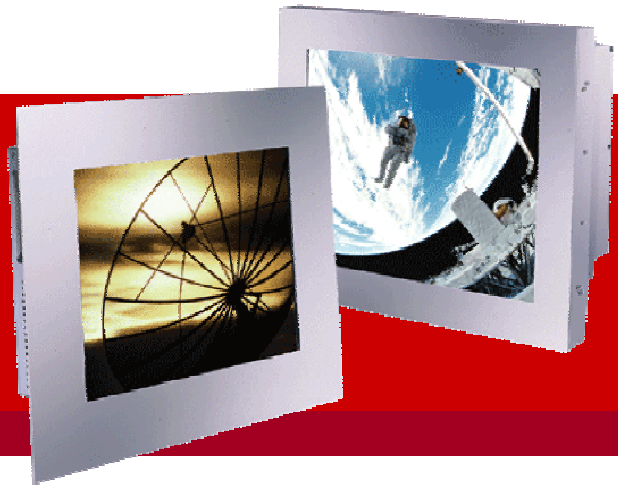# Panel PC

OP 1200/1500/1700

(MB: **PC920**, System Chipset: **Intel 945G**)

**12.1" /15"/17" Intel Core 2 Duo
Industrial Panel PC with Versatile Bezel Design**

Service Manual (Version 2807)

Version v1008, August 2010

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Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment onto an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shielded interconnect cables and a shielded AC power cable must be employed with this equipment to ensure compliance with the pertinent RF emission limits governing this device. Changes or modifications not expressly approved by the system's manufacturer could void the user's authority to operate the equipment.

Declaration of conformity

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- This device may not cause harmful interference, This device must accept any interference received, including interference that may cause undesired operation

Unpacking

Unpacking the cartons, you will see the OP SERIES panel PC cabinets packed in separate cartons. Remove all the EPE foams stuffed in the cartons and the panel PC cabinets. These packing materials are used to protect the components from swinging around during local transportation. It is strongly recommended that they are kept for future transportation use. Check and see if the following items are included and in good condition.

- ◆ **OP SERIES unit**
- ◆ **Pedestal set**
- ◆ **Accessory box**
    - Power cord (90º)   x 1
    - Utilities, drivers & user manual CD diskette x 1
    - Panel mounting kit (optional)   x 1 set

Make sure that all of the items listed above are present. If any of the above items is missing, contact your dealer immediately.

Warranty

All products produced by the manufacturer are warranted against defective materials and workmanship for one year starting from the date of delivery to the original purchaser. However, this warranty does not apply to: (1) damage caused by accident, abuse, misuse, misapplication, (2) the product or part has been modified, (3) the product serial number or warranty label has been removed or defaced.

Important Safety Precautions

Before getting started, read these instructions and save them for later reference.

1. To access any internal components of the system, confirm the system power is turned off and make sure all the system fans already stop turning.
2. Turn off the computer before cleaning. Clean with a damp or dry cloth only. Do not spray any liquid cleaner on screen.
3. The power socket used to plug in the power cord must be located near the system and easily accessible. Do not use outlets on the same circuit of the systems that regularly switched on and off.
4. Make sure the voltage of the power source is correct before connecting the system to the power outlet.
5. If the system is sharing an extension cord with other devices, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating.
6. Do not expose the power cord, power outlet and extension cord to moisture.
7. Install the system on a reliable surface to prevent damage caused by dropping.
8. Disconnect the power cord from the system before any installation. Make sure both the system and the external devices are turned off. The sudden surge of power may ruin any sensitive components. Also make sure the system is properly grounded.
9. During installation of any internal components, be sure to ground yourself to keep from any static charge. Most electronic components are sensitive to the static electric charge. Use a grounding wrist strap and place all electronic components in any static-shielded devices.
10. The openings on the system cabinet are for the cabin ventilation to prevent the system from overheating. DO NOT COVER THE OPENINGS.
11. The brightness of the flat panel display will decrease with use. However, hours of use will vary depending on the application environment.
12. Avoid using sharp objects to operate the touch panel. Scratches on the touch panel may cause mal-calibration or non-function to the touch panel.
13. The LCD panel display is not subject to shock or vibration. When assembling the computer, make sure it is securely installed.

Table of Contents

1. Introduction

This chapter provides background information and detail specification on the OP SERIES. Sections in this chapter include:

- ✓ General Information
- ✓ What covers in this Manual
- ✓ Specification
- ✓ Dimension

1.1. General Information

The information revolution that started from the mid '90s inaugurated a new competitive era where consumer computing technology was exploited to do business operation quicker than ever before. Many enterprises from life-related industries such as **Photo printing**, **Banking**, **Medical** to **POS**, **Kiosk**, **Security**, **Advertising** … etc. all are eager or forced to automate their industries with computers in order to thrive in this new age. For their industrial automation, there is one thing in common, i.e. space is always a premium and system stability is always a must in their environmental applications.

Fully configurable and with its versatile front bezel design, the **OP SERIES** system is an ideal solution platform for any customized integration and industrial automation. The small bezel is mainly designed for Kiosk integration when the Kiosk cabinet is with a curve surface. The big bezel is for panel mounting or for Kiosk integration when the Kiosk cabinet is of flat surface and allows the computer to be fixed to the Kiosk cabinet directly from inside. The aluminum alloy bezel is mainly designed for panel mounting in any industrial floor.

1.2. What Covers in this Manual

This service manual provides service information for the OP SERIES panel PC. This manual is designed to help trained service personnel to locate and fix failing parts on the OP SERIES. Only service technicians are allowed to open the system for service. You do not need to read everything in this handbook to service the system.

For a quick start, see the following chapter summaries;

Chapter 1 (the current chapter) provides background information and detail specification on the OP 1200/1500/1700.

Chapter 2 identifies the OP SERIES system exterior components and provides instructions to help you to use the system as soon as possible.

Chapter 3 details the panel PC's various mounting options by graphical illustrations.

Chapter 4 helps you to knock down the system into parts to access components.

Chapter 5 helps you to build up the panel PC.

Chapter 6 provides detail information of the jumper settings and connector signals of the system control board and I/O boards.

Chapter 7 explains the AWARD BIOS setup.

Chapter 8 introduces the Ethernet, XGA, audio and touchscreen drivers.

Appendix A introduces the built-in LCD.

Appendix B introduces the system's onboard DIO.

Appendix C introduces the DiskOnChip® installation.

Appendix D introduces the Wake-On-LAN feature.

Appendix E describes the system IO port address

Appendix F explains the first MB memory map.

Appendix G provides the specifications for the built-in power supply.

1.3. Specifications

OP SERIES: 12.1"/15"/17" TFT Intel® Core 2 Duo industrial panel PC with ***versatile*** bezel design

◆   **CPU**
  ✧   Intel Celeron 2.0 GHz up to Core 2 Duo 2.6 GHz

◆   **Motherboard**: PC920

◆   **System Chipset**: Intel 945G & ICH7

◆   **System BIOS**: Award PnP Flash BIOS

◆   **System Memory**: 2*240 pin DDR2 socket supporting system memory up to 4GB

◆   **Display Module**
  ✧   **OP 1200**
  ✓   12.1" color TFT, 800*600
  ✓   Luminance (cd/m2): 400 or above

  ✧   **OP 1500**
  ✓   15" color TFT, 1024*768
  ✓   Luminance (cd/m2): 250 or above

  ✧   **OP 1700**
  ✓   17" color TFT, 1280*1024
  ✓   Luminance (cd/m2): 420 or above

  ✧   Integrated 2D/3D graphics engine, 4X AGP
  ✧   Supports Dynamic Video Memory Technology (DVMT)
  ✧   Supporting LCD/VGA

◆   **Standard I/Os**
  ✧   Serial ports x 4: COM 1, 2 & 4 with +5V/12 power output on pin #9, COM 3 internal type reserved for touchscreen, COM2 RS-232/485 jumper selectable
  ✧   Parallel port x 1: supports SPP/EPP/ECP
  ✧   External FDD interface x 1
  ✧   External IDE interface
  ✧   +5V/+12V DC-out x 1
  ✧   PS/2 keyboard interface x 1
  ✧   PS/2 mouse interface x 1
  ✧   DIO: Input x 2, output x 2
  ✧   USB interface x 2
  ✧   VGA interface x 1
  ✧   Brightness VR x 1

◆   **Audio**
  ✧   Speaker x 2
  ✧   Speaker-out, line-in & MIC-in

◆   **Ethernet**
  ✧   100/10 Base-T PnP Ethernet with RJ-45
  ✧   Supports Wake-on-LAN

◆ **Expansion Slot**
  ✧ PCI*2
◆ **Audio Function**
  ✧ Full duplex and independent sample rate converter for audio recording & playback
  ✧ Supports Microsoft DirectSound
  ✧ 3D positional audio effects
  ✧ Hi-performance, mixed-signal stereo
  ✧ MIC-In, speaker-out, line-In
  ✧ Pin header for CD-audio in
◆ **Hardware Monitor**
  ✧ Monitors processor & system temperature
  ✧ Monitors 5VSB, VBAT, 1.5V, 3.3V, +5V, +12V and processor voltages
  ✧ Monitors processor and chassis fan speeds
  ✧ Controls processor, chassis fan speed and failure alarm
  ✧ Automatic fan on/off control
  ✧ Read-back capability that displays temperature, voltage and fan speed
  ✧ Supports Intel processor thermal diode output (real processor temperature)
◆ **Power Supply:** ATX 250W (@25°C), 220W (@50°C), 100~240V/5~3A @50~60Hz
◆ **Touchscreen** (optional, sharing COM3)
  ✧ 12.1"/15"/17" analog resistive type with RS-232 controller
  ✧ 15"/17" surface acoustic wave type (SAW)
◆ **Drive Bay**
  ✧ 3.5" HDD SATA interface
  ✧ Slim CD-ROM or equivalent device

MECHANICAL & ENVIRONMENTAL

◆ **Construction:** Heavy-duty steel

◆ **Dimension** (chassis only, unit: mm)

    ✧ OP 1200: 354*283*115 (L*W*D)

    ✧ OP 1500: 395*320*127 (L*W*D)

    ✧ OP 1700: 426*350*130 (L*W*D)

◆ **Front Bezels**

    ✧ OP 1200S: 354*283 mm (small bezel)

    ✧ OP 1500S: 395*320 mm (small bezel)

    ✧ OP 1700S: 426*350 mm (small bezel)

    ✧ OP 1200B: 405*330 mm (big bezel)

    ✧ OP 1500B: 448*371 mm (big bezel)

    ✧ OP 1700B: 478*401 mm (big bezel)

    ✧ OP 1200A: 405*330 mm (aluminum bezel)

    ✧ OP 1500A: 448*371 mm (aluminum bezel)

    ✧ OP 1700A: 478*401 mm (aluminum bezel)

◆ **Mounting**

    ✧ Panel mount with mounting kits

    ✧ Wall mount with swing arm: standard VESA mounting holes (75*75 mm)

    ✧ To Kiosk enclosure

Specifications are subject to change without notice.

2. Using the System

✓ Identifying the System
✓ Panel PC I/O outlets
✓ Panel PC dimension
✓ Powering up the System
✓ Running the BIOS Setup
✓ Operating System & Driver Installation

2.1. Identifying the System

Before getting started, take a moment to familiarize yourself with the system and the I/O arrangement of the OP 1200/1500/1700. The OP SERIES's front view appears as below.

The illustrations of the OP 1200/1500/1700 may differ slightly because the OP SERIES system series has three different LCD size: 12.1", 15" & 17".

Small bezel

12.1"/15.0"/17.0"
LCD & Touchscreen

OP SERIES WITH SMALL BEZEL
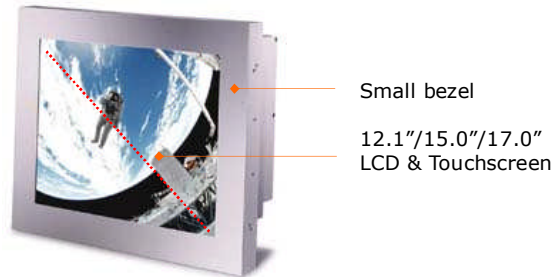
Aluminum bezel
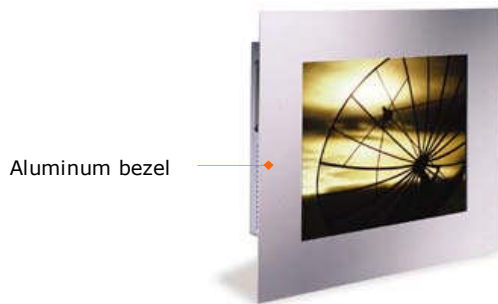
Aluminum bezel

OP SERIES WITH BIG BEZEL
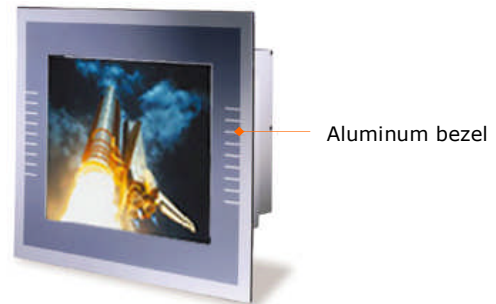
OP SERIES WITH ALUMINUM

OP SERIES FRONT

2.2. Panel PC I/O Outlets

When you turn around the OP SERIES system, you will find the power switch and all the I/O ports are located at the rear cover of the panel PC.

Dust filter
17

18 19 20

1 2 3 4 5 6 7

8 9 10 11 12 13 14 15 16
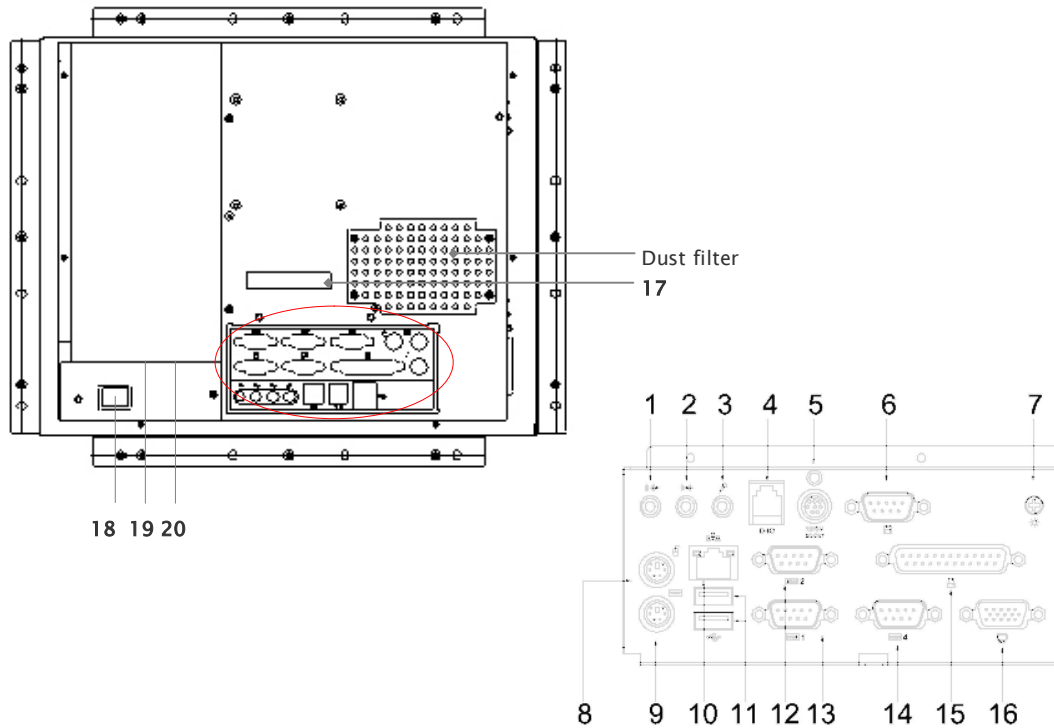
1. Speaker-out	2. Line-in	3. MIC-in
4. 2-channel DIO	5. +5/12V DC-out	6. External FDD
7. VR brightness	8. PS/2 Mouse	9. PS/2 Keyboard
10. Ethernet (RJ-45)	11. USB*2	12. COM 1
13. COM 2	14. COM 4	15. Printer port
16. VGA port	17. External IDE	18.PPC power switch
19. Power supply switch	20. AC inlet	

1. Speaker-out: This jack is to output the audio to external devices such as speakers or earphones.

2. Line-in: This jack is used to input audio from an external audio device such as a CD player, tape recorder or a radio.

3. MIC-in: This jack is used to record sound or voice by connecting to an external microphone.

4. DIO: The system provides 2-channel digital input and output.

5. +5V/12V DC-out: The DC-out can provide +5V/12 power source for peripheral devices such as smart card reader and scanner.

6. External FDD: This port is provided to connect to an external floppy disk drive. An optional FDD cable is needed to connect a standard 3.5" FDD to the system.

7. VR brightness control: This knob is to control the brightness of the LCD screen.

8. PS/2 Mouse: This port is for PS/2 mouse connection.

9. PS/2 Keyboard: This port is for PS/2 keyboard connection.

10. Ethernet (RJ-45): The system provides a 100/10 Base-T Ethernet interface.

11. USB*2: These two ports are for USB device connection.

12. COM1: This port is for serial device connection.

13. COM2: This port is for serial device connection.

14. COM4: This port is for serial device connection.

15. Printer Port: This port is provided to connect to a parallel device.

16. VGA port: This port is provided to connect to an analog monitor.

17. External IDE: This port is for external IDE device connection.

18. System power switch

19. Power supply switch

20. AC inlet

These I/O interfaces are used to connect external peripheral devices. Before connecting any devices to the panel PC, make sure the system and the peripheral devices are turned off. If there are any retaining screws on the device cables, make sure they are properly fastened to the secure bolts on the sides of each port. You might need to install drivers for the new devices. Refer to the peripheral devices manuals for instruction to configure the operation environment to recognize the new attached devices.

2.3. OP SERIES Dimension

2.3.1. OP 1200

The OP 1200's chassis size is shown below. This does not include the dimension of the bezel.
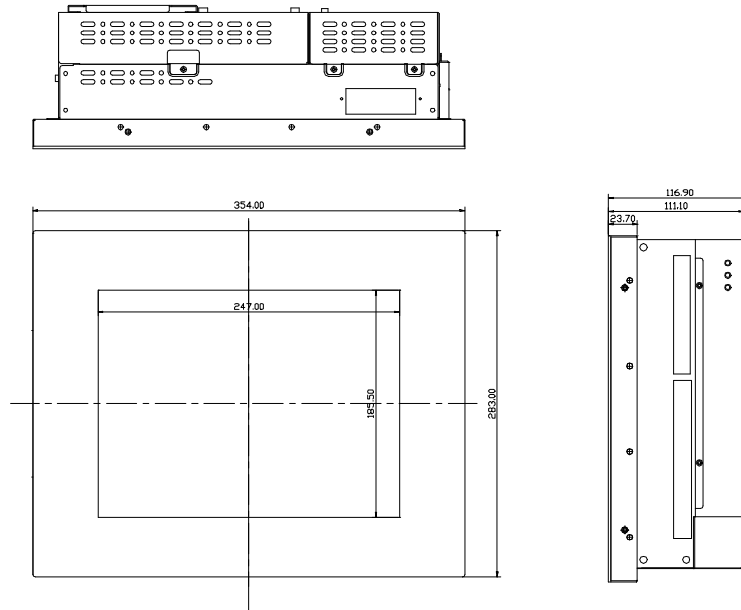
OP 1200 DIMENSION

2.3.2. OP 1500

The OP 1500's chassis size is shown below. This does not include the dimension of the bezel.
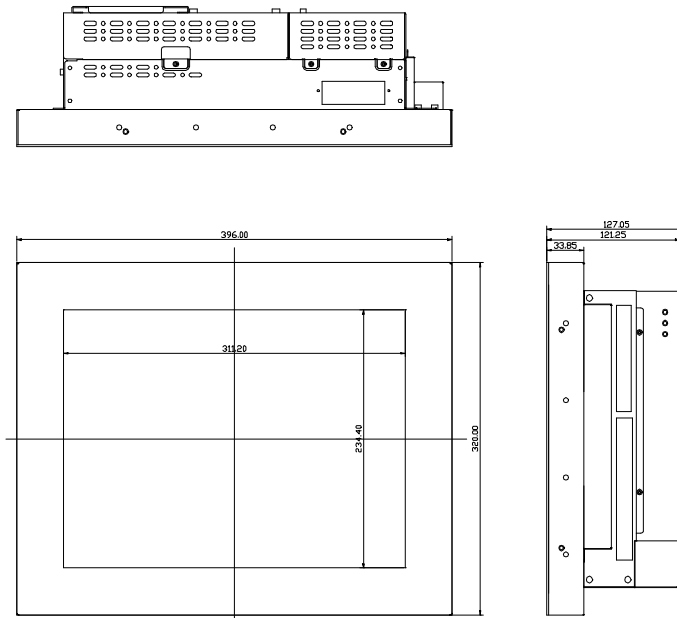
OP 1500 DIMENSION

2.3.3. OP 1700

The OP 1700's chassis size is shown below. This does not include the dimension of the bezel.
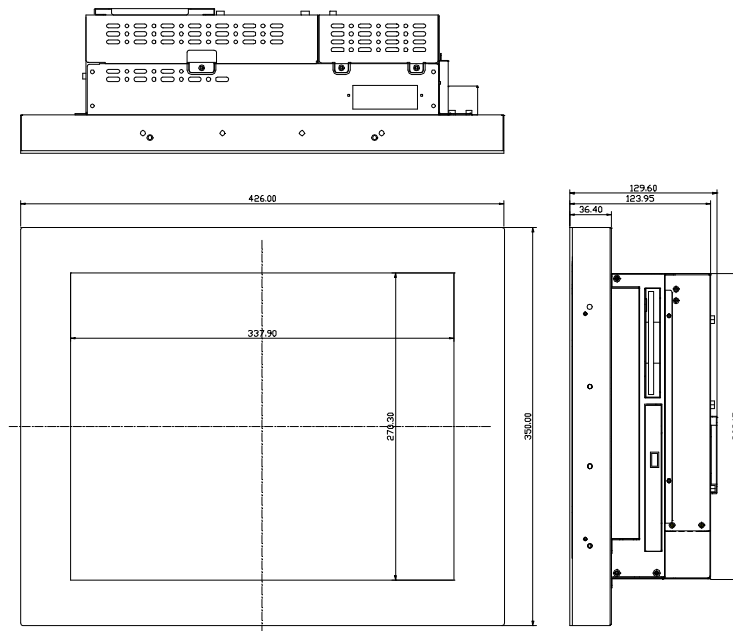
OP 1700 DIMENSION

2.4. Powering up the System

Upon receipt of the OP SERIES, the system should have been properly set up and configured by your dealer.

To power up the system, follow the procedures below.

1. Find the power cord from the accessory box. Connect the 3-pin female end of the power cord to the AC inlet located at the right rear lower side of the panel PC. Plug the 3-pin male end to an AC power socket.

2. If there are any other peripheral devices connected to the system, make sure all the device cables are properly retained and connected to the panel I/O ports.

3. Power on the external peripheral devices first.

4. When facing the system, from your point of view, the power switch is at the right rear lower side of the panel PC. Press the power switch.
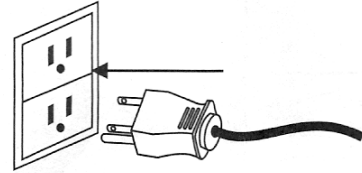
2.5. Running the BIOS Setup

If you are a commercial user, the OP SERIES system should have been properly set up and configured by your dealer. You may still find it necessary to change the system configuration information. In this case, you need to run the system's BIOS setup program.

Under the following conditions, the CMOS settings are to be changed.

1. The system is starting for the first time.

2. The hardware devices attached to the OP SERIES system have been changed.

3. The CMOS memory has lost power and the configuration information has been erased.

The BIOS setup program is stored in ROM, which can be accessed by pressing <DEL> key on the keyboard immediately when the system is powered on.

In order to retain the specified setup information when the system power is turned off, the system setup information is stored in a battery-backed CMOS RAM. The battery is to ensure the settings will not be erased when the computer is turned off or reset. When the computer is powered on again, the system will read the settings stored in the CMOS RAM and compare them to the equipment check conducted during the power on self-test (POST). If any error or mismatch occurs, an error message will be shown on the screen and the computer will be prompted to run the setup program.

To change the BIOS setup, please refer to Chapter 7 for more information.

2.6.   Operating System and Driver Installation

The OP SERIES system is not equipped with an operating system when delivered from the original manufacturer. If you are a commercial user, the system is likely to have been pre-installed proper operating system and software drivers by your dealer or system integrator.

If the system is not pre-installed with any system OS and drivers or you intend to install your preferred ones, there are several ways to load OS and software into the system.

1. Via an USB data-retrieval devices

2. Via the CD-ROM

3. Via Ethernet

Recent releases of operating systems always include setup programs that load automatically and guide you through the installation. You can also refer to your OS user manual for instructions on formatting or partitioning the hard disk drive before any software installation.

The OP SERIES system provides the following utility drivers stored in the CD-ROM diskette or utilities diskettes;

✧   Ethernet utilities
✧   VGA utilities
✧   Audio drivers
✧   Touchscreen drivers

3. Versatile Mounting Options

The OP SERIES system is designed for universal mounting to fit into different system enclosures for various environmental applications. This chapter highlights the steps of different mounting alternatives of the OP SERIES system. Sections include

✓ Different Front Bezels

✓ Mounting Brackets

✓ Panel Mount

3.1. Various Front Bezels

The standard OP SERIES systems provide three kinds of front bezels for different environmental applications.

3.1.1. OP SERIES with Small Bezel

The **OP SERIES S** is an industrial panel PC integrated with a small bezel. The front bezel size is identical to the computer's chassis size. This type of bezel is mainly designed for Kiosk integration when the Kiosk cabinet is with a curve surface and does not allow a big bezel computer to be fitted in.

When integrating the OP SERIES S system into the Kiosk cabinet, the integrator may need to design special metal brackets per the cabinet's specific mechanism in order to fix the OP SERIES system to the Kiosk cabinet.

OP SERIES SMALL

3.1.2. OP SERIES with Big Bezel

The **OP SERIES B** is an industrial panel PC with a big bezel. The front bezel size is larger than the computer's chassis size. This type of bezel is mainly designed for panel mounting or for Kiosk integration when the Kiosk cabinet is of flat surface and allows the computer to be fixed to the Kiosk cabinet directly from inside.

When integrating the OP SERIES B system into the Kiosk cabinet, the integrator can either use the provided metal brackets or design special metal brackets per the cabinet's specific mechanism in order to fix the OP SERIES system to the Kiosk cabinet.

OP SERIES BIG
BEZEL

3.1.3. **Aluminum Alloy Bezel**

The **OP SERIES A** is an industrial panel PC with an aluminum alloy bezel. This aluminum alloy bezel is mainly designed for panel mounting. It not only strengthens the system's framework but also beautifies the system outlook when the system is panel mounted.
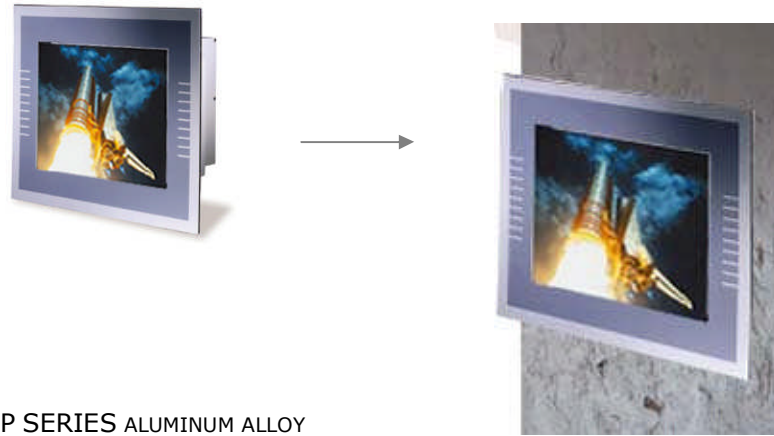
OP SERIES ALUMINUM ALLOY

3.2. L-shape Mounting Brackets

The OP SERIES system provides a pair of L-shape mounting brackets for system panel mounting. On the chassis sides, there are at least 4 screw holes on each side used to fix the metal brackets and the chassis together.

