POS-478

Socket 478 Pentium 4 with

Multimedia POS Control Board

User Manual

Version 1.1

August 21, 2003

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Support

Any questions regarding the product or the content of this manual please email us at: support@iei.com.tw

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1. Introduction

Thank you for choosing POS-478 Socket 478 Pentium 4 with Multimedia POS Control Board.   POS-478 board is an POS form factor board equipped with high performance processor and advanced high performance multi-mode I/O, designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

POS-478 is built-in with AGP4X VGA (Intel 845GV), which is a VGA controller supporting 3D graphics capability to provide up to 2048x1536x16-color resolution. The onboard VGA shares 8MB system DDR-SDRAM.   POS-478 provides a highly integrated scaling IC with LVDS Transmitter with a scaled resolution up to SXGA for single pixel Input.   It supports up to 48-bit color TFT LCD.

An advanced high performance super AT I/O chip — ITE IT8712 is used in POS-478 board.   Both on-chip UARTs are compatible with the NS16C550.   The parallel port and IDE interface are compatible with IBM PC/AT architecture.

POS-478 has one 10/100 Fast Ethernet LAN built-in (ICH4) and one Intel 82540 Gigabit LAN.   They are of high performance networking functions and low power features.

POS-478 is equipped with IEEE1394 controller (TI TSB43AA22).   You can connect it to your 1394 devices.   POS-478 also provides two Serial ATA ports to connect with Serial ATA devices.

POS-478 uses the advanced Intel 845GV Chipsets which are 100% software compatible chipset with PCI 2.2 standard.

1.1 Specifications

CPU (PGA 478)	Intel Pentium 4 processor. Supports 400/533 MHz FSB.
Bus speed	PCI: 33MHz
DMA channels	7
Interrupt levels	15
Chipset	INTEL 845GV (GMCH)
Real-time clock	INTEL 82801DB (ICH4)
System memory	Two 184-pin DIMM sockets support DDR 200/266 SDRAM. The maximum memory is up to 2 GB.
ATA/100 IDE interface	Up to four PCI Enhanced IDE hard drives. The ATA/100 IDE can handle data transfer up to 100MB/s. Compatible with existing ATA-2 IDE specifications its best advantage, so there is no need to do any changes for user's current accessories.
Floppy disk drive interface	Supports up to two floppy disk drives, 5.25"(360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB).
Serial ports	COM1 (RS-232), COM2 (RS-232/RS-422/ RS-485), COM3 (RS-232) & COM4 (RS-232) with 16C550 UART (or compatible) with 16-byte FIFO buffer. Support up to 115.2Kbps. Ports can be individually configured to COM1, COM2, COM3, COM4 or disabled.
Bi-directional parallel port	Configurable to LPT1, LPT2 or disabled. Supports EPP/ECP/SPP.
Hardware monitor	Built-in to monitor power supply voltage and fan speed status.
IrDA port	Supports Serial Infrared (SIR) and Amplitude Shift Keyed IR (ASKIR) interface.
USB port	Supports 6 USB2.0 ports for future expansion.
Watch-dog timer	Software Programmable Reset generated when CPU does not periodically trigger the timer. Your can use BIOS INT15 to control the watchdog and generate a system reset.
VGA controller	Built-in AGP2.0 4X 3D graphics engine. Share system DDR SDRAM 8M. Screen Resolution: up to 2048x1536x16.
LVDS connector	Extra Display output, Support up to 48-bit color TFT LCD. Resolution up to SXGA for single pixel input.

Ethernet	One ICH4 Fast Ethernet controllers, IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard. One Intel 82540 Gigabit LAN. Two RJ45 connectors are located on board for easy connection.
Serial ATA	Support Two independent serial ATA channels. Serial ATA generation 1 transfer rate of 150MB/s. (Only for POS-478S)
1394 Port	Support Two 1394 ports compliant with 1394 OHCI specification 1.1, IEEE 1394-1395 and 1394a-2000.
Keyboard and PS/2 mouse connector	6-pin mini DIN connector is located on board for easy connection to a keyboard and PS/2 mouse. For alternative application, a keyboard and a PS/2 mouse pin header connector are also available on board.
Digital input/output	It provide with 4bit digital input/output (+5V level). Your can use I/O PORT 201H to control it.
Audio	AC'97 Audio CODEC
PCI Slot	Expansion bus, only PCI slot are provided.
Compact flash	It can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
Power consumption	(PENTIUM 4: 2GHz, 1GB DDR PC2700 SDRAM) +5V @ 4.7A, +12V @ 7A, +3.3V@ 4.2A, +5VSB @ 0.5A, -12V @ 0.1A Recommended: 350-watt power supply or higher
Operating temperature	0℃~60℃ (*CPU needs Cooler & silicone heatsink paste*)

WARNING!

1. Never run the processor without the heat sink (cooler) properly and firmly attached.

2. Please use ATX-12V Power Connector (PW1) to provide power to the CPU.

1.2 Package Contents

In addition to this User's Manual, POS-478 package includes the following items:

- POS-478 with Multimedia POS Control Board x 1
- FDD cable x 1
- ATA/100 IDE cable x 1
- Serial ATA IDE cable (only for POS-478S) x 2
- Serial ATA Power cable (only for POS-478S) x 1
- Printer cable x 1
- RS-232 serial port cable x 1
- Power cable for P4 CPU x 1
- Driver CD x 1

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

2. Installation

This chapter describes how to install POS-478. Follow the instructions and unpacking precautions carefully.

2.1 POS-478 Layout
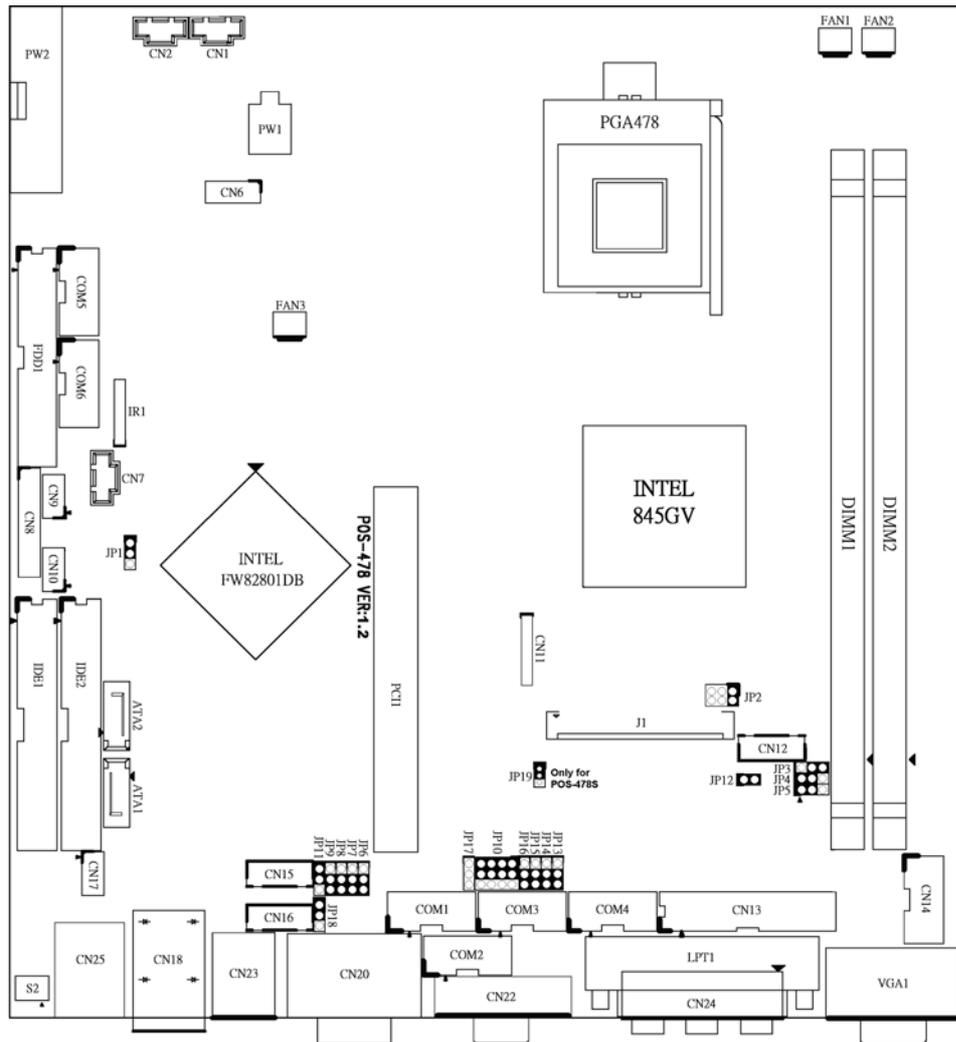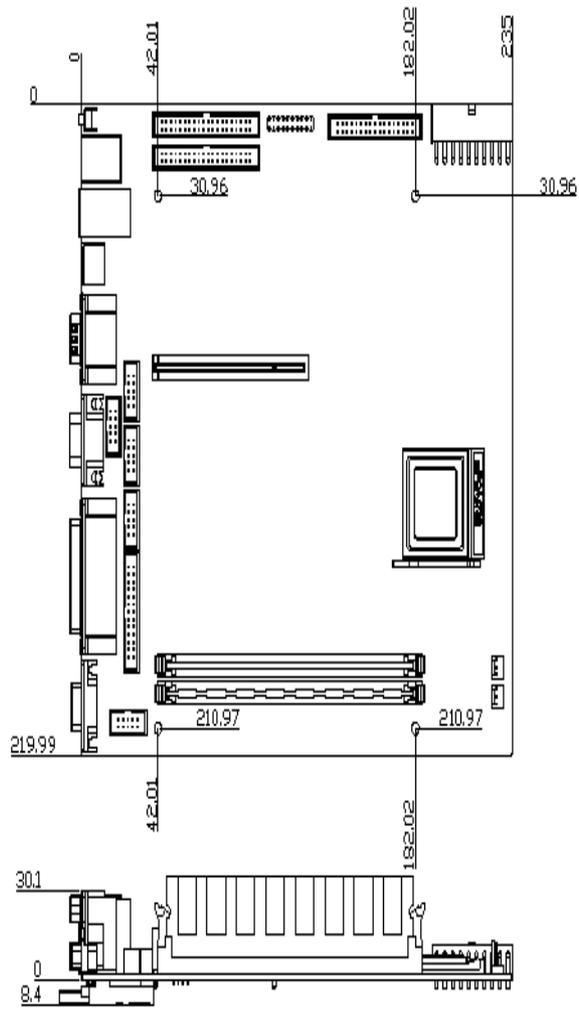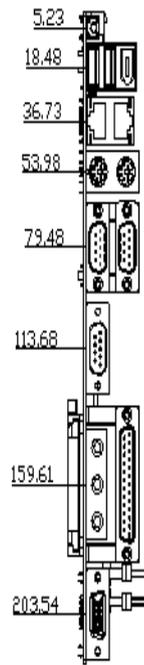
2.2 Unpacking Precautions

