FabiaTech Corporation

IPC Solution

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**ISA CPU Card**

# Low Power Series

# FB2505 User's Manual

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Part Number: FB2505

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- Description of you peripheral attachments
- Description of your software (operating system, version, application software, etc.) and BIOS configuration
- Description of the symptoms (Extract wording any message)

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# Table of Content

**FB2505 User's Manual** ..... i

**Chapter 1 Introducing the FB2505 System** ..... 1

Overview ..... 1

Series Comparison Table ..... 2

Layout ..... 3

Specifications ..... 4

Packing List ..... 5

**Chapter 2 Hardware Installation** ..... 7

Before Installation ..... 7

Hardware Features ..... 8

J2: External Power/HDD LED's Indicators & Reset Header ..... 9

CN15, CN16: Keyboard/Mouse Connector ..... 9

CN11: USB Connector ..... 10

CN13: RJ45 LAN Connector ..... 10

CN8: 26-pin Parallel Port Connector ..... 11

CN3: Floppy Connector ..... 12

CN2: IDE hard Disk Connector ..... 13

CN6: TTL I/O Connector ..... 14

DB2, CN9: RS232 Serial Ports 1,2 Connectors and Jumpers ..... 14

Serial Port 2 (CN9, JP2, and JP4) ..... 15

JP5: Clear CMOS Data ..... 15

DIMM1: So-DIMM Socket (Optional) ..... 16

CN17 & JP1: Compact Flash Socket and Master/Slave Select ..... 16

CN7: Audio Connector (For FB2505A) ..... 17

FB4641x: Provides Audio and USB Board ..... 17

CN14: Power Connector (6-pin 2.5mm JST) ..... 18

BUS1: PC/104 Bus Connectors ..... 18

BZ1 & LED2: On-Board Buzzer & On-Board Power LED ..... 20

**Chapter 3 Installing CRT & LCD Display** ..... 21

LCD FLAT PANEL DISPLAY ..... 21

CRT Display (DB1) ..... 22

CN4: LCD Connector (For FB2505A) ..... 23
**Chapter 4 BIOS Setup ..... 25**
Overview ..... 25
BIOS Functions ..... 26
Keyboard Convention ..... 27
Main Setup ..... 28
System Memory ..... 28
System Date & Time Setup ..... 28
Advanced Setup ..... 29
CPU Configuration ..... 29
IDE Configuration ..... 30
IDE Primary/Secondary Master/Slave ..... 30
Hard Disk Write Protect ..... 31
IDE Detect Time Out (Sec.) ..... 31
Floppy Configuration ..... 32
Floppy A,B ..... 32
Floppy Drive Seek ..... 32
SuperIO Configuration ..... 33
KBC Clock Rate Selection ..... 33
OnBoard Floppy Controller ..... 33
Floppy Drive Swap ..... 33
Serial Port 1 Address ..... 34
Serial Port 2 Address ..... 34
Parallel Port Address ..... 34
Parallel Port Mode ..... 34
Parallel Port IRQ ..... 34
ITE8888 ISA Decode IO ..... 35
Decode I/O Space 0~4 ..... 35
Decode I/O Speed 0~4 ..... 35
Decode I/O Addr. 0~4 [15:4] ..... 35
Decode I/O Size 0~4 ..... 35
ITE8888 ISA Decode Memory ..... 36

Decode Memory Space 0~4 ....36
Decode Memory Speed 0~4 ....36
Decode Memory Addr. 0~4 [23:12] ....36
Decode Memory Size 0~4 ....36
Hardware Health Configuration ....37
USB Configuration ....37
USB Function ....38
Legacy USB Support ....38
BIOS ECHI Hand-Off ....38
PCIPnP Setup ....39
Plug and Plug Aware O/S ....39
PCI Latency Timer ....39
PCI IDE BusMaster ....39
IRQ 3 –15 ....40
DMA Channel 0 – 7 ....40
Boot Setup ....41
Boot Setting Configuration ....41
Quick Boot ....41
Boot Up Num-Lock ....42
PS/2 Mouse Support ....42
Wait for 'F1' If Error ....42
Hit 'DEL' Message Display ....42
Boot Device ....43
First /Second /Third Hard Disk Boot Device ....43
Hard Disk Drives ....43
Removable Drives ....44
Security setup ....45
Clean User Password ....46
Password Check ....46
Chipset Setup ....47
Northbridge Configuration ....47
Configure SDRAM Timing by SPD ....47

Internal Graphics Memory....47
SMI712 Flat Panel Configuration....48
Southbridge Configuration....49
Lan Boot ROM Controller....49
USB 2.0/USB 1.1 Controller....49
Onboard AC'97 Audio....49
Power Management....50
Power Management/APM....50
BIOS PM at Boot....50
Standby Time Out (Minute)....50
**Chapter 5 Driver and Utility....51**
VGA Drivers....51
WINDOWS XP Driver....51
PCI to ISA Bridge Drivers....51
WINDOWS XP/2000 Driver....51
Audio Drivers....52
WINDOWS XP Driver....52
AES Drivers....52
WINDOWS XP Driver....52
LAN Utility & Driver....53
BIOS Flash Utility....53
Watchdog Timer....54
Watchdog Timer Setting....55
Watchdog Timer Enabled....56
Watchdog Timer Trigger....56
Watchdog Timer Disabled....57
**Chapter 6 Technical Reference....59**
Trouble Shooting for Post Beep and Error Messages....59
POST BEEP....59
Error Message....59
CMOS BATTERY FAILURE....59
CMOS CHECKSUM ERROR....60
DISK BOOT FAILURE....60

DISKETTE DRIVES OR TYPES MISMATCH ERROR ..... 60
ERROR ENCOUNTERED INITIALIZING HARD DRIVE ..... 60
ERROR INITIALIZING HARD DISK CONTROLLER ..... 60
KEYBOARD ERROR OR NO KEYBOARD PRESENT ..... 60
MEMORY ADDRESS ERROR ..... 60
MEMORY SIZE HAS CHANGED ..... 61
MEMORY VERIFYING ERROR ..... 61
OFFENDING ADDRESS MISSING ..... 61
REBOOT ERROR ..... 61
SYSTEM HALTED ..... 61
Technical Reference ..... 62
Physical and Environmental ..... 62
Real-Time Clock and Non-Volatile RAM ..... 62
CMOS RAM Map ..... 64
I/O Port Address Map ..... 65
Interrupt Request Lines (IRQ) ..... 66
Serial Ports ..... 67
Receiver Buffer Register (RBR) ..... 67
Transmitter Holding Register (THR) ..... 67
Interrupt Enable Register (IER) ..... 67
Interrupt Identification Register (IIR) ..... 68
Line Control Register (LCR) ..... 68
MODEM Control Register (MCR) ..... 69
Line Status Register (LSR) ..... 69
MODEM Status Register (MSR) ..... 69
Divisor Latch (LS, MS) ..... 70
How to configure I/O port resource ..... 71
**Appendix ..... 73**
Dimension ..... 73

# Chapter 1 Introducing the FB2505 System

## Overview

The FB2505 is an AMD Geode™ LX-800 Low power processor, all in one, ISA CPU card. This user's manual provides information on the physical features, installation, and BIOS setup of the FB2505.

Built to unleash the total potential of the AMD Geode™ Processor, the FB2505(A) is a single board computer capable of handling today's demanding requirements. Able to support 500 MHz CPU, this unit supports 10/100M interface network port, TTL I/O, Compact Flash socket, audio, 1 DIMM socket supports up to 1GB DDR RAM, two USB2.0 ports, and a VGA controller.

Each FB2505 has two ports for I/O communications. One RS-232C and one RS-232/ 422/485 ports are available. There is also a watchdog timer that can be configured from software to automatically reset the system. And for easy configuration, AMI BIOS are available.

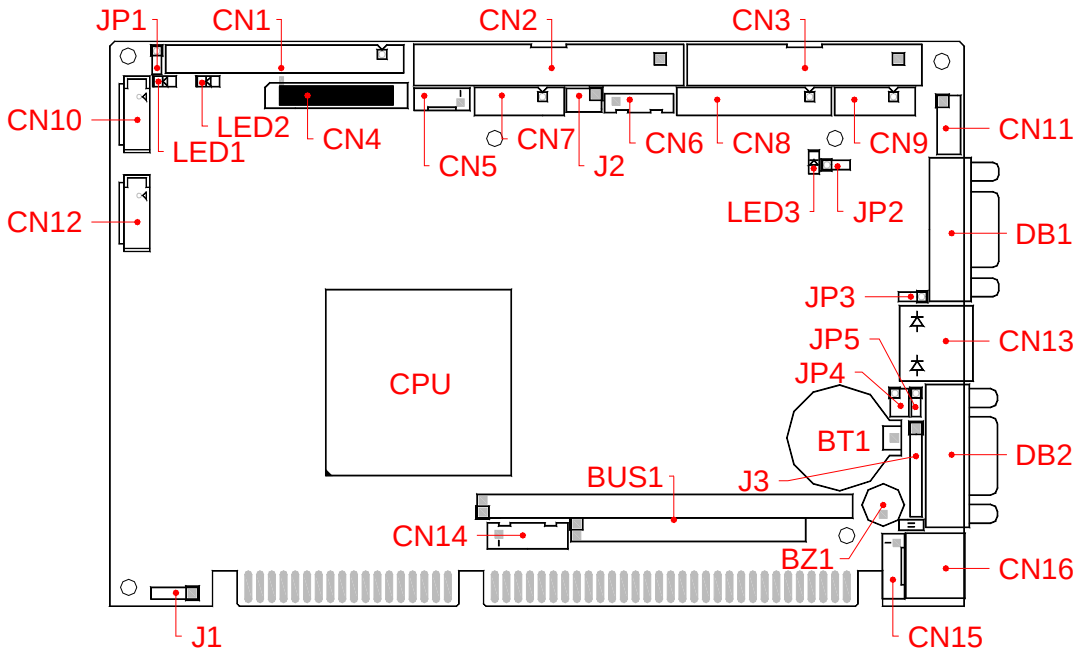
Power management is also featured to lower the rate of consumption. The unit supports doze mode, <Suspend Mode> and <Standby mode> as well as it adheres to the "Green Function" standard.

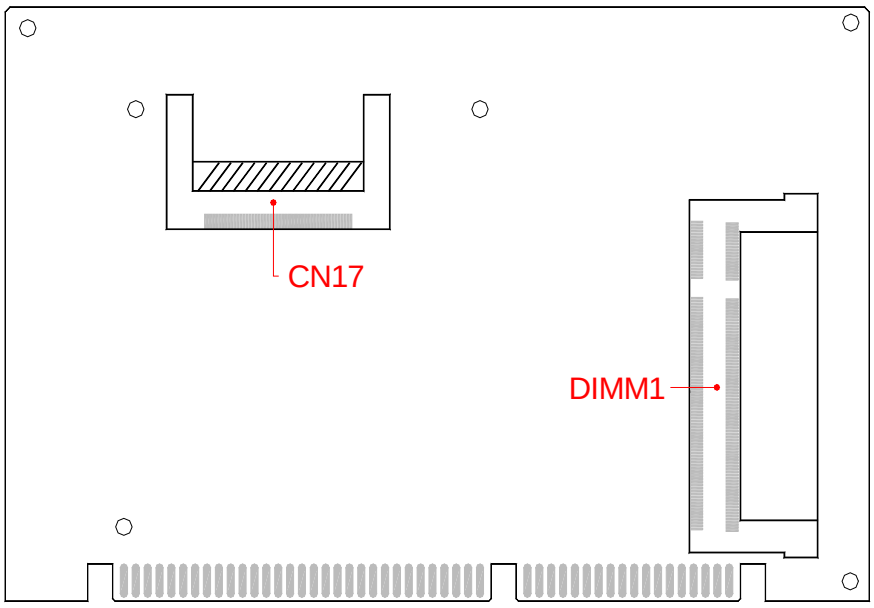
The FB2505 is perfect for POS and POI applications, network systems, panel / MMI's, order entry kiosks, test equipment, OEM projects or as a motherboard for a panel PC. The unit is only 185 X122mm, offering unparalleled performance in a very small footprint.

## Series Comparison Table

| Model | FB2505 | FB2505A |
|---|---|---|
| Processor | AMD LX800 CPU | |
| VGA Chipset | CS5536 | SMI712 |
| CRT / LCD | Only CRT | CRT/LCD |
| DIMM1(MAX.1GB DDR) | NO | Yes |
| On-Board Memory | DDR-128MB | |
| Watchdog Timer | Yes | |
| Multi I/O | Two Serial and One Parallel | |
| Digital IO | 2-In/2-Out | |
| Enhanced IDE | One | |
| Compact Flash Socket | One | |
| USB 2.0 | Two | |
| Audio | No | Yes |
| RJ45 port (10/100Mbps) | One | |
| Dimensions (Unit: mm) | 185(D) x 122(W) | |

## Layout


JP1
CN1
CN2
CN3
CN10
LED2
LED1
CN4
CN5
CN7
J2
CN6
CN8
CN9
CN11
CN12
LED3
JP2
DB1
JP3
JP5
CN13
JP4
CPU
BT1
DB2
BUS1
J3
CN14
BZ1
CN16
J1
CN15


CN17
DIMM1

## Specifications

- AMD Geode™ LX800 (500MHz) Low Power CPU.
- AMD Geode CS5536 chipset and 64KB or above L2 cache inside the CPUs.
- Support 200 pin So-DIMM socket for up to 1GB DDR-333/400 RAM (FB2505A)
- One 10M/100M Base-TX Ethernet port.
- Support CRT port and up to 254MB shared memory. (FB2505).
- Supports CRT port and LCD interface up to 4MB VGA memory.(FB2505A)
- Two USB (V2.0) ports and PCI IDE interface.
- Compact Flash socket for 3.3V Compact Flash and Micro Drives.
- One RS-232 and One RS-232/RS-422/RS-485 ports.
- PS/2 compatible keyboard and mouse interface.
- Providing header for external speaker and hard disk access LED.
- Software programmable watchdog timer.
- Providing one AC97 audio function. (FB2505A)
- Flash BIOS with easy upgrade utility.
- Compact size, 185 mm x 122 mm.
- Power requirement: +5V only, 1.3A maximum. (500MHz CPU)

## Packing List

Upon receiving the package, verify the following things. If any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FB2505 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FB2505 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FB2505 system.

**Note:** After FB2505 is installed, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following list the accessories that may be included in your FB2505 package. Some of the accessories are optional shipped only upon order.

- One FB2505 (A) All-In-One CPU card.
- One 40-pin hard disk drive interface cable.
- One 34-pin floppy drive interface cable.
- One serial port and parallel port interface cable with bracket.
- One 2-port USB adapter cable.(**Optional**)
- One USB cable, one Audio cable, and one FB4641x Audio/USB adapter board. (All are Optional items for FB2505A)
- One compact disc containing manual file in PDF format and necessary drivers and utilities.

# Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

## Before Installation

Before you install the system, make sure you follow the below descriptions.

1. Before removing the board from its anti-static bag, wear an anti-static strap to prevent the generation of Electricity Static Discharge (ESD). The ESD may be generated by man's physical touch. It may do damage to the board circuit.

2. Install any connector, module, or add on card, be sure that the power is disconnected from the system board. If not, this may damage the system board components, module, or the add-on-card.