Mounting brackets to
be mounted here
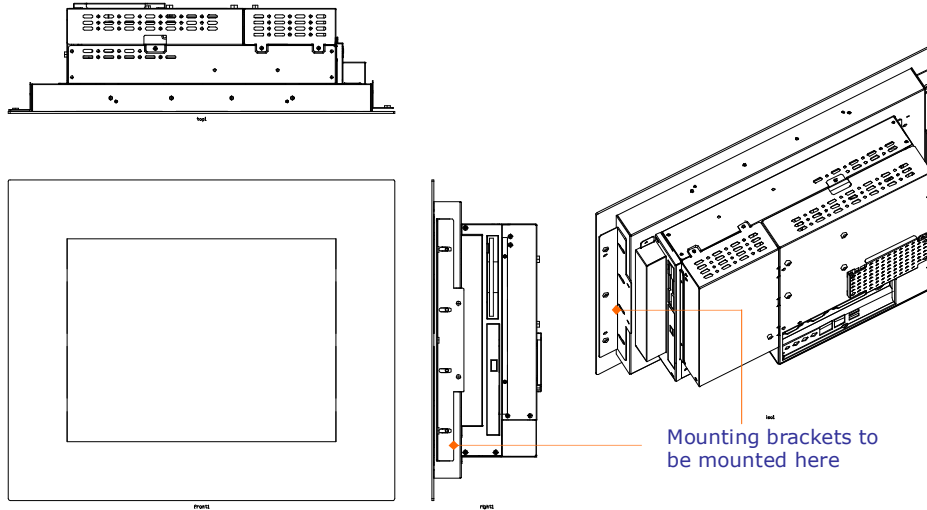
OP SERIES B MOUNTING WITH L-SHAPE MOUNTING BRACKETS

`

Mounting brackets
to be mounted here
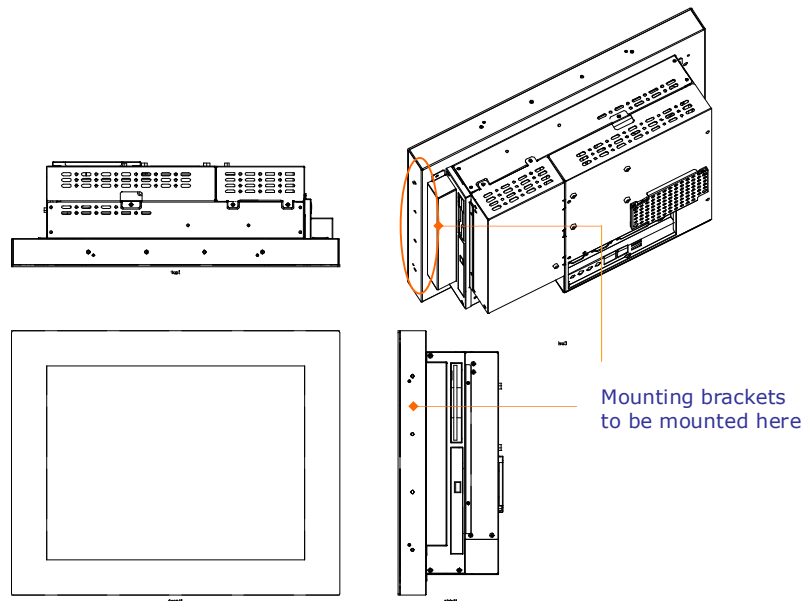
OP SERIES S MOUNTING WITH L-SHAPE MOUNTING BRACKETS

3.2.1. OP 1200 Panel Mount

The following figures illustrate the distance between the screw holes on the bezel to be fixed with the L-shape mounting brackets.
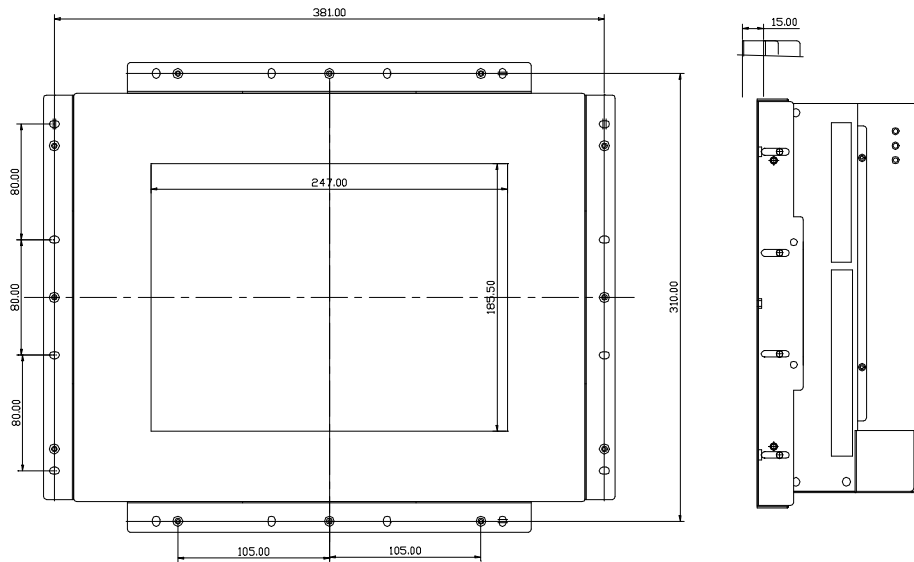
OP 1200 WITH SMALL BEZEL
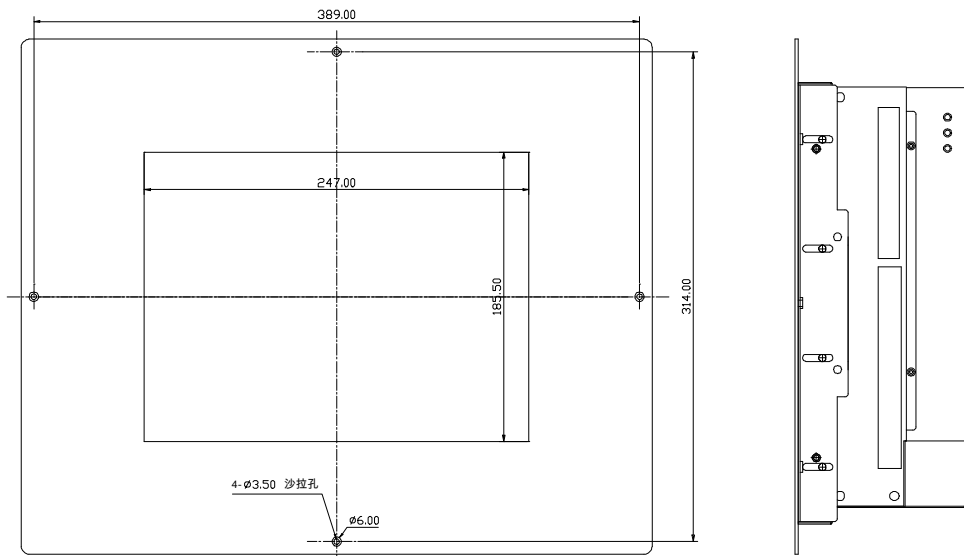
OP 1200 WITH BIG BEZEL

3.2.2. OP 1500 Panel Mount

The following figures illustrate the distance between the screw holes on the bezel to be fixed with the L-shape mounting brackets.
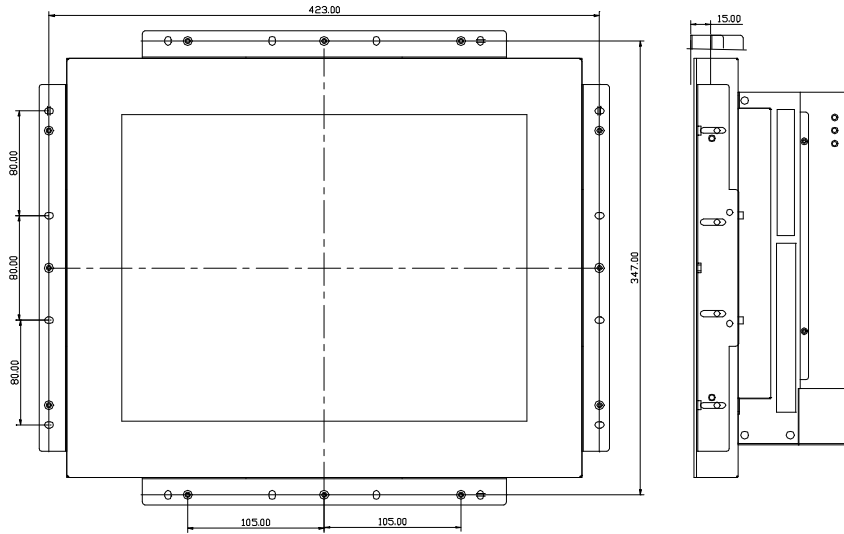
OP 1500 WITH SMALL BEZEL
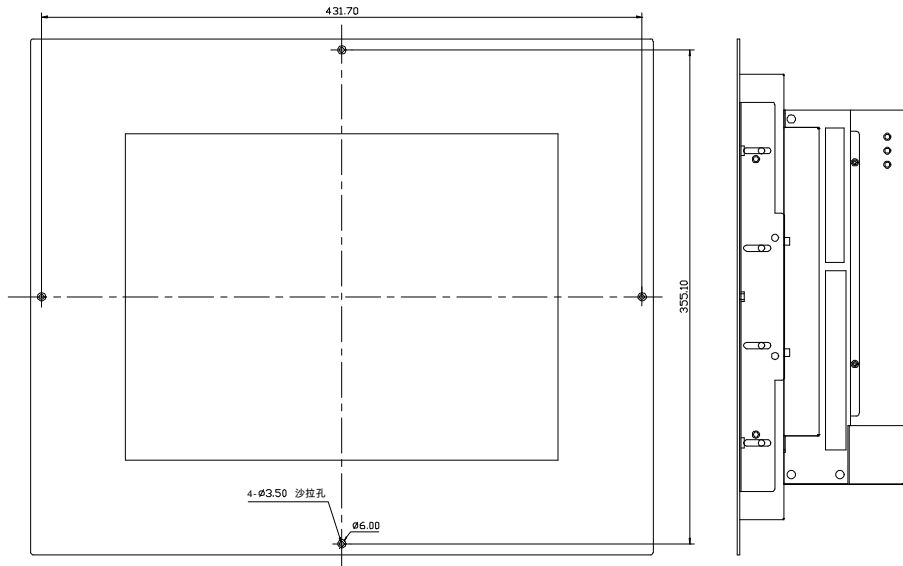
OP 1500 WITH BIG BEZEL

3.2.3. OP 1700 Panel Mount

The following figures illustrate the distance between the screw holes on the bezel to be fixed with the L-shape mounting brackets.
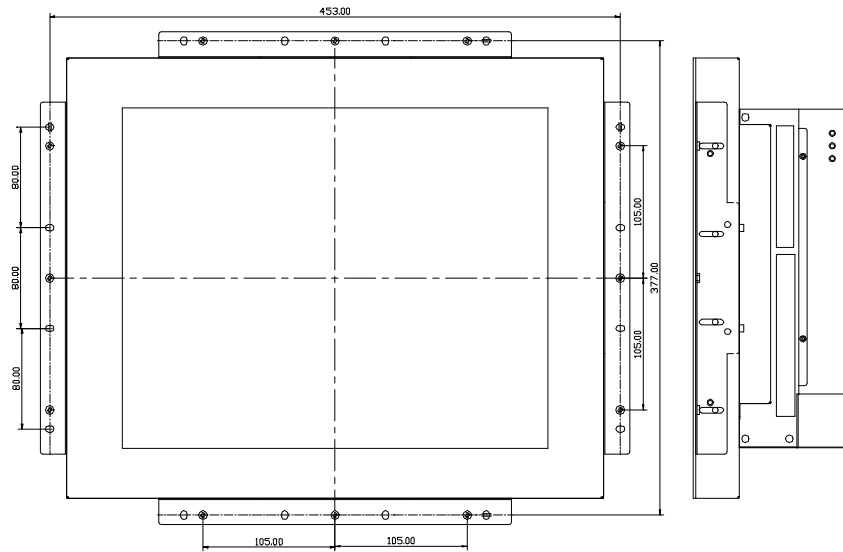
OP 1700 WITH SMALL BEZEL
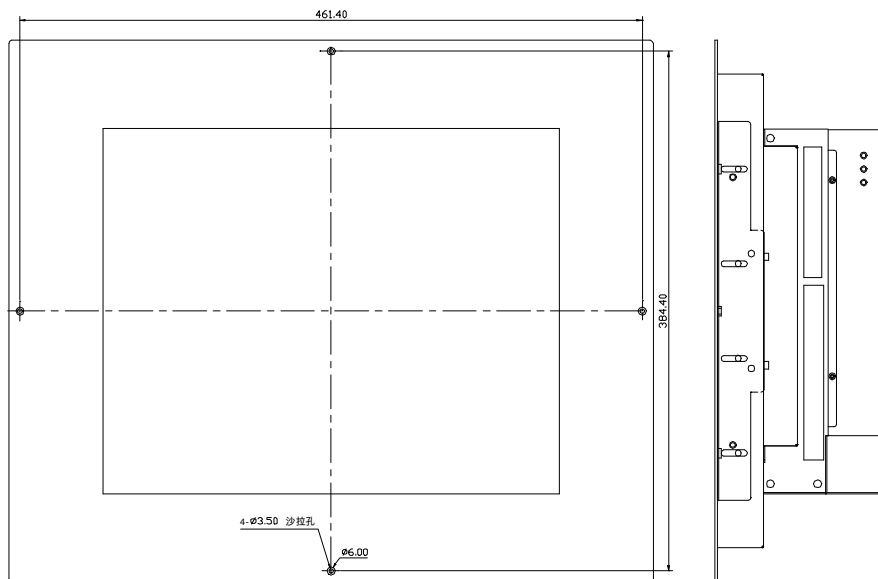
OP 1700 WITH BIG BEZEL

3.3. Wall Mounting and Mobile Applications

The OP SERIES system provides 1 set of VESA mounting holes, 75*75mm on the rear side of the chassis. System integrators can design their special wall mount brackets per the VESA holes or obtain market-available swing arms for wall mounting, table mounting or mobile applications.

4. Knocking down the Panel PC

This chapter highlights how to knock down the system into parts to access the modules or components inside the panel PC.

4.1. What Contains in each Module

The OP SERIES panel PC is mainly composed of two parts, one front bezel module and the other panel PC module. Under some conditions, you might need to knock down the system into parts to access some internal components for specific purpose. Most of the devices in the systems are integrated to devices brackets, then install to the system.   If you are removing the devices out of the cabinet or the PC compartment for testing purpose, please keep the devices on their brackets as they were.   If the devices are to be sent back to the manufacturer for repair, please remove them from the brackets and send back the devices only.

This chapter highlights the steps to knock down the system into parts. Please be reminded again that *only trained technicians are allowed to open the system for maintenance and service*. You might not need to knock the system completely into individual parts to find the needed components. Disassembling the Panel PC

The following table lists the hierarchy of each individual in the panel PC.

LEVEL	DECRIPTION
0.1	**Panel PC**
..2	**Display Module**
...3	Front Bezel Module
...3	LCD Module
..2	**PC Module**
...3	Motherboard Module
...3	HDD Module
...3	Touchscreen Controller Module
...3	Expansion Door Module
...3	Inverter Module
...3	Slim CD-ROM/FDD Module
...3	Power Supply Module
...3	Riser Card Module
...3	PC I/O Cover Module

The following steps highlight the procedures to knock the panel PC into individual modules.

1. Remove the metal PC I/O cover by loosening the seven retaining screws.

2. Unplug the IDE cable on the external IDE board.

3. Remove the riser card module from the motherboard's ESIA slot.

4. Disconnect the two power supply's power cables and the power switch cable from the motherboard. Disconnect the two 4-pole power cables from the HDD and CD-ROM. Remove the power supply module from the chassis by unscrewing the four retaining screws.

5. Unplug all the cables on the motherboard coming from the CD-ROM/FDD module. Detach the CD-ROM/FDD module by removing the three retaining screws.

6. For OP 1500 and 170, disconnect the inverter cable. Remove the inverter cover by loosening the two retaining screws. Disconnect the two LCD power wires from the inverter. Remove the inverter by loosening the two retaining bolts.

7. Disconnect the LVDS cable and the two touchscreen cables and power wire from the motherboard. Detach the chassis from the display module by loosening the six retaining screws.

8. Detach the expansion door from the chassis by loosening the three retaining screws.

9. Detach the touchscreen controller module from the chassis by loosening the two retaining screws.

10. Detach the IDE cable of the HDD module from the motherboard. Remove the HDD module from the chassis by loosening the retaining screw.

11. Remove the motherboard from the chassis by unscrewing the eight retaining screws.

The panel PC is now knocked down into individual modules.

4.1.1. Disassembling the Display Module

The display module (A) is mainly composed of two modules, one LCD (B) and the other front bezel (C) modules.

To disassemble the display module, follow the steps below.

1. Detach the LCD module (A) from the front the bezel module (B) by unscrewing the six screws used to fix the two modules together.

2. Remove the LCD panel (1) from the LCD holder (2) by unscrewing the four screws used to retain them together.

3. For OP 1200, detach the LCD power wires from the inverter and remove the inverter (4) from the LCD holder by loosening the two retaining screws. For OP 1500 and 170, detach the two LCD brackets (3) from the LCD panel by unscrewing the two screws at each side.

4. Remove the touchscreen (5) from the front bezel (6) by unscrewing the ten screws used to retain the four touch brackets (7) to the front bezel.
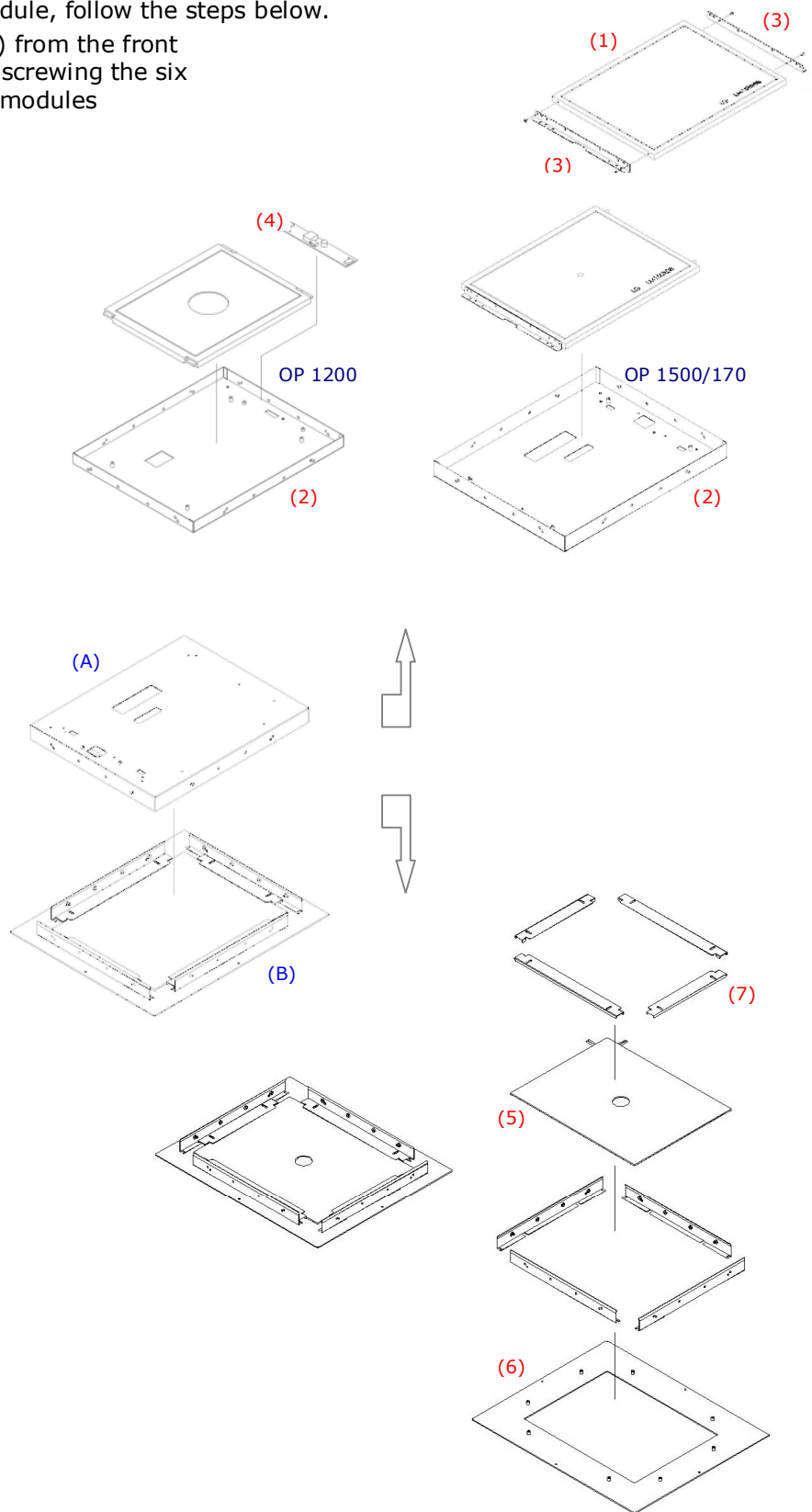
4.1.2. Knocking down the panel PC's Individual Modules

The panel PC is now separated into several individual modules. You may need to further knock some modules down into parts for repair purpose. Refer to the following sections to detach the components from these modules.

4.1.2.1. Disassembling the PC I/O Module

The I/O module is mainly composed of three I/O boards. All the onboard I/O signal of the OP SERIES's motherboard is connected to these boards for external device connection.

1. Detach the I/O board module (1) from the PC I/O cover (2) by unscrewing the four retaining screws.

2. Detach the 22P*2 flat cable used to link the IO-005 (3) and IO-006 (4) boards.

3. Detach the two IO boards from the I/O bracket (5) by loosening the securing bolts and retaining screw.

4. Remove the external IDE board (6) from the PC I/O cover by loosening the four retaining screws.

5. Detach the filter cover (7) from the PC I/O cover by unscrewing the four retaining screws.
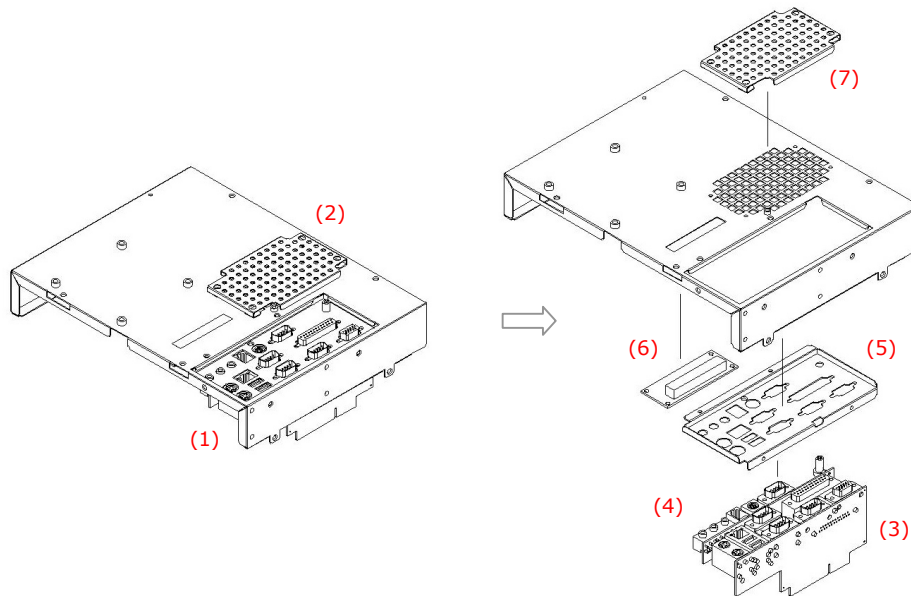
4.1.2.2. Disassembling the Riser Card Module

The riser card module is used for plugging add-on-cards. To detach the riser card (1) from its bracket (2), simply remove the two retaining screws.
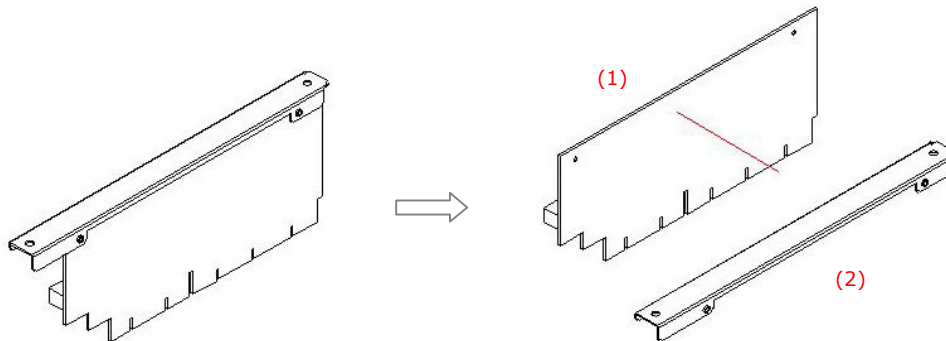
4.1.2.3. Disassembling the Power Supply Module

1. Loosen all the cable ties used to tie the power cables on the power module (2).
2. Remove the power switch extension cable (1) from the power module (2).
3. Remove the power supply (3) from the power bay (4) by unscrewing the four retaining screws.
4. Detach the small power bracket (5) from the power supply by removing the two retaining screws.
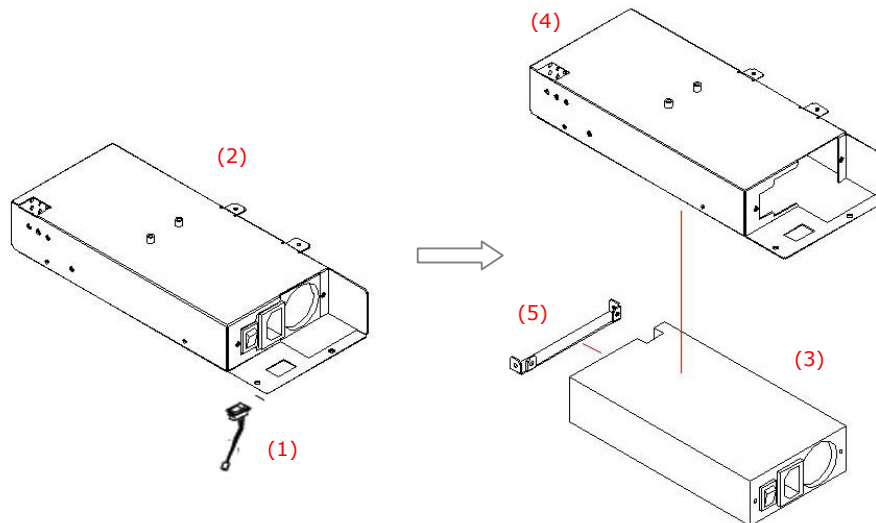
4.1.2.4. Detaching the slim CD-ROM/FDD

1. Detach the retaining bracket (2) from the CD-ROM/FDD module (2)

2. Remove the CD-ROM module (3) and FDD (4) from the device bracket (5) by loosening the four retaining screws.

3. Detach the CD-ROM board (6) from the CD-ROM (7) by loosening the two retaining screws.
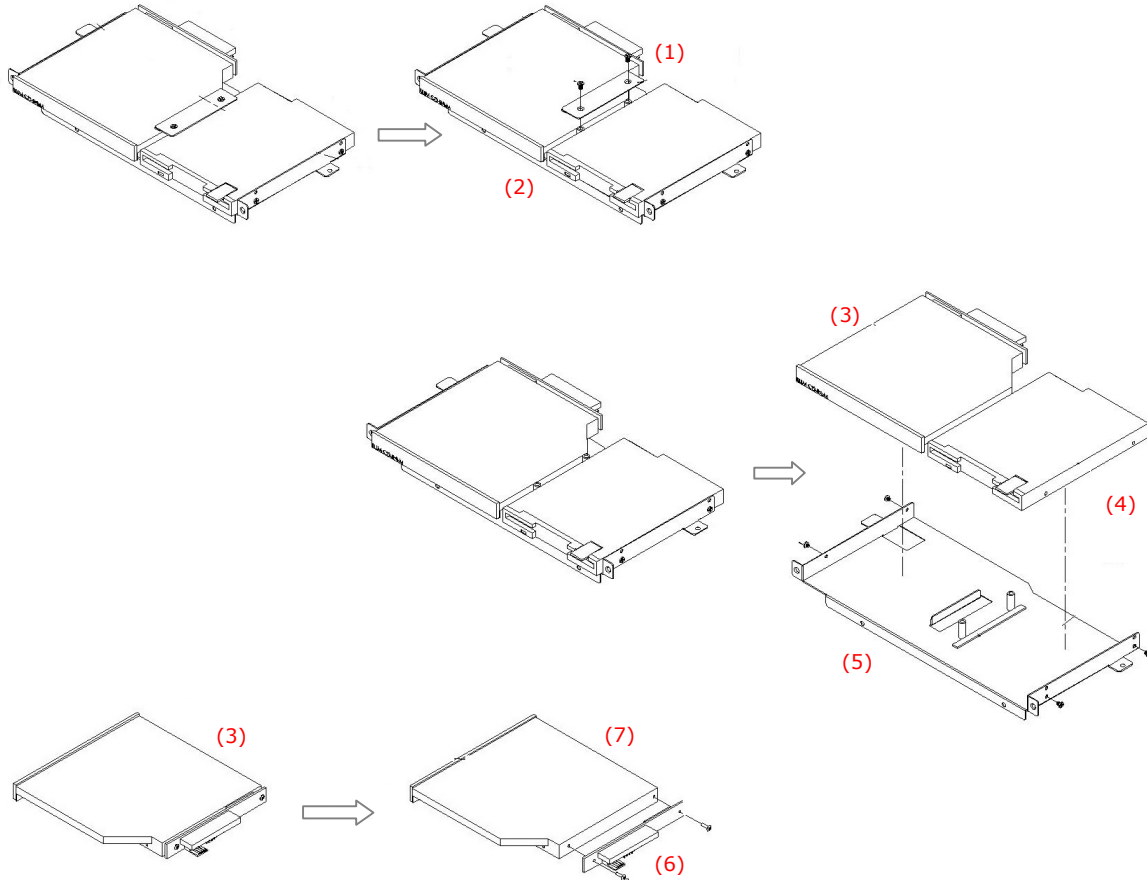
4.1.2.5. Disassembling the Expansion Door