Some components on POS-478 with Multimedia POS Control Board are very sensitive to static electric charges and can be damaged by a sudden rush of power.   To protect it from unintended damage, be sure to follow these precautions:

- Ground yourself to remove any static charge before touching POS-478. You can do it by using a wrist strap connected to the ground or by frequently touching any conducting materials connected to the ground.

- Handle your POS-478 by its edges.   Do not touch IC chips, leads or circuitry.

- Do not plug any connector or jumper when the power is on.

Table of Jumpers

Label	Function
JP1	CMOS State Setting
JP2	LCD Voltage Setting
JP3	LCD 24 bit or 18 bit LCD Setting
JP4	LCD CLK Signal Setting
JP5	LCD Single Pixel or Dual Pixel Setting
JP6	Set pin 9 of COM2 Voltage Setting
JP7	Set pin 9 of COM1 Voltage Setting
JP8	Set pin 9 of COM2 as Signal RI or Voltage Setting
JP9	Set pin 9 of COM1 as Signal RI or Voltage Setting
JP10	COM2 Mode Setting
JP11	COM2 Mode RS-232 or RS-422/RS-485 Setting
JP12	CompactFlash Master/Slave Setting
JP13	Set pin 9 of COM3 Voltage Setting
JP14	Set pin 9 of COM4 Voltage Setting
JP15	Set pin 9 of COM3 as Signal RI or Voltage Setting
JP16	Set pin 9 of COM4 as Signal RI or Voltage Setting
JP17	COM2 Mode RS-422 or RS-485 Setting
JP18	Keyboard & Mouse Power Source Setting
JP19	Enable or Disable Serial ATA (only for POS-478S)

2.3 CompactFlashDisk™ TYPE II Flash Disk Setting

The CompactFlashDisk™ is 100% compatible to IDE hard disk.   It is "plug and play", easy to use and reliable.   The CompactFlashDisk™ is available from 8MB to 1GB.

- **JP12: CompactFlashDisk™ IDE Master & Slave Setting**

PIN	Description
Open	Slave
Short	**Master**

2.4 Clear CMOS Setup

If you forget the CMOS password, you can clear or reset it by closing the JP1. After JP1 (2-3) is closed, turn on the power for about 3 seconds then turn it off and open the JP1 (2-3).   Now, the password has been cleared from your CMOS.

- **JP1: Clear CMOS Setup**

PIN	Description
1-2	Normal Operation
2-3	Clear CMOS Setup

2.5 COM2 RS-232/422/485 Selection

- **JP10, JP11, JP17: COM2 Mode Selection**

```
   3   6   9   12
   •   •   •   •
   •   •   •   •                  •   •   •
   •   •   •   •

   2   5   8   11        1   2   3
   1   4   7   10   (JP10)    (JP11, JP17)
```
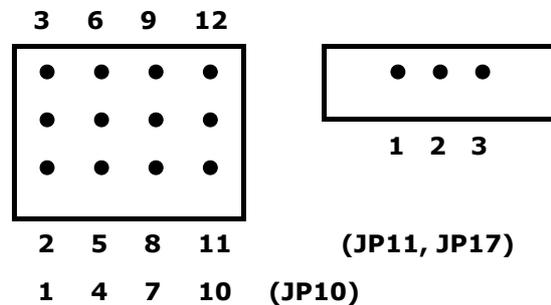
JP10	JP11	JP17	Description
1-2,4-5,7-8,10-11	1-2	NA	RS-232
2-3,5-6,8-9,11-12	2-3	1-2	RS-422
2-3,5-6,8-9,11-12	2-3	2-3	RS-485

2.6 COM Port RI and Voltage Selection

- **JP7, JP9: Set pin 9 of COM1 as signal RI or voltage source**

JP9	Description
2-3	COM1 RI PIN Use RI
1-2	COM1 RI PIN Use Voltage

JP7	Description
2-3	COM1 RI PIN Use Voltage +12V
1-2	COM1 RI PIN Use Voltage +5V

*The use of JP7 (2-3) or (1-2) will not make any difference when JP9 (2-3) is in use.

- **JP6, JP8: Set pin 9 of COM2 as signal RI or voltage source**

JP8	Description
2-3	COM2 RI PIN Use RI
1-2	COM2 RI PIN Use Voltage

JP6	Description
2-3	COM2 RI PIN Use Voltage +12V
1-2	COM2 RI PIN Use Voltage +5V

*The use of JP6 (2-3) or (1-2) will not make any difference when JP8 (2-3) is in use.

- **JP13, JP15: Set pin 9 of COM3 as signal RI or voltage source**

JP15	Description
2-3	**COM3 RI PIN Use RI**
1-2	COM3 RI PIN Use Voltage

JP13	Description
2-3	**COM3 RI PIN Use Voltage +12V**
1-2	COM3 RI PIN Use Voltage +5V

*The use of JP13 (2-3) or (1-2) will not make any difference when JP15 (2-3) is in use.

- **JP14, JP16: Set pin 9 of COM4 as signal RI or voltage source**

JP16	Description
2-3	**COM4 RI PIN Use RI**
1-2	COM4 RI PIN Use Voltage

JP14	Description
2-3	**COM4 RI PIN Use Voltage +12V**
1-2	COM4 RI PIN Use Voltage +5V

*The use of JP14 (2-3) or (1-2) will not make any difference when JP16 (2-3) is in use.

2.7 Keyboard & Mouse Power Source Setting

- **JP18: Keyboard & Mouse Power Selection**

JP18	Description
1-2	**VCC**
2-3	5VSB

2.8 LCD Panel Setup

POS-478 provides a highly integrated scaling IC with LVDS Transmitter with a scaled resolution up to SXGA for single pixel Input.   Supports up to 48-bit color TFT LCD.

