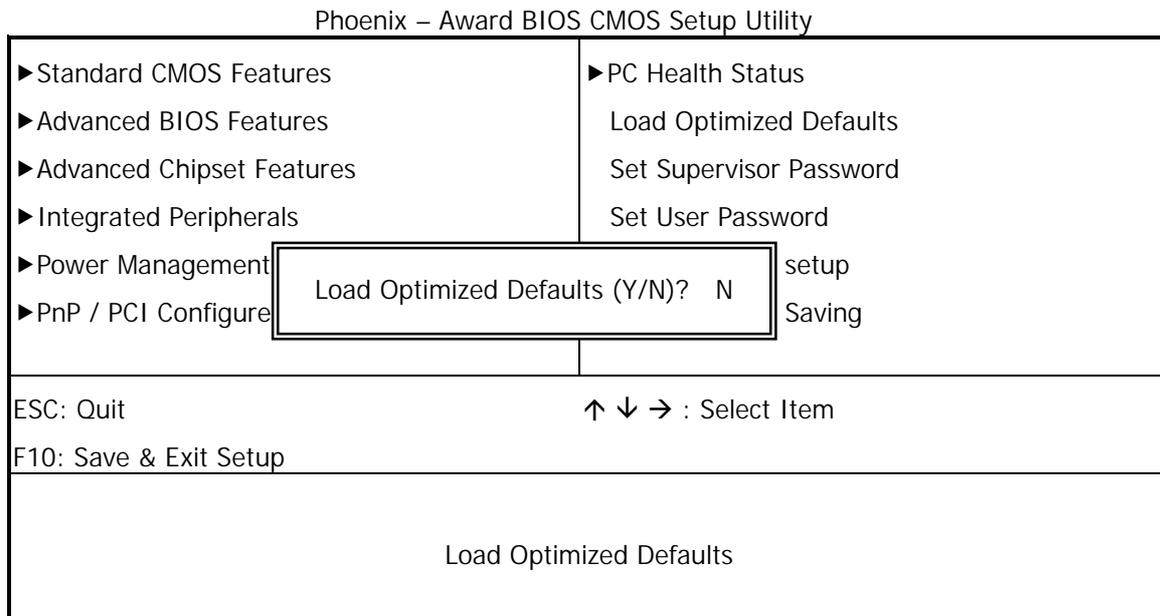
Vcore: This item shows the current system voltage.