Detach the two metal brackets (1) from the expansion door (2) by removing the two retaining screws.
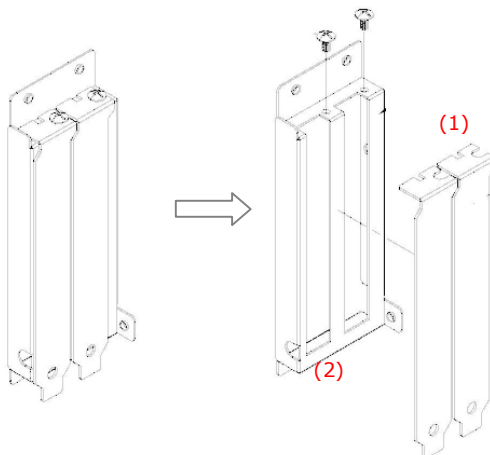
4.1.2.6. Detaching the HDD

1. Detach the HDD ribbon cable from the HDD (1).
2. Remove the HDD from the HDD bay by loosening the four retaining screws.
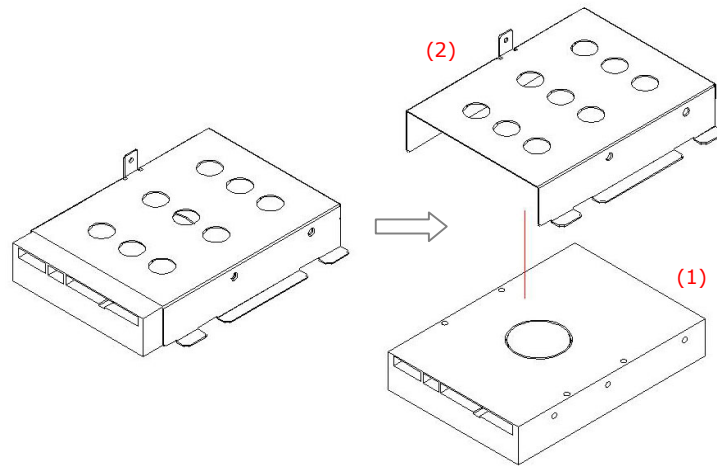
4.1.2.7. Detaching the Touchscreen Controller

1. Detach the tocuhscreen controller (1) from the device bracket by removing the four retaining screws.
2. Disconnect the two cables from the controller.
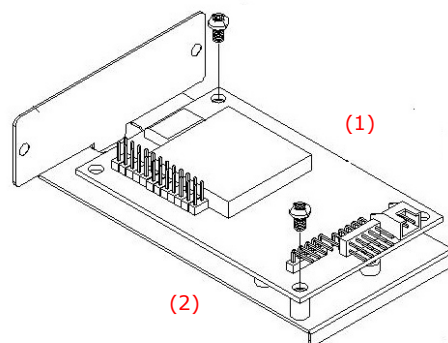
4.1.2.8. Removing CPU & DDR

The two components you might need to remove from the motherboard are the CPU and DDR memory module. Follow the steps below to remove the CPU (2) and DDR module (3) from the motherboard.

The two components you might need to remove from the motherboard are the CPU and DDR memory module. Please note that the Celeron M CPU in OP SERIES (PC920) system is an onboard BGA type and irremovable, therefore, the CPU in OP SERIES is not upgradeable unless the motherboard is replaced. The following steps illustrate the way to remove the Pentium M CPU (2) from the PC920 motherboard and DDR from both motherboards.

1. Unplug the CPU fan cable from FAN1 on the motherboard.
2. Remove the fan by loosening the four retaining screws.
3. Release the four screws to remove the heatsink.
4. Remove the heatsink on the CPU. Then remove the CPU by pulling the lever out a little and raising it, then lifting out the existing CPU from the socket.
5. Cut the cable ties on the DDR sockets. There are two white eject levers at each end of the DDR socket. Push them outwards until they separate from the two vertical posts.
6. Holding the DDR with the notch on the upper right corner, then remove the DDR from the DDR socket at 90° angle.
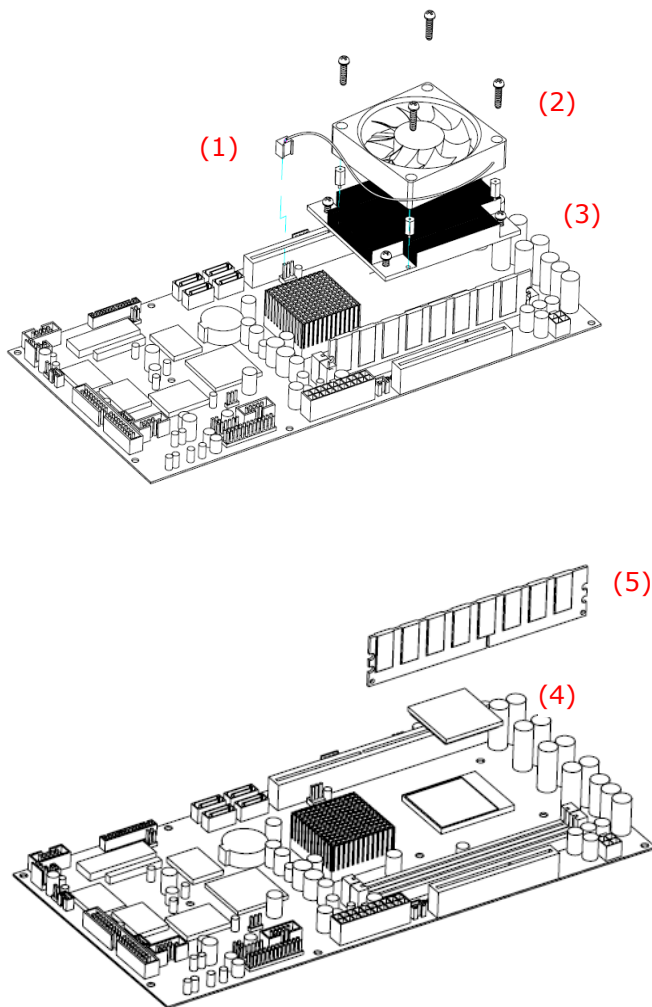
5. Building up the Panel PC

This chapter overviews the installation of the OP SERIES's internal components and devices. Sections include:

✓   Display Module Assembly

✓   PC Module Assembly

✓   Pedestal Assembly

✓   Panel PC Integrating

After knocking down the system into parts or replacing new components, you need to build up the system again. The OP SERIES is composed of two modules, one **display module** and the other **PC module**.

In terms of LCD size, the OP SERIES has three models, one 12.1", another 15" and the other 17". The assembly of the three models is basically the same except the LCD assembly. The following diagram highlights the system major parts that make up the OP 1200 main system.

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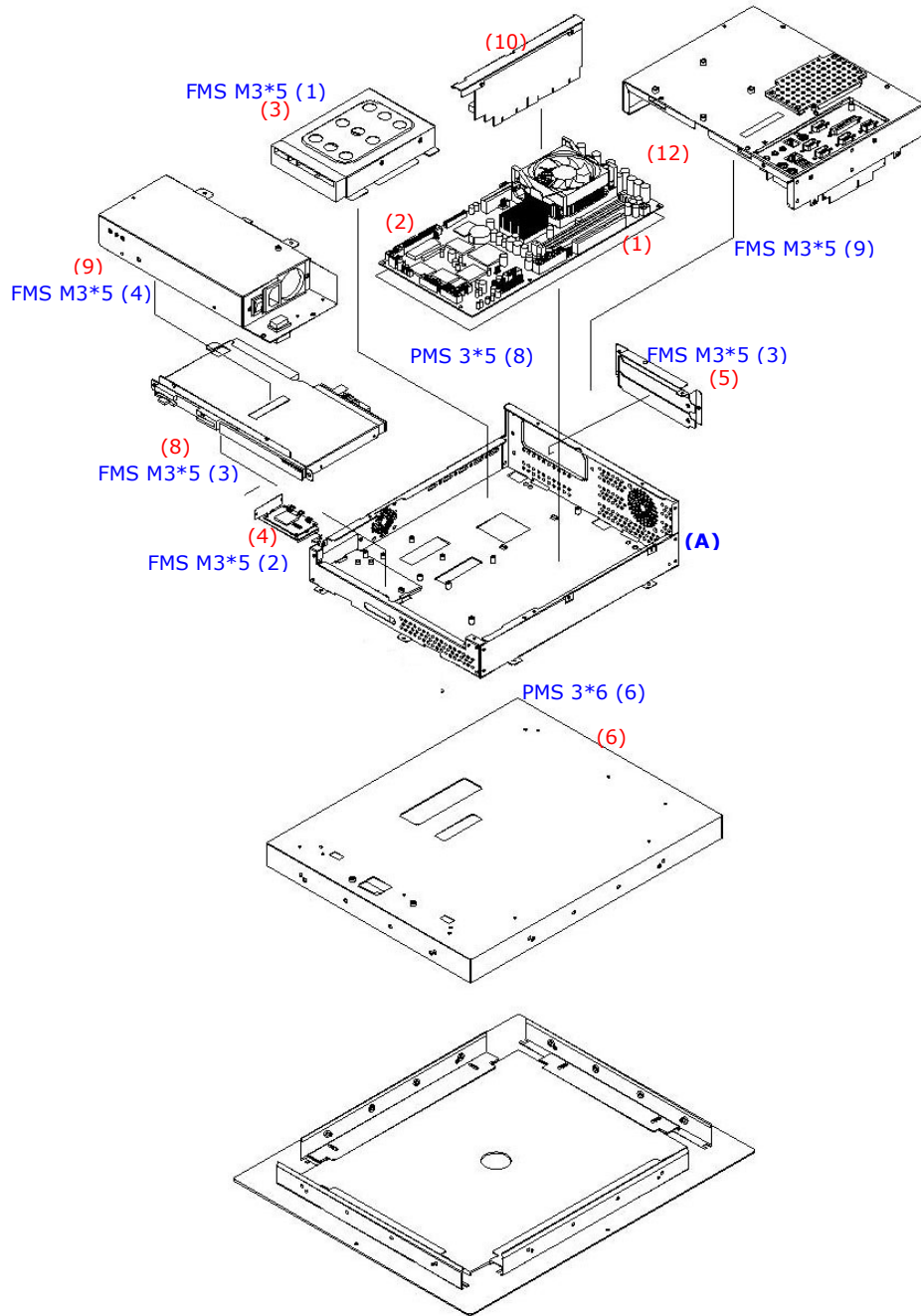
OP 1200 ASSEMBLY

The following diagram shows the system major parts that make up the OP 1500 main system.
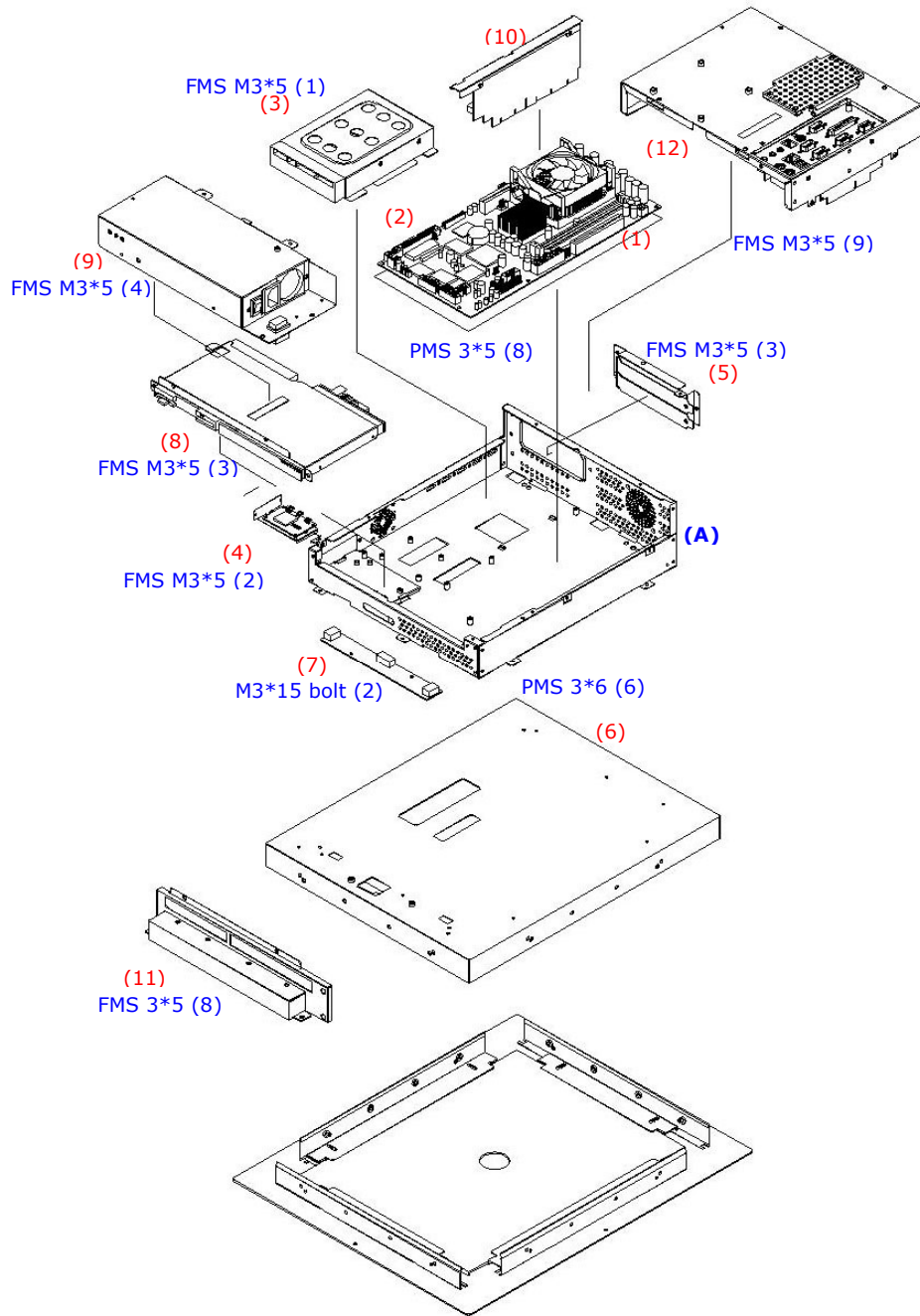
OP 1500/1700 ASSEMBLY

5.1. Display Module Assembly

The display module consists of two modules, one front bezel module and the other LCD module.

5.1.1. Front Bezel Assembly

The following steps illustrate the ways to assemble touchcreen and some accessories to the front bezel.

1. Refer to the figure below. There are four one-side adhesive foam sponges. Attach the four 1mm sponge tapes to the front bezel (1). The sponge tapes act as bumpers to absorb the pressure when the touchscreen is fixed to the front bezel.

2. There are 4 metal brackets (3) used to fix the touchscreen (2) to the front bezel. The metal brackets have to be taped with foam sponges.

3. Put the touchscreen to the bezel with its active side facing downwards and its white flat cable at the left side. Make sure the touch panel's active area is aligned in the opening of the front bezel.

4. Make sure the white flat cable comes out from the underneath of the left bracket. Then, fix the touchscreen to the front bezel with the four metal brackets and retain them together with three PMS M3*6 screws for the up and down sides and two PMS M3*6 screws for the right and left sides. The foam sponges are used bumpers to absorb the pressure caused by the four metal brackets when driven tightly to the touchscreen.
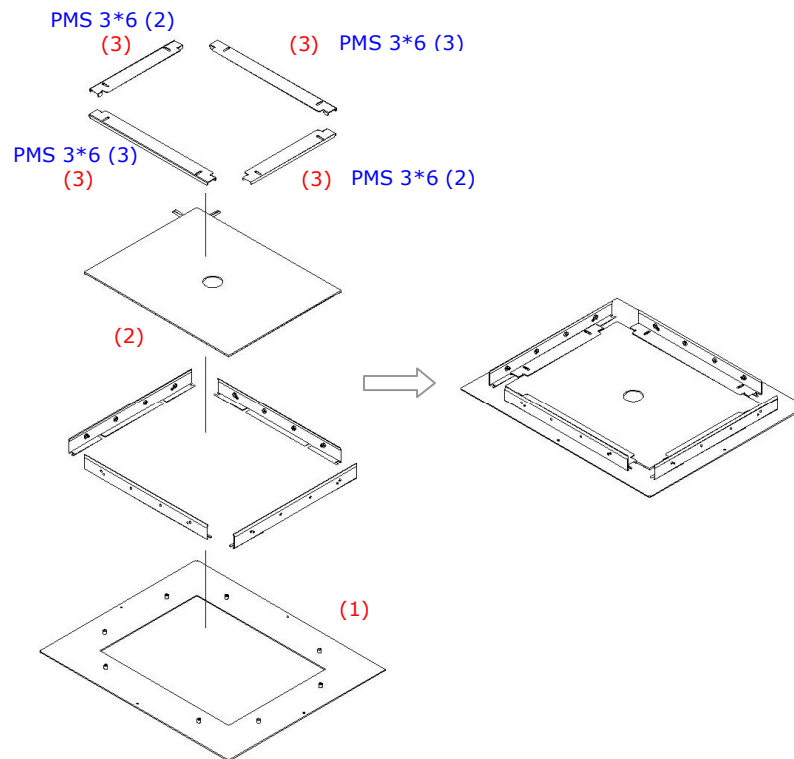
FRONT BEZEL ASSEMBLY

5.1.2. LCD Module Assembly

The assembly of OP 1200 LCD module slightly differs from that of OP 1500.

5.1.2.1. OP 1200 LCD Assembly

The standard LCD used in OP 1200 is 12.1" LVDS LG.Philip LB121S03 or its equivalent. The following figure illustrates the steps to integrate OP 1200 LCD module.

1. Attach the insulator to the inverter.
2. The inverter cable is a 4-pin to 4-pin wire with wafer connectors at both sides. Connect one end to inverter first.
3. The inverter module is to be fixed at the right middle side of the LCD holder with the up side down.
4. Plug one end of the LVDS cable to the LCD connector at rear side of the LCD.
5. Connect the LCD's pink-white power wires from the LCD to the inverter.
6. Retain the LCD panel to the LCD holder (3) with two PMS M3*6 screws at each side.
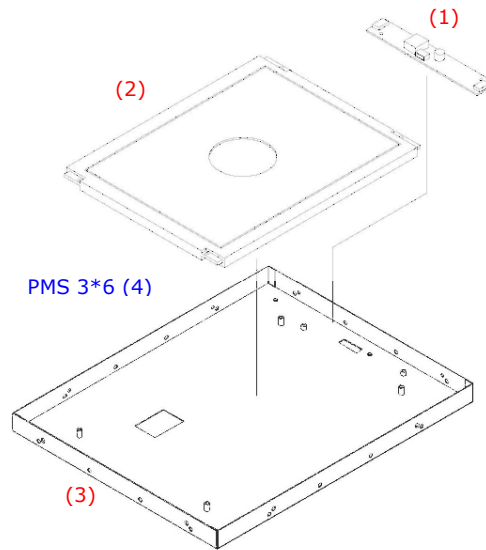
OP 1200 LCD MODULE ASSEMBLY

5.1.2.2. OP 1500/170 LCD assembly

The standard LCD used in OP 1500 is 15" LVDS LG.Philip LM151X08 or its equivalent. The standard LCD used in OP 1700 is a 17" LVDS LG.Philip LM170E01 or its equivalent. The following figure illustrates the steps to integrate OP 1500/170 LCD module.

1. There are two LCD brackets (1) used to fix to the LCD panel to the LCD holder from the left & right sides. Fix the LCD brackets (1) to the LCD panel (2) with two PMS M3*5 screws at each side.

2. Make sure the LCD's pink-white power wires come out from two openings at the right side of the LCD holder. Fix the LCD panel to the LCD holder (3) with two PMS M3*6 screws at each side.
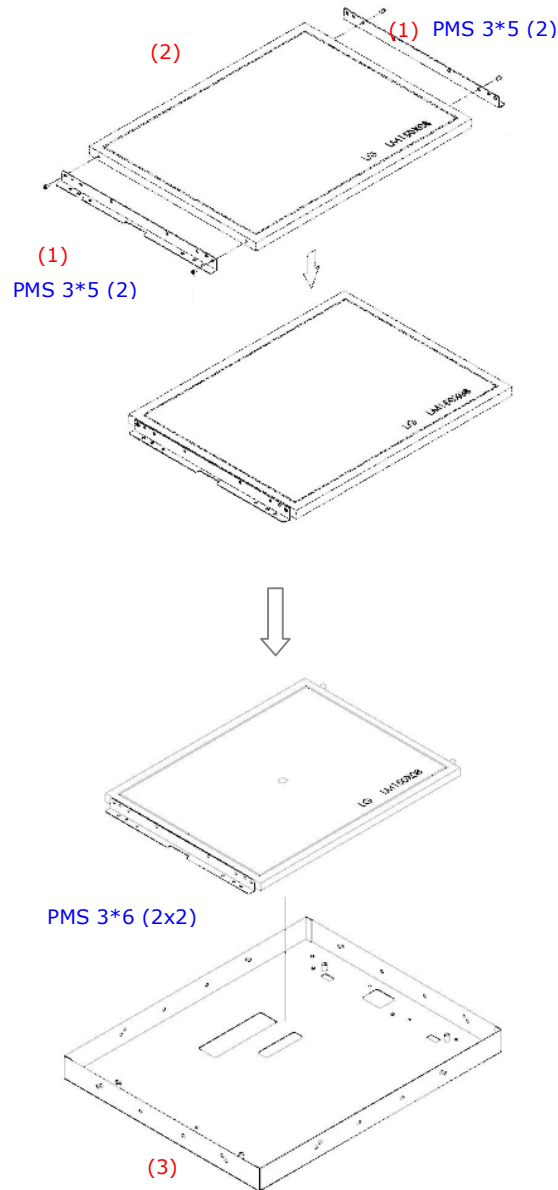
OP 1500/1700 LCD MODULE

5.1.3. Display Module Integration

After finishing the LCD module installation, the module is to be assembled to the front bezel module to make a complete display module.

1. Use dust air blower to blow any dust between the LCD and touchscreen before they are integrated together. Retain the LCD module (2) and the front bezel module (1) together with six PMS M3*8 screws.

2. Make sure the LCD's pink-white power wires come out from two rectangle openings at the left upper and lower sides of the LCD holder. And make sure the touchscreen flat cable comes out from the rectangle opening at the left middle side of the LCD holder.

3. The LVDS cable (3) is to be firmly plugged to the LCD connector located at the rear side of the LCD panel first. Insert the other end underneath the LCD holder and have it come out from the small opening at the middle side of the LCD holder.

The display module installation is now completed.
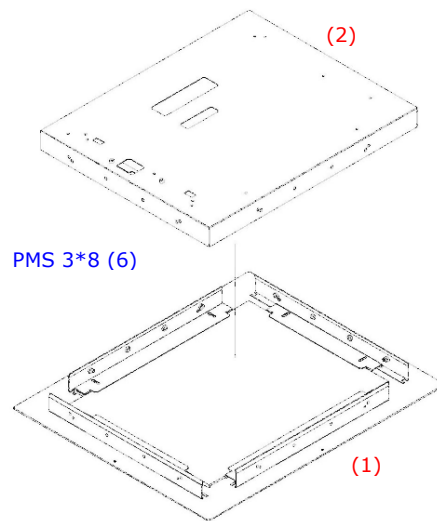
DISPLAY MODULE ASSEMBLY

5.2. PC Module Assembly

The OP SERIES panel PC's core engine is a Celeron/Pentium® IV multimedia panel PC. The system control board (2) and other internal devices such as HDD (3) and power supply (5) are to be housed in a chassis (A). The system's performance depends on the installed CPU and the capacity of the system memory and hard disk drive. In some circumstances, you might intend to upgrade or maintain the system. The hard disk drive can be removed by releasing the thumbscrew at the upper side of the chassis. By removing the PC I/O cover (7), the internal components such as CPU, DDR, and power supply can be easily accessed for maintenance and upgrade.

The PC module is composed of eight individual modules, motherboard module, HDD module, touchscreen controller module, expansion door module, slim CD-ROM/FDD module, inverter module, power supply module, riser card module and PC cover module

These modules are to be integrated to individual modules first, then, installed together with the display module and rear plastic cover to make a complete PC module.

5.2.1. Motherboard Assembly

5.2.1.1. Installing the CPU

The motherboard provides one LGA775 Socket, able to adapt a LGA775 Socket Intel® Core 2 Duo CPU. Please note that the Core 2 Duo CPU in OP SERIES (PC920) system is an onboard BGA type and irremovable, therefore, the CPU in OP SERIES is not upgradeable unless the motherboard is replaced. The following steps illustrate the way to remove the CPU (2) from the PC850 motherboard and DDR from both motherboards. The CPU in the OP SERIES (PC920) system must come with a heat sink and cooling fan on to avoid overheating. To install or upgrade a new CPU for OP SERIES system, follow the instructions below.

1. Pull the CPU lever up by pulling it outwards a little bit, then upwards. To insert the CPU (1) into the socket (2), the notch on the corner of the CPU (the corner with golden or white dot) should point toward the end of the socket lever. If the insertion of the CPU to the socket is not easy, check whether the CPU pins correspond with the holes on the socket.