PANEL MODEL	JP2	JP3	JP4	JP5
LG LP150X1	1-2	2-3	1-2	1-2
ChiMei M170E4	3-4	2-3	1-2	OPEN
Toshiba LTM15C423S	1-2	2-3	1-2	OPEN
Torisan TM121XG-02	1-2	2-3	1-2	1-2
ChiMei M150X3-L04	1-2	2-3	1-2	1-2
LG LM150X06 (A3)	1-2	2-3	1-2	1-2
IMES DM121-53DR	1-2	2-3	1-2	1-2
UniPac UB104S01	1-2	2-3	1-2	1-2

- **JP2: LCD Voltage Setting**

JP2	Description
1-2	+3.3V
3-4	+5V
5-6	+12V

- JP3: 24-bit or 18-bit LCD Selection (for one pixel).   Tie to DVCC to select non-conventional color mapping 24 bit LCD only.   Tie to GND to select 18-bit LCD.   This setting also is for 24-bit LCD with conventional color mapping.

JP3	Description
2-3	GND
1-2	DVCC

- JP4: Tie to DVCC, DS90C2501 will invert CLKINP and CLKINM signals internally.   This feature can save PCB layout error by accidentally swap CLKINP and CLKINM pins.   Default setting is DVCC.

JP4	Description
1-2	DVCC
2-3	GND

- JP5: Tie DUAL pin to DVCC for single pixel in to single pixel out operation. Tie DUAL pin to 1/2 DVCC for single pixel in to dual pixel out operation. This is for LCD requires dual pixel input.   Default setting is DVCC.

JP5	Description
1-2	DVCC
2-3	GND
OPEN	1/2 DVCC

2.9   Serial ATA Enable/Disable Setting

- **JP19: Enable / Disable Serial ATA Function.   (Only for POS-478S)**

JP19	Description
1-2	Enabled
2-3	Disabled

3. Connection

This chapter describes how to connect peripherals, switches and indicators to POS-478 board.

3.1 Floppy Disk Drive Connector

POS-478 board is equipped with a 34-pin daisy-chain driver connector cable.

- **FDD1: FDD Connector**

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

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE (Integrated Device Electronics) hard disk drives to POS-478 IDE controller.

IDE1, IDE2: Primary, Secondary IDE Connector

- **IDE1 (Blue), IDE2 (White): IDE Interface Connector**

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	N/C
21	IDE DRQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IDE CHRDY	28	GND
29	IDE DACK	30	GND
31	INTERRUPT	32	N/C
33	SA 1	34	N/C
35	SA 0	36	SA 2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GND

3.3 Parallel Ports

These ports are usually connected to printer. POS-478 includes two on-board parallel ports, accessed through one 25-pin D-type female connector LPT1 (LPT1) and one 26-pin flat-cable connector CN13 (LPT2).

- **LPT1: (LPT1 DB-25 Female) Parallel Port Connector**

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

- **CN13: (LPT2 Header 2.54 mm) Parallel Port Connector**

PIN	Description	PIN	Description
1	STROBE#	2	AUTO FORM FEED #
3	DATA 0	4	ERROR#
5	DATA 1	6	INITIALIZE
7	DATA 2	8	PRINTER SELECT LN#
9	DATA 3	10	GND
11	DATA 4	12	GND
13	DATA 5	14	GND
15	DATA 6	16	GND
17	DATA 7	18	GND
19	ACKNOWLEDGE	20	GND
21	BUSY	22	GND
23	PAPER EMPTY	24	GND
25	PRINTER SELECT	26	N/C

3.4   Serial Ports

POS-478 offers four high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO serial ports (COM1/COM2/COM3/COM4).

- **COM1: Serial Port 2x5 pin header Connector**

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

- **CN20A: Serial Port DB-9 Male Connector (COM1)**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- **COM2: Serial Port 2 x 5 Pin Header Connector**
  COM2 Support Three Mode: RS-232, RS-422, And RS-485

  (For 2 x 5 pin header connector)

  RS-232 Mode

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

  RS-422 Mode

PIN	Description	PIN	Description
1	TXD-	2	RX-
3	TXD+	4	RX+
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

RS-485 Mode

PIN	Description	PIN	Description
1	RTX-	2	NC
3	RTX+	4	NC
5	NC	6	NC
7	NC	8	Voltage
9	NC	10	NC

- **CN20B: Serial Port DB-9 Male Connector (COM2)**

  COM2 supports three modes: RS-232, RS-422, RS-485 (For DB-9 Connector)

RS-232 Mode

PIN	Description	PIN	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTX
4	DTR	9	RI
5	GND		

RS-422 Mode

PIN	Description	PIN	Description
1	TXD-	6	RX-
2	TXD+	7	RX+
3	NC	8	NC
4	NC	9	Voltage
5	NC		

RS-485 Mode

PIN	Description	PIN	Description
1	RTX-	6	NC
2	RTX+	7	NC
3	NC	8	NC
4	NC	9	Voltage
5	NC		

- **COM3: Serial Port 2x5 Pin Header Connector**

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

- **COM4: Serial Port 2x5 Pin Header Connector**

PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTX
7	DTR	8	RI
9	GND	10	NC

- **CN22: Serial Port DB-9 Male Connector (COM4)**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND (GND)
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

3.5 Keyboard / Mouse Connector

POS-478 provides one keyboard and one mouse header connector, one external keyboard & Mouse connector.

- **CN23A (Purple): Extended Keyboard 6-pin Mini Din Connector**

PIN	Description
1	KB DATA
2	NC
3	GND
4	VCC
5	KB CLOCK
6	NC

- **CN23B (Green): Extended Mouse 6-pin Mini Din Connector**

PIN	Description
1	MS DATA
2	NC
3	GND
4	VCC
5	MS CLOCK
6	NC

- **CN16: 5-pin Header Keyboard Connector**

PIN	Description
1	KB CLOCK
2	KB DATA
3	N/C
4	GND
5	+5V

- **CN15: PS/2 Mouse 5-pin Header Connector**

PIN	Description
1	MS CLOCK
2	MS DATA
3	N/C
4	GND
5	+5V

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board.   All the functions are in the CN8 connector.

- **CN8: Multi Panel**

PIN	Description	PIN	Description
1	SPEAKER	11	POWER-VCC
2	ACPI LED	12	N/C
3	N/C	13	GND
4	+5V	14	KEYLOCK
5	RESET SW	15	GND
6	GND	16	GND
7	IDE LED -	17	N/C
8	IDE LED+	18	ATX POWER CONTROL
9	ATX POWER BUTTON	19	ATX 5VSB
10	GND	20	ATX 5VSB

3.7 USB Port Connector

POS-478 has six built-in USB ports for the future new I/O bus expansion.

- **CN9, CN10: 8-PIN Header USB Connectors**

```
 7   5   3   1
┌───────────────┐
│ O   O   O   O │
│ O   O   O   O │
└───────────────┘
 8   6   4   2
```
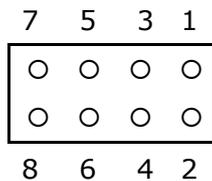
PIN		Description
1	8	VCC
3	6	USBD0-
5	4	USBD0+
7	2	GND

- **CN25A: 2 External USB Connectors**

PIN		Description
1	5	VCC
2	6	USBD0-
3	7	USBD0+
4	8	GND
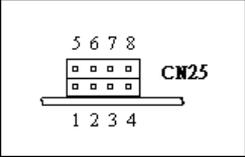
3.8   IrDA Infrared Interface Port

POS-478 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface.   To use the IrDA port, configure the FIR or ASKIR model in the Peripheral Setup COM2 in BIOS. Then the normal RS-232 COM2 will be disabled.

- **IR1: IrDA Connector**

PIN	Description
1	+5V
2	NC
3	IR-RX
4	GND
5	IR-TX
6	+5V

3.9 VGA Connector

POS-478 provides one DB-15 female connector and one built-in 10-pin VGA header connector can be connected directly to your monochrome CRT monitor as well as high resolution color CRT monitor.