3. When you connect the connectors and memory modules, be careful with the pin orientations.

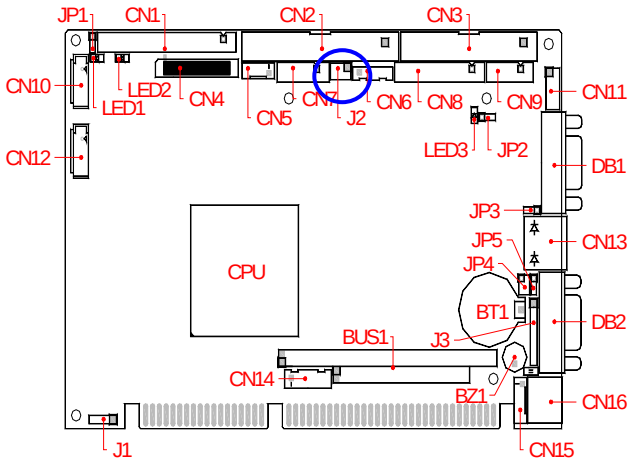
## Hardware Features

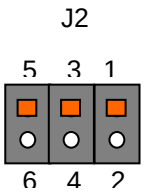
The following list is for the setup of the connectors and jumpers of the FB2505.

| Item | Description |
|---|---|
| CN1 | Reserved |
| CN2 | 40-pin 2.54mm IDE 1 hard disk connector (IDC). |
| CN3 | 34-pin 2.54mm floppy connector (IDC). |
| CN4 (FB2505A) | 40-pin LCD Connector (DF13-40) |
| CN5 (FB2505A) | 5-pin 2.0mm Connector for Inverter board (JST) |
| CN6 | 5-pin 2.54mm for TTL I/O (JST) |
| CN7 (FB2505A) | 12-pin 2.0mm Audio connector for provides AC97 signals (IDC) |
| CN8 | 26-pin 2.0mm parallel port connector (IDC). |
| CN9 | 10-pin RS-232 port 2 connector (IDC). |
| CN10,CN12 | Reserved |
| CN11 | 10-pin 2.54mm USB connector header |
| CN13 | RJ45-LAN connector |
| CN14 | 6-pin 2.54mm power connector |
| CN15 | 6 – pin 2.0mm connector for Keyboard and Mouse (JST) |
| CN16 | Keyboard and Mouse connector |
| CN17,JP1 | Compact Flash Socket and Master/Slave Select |
| J1 | Reserved |
| J2 | 6-pin Power/HDD LED Indicator and Reset header |
| J3 | Reserved |
| BZ1 | Onboard Buzzer |
| JP2 | Terminal Resistor for RS485 |
| JP3 | Reserved |
| JP4 | selects RS232/RS422/RS485 for serial port 2 |
| JP5 | Clear CMOS data header |
| DB1 | CRT connector with D-SUB 15 |
| DB2 | RS232 9-pin D – type male connector |
| LED1,LED2 | Reserved |
| LED3 | Power and watchdog of LED indicator |
| BUS1/2 | PC-104 ISA BUS Connector |
| DIMM1(FB2505A) | 200-pin So-DIM Socket for up to 1GB DDR-333/400 RAM |

### □ J2: External Power/HDD LED's Indicators & Reset Header

The Power and HDD LED's has two distinctive status: Off for inactive operation and blinking light for activity. And pin 5, 6 is a 2-pin header for connecting to system reset button. Shorting the circuit of the 2 pins makes the hardware reset and FB2505 restart system. It is similar to power off the system and then power it on again.

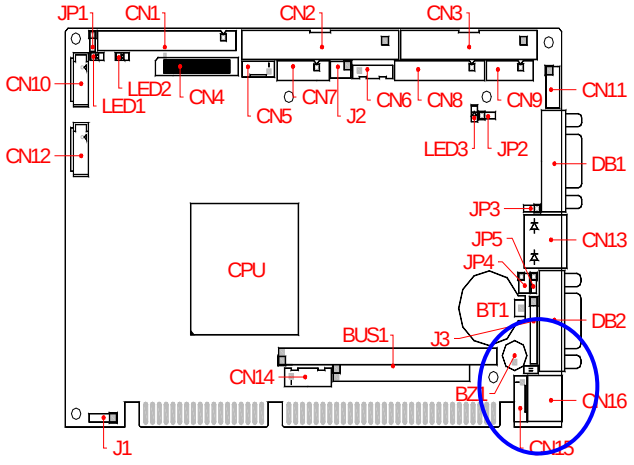


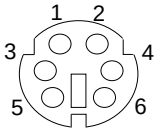

| J2 | Signal | J2 | Signal |
|---|---|---|---|
| 1 | P/W LED+ | 2 | P/W LED - |
| 3 | HDD LED+ | 4 | HDD LED - |
| 5 | Reset | 6 | GND |

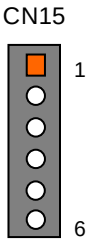
### □ CN15, CN16: Keyboard/Mouse Connector

CN16 is a standard PS/2 type keyboard connector, so any PS/2 type keyboard can plug into directly without extra adapter cable. CN15 provides PS/2 mouse interface, use the included mouse adapter cable to connect between CN15 and standard PS/2 mouse.




CN16 Front View

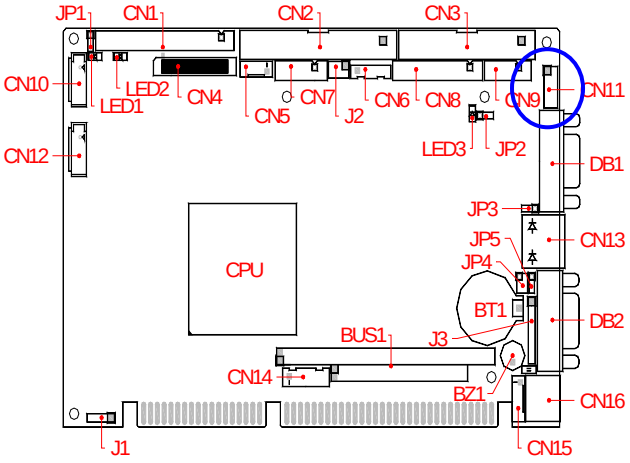


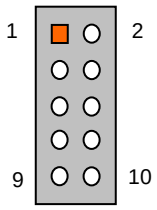

| CN15 | CN16 | Signal |
|---|---|---|
| 1 | 2 | Mouse Data |
| 2 | 1 | Keyboard Data |
| 3 | 3 | Ground |
| 4 | 4 | VCC |
| 5 | 6 | Mouse Clock |
| 6 | 5 | Keyboard Clock |

## □ CN11: USB Connector

CN11 is a 10-pin connector. Use included adapter cable (Optional) for transfering to standard port USB connector. The upper port is USB #0 and the lower port is USB#1



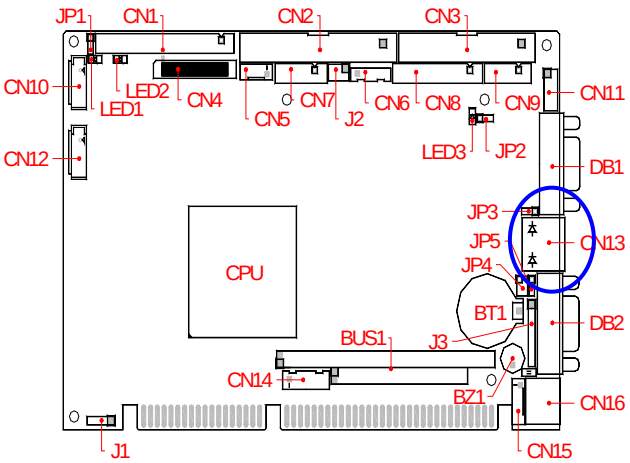

CN11




| CN11 | Description | CN11 | Description |
|---|---|---|---|
| 1 | USBV0 | 2 | Case Ground |
| 3 | USBD0- | 4 | USBG1 |
| 5 | USBD0+ | 6 | USBD1+ |
| 7 | USBG0 | 8 | USBD1- |
| 9 | Case Ground | 10 | USBV1 |

## □ CN13: RJ45 LAN Connector

The CN13 contain LAN twist pair signals and LAN accesses indicator signal is RJ45 type connector with 2 LED indicators. The down side LED (orange) indicates data which is being accessed and the up side LED (green) indicates on-line status. (When lighted indicates on-line and off indicates off-line).




CN13

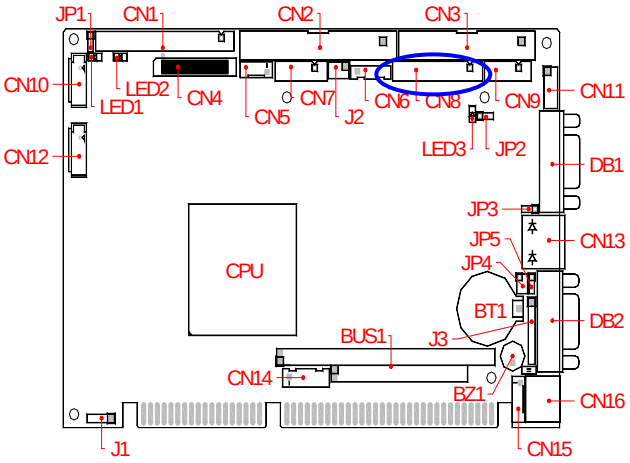
(Front View)

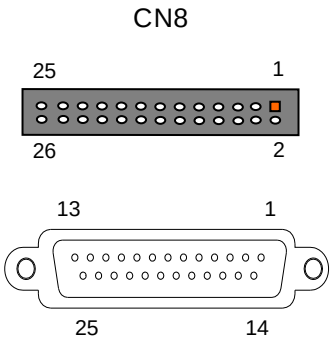
The following lists the pin assignments of RJ45.

| RJ45 | Signal | RJ45 | Signal |
|---|---|---|---|
| 1 | TPTX+ | 5 | FBG1 |
| 2 | TPTX - | 6 | TPRX - |
| 3 | TPRX+ | 7 | FBG2 |
| 4 | FBG1 | 8 | FBG2 |

## □ CN8: 26-pin Parallel Port Connector

The included printer interface cable is used to transfer 26-pin connector into standard DB25 connector.

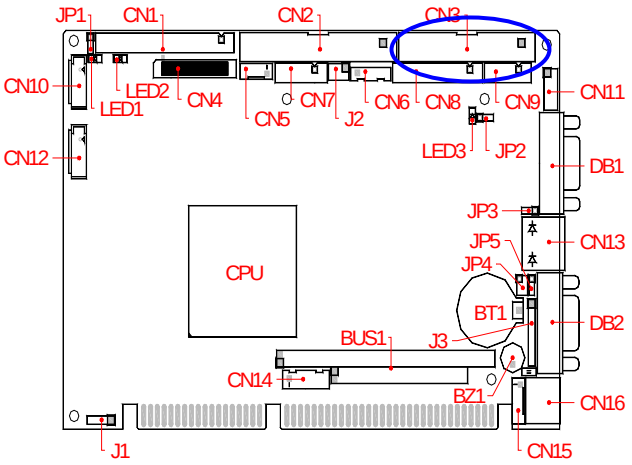


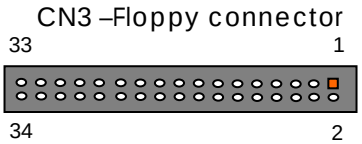




| CN8 | DB-25 | Signal | CN8 | DB-25 | Signal |
|---|---|---|---|---|---|
| 1 | 1 | -STROBE | 2 | 14 | -AUTO FORM FEED |
| 3 | 2 | DATA 0 | 4 | 15 | -ERROR |
| 5 | 3 | DATA 1 | 6 | 16 | -INITIALIZE |
| 7 | 4 | DATA 2 | 8 | 17 | -PRINTER SELECT IN |
| 9 | 5 | DATA 3 | 10 | 18 | Ground |
| 11 | 6 | DATA 4 | 12 | 19 | Ground |
| 13 | 7 | DATA 5 | 14 | 20 | Ground |
| 15 | 8 | DATA 6 | 16 | 21 | Ground |
| 17 | 9 | DATA 7 | 18 | 22 | Ground |
| 19 | 10 | -ACKNOWLEDGE | 20 | 23 | Ground |
| 21 | 11 | BUSY | 22 | 24 | Ground |
| 23 | 12 | PAPER | 24 | 25 | Ground |
| 25 | 13 | PRINTER SELECT | 26 | -- | No Used |

## □ CN3: Floppy Connector

The included floppy drive interface cable is used standard 34-pin connector. The following table shows signal connections 34-pin connectors.

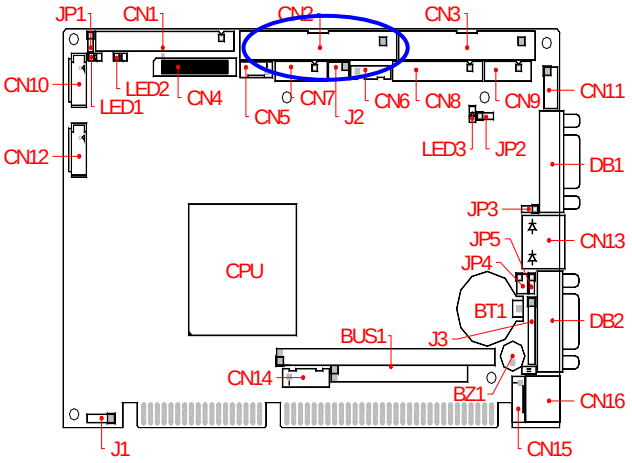


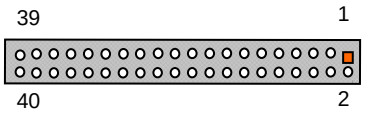

| CN3 | Signal | CN3 | Signal |
|---|---|---|---|
| 2 | Drive Enable A | 23 | Ground |
| 8 | -Index | 24 | -Write Enable |
| 12 | -Select A | 26 | -Track 0 |
| 11 | Ground | 28 | -Write Protect |
| 16 | -Motor A | 29 | Ground |
| 14 | - Select B | 30 | -Read Data |
| 10 | -Motor B | 31 | Ground |
| 9 | Ground | 32 | -Head |
| 18 | -Direction | 33 | NC |
| 20 | -Step | 34 | -Disk Change |
| 22 | -Write Data | Others | No Connection |

## □ CN2: IDE hard Disk Connector

CN2 is 40-pin 2.54mm IDE hard disk connector. The IDE interface can supports 2 IDE devices with ultra DMA mode.



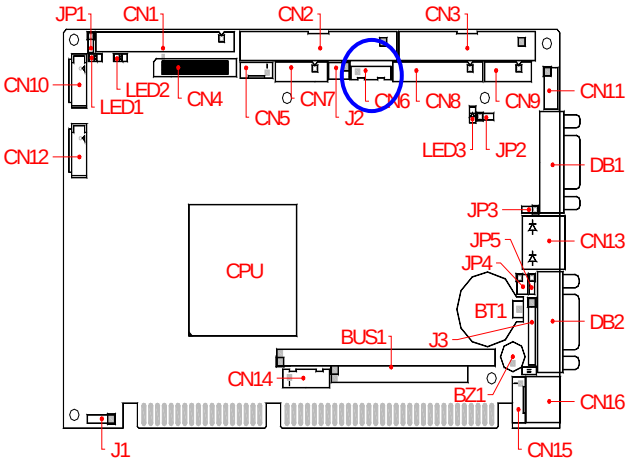

CN2 – Hard disk connector

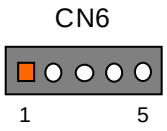



The following table lists the pin description of CN2.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | -RESET | 2 | GROUND |
| 3 | DATA 7 | 4 | DATA 8 |
| 5 | DATA 6 | 6 | DATA 9 |
| 7 | DATA 5 | 8 | DATA 10 |
| 9 | DATA 4 | 10 | DATA 11 |
| 11 | DATA 3 | 12 | DATA 12 |
| 13 | DATA 2 | 14 | DATA 13 |
| 15 | DATA 1 | 16 | DATA 14 |
| 17 | DATA 0 | 18 | DATA 15 |
| 19 | GROUND | 20 | VCC(+5V) |
| 21 | IDEDREQ | 22 | GROUND |
| 23 | -IOW A | 24 | GROUND |
| 25 | -IOR A | 26 | GROUND |
| 27 | IDEIORDYA | 28 | GROUND |
| 29 | -DACKA | 30 | GROUND |
| 31 | AINT | 32 | GROUND |
| 33 | SA 1 | 34 | Not Used |
| 35 | SA 0 | 36 | SA 2 |
| 37 | CS 0 | 38 | CS 1 |
| 39 | HD LED A | 40 | GROUND |

### □ CN6: TTL I/O Connector

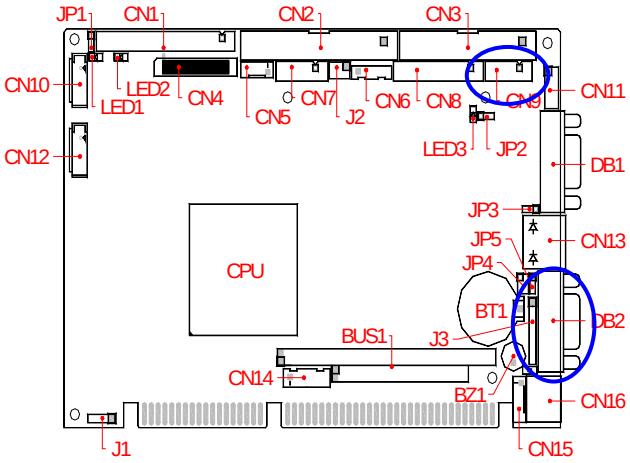


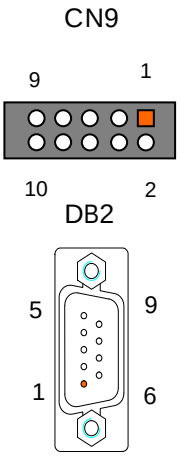




| CN6 | TTL Lines | Bit Location |
|---|---|---|
| 1 | Output Line 0 | Bit 1 of A20h |
| 2 | Output Line 1 | Bit 2 of A20h |
| 3 | Input Line 0 | Bit 3 of A20h |
| 4 | Input Line 1 | Bit 4 of A20h |
| 5 | Ground | - |

### □ DB2, CN9: RS232 Serial Ports 1,2 Connectors and Jumpers

The DB2 connector on bracket is 9-pin D-type male connector the serial port 2 adapter cables are used to transfer 10-pin IDC connector into standard DB9 connectors.