2. After inserting the CPU into the socket, pull the lever down to make sure the CPU is in place.

3. Put the heat sink set (3) on the CPU and lock four screws at each side.

4. Put the fan (4) on the heat sink and lock four screws at each side..

5. The CPU cooling fan comes with a power wire (5). Connect the power wire to the 3-pin power connector FAN1 at the left side of the CPU retention on the motherboard. Tie the power wires together with a nylon cable tie.
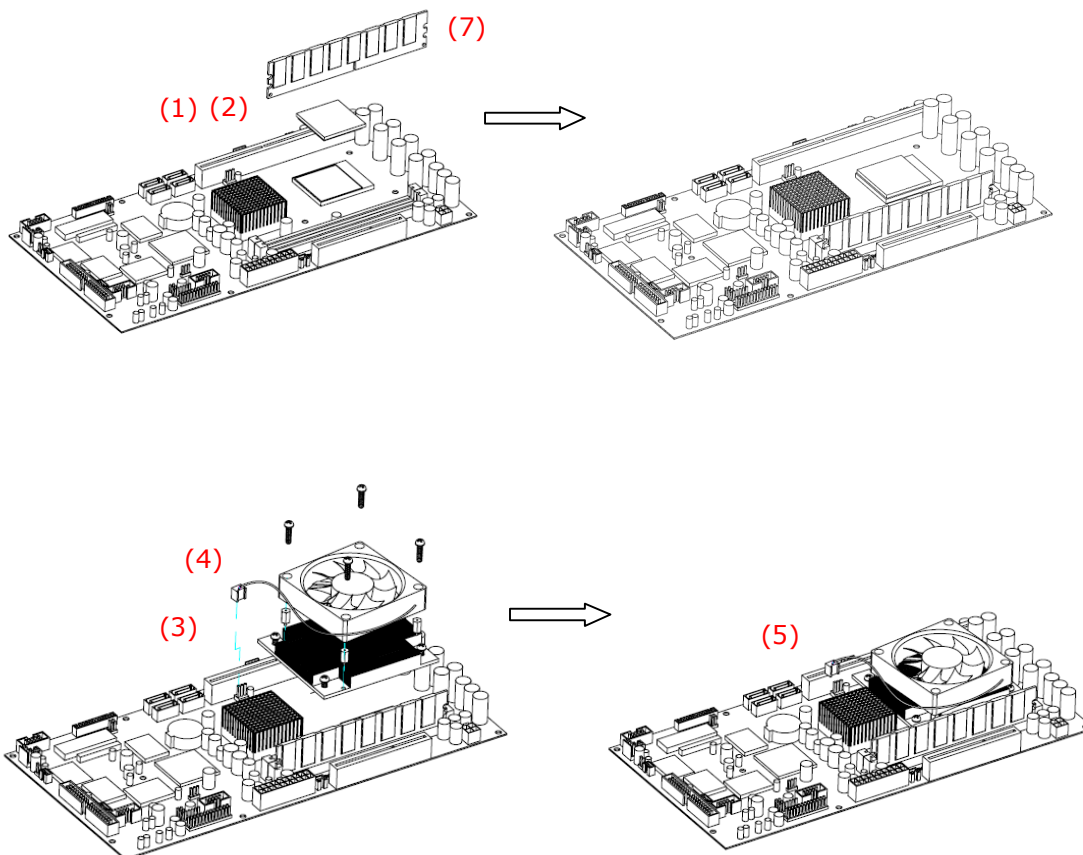
5.2.1.2. Installing the DDR Memory Module

The panel PC's control board provides 2 x 240-pin DDR sockets, able to support DDR memory up to 2GB. To install the memory module, follow the instructions below.

1. Find the 240 pin DDR2 sockets on the motherboard.

2. There are two white eject levers at each end of the DDR socket. Push them outward until they separate from the two vertical posts.

3. Holding the memory module with the notch on the upper right corner, then insert the memory module into the DDR2 socket at 90° angle.

4. Push the two eject levers toward the vertical posts until they click into place. The memory module is now upright.

5. Retain the memory module (7) to the DDR2 socket by firmly fastening the DDR and the eject levers together with nylon cable ties.

The system is able to auto detect the new memory size and there is no need to change the system configuration after installation.

Make sure that the memory module you are using can handle the specified DDR MHz. Inadequate memory module might low down the system performance or make the computer unable to boot up.

5.2.2. Touchscreen Controller Assembly

For easy maintenance in the future, the touchscreen controller is to be installed to a bracket rather than to the system compartment directly.

1. For Elo touch, the touchscreen cable (3) is a flat cable with 5P*2 box headers at both sides. One end is connected to P3 on the touchscreen controller (1) first.

2. There is a 2P (black & red) power wire (4) to provide the power source for the touchscreen. Connect one end to P2 on the controller.

3. Make the controller's coach chip (5) at the upper side. Retain the touchscreen controller to the bracket (2) with two PMS M3*5 screws.
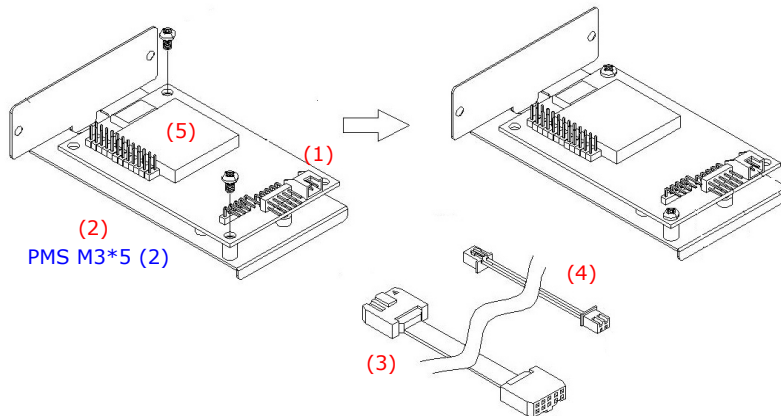
5.2.3. HDD Module Assembly

The panel PC is able to accommodate a 3.5" HDD. It is to be integrated to the drive bay first, then to the chassis.

1. Retain the hard disk drive (1) to the HDD bay (2) with four FMS 6#32 5L screw at each side.

2. Connect one end of a 20P*2 HDD ribbon cable to the hard disk.
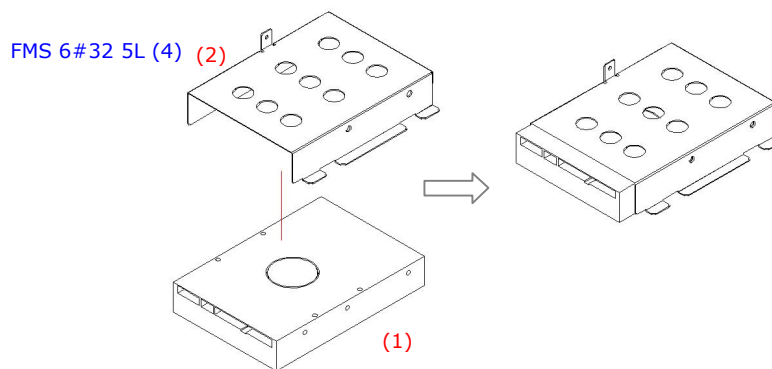
HDD INSTALLATION

5.2.4. Power Module Assembly

The power supply is to be integrated to a power bay before it is installed to the panel PC. The following figure illustrates the steps to assemble the ATX power module. For the specification of the power supply, please refer to APPENDIX.

1. Attach the power bracket (2) to the power supply (3) and fix them together with two FMS 6#32 5L screws. This small bracket is used to prevent the power supply from moving around in the power bay.

2. Insert the power supply to the power bay (1) and fix them together with two FMS M3*5 and two FMS 6#32 5L screws.

3. Protect the front section power cables with a nylon protector. The nylon protector is to prevent the power wires from being cut by the metal brackets.

4. Attach two nylon adhesive cable tie bases to the side of the power bracket.

5. Retain the power cable bundle to the mounting base with a cable tie.

6. Insert a power switch (4) extension cable to the power bracket (1).

FMS 3*5 (2)
FMS 6#32 5L (2)

The power cable coming out from the opening and connected to the MB's ATX power connector.
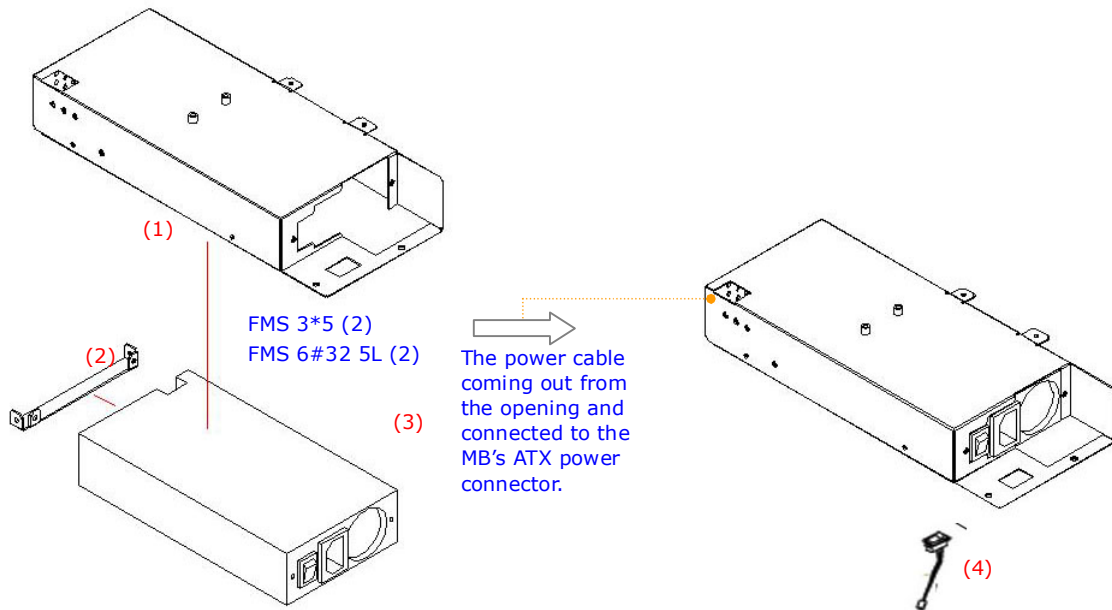
POWER MODULE ASSEMBLY

5.2.5. FDD/CD-ROM Assembly

The following steps show the ways to install an internal CD-ROM or DVD-ROM and floppy disk drive.

1. Attach the CD-ROM board (1) to the slim CD-ROM (2) and fix them together with two TMS 2*8 screws to make a CD-ROM module (3).

2. Insert the CD-ROM module (3) to the CD-ROM/FDD bracket (4) and fix them together with two IMS M2*2.25 screws.

3. There is a 40-pin CD-ROM ribbon cable (7). Connect one end to the CD-ROM board.

4. Attach one end of the 26-pin FDD flat cable to the slim floppy disk drive (5) first.

5. Insert the FDD module to the right side of the CD-ROM/FDD bracket and fix them together with two IMS 2*6 screws.

6. There is a small metal bracket (6) taped with foam sponge used to firmly fix the CD-ROM and FDD modules to the CD-ROM/FDD bracket. Retain this bracket to the device bracket with two FMS M3*5 screws. This small bracket is to prevent the CD-ROM/FDD from moving when installed to the FDD/CD-ROM bracket.
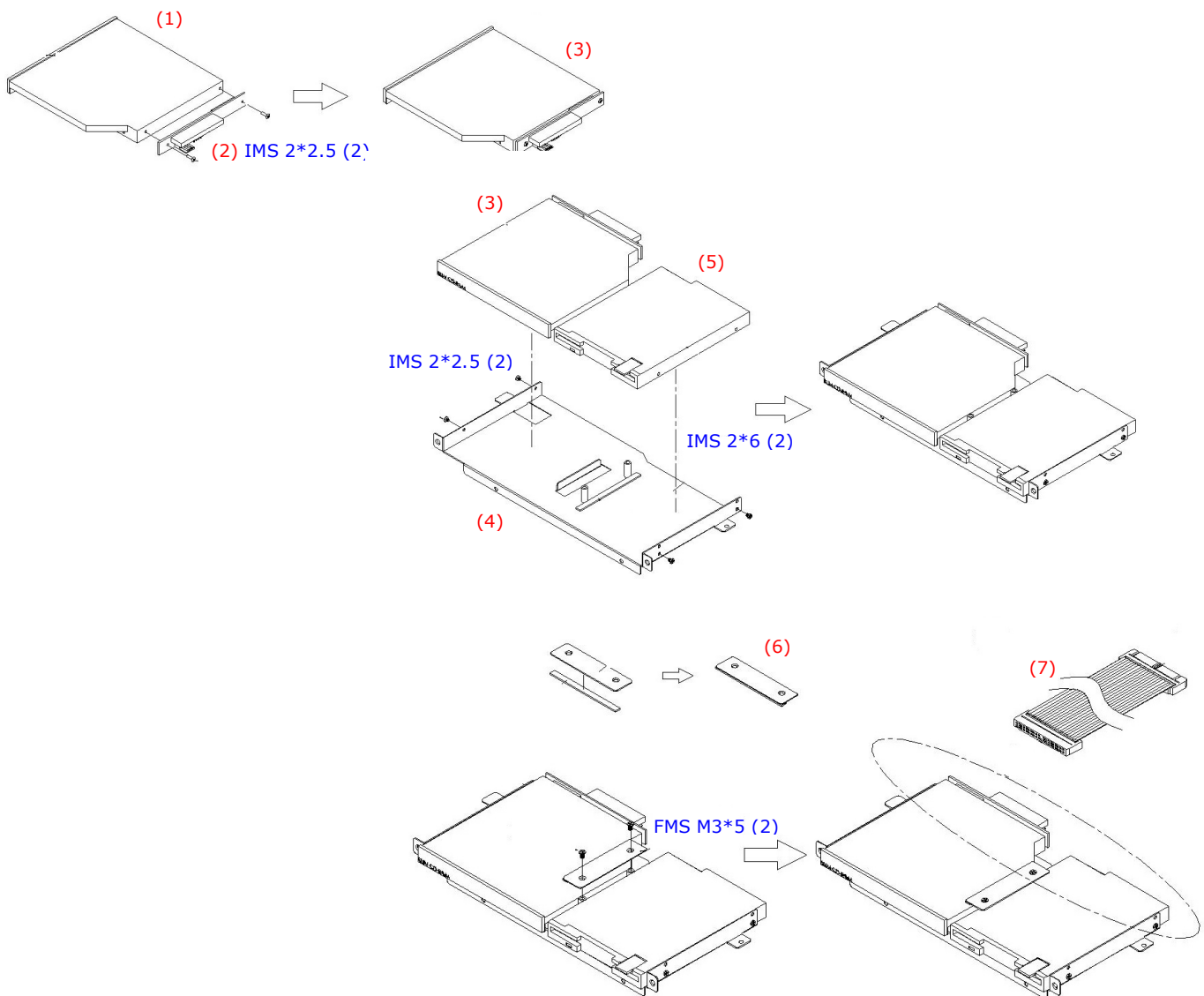
5.2.6. Expansion Door Assembly

If no add-on-card is to be used with the system, fix the two metal brackets (1) to the expansion door (2) with two TMS 3*6 screws. If an add-on-card is to be used with the system, then only fix one metal cover to the expansion door.

TMS 3*6 (2)

(2)

(1)
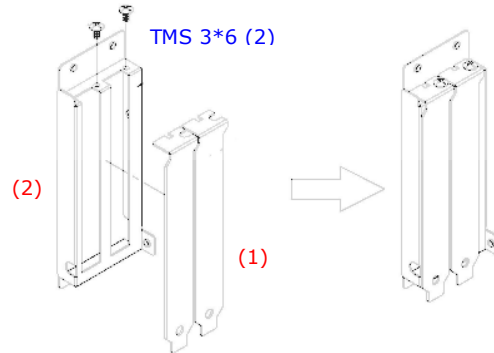
5.2.7. Riser Card Assembly

Retain the riser card (1) to the riser card bracket (2) with two PMS M3*5 screws.

PMS 3*5 (2)

(2)

(1)
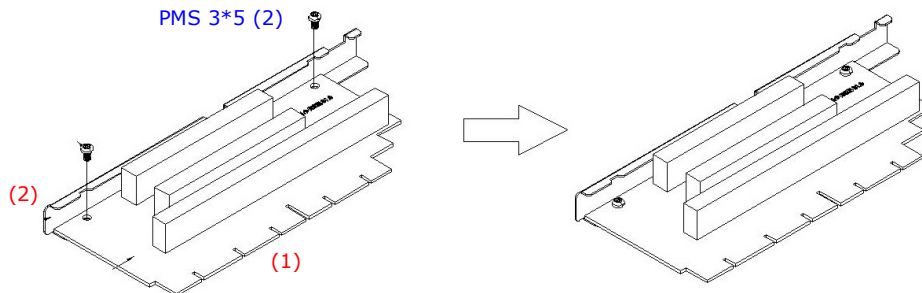
5.2.8. I/O Module Assembly

Refer to the figure below.

1. Retain the external IDE board (5) to the PC metal cover (7) with four PMS M3*5 screws.

2. Insert a filter to the filter cover (6). Retain the filter cover set to the PC metal cover with four FMS M3*5 screws.

3. Attach the IO-006 I/O board (1) to the I/O bracket (3) and fix them together with two 4*12 secure bolts and one FMS 3*5 screw.

4. Attach the IO-005 (2) I/O board to the I/O bracket (3) and fix them together with ten 4*12 secure bolts.

5. Plug one end of a 22P*2 flat cable to CN4 on IO-005 (2) with the other end to CN6 on IO-006. This cable is to link the signal on two I/O boards together.

6. Fix the complete I/O module to the panel PC metal cover (7) with four FMS M3*5 screws.
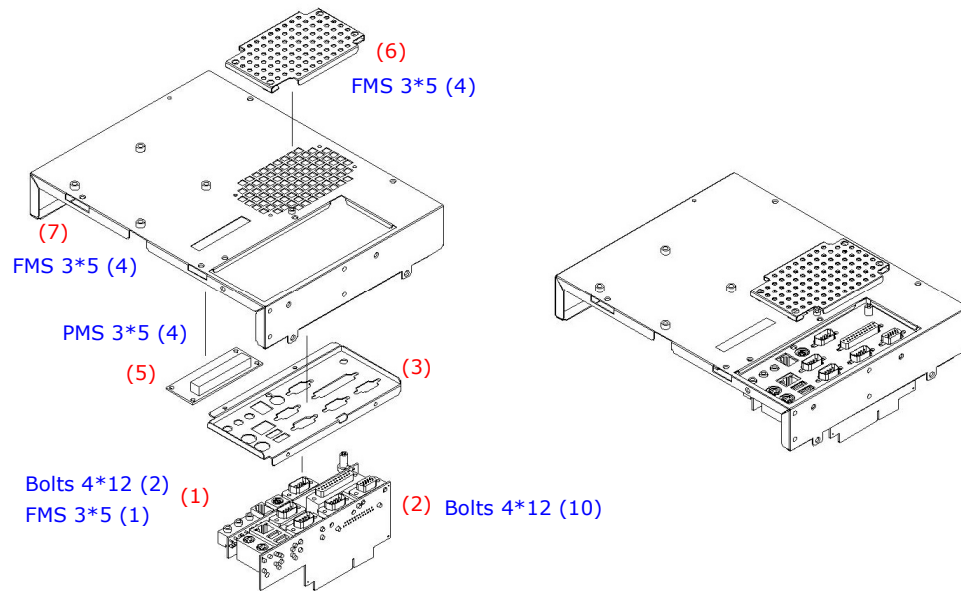
5.2.9. PC Module Integration

The PC's individual modules are now ready for final integration to the PC chassis to make a complete panel PC. The sequence for integration is from the motherboard, the HDD module, the toucshcreen controller, the expansion door, the CD-ROM/FDD module, the display module, the inverter, the power supply, the riser card and then followed by the PC cover module.

Follow the steps below to integrate the individual modules to the system chassis.

5.2.9.1. Motherboard Integration

1. The motherboard (2) is the first component to be assembled to the PC chassis (A). Make sure the CPU with cooling fan and DDR are already properly installed to the motherboard. From your point of view, the expansion opening is at your right side. The motherboard module is to be installed to the lower side of the chassis.

2. Tape the motherboard insulator (1) to the chassis first. The insulator is to isolate the electronic components on the reverse side of the motherboard from the metal compartment to prevent short circuitry caused during system operation.

3. There are eight screws holes on the motherboard. Retain the motherboard (2) to the chassis with eight PMS M3*5 screws.
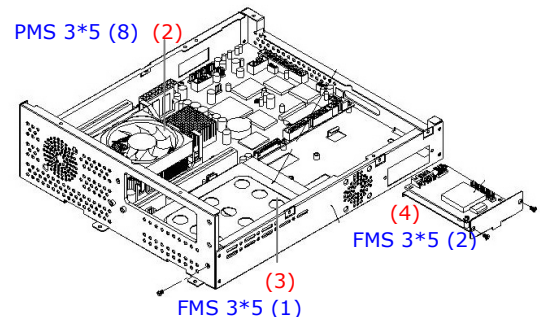
5.2.9.2. HDD Module Integration

4. There are two clamps at the bottom side used to hold the HDD module to the chassis. Insert the HDD module to the chassis and clamp it into place. Retain the HDD module (3) to the chassis with one FMS M3*5 screw at the upper side of the chassis.

5. Connect the other end of the 20P*2 HDD ribbon cable to IDE1 at the left upper side of the motherboard.
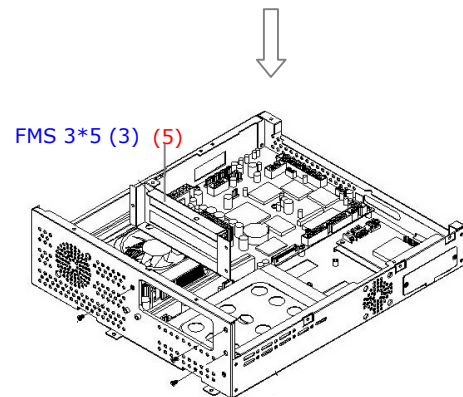
5.2.9.3. Touchscreen Controller Integration

6. Insert the touchscreen controller bracket (4) to the chassis from the opening at the left upper side opening and retain it to the chassis with two FMS M3*5 screws.

7. Connect the other end of the 5P*2 flat cable from the controller to COM3 at left upper side of the motherboard.

8. Connect the other end of the 2P power wire to the CN1 on the motherboard.
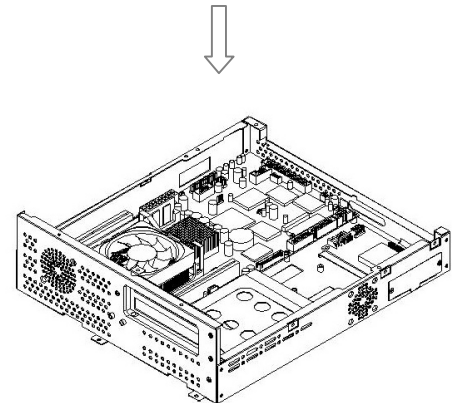
5.2.9.4. Expansion Door Integration

9. Retain the expansion door (5) to the opening at the right side of the chassis with three FMS M3*5 screws.

PMS 3*5 (8) (2)

(4)

FMS 3*5 (2)

(3)

FMS 3*5 (1)

FMS 3*5 (3) (5)

5.2.9.5.   Display Module Integration

Due to cabling concern, the display module has to be integrated to the PC module before the CD-ROM/FDD module integration.

7. Retain the PC chassis to the display module (6) with six PMS M3*6 screws.

8. One end of the LVDS cable is already plugged to the LCD panel and the other end is to come out from the small opening at the middle of the LCD holder. Make sure this other end is to go through the rectangle opening at the rear side of the system chassis and have it connected to LCD connector, LCD1 on the motherboard.

9. The touchscreen 5P white flat cable should go through the rectangle opening at the left side of the LCD holder, then get into the chassis from the oval-shape opening at the left side of the chassis. Connect this cable to P4 on the touchcreen controller.

10. The inverter cable for OP 1500 is a 7P to 4P cable with wafer connectors at both sides. Insert the 7P end into the left opening of the inverter insulator and have it connected to CN1 on the inverter first.

11. Connect the OP 1500/1700 LCD pink-white power wires from the LCD to CN2 and CN3 on the inverter.

12. Retain OP 1500's inverter (7) to the left side of the display module with two M3*15 bolts.

13. Insert the inverter cable to the chassis through the small opening at the left side of the chassis. Connect the other end of the inverter cable to the motherboard's INV1.
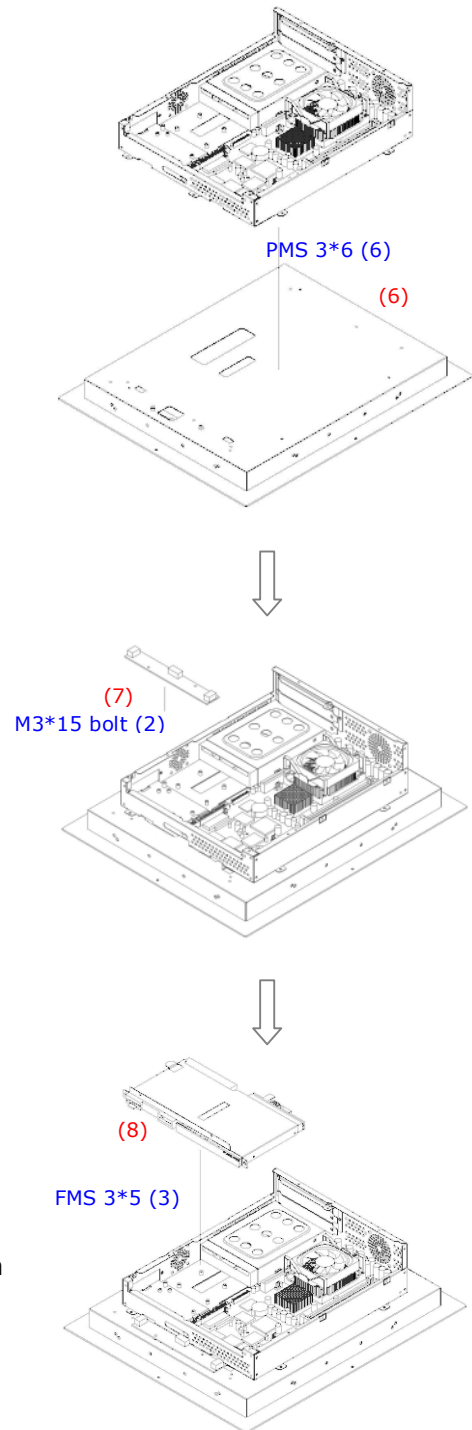
5.2.9.6.   Slim CD-ROM/FDD Integration

14. The CD-ROM/FDD module (8) is to be installed on the left side of the chassis.

15. Connect the 40-pin end of the CD-ROM ribbon cable to the motherboard's IDE2 connector.

16. There is a 4-pin black & red CD audio-in wire to be plugged to CD1 on the motherboard. Connect the other end to the 4-pin black pin connector on the CD-ROM board.

17. Connect the other end of the FDD cable to the FDD1 on the motherboard.

18. Fix the whole unit to the chassis and fix them together with three FMS M3*5 screws.

PMS 3*6 (6)

(6)

(7)

M3*15 bolt (2)

(8)

FMS 3*5 (3)

5.2.9.7. Power Supply Integration

19. Integrate the power supply module (9) to the PC's chassis and retain them together with three FMS M3*5 screws.

20. Connect the power switch cable to CN3 on the motherboard.

21. Plug the ATX 10P*2 power cable to the ATX power connector, ATXP2 on the motherboard.

22. Plug the ATX12V 2P*2 power cable to the ATX12V power connector, ATXP1 on the motherboard.

23. Connect the big 4-pole end of the power cable to the HDD.

24. Connect the small 4-pole end of the power cable to the CD-ROM board.
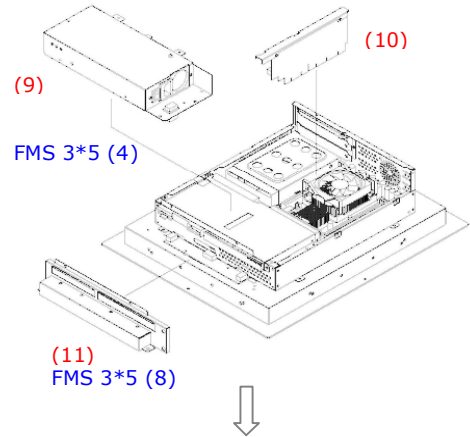
5.2.9.8. Riser Card Integration

25. Have the riser card module (10) firmly plugged to the ESIA slot on the motherboard.

5.2.9.9. Inverter Cover Integration

26. Retain the inverter cover (11) to the left side of the chassis with eight FMS M3*5 screws.

5.2.9.10. I/O Cover Integration

27. Plug the I/O module (12) to the IOINF1 slot on the motherboard and retain it to the chassis with nine FMS M3*5 screws.

5.2.9.11. I/O Cover Integration

28. Plug the I/O module to the IOINF1 slot on the motherboard and retain it to the chassis with nine FMS M3*5 screws.
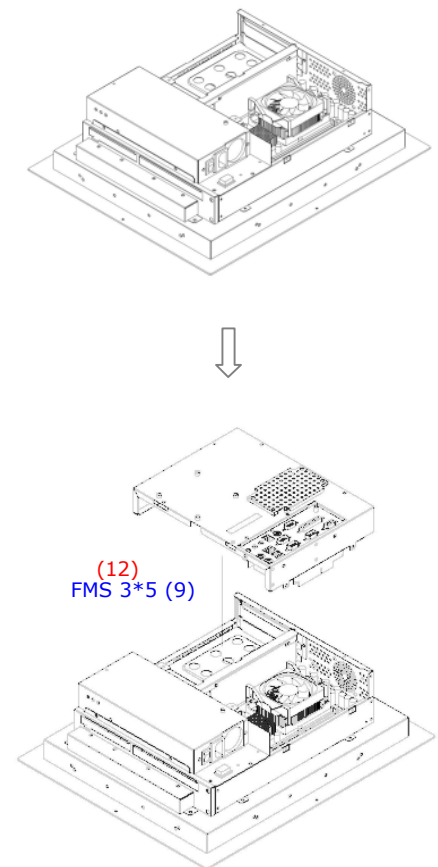
6. System Motherboard & I/O Boards

The system controller used in the OP SERIES system is a special-design Intel LGA775 Socket Core 2 Duo multimedia motherboard. All the onboard signal is connected to the external I/O ports via two I/O boards. This chapter provides jumper definition and connector signal of the motherboard and the I/O boards.