- **VGA1: DB-15 Female VGA Connector**

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

- **CN14: 10-pin Header VGA Connector**

PIN	Description	PIN	Description
1	RED	2	SMCLK
3	GREEN	4	SMDATA
5	BLUE	6	GND
7	H-SYNC	8	GND
9	V-SYNC	10	GND

3.10 LAN RJ45 Connector

POS-478 is equipped with one 10/100Mbps Ethernet Controller (built in INTEL ICH4) and one 10/100Mbps or 100Mbps/1Gbps Ethernet Controller (Intel 82551 or 82540).　You can connect it to your LAN through RJ45 LAN connector.　The pin assignments are as follows:

- **CN18: LAN RJ45 Connector**

PIN	Description	PIN	Description
1	TX+	5	N/C
2	TX-	6	RX-
3	RX+	7	N/C
4	N/C	8	N/C
13	MDX0+	17	MDX2-
14	MDX0-	18	MDX1-
15	MDX1+	19	MDX3+
16	MDX2+	20	MDX3-

- **CN17: LAN Link and Active LED Connector**

PIN	Description	PIN	Description
1	ICH4_ACT+	2	ICH4_ACT-
3	ICH4_LINK+	4	ICH4_LINK-
5	Intel_ACT+	6	Intel_ACT-
7	Intel_LINK+	8	Intel_LINK-

3.11 Fan Connector

POS-478 provides CPU cooling and system fan connectors.   These connectors can supply 12V/500mA to the cooling fan.

- **FAN1: CPU Fan Connector**

PIN	Description
1	GND
2	+12V
3	Fan Sensor

- **FAN2: System Fan Connector**

PIN	Description
1	GND
2	+12V
3	Fan Sensor

3.12 LCD Backlight Connector

- **CN12: LCD Backlight Connector**

PIN	Description	PIN	Description
1	NC	2	GND
3	+12V	4	GND
5	ENABKL		

3.13 LCD Panel LVDS Interface Connector

POS-478 provides a highly integrated scaling IC with LVDS Transmitter with a scaled resolution up to SXGA for single pixel Input.   It supports up to 48-bit color TFT LCD.

- **J1: DF14-30F LVDS Interface Connector**

PIN	Description	PIN	Description
1	GND	2	GND
3	A3P	4	A3M
5	CLK1P	6	CLK1M
7	A2P	8	A2M
9	A1P	10	A1M
11	A0P	12	A0M
13	GND	14	GND
15	A7P	16	A7M
17	CLK2P	18	CLK2M
19	A6P	20	A6M
21	A5P	22	A5M
23	A4P	24	A4M
25	GND	26	GND
27	LCD_VDD	28	LCD_VDD
29	LCD_VDD	30	LCD_VDD

3.14 Audio Connector

- **CN7: Audio CD IN (2.54mm)**

PIN	Description	PIN	Description
1	CD IN_L	2	GND
3	GND	4	CD IN_R

- **CN1: Audio AUX IN (2.54mm)**

PIN	Description	PIN	Description
1	AUX IN_L	2	GND
3	GND	4	AUX IN_R

- **CN2: Audio LINE OUT (2.54mm)**

PIN	Description	PIN	Description
1	LINEOUT_L	2	GND
3	GND	4	LINE OUT_R

- **CN24: Audio Jack**

Color	Description
RED	MIC IN
BLUE	LINE IN
GREEN	SPEAK OUT

3.15 Digital Input / Output

POS-478 provides you with digital input/output.

- **CN6: Digital Input / Output**

PIN	Description	PIN	Description
1	GND	2	+5V
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

3.16 CompactFlash TYPE II Storage Card Socket

POS-478 configures CompactFlash TYPE II Storage Card in IDE Mode.

- **CFA1: CompactFlash TYPE II Socket PIN Assignment**

PIN	Description	PIN	Description
1	GROUND	26	CARD DETECT1
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS1#	32	CS3#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	OBLIGATORY TO PULL HIGH
12	N/C	37	IRQ15
13	VCC	38	VCC
14	N/C	39	MASTER/SLAVE
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	N/C
19	A1	44	OBLIGATORY TO PULL HIGH
20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	N/C	49	D10
25	CARD DETECT2	50	GROUND

3.17 ATX Power Connector

PW2 is a 20-pin ATX Power Supply Connector.   Please refer to the following table for the pin assignments.

- **PW2: ATX Power Supply Connector**
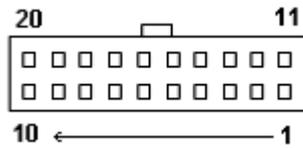
PIN	Description	PIN	Description
11	3.3V	1	3.3V
12	-12V	2	3.3V
13	GND	3	GND
14	PS-ON	4	+5V
15	GND	5	GND
16	GND	6	+5V
17	GND	7	GND
18	-5V	8	Power good
19	+5V	9	5VSB
20	+5V	10	+12V

3.18 ATX-12V Power Connector

This connector supports the ATX power, functions such as modem Ring on, and wake-up LAN and soft power off are supported by mainboard.

- **PW1: ATX-12V Power Connector**

PW1			
PIN	**Description**	**PIN**	**Description**
1	GND	2	GND
3	+12V	4	+12V

Note: The power from PW1 should support at least 6.5A current for the use of P4 CPU.   If the power is not enough, the operation of CPU could be abnormal.   Be sure the power from power supply is enough, and don't share this power with other devices, such as hard disk etc.   You can use ICP's special cable for connection if your power supply doesn't have suitable cable.

3.19 Internal Switches and Indicators

There is one internal switch controlling your CPU board.

- **S2: Reset Switch**

PIN	Description	PIN	Description
1	Reset	2	GND

- **D7: Standby Voltage LED Indicator.**

3.20 IEEE-1394 Connector

POS-478 is equipped with IEEE1394 controller (TI TSB43AA22). You can connect it to your 1394 device through CN11, and CN25B connectors. The pin assignments are as follows:

- **CN11: 8-pin Header 1394 Connector**

PIN	Description	PIN	Description
1	+12V	2	GND
3	TPB-	4	TPB+
5	TPA-	6	TPA+
7	NC/FG	8	NC/FG

- **CN25B: 1394 Connector**

PIN	Description	PIN	Description
1	+12V	2	GND
3	TPB-	4	TPB+
5	TPA-	6	TPA+

3.21 Serial ATA Connector (only for POS-478S)

POS-478S provides 2 Serial ATA ports to connect with Serial ATA devices.

- **ATA1, ATA2: Serial ATA Connector**

PIN	Description	PIN	Description
1	S_TXP	3	S_RXN
2	S_TXN	4	S_RXP

4. AMI BIOS SETUP

4.1 Introduction

This manual discusses AMI Setup program built into the ROM BIOS.   The Setup program allows users to modify the basic system configuration.   This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.2 Starting Setup

AMI BIOS is immediately activated when you first power on the computer. BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it.   When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. By pressing the <Del>key when the following message appears briefly at the bottom of the screen during the POST.

    Press DEL to enter SETUP

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

PRESS F2 TO CONTINUE, DEL TO ENTER SETUP

4.3   Using Setup

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

Keys	Description
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F4 key	Reserved
F5 key	Reserved
F6 key	Reserved
F7 key	Reserved
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the **F1** key again.

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

4.5 Main Menu

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

```
              AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.54
            (C)2001 American Megatrends, Inc. All Rights Reserved

                         Standard CMOS Setup
                         Advanced CMOS Setup
                        Advanced Chipset Setup
                        Power Management Setup
                       PCI / Plug and Play Setup
                           Peripheral Setup
                        Hardware Monitor Setup
                        Auto-Detect Hard Disks
                         Change User Password
                       Change Supervisor Password
                  Auto Configuration with Optimal Settings
                 Auto Configuration with Fail Safe Settings
                        Save Settings and Exit
                          Exit Without Saving


           Standard CMOS setup for changing time, date, hard disk type, etc.
                  ESC:Exit  ↑↓:Sel  F2/F3:Color  F10:Save & Exit
```

Note that a brief description of each highlighted selection appears at the bottom of the screen.
The main menu includes the following main setup categories.   Recall that some systems may not include all entries.

Standard CMOS Setup
Use this menu for basic system configuration.

Advanced CMOS Setup
Use this menu to set the Advanced Features available on your system.

Advanced Chipset Setup
Use this menu to change the values in the chipset registers and optimize your system's performance.

Power Management Setup
When Disabled, SMI will not be initialized, and complete power management functionality is removed until this option is set to Enabled.