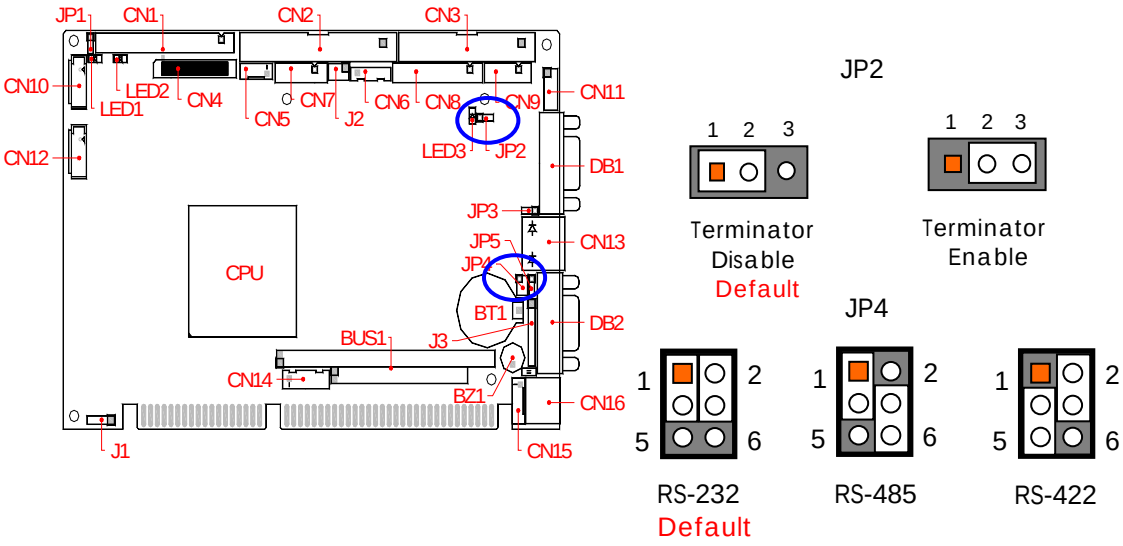



| CN9 | Signal | RS422 | RS485 | DB9 |
|---|---|---|---|---|
| 1 | -DCD2 | | | 1 |
| 2 | -DSR2 | | | 6 |
| 3 | RXD2 | RX- | 485- | 2 |
| 4 | -RTS2 | TX- | | 7 |
| 5 | TXD2 | RX+ | 485+ | 3 |
| 6 | -CTS2 | TX+ | | 8 |
| 7 | -DTR2 | | | 4 |
| 8 | -RI2 | | | 9 |
| 9 | GROUND | | | 5 |
| 10 | CASE GROUND | | | |

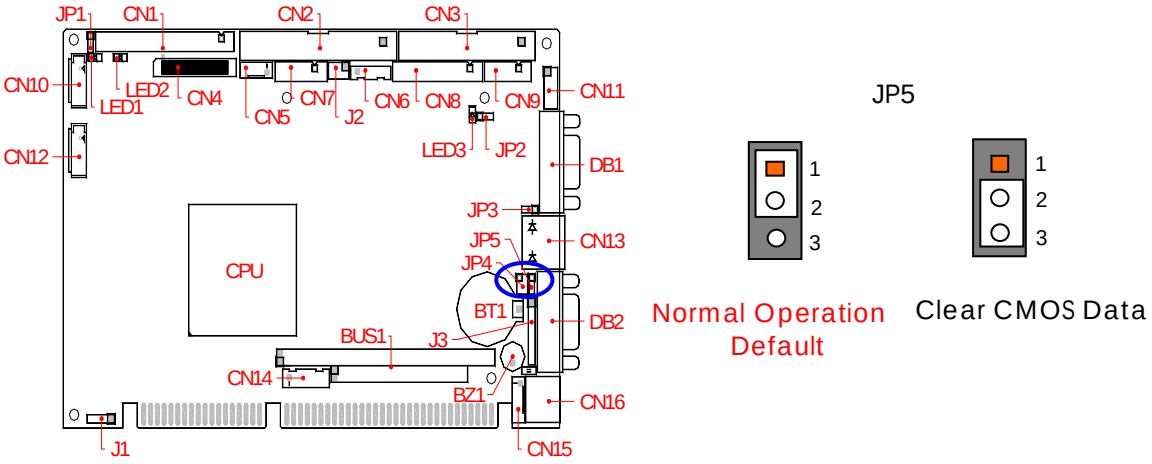
### ➢ Serial Port 2 (CN9, JP2, and JP4)

Serial port 2 is designed for multiple proposes. It could be RS-232C, RS-422 or RS-485 by selecting JP4, and JP2 is use to enable or disable terminator if RS-485 mode is selected.



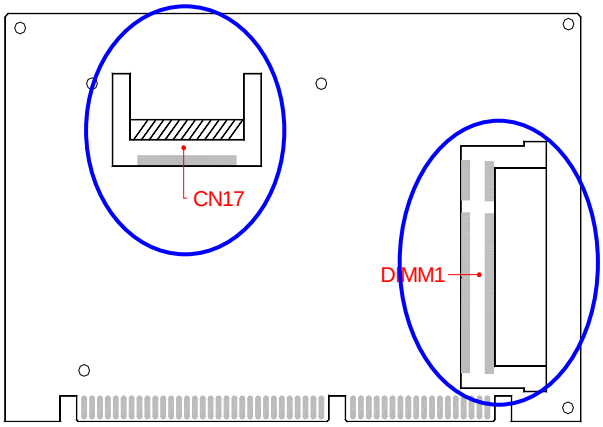

### □ JP5: Clear CMOS Data

You can use JP5 to clear CMOS data. The CMOS stores information like system date, time, boot up device, password, IRQ... which are set up with the BIOS. To clear the CMOS, set JP1 to 2-3 and then return to 1-2 before system powers off. The default setting is 1-2.



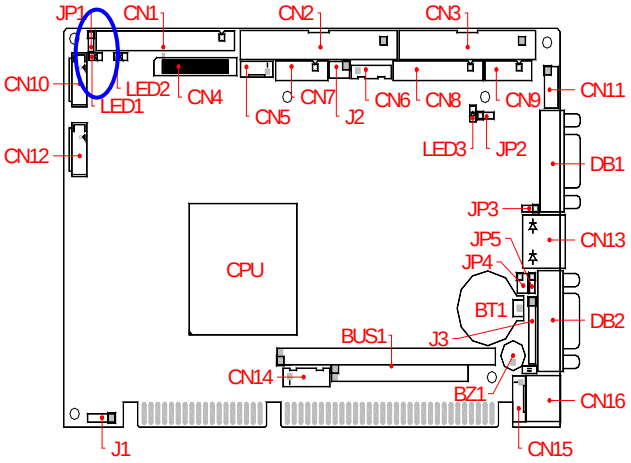
### □ DIMM1: So-DIMM Socket (For FB2505A)

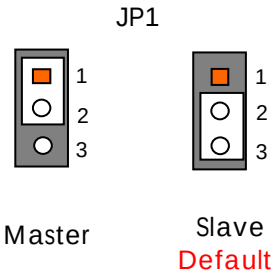
The DIMM1 socket on the solder side accepts 128MB to 1GB of DDR RAM modules




### □ CN17 & JP1: Compact Flash Socket and Master/Slave Select

The Compact Flash socket CN17 (on the solder side) is optional and supports 3.3V Compact Flash and Micro Drives. JP1 is used to select master/slave device of this socket. Be sure to ward off the same master/slave setting with which connects to IDE (CN2) connector, if you use CN17 and CN2 simultaneously.

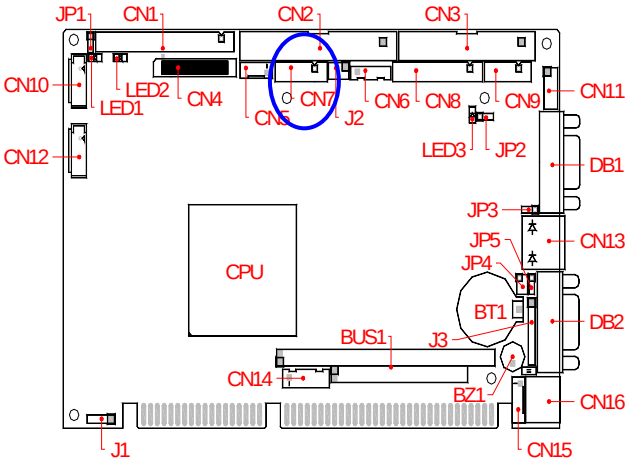


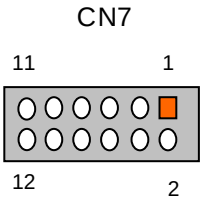




**Note**: The Compact Flash socket supports 3.3V Compact Flash and Micro Drives. The JP1 is used to select master/slave device of this socket and the default is slave (close). Be sure not to set master/slave to the same IDE connector, if you use CF and IDE hard disk simultaneously.

### □ CN7: Audio Connector (For FB2505A)

CN7 is a 12-pin 2.0mm IDC connector with AC97 signals for Audio I/O. Use the included Audio cable and FB4641x adapter board for your Audio applications.

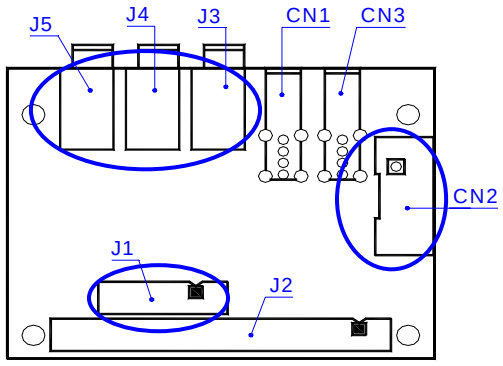


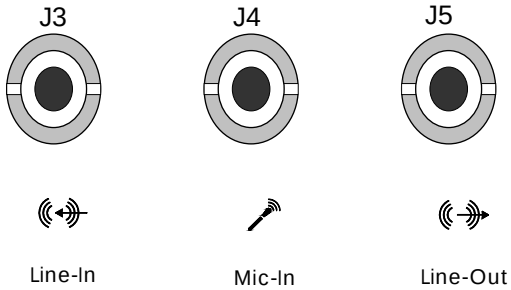




| CN7 | Description | CN7 | Description |
|---|---|---|---|
| 1 | BITCLK | 2 | N.C |
| 3 | +5V | 4 | SYNC |
| 5 | Ground | 6 | Ground |
| 7 | +3.3V | 8 | ACRST# |
| 9 | SDOUT | 10 | SPKR |
| 11 | SDIN | 12 | SDIN2 |

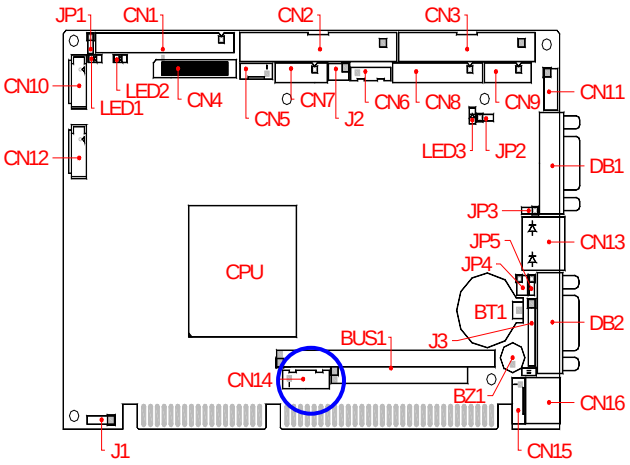
### ➢ FB4641x: Provides Audio and USB Board

The J3, J4, and J5 connectors on FB4641x are 2-way Line-In, mono Microphone input, and 2-way Lineout respectively. You can connect J1, CN2 cable from FB2505A CN7, CN11. The following figure shows these Audio connectors on FB4641x board:

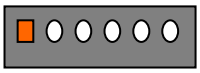


### □ CN14: Power Connector (6-pin 2.5mm JST)




CN14



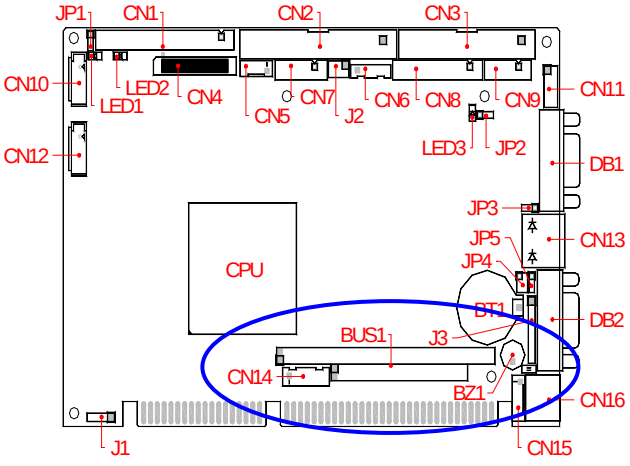
1 6

| CN14 | Signal |
|---|---|
| 1 | Ground |
| 2 | +5V |
| 3 | +5V |
| 4 | Ground |
| 5 | Ground |
| 6 | +12V |

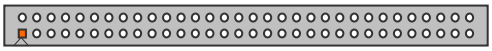
**Note**: FB2505 needs +5V only, +12V is not necessary.

**Note**: Be careful with the pin orientation when installing power connector. A wrong connection can easily destroy your FB2505 board.

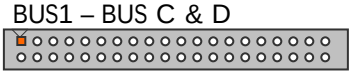
### □ BUS1: PC/104 Bus Connectors




BUS1 – BUS A & B



BUS1 – BUS C & D



**PC/104 A & B Pin**

| A | Signal | A | Signal | B | Signal | B | Signal |
|---|---|---|---|---|---|---|---|
| A1 | -IOCHK | A17 | SA14 | B1 | Ground | B17 | -- |
| A2 | SD7 | A18 | SA13 | B2 | RSTDRV | B18 | -- |
| A3 | SD6 | A19 | SA12 | B3 | +5V | B19 | -Refresh |
| A4 | SD5 | A20 | SA11 | B4 | IRQ9 | B20 | BUSCLK |
| A5 | SD4 | A21 | SA10 | B5 | -- | B21 | IRQ7 |
| A6 | SD3 | A22 | SA9 | B6 | -- | B22 | IRQ6 |
| A7 | SD2 | A23 | SA8 | B7 | -- | B23 | IRQ5 |
| A8 | SD1 | A24 | SA7 | B8 | -ZWS | B24 | IRQ4 |
| A9 | SD0 | A25 | SA6 | B9 | +12V | B25 | IRQ3 |
| A10 | IORDY | A26 | SA5 | B10 | KEY | B26 | -- |
| A11 | AEN | A27 | SA4 | B11 | -SMEMW | B27 | TC |
| A12 | SA19 | A28 | SA3 | B12 | -SMEMR | B28 | ALE |
| A13 | SA18 | A29 | SA2 | B13 | -IOW | B29 | +5V |
| A14 | SA17 | A30 | SA1 | B14 | -IOR | B30 | OSC |
| A15 | SA16 | A31 | SA0 | B15 | -- | B31 | Ground |
| A16 | SA15 | A32 | Ground | B16 | -- | B32 | Ground |

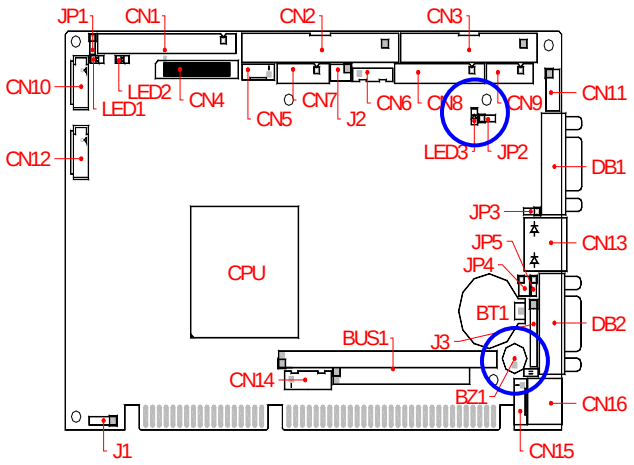
**PC/104 C& D Pin**

| C | Signal | C | Signal | D | Signal | D | Signal |
|---|---|---|---|---|---|---|---|
| C1 | GND | C11 | MEMW# | D1 | Ground | D11 | -- |
| C2 | SBHE | C12 | SD8 | D2 | MEMCS16# | D12 | -- |
| C3 | LA23 | C13 | SD9 | D3 | IOCS16# | D13 | -- |
| C4 | LA22 | C24 | SD10 | D4 | IRQ10 | D14 | -- |
| C5 | LA21 | C25 | SD11 | D5 | IRQ11 | D15 | -- |
| C6 | LA20 | C26 | SD12 | D6 | IRQ12 | D16 | -- |
| C7 | LA19 | C27 | SD13 | D7 | IRQ15 | D17 | VCC |
| C8 | LA18 | C28 | SD14 | D8 | IRQ14 | D18 | Master# |
| C9 | LA17 | C29 | SD15 | D9 | -- | D19 | GND |
| C10 | MEMR# | C20 | KEY | D10 | -- | D20 | GND |

**Note**: The FB2505 (AMD Geode Architecture) does not support ISA-DMA mode. The PC/104 ISA can't automatically get accessed to I/O Port resource, if you add on the PC-104 I/O card or memory map card to FB2505.