3.10 Load Optimized Defaults

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

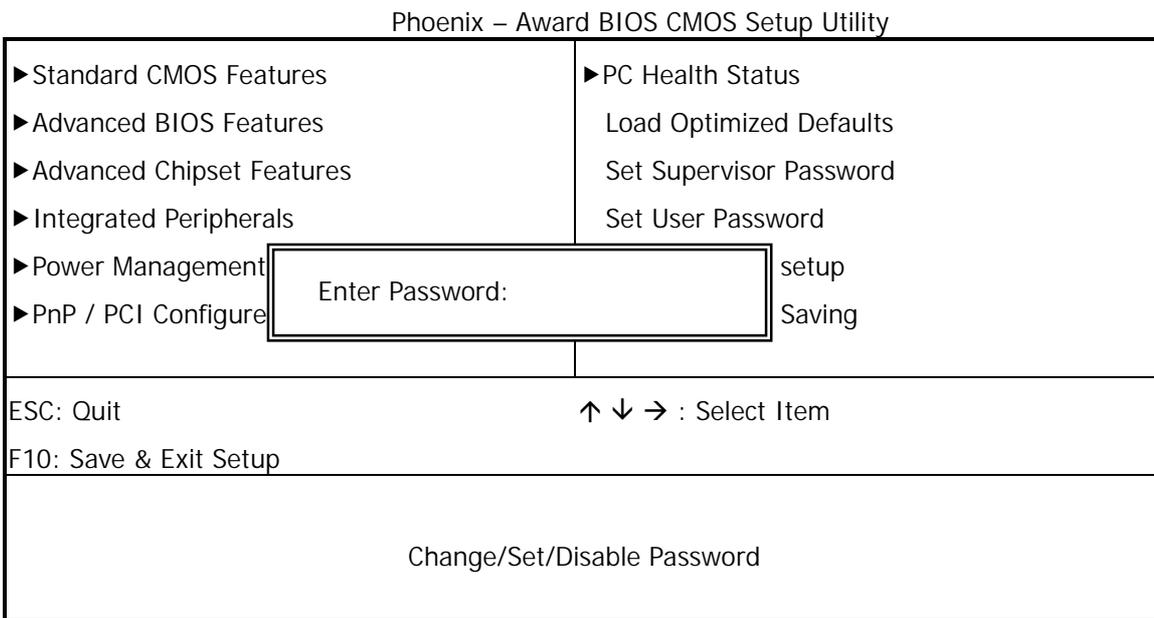
Load Optimized Defaults (Y/N)? N

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



3.11 Set Supervisor / User Password

The "SUPERVISOR/USER PASSWORD" utility sets the password. The SBC is shipped with the password disabled. If you want to change the password, you must first enter the current password, and then at the prompt -- enter your new password. The password is case sensitive, and can be up to 8 alphanumeric characters. Press <Enter> after you have finished typing in the password. At the next prompt, confirm the new password by re-typing it and pressing <Enter> again. When you are done, the screen automatically reverts to the main screen. Remember that when you use this feature, the "Security Option" line in BIOS FEATURES SETUP will determine when entering the password will be required.



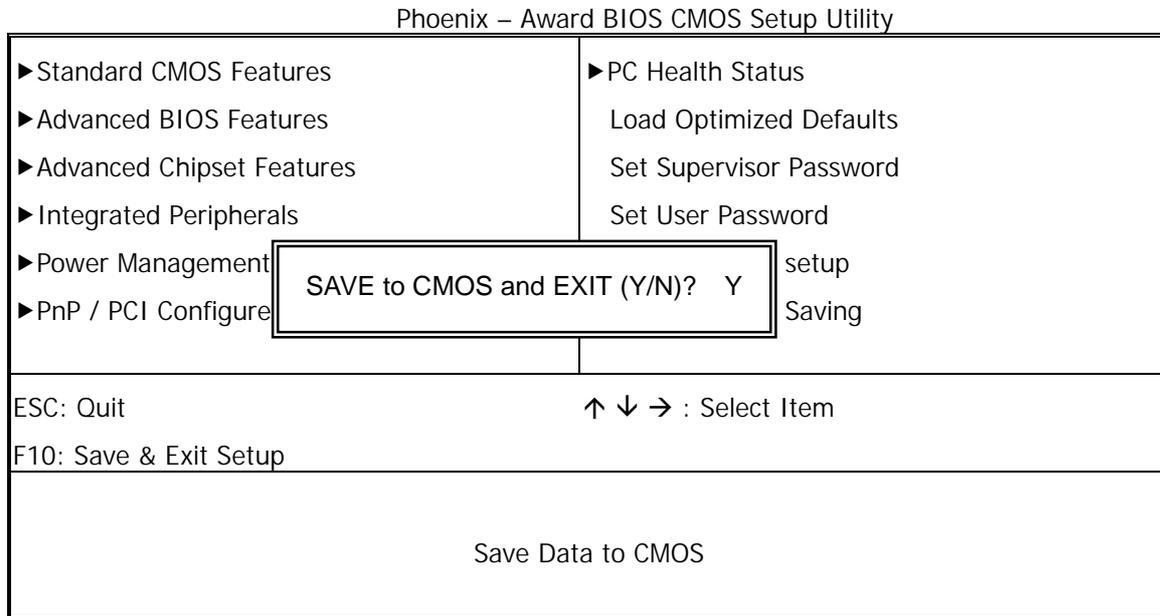
To disable the password, press the <Enter> key instead of entering a new password when the "Enter Password" in the dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note: If you forget your password, the only way to solve this problem is to discharge the CMOS memory.

3.12 Save & Exit Setup

Select this option and press the <Enter> key to save the new setting information in the CMOS memory and continue with the booting process.



3.13 Exit Without Saving

Select this option and press the <Enter > key to exit the Setup Utility without recording any new values or changing old ones.

Phoenix – Award BIOS CMOS Setup Utility

▶ Standard CMOS Features	▶ PC Health Status
▶ Advanced BIOS Features	Load Optimized Defaults
▶ Advanced Chipset Features	Set Supervisor Password
▶ Integrated Peripherals	Set User Password
▶ Power Management	setup
▶ PnP / PCI Configure	Saving
Quit Without Saving (Y/N)? N	
ESC: Quit	↑ ↓ → : Select Item
F10: Save & Exit Setup	
Abandon all Data	