PCI / Plug and Play Setup

This entry appears if your system supports PnP / PCI.

Peripheral Setup

Use this menu to specify your settings for integrated peripherals.

Hardware Monitor Setup

Use this menu to monitor your hardware.

Auto-detect Hard Disks

Use this menu to specify your settings for hard disks control.

Change User Password

Use this menu to set User Password.

Change Supervisor Password

Use this menu to set Supervisor Password.

Auto Configuration with Optimal Settings

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

Auto Configuration with Fail-Safe Settings

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Save Settings and Exit

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

4.6 Standard CMOS Setup

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

Main Menu Selections

```
                    AMIBIOS SETUP - STANDARD CMOS SETUP
             (C)2001 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy): Tue Apr 22,2003                    Base Memory: 0 KB
Time (hh/mm/ss)  : 15:30:55                           Extd Memory: 0 MB

Floppy Drive A:    1.44 MB 3½
Floppy Drive B:    Not Installed
                                                 LBA  Blk  PIO  32Bit
          Type          Size    Cyln  Head WPcom Sec Mode Mode Mode Mode
Pri Master: Auto                                                    On
Pri Slave : Auto                                                   On
Sec Master: Auto                                                   On
Sec Slave : Auto                                                   On

Boot Sector Virus Protection    Disabled

Month:   Jan - Dec                            ESC:Exit  ↑↓:Sel
  Day:    01 - 31                             PgUp/PgDn:Modify
  Year: 1980 - 2099                           F1:Help F2/F3:Color
```

Item	Options	Description
Date	MM DD YYYY	Set the system date.
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
Floppy Drive A Floppy Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system.
Boot Sector Virus protection	Disabled Enabled	All it does is warn you when attempts are made to write to your boot sector or partition table.
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up

4.7 Advanced CMOS Setup

This section allows you to configure your system for basic operation.   You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

```
                   AMIBIOS SETUP - ADVANCED CMOS SETUP
             (C)2001 American Megatrends, Inc. All Rights Reserved
┌──────────────────────────────────────────────────┬─────────────────────┐
│ Quick Boot                        Enabled         │ Available Options:  │
│ 1st Boot Device                   Floppy          │    Disabled         │
│ 2nd Boot Device                   IDE-0           │ ► Enabled           │
│ 3rd Boot Device                   CD/DVD          │                     │
│ Try Other Boot Devices            Yes             │                     │
│ Boot From Lan                     Disabled        │                     │
│ Floppy Access Control             Read-Write      │                     │
│ Hard Disk Access Control          Read-Write      │                     │
│ S.M.A.R.T. for Hard Disks         Disabled        │                     │
│ BootUp Num-Lock                   On              │                     │
│ Floppy Drive Swap                 Disabled        │                     │
│ Floppy Drive Seek                 Disabled        │                     │
│ PS/2 Mouse Support                Enabled         │                     │
│ System Keyboard                   Absent          │                     │
│ Primary Display                   VGA/EGA         │                     │
│ Password Check                    Setup           │                     │
│ Boot To OS/2                      No              │                     │
│ CPU MicroCode Updation            Enabled         │ ESC:Exit  ↑↓:Sel    │
│ BIOS Protect                      Enabled         │ PgUp/PgDn:Modify    │
│ L1 Cache                          Enabled       ▼ │ F1:Help F2/F3:Color │
└──────────────────────────────────────────────────┴─────────────────────┘
```

Quick Boot

When set to Enabled, DRAM testing function will be disabled.

1st /2nd /3rd Boot Device

This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes.   The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.

Try Other Boot Devices

Set this option to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the 1st Boot Device, 2nd Boot Device, 3rd Boot Device, 4th Boot Device options.   The settings are Yes or No.

Boot From LAN

Set to Enabled to the system boot from LAN.

Floppy Access Control

This option specifies the read/write access that is set when booting from a floppy drive.   The settings are Read/Write or Read-Only.

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Hard Disk Access Control

This option specifies the read/write access that is set when booting from a hard disk drive.   The settings are Read/Write or Read-Only.

S.M.A.R.T. for Hard Disks

Self-Monitoring, Analysis and Reporting Technology.   This option can help BIOS to warn the user of the possible device failure and give user a chance to back up the device before actual failure happens.   The settings are Disabled, Enabled.

Boot Up Num-Lock

When on, this option turns off Num Lock when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard.

Floppy Drive Swap

Set this option to Enabled to permit drives A: and B: to be swapped. The settings are Enabled or Disabled.

Floppy Drive Seek

Set this option to Enabled to specify that floppy drives A: will perform a Seek operation at system boot.   The settings are Enabled or Disabled.

PS/2 Mouse Support

When this option is enabled, BIOS support a PS/2- type mouse.

System Keyboard

This option does not specify if a keyboard is attached to the computer.   It specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstation with no keyboard.   The settings are Absent, Present.

Primary Display

Select this option to configure the type of monitor attached to the computer. The settings are Monochrome, Color 40x25.Color 80x25,VGA/PGA/EGA, or Not Install.

Password Check

This option enables the password check option every time the system boots or the end user runs Setup.   If always is chosen a user password prompt appears every time the computer is tuned on.   If setup is chosen, the password prompt appears if BIOS is executed.

Boot To OS/2

Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the motherboard.   The settings are YES or NO.

BIOS Protect

Set this option to Disabled when you want to flash BIOS.

L1 Cache

The option enabled or disabled the internal cache memory in the processor.

L2 Cache

The option enables secondary cache memory.   Select Enabled to enable external cache memory, vice versa.

```
                    AMIBIOS SETUP - ADVANCED CMOS SETUP
            (C)2001 American Megatrends, Inc. All Rights Reserved

BootUp Num-Lock              On          ▲  Available Options:
Floppy Drive Swap           Disabled     ▓  ► Disabled
Floppy Drive Seek           Disabled     ▓    Enabled
PS/2 Mouse Support          Enabled      ▓    Cached
System Keyboard             Absent       ▓
Primary Display             VGA/EGA      ▓
Password Check              Setup        ▓
Boot To OS/2                No           ▓
CPU MicroCode Updation      Enabled      ▓
BIOS Protect                Enabled      ▓
L1 Cache                    Enabled      ▓
L2 Cache                    Enabled      ▓
System BIOS Cacheable       Disabled     ▓
C000,32k Shadow             Cached
C800,16k Shadow             Disabled
CC00,16k Shadow             Disabled
D000,16k Shadow             Disabled
D400,16k Shadow             Disabled     ESC:Exit  ↑↓:Sel
D800,16k Shadow             Disabled     PgUp/PgDn:Modify
DC00,16k Shadow             Disabled     F1:Help F2/F3:Color
```

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System BIOS Cacheable

When this option is set to Enabled, the System ROM area from F0000-FFFFF is copied (shadowed) to RAM for faster execution.

C000, 32k Shadow

When this option is set to Enabled, the Video ROM area from C0000-C7FFF is copied (shadowed) to RAM for faster execution.
Disabled: The contents of the video ROM are not copied to RAM.
Cached: The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM and can be written to or read from cache memory.
Enabled: The contents of the video ROM area from C0000h–C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

C800, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title.   The settings are Enable Disable, Cached.   The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000, 32k Shadow.

CC00, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title.   The settings are Enable Disable, Cached.   The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.800, 16k Shadow.

D000, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title.   The settings are Enable Disable, Cached.   The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. C00, 16k Shadow.

D400, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title.   The settings are Enable Disable, Cached.   The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.000, 16k Shadow.

D800, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.400, 16k Shadow.
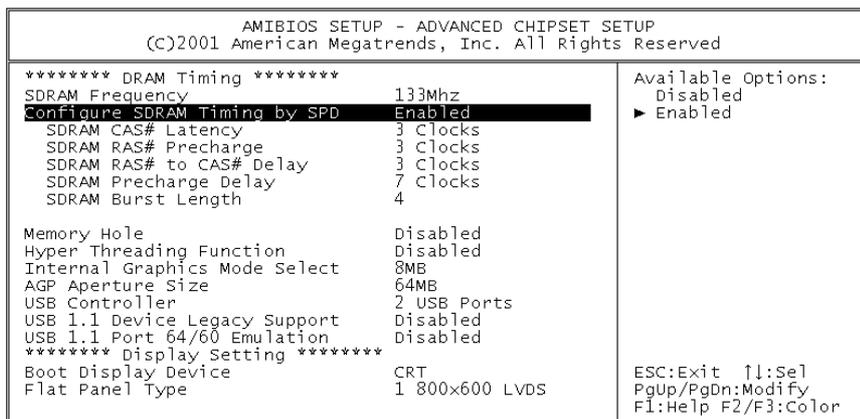
DC00, 16k Shadow

These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. ISA adapter cards will be allocated to PCI adapter cards.800, 16k Shadow.