You can refer to Chapter 5 Technical Reference "How to configure I/O port resource" for setting up the I/O and Memory resource manual.

## □ BZ1 & LED3: On-Board Buzzer & On-Board Power LED



# Chapter 3 Installing CRT & LCD Display

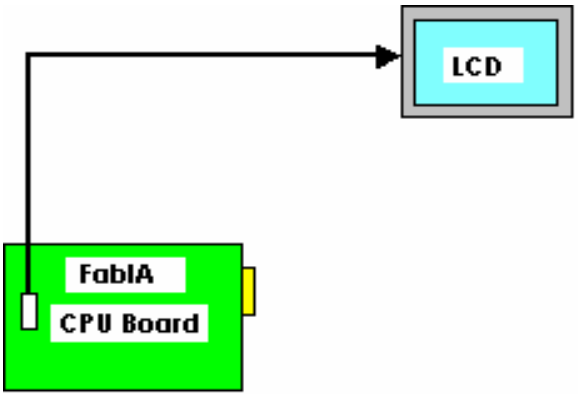
This chapter describes the configuration and installation procedure of LCD and CRT displays. Both CRT and LCD displays may be used at the same time. However, each type of LCD requires different BIOS. This section describes the configuration and installation procedure using LCD display. Skip this section if you are using CRT monitor only.

- LCD Flat Panel Display (FB2505A)
- CRT & LCD Display

## LCD FLAT PANEL DISPLAY

Using the BIOS setting for different types of LCD pane, then set your system properly and configures BIOS setting for the right type of LCD panel you are using.

The following shows the block diagram of using FB2505A for LCD display.



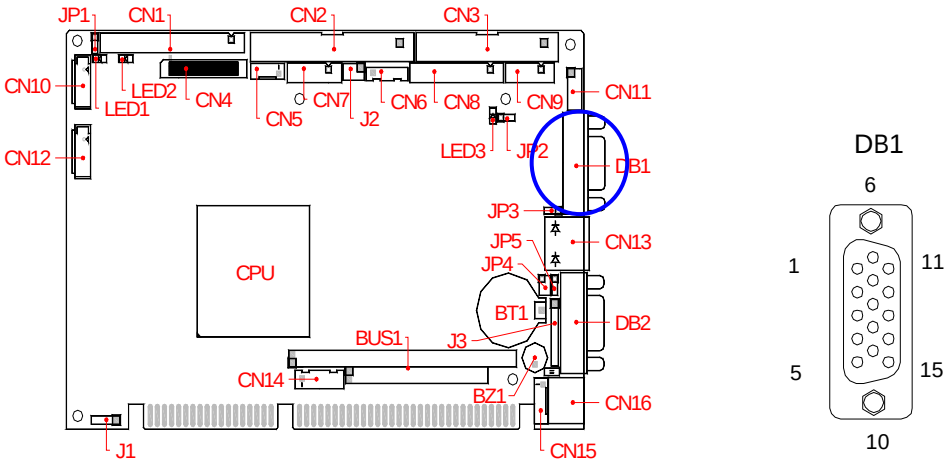

**LCD Panel Block Diagram**

The diagram shows that FB2505A needs components to be linked with a LCD panel.

**NOTE:** Be careful with the pin orientation when installing connectors and the cables. A wrong connection can easily destroy your LCD panel. The pin 1 of the cable connectors is indicated with a sticker and the pin1 of the ribbon cable usually has a different color.

## CRT Display (DB1)

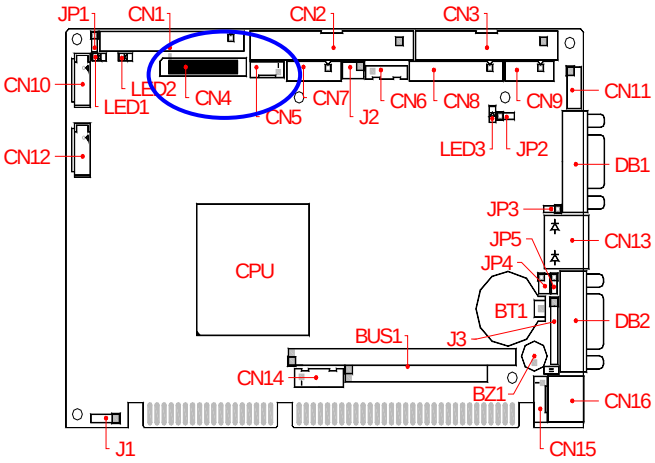
The FB2505 supports a CRT colored monitor. It can be connected to create a compact video solution for the industrial environment. 254MB simulated VRAM allows a maximum CRT resolution of 1920X1440 with 32 bpp at 85Hz.

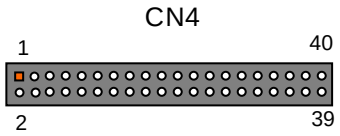


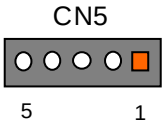

| DB1 | Signal | DB-15 | DB1 | Signal | DB15 |
|---|---|---|---|---|---|
| 1 | RED | 1 | 2 | Case Ground | Case |
| 3 | GREEN | 2 | 4 | Digital Ground | 5,10 |
| 5 | BLUE | 3 | 6 | Analog Ground | 6,7,8 |
| 7 | VSYNC | 14 | 8 | DDC Data | 12 |
| 9 | HSYNC | 13 | 10 | DDC Clock | 15 |

## □ CN4: LCD Connector (For FB2505A)

CN4 is a 24-bit LCD interface connector and CN5 is the power connector for inverter board. The pin assignments are listed in the following table.




| CN4 | Signal | CN4 | Signal |
|---|---|---|---|
| 1 | +5V | 2 | +5V |
| 3 | Ground | 4 | Ground |
| 5 | +3.3V | 6 | +3.3V |
| 7 | NC | 8 | Ground |
| 9 | FP0 | 10 | FP1 |
| 11 | FP2 | 12 | FP3 |
| 13 | FP4 | 14 | FP5 |
| 15 | FP6 | 16 | FP7 |
| 17 | FP8 | 18 | FP9 |
| 19 | FP10 | 20 | FP11 |
| 21 | FP12 | 22 | FP13 |
| 23 | FP14 | 24 | FP15 |
| 25 | FP16 | 26 | FP17 |
| 27 | FP18 | 28 | FP19 |
| 29 | FP20 | 30 | FP21 |
| 31 | FP22 | 32 | FP23 |
| 33 | Ground | 34 | Ground |
| 35 | SHFCLK | 36 | FP (VS) |
| 37 | DE | 38 | LP (HS) |
| 39 | ENVDD | 40 | ENAVEE |

| CN5 | Signal |
|---|---|
| 1 | +12 V |
| 2 | GND |
| 3 | ENABLK |
| 4 | N.C |
| 5 | +5 V |

**NOTE:** If any trouble occurs when connecting FB2505A with LCD panels, you could contact technical support division of FabiaTech Corporation.

# Chapter 4 BIOS Setup

This chapter describes the BIOS setup.

## Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, the ISA bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

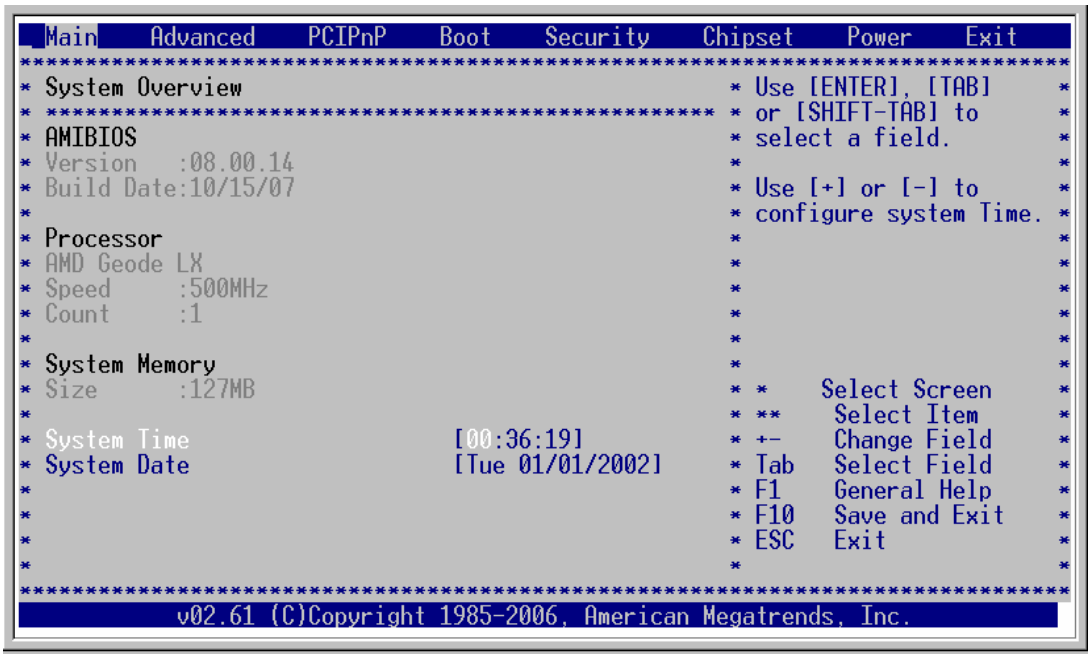
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

Note: Change the parameters when you fully understand their functions and subsequence.




## □ BIOS Functions

On the menu, you can perform the following functions

1. Main
2. Advanced
   - CPU Configuration
   - IDE Configuration
   - Floppy Configuration
   - SuperIO Configuration
   - Hardware Health Configuration
   - USB Configuration
3. PCIPnP
4. Boot
   - Boot Settings Configuration
   - Boot Device Priority
   - Hard Disk Drives
   - Removable Drivers
5. Security
   - Change Supervisor
   - Change User Password
   - Clear User Password
6. Chipset
   - NorthBridge Configuration
   - SouthBridge Configuration
7. Power
8. Exit
   - Save Changes and Exit: Exit system setup after saving the changes.F10 key can be used for this operation.
   - Discard Changes and Exit: Exit system setup without saving any changes. ESC key can be used for this operation.

- Discard Changes: Discard changes down so far any of the set questions. F7 key can be used this operation.
- Load Optimized Default: to auto configure the system according to optimal setting with pre-defined values. This is also the factory default setting of the system when you receive the board.
- Load Fail-Safe Default: to configure the system in fail-safe mode with predefined values.

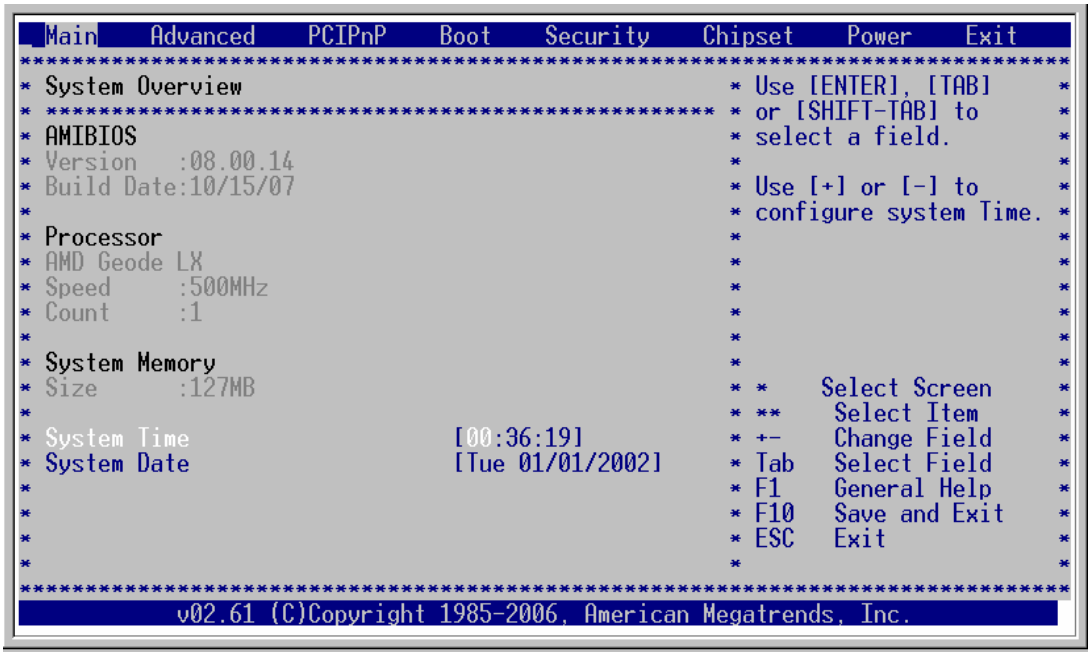
**Keyboard Convention**

On the BIOS, the following keys can be used to operate and manage the menu:

| Item | Function |
|---|---|
| F1 | To display the help menu if you do not know the purpose or function of the item you are going to configure |
| ←→ Right /Left Arrow Keys | Select Screen |
| ↑↓ UP/Down Arrow Keys | Select Item |
| **+ -** | Change Option/Field |
| Enter | Go to SUB Screen |
| PGDN | Next Page |
| PGUP | Previous Page |
| HOME | Go to Top Of Screen |
| END | Go to Bottom Of Screen |
| F2/F3 | Change Colors |
| F7 | Discard Change |
| F8 | Load Fail-Safe Default |
| F9 | Load Optimized Default |
| F10 | Save and exit |
| ESC | To exit the current menu or message |

# Main Setup

This section describes basic system hardware configuration, system clock setup and BIOS version information. If the CPU board is already installed in a working system, you will not need to select this option anymore.




➢ **System Memory**

This option is display-only which is determined by POST (Power On Self Test) of the BIOS.