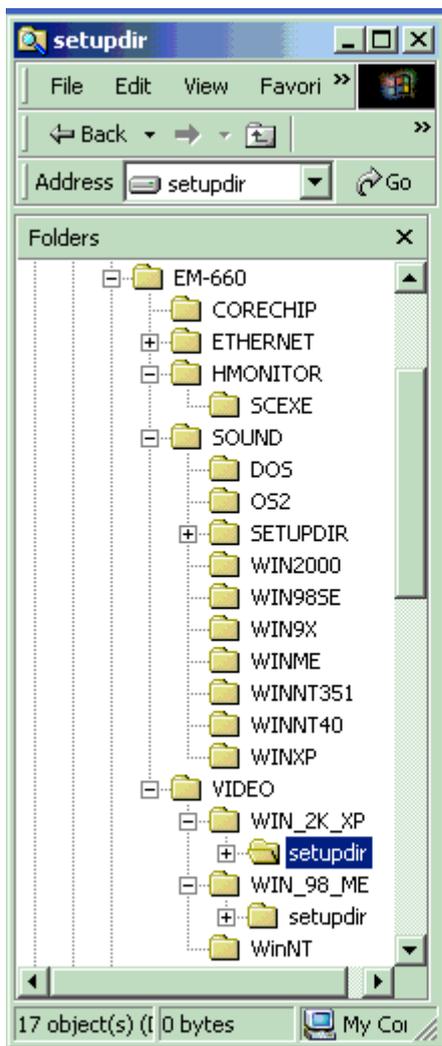
Chapter 4 Drivers Support

4.1 Use Your Driver CD-ROM

This chapter provides information on how to install the drivers in generally and related directory that come with the CD-ROM in the package. Please follow the instructions set forth on the screen carefully.

1. Find the directory for your O/S accordingly.
2. Always read the README.TXT before installation
3. Run the *.EXE and follow the installation prompt step by step.

4.2 File Directory



Note: Windows Windows XP and ME should optimally configure the VIA chipset. Not need to run VIA Chipset Software Installation Utility.

APPENDIX A. Watch-Dog Timer

To use the watch-dog timer:

- Step 1.** Enable and re-trigger the Watchdog timer: Output port **443H**
Step 2. Disable : Output port **441H**

EX.1: For DOS

Execute the **DEBUG.EXE** file under DOS, Then key-in **O443**. The system will reboot automatically according to the time-out you set.

Enable

```
C:\DOS> DEBUG
O 443 0~F
```

Disable

```
C:\DOS> DEBUG
O 441 0~F
```

EX.2: For assemble Language

Enable:

```
:
:
MOV  DX, 443H
OUT  DX, AL
:
:
```

Disable:

```
:
:
MOV  DX, 441H
OUT  DX, AL
:
```

APPENDIX B. Brightness Control

Under Command:

RUN EM60LAWD.EXE

EM-660 LCD Panel Bright Control . For AWD BIOS.

VT686B GP04 (push up) Press +

VT686B GP05 (push down) Press-

Please input (+ / - /other key to exit)

Terms and Conditions

Date: 2003.02.27

Warranty Policy

1. All products are warranted against defects in materials and workmanship on a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (for the replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service", RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty..
 - A. Improper or inadequate maintenance by the customer.
 - B. Unauthorized modification or misuse.
 - C. Operation outside of the environmental specifications for the product.

RMA Service

1. **Request a RMA#:**

Complete and fax to Supplier the "RMA Request Form" to obtain a RMA number.

2. **Shipping:**

- A. The customer is requested to fill up the problem code as listed. If none of the code is selected, please write the symptom description on the remark.
- B. Ship the defective units with freight prepaid.
- C. Mark the RMA # clearly on the box.
- D. Shipping damage as a result of inadequate packing is the customer's responsibility.
- E. Use the original packing materials whenever possible.

3. **All RMA# are valid for 30 days only:**

When RMA goods are received after valid RMA# period, the goods will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out this "RMA Service Request Form".
Without this form your RMA will be REJECTED!!!

RMA No:	Reasons to Return: <input type="checkbox"/> Repair(Please include failure details) <input type="checkbox"/> Testing Purpose		
Company:	Contact Person:		
Phone No.	Purchased Date:		
Fax No.:	Applied Date:		
Return Shipping Address: _____			
Shipping by: <input type="checkbox"/> Air Freight <input type="checkbox"/> Sea <input type="checkbox"/> Express :_____ <input type="checkbox"/> Others:_____			

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

***Problem Code:**

- | | | | |
|------------------------|------------------------------|--------------------|--------------------------|
| 01: D.O.A. | 07: BIOS Problem | 13: SCSI | 19: DIO |
| 02: Second Time R.M.A. | 08: Keyboard Controller Fail | 14: LPT Port | 20: Buzzer |
| 03: CMOS Data Lost | 09: Cache RMA Problem | 15: PS2 | 21: Shut Down |
| 04: FDC Fail | 10: Memory Socket Bad | 16: LAN | 22: Panel Fail |
| 05: HDC Fail | 11: Hang Up Software | 17: COM Port | 23: CRT Fail |
| 06: Bad Slot | 12: Out Look Damage | 18: Watchdog Timer | 24: Others (Pls specify) |

Request Party

Confirmed By Supplier

Authorized Signatures / Date

Authorized Signatures / Date