4.8 Advanced Chipset Setup

```
           AMIBIOS SETUP - ADVANCED CHIPSET SETUP
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 ******** DRAM Timing ********                    Available Options:
 SDRAM Frequency               133Mhz               Disabled
 Configure SDRAM Timing by SPD Enabled            ► Enabled
   SDRAM CAS# Latency          3 Clocks
   SDRAM RAS# Precharge        3 Clocks
   SDRAM RAS# to CAS# Delay    3 Clocks
   SDRAM Precharge Delay       7 Clocks
   SDRAM Burst Length          4

 Memory Hole                   Disabled
 Hyper Threading Function      Disabled
 Internal Graphics Mode Select 8MB
 AGP Aperture Size             64MB
 USB Controller                2 USB Ports
 USB 1.1 Device Legacy Support Disabled
 USB 1.1 Port 64/60 Emulation  Disabled
 ******** Display Setting ********
 Boot Display Device           CRT               ESC:Exit  ↑↓:Sel
 Flat Panel Type               1 800x600 LVDS    PgUp/PgDn:Modify
                                                 F1:Help F2/F3:Color
```

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system.

SDRAM Frequency

This setting is decided by Memory frequency.

Configure SDRAM Timing by SPD

This field detects the capability of the SDRAM modules that you are using -Enabled or Disabled.

SDRAM CAS# Latency

This controls the latency between the SDRAM read command and the time that the data actually becomes available.

Memory Hole

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.

Hyper Threading Function

Set this option to Enabled to use INTEL Hyper Threading Function.

Internal Graphics Mode Select

This option is setting for sharing memory size from system memory to Video memory.

USB Controller

This option is setting for USB 2.0 controller.　You can select 2 USB ports, 4 USB ports, 6 USB ports and Disabled.

Boot Display Device

This option is setting for display output from CRT or CRT & LFP.

Flat Panel Type

This option is setting for panel resolution.　The selections include 800 x 600 LVDS, 1024 x 768 LVDS and 1280 x 1024 LVDS.

4.9 Power Management Setup

```
                    AMIBIOS SETUP - POWER MANAGEMENT SETUP
                  (C)2001 American Megatrends, Inc. All Rights Reserved

ACPI Aware O/S (S1)              Yes              Available Options:
Re-Call VGA BIOS at S3 Resuming  Enabled            No
Power Management/APM            Enabled          ► Yes
Video Power Down Mode           Disabled
Hard Disk Power Down Mode       Disabled
Standby Time Out (Minute)       Disabled
Suspend Time Out (Minute)       Disabled
Primary Master IDE              Monitor
Primary Slave IDE               Ignore
Secondary Master IDE            Monitor
Secondary Slave IDE             Ignore
Power Button Function           On/Off
Restore on AC/Power Loss        Last State
Resume On Ring                  Disabled
Resume On LAN                   Disabled
Resume On PME#                  Disabled
Resume On RTC Alarm             Disabled
RTC Alarm Date                  15               ESC:Exit  ↑↓:Sel
RTC Alarm Hour                  12               PgUp/PgDn:Modify
RTC Alarm Minute                30            ▼  F1:Help F2/F3:Color
```

ACPI Aware O/S

This feature is switch of ACPI function.   Configuration option: [Yes] or [No].

Power Management/APM

When Disabled, SMI will not be initialized, and complete power management functionality is removed until this option is set to Enabled.

Suspend Time Out (Minute)

If no activity occurs during this time period, BIOS will place the system into suspend low power state.   The "Standby Time Out" period must expire first (if enabled) before this time out period begins.
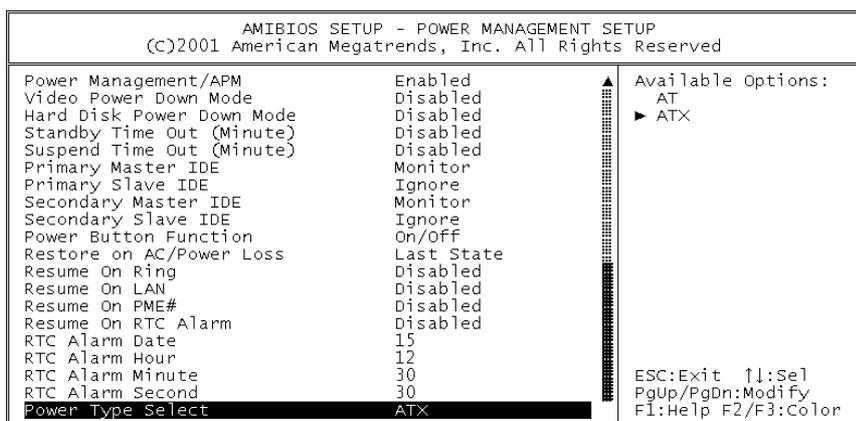
Resume on Ring

Modem ring resumes from soft off.

RTC Alarm Date, Hour, Minute

When this option is set enabled, system will wake up from soft off mode according to your set time.
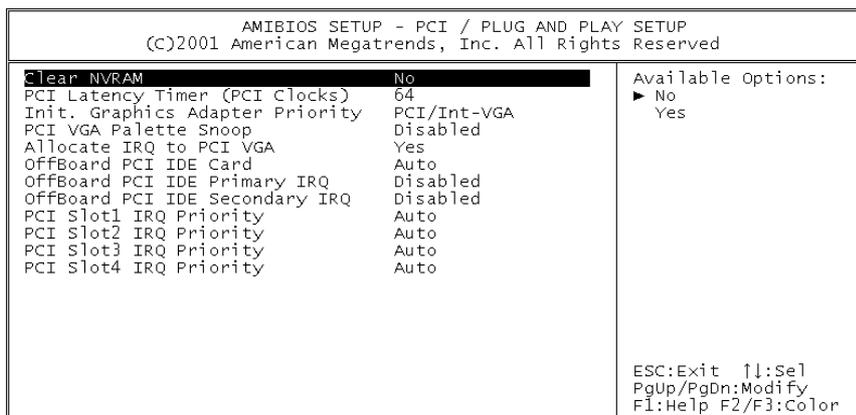
Power Type Select

```
                AMIBIOS SETUP - POWER MANAGEMENT SETUP
           (C)2001 American Megatrends, Inc. All Rights Reserved
  Power Management/APM          Enabled      ▲  Available Options:
  Video Power Down Mode         Disabled     ▒    AT
  Hard Disk Power Down Mode     Disabled     ▒  ► ATX
  Standby Time Out (Minute)     Disabled     ▒
  Suspend Time Out (Minute)     Disabled     ▒
  Primary Master IDE            Monitor      ▒
  Primary Slave IDE             Ignore       ▒
  Secondary Master IDE          Monitor      ▒
  Secondary Slave IDE           Ignore       ▒
  Power Button Function         On/Off       ▒
  Restore on AC/Power Loss      Last State   ▒
  Resume On Ring                Disabled     ▒
  Resume On LAN                 Disabled     █
  Resume On PME#                Disabled     █
  Resume On RTC Alarm           Disabled     █
  RTC Alarm Date                15           █
  RTC Alarm Hour                12           █
  RTC Alarm Minute              30              ESC:Exit  ↑↓:Sel
  RTC Alarm Second              30              PgUp/PgDn:Modify
  Power Type Select             ATX             F1:Help F2/F3:Color
```

This feature is switch of Power Type function.