➢ **System Date & Time Setup**

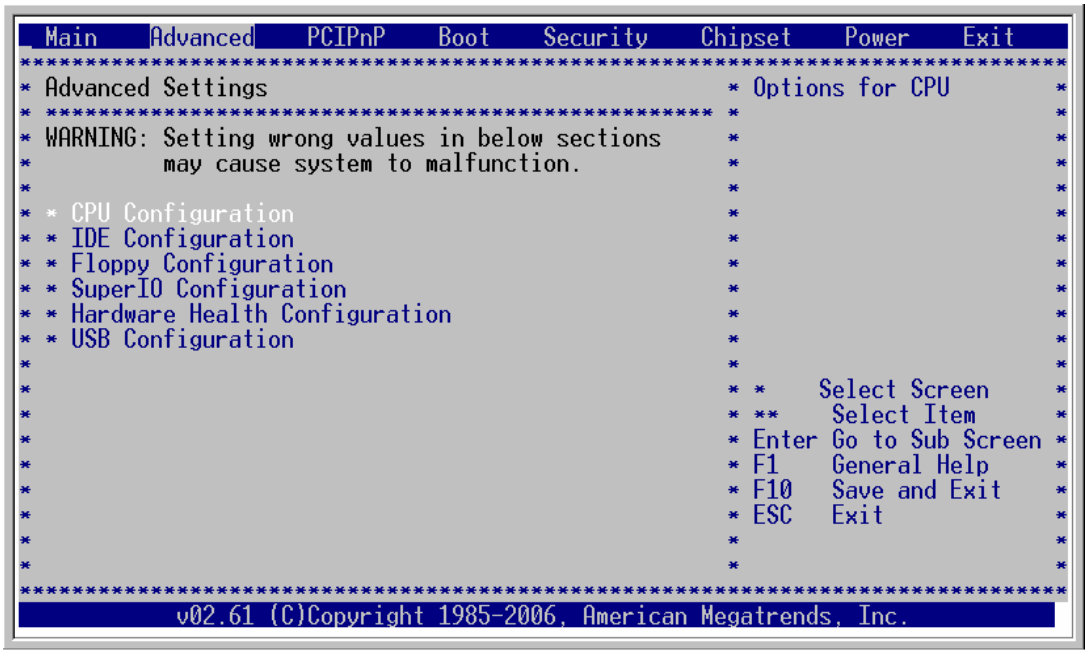
Highlight the <Date> field and then press the [Page Up] / [Page Down] or [+]/ [-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [Page Up] / [Page Down] or [+]/ [-] keys to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

## Advanced Setup

Select the *Advanced* tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages




### ➢ CPU Configuration

You can use this screen to select options for the CPU information. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

**Note:** The CPU Configuration setup screen varies depending on the installed processor.

➢ **IDE Configuration**

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the *IDE Configuration* screen is shown below.

➢ **IDE Primary/Secondary Master/Slave**

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship, which is determined by the cabling configuration used to attach them to the controller. Your system supports one IDE controller – a primary and a secondary – so you have the ability to install up to four separate hard disks.

**Hard Disk Type**

The BIOS supports various types for user settings, The BIOS supports <Pri Master>, <Pri Slave>, so the user can install up to two hard disks. For the master and slave jumpers, please refer to the hard disk's installation descriptions and the hard disk jumper settings. You can select <AUTO> under the <TYPE> and <MODE> fields. This will enable auto detection of your IDE drives during boot up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

**PIO MODE**

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell

the controller what it wants and then let the controller and the CPU perform the complete task by them. This is simpler and more efficient (and faster). Your system supports five modes, numbered from 0 to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

**BLOCK Mode**
This option allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).
**S.M.A.R.T**

This field is used to activate the S.M.A.R.T (System Management and Reporting Technologies) function for S.M.A.R.T HDD drives. This function requires an application that can give S.M.A.R.T message.

- **Hard Disk Write Protect**

Set this option to protect the hard disk drive from being overwritten. The Optimal and Fail-Safe default setting is *Disabled*.

**Available Options:** Disabled, Enabled

**Default setting:** Disable

- **IDE Detect Time Out (Sec.)**

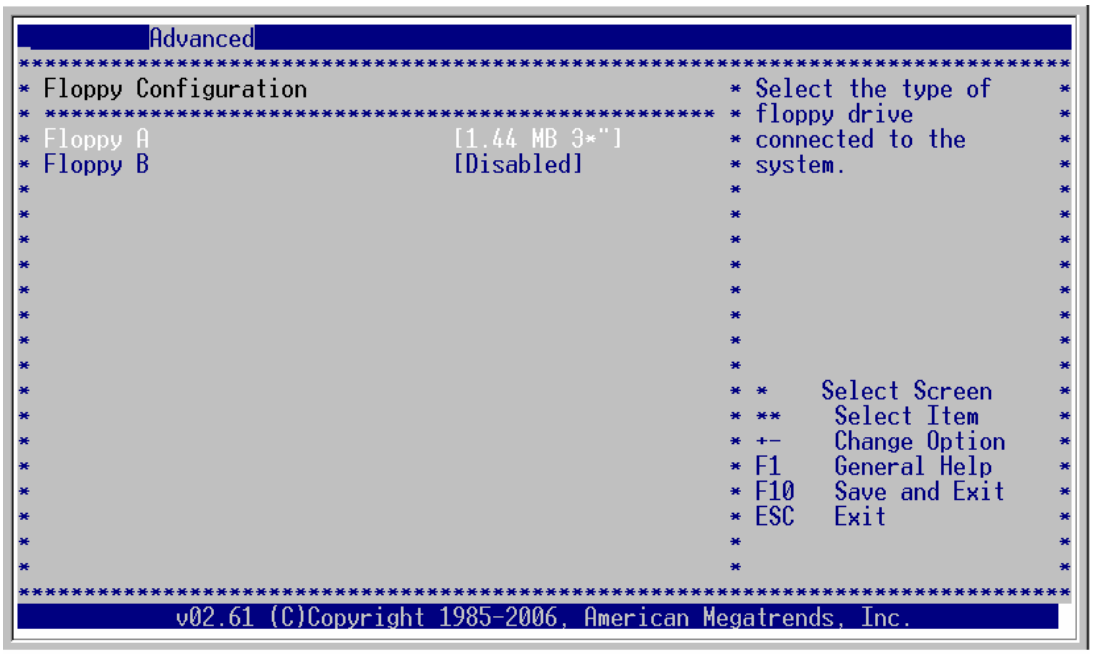
Set this option to stop the AMIBIOS from searching for IDE devices within the specified number of seconds. Basically, this allows you to fine-tune the settings to allow for faster boot times. Adjust this setting until a suitable timing that can detect all IDE disk drives attached is found.

**Available Options:** 0, 5,10, 15, 20, 25, 30, and 35

**Default setting:** 35

### ➢ Floppy Configuration

You can use this screen to specify options for the Floppy Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.




### ➢ Floppy A,B

Move the cursor to these fields via up and down <arrow> keys. Select the floppy type. The Optimal setting for floppy drive A: is *1.44 MB 3½".* The Fail-Safe setting for floppy drive A: is *1.44 MB 3½".* The Optimal setting for floppy drive B: is *Disabled.* The Fail-Safe setting for floppy drive B: is *Disabled*

### ➢ Floppy Drive Seek

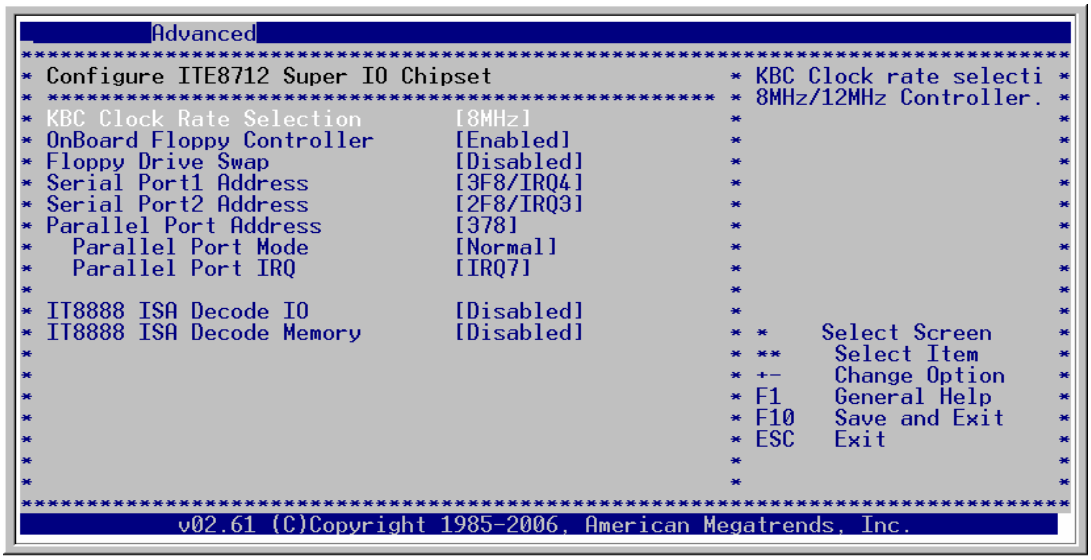
This field is used to set if the BIOS will seek the floppy <A> drive upon boot.

**Available Options:** Disabled, Enabled

**Default setting:** Disabled

➢ **SuperIO Configuration**

This section describes the function of Super I/O settings.




➢ **KBC Clock Rate Selection**

This field is select KBC Clock rate 8MHz or 12MHz Controller on the FB2505.

**Available Options:** Disabled, Enabled and Auto

Default setting: Auto

➢ **OnBoard Floppy Controller**

This field enables the floppy drive controller on the FB2505.

**Available Options:** Disabled, Enabled and Auto

**Default setting:** Auto

➢ **Floppy Drive Swap**

The field reverses the drive letter assignments of your floppy disk drives in the Swap A, B setting, otherwise leave on the default setting of ***Disabled*** (No Swap). This works separately from the BIOS Features floppy disk swap feature. It is functionally the same as physically interchanging the connectors of the floppy disk drives. When the function's setting is <***Enabled***>, the BIOS swapped floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A under DOS.

**Available options:** Disabled, Enabled

**Default setting:** Disabled

- **Serial Port 1 Address**

These fields select the I/O port address for each Serial port.

**Available Options:** Disabled, 3F8H/COM1, 3E8H/COM3, and 2E8H/COM4.

**Default setting:** 3F8H/COM1

- **Serial Port 2 Address**

These fields select the I/O port address for each Serial port.

**Available Options:** Disabled, 2F8H/COM2, 3E8H/COM3, and 2E8H/COM4.

**Default setting:** 2F8H/COM2

- **Parallel Port Address**

This field selects the I/O port address for parallel port.

**Available Options:** Disabled, 378, 278, and 3BCH

**Default setting:** 378

- **Parallel Port Mode**

This field specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE P1284 specifications.

**Available Options:** Normal, Bi-Dir, ECP, EPP, and ECP+EPP

**Default setting:** Normal

- **Parallel Port IRQ**

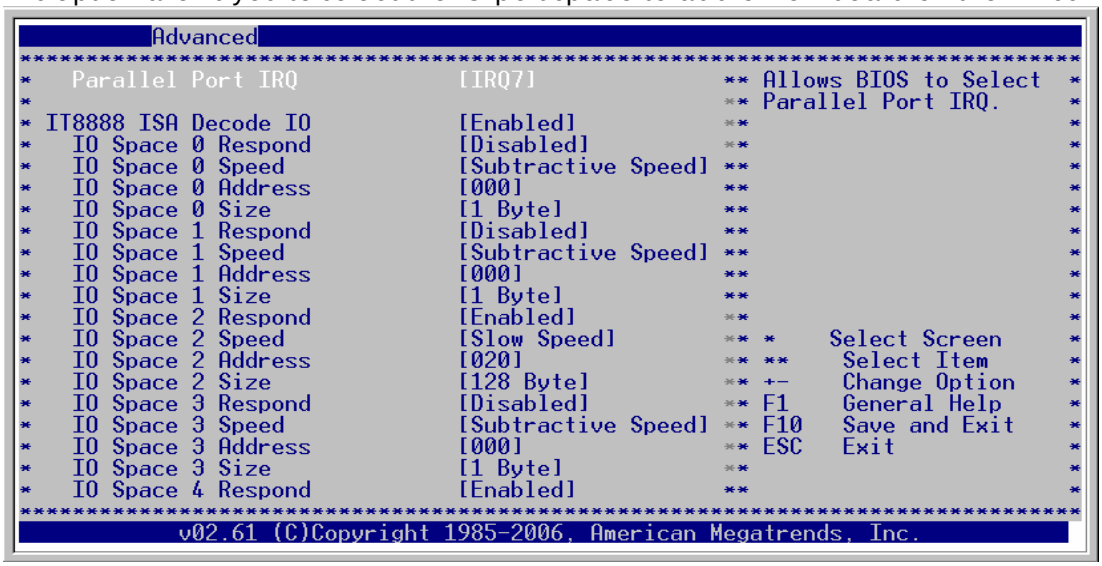
This field specifies the IRQ for the parallel port.

**Available Options:** IRQ5 and IRQ7

**Default setting:** IRQ7

➢ **ITE8888 ISA Decode IO**

This option allows you to select the IO port space to add on ISA board on the FB2602.




➢ **Decode I/O Space 0~4**

These fields are used for the enable configuration and the positive decode IO Space.

**Available Options:** Disabled and Enable

**Default setting:** Disable

➢ **Decode I/O Speed 0~4**

This field is used for the decoding speed for IO Space.

**Available Options:** Subtractive Speed, Medium Speed, Slow Speed and Fast Speed.

**Default setting:** Subtractive Speed

➢ **Decode I/O Addr. 0~4 [15:4]**

These fields is used for the configuration IO Space

**Available Options:** Min= (001) ~Max (FFF)

**Default setting:** (001)

➢ **Decode I/O Size 0~4**

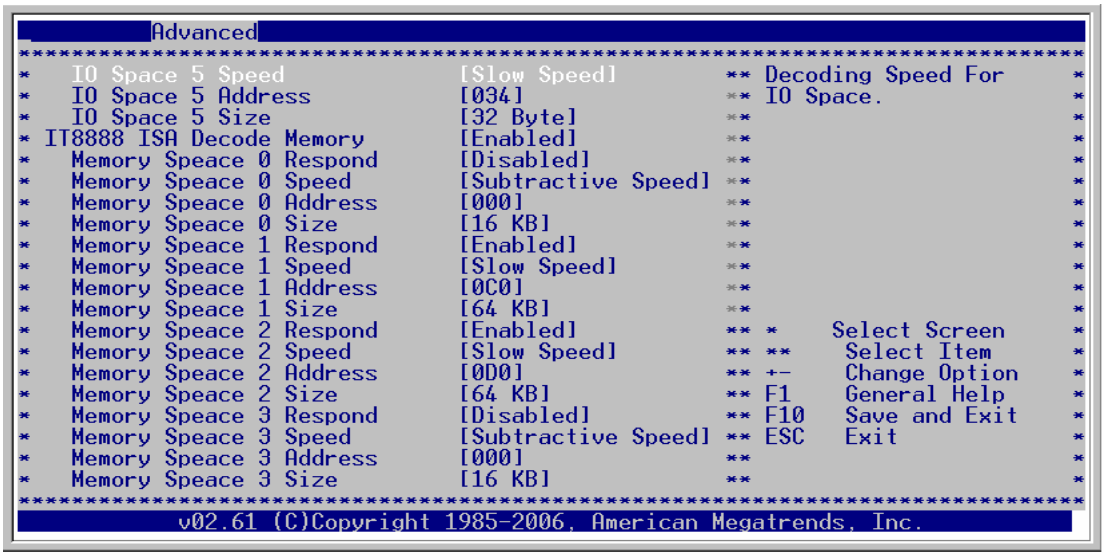
This field is used for the configuration IO Space size.

**Available Options:** 1 Bytes, 2 Bytes, 4 Bytes, 8 Bytes, 16 Bytes, 32 Bytes, 64 Bytes and 128Byte.,

Default setting: 1 Bytes

➢ **ITE8888 ISA Decode Memory**

This option allows your to select the Memory space to add on ISA board on the FB2602.




➢ **Decode Memory Space 0~4**

These fields are used for the enable configuration and the positive decode Memory Space.

**Available Options:** Disabled and Enable

**Default setting:** Disable

➢ **Decode Memory Speed 0~4**

This field is used for the decoding speed for memory Space.

**Available Options:** Subtractive Speed, Medium Speed, Slow Speed and Fast Speed.

**Default setting:** Subtractive Speed

➢ **Decode Memory Addr. 0~4 [23:12]**

These fields are used for the configuration Memory Space.