6.1. OP SERIES Motherboard

This section provides background information and detail specification on the OP SERIES system engine, PC920. Sections include:
✧ General Information
✧ Specification
✧ Board placement & Dimension

6.1.1. General Information

The **PC920** is an Intel Core 2 Duo (LGA775 Socket) multimedia ATX motherboard with LCD/VGA controller, Ethernet 100/10, AC97 sound, and IDE flash disk. By integrating single chip, Intel 945G, the PC920 provides a high performance/low cost desktop solution.

Highly integrated, the PC920 can adapt Intel® LGA775 Socket Core 2 Duo CPU. Onboard features include four serial ports, one multi–mode Parallel ports, a floppy drive controller and a PS/2 keyboard PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and ATA 100 mode. Up to four IDE devices can be connected, including large hard disks, CD-ROM drives and other IDE devices. The full PC functionality coupled with its multi-I/Os stand ready to accommodate a wide range of PC peripherals. Compact in size and with its highly integrated multimedia and networking functions, the PC920 is the most powerful PC engine to build any small footprint all-in-one PC system for integration into any space-constricted embedded applications.

Fully configurable and with its modular design, the PC920 is an ideal platform for any consumer computing applications where space is a premium.

6.1.2. Specifications

PC920 : Multimedia Socket LGA775 Intel Pentium IV Motherboard with XGA, LCD, Ethernet & Audio Interface

- **CPU** : Intel Socket LGA775,533/800/1066MHz FSB

  Intel Core2 DUO LGA775 2.66GHz+

  Intel Pentium Dual-Core LGA775 2.4GHz+

  Intel Celeron LGA775 3.6GHz+

1.1. Main Chipset : Intel 945G & ICH7

- **System BIOS** : Award PnP Flash BIOS

- **System Memory** : 2 x 240 pin DDRII sockets supporting system memory up to 4GB

- **L2 Cache** : CPU built-in

- **Standard I/O** :

◆ Serial ports x 4: COM 1, 2 & 4 with +5V/12 power output on pin #9, COM 3 internal type reserved for touchscreen, COM2 RS-232/485 jumper selectable

  Parallel Port x 1: supports SPP/EPP/ECP

  SATA ports x 4

  ATA 100/66 IDE x 1 : supports up to 2 IDE devices

  FDD x 1, supports 1 floppy disk drives

  PS/2 Keyboard Interface x 1

  Internal Keyboard Interface x 1

  PS/2 Mouse Interface x 1

  USB Interface x 6 : supports USB 2.0 devices(internal x4 port ,external x2 port)

  IrDA, 6-pin header Support IrDA version 1.0 SIR & Consumer IR

- **Ethernet** :

  100/10 Base-T Ethernet
  Support WAKE-ON-LAN

- **Display** :

  Supports 2-channel LVDS LCD, resolution up to 1600x1200

  Integrated 2D/3D graphics engine, 4X AGP

  Share system memory architecture able to utilize the display memory size up to 64MB

  Maximum resolution for video chipset : 640x480, 800x600, 1024x768, 1280x1024, 1600x1200, 1920x1200, True-color

- **Audio Function** :

  Full duplex and independent sample rate converter for audio recording & playback
  Supports Microsoft DirectSound
  3D positional audio effects
  Hi-performance, mixed-signal, stereo
  MIC-In, Speaker-Out, Line-In
  Pin header for CD-audio in

- **Hardware Monitor** :

  Monitoring processor & system
  Monitoring 5VSB, VBAT, 1.5V, 3.3V, +5V, +12V, -12V, and processor voltages
  Monitoring processor, chassis fan speeds
  Controlling processor and chassis fan speed and failure alarm

Automatic fan on/off control

Read back capability that displays temperature, voltage and fan speed

Supporting Intel processor thermal diode output (real processor temperature)

■ **Expansion Bus** : PCI/ISA x 1

■ **Power** : ATX power

◆ **Dimension** : 300*146 mm (L*W)

6.1.3. Locating Jumpers & Connectors
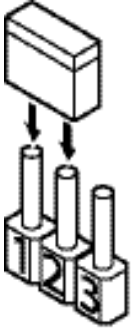
The following figure helps you to locate the jumpers and connectors on the motherboard.
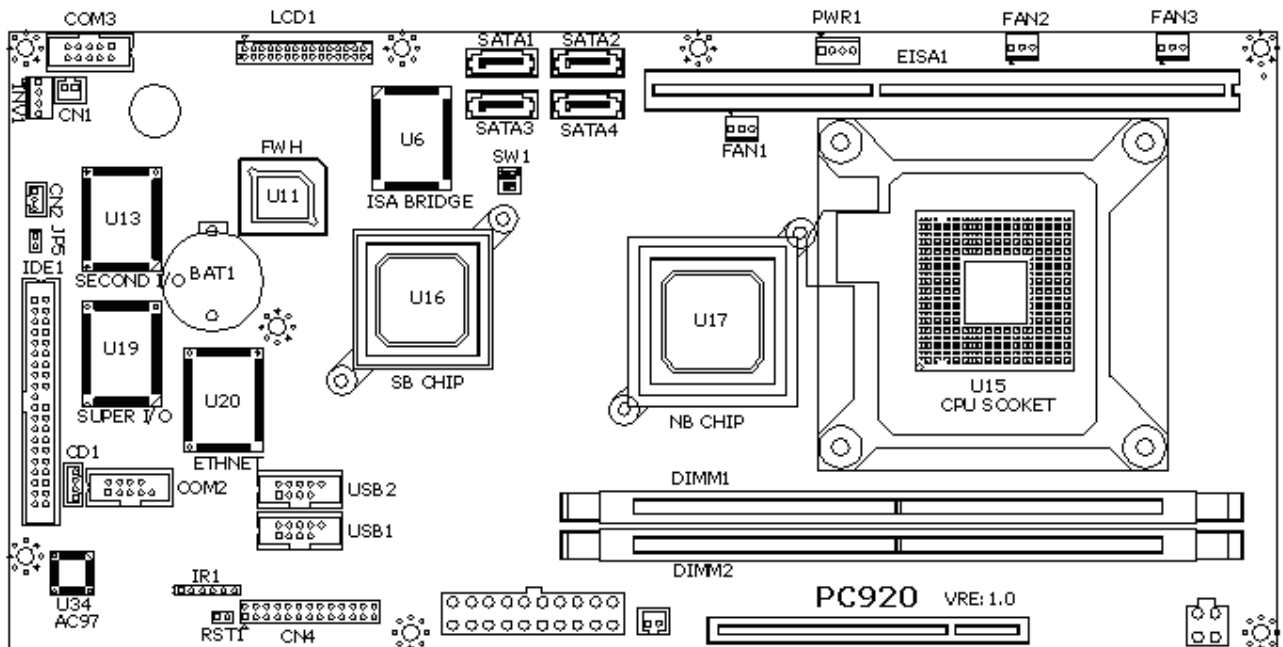
6.1.4. How to Set Jumpers

The jumpers on the motherboard are to set system configuration options. When setting the jumpers, be sure the shunts (jumper caps) are placed on the correct pins.

This 2-pin jumper is **Open**.	
This 2-pin jumper is **Closed**.	
This 3-pin jumper is **Closed** on pins 1 and 2.	

6.1.5. Jumpers & Jumper Setting

The table below lists the function of each jumper. The related jumper settings are shown in the coming sections.

Jumper	Description
JP3	Clear CMOS

6.1.5.1. *Clear CMOS* (JP3)

1-2	Normal
2-3	Clear CMOS

6.1.6. Connectors & Pin Assignment

The table below lists the function of each connector on the PC920. Their corresponding pin assignments will be shown in the following sections.

Connector	Description
ATXP1	ATX power connector
ATXP2	ATX +12V power connector
CN1	Power connector for touchscreen
PWR1	Power Output Connector
INV1	LCD Inverter connector
LCD1	LCD connector
USB1,2	USB1&USB2 port connector
IDE1	PATA connector For CD-ROM
SATA1~4	SATA1~4 connector
COM2	Serial port 2
COM3	Serial port 3 (for touchscreen)
CD1	CD audio In
IR1	IR/CIR connector
CN4	KB/Mouse/Speaker/LED connector
EISA1	PCI/ISA expansion slot
IOINF1	I/O slot
FAN1	CPU FAN connector
FAN2/FAN3	System FAN connector
CN3	ATX power ON Switch
RST1	Reset connector
CN2	EXT. LAN wake up connector

6.1.6.1. ATXP1: ATX Power Connector

ATXP1 is a standard ATX power connector.   This connector is provided to connect to an ATX power supply. The plug of the power supply will only insert in one orientation due to the different hole size. Find the proper orientation and push down the power connector firmly to make sure the pins are aligned. Its pin assignments are listed below :

Pin #	Signal	Pin #	Signal
	3.3V	11	3.3V
2	3.3V	12	-12V
3	Gnd	13	Gnd
4	+5V	14	PSON#
5	Gnd	15	Gnd
6	+5V	16	Gnd
7	Gnd	17	Gnd
8	PWROK	18	-5V
9	SB5V	19	+5V
10	+12V	20	+5V

6.1.6.2. ATXP2: ATX +12V Power Connector

ATXP2 is a standard +12V ATX power connector.   Its pin assignments are listed below

Pin #	Signal	Pin #	Signal
1	GND	3	+12V
2	GND	4	+12V

6.1.6.3. CN1: Touchscreen Power Connector

Pin #	Signal
1	GND
2	VCC

6.1.6.4. PWR1: Power Output Connector

Pin #	Signal
1	+12V
	GND
	GND
2	VCC

6.1.6.5. INV1:   LCD Inverter Connector

Pin #	Signal
1	Backlight ADJ
2	GND
3	Backlight Enable
4	12V

6.1.6.6. *USB1,2: USB Port Connector*

Pin #	Signal	Pin #	Signal
1	USB VCC	2	USB VCC
3	USB P4-	4	USB P5-
5	USB P4+	6	USB P5+
7	GND	8	GND
9	KEY	10	HEAD#

6.1.6.7. *LCD1: LCD Connector*

Pin #	Signal	Pin #	Signal
1	YA0M	2	YA0P
3	YA1M	4	YA1P
5	YA2M	6	YA2P
7	GND	8	CLKAM
9	CLKAP	10	YA3M
11	YA3P	12	YB0M
13	YB0P	14	GND
15	YB1M	16	YB1P
17	GND	18	YB2M
19	YB2P	20	CLKBM
21	CLKBP	22	YB3M
23	YB3P	24	GND
25	VCC3	26	VCC3
27	VCC3	28	VCC
29	VCC	30	VCC

6.1.6.8. IDE1: PATA Connector for CD-ROM

The PC920 provides one sets of 40-pin IDE connectors. The built-in high speed PCI IDE controller supports both PIO and ATA 100 mode. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives and ATAPI devices. Their corresponding pin assignments are listed below :

Pin #	Signal	Pin #	Signal
1	RESET#	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA10
9	DATA 4	10	DATA11
11	DATA 3	12	DATA12
13	DATA 2	14	DATA13
15	DATA 1	16	DATA14
17	DATA 0	18	DATA15
19	GND	20	NC
21	IDEREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	ICHRDY#	28	GND
29	DACK	30	GND
31	IDEIRQ	32	NC
33	A1	34	LID
35	A0	36	A2
37	IDECS0	38	IDECS1
39	HDD LED	40	GND

6.1.6.9. SATA1~4 : SATA Connector

The PC920 has an integrated SATA host controller that supports independent DMA operation on four ports and supports data transfer rates of up to 3.0Gb/s (300 MB/s). Their corresponding pin assignments are listed below :

Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXP
6	RXN
7	GND

6.1.6.10. *COM2*

COM2 is a RS-232, 422 or 485, selected via BIOS setup.

Pin #	Signal	Pin #	Signal
1	DCD/422TX-	2	DSR
3	RXD/422TX+	4	RTS
5	TXD/422RX+	6	CTS
7	DTR/422RX-	8	RI
9	GND	10	KEY

6.1.6.11. *COM3*

COM 3 is an internal RS-232 reserved for touchscreen. Its corresponding pin assignment is listed as below;

Pin #	Signal	Pin #	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	VCC

6.1.6.12. *CD1: CD Audio IN*

Pin #	Signal
1	Left channel
2	CD GND
3	CD GND
4	Right channel

6.1.6.13. *IR: IR/CIR Connector*

IR	
Pin #	Signal
1	5V
2	NC
3	IRRX
4	GND
5	IRTX
6	CIRRX

6.1.6.14. CN4: Power LED & EXT. KB/MS, USB

Pin #	Signal	Pin #	Signal
1	VCC	2	VCC
3	HDD LED	4	LAN LED
5	Suspend LED	6	IRTX
7	KEY	8	IRRX
9	BACKLIGHT CTRL INPUT	10	CIRRX (Option)
11	GND	12	GND
13	SPK-LO	14	SPK-RO
15	SPK-LN	16	SPK-RN
17	GND	18	GND
19	USB P2-	20	EXT.KBDAT
21	USB P2+	22	EXT.KBCLK
23	USB P3-	24	EXT.MSDAT
25	USB P3+	26	EXT.MSCLK

6.1.6.15. IOINF 1:I/O Connector

The PC920's onboard I/O signal for LAN, USB, keyboard, mouse, VGA, COM ports and parallel port are all mixed in the IOINF1 slot. By plugging an IO-005 I/O board and connected to another IO-006 I/O board, all the onboard signal are connected to the system external I/O ports. Please be noted that the IOINF1 is a slot in AGP slot form, but it is not to be plugged with any AGP card.

6.1.6.16. EISA1: PCI/ISA Expansion Slot

The PC920 provides an ISA/PCI slot for ISA and PCI device expansion.
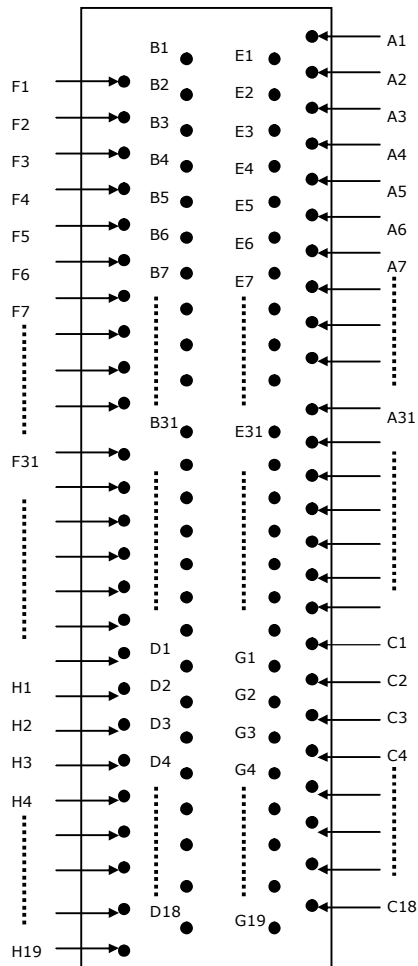
EISA1: PCI/ISA Slot Side View

EISA1: PCI/ISA Slot Connector Pin Assignment

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
F1	GND	B1	GND	E1	GND	A1	IOCHK
F2	GND	B2	ISARST	E2	GND	A2	SD7
F3	INTB	B3	VCC	E3	INTC	A3	SD6
F4	INTA	B4	IRQ9	E4	INTD	A4	SD5
F5	VCC	B5	-5V	E5	VCC	A5	SD4
F6	KEY	B6	DRQ2	E6	KEY	A6	SD3
F7	VCC	B7	-12V	E7	VCC	A7	SD2
F8	PCICLK1	B8	OWS	E8	PCIRST	A8	SD1
F9	GND	B9	+12V	E9	GNT0	A9	SD0
F10	GNT3	B10	GND	E10	REQ0	A10	IORDY
F11	GND	B11	SMEMW	E11	GND	A11	AEN
F12	REQ3	B12	SMEMR	E12	PCILKE2	A12	SA19
F13	AD31	B13	IOW	E13	GND	A13	SA18
F14	AD29	B14	IOR	E14	AD30	A14	SA17
F15	NC	B15	DACK3	E15	NC	A15	SA16
F16	KEY	B16	DRQ3	E16	KEY	A16	SA15
F17	NC	B17	DACK1	E17	NC	A17	SA14
F18	AD27	B18	DRQ1	E18	AD28	A18	SA13
F19	AD25	B19	REF	E19	AD26	A19	SA12
F20	CBE3	B20	ATCLK	E20	AD24	A20	SA11
F21	AD23	B21	IRQ7	E21	AD22	A21	SA10
F22	AD21	B22	IRQ6	E22	AD20	A22	SA9
F23	AD19	B23	IRQ5	E23	AD18	A23	SA8
F24	NC	B24	IRQ4	E24	NC	A24	SA7
F25	KEY	B25	IRQ3	E25	KEY	A25	SA6
F26	NC	B26	DACK2	E26	NC	A26	SA5
F27	AD17	B27	TC	E27	AD16	A27	SA4
F28	IRDY	B28	ALE	E28	FRAME	A28	SA3
F29	DEVSEL	B29	VCC	E29	CBE2	A29	SA2
F30	LOCK	B30	OSC	E30	TRDY	A30	SA1
F31	PERR	B31	GND	E31	STOP	A31	SA0
H1	SERR	D1	MEMCS16	G1	NC	C1	SBHE
H2	AD15	D2	IOCS16	G2	NC	C2	LA23
H3	AD14	D3	IRQ10	G3	CBE1	C3	LA22
H4	AD12	D4	IRQ11	G4	PAR	C4	LA21
H5	GND	D5	IRQ12	G5	GND	C5	LA20
H6	KEY	D6	IRQ15	G6	KEY	C6	LA19
H7	GND	D7	IRQ14	G7	GND	C7	LA18
H8	AD10	D8	DACK0	G8	AD13	C8	LA17
H9	AD8	D9	DRQ0	G9	AD11	C9	MEMR
H10	AD7	D10	DACK5	G10	AD9	C10	MEMW
H11	AD5	D11	DRQ5	G11	CBE0	C11	SD8
H12	AD3	D12	DACK6	G12	AD6	C12	SD9
H13	AD1	D13	DRQ6	G13	AD4	C13	SD10

H14	AD0	D14	DACK7	G14	AD2	C14	SD11
H15	KEY	D15	DRQ7	G15	KEY	C15	SD12
H16	VCC	D16	VCC	G16	VCC	C16	SD13
H17	VCC	D17	MASTER	G17	VCC	C17	SD14
H18	GND	D18	GND	G18	GND	C18	SD15
H19	GND			G19	GND		

6.1.6.17. FAN 1~3: FAN Connector

Pin #	Signal
1	GND
2	+12V
3	FAN SPEED DECECT

6.1.6.18. CN3: ATX Power on Switch

Pin #	Signal
1	5VSB
2	Power ON/OFF

6.1.6.19. RST1: Reset System Connector

Pin #	Signal
1	RESET
2	GND

6.1.6.20. CN2: External LAN Wake-up

Pin #	Signal
1	5VSB
2	GND
3	LAN WAKE-UP

6.2. OP SERIES I/O Boards

The **IO-005** and **IO-006** are two docking boards used to connect all the I/O signal from OP SERIES's Motherboard to the exterior of the system for external device connection. This section provides jumper definition and connector signal of the two I/O boards.
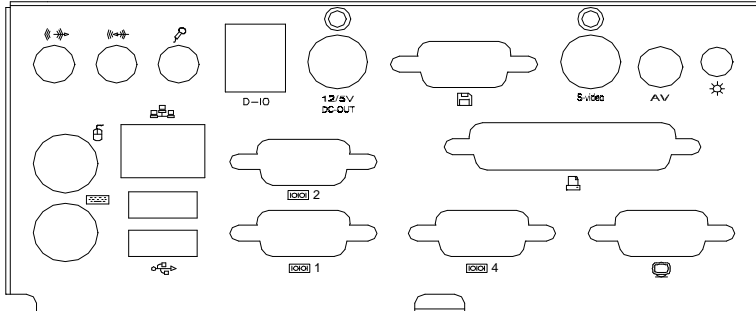
6.2.1. I/O Board IO-005

The IO-005 connects the onboard keyboard, mouse, Ethernet, USB ports, COM1, COM2, COM4 , parallel port and VGA signal from the Motherboard to the system for external device connection.
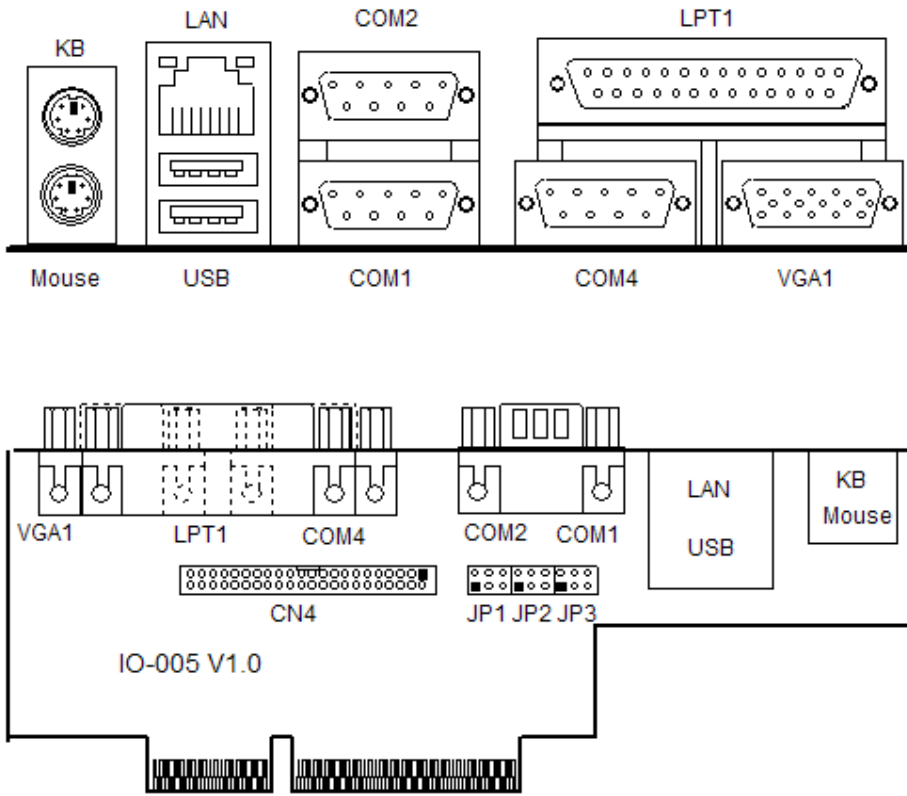
6.2.1.1. Jumpers & Jumper Setting

The table below lists the function of each jumper on IO-005.

JP3	COM1 pin 9 power selection
JP2	COM2 pin 9 power selection
JP1	COM4 pin 9 power selection

The OP SERIES onboard COM port power selection is selected via jumper setting

RI	5V	12V
1-2	3-4	5-6

6.2.1.2. CN4: EXT. Connector

The onboard speaker-out, line-in, MIC-in, DIO and external FDD are connected to the CN4 on IO-005. Then, via a 44-pin flat cable, these signals are linked to IO-006 for external device connection.

6.2.2. IO Board-IO006

The **IO-006** is an I/O board links the onboard speaker-out, line-in, MIC-in, DIO and external FDD from Io-005 to the system for external device connection.
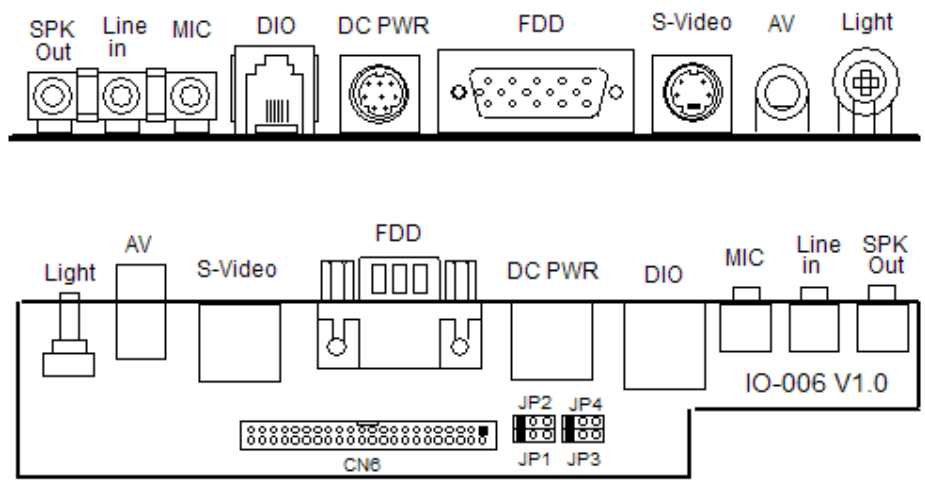
6.2.2.1. Jumpers & Jumper Setting

CN4 DIO port : The DIO port address setting is selected in CMOS SETTING. Select ADDRES 200H OR 208H

Read DIO IN BIT0~BIT3 IN DIO PORT ADDRES BIT0~3
WRITE DIO OUT BIT0~3 IN DIO PORT ADDRES BIT4~7

JP2: CN4 DIO port pin#2 select

1-2	DIO IN Bit 0
2-3	DIO OUT Bit 2

JP1: CN4 DIO port pin#3 select

1-2	DIO IN Bit 1
2-3	DIO OUT Bit 3

JP4: CN4 DIO port pin#5 select

1-2	DIO OUT Bit 0
2-3	DIO IN Bit 2

JP2: CN4 DIO port pin#6 select

1-2	DIO OUT Bit 1
2-3	DIO IN Bit 3

6.2.2.2. CN6: EXT. Connector

CN6 is a 44-pin connector links the onboard speaker-out, line-in, MIC-in, DIO and external FDD to the IO-006 for external device connection.

6.2.3. Connectors & Pin Assignment

The table below lists the function of each connector on IO-005 and IO-006. Their corresponding pin assignments will be shown in the following sections.

Keyboard	Keyboard connector
Mouse	Mouse connector
COM1	Serial port 1 (3F8)
COM2	Serial port 2 (2F8)
COM4	Serial port 4 (2E8)
DC Power	DC power +5V/+12VC output
LPT	Parallel port
CRT	CRT display connector
FDD	External FDD connector
USB1	USB connector 1
USB2	USB connector 2
DIO	Digital I/O connector
LAN	Ethernet connector
MIC-in	Microphone-in connector
Line-in	Line-in connector
SPK-out	Speaker output connector
VR	LCD Backlight control

6.2.3.1. Keyboard: PS/2 KB Connector

Pin #	Signal
1	KBDATA
2	NC
3	GND
4	SB5V
5	KBCLK
6	NC

6.2.3.2. Mouse: PS/2 Mouse

Pin #	Signal
1	MSDATA
2	NC
3	GND
4	5V
5	MSCLK
6	NC

6.2.3.3. COM1, COM2, COM4 (DB-9)

Pin #	Signal	Pin #	Signal
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI (+5V/12V)
5	GND		

6.2.3.4. DC Power: DC Power Output

Pin #	Signal	Pin #	Signal
1	GND	5	+5V
2	GND	6	+12V
3	+5V	7	GND
4	+12V	8	GND

6.2.3.5. LPT1: D-SUB-25 Parallel Port

Pin #	Signal	Pin #	Signal
1	STRB#	14	AFD#
2	DATA 0	15	ERROR#
3	DATA 1	16	INIT#
4	DATA 2	17	SLINT#
5	DATA 3	18	GND
6	DATA 4	19	GND
7	DATA 5	20	GND
8	DATA 6	21	GND
9	DATA 7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT		

6.2.3.6. CRT: VGA (D-SUB 15 Pin)

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	Red	6	GND	11	NC
2	Green	7	GND	12	DDCDATA
3	Blue	8	GND	13	Hsync
4	NC	9	NC	14	Vsync
5	GND	10	GND	15	DDCCLK

6.2.3.7. FDD: External FDD Connector

Pin #	Signal	Pin #	Signal	Pin #	Signal
1	RWC#	6	WP#	11	RDATA#
2	INDEX#	7	TRAK0#	12	HEAD#
3	MOA#	8	WE#	13	DSKCHG#
4	DSA#	9	WD#	14	GND
5	DIR#	10	STEP#	15	GND

6.2.3.8. J11: USB 1, USB2 Connector

USB1		USB2	
Pin #	Signal	Pin #	Signal
1	USBVCC	1	USBVCC
2	Data-	2	Data-
3	Data+	3	Data+
4	GND	4	GND

6.2.3.9. DIO1: RJ-11 Connector

Pin #	Signal	Pin #	Signal
1	+12V	2	IN_0/OUT_2
3	IN_1/OUT_3	4	GND
5	OUT_0/IN_2	6	OUT_1/IN_3

6.2.3.10. LAN1: RJ-45 Ethernet Connector

Pin #	Signal	Pin #	Signal
1	TD+	2	TD-
3	RO+	4	NC
5	NC	6	RO-
7	NC	8	NC

6.2.3.11. MIC1

Pin #	Signal
1	Vref
2	NC
3	NC
4	MIC IN
5	GND

6.2.3.12. LINE 1

Pin #	Signal
1	Right CHI
2	NC
3	NC
4	Left CH
5	GND

6.2.3.13. SPK 1

Pin #	Signal
1	Right CHI
2	NC
3	NC
4	Left CH
5	GND

7. BIOS Setup Utility

The BIOS (Basic Input and Output System) Setup Utility displays the system's configuration status and provides options to set system parameters. The parameters are stored in battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS. This chapter describes how to set up BIOS configuration.