Configuration options: [AT] [ATX]

4.10 PCI / Plug and Play Setup

```
                AMIBIOS SETUP - PCI / PLUG AND PLAY SETUP
           (C)2001 American Megatrends, Inc. All Rights Reserved
  Clear NVRAM                      No           Available Options:
  PCI Latency Timer (PCI Clocks)   64         ► No
  Init. Graphics Adapter Priority  PCI/Int-VGA   Yes
  PCI VGA Palette Snoop            Disabled
  Allocate IRQ to PCI VGA          Yes
  OffBoard PCI IDE Card            Auto
  OffBoard PCI IDE Primary IRQ     Disabled
  OffBoard PCI IDE Secondary IRQ   Disabled
  PCI Slot1 IRQ Priority           Auto
  PCI Slot2 IRQ Priority           Auto
  PCI Slot3 IRQ Priority           Auto
  PCI Slot4 IRQ Priority           Auto



                                                ESC:Exit  ↑↓:Sel
                                                PgUp/PgDn:Modify
                                                F1:Help F2/F3:Color
```

Clear NVRAM

When this option is set to Yes, system can auto clear NVRAM.   The settings are Yes or No.

PCI Latency Timer (PCI Clocks)

This option specifies the latency timings (in PCI clocks) for PCI devices installed in the PCI expansion slots.   The settings are 32, 64, 96, 128, 160, 192, 224, or 248.

Init. Graphics Adapter Priority

This setting is to select primary graphic by PCI or AGP Adapter.

Allocate IRQ to PCI VGA

Set this option to Yes to allocate an IRQ to the VGA device on the PCI bus. The settings are Yes or No.

OffBoard PCI IDE Card

This question is needed for off-board non-compliant PCI IDE card.   If present, BIOS needs to know which slot it is in and how the IRQ is used by the card.

OffBoard PCI IDE Primary IRQ

This option specifies the PCI interrupt used by the primary IDE channel on the offboard PCI IDE controller.   The settings are Disabled, Hardwired, INTA, INTB, INTC, or INTD.

OffBoard PCI IDE Secondary IRQ

This option specifies the PCI interrupt used by the secondary IDE channel on the offboard PCI IDE controller.   The settings are Disabled, Hardwired, INTA, INTB, INTC, or INTD.

PCI Slot1 / Slot2 / Slot3 / Slot4 IRQ Priority

The option specifies the IRQ priority for PCI device installed in the PCI expansion slot.   The settings are Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

4.11 Peripheral Setup

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

```
                    AMIBIOS SETUP - PERIPHERAL SETUP
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OnBoard IDE                    Both              Available Options:
OnBoard LAN                    Enabled             Disabled
OnBoard AC'97 Audio            Enabled             Primary
OnBoard FDC                    Enabled             Secondary
OnBoard Serial Port1           3F8/COM1          ► Both
OnBoard Serial Port2           2F8/COM2
  Serial Port2 Mode            Normal
OnBoard Parallel Port          378
  Parallel Port Mode           Normal
  Parallel Port IRQ            7
  Parallel Port DMA Channel    N/A
OnBoard Serial Port C          3E8/COM3
  Serial Port C IRQ            11
OnBoard Serial Port D          2E8/COM4
  Serial Port D IRQ            10
OnBoard Parallel Port 2        Disabled
  Parallel Port 2 IRQ          N/A
                                                 ESC:Exit  ↑↓:Sel
                                                 PgUp/PgDn:Modify
                                                 F1:Help F2/F3:Color
```

OnBoard LAN

This option is setting to enable or disable Onboard LAN Function.

OnBoard AC'97 Audio

This option is setting to enable or disable Onboard AC'97 Audio Function.

OnBoard FDC.

This option is setting to enable or disable Onboard FDC Function.

OnBoard Serial Port 1 /Port 2 /Port C /Port D

This option specifies the base I/O port address of serial port 1.　The settings are Auto (AMIBIOS automatically determines the correct base I/O port address), Disabled, 3F8h, 2F8h, 2E8h, or 3E8h.

Serial Port2 Mode

This option specifies the IR active pulse or inverting clock of serial port B.

OnBoard Parallel Port1 /Port2

This option specifies the base I/O port address of parallel port on the motherboard.　The settings are Disabled, 378h, 278h, or 3BCh.

Parallel Port Mode

This option specifies the parallel port mode.   The settings are Normal, Bi-Dir, EPP, and ECP.

Normal: The normal parallel port mode is used.

Bi-Dir: Use this setting to support bi-directional transfers on the parallel port.

EPP: The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification.   EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by   the host device.

ECP: The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification.   ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second.   ECP provides symmetric bi-directional communication.

EPP Version

EPP data or address read cycle 1.9 or 1.7

Parallel Port /Port2 IRQ

This option specifies the IRQ used by the parallel port.   The settings are Auto, (IRQ) 5, (IRQ) 7.

Parallel Port DMA Channel

This option is only available if the setting for the Parallel Port Mode option is ECP.   This option sets the DMA channel used by the parallel port.   The settings are DMA Channel 0, 1, or 3.

Hardware Monitor Setup

```
              AMIBIOS SETUP - HARDWARE MONITOR SETUP
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 -=≡ System Hardware Monitor ≡= -
     CPU Case Temperature        15°C/59°F
     System Temperature          38°C/100°F
     Fan_1 Speed                 0 RPM
     Fan_2 Speed                 4200 RPM
     Vcore                       1.488V
     +1.5V                       1.488V
     +3.3V                       3.344V
     + 5.0V                      5.278V
     +12.0V                      12.048V
     -12.0V                      -12.203V
     - 5.0V                      -4.993V
     +5V SB                      5.278V
     Battery                     2.864V




                                            ESC:Exit  ↑↓:Sel
                                            PgUp/PgDn:Modify
                                            F1:Help F2/F3:Color
```

Change Supervisor Password

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

Supervisor password: To enter and change the options of the setup menus.

User password: To enter the setup menus only but do not have the right to change the options.   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 the password, up to eight characters in length, and press <Enter>.   The password typed now will clear any previously entered password from CMOS memory.   You will be asked to confirm the password.   Type the password again and press <Enter>.   You may also press <Esc> to abort the selection and not enter a password.

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

Password Disabled

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup.   This prevents an unauthorized person from changing any part of your system configuration.   Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted.   This would prevent unauthorized use of your computer.

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

Appendix A Watchdog Timer

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function: AL–2: Set the Watchdog Timer's period   BL: Time-out value (Its unit--second or minute, is dependent on the item "Watchdog Timer unit select" in CMOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. While the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, Watchdog Timer must be periodically refreshed by calling sub-function 2. However, Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Note: When exiting a program it is necessary to disable Watchdog Timer, otherwise the system will reset.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H               ;setting the time-out value
        MOV     BL, 30                  ;time-out value is 48 seconds
        INT                             ;15H
 ;
; ADD YOUR APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1          ;is your application over?
        JNE      W_LOOP             ;No, restart your application

         MOV    AX, 6F02H          ;disable Watchdog Timer
         MOV    BL, 0                      ;
         INT     15H
;
; EXIT
;
```

Appendix B I/O Address Map

I/O Address Map

I/O Address Map	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-OFF	Math Coprocessor
170-1F7	BUS Master PCI IDE Controller
278-27F	Parallel Printer Port 2
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
376-376	BUS Master PCI IDE Controller
378-37F	Parallel Printer Port 1
3B0-3DF	Intel 82845G/GL Graphic Controller
3F0-3F7	Floppy Disk Controller
3E8-3EF	Serial Port 3
3F8-3FF	Serial Port 1
480-48F	PCI BUS

1 st MB Memory Address Map

Memory address	Description
00000-9FFFF	SYSTEM MEMORY
A0000-BFFFF	VGA BUFFER
C0000-CFFFF	VGA BIOS
E0000-FFFFF	SYSTEM BIOS
100000	EXTEND MEMORY

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	AC97 AUDIO
IRQ2	IRQ Controller	IRQ10	IRQ Holder for PCI steering
IRQ3	COM2	IRQ11	ICH4 USB2.0
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	INTEL ICH4 LAN	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignment

Channel	Function
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix C How to Use Wake-Up Function

POS-478 provides two kinds of Wake up Function: Modem Wake-up and LAN Wakeup.

Wake-Up function will be activated when ATX power supply is in use.

Wake –Up On Modem (Ring):

Enable Wake-Up On LAN/Ring of CMOS SETUP.　ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.

Wake-Up On LAN:

When your computer is in power-down status, LAN Link/Active LED will flash.　This status indicates that the LAN chip has entered standby mode and waits for Wake-Up signal.　You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN.　Every LAN chip has a factory set ID, which you can find it from network information in WINDOWS.

ID format is xxxxxxxxxxxx
Example ID: 009027388320

Appendix D Digital I/O

One of digital circuit's characteristics is its fast response to high or low signal.   This kind of response is highly needed for harsh and critical industrial operating environment.   That is why we design 4-bit digital inputs and 4-bit digital outputs on POS-478.

There are two kinds of signals (Input and Output) used by the Digital I/O function. These signals are used to control external devices that need On/Off circuit or TTL devices.   When one of the signals has been selected, users can read or write data to the system through the Digital I/O function.

Digital I/O Address = 201H

- **CN6: Digital Input / Output**

PIN	Description	PIN	Description
1	GND	2	+5V
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Example program:

```
MOV      DX, 201H            ;Output Setting is
MOV      AL,80H              ;AL high 4 bits
OUT       DX,AL             ;80H →pin3, 40H →pin4
                            ;20H →pin5, 10H →pin6
```

Example program:

```
MOV      DX, 201H            ;Input Value at
IN          AL,DX           ;AL low 4 bits
```

Appendix E Creating/Deleting SATA Raid Sets

Creating and deleting RAID sets is a function found in the BIOS.   During boot-up, the following message will appear, pausing for a few moments to allow the user to choose what to do:

Press <CRTL-S> or F4 to enter RAID utility

An easy-to-use screen will appear with the following choices in the top left:

Create RAID Set
Delete RAID Set
Rebuild RAID Set
Resolve Conflicts

Below this will be listed the drives currently installed on the system.

The top right half of the screen displays directions and comments for the user. The bottom right half lists the command keys:

Arrows up and down are Select Keys
ESC takes the user to the previous menu
Enter selects the user's choice
Ctrl-E exits the utility

Creating RAID Sets
Because SATA Raid supports two drives, creating RAID Sets is a simple procedure.

1. Select "**Create RAID Set**."
2. Choose either a "**Striped**" or "**Mirrored**" RAID Set.
3. Select if you want the utility to Auto Configure the RAID Set or if you want to manually configure the RAID Set.   For Striped Sets, you can change the chunk size. For Mirrored Sets, you assign which is the Source and Target drives, as well as if you want Disk Copy.

What is Disk Copy?   If the disk assigned as the source disk already has been partitioned and has data stored on it, and then a second disk is added   for redundancy, the data on the source drive can be copied to the destination drive, so the disks are identical, and all subsequent data will be written to both drives as a Mirrored set.   If, however, the source disk does not have data already stored on it, there is no need for Disk Copy.

The utility will ask, "**Are You Sure?**" before completing the configuration.

Deleting RAID Sets

1. To remove one or more RAID sets, select "Delete RAID Set."
2. Select desired set and press Y when asked "Are You Sure?"

Resolving Conflict

When a RAID set is created, the metadata written to the disk includes drive connection information (Primary Channel, Secondary Channel).   If, after a disk failure, the replacement disk was previously part of a RAID set (or used in another system), it may have conflicting metadata, specifically in reference to the drive connection information.   If so, this will prohibit the RAID set from being either created or rebuilt, In order for the RAID set to function properly, this old metadata must be first overwritten with the new metadata.   To resolve this, select "Resolve Conflict" and the correct metadata, including the correct drive connection information, will be written to the replacement disk.

Appendix F Connecting LCD to POS-478

POS-478 can support both one-channel and two-channel LVDS LCD through connector J1.   We use the LCD – LTM15C423S (2-channel) as an example to explain the signal mapping and data format.

The pixel data of LTM15C423S is 48-bit wide.   To use 36-bit LCD, neglect the third pair of signals — (DATA3+, DATA3-).   In other words, only the data of MSB (R2 ~ R7, G2 ~ G7, B2 ~ B7) will be left.   On the other hand, if one- channel LCD is used, only the first channel (CH1) is necessary.   The way of dealing with 18-bit data is the same as that of 36-bit (data of MSB are kept useful).   For further information on different types of LCD, refer to the datasheet.

Signal mapping between LTM15C423S and J1 (POS-478)

J1 (POS-478)		LTM15C423S	
PIN	NAME	PIN	NAME
3	CH1 DATA3+	15	R1IN3+
4	CH1 DATA3-	14	R1IN3-
5	CH1 CLK+	13	R1CK+
6	CH1 CLK-	12	R1CK-+
7	CH1 DATA2+	11	R1IN2+
8	CH1 DATA2-	10	R1IN2-
9	CH1 DATA1+	9	R1IN1+
10	CH1 DATA1-	8	R1IN1-
11	CH1 DATA0+	7	R1IN0+
12	CHA DATA0-	6	R1IN0-
15	CH2 DATA3+	26	R2IN3+
16	CH2 DATA3-	25	R2IN3+
17	CH2 CLK+	24	R2CK+
18	CH2 CLK-	23	R2CK-
19	CH2 DATA2+	22	R2IN2+
20	CH2 DATA2-	21	R2IN2-
21	CH2 DATA1+	20	R2IN1+
22	CH2 DATA1-	19	R2IN1-
23	CH2 DATA0+	18	R2IN0+

24	CH2 DATA0-	17	R2IN0-
		29	SELLVDS (H)
		30	SELFRC (H)
1, 2, 13, 14, 25, 26	GND	4, 5, 16, 27	GND
27, 28, 29, 30	LCD power	1, 2, 3	VDD

*48 BIT -- SELLVDS=H, SELFRC=H

DATA format (output of POS-478) for LTM15C423S (48 bit)

Signal Name	Function (Graphics controller output signal)	PIN Name
OR2	RED Odd pixels DATA	CH1 DATA0- CH1 DATA0+
OR3	RED Odd pixels DATA	
OR4	RED Odd pixels DATA	
OR5	RED Odd pixels DATA	
OR6	RED Odd pixels DATA	
OR7	RED Odd pixels DATA (MSB)	
OG2	GREEN Odd pixels DATA	
OG3	GREEN Odd pixels DATA	CH1 DATA1- CH1 DATA1+
OG4	GREEN Odd pixels DATA	
OG5	GREEN Odd pixels DATA	
OG6	GREEN Odd pixels DATA	
OG7	GREEN Odd pixels DATA (MSB)	
OB2	BLUE Odd pixels DATA	
OB3	BLUE Odd pixels DATA	
OB4	BLUE Odd pixels DATA	CH1 DATA2- CH1 DATA2+
OB5	BLUE Odd pixels DATA	
OB6	BLUE Odd pixels DATA	
OB7	BLUE Odd pixels DATA (MSB)	
GND		
GND		
ENAB	COMPOUND SYNCHRONIZATION SIGNAL	
OR0	RED Odd pixels DATA (LSB)	CH1 DATA3- CH1 DATA3+
OR1	RED Odd pixels DATA	
OG0	GREEN Odd pixels DATA (LSB)	
OG1	GREEN Odd pixels DATA	

OB0	BLUE Odd pixels DATA (LSB)	
OB1	BLUE Odd pixels DATA	
GND		
NCLK	DATA SAMPLING CLOCK (Odd)	CH1 CLK+ CH1 CLK-
ER2	RED Even pixels DATA	CH2 DATA0- CH2 DATA0+
ER3	RED Even pixels DATA	
ER4	RED Even pixels DATA	
ER5	RED Even pixels DATA	
ER6	RED Even pixels DATA	
ER7	RED Even pixels DATA (MSB)	
EG2	GREEN Even pixels DATA	
EG3	GREEN Even pixels DATA	CH2 DATA1- CH2 DATA1+
EG4	GREEN Even pixels DATA	
EG5	GREEN Even pixels DATA	
EG6	GREEN Even pixels DATA	
EG7	GREEN Even pixels DATA (MSB)	
EB2	BLUE Even pixels DATA	
EB3	BLUE Even pixels DATA	
EB4	BLUE Even pixels DATA	CH2 DATA2- CH2 DATA2+
EB5	BLUE Even pixels DATA	
EB6	BLUE Even pixels DATA	
EB7	BLUE Even pixels DATA (MSB)	
GND		
GND		
GND		
ER0	RED Even pixels DATA (LSB)	CH2 DATA3- CH2 DATA3+
ER1	RED Even pixels DATA	
EG0	GREEN Even pixels DATA (LSB)	
EG1	GREEN Even pixels DATA	
EB0	BLUE Even pixels DATA (LSB)	
EB1	BLUE Even pixels DATA	
GND		
NCLK	DATA SAMPLING CLOCK (Even)	CH2 CLK- CH2 CLK+