**Available Options:** Min= (001) ~Max (FFF)

**Default setting:** (001)

➢ **Decode Memory Size 0~4**

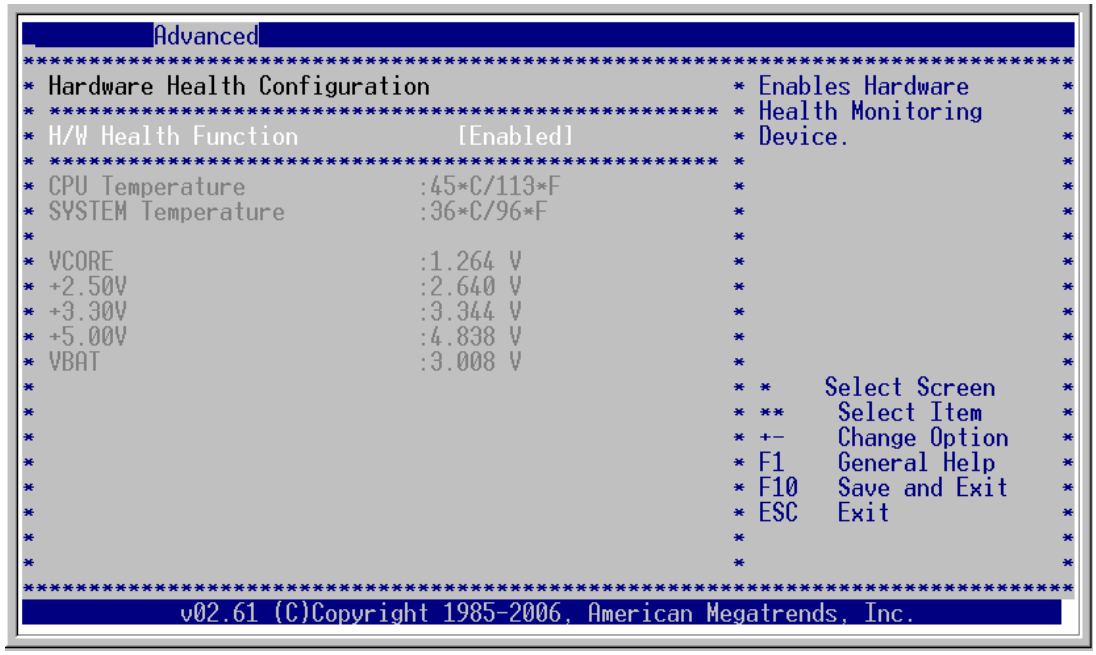
This field is used for the configuration memory Space size.

**Available Options:** 16 KB, 32 KB, 64 KB, 128 KB, 256 KB, 512 KB,1 MB and 2 MB

Default setting: 16 KB

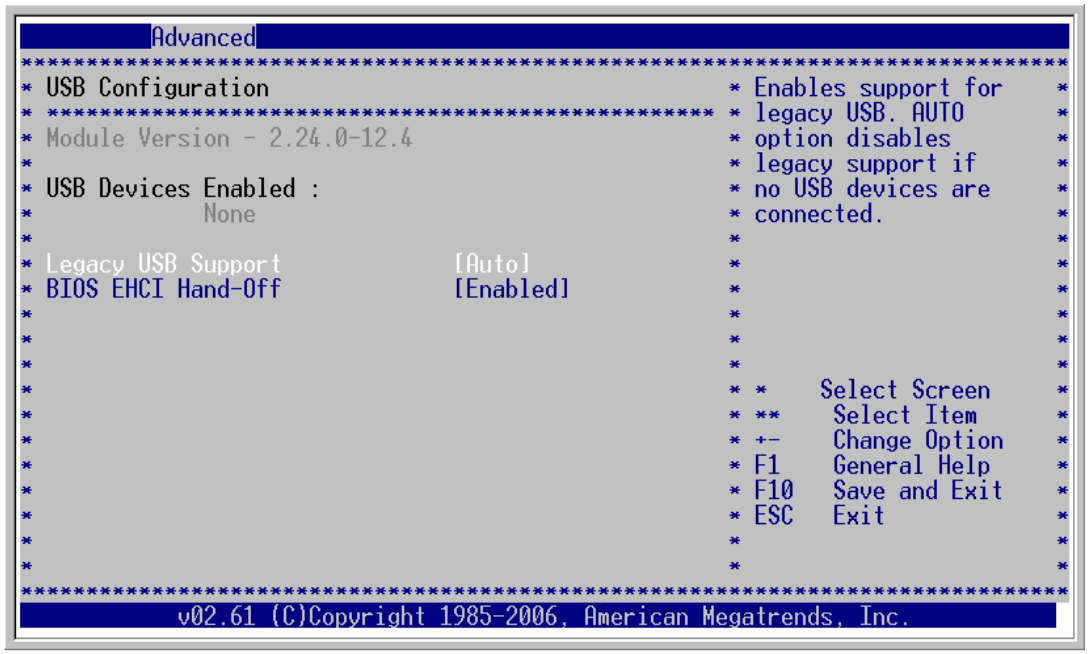
➢ **Hardware Health Configuration**

On the Hardware Monitor Setup screen, you can monitor the system temperature, and CPU voltage…




➢ **USB Configuration**

You can use this screen to select options for the USB Configuration.



- **USB Function**

Select Enable, if a USB device is installed to the system. If Disabled are selected, the system will not be able to use a USB device.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

- **Legacy USB Support**

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

- **BIOS ECHI Hand-Off**

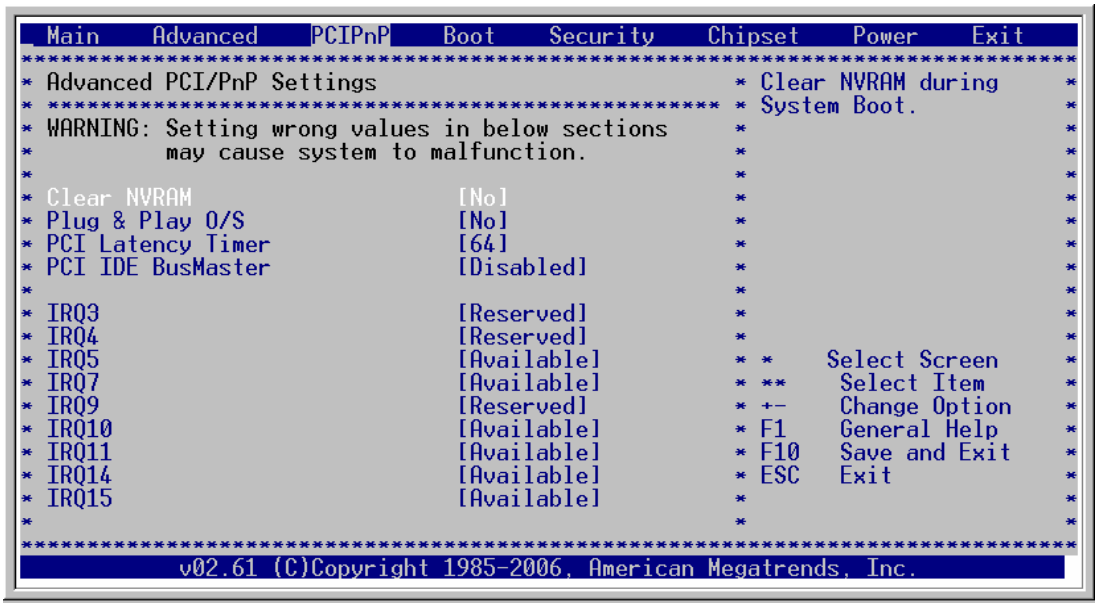
This is a workaround for OS without ECHI Hand-Off support. The ECHI ownership change should claim by ECHI driver.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

## PCIPnP Setup

Select the *PCI/PnP* tab from the setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.




➢ **Plug and Plug Aware O/S**

Set to Yes to inform BIOS that the operating system can handle Plug and Play (PnP) devices.

**Available Options:** Yes, No

**Default setting:** No

➢ **PCI Latency Timer**

This field specifies the latency timings (in PCI clock) PCI devices installed in the PCI expansion bus.

**Available Options:** 32, 64, 96, 128, 160,192, 224, and 248

**Default setting:** 64

➢ **PCI IDE BusMaster**

This option is to specify that the IDE controller on the PCI local bus have bus-mastering capability.

**Available Options:** Enable, Disable

**Default setting:** Disable

- **IRQ 3 –15**

When I/O resources are controlled manually, you can assign each system interrupt as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

- **DMA Channel 0 – 7**

When I/O resources are controlled manually, you can assign each system DMA as one of the following types, based on the type of device using the interrupt:

ISA/EISA devices comply with the original PC AT bus specification, requiring a specific interrupt (Such as IRQ5 for COM1).

PnP (PCI/ISA) devices: comply with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

**Available Options:** PnP, ISA/EISA

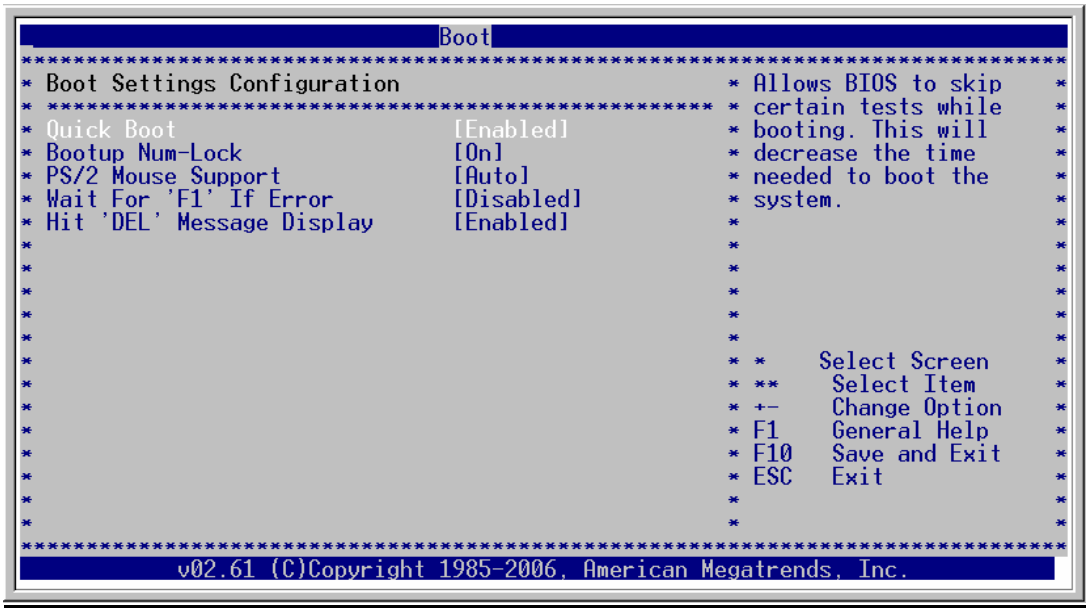
**Default setting:** PnP

## Boot Setup

Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section. Select an item on the Boot Setup screen to access the sub menu for:

- BIOS Setting Configuration
- Boot Device Priority
- Hard disk drives
- Removable Devices•

➢ **Boot Setting Configuration**




➢ **Quick Boot**

This field is used to activate the quick boot function of the system. When set to Enabled,

1. BIOS will not wait for up to 40 seconds if a Ready signal is not received from the IDE drive, and will not configure its drive.

2. BIOS will not wait for 0.5 seconds after sending a RESET signal to the IDE drive.

3. You cannot run BIOS Setup at system boot since there is no delay for the Hit, Del. To run Setup message.

**Available Options:** Disabled, Enabled

**Default setting:** Enabled

- **Boot Up Num-Lock**

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

**Available options:** On, Off

**Default setting:** On

- **PS/2 Mouse Support**

The PS/2 mouse function is optional. Before you configure this field, make sure your FB2602 supports this feature. The setting of ***Enabled*** allows the system to detect a PS/2 mouse on boot up. If detected, IRQ12 will be used for the PS/2 mouse. IRQ 12 will be reserved for expansion cards if a PS/2 mouse is not detected. ***Disabled*** will reserve IRQ12 for expansion cards and therefore the PS/2 mouse will not function.

**Available options:** Disabled, Enabled and Auto

**Default setting:** Auto

- **Wait for 'F1' If Error**

AMIBIOS POST error messages are followed by:

```
Press <F1> to continue
```

If this field is set to ***Disabled***, the AMIBIOS does not wait for you to press the <F1> key after an error message.

- **Hit 'DEL' Message Display**

Set this field to ***Disabled*** to prevent the message as follows:

```
Hit 'DEL' if you want to run setup
```

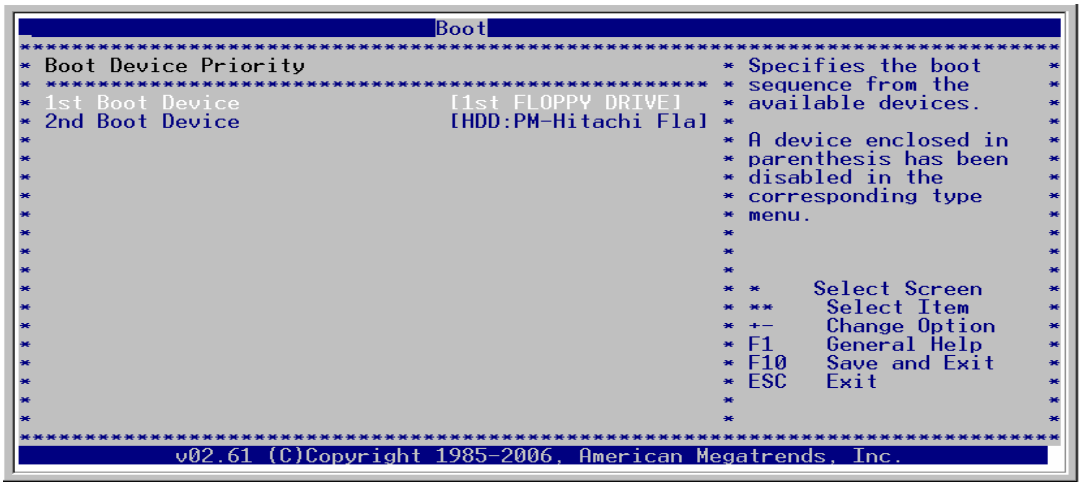
It will prevent the message from appearing on the first BIOS screen when the computer boots.

**Available options:** Disabled, Enabled

**Default setting:** Enabled

### ➢ Boot Device

Use this screen to specify the order in which the system checks for the device to boot from. To access this screen, select Boot Device Priority on the Boot Setup screen and press <Enter>.



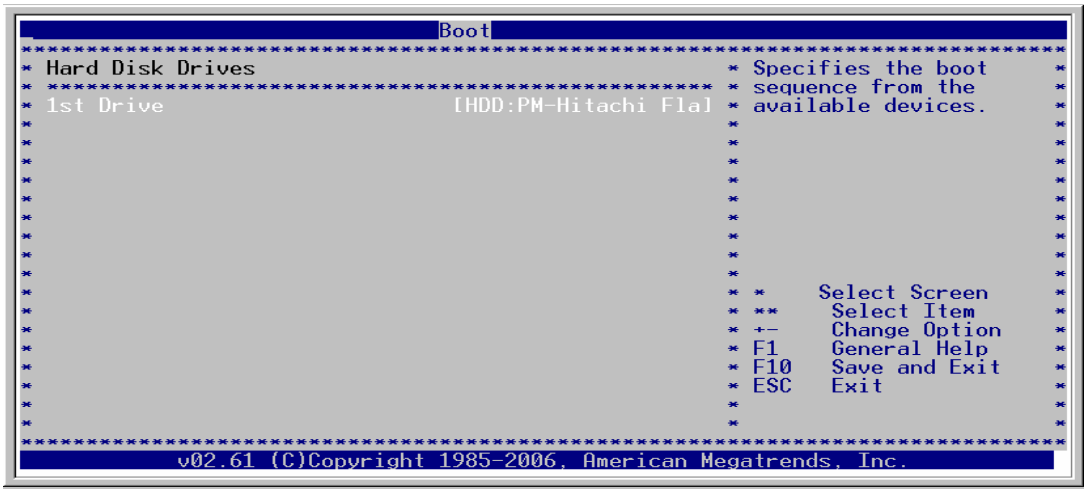

### ➢ First /Second /Third Hard Disk Boot Device

Set the boot device options to determine the sequence in which the computer checks which device to boot from. The settings are *Removable Dev., Hard Drive, or ATAPI CDROM.*

**Note:** When you select a boot category from the boot menu, a list of devices in that category appears. For example, if the system has three hard disk drives connected, then the list will show all three hard disk drives attached

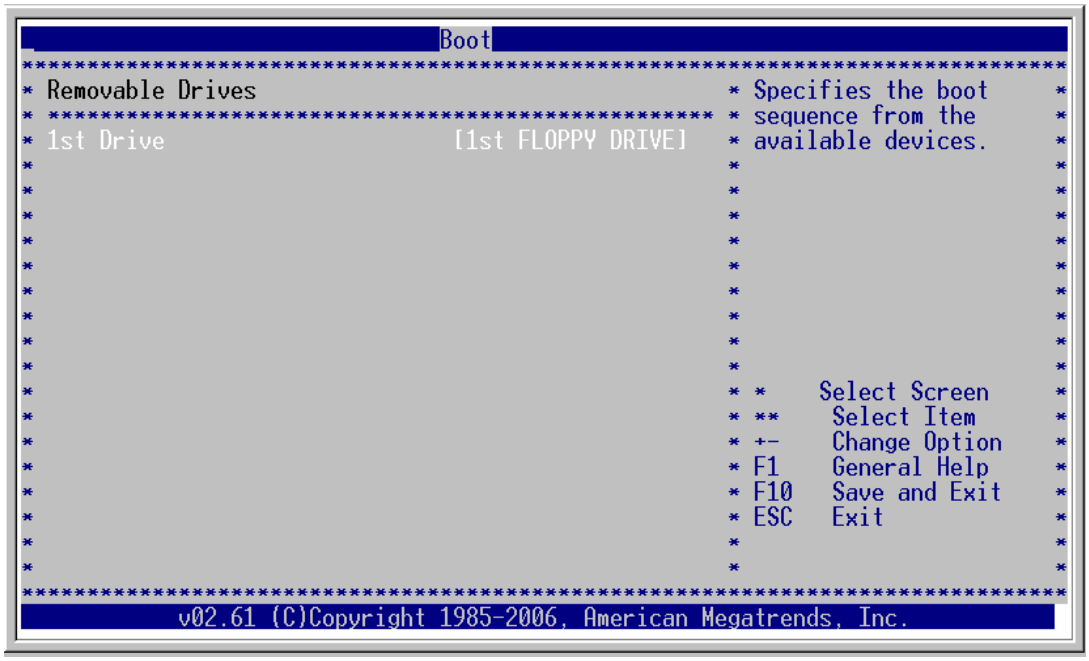
### ➢ Hard Disk Drives

Use this screen to view the hard disk drives in the system. To access this screen, select Hard disk drives on the Boot Setup screen and press <Enter>.