7.1. About the BIOS Setup Utility

The BIOS Setup Utility enables you to configure the following items :

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

- This Setup Utility should be used for the following :
- The system is staring for the first time.
- The hardware devices attached to the systems have been changed
- The CMOS memory has lost power and the configuration information has been erased.
- When a configuration error is detected and you are prompted to make changes to the Setup Utility
- When trying to resolve IRQ conflicts
- When making changes to the Power Management configuration
- When changing the User or Supervisor password

The BIOS setup program is stored in ROM, which can be accessed by pressing <DEL> key on the keyboard immediately when the system is powered on.

In order to retain the specified setup information when the system power is turned off, the system setup information is stored in a battery-backed CMOS RAM. The battery is to ensure the settings will not be erased when the computer is turned off or reset. When the computer is powered on again, the system will read the settings stored in the CMOS RAM and compare them to the equipment check conducted during the power on self test (POST). If any error or mismatch occurs, an error message will be shown on the screen and the computer will be prompted to run the setup program.

7.2. Control Key Definition

The BIOS navigation keys are listed below.

↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc	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	Increase the numeric value or make changes
PgDn	Decrease the numeric value or make changes
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F5	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7	Load the default
F10	Save all the CMOS changes, only for Main Menu

7.3. Getting Help

7.3.1. Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

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>.

7.4. AWARD BIOS Setup

7.4.1. Entering the Setup Utility

When you power on the system, BIOS enters the Power-On Self Test (POST) routines. POST is a series of built-in diagnostics performed by the BIOS. After the POST routines are completed, the following message appears :

<div align="center">

Press DEL to enter SETUP

</div>

Press the delete key <Delete> to access the Award BIOS Setup Utility. The setup main menu will appear on the screen. The main menu of the Setup Utility displays a list of the options that are available. A highlight indicates which option is currently selected. Use the cursor arrow keys to move the highlight to other options. When an option is highlighted, execute the option by pressing <Enter>.

Some options lead to pop-up dialog boxes that prompt you to verify that you wish to execute that option. Other options lead to dialog boxes that prompt you for information.

Some options (marked with a triangle ▶) lead to submenus that enable you to change the values for the option. Use the cursor arrow keys to scroll through the items in the submenu.

Phoenix – AwardBIOS CMOS Setup Utility	
➢ **Standard CMOS Feature**	➢ **Frequency/Voltage Control**
➢ **Advanced BOIS Features**	**Load Fail-Safe Defaults**
➢ **Advanced Chipset Features**	**Load Optimized Defaults**
➢ **Integrated Peripherals**	**Set Supervisor Password**
➢ **Power Management Setup**	**Set User Password**
➢ **PnP/PCI Configuration**	**Save & Exit Setup**
➢ **PC Health Status**	**Exit Without Saving**
Esc : Quit	↑↓→ ← : **Select Item**
F10 : Save & Exit Setup	
Time, Date, hard Dick Type...	

The following lists the functions of the items on the BIOS main menu.

Standard CMOS Setup : This setup page includes all the items in standard compatible BIOS.

- ■ **Advanced BIOS Features** : This setup page includes all the items of Award special enhanced features.

- ■ **Advanced Chipset Features** : This setup page includes all the items of the chipset special features.

- ■ **Integrated Peripherals** : This setup page includes all onboard peripherals.

- ■ **Power Management Setup** : This setup page includes all the items of Green function features.

- ■ **PnP/PCI Configuration** : This setup page includes all the configurations of PCI & PnP ISA resources.

- ■ **PC Health Status** : This setup page auto detects the temperature, voltage and fan speed.

- ■ **Frequency/Voltage Contro**l : This setup page includes the CPU/DDR/PCI frequency setting.

- ■ **Load Fail-Safe Defaults** : BIOS Defaults indicates the most appropriate value of the system parameters that the system would be in safe configuration.

- ■ **Load Optimized Defaults** : Setup Defaults indicates the value of the system parameters that the system would be in the best performance configuration.

- ■ **Set Supervisor Password** : The supervisor's password can be set or changed or disabled in this setup page. It allows you to limit access to the system and setup, or just to setup.

- ■ **Set User Password** : The user's password can be set or changed or disabled in this setup page. It allows you to limit access to the system and setup, or just to setup.

- ■ **Save & Exit Setup** : Save CMOS value settings to CMOS and exit setup.

- ■ **Exit without Saving** : Abandon all CMOS value changes and exit setup.

- ▪

7.4.2. Standard CMOS Features

Selecting **Standard CMOS Features** on the main menu displays the following menu. This menu allows the user to configure the system components such as date, time, hard disk drive, floppy disk drive and display type.

```
                  Phoenix – AwardBIOS CMOS Setup Utility
                          Standard CMOS Features
 ┌──────────────────────────────────────────────────┬─────────────────────┐
 │  Date (mm : dd : yy)        Web, Feb 23 005       │      Item Help      │
 │                                                   ├─────────────────────┤
 │  Time (hh : mm : ss)         11  :  7  :  48      │  Menu Level ➤       │
 │                                                   │                     │
 │ ➤IDE Primary  Master        [None]                │                     │
 │ ➤IDE Primary  Slave         [None]                │  Press [Enter] to enter │
 │ ➤IDE Secondary Master        [None]               │  next page for detail   │
 │ ➤IDE Secondary Slave         [None]               │  hard drive settings    │
 │                                                   │                     │
 │  Video                    [EGA/VGA]               │                     │
 │  Halt  on                 [All , But Keyboard]    │                     │
 │  Panel  Number             [Setting By H/W]       │                     │
 │                                                   │                     │
 │  Base Memory                 640K                 │                     │
 │  Extended  Memory          490496K                │                     │
 │  Total  Memory             491520K                │                     │
 └──────────────────────────────────────────────────┴─────────────────────┘
  ↑ ↓ →  Move   Enter : Select  +/-/PU/PD : Value  F10 : Save  ESC : Exit  F1 : General Help
```

■ **Date**

The **Date** item show the current date held by the system. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Date Properties utility.

The date format is <day>, <month>, <date>, <year>.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
month	The month, Jan. through Dec.
date	The date, from 1 to 31 (or the maximum allowed in the month)
year	The year, from 1994 through 2079

■ **Time**

The **Time** item show the current time held system. If you are running a Windows OS, these items are automatically updated whenever you make changes to the Windows Time Properties utility.

The times format in <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13 : 00 : 00.

■ **Primary HDDs/Secondary HDDs**

This field is used to configure the IDE hard drive installed in the system. Move the cursor to highlight the IDE Primary/Secondary Master/Slave fields and press <Enter>. The IDE Primary Master submenu opens :

IDE HDD Auto-Detection

Press <**Enter**> while this item is highlighted if you want the Setup Utility to automatically detect and configure a hard disk drive on the IDE channel.

IDE Primary/Secondary Master/Slave

If you leave this item at Auto, the system will automatically detect and configure any IDE devices it finds. If it fails to find a hard disk, change the value to Manual and then manually configure the drive by entering the characteristics of the drive in the fields described below :

- ✓ **Capacity** – displays the capacity of the HDD in megabytes (MB).
- ✓ **Cylinder** – indicates the number of cylinders that the HDD has. A cylinder is the sum total of all tracks that are in the same location on every disk surface.
- ✓ **Head** – displays the number of heads in the HDD. A head is a device that reads and writes data on the hard disk.
- ✓ **Precomp** – displays the track where precompensation is initiated. Precompensation is a feature whereby the HDD uses a stronger magnetic field to write data in sectors that are closer to the center of the disk. In CAV recording, in which the disk spins at a constant speed, the sectors closest to the spindle are packed tighter than the outer sectors.
- ✓ **Landing Zone** – displays the location of the safe non-data area on a hard disk that is used for parking the read/write head.
- ✓ **Sector** – displays the number of sectors available on the HDD. A sector is the smallest unit of storage space on a disk.

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

■ **Drive A type/Drive B type**

The item identifies the types of floppy disk drive A or drive B that has been installed in the computer.

None	No floppy drive installed
360K, 5.25"	5.25 inch PC-type standard drive; 360K byte
1.2M, 5.25"	5.25 inch AT-type high-density drive; 1.2M bytes (3.5 inch when 3 Mode is Enabled).
720K, 3.5"	3.5 inch double-sided drive; 720K byte
1.44M, 3.5"	3.5 inch double-sided drive; 1.44M byte
2.88M, 3.5"	3.5 inch double-sided drive; 2.88M byte

■ **Video**

This item defines the video mode of the system. This main board has a built-in VGA graphics system; you must leave this item at the default setting.

■ **Halt on**

This item defines the operation of the system POST (Power On Self Test) routine. You can use this item to select which types of errors in the POST are sufficient to halt the system.

■ **Panel Number**

The item selects the panel resolution and LVDS interface for single or dual.

■ **Base Memory, Extended Memory and Total Memory**

These items are automatically detected by the system at start up time. These are display-only fields. You cannot make changes to these fields.

- ✓ **Base Memory** – This field displays the amount of conventional memory detected by the system during boot.
- ✓ **Extended Memory** – This field displays the amount of extended memory detected by the system during boot.
- ✓ **Total Memory** – This field displays the total amount of memory (Base and Extended) detected by the system during boot.

7.4.3. Advanced BIOS Features

Selecting Advanced BIOS Features on the main menu displays this following menu.

Phoenix – AwardBIOS CMOS Setup Utility Advanced BIOS Features		
➢ CPU Feature	[Press Enter]	**Item Help**
➢ Hard Disk Boot Priority	[Press Enter]	Menu Level➢
Virus Warning	[Disabled]	
CPU L1 & L2 Cache	[Enabled]	Allows you to choose the
CPU L3 Cache	[Enabled]	VIRUS warning Feature
Quick Power On Self Test	[Enabled]	for IDE Hard Disk boot
First Boot device	[HDD-0]	sector protection. If this
Second Boot Device	[CDROM]	Function is enabled and
Third Boot Device	[USB-FDD]	someone attempt to
Boot Other Device	[Enabled]	write data into this area ,
Swap Floppy Device	[Disabled]	BIOS will show a
Boot Up Floppy Seek	[Disabled]	warning message on
Boot Up NumLock Status	[On]	screen and alarm beep
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
x Typematic Rate (Chars/sec)	6	
x Typematic Delay (Msec)	250	
Security Option	[Setup]	
APIC Mode	[Enable]	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
Report No FDD For WIN 95	[No]	
Small Logo (EPA) Show	[Disabled]	
↑↓→ Move Enter : Select +/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help		
F5 : Previous Values F6 : Fail-Safe Default F7 : Optimized Defaults		

■   **CPU Feature**

Setting the CPU thermal management mode

Hard Disk Boot Priority

Select Hard Disk Boot Device Priority

■   **Virus Warning**

When enabled, this item provides protection against viruses that try to write to the boot sector and partition table of the hard disk drive. You need to disable this item when installing an operating system. We recommend that you enable anti-virus protection as soon as you have installed an operating system.

Enabled : activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled : no warning message will appear when anything attempts to access the boot sector or hard disk partition table.

■ **CPU Internal Cache/External Cache**

All processors that can be installed in this main board use internal level 1 (L1) and external level 2 (L2) cache memory. These two items speed up memory access. However, it still depends on CPU/chipset design. Leave this item at the default setting for better performance.

Enabled : enables cache

Disabled : disable cache

■ **Quick Power On Self Test**

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

Enabled : enables quick POST

Disabled : normal POST

■ **First/Second/Third/Boot Device**

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

■ **Boot Other Device**

When enabled, the system searches all other possible locations for an operating system if it fails to find one in the devices specified under the First, Second, and Third boot devices.

■ **Swap Floppy Drive**

If the system has two floppy drives, you can swap the logical drive name assignments.

The choice : Enabled & Disabled.

■ **Boot Up Floppy Seek**

This category seeks disk drives during boot up. Disabling speeds boot up.

The choice : Enabled & Disabled.

■ **Boot Up NumLock Status**

This item defines if the keyboard Num Lock key is active when the system is started.

■ **Gate A20 Option**

This item defines how the system handles legacy software that was written for an earlier generation of processors. Leave this item at the default setting.

■ **Typematic Rate Setting**

If this item is enabled, you can use the following two items to set the typematic rate and the typematic delay settings for the keyboard.

■ **Typematic Rate (Chars/Sec)**

Use this item to define how many characters per second are generated by a held-down key.

■ **Typematic Delay (Msec)**

Use this item to define how many milliseconds must elapse before a held-down key begins generating repeat characters.

■ **Security Option**

If you have installed password protection, this item defines if the password is required at system start up, or if it is only required when a user tries to enter the Setup Utility.

■ **APIC Mode**

Enable or Disable APIC(Advanced Programmable Interrupt Controller) mode

■ **MPS Version Control For OS**

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.

MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. It is also required for a secondary PCI bus to work without the need for a bridge. Newer versions of server operating systems will generally support MPS

1.4 and as such, you should change the BIOS Setup from the default of 1.1 to 1.4 if your operating system supports version 1.4. Leave it as 1.1 only if you are running older server OSes.

■ **OS Select For DRAM > 64MB**

This item is only required if you have installed more than 64 MB of memory and you are running the OS/2 operating system. Otherwise, leave this item at the default.

■ **Report No FDD For Win 95**

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

■ **Small Logo (EPA)Show**

This item determines whether the EPA logo is to appear during boot up.

7.4.4. Advanced Chipset Features

Selecting Advanced Chipset Features on the main menu displays this following menu.

This option displays critical timing parameters of the main board. Leave the items on this menu at their default settings unless you are very familiar with the technical specifications of the system hardware. If you change the values incorrectly, you may introduce fatal errors or recurring instability into the system.

```
         Phoenix – AwardBIOS CMOS Setup Utility
                 Advanced Chipset Features
   ┌──────────────────────────────────────────────┬──────────────────┐
     DRAM Timing Selectable        [By SPD]           Item Help
   x CAS Latency Time              Auto            Menu Level▷
   x DRAM RAS# to CAS# delay       Auto
   x DRAN RAS# precharge           Auto
   x Precharge delay (tRAS)        Auto
   x System Memory Frequency       Auto
     System BIOS Cacheable         [Enabled]
     Video BIOS Cacheable          [Disabled]
     Memory Hole at 15m-16M        [Disabled]

     ** On-Chip VGA Setting **
     PEG/Onchip VGA Control        [Auto]
     On-Chip Frame Buffer Size     [ 8MB]
     DVMT Mode                     [DVMT]
     DVMT/FIXED Memory Size        [128MB]
     Boot display                  [Auto]
     Panel Scaling                 [Auto]
   └──────────────────────────────────────────────┴──────────────────┘
   ↑ ↓ → Move  Enter : Select  +/-/PU/PD : Value   F10 : Save  ESC : Exit  F1 : General Help
      F5 :   Previous Values      F6 : Fail-Safe Default    F7 : Optimized Defaults
```

- ■ **DRAM Timing Selectable**

Menu setting the DRAM time

- ■ **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 options are Enabled or Disabled.

- ■ **Video BIOS Cacheable**

Selecting Enabled allows caching of the Video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The options are Enabled or Disabled.

- ■ **Memory Hole at 15M-16M** :

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

- ■ **PEG/OnChip VGA Control**

This item is to enable or disable the onboard VGA function

- ■ **On-Chip Frame Buffer Size**

This item is to set buffer size

The options are 1M.4M.8M.16M or 32M

- ■ **DVMT Mode**

This item is to select the DVMT mode

- ■ **DVMT/FIXED Memory Size**

This item is to set DVMT/FIXED mode memory size

The options are 64MB/128MB/224MB

■ **Boot Display**

This item is to select the boot display from VBIOS Default or CRT,LCD

■ **Panel Scaling**

This item is to select Panel scaling function

7.4.5. Integrated Peripherals

Selecting **Integrated Peripherals** on the main menu displays the following menu. This option defines the operation of peripheral components on the system's input/output ports.

```
          Phoenix – AwardBIOS CMOS Setup Utility
                  Integrated Peripherals
 ┌─────────────────────────────────────────────┬──────────────────────┐
 │  ➢ OnChip IDE Device        [Press Enter]    │     Item Help        │
 │  ➢ OnChip Device            [Press Enter]    │  Menu Level➢         │
 │  ➢ SuperIO Device           [Press Enter]    │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 │                                              │                      │
 └──────────────────────────────────────────────                      │
  ↑ ↓ →  Move  Enter : Select   +/-/PU/PD :Value   F10 :Save   ESC :Exit   F1 :General Help
       F5 :  Previous Values        F6 : Fail-Safe Default        F7 : Optimized Defaults
```
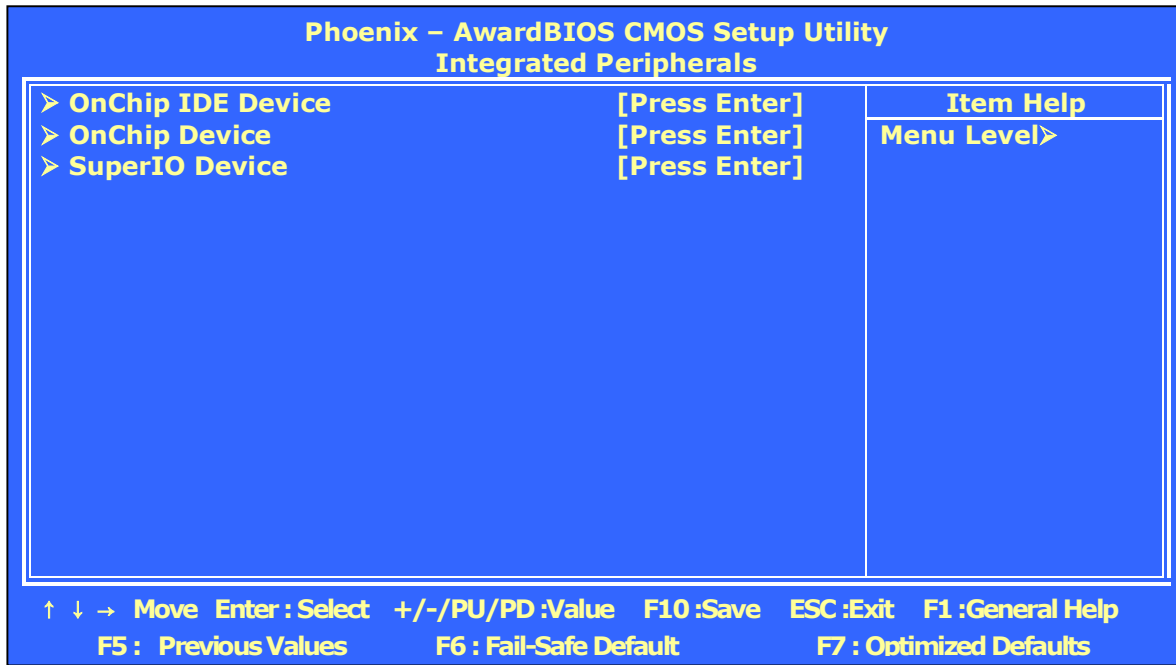
7.4.5.1. OnChip IDE Device

If the **OnChip IDE Device** option is selected from the **Integrated Peripherals** menu, the screen below will appear.

```
        Phoenix – AwardBIOS CMOS Setup Utility
                  OnChip IDE Device
───────────────────────────────────────────────────────────────
   IDE HDD Block Mode              [Enabled]        │  Item Help
   IDE DMA transfer access         [Enabled]        │  Menu
                                                    │  Level
   On-Chip Primary   PCI IDE       [Enabled]        │
   IDE Primary Master PIO          [Auto]           │
   IDE Primary Slave  PIO          [Auto]           │
   IDE Primary Master UDMA         [Auto]           │
   IDE Primary Slave  UDMA         [Auto]           │
   On-Chip Secondary PCI IDE       [Enabled]        │
   IDE secondary Master PIO        [Auto]           │
   IDE secondary Slave  PIO        [Auto]           │
   IDE secondary Master UDMA       [Auto]           │
   IDE secondary Slave  UDMA       [Auto]           │
                                                    │
   *** On-Chip Serial ATA Aetting ***               │
   On-Chip Serial ATA              [Auto]           │
   SATA PORT Speed Settings        Disable          │
   PATA IDE Mode                   Primary          │
   SATA Port                       P1,P3 is Secondary│
───────────────────────────────────────────────────────────────
 ↑ ↓ →  Move  Enter : Select  +/-/PU/PD : Value  F10 : Save  ESC : Exit  F1 : General Help
    F5  :  Previous Values     F6  :  Fail-Safe Default     F7  :  Optimized Defaults
```

■ **IDE HDD Block Mode** :

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

The options are Enabled or Disabled.

■ **IDE DMA transfer access** :

The item is to select the IDE DMA mode

The options are Enabled or Disabled.

■ **On-Chip Primary & Secondary PCI/IDE**

This option enables you to activate/inactivate the Primary & Secondary IDE channel of the motherboard's onboard IDE controller. You should leave this enabled if you are using this onboard IDE channel. Disabling it will prevent the IDE devices attached to this channel from functioning at all.

■ **IDE Primary Master/Slave PIO**

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

The options are Auto, Mode 0, Mode 1, Mode 2, Mode 3 or Mode 4.

■ **Primary Master/Slave UltraDMA**

UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 100MB/s. When you select Auto in the four IDE UDMA fields (for interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

The options are Auto or Disabled.

■ **On-Chip Serial ATA** :

The item is to setting the On-Chip SATA Function

7.4.5.2. OnChip Device

If the **OnChip Device** option is selected from the **Integrated Peripherals** menu, the screen below will appear.

```
          Phoenix – AwardBIOS CMOS Setup Utility
                      OnChip Device
┌─────────────────────────────────────────────┬──────────────────┐
│  USB Controller              [Enabled]       │    Item Help     │
│  USB 2.0 Controller          [Enabled]       │  Menu Level▷     │
│  USB Keyboard Support        [Auto]          │                  │
│  AC97 Audio                  [AC97 Audio]    │                  │
│  Flash ROM Write             [Enabled]       │                  │
│  LAN Control                 [Enabled]       │                  │
│                                              │                  │
│                                              │                  │
└─────────────────────────────────────────────┴──────────────────┘
  ↑ ↓ → Move   Enter : Select   +/-/PU/PD : Value  F10 : Save   ESC : Exit  F1 : General
  Help
```
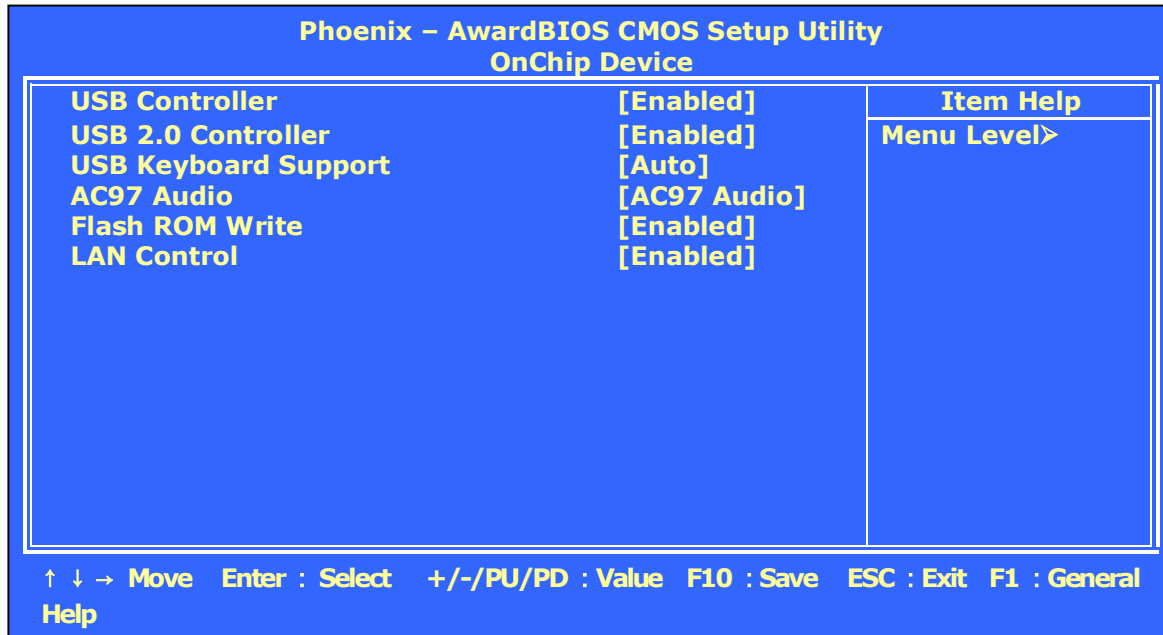
■ **USB Controller**

This function is similar to Assign IRQ For USB. It enables or disables IRQ allocation for the USB (Universal Serial Bus). Enable this if you are using a USB device. If you disable this while using a USB device, you may have problems running that device. However, if you don't use any USB devices, set the option to Disabled. It will free up an IRQ for other devices to use.

■ **USB 2.0 Controller**

This item is for disable/enable EHCI controller only, Support the high speed USB device.

The options are Enabled or Disabled.

■ **USB Keyboard Support**

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

The options are Enabled or Disabled.

■ **AC97 Audio**

Select Auto to support AC97 Audio.

The options are AC97 Audio or Disabled.

■ **Flash ROM Write**

This item supports the BIOS ROM write Enable/Boot block lock/Disable

■ **Onboard LAN Function**

The item can enable or disable the onboard Ethernet controller

7.4.5.3. *SuperIO Device*

If the **SuperIO Device** option is selected from the **Integrated Peripherals** menu, the screen below will appear.

```
┌──────────────────────────────────────────────────────────────────┐
│              Phoenix – AwardBIOS CMOS Setup Utility                │
│                        SuperIO Device                              │
│ ┌────────────────────────────────────────┬─────────────────────┐  │
│ │  POWER ON Function         [BUTTON INLY]│     Item Help        │ │
│ │X  KB Power ON Password      Enter       │   Menu Level▷        │ │
│ │X  Hot Key Power ON          Ctrl-F1     │                      │ │
│ │   Onboard Serial Port 1    [3F8]        │                      │ │
│ │   Onboard UART 1 IRQ       [IRQ4]       │                      │ │
│ │   COM2 Selectable Type     [RS232]      │                      │ │
│ │   Onboard Serial Port 2    [2F8]        │                      │ │
│ │   Onboard UART 2 IRQ       [IRQ3]       │                      │ │
│ │   Onboard Serial Port 3    [3E8]        │                      │ │
│ │   Onboard UART 3 IRQ       [IRQ10]      │                      │ │
│ │   Onboard Serial Port 4    [2E8]        │                      │ │
│ │   Onboard UART 4 IRQ       [IRQ11]      │                      │ │
│ │   Serial Port 4  Mode      [Normal]     │                      │ │
│ │X  IR Duplex mode            Half        │                      │ │
│ │X  Use IR Pins               IR-Rx2Tx2   │                      │ │
│ │   Onboard Parallel Port 1  [378/IRQ7]   │                      │ │
│ │   Parallel Port 1 Mode     [SPP]        │                      │ │
│ │X  EPP1 Mode Select          EPP1.7      │                      │ │
│ │X  ECP1 Mode Use DMA         3           │                      │ │
│ │   DIO Port Address         [200]        │                      │ │
│ └────────────────────────────────────────┴─────────────────────┘  │
│  ↑ ↓ → Move   Enter : Select +/-/PU/PD : Value F10 : Save ESC : Exit  F1 : General Help │
│     F5 :  Previous Values      F6 : Fail-Safe Default     F7 : Optimized Defaults │
└──────────────────────────────────────────────────────────────────┘
```

■   **Power On Function**

This function allows you to set the method by which your system can be turned on. Normally, it should be set as Button Only so that your system will only start up if you use the button/switch on the casing. Other alternative options including starting up the system using the keyboard (if it supports the Keyboard 98 standard), a keyboard hot key (for other standard keyboards) or the mouse.

■   **KB Power On Password**

This item can be used to prompt a password when the system power is resumed by keyboard action.

■   **Hot Key Power On**

This item can be used to prompt a hot key when the system power is resumed by keyboard action.

■   **Onboard Serial Port 1/Port 2/Port 3/Port 4**

This item is to select an address for the serial ports.
The options are 3F8/2F8/3E8/2E8, Disabled.

■   **Onboard UART 1/ UART 2/ UART 3/ UART 4 IRQ**

This item is to select an IRQ for the serial ports.
The options are IRQ4/IRQ3/IRQ10/IRQ11/IRQ9/IRQ5,

■   **COM2 Selectable type** :

This item is to select the COM2 port type
The options are RS232/RS422/RS485.

■   **Onboard Parallel Port 1** :

This item allows you to determine the onboard parallel port controller's I/O address and parallel port mode.
The options are 378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disable.

The options are SPP, EPP, ECP, ECP+EPP, Normal.

■   **DIO Port Address** :

This item is to select the DIO port I/O address
The options are 200/208.

7.4.6. Power Management Setup

Selecting **Power Management Setup** on the main menu displays the following menu.

```
         Phoenix – AwardBIOS CMOS Setup Utility
                 Power Management Device
┌─────────────────────────────────────────┬──────────────────┐
│   ACPI Function              [Enabled]   │     Item Help    │
│   ACPI Suspend Type          [S1(POS)]   │  Menu Level▷     │
│ X Run VGABIOS If S3 resume    NO         │                  │
│   Power Management           [User Define]│                 │
│   Video off Method           [DPMS]      │                  │
│   Video off In Suspend       [Yes]       │                  │
│   Suspend Type               [Stop Grant]│                  │
│   MODEM Use IRQ              [3]          │                  │
│   Suspend Mode               [Disabled]  │                  │
│   HDD Power Down             [Disabled]  │                  │
│   Soft –off by PWR-BTTN      [Instant-off]│                 │
│   POWER After PWR-Fail       [off]       │                  │
│   Wake-up by PCI card        [Enabled]   │                  │
│   Power on by Ring           [Enabled]   │                  │
│   Wake up on LAN             [Enabled]   │                  │
│ X USB KB Wake-up From S3      Disabled   │                  │
│   Resume by alarm            [Disabled]  │                  │
│ X Date (of  Month ) Alarm     0          │                  │
│ X Time (hh : mm : ss) Alarm   0  :  0  : 0│                 │
│                                          │                  │
│   ** Reload Global Time Events**         │                  │
│   Primary IDE 0              [Disabled]  │                  │
│   Primary IDE 1              [Disabled]  │                  │
│   Secondary IDE 0            [Disabled]  │                  │
│   Secondary IDE 1            [Disabled]  │                  │
│   FDD,COM,LPT Port           [Disabled]  │                  │
│   PCI PIRQ[A-D]#             [Disabled]  │                  │
├──────────────────────────────────────────────────────────────┤
│ ↑ ↓ → Move  Enter : Select  +/-/PU/PD :Value  F10 :Save       │
│                          ESC :Exit   F1 :General Help          │
└──────────────────────────────────────────────────────────────┘
```

- **ACPI Function**

This item allows the user to select the ACPI (Advanced Configuration and Power Interface) function. The options are S1, S3 & Disable

- **Power Management**

Power Management mode setting is to select the wake-up device.

Video Off Method

This item defines how the video is powered down to save power. The default setting is DPMS Mode.

- **Video Off in Suspend**

This option defines if the video is powered down when the system is put into suspend mode. The default setting is Suspend -> Off.

- **Suspend Type**

If this item is set to the default Stop Grant, the CPU will go into Idle Mode during power saving mode.

- **MODEM Use IRQ**

If you want an incoming call on a modem to automatically resume the system from a power-saving mode, use this item to specify the interrupt request line (IRQ) that is used by the modem. You might have to connect the fax/modem to the main board Wake On Modem connector for this feature to work. The default setting is 3.

- **Suspend Mode**

The CPU clock will be stopped and the video signal will be suspended if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected. Options are from 1 Min to 1 Hour and Disabled. The default setting is Disabled.

- **HDD Power Down**

The IDE hard drive will spin down if it is not accessed within a specified length of time. Options are from 1 Min to 15 Min and Disabled. The default setting is 15 Min.

- **Soft-Off by PWR-BTN**

Under ACPI (Advanced Configuration and Power management Interface) you can create a software power down. In a software power down, the system can be resumed by Wake Up Alarms. This item lets you install a software power down that is controlled by the normal power button on your system. If the item is set to Instant-Off, then the power button causes a software power down. If the item is set to Delay 4 Sec., you have to hold the power button down for four seconds to cause a software power down. The default setting is Instant-Off.

- **Wake-Up by PCI card**

Use this item to enable PCI activity to wake up the system from a power-saving mode.
The default setting is Disabled.

- **Power On by Ring**

Use this item to enable modem activity to wakeup the system from a power saving mode.

- **Wake up on LAN**

Use this item to enable LAN activity to wake up the system from a power-saving mode. The default setting is Disabled.

- **USB KB Wake-up from S3**

When enabled, the system power will resume the system from a power saving mode if there is any USB keyboard activity.

- **Resume by Alarm**

When set to Enabled, the following two fields become available and you can set the date (day of the month), hour, minute and second to turn on your system. When set to 0 (zero) for the day of the month, the alarm will power on your system every day at the specified time. The default setting is Disabled.

- **Date (of Month) Alarm**

When set to "0" the system powers on everyday at the time specified in the "Time (hh:mm:ss) Alarm"

field. Select a date from 1 to 31 for the system to power on at the time specified in the "Time (hh :

mm : ss) Alarm" field. The default setting is 0.

- **Time (hh : mm : ss) Alarm**

Set the time for the system to power on as defined in the 'Date (of Month) Alarm" field.

** Reload Global Timer Events **

Global Timer (power management) events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything that occurs to a device that is configured as Enabled, even when the system is in a power-down mode.

- **Primary/Secondary IDE 0/1**

When these items are enabled, the system will restart the power-saving timeout counters when any activity is detected on any of the drives or devices on the primary or secondary IDE channels.

- **FDD, COM, LPT Port**

When this item is enabled, the system will restart the power-saving timeout counters when any activity is detected on the floppy disk drive, serial ports, or the parallel port. The default setting is Disabled.

- **PCI PIRQ[A-D]#**

When disabled, any PCI device set as the Master will not power on the system. The default setting is Disabled.

Press <Esc> to return to the main menu.

7.4.7. PnP/PCI Configuration

Selecting PnP/PCI Configuration on the main menu displays the following menu.

```
         Phoenix – AwardBIOS CMOS Setup Utility
                  PnP/PCI Configurations
    ┌──────────────────────────────────────────────┬──────────────────┐
    │  Init Display First          [PCI Slot]       │    Item Help     │
    │  Reset Configuration Data    [Disabled]       │  Menu Level▷     │
    │                                               │                  │
    │  Resource controlled by      [Auto(ESCD)]     │                  │
    │ X IRQ Resources              [Press Enter]    │                  │
    │                                               │                  │
    │  PCI/VGA Palette Snoop       [Disabled]       │                  │
    │                                               │                  │
    │                                               │                  │
    │                                               │                  │
    │                                               │                  │
    │                                               │                  │
    │                                               │                  │
    └──────────────────────────────────────────────┴──────────────────┘
    ↑ ↓ → Move   Enter : Select +/-/PU/PD : Value F10 : Save ESC : Exit F1 : General Help
      F5 :  Previous Values      F6 : Fail-Safe Default    F7 : Optimized Defaults
```
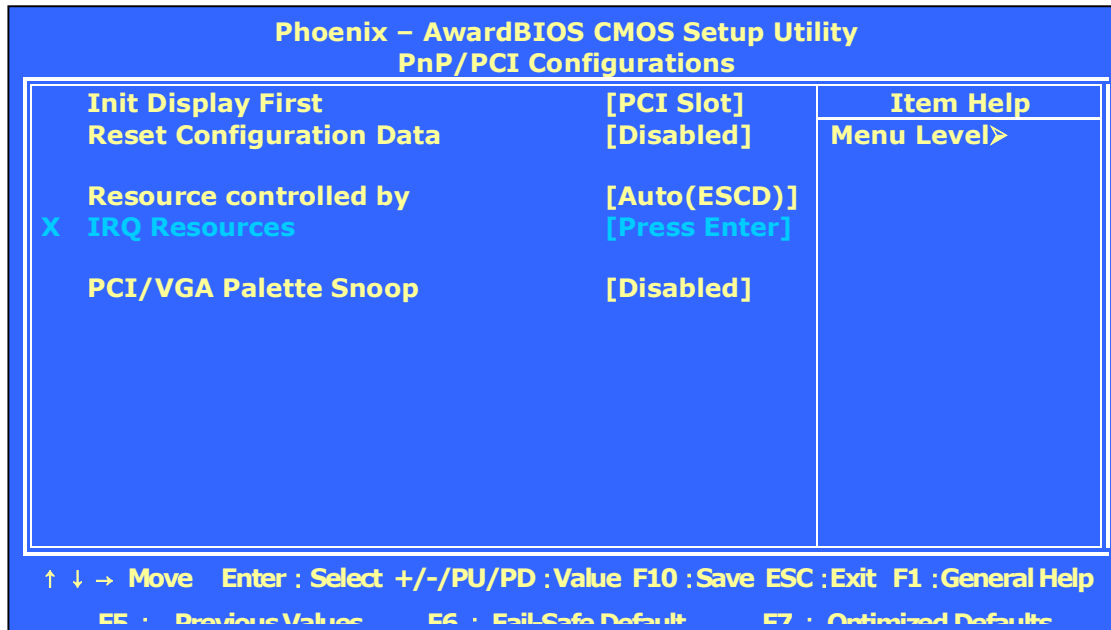
■ **Init Display First**

This item allows you to decide to active which Display controller first by PCI slot or Onboard.

The options are PCI Slot or Onboard

■ **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 can not boot.

The options are Enabled or Disabled.

■ **Resource controlled by**

The Award Plug and Play BIOS has the capacity to automatically configure the boot and Plug and Play compatible devices.

However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows□95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "□").

The options are Auto (ESCD), Manual.

■ **IRQ Resources**

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

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

This item allows you to determine the IRQ assigned to the ISA bus and is not available to any PCI slot. Legacy ISA is for devices compliant with the original PC AT bus specification. PCI/ISA PnP is for devices compliant with the Plug and Play standard whether designed for PCI or ISA bus architecture.

The options are PCI Device or Reserved.

■ **PCI/VGA Palette Snoop**

This option is only useful if you use an MPEG card or an add-on card that makes use of the graphics card's Feature Connector. It corrects incorrect colour reproduction by "snooping" into the graphics card's framebuffer memory and modifying (synchronizing) the information delivered from the graphics card's Feature Connector to the MPEG or add-on card. It will also solve the problem of display inversion to a black screen after using the MPEG card.

7.4.8. PC Health Status

Selecting PC Health Status on the main menu displays the following menu.

This option auto detects the system's temperature, voltage and fan speed.

```
┌──────────────────────────────────────────────────────────────────────┐
│              Phoenix – AwardBIOS CMOS Setup Utility                    │
│                        PC Health Status                               │
│ ┌────────────────────────────────────────────┬─────────────────────┐ │
│ │ Shutdown Temperature      [60℃/140℉]        │     Item Help       │ │
│ │                                             │                     │ │
│ │ CPU Warning Temperture    [Disabled]        │  Menu Level▷        │ │
│ │ Current System Temp        30 ℃/ 86℉        │                     │ │
│ │                                             │                     │ │
│ │ Current CPU Temp           29 ℃/ 84℉        │                     │ │
│ │                                             │                     │ │
│ │ System1 Fan Speed          0  RPM           │                     │ │
│ │ CPU    Fan Speed           0  RPM           │                     │ │
│ │ System2 Fan Speed          0  RPM           │                     │ │
│ │ VCore(V)                   1.26 V           │                     │ │
│ │ +1.5V                      1.52 V           │                     │ │
│ │ VCC3 (V)                   3.32 V           │                     │ │
│ │ VTT   (V)                  1.53 V           │                     │ │
│ │ VCC   (V)                  5.05 V           │                     │ │
│ │ +12 V                      12.03 V          │                     │ │
│ │ VBAT (V)                   3.20 V           │                     │ │
│ │ 3VSB (V)                   3.31 V           │                     │ │
│ │ SYS  Fan Control Mode     [Temp. Cruise]    │                     │ │
│ │ CPU  Fan Control Mode     [Smart Fan]       │                     │ │
│ │ SYS1 Fan Control Mode     [Temp. Cruise]    │                     │ │
│ │                                             │                     │ │
│ └────────────────────────────────────────────┴─────────────────────┘ │
│  ↑ ↓ →  Move  Enter : Select  +/-/PU/PD :Value F10 :Save  ESC :Exit F1 :General Help │
└──────────────────────────────────────────────────────────────────────┘
```

■   **Shutdown Temperature**

This item allows you to select System shutdown temperature.

The options are 60oC/140 oF, 65 oC /149 oF, 70 oC/158 oF or Disabled.

■   **CPU Warning Temperature**

This item allows you to select CPU Warning temperature.

The options are 50oC/122 oF~, 70 oC/158 oF or Disabled.

■   **SYS Fan Control Mode**

This item is to select Fan control mode

The options are Temp. Cruise or Disabled.

■   **CPU Fan Control Mode**

This item is to select Fan control mode

The options are Temp. Cruise, Smart fan or Disabled

7.4.9. Frequency Voltage Control

This setup page is for the CPU, SDRAM and PCI frequency setting.

```
              Phoenix – AwardBIOS CMOS Setup Utility
                      Frequency/Voltage Control

    Auto Detect PCI Clk          [Enabled]          Item Help
    Spread Spectrum              [Enable]        Menu Level➢
    CPU Host/PCIEX/PCI Clock     [Default]



↑ ↓ → Move Enter : Select  +/-/PU/PD : Value F10 : Save ESC : Exit  F1 : General Help
      F5 ： Previous Values     F6 ： Fail-Safe Default     F7 ： Optimized Defaults
```
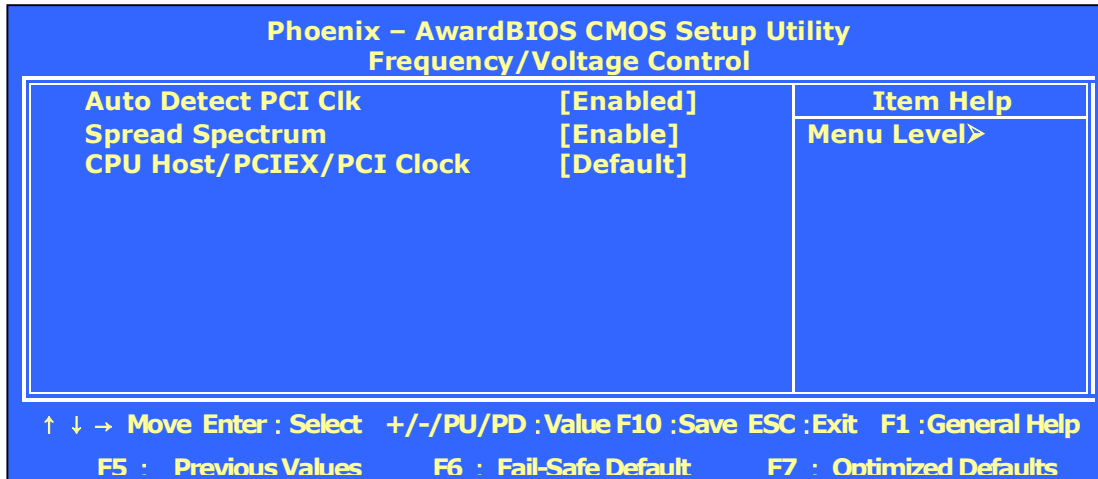
■   **Auto Detect PCI Clk**

This item allows you to select auto detect PCI Clock.

The options are Enabled or Disabled.

■   **Spread Spectrum**

This item allows you to Enabled/Disabled the spread spectrum modulate.

The options are Enabled or Disabled.

■   **CPU Host/PCIEX/PCI Clock**

This item allows you to select CPU frequency.

7.4.10. Load Fail-Safe Defaults

The default values of the Load Fail-Safe Defaults indicate the most appropriate value of the system parameters that the system would be in safe configuration.

```
              Phoenix – AwardBIOS CMOS Setup Utility

  ➢ Standard CMOS Feature          ➢ Frequency/Voltage Control

  ➢ Advanced BOIS Features           Load Fail-Safe Defaults

  ➢ Advanced Chipset Features        Load Optimized Defaults

  ➢ Integrated Peripherals           Set Supervisor Password

  ➢ Power Managem                              ord
                       Load fail-safe Defaults (Y/N)? N    up
  ➢ PnP/PCI Configu

  ➢ PC Health Status                           ving

   Esc ： Quit             ↑↓→←     : Select Item

   F10 ： Save & Exit Setup

                     Time, Date, hard Dick Type…
```
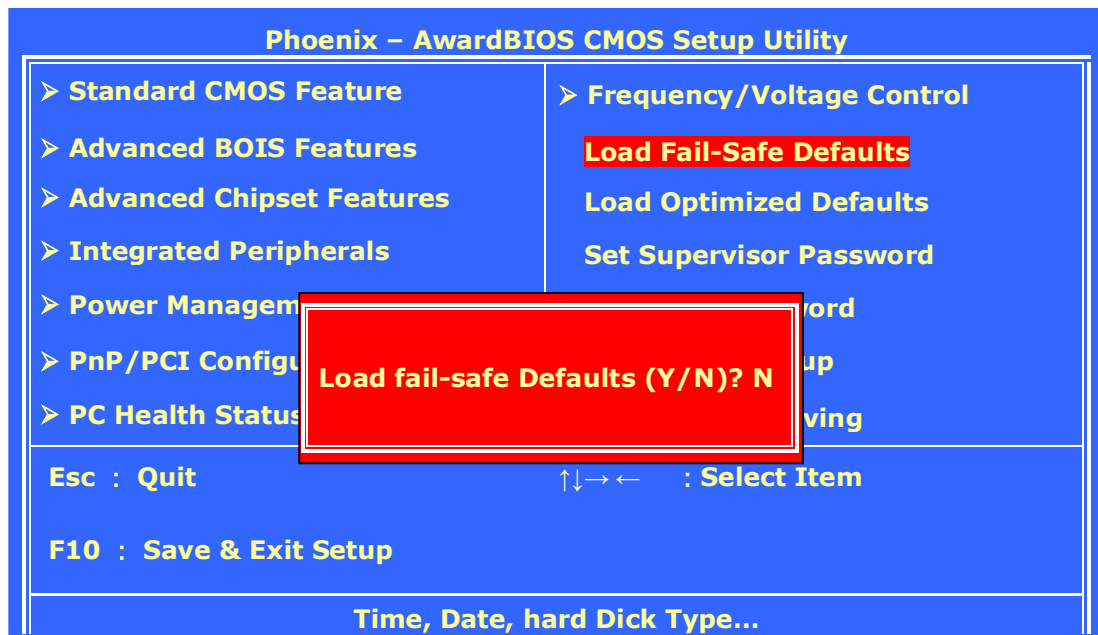
7.4.11. Load Optimized Defaults

The default values of the **Load Optimized Defaults** indicate the most appropriate value of the system parameters that the system would be in best performance configuration.

```
         Phoenix – AwardBIOS CMOS Setup Utility

  ➢ Standard CMOS Feature        ➢ Frequency/Voltage Control

  ➢ Advanced BOIS Features          Load Fail-Safe Defaults

  ➢ Advanced Chipset Features       Load Optimized Defaults

  ➢ Integrated Peripherals          Set Supervisor Password

  ➢ Power Management
                        Load Optimized Defaults (Y/N)? N
  ➢ PnP/PCI Configurat

  ➢ PC Health Status

   Esc : Quit            ↑↓→←       : Select Item

   F10 : Save & Exit Setup

              Time, Date, hard Dick Type...
```

7.4.12. User Password

The USER PASSWORD is used to set the password. To change the password, select this option from the main menu and press <Enter>.

If the CMOS does not work properly or the USER PASSWORD option is selected for the first time, then a default password is stored in the ROM. The following message will appear on the screen;

Enter Password

Press <Enter>.

If the CMOS is working properly or the USER PASSWORD option is selected to change the default password, then the current password (the ROM password or the use-defined password) stored in the ROM needs to be entered first. The following message will appear on the screen;

Confirm Password

Enter the current password and press <Enter>.

After pressing <Enter>, then the new password (8 characters at most) can be entered now. The new password will be stored in the CMOS.

Please note that to enable this option, either **Setup** or **System** is to be selected from the **ADVANCED BIOS FEATRUES** first

7.4.13. Save and Exit Setup

If the Save & Exit Setup option is selected, the values entered the setup utilities will be saved in the chipset's CMOS memory. When the system is turned on every time, the CPU will che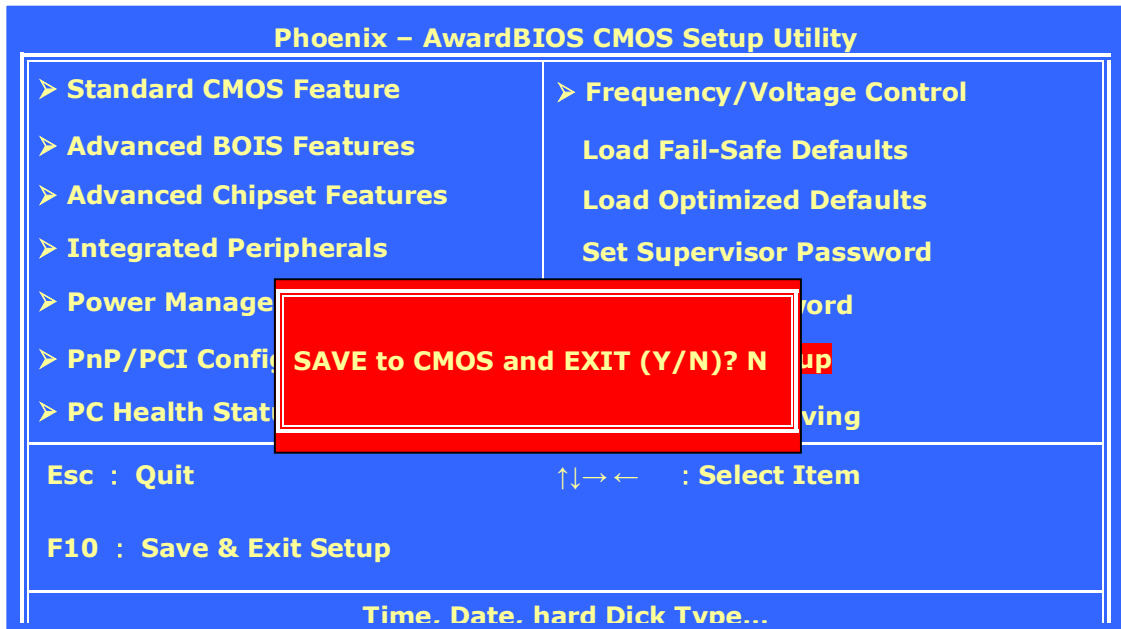ck the CMOS to compare the CMOS data to see whether it matches the system. These data are very important for the system operation.

Phoenix – AwardBIOS CMOS Setup Utility

➢ Standard CMOS Feature   ➢ Frequency/Voltage Control

➢ Advanced BOIS Features   Load Fail-Safe Defaults

➢ Advanced Chipset Features   Load Optimized Defaults

➢ Integrated Peripherals   Set Supervisor Password

➢ Power Manage   ord

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

➢ PnP/PCI Confi   up

➢ PC Health Stat   ving

Esc : Quit   ↑↓→←   : Select Item

F10 : Save & Exit Setup

Time, Date, hard Dick Type...

7.4.14. Exit Without Saving

If the Exit Without Saving option is selected and <ENTER> is pressed, you will exit the Setup program without saving any new values. The CMOS will still keep the old values.

Phoenix – AwardBIOS CMOS Setup Utility

➢ Standard CMOS Feature   ➢ Frequency/Voltage Control

➢ Advanced BOIS Features   Load Fail-Safe Defaults

➢ Advanced Chipset Features   Load Optimized Defaults

➢ Integrated Peripherals   Set Supervisor Password

➢ Power Manage   rd

Quit Without Saving (Y/N)? N   p

➢ PnP/PCI Confi

➢ PC Health Stat   ing

Esc : Quit   ↑↓→←   : Select Item

F10 : Save & Exit Setup

Time, Date, hard Dick Type...

8. Software & Drivers Installation

The chapter introduces the PC920 onboard VGA, Ethernet, Audio and the respective drivers and installation.

.

8.1. System Chipset Drivers

The system chipset used on PC920 is **Intel 945GV**. The chipset drivers for different operating systems are stored under the following route:

Drivers/Motherboard/PC920/Chipset

For updated system drivers, please have them downloaded from the following website

http://www.intel.com

8.2. Ethernet Drivers

The PC920 provides a 10/100 Base T fast Ethernet.

The Ethernet chipset used on PC920 is **Realtek RTL8100B**. The PC920 Ethernet drive diskette or CD diskette contains the following drivers.

Realtek RTL8100 Ethernet drivers for

- ✧ Windows 95/95OSR2
- ✧ Windows 98
- ✧ Windows 2000
- ✧ Windows NT
- ✧ Windows ME
- ✧ Windows XP

The related drivers are stored under the following route:

Drivers/Motherboard/PC920/LAN

For the Ethernet drivers, please download the updated drivers from the following website

http://www.realtek.com.tw

8.3. PC920 AGP XGA

By integrating an advanced hardware 2D/3D GUI engine and 64-bit graphic display interface, the PC920 can deliver AGP 4X performance and memory bandwidth of up to 1GB. It adopts *Share System Memory* architecture that can flexibly utilize the frame buffer size up to 64MB.

The PC920 XGA driver diskettes contain the following driver:

Intel 945G VGA drivers for

- ✧ Windows 95/95OSR2
- ✧ Windows 98
- ✧ Windows ME
- ✧ Windows 2000
- ✧ Windows NT
- ✧ Windows XP

The related drivers are stored under the following route:

Drivers/Motherboard/PC920/VGA

For updated system drivers, please have them downloaded from the following website

http://www.intel.com

8.4. Audio Setup

The audio chipset used on PC920 is **Realtek A406**. PC920 audio driver diskette contains the following drivers:

The Realtek A406 audio drivers contain the following drivers:

- ✧ Windows 95/95OSR2
- ✧ Windows 98
- ✧ Windows 2000
- ✧ Windows NT
- ✧ Windows ME
- ✧ Windows XP

The related drivers are stored under the following route:

Drivers/Motherboard/PC920/Audio

For updated audio drivers, please have them downloaded from the following website

http://www.realtek.com.tw

8.5. Touchscreen Drivers

If your use Elo brand touch, the panel PC touchscreen driver are stored in the following route:
Drivers/Touch screen Driver/ Elo Resistive & SAW Touch

If your use Taiwan Resistive brand touch, the panel PC touchscreen driver are stored in the following route:
Drivers/Touch screen Driver/ Taiwan Resistive Touch

The most updated touch drivers are also downloadable from the following websites:

    http://www.elotouch.com or
    http://www.eeti.com.tw

8.6. Driver Installation

To install the Ethernet, VGA and Audio drivers, make sure you know the chipset models on the motherboard.

Motherboard Model	PC920
System Chipset	Intel 945G
VGA Chipset	Intel 945G integrated
Ethernet Chipset	Realtek RTL8100B
Audio Chipset	Realtek ALC202A

Find the correct drivers from the correct directory and execute the execution files. All the related drivers are stored in the floppy diskettes or the tool CD

Please refer to the readme.txt file under each directory for more drivers' information.

Recent releases of operating systems always include setup programs that load automatically and guide you through the installation.

APPENDIX

A: LCD Specification

A-1: OP 1200 LCD

The standard display used for the OP 1200 is a LG.Phillips 12.1" TFT LCD, LB121S03 or its equivalents. It is a color active matrix liquid crystal display with an integral cold cathode fluorescent lamp (CCFL) backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive type display operating in the normally white mode. Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 6-bit gray scale signal for each dot, thus, presenting a palette of more than 262,144 colors.