➢ **Removable Drives**

Use this screen to view the removable drives attached to the system. To access this screen, select Removable Devices on the Boot Setup screen and press <Enter>.



## Security setup

There are two security passwords: Supervisor and User. Supervisor is a privileged person that can change the User password from the BIOS. According to the default setting, both access passwords are not set up and are only valid after you set the password from the BIOS.

- Change Supervisor Password
- Change User Password
- Clear User Password

To set the password, please complete the following steps.

1. Select **Change Supervisor Password.**

2. Type the desired password (up to 6 character length) when you see the message, “Enter New Supervisor Password.”

3. Then you can go on to set a user password (up to 6 character length) if required. Note that you cannot configure the User password until the Supervisor password is set up.

4. Enter Advanced BIOS Features screen and point to the Security Option field.

5. Select System or Setup.

✧ **Aways:** a visitor who attempts to enter BIOS or operating system will be prompted for password.

✧ **Setup:** a visitor who attempts to the operating system will be prompted for user password. You can enter either User password or Supervisor password.

6. Point to **Save Settings and Exit** and press Enter.

7. Press Y when you see the message, "Save Current Settings and Exit (Y/N)?"

Note: it is suggested that you write down the password in a safe place to avoid that password may be forgotten or missing.

➢ **Clean User Password**

Select Clear User Password from the Security Setup menu and press <Enter>. Clear New Password > [Ok] [Cancel] appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>.

✧ **Password Check**

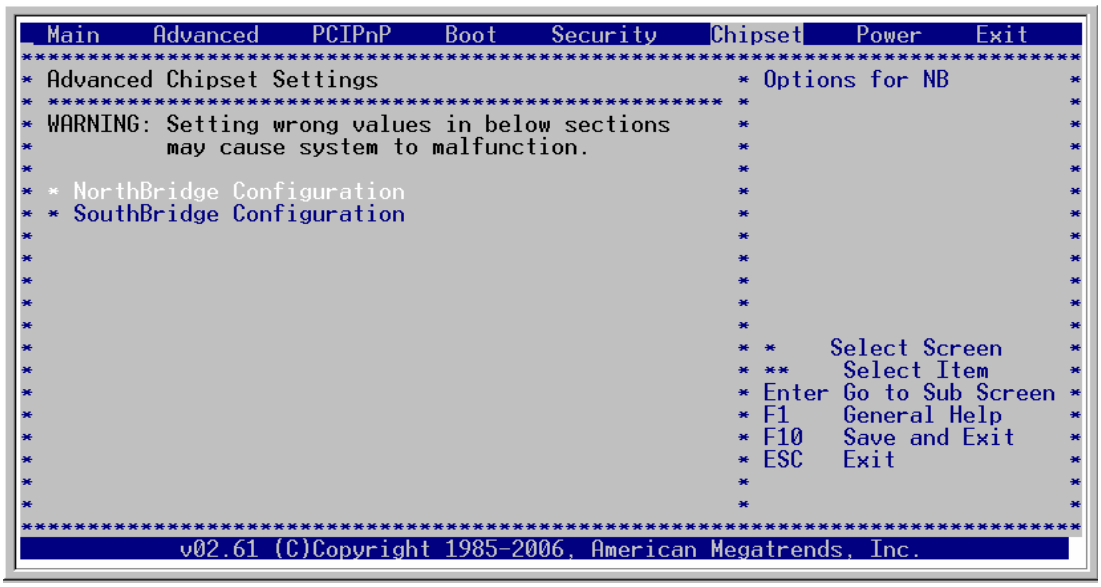
This field enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If ***Always*** is chosen, a user password prompt appears every time and the BIOS Setup Program executes and the computer is turned on. If ***Setup*** is chosen, the password prompt appears if the BIOS executed.

**Available options:** Setup, Always

**Default setting:** Setup

# Chipset Setup

This section describes the configuration of the board's chipset features.
- NorthBridge Configuration
- SouthBridge Configuration




➢ **Northbridge Configuration**

You can use this screen to select options for the North Bridge Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.

➢ **Configure SDRAM Timing by SPD**

SPD represents Serial Presence Detect. It is an 8-bit, 2048 bits EEPROM, built on the SDRAM for 100 MHz frequencies. If the installed SDRAM supports SPD function, select SPD. If not, you can select based on other access time of the SDRAM.

**Available Options:** Disabled, Enabled

**Default setting:** Enable

➢ **Internal Graphics Memory**

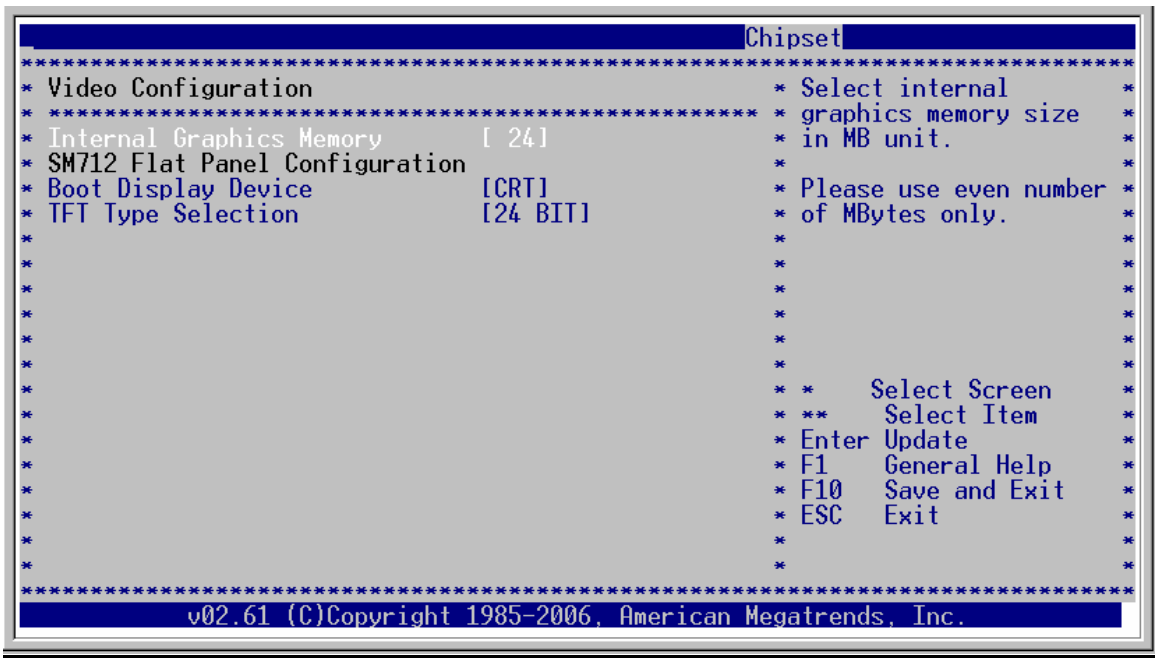
This field is share memory architecture (SMA) for frame buffer memory. SMA allows system memory to be efficiently share by the host CPU and allocated depending on user preference, application requirements, and total size of system memory.

**Available Options:** Disable, 1~ 254MB

**Default setting:** 24MB

➢ **SMI712 Flat Panel Configuration**

This field item is for FB2505A, when using the LCD the field specifies the selections of display for different TFT LCD display type.




***Boot Display Device***

This field specifies which VGA display will be used when the system is boot. You can select either the LCD or the CRT booting on the VGA.

**Available Options:** Both, LCD, and CRT

**Default setting:** CRT

**Data Bus Type**

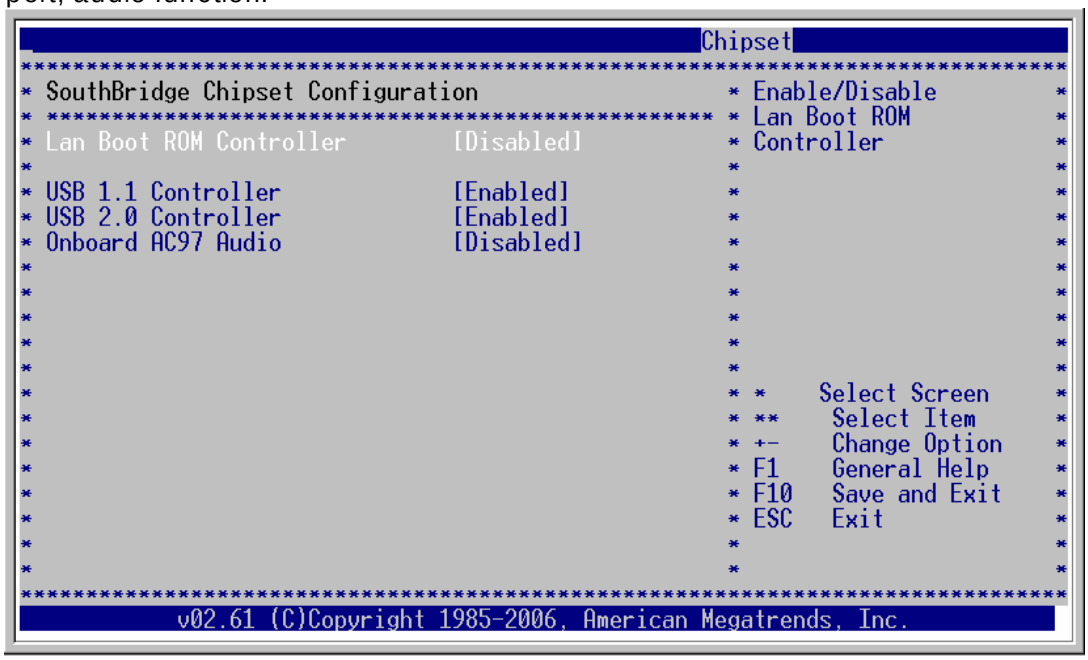
This field specifies the Data Bus width and data type

**Available Options:** 9 BIT,12 BIT,18 BIT, and 24 bit

**Default setting:** 24 BIT

➢ **Southbridge Configuration**

You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the basic I/O functions, LAN port, audio function.




➢ **Lan Boot ROM Controller**

This field specifies the PXE boot ROM of the onboard LAN chip.

**Available Options:** Disabled, Enable

**Default setting:** Disable

➢ **USB 2.0/USB 1.1 Controller**

This field is configures the USB 2.0 controller in High speed (480Mbps) or USB 1.1 controller in Full speed (12Mbps).

**Available Options:** Disabled, Enable

**Default setting:** Enable

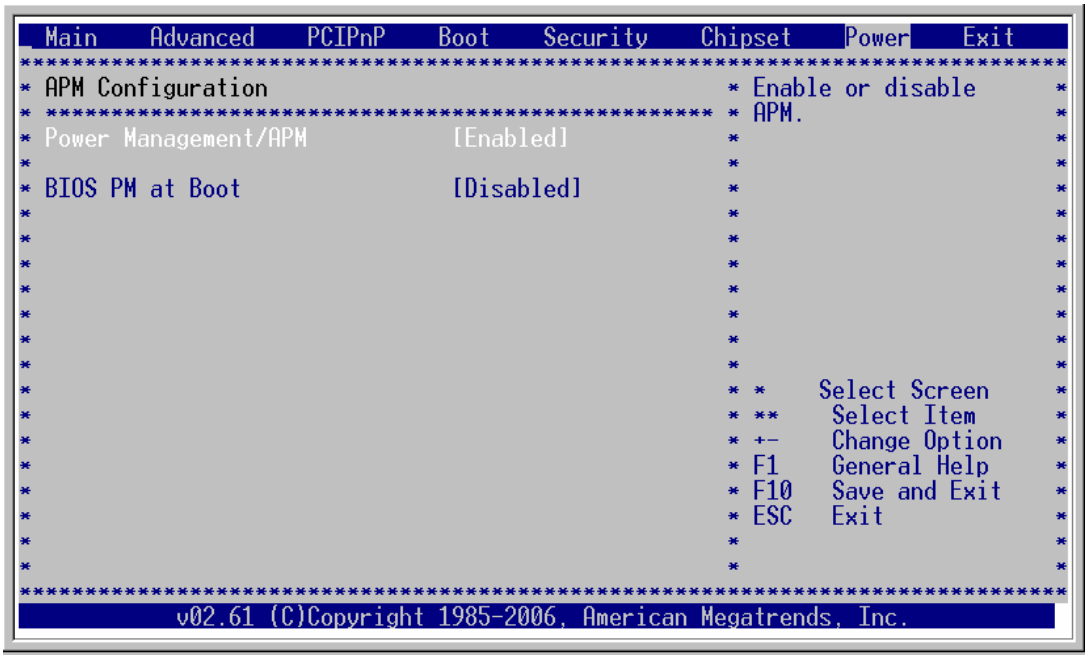
➢ **Onboard AC'97 Audio**

This field specifies the internal Audio Control.

**Available Options:** Disable, Enable

**Default setting:** Disable

## Power Management




➢ **Power Management/APM**

Select Enabled to activate the chipset Power Management and APM (Advanced Power Management) features.

**Available Options:** Disable, and Enable

**Default setting:** Enable

➢ **BIOS PM at Boot**

BIOS will turn on Legacy PM booting the OS.

**Available Options:** Disable, and Enable

**Default setting:** Disable

➢ **Standby Time Out (Minute)**

This field specifies the length of a period of system inactivity (like hard disk or video) while in full power on state. When this length of time expires, the system enters Standby power state.

**Available Options:** Disabled, 1 Minute, 2 Minute, 4 Minute, and 8 Minute, up to 60 Minute.

**Default setting:** Disabled

# Chapter 5 Driver and Utility

The enclosed diskette includes FB2505 VGA, AUDIO, AES, LAN driver and PCI to ISA bridge driver. To install and configure you FB2505 system, you need to perform the following steps.

## VGA Drivers

- **WINDOWS XP Driver**

1 To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA> Geode_LX >WINXP. If your system is not equipped with a CD ROM device, copy the VGA driver from the CD ROM to a CF.

2 Open Control Panel. [Start->Settings->Control Panel].

3 Click on System button> Select Hardware >click on Device Manager.

4 Click on Video Controller (VGA Compatible) >Update Driver> Select Specify a location > Browse > Select “IX_win ” file from CF .

5 Click on OK >Next >Yes >Finish

6 In the WINDOWS-XP, you can find the <DISPLAYL> icon located in the {CONTROL PANEL} group.

7 Adjust the <Resolution> and <Color>,

## PCI to ISA Bridge Drivers

- **WINDOWS XP/2000 Driver**

1 To install the PCI To ISA Bridge driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SYSTEM >ITE8888 >WINXP_2K. If your system is not equipped with a CD ROM device, copy the PCI To ISA Bridge driver from the CD ROM to a CF.

2 Open Control Panel. [Start->Setting>Control Panel].

3 Click on System button> Select Hardware >click on Device Manager.

4 Click on Other ISA to PCI bridge >Update Driver> Select Specify a location > Browse > Select “It” file from CF.

5 Click on OK >Next >Yes >Finish

## Audio Drivers

- **WINDOWS XP Driver**

1 To install the Audio driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>CS5536>WINXP. If your system is not equipped with a CD ROM device, copy the Audio driver from the CD ROM to a CF.

2 Open Control Panel. [Start->Settings->Control Panel].

3 Click on System button> Select Hardware >click on Device Manager.

4 Click on Multimedia Audio Controller >Update Driver> Select Specify a location > Browse > Select “lxWDMAu ” file from CF .