A-1-1. Specification

Item	Specification
Active Screen Size	12.1 inches (30.75cm) diagonal
Outline Dimension	276(H) × 209(V) × 11(D) mm
Pixel Pitch	0.3075 mm × 0.3075 mm
Pixel Format	800 horiz. By 600 vert. Pixels RGB strip arrangement
Color Depth	6-bit, 262,144 colors
Luminance, White	400 cd/m2 (Typ.)
Power Consumption	6.8 Watt(Typ.)
Weight	655g (Max.)
Display Operating Mode	Transmissive mode, normally white
Surface Treatment	Anti-glare treatment

A-1-2. Absolute Maximum Ratings of Environment

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit

Parameter	Symbol	Values		Units	Notes
		Min	Max		
Power Input Voltage	VCC	-0.3	+4.0	Vdc	at 25 ± 2 °C
Operating Temperature	TOP	0	70	°C	1
Storage Temperature	TST	-30	80	°C	1
Operating Ambient Humidity	HOP	10	90	%RH	1
Storage Humidity	HST	10	90	%RH	1

A-1-3. Electrical Characteristics

The LB121S03 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. The second input which powers the CCFL, is typically generated by an inverter. The inverter is an external unit to the LCD.

Parameter	Symbol	Value			Unit	Notes
		Min	Typ	Max		
MODULE						
Power Supply Input Voltage	VCC	3.0	3.3	3.6	Vdc	
Power Supply Input Current	I_C	-	190	270	mA	1
Power Consumption	P_C	-	0.6	0.9	Watt	1
LAMP						
Operating Voltage	V_{BL}	470(8mA)	515(6mA)	470(3mA)	V_{RMS}	
Operating Current	I_{BL}				mA_{RMS}	
Established Starting Voltage	V_S					
@25°C				800	V_{RMS}	
@0°C				1,000	V_{RMS}	
Operating Frequency	f_{BL}	40	60	80	KHz	
Discharge Stabilization	T_S			3	Min	

Power Consumption	PBL		6.18	7.52	Watt	
Life Time		50,000			Hr	

A-2: OP 1500 LCD

The standard display used for the OP 1500 is either an LG.Phillips LM150X08-TL03 or an AUO M150XN07 or its equivalent. LM150X08-TL03 is a color active matrix liquid crystal display with an integral cold cathode fluorescent lamp (CCFL) backlight system. The matrix employs a-Si thin film transistor as the active element.

A-2-1: 15" LG.Phillips LM150X08-TL03

It is a transmissive type display operating in the normally white mode. It has a 15" diagonally measured active display area with XGA resolution (768 vertical by 1024 horizontal pixel array).

Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with an 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16M colors. It has been designed to apply the 8-bit 1 port LVDS interface.

A-2-1-1. Specification

Item	Specification
Active Screen Size	15.0 inches (38.016cm) diagonal (Aspect ratio 4:3)
Outline Dimension	326.5(H) x 253.5 (V) x 11.2(D) mm (Typ.)
Pixel Pitch	0.297 mm x 0.297 mm
Pixel Format	1024 horiz. By 768 vert. Pixels RGB strip arrangement
Color Depth	16M colors (6-bit with FRC)
Luminance, White	250 cd/m2 (Center 1 points Typ.)
Viewing Angle (CR>10)	R/L 130 (Typ.), U/D 100 (Typ)
Power Consumption	Total 10.12 Watt (Typ.) (1.16 Watt@VLCD, 8.96 Watt@250cd/[Lamp=8mA])
Weight	1,000 g (Typ.)
Display Operating Mode	Transmissive mode, normally white
Surface Treatment	Hard coating(3H) & Anti-glare (Haze 13%) treatment of the front polarizer

A-2-1-2. Absolute Maximum Ratings of Environment

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit

Parameter	Symbol	Values		Units	Notes
		Min	Max		
Power Input Voltage	VLCD	-0.3	+3.6	Vdc	at 25 ± 2 °C
Operating Temperature	TOP	0	50	°C	1
Storage Temperature	TST	-20	60	°C	1
Operating Ambient Humidity	HOP	10	90	%RH	1
Storage Humidity	HST	10	90	%RH	1

A-2-1-3. Electrical Characteristics

Parameter	Symbol	Value			Unit	Notes
		Min	Typ	Max		
Power Supply Input Voltage	VLCD	3.15	3.3	3.45	Vdc	
Power Supply Input Current	ILCD	-	350	400	mA	1
Power Consumption	PLCD	-	1.16	1.60	Watt	1
Rush current	IRUSH	-	-	2.0	A	3

1.   The specified current and power consumption are under the VLCD=3.3V, 25 ± 2°C, fV=60Hz condition whereas mosaic pattern(8 x 6) is displayed and fV is the frame frequency.
2.   The current is specified at the maximum current pattern.
3.   The duration of rush current is about 2ms and rising time of power Input is 1ms (min.).

A-2-2: <u>15" AUO M150XN07</u>

A-2-2-1. Specifications

Items	Specifications			
Screen diagonal	381 mm (15")			
Active Area	304.18 (H) x 228.096 mm			
Pixels H x V	1024 (x3) x 768			
Pixel Pitch	0.297 (per one triad) x 0.297			
Pixel Arrangement	R.G.B. Vertical Stripe			
Display Mode	TN mode, Normally White			
White Luminance	250 cd/m^2 (Typ) @8mA			
Contrast Ratio	500 : 1 (Typ)			Note 1
Optical Rise Time/Fall Time	12 msec (Typ)			
Color Saturation	65% NTSC			
Nominal Input Voltage (VDD)	+3.3V			
Power Consumption (VDD line + CCFL line)	13.3W (Typ.) @8mA (All black pattern)			
Weight	1100 g (Typ.)			
Physical Size		Min.	Typ.	Max
	Horizontal (H)	326.0	326.5	327
	Vertical (V)	253	253.5	254
	Depth (D)	-	-	12.0
Electrical Interface	1 channel LVDS			
Support Color	16.2M colors (RGB 6-bit + FRC data)			
Temperature Range	Operating	0 to +50ºC		
	Storage	-20 to +60ºC		
Surface Treatment	Hard-coating (3H), anti-glare treatment			

Note 1: System should warm up for at least one hour.

A-2-2-2. Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Note
LCD Logic/LCD Drive	VDD	0.3	+3.6	Volt	Note 1
Backlight CCFL Current	IRCFL	-	8.5	(mA) rms	Note 1, 2
Operating Temperature	TOP	0	+50	ºC	Note 3
Operating Humidity	HOP	8	90	%RH	Note 3
Storage Temperature	TST	-20	+60	ºC	Note 3
Storage Humidity	HST	8	90	%RH	Note 3

Note 1: With in Ta (25**ºC**)
Note 2: Permanent damage to the device may occur if exceed maximum values
Note 3: For quality performance, please refer to AUO IIS (Incoming Inspection Standard) . Please refer the graph below for the corresponding of temperature and humidity."

A-2-2-3. Electrical Characteristics

Input power specifications are as follows

Symbol	Parameter	Min.	Typ.	Max.	Unit	Condition
VDD	Logic/LCD Drive Voltage	3.3	3.3	3.6	Volt	± 10%
IDD	VDD current	-	600	700	mA	Vin=3.3V, Gray Bar Pattern, @60Hz
Irush	LCD Inrush Current	-	-	3	A	
PDD	VDD Power		2.2	2.3	Watt	Vin=3.3V, Gray Bar Pattern, @60Hz
VDDrp	Allowable Logic/LCD Drive Ripple Voltage			100	mV p-p	Vin=3.3V, All Black Pattern, @75Hz

A-2-2-3. Electrical Characteristics

V_{DD}=3.3V, fv=60Hz, fh=4.84KHz, fclk=65Mhz, Ta=25°C

Item	Symbol	Condition	Min.	Typ..	Max.	Unit	Note
Power Supply Voltage	V_{DD} -V_{SS}		3.0	3.3	3.6	V	
LVDS Input	V_{TH}	High level	-	-	+100	mV	V_{CM}=12.V
Threshold Voltage	V_{TL}	Low level	-100	-	-		
LVDS Input Common Mode Voltage			1.0	1.2	1.4	V	
LVDS Input Termination Resistor	RT		-	100	-	Ω	Internal
Power Supply Current	I_{DD}	Note 1	-	(430)	800	mA	

NOTE 1: Under the following display image: Typ. Value, display pattern is 256 gray scale bar.

NOTE 2: V_{CM}: Common Mode Voltage of LVDS Input

A-2-2-5. Environmental Absolute Maximum Ratings

Ta: 25°C

Item	Symbol	Condition	Min.	Max.	Unit	Note
Ambient	T_{ST}	Storage	-20	60	^{o}C	Note 1
Temperature	T_{OP}	Operation	0	50		
Humidity	-	Ta=40°C max	-	85	%RH	No condensation Note 2
Vibration	-	Storage	-	1.5	G	Note 3
Shock	-	Storage	-	50	G	XYZ 11msec/direction

NOTE 1: Care should be taken so that the LCD module may not be subjected to the temperature beyond this specification.

NOTE 2: Ta>40°C: Absolute humidity should be less than that of 80%RH/40°C

NOTE 3: 10~200Hz, 300min/cycle, X/Y/Z each one cycle except for resonant frequency

A-3: OP 1700 LCD

The standard display used for the OP 1700 is either an LG.Phillips LM170E01 or its equivalent. LM170E01 is a color active matrix liquid crystal display with an integral cold cathode fluorescent lamp (CCFL) backlight system. The matrix employs a-Si thin film transistor as the active element.

It is a transmissive type display operating in the normally white mode. This TFT-LCD has a 17.0 inch diagonal measured active display area with SXGA resolution (1024 vertical by 1280 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 8-bit gray scale signal for each dot, thus, presenting a palette of more than 16.2M colors with FRC (Frame Rate Control). The LM170E01-TLE1 has been designed to apply the interface method that enables low power, high speed, low EMI. FPD Link or compatible must be used as a LVDS (Low Voltage Differential Signaling) chip. The LM170E01-TLE1 is intended to support applications where thin thickness, wide viewing angle, low power are critical factors and graphic displays are important.

A-3-1. Specification

Item	Specification
Active Screen Size	17.0 inches (43.27 cm) diagonal
Outline Dimension	358.5(H) x 296.5 (V) x 17(D) mm (Typ.)
Pixel Pitch	0.264 mm x 0.264 mm
Pixel Format	1280 horiz. by 1024 vert. pixels RGB strip arrangement
Color Depth	16.2M colors (6-bit with FRC)
Luminance, White	420 cd/m2 (Center 1 points Typ.)
Power Consumption	Total 21.30 Watt (Typ.)
Weight	2,150 g (Typ.)
Display Operating Mode	Transmissive mode, normally white
Surface Treatment	Hard coating(2H) & Glare treatment of the front polarizer

A-3-2. Absolute Maximum Ratings of Environment

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit

Parameter	Symbol	Values Min	Values Max	Units	Notes
Power Input Voltage	V_{CC}	-0.3	+5.5	Vdc	at 25 °C
Operating Temperature	T_{OP}	0	50	°C	1
Storage Temperature	T_{ST}	-20	60	°C	1
Operating Ambient Humidity	H_{OP}	10	90	%RH	1
Storage Humidity	H_{ST}	10	90	%RH	1

1. Temperature and relative humidity range are shown in the figure below.

   Wet bulb temperature should be 39 °C Max and no condensation of water.

A-3-3. Electrical Characteristics

Parameter	Symbol	Value Min.	Value Typ.	Value Max.	Unit	Notes
MODULE						
Power Supply Input Voltage	V_{CC}	4.5	5.0	5.5	V	
Permissive Power Input Ripple	V_{RF}	-	-	0.1	V	
Power Supply Input Current	I_{CC}	-	0.5	0.58	mA	1
Power Consumption	P_{C}	-	2.5	2.9	Watts	2
LAMP						
Operating Voltage	V_{BL}	615 (6.0mA)	628 (7.5mA)	740 (3.0mA)	V_{RMS}	3
Operating Current	I_{BL}	3.0	7.5	8.0	mA_{RMS}	
Established Starting Voltage	V_{BB}					4
@25ºC				1,000	V_{RMS}	
@0ºC				1,250	V_{RMS}	
Operating Frequency	f_{BL}	40	60	70	KHz	5
Discharge Stabilization	T_{S}			3	Min	6
Power Consumption	P_{BL}		18.8	20.68	Watt	7
Life Time		40,000			Hrs	8

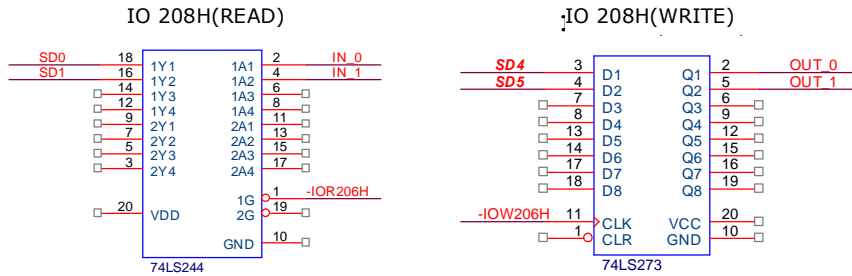## B: DIO (Digital Input & Output)

The OP SERIES provides 2-channel digital input and output that can be used for the system's simple automation control needs. The digital I/O can be configured to control the opening of a cash drawer or to sense the warning signal of an uninterrupted power system (UPS) or to do the store security control.

The DIO port address and pin definition is listed below:

I/O Port address: 200H/208H by CMOS setting

   Read: SD0, SD1

   Write: SD4, SD5

The Digital I/O is of TTL interface.   It is controlled via software programming.

Digital I/O Programming

Input/output address: 208H

In_Data 0~3=SD0~SD1

Out_Data 0~3 SD4~SD7

EXAMPLE:

10   REM Digital I/O example program

20   X = INP (&H208)   REM INPUT Digital I/O port
                            for 4 bit

30   X = OUT (&H208)   REM OUTPUT Digital I/O port
                            for 4 bit

60   END

100 Return

Port 208H Definition

C: DiskOnChip® Installation

The OP 1200/1500 IV is equipped with an internal flash disk which can emulate a floppy disk drive by adapting DiskOnChip® memory chips from 2MB to 144MB capacity, and the flash disk is fully compatible with floppy disk format of MS-DOS system.

To install a DiskOnChip® memory to the provided socket, follow the instructions below;

1. Make sure the computer is turned off
2. Insert the DiskOnChip® memory device into the onboard socket. Make sure that pin 1 of the DiskOnChip® is aligned with the pin 1 of the socket.
3. Power up the computer
4. During the power up, the DiskOnChip® drivers will be automatically loaded into the system memory.
5. At this time, the DiskOnChip® can be accessed as any disk drive.
6. If it is the only disk in the system, it will appear as the first drive, drive C:.
7. If there are more drives already attached to the system, then by default, the DiskOnChip® will appear as the last drive unless specially programmed.
8. If the DiskOnChip® is to be bootable, then follow the steps below

    a. Use DOS command to copy the operating files into the DiskOnChip®

    b. The DiskOnChip® is to be configured as the first drive, drive C: in the system. Use the DUPDATE utility.

      DUPDATE D /S: DOC104.EXB /FIRST (set as c:)

      DUPDATE C /S: DOC104.EXB (set as d:)

For more information and for the latest software utility and utilities manual on the DiskOnChip®, visit M-System website at www.m-sys.com .

D: System I/O Ports

Address range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8024 keyboard controller
070-07F	Real time clock, non-maskable interrupt mask (NMI)
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
1F0-1F8	Fixed disk
200-207	Game Port (not used)
443	Watchdog timer
143	Watchdog timer
208	DIO port
2E8	Serial port #4
2F8-2FF	Serial port #2
300-31F	Prototype card (not used)
330-331	MPU-401 Compatible
360-36F	Reserved
378-37F	Parallel printer port 1 (LPT1)
380-38F	SDLC, bisynchronous 2 (not used)
3A0-3AF	Bisynchronous 1 (not used)
3B0-3BF	Monochrome display and printer adapter (LPT1) (not used)
3C0-3CF	Reserved
3D0-3DF	Color/graphics monitor adapter
3E8	Serial port #3
3F0-3F7	Diskette controller
3F8-3FF	Serial port #1

E: Wake-On-LAN

The Wake-On-LAN is a remote management tool with the advantage to reduce system management workload. It provides the capability to remotely power on the client computers supporting Wake-On-LAN by simply sending a "wake up packet". After powering up the client systems, the user is able to monitor the remote systems' status and to upload or download files to or from the clients. With this feature, MIS persons can flexibly perform client maintenance during off-hours; the Total Cost of Ownership (TCO) will be thus lowered.

To use Wake On LAN function, the client system must have a network card with chipset that supports the Wake-On-LAN and an ATX power supply meeting 2.01 with at least 720mA standby current is also required to support the Ethernet card for this function. The OP SERIES is a panel PC system with these two features. To use the OP SERIES Wake-On-LAN function, please refer to the following;

1. **Download the "Wake up packet**",
PCnet Family Software Magic Packet Utility. This utility is downloadable from AMD website at

http://www.amd.com/us-en/Networking/ProductInformation/0,,50_2330,00.html

Or refer to the **Magic Packet™ Technology** at AMD website for how to write your own wake-up program.

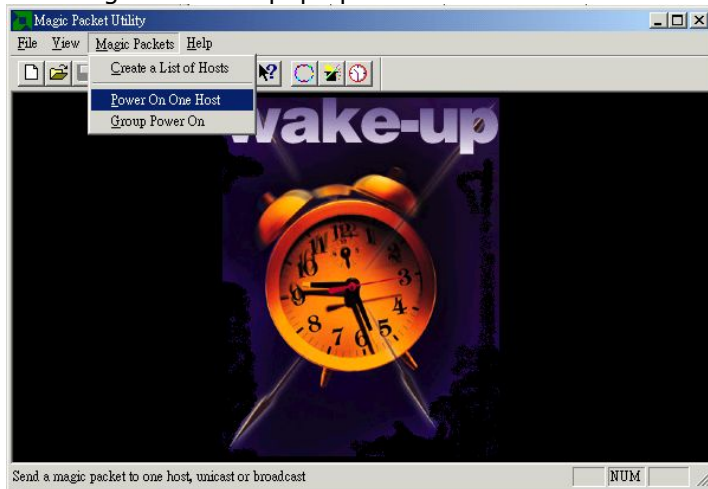http://www.amd.com/us-en/Networking/TechnicalResources/0,,50_2334_2481,00.html

2. **BIOS Setting**
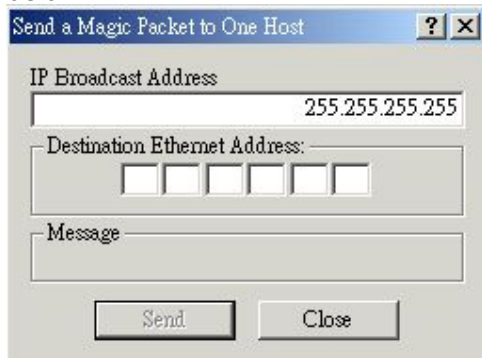   Enter the *POWER MANAGEMENT SETUP\\PM WAKE UP EVENTS* to enable the *MACPME POWER UP CONTROL*

3. Wake up Packet

To use the AMD's Magic Packet, program installation is not needed. Just open the MAGPAC.EXE, then the following screen will pop up.


The remote computer can be waken up by selecting the *MAGIC PACKETS | POWER ON ONE HOST* as shown below.

Do not change the *IP BROADCAST ADDRESS*. The *DESTINATION ETHERNET ADDRESS* is to be filled in with the Ethernet card's MAC address.

To obtain the Ethernet card MAC, under Windows 9x, just enter *START\RUN* to open the *winipcfg.exe*, then the following screen will pop up. If the OS is Windows NT 4.0 or 2000 or XP, then you need to enter DOS mode to run *ipconfig.exe* to obtain the MAC.
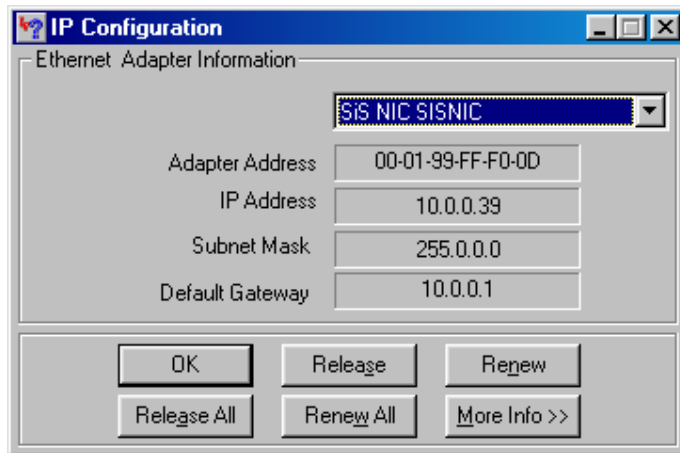
The adapter address is the LAN card's MAC address.

4. After obtaining all the above information, the remote computer can be powered on now.

Now you can use *Desktop On Call* or other remote software to control the remote computer.

F: First MB Memory Map

Address range (Hex)	Device
F000h-FFFFh	System ROM
CC00h-EFFFh	Unused
C000h-CBFFh	Expansion ROM
B800h-BFFFh	CGA/EGA/VGA text
B000h-B7FFh	Unused
A000h-AFFFh	EGA/VGA graphics
0000h-9FFFh	Base memory
D000-D7FFH	DiskOnChip®(Default)

G: Power Supply

The power supply used in the OP SERIES system is a 250 watts (@25°C), 220 watt ((@50°C), AC-line powered switching power supply with active PFC (Power Factor Correction) circuit. It meets EN61000-3-2 and features with full range input. Its model number is FSP250-50PLB (1U).

G-1: Output Electrical requirement

The subject power supply will meet all electrical specifications below, over the full operation temperature range and dynamic load regulation.

■   **Output Rating**

250W 25° C

Output	Nominal	Regulation	Ripple/Noise	Min.	Max.	Peak
1	+3.3V	+-5%	50mV	0.5A.	18.0A	
2	+5V	+-5%	50mV	0.3A	20.0A	
3	+12V	+-5%	120mV	1.0A	16.0A	18.0A
4	-12V	+-5%	120mV	0.0A	0.5A	
5	+5VSB	+-5%	100mV	0.0A	2.0A	2.5A

▪   -12V, 3.3V, +5V, +12V will have the regulation +-10% when all load take off

▪   The +3.3V and +5V total output shall not exceed 150 watts. The +3.3V, +5V and +12V total output shall not exceed 206.4 watts and the total output power for this subject power is 250 watts.

220W 50° C

Output	Nominal	Regulation	Ripple/Noise	Min.	Max.	Peak
1	+3.3V	+-5%	50mV	0.5A.	14.0A	
2	+5V	+-5%	50mV	0.3A	18.0A	
3	+12V	+-5%	120mV	1.0A	14.0A	16.0A
4	-12V	+-5%	120mV	0.0A	0.5A	
5	+5VSB	+-5%	100mV	0.0A	2.0A	2.5A

▪   -12V, 3.3V, +5V, +12V will have the regulation +-10% when all load take off

▪   The +3.3V and +5V total output shall not exceed 110 watts. The +3.3V, +5V and +12V total output shall not exceed 206.4 watts and the total output power for this subject power is 220 watts.

▪   Ripple and noise measurements shall be made under the specified load conditions through a single pole pass filter with 20Mhz cutoff frequency. Outputs shall bypass at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

■   **Load Capacity Specification:** The cross regulation defined as follows, the voltage regulation limits DC includes DC output ripple & noise.

LOAD	STM	+3.3V	+5V	+12V	-12V
ALL MAX	HHHH	15.0A.	13.1A.	10.1A	0.5A
+5V MAX other MIN	LHLL	0.5A	20.0A	3.0A	0.0A
+3.3 MAX other MIN	HLLL	18.0A	0.3A	1.5A	0.0A
+12V MAX other MIN	LLHL	0.5A	0.3A	16.0A	0.0A
ALL MIN.	LLLL	0.3A	0.3A	1.0A	0.0A

■   **Hold-up Time @ full Load**

115V/60Hz   17 mSec. Minimum

230V/50Hz   17 mSec. Minimum

■   **Output Rise Time**

(10% to 90% of final output value, @ full load)

115V-rms or 230V-rms   +5Vdc=20ms Maximum

■ **Over voltage Protection**

+5Vdc output: +5.7Vdc minimum +6.5Vdc max.

+12Vdc output: +13.3Vdc minimum   +15.6Vdc max.

+3.3Vdc output: +3.7Vdc minimum   +4.5Vdc max.

■ **Short Circuit Protection**

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +3.3V, +5V or +12V, the power supply will shut down and latch off. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for more than 2 seconds.

In the event of an output short circuit condition on -12V, the power supply will not be latched off. The power supply shall return to normal operation as soon as the short circuit has been removed and the power switch has been turned off for more than 2 seconds.

■ **Overload Protection**

Overload currents defined as a 10 amp/sec fault current ramp starting from full load, applied to the +3.3V, +5V output, shall not cause that output to exceed 36 amp before the output voltage drops below 0.5 volts and is latched off. The 12V output shall not exceed 24 amp under the same ramp conditions starting at full load before it is latched off.

■ **Power Good Signal**

The power good signal is a TTL compatible signal for the purpose of initiating an orderly star-up procedure under the normal input operating conditions. This signal is asserted (low) until +5Vdc has reached 4.75 volts during power up. Characteristics;

TTL signal asserted (low state): less than 0.5V while sinking 10mA.

TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.

High state output impedance: less or equal to 1Kohm from output to common.

■ **Output Transient Load Response**

+5V and +12V must be within specification for a step change in current as specified below. The output will be tested one session at a time with all other sections at maximum load. The test transition will be from IA to IB to IA.

+5Vdc:

IA:	20.0 amp
IB:	15.0 amp
Volts variation:	+5V +-5%
Setting time:	10 ms max.
Transient load slew rate is	0.5A/uS

+12Vdc:

IA:	16.0 amp
IB:	12.0 amp
Volts variation:	+12V +-5%
Setting time:	10 ms max.
Transient load slew rate is	0.1A/uS

+3.3Vdc:

IA:	16.8 amp
IB:	13.0 amp
Volts variation:	+3.3V +-5%
Setting Time:	10 ms max.
Transient load slew rate is	0.1A/uS

G-2: Input Electrical Specifications

■ **AC Input**

AC Input Line Requirement

Parameter	Min.	Nor.[1]	Max.	Unit
Vin (115VAC)	90	115	135	VACrms
Vin (230VAC)	180	230	265	VACrms
Vin Frequency	47	--	63	Hz

▪ Normal voltages for test purpose are considered to be within +-1.0V of normal.

■ **Inrush Current**

(Cold start – 25°C)

115V	50 Amp - peak
230V	80 Amp - peak

■ **Input Line Current**

115V	5.0 Amp–rms maximum
230V	3.0 Amp–rms maximum

■ **Efficiency**

115VAC@ full load	68% minimum
230VAC@ full load	68% minimum.

G-3: Environmental Requirements

The power supply will be compliant with each item in the specifications for the following environmental conditions.

■ Temperature Range

Operating	220V	0~50oC
	250V	0~25oC
Storage	20~80ºC	

■ Humidity

Operating	5~95% RH, non-condensing
Storage	5~95% RH, non-condensing

■ Vibration

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Vibrating Operating – sine wave excited, 0.5 G maximum acceleration, 10-250Hz swept at one octave/min. Fifteen minutes dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursion two times large than non-resonant excursions.

Plane of vibration to be along mutually perpendicular axes.

■ Shock

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Storage: 40G, 11 mSec, half-sine wave pulse in both directions on three mutually perpendicular axes.

Operating: 10G, 11 mSec, half-sine wave pulse in both directions on three mutually perpendicular axes.

■ Cooling Specifications

The power supply is cooled by a self-contained, 40mm, 12VDC.

G-4: Safety

■ Leakage Current

The leakage current from AC to safety ground will not exceed 3.5mA-rms @ 240VAC, 50Hz.

G-5: Electromagnetic Compatibility

■ Line Conducted EMI

The subject power supply will meet FCC and VFG class B requirements.

■ Radiated EMI

The subject power supply will meet FCC and CISPR 22 requirements.

G-6: Reliability

■ MTBF

The subject power supply has a minimum MTBF of 100,000 hours of continuous operation at 25oC maximum output load and nominal AC input voltages.

G-7: Dimension

■ W x H x D - 190 x 80 x 40 (mm)