5 Click on OK >Next >Yes >Finish

## AES Drivers

- **WINDOWS XP Driver**

1 To install the SysChip driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SysChip>GeodeLX_XP_AES. If your system is not equipped with a CD ROM device, copy the AES driver from the CD ROM to a CF.

2 On the target LX processor computer running Windows XP, open the device manager.

3 Find the question mark on "Entertainment Encryption/Decryption Device" in Other Devices.

4 Pick "Install from a list or specific location" and click next.

Pick "Don't search. I will choose the driver to install." and click next.

Pick "Show All Devices", wait, and pick "Have Disk".

5 It will come back with "Geode LX AES Crypto Driver", click Next.

Click yes to the warning box that comes up.

## LAN Utility & Driver

1 To install the LAN utility OR driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8139C>DIAG. If your system is not equipped with a CD ROM device, copy the LAN driver from the CD ROM to a CF.

2 Execute install.exe file.

**Note**: In the LAN directory, a HELPME.EXE file is included to provide installation information.

## BIOS Flash Utility

In the <UTILITY> directory, there is the FLASH845.EXE file.

Step 1: Use the AFU409.EXE program to update the BIOS setting.

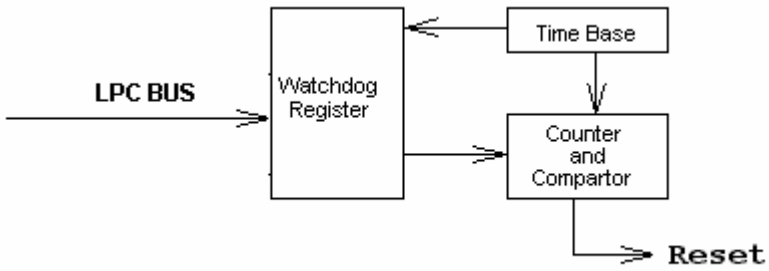
Step 2: And then refer to the chapter "BIOS Setup", as the steps to modify BIOS.

Step 3: Now the CPU board's BIOS loaded with are the newest program; user can use it to modify BIOS function in the future, when the BIOS add some functions.

## Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The FB2505 is equipped with a programmable time-out period watchdog timer. You can use your own program to enable the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 255 seconds or minutes.




The CD –ROM includes a Watch Dog demo file. In the file, there are 3 execution programs written in different forms. The sub-directories of the file are:

1. WATCHDOG/ASSEMBLE: Library and Test Program written in Assembly Language

2. WATCHDOG/TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

**Note**: In the WATCHDOG/ITE8712 directory, README.TXT file is included to provide demo program information.

➢ **Watchdog Timer Setting**

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. LED on the Front side is the watchdog timer indicator. Whenever the watchdog timer is enabled, the LED will blink to indicate that the timer is counting. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 second. The period for the watchdog timer time-out is between 1 to FF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

| Time Factor | Time-Out Period (Seconds) | Time-Out Period (Minutes) |
|---|---|---|
| 1 | 1 | 1 |
| 2 | 2 | 2 |
| 3 | 3 | 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| “ | “ | “ |
| “ | “ | “ |
| “ | “ | “ |
| FF | FF | FF |

➢ **Watchdog Timer Enabled**

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog. The following is a Turbo C++ program, which demonstrates how to enable the watchdog timer and set the time-out period at 6 seconds.

```
#include “stdio.H”
#include “WDLIB.H”

main( )
{
char WD_TIME=ox6;

InitWD(equWdUnitS);
printf (“Enable watchdog”);
//Trigger watchdog Timer Output is 6 seconds
EnWD(WD_TIME);
}
```

➢ **Watchdog Timer Trigger**

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in the next trigger. Below is a Turbo C++ program, which demonstrates how to trigger the watchdog timer:

```
#include “stdio.H”
#include “WDLIB.H”

main( )
{
char WD_TIME=ox6;

InitWD(equWdUnitS);
printf (“Enable watchdog”);
//Trigger watchdog Timer Output is 6 seconds
EnWD(WD_TIME);
}
```

- **Watchdog Timer Disabled**

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
#include “stdio.H”
#include “WDLIB.H”

main( )
  {
  InitWD(equWdUnitS);
  printf (“Disable Watch Dog”);
  //Disable watch dog
  DisWD(WD_TIME);
}
```

# Chapter 6 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Trouble Shooting for Post Beep & Error Messages
- Technical Reference
- How to configuration I/O port resource

## Trouble Shooting for Post Beep and Error Messages

The following information informs the Post Beep & error messages. Please adjust your systems according to the messages below. Make sure all the components and connectors are in proper position and firmly attached. If the errors still exist, please contact with your distributor for maintenance.

➢ **POST BEEP**

Currently there are two kinds of beep codes in BIOS setup.

- One indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps.
- The other indicates that an error has occurred in your DRAM. This beep code consists of a constant single long beep.

➢ **Error Message**

◆ **CMOS BATTERY FAILURE**

When the CMOS battery is out of work or has run out, the user has to replace it with a new battery.

◆ **CMOS CHECKSUM ERROR**

This error informs that the CMOS has corrupted. When the battery runs weak, this situation might happen. Please check the battery and change a new one when necessary.

◆ **DISK BOOT FAILURE**

When you can't find the boot device, insert a system disk into Drive A and press < Enter >. Make sure both the controller and cables are all in proper positions, and also make sure the disk is formatted. Then reboot the system.

◆ **DISKETTE DRIVES OR TYPES MISMATCH ERROR**

When the diskette drive type is different from CMOS, please run setup or configure the drive again.

◆ **ERROR ENCOUNTERED INITIALIZING HARD DRIVE**

When you can't initializes the hard drive, ensure the following things:

1. The adapter is installed correctly
2. All cables are correctly and firmly attached
3. The correct hard drive type is selected in BIOS Setup

◆ **ERROR INITIALIZING HARD DISK CONTROLLER**

When this error occurs, ensure the following things:

1. The cord is exactly installed in the bus.
2. The correct hard drive type is selected in BIOS Setup
3. Whether all of the jumpers are set correctly in the hard drive

◆ **KEYBOARD ERROR OR NO KEYBOARD PRESENT**

When this situation happens, please check keyboard attachment and no keys being pressed during the boot. If you are purposely configuring the system without a keyboard, set the error halt condition in BIOS Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot procedure.

◆ **MEMORY ADDRESS ERROR**

When the memory address indicates error, you can use this location along with the memory map for your system to find and replace the bad memory chips.

◆ **MEMORY SIZE HAS CHANGED**

Memory has been added or removed since last boot. In EISA mode, use Configuration Utility to re-configure the memory configuration. In ISA mode enter BIOS Setup and enter the new memory size in the memory fields.

◆ **MEMORY VERIFYING ERROR**

It indicates an error verifying a value is already written to memory. Use the location along with your system's memory map to locate the bad chip.

◆ **OFFENDING ADDRESS MISSING**

This message is used in connection with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

◆ **REBOOT ERROR**

When this error occurs that requires you to reboot. Press any key and the system will reboot.

◆ **SYSTEM HALTED**

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

# Technical Reference

- **Physical and Environmental**

Temperature: Operating 0°C ~ 60°C

Relative humidity 5 % to 95 % non-condensing

- **Real-Time Clock and Non-Volatile RAM**

The FB2505 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

| Address | Description |
|---|---|
| 00 | Seconds |
| 01 | Second alarm |
| 02 | Minutes |
| 03 | Minute alarm |
| 04 | Hours |
| 05 | Hour alarm |
| 06 | Day of week |
| 07 | Date of month |
| 08 | Month |
| 09 | Year |
| 0A | Status register A |
| 0B | Status register B |
| 0C | Status register C |
| 0D | Status register D |
| 0E | Diagnostic status byte |
| 0F | Shutdown status byte |
| 10 | Diskette drive type byte, drive A and B |
| 11 | Fixed disk type byte, drive C |

| Address | Description |
|---|---|
| 12 | Fixed disk type byte, drive D |
| 13 | Reserved |
| 14 | Equipment byte |
| 15 | Low base memory byte |
| 16 | High base memory byte |
| 17 | Low expansion memory byte |
| 18 | High expansion memory byte |
| 19-2D | Reserved |
| 2E-2F | 2-byte CMOS checksum |
| 30 | Low actual expansion memory byte |
| 31 | High actual expansion memory byte |
| 32 | Date century byte |
| 33 | Information flags (set during power on) |
| 34-7F | Reserved for system BIOS |

- **CMOS RAM Map**

| Register | Description |
|---|---|
| 00h -10h | Standard AT-compatible RTC and Status and Status Register data definitions |
| 11h – 13h | Varies |
| 14h | Equipment<br>Bits 7-6 Number of Floppy Drives<br>00 1 Drive<br>01 2 Drives<br>Bits 5-4 Monitor Type<br>00 Not CGA or MDA 01 40x25 CGA<br>01 2 Drives 80x25 CGA<br>Bits 3 Display Enabled<br>0 Disabled<br>1 Enabled<br>Bit 2 Keyboard Enabled<br>00 Not CGA or MDA 01 40x25 CGA<br>01 2 Drives 80x25 CGA<br>Bit 1 Math Coprocessor Installed<br>0 Absent<br>1 Present<br>Bit 0 Floppy Drive Installed<br>0 Disabled<br>1 Enabled |
| 15h | Base Memory (in 1KB increments), Low Byte |
| 16h | Base Memory (in 1KB increments), High Byte |
| 17h | IBM-compatible memory (in 1KB increments), Low Byte |
| 18h | IBM-compatible memory (in 1KB increments), High Byte (max 15 MB) |
| 19h-2Dh | Vaires |
| 2Eh | Standard CMOS RAM checksum, high byte |
| 2Fh | Standard CMOS RAM checksum, low byte |
| 30h | IBM-compatible Extended Memory, Low Byte (POST) in KB |
| 31h | IBM-compatible Extended Memory, High Byte (POST) in KB |
| 32h | Century Byte |
| 33h | Reserved. Do not use |
| 34h | Reserved. Do not use |
| 35h | Low byte of extended memory (POST) in 64 KB |
| 36h | High byte of extended memory (POST) in 64 KB |
| 37h-3Dh | Varies |
| 3Eh | Extended CMOS Checksum, Low Byte (including 34h-3Dh) |
| 3Fh | Extended CMOS Checksum, High Byte (including 34h-3Dh) |

- **I/O Port Address Map**

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

| Address | Device Description |
|---|---|
| 000h - 01Fh | DMA Controller #1 |
| 020h - 03Fh | Interrupt Controller #1 |
| 040h - 05Fh | Timer |
| 060h - 06Fh | Keyboard Controller |
| 070h - 073h | Real Time Clock, NMI |
| 080h - 09Fh | DMA Page Register |
| 0A0h - 0BFh | Interrupt Controller #2 |
| 0C0h - 0DFh | DMA Controller #2 |
| 0F0h | Clear Math Coprocessor Busy Signal |
| 0F1h | Reset Math Coprocessor |
| 1F0h - 1F7h | IDE Interface |
| 290h – 297h | System Chipset |
| 2E8h – 2EFh | Serial Port #4(COM4) |
| 2F8h - 2FFh | Serial Port #2(COM2) |
| 2B0 - 2DF | Graphics adapter Controller |
| 378h - 3FFh | Parallel Port #1(LPT1) |
| 360 - 36F | Network Ports |
| 3B0 - 3BF | Monochrome & Printer adapter |
| 3C0 - 3CF | EGA adapter |
| 3D0 - 3DF | CGA adapter |
| 3E8h – 3EFh | Serial Port #3(COM3) |
| 3F0h - 3F7h | Floppy Disk Controller |
| 3F8h - 3FFh | Serial Port #1(COM1) |

- **Interrupt Request Lines (IRQ)**

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

| Level | Function |
|---|---|
| IRQ0 | System Timer Output |
| IRQ1 | Keyboard |
| IRQ2 | Interrupt Cascade |
| IRQ3 | Serial Port #2 |
| IRQ4 | Serial Port #1 |
| IRQ5 | USB |
| IRQ6 | Floppy Disk Controller |
| IRQ7 | Parallel Port #1 |
| IRQ8 | Real Time Clock |
| IRQ9 | - Reserved - |
| IRQ10 | Ethernet |
| IRQ11 | - Reserved - |
| IRQ12 | PS2 Mouse |
| IRQ13 | FPU |
| IRQ14 | Primary IDE |
| IRQ15 | Secondary IDE |

➢ **Serial Ports**

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. Also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

| DLAB | Port Address | Register |
|---|---|---|
| 0 | Base + 0 | Receiver buffer (read) |
| | | Transmitter holding register (write) |
| 0 | Base + 1 | Interrupt enable |
| X | Base + 2 | Interrupt identification (read only) |
| X | Base + 3 | Line control |
| X | Base + 4 | MODEM control |
| X | Base + 5 | Line status |
| X | Base + 6 | MODEM status |
| X | Base + 7 | Scratched register |
| 1 | Base + 0 | Divisor latch (least significant byte) |
| 1 | Base + 1 | Divisor latch (most significant byte) |

◆ **Receiver Buffer Register (RBR)**

Bit 0-7: Received data byte (Read Only)

◆ **Transmitter Holding Register (THR)**

Bit 0-7: Transmitter holding data byte (Write Only)

◆ **Interrupt Enable Register (IER)**

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

- **Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

- **Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

| WLS1 | WLS0 | Word Length |
|---|---|---|
| 0 | 0 | 5 Bits |
| 0 | 1 | 6 Bits |
| 1 | 0 | 7 Bits |
| 1 | 1 | 8 Bits |

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

◆ **MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

◆ **Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

◆ **MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

◆ **Divisor Latch (LS, MS)**

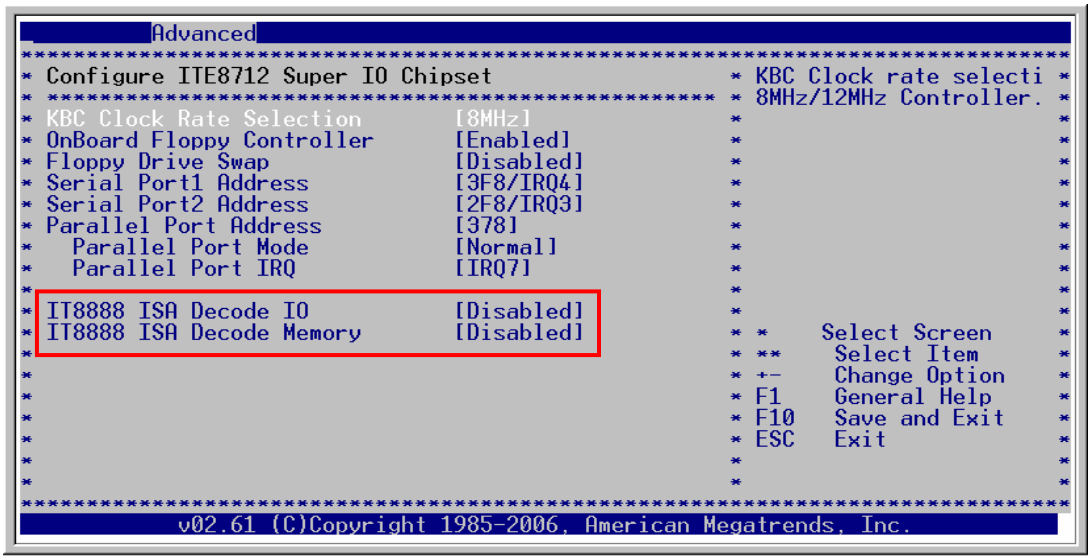
| | LS | MS |
|---|---|---|
| Bit 0: | Bit 0 | Bit 8 |
| Bit 1: | Bit 1 | Bit 9 |
| Bit 2: | Bit 2 | Bit 10 |
| Bit 3: | Bit 3 | Bit 11 |
| Bit 4: | Bit 4 | Bit 12 |
| Bit 5: | Bit 5 | Bit 13 |
| Bit 6: | Bit 6 | Bit 14 |
| Bit 7: | Bit 7 | Bit 15 |

| Desired Baud Rate | Divisor Used to Generate 16x Clock |
|---|---|
| 300 | 384 |
| 600 | 192 |
| 1200 | 96 |
| 1800 | 64 |
| 2400 | 48 |
| 3600 | 32 |
| 4800 | 24 |
| 9600 | 12 |
| 14400 | 8 |
| 19200 | 6 |
| 28800 | 4 |
| 38400 | 3 |
| 57600 | 2 |
| 115200 | 1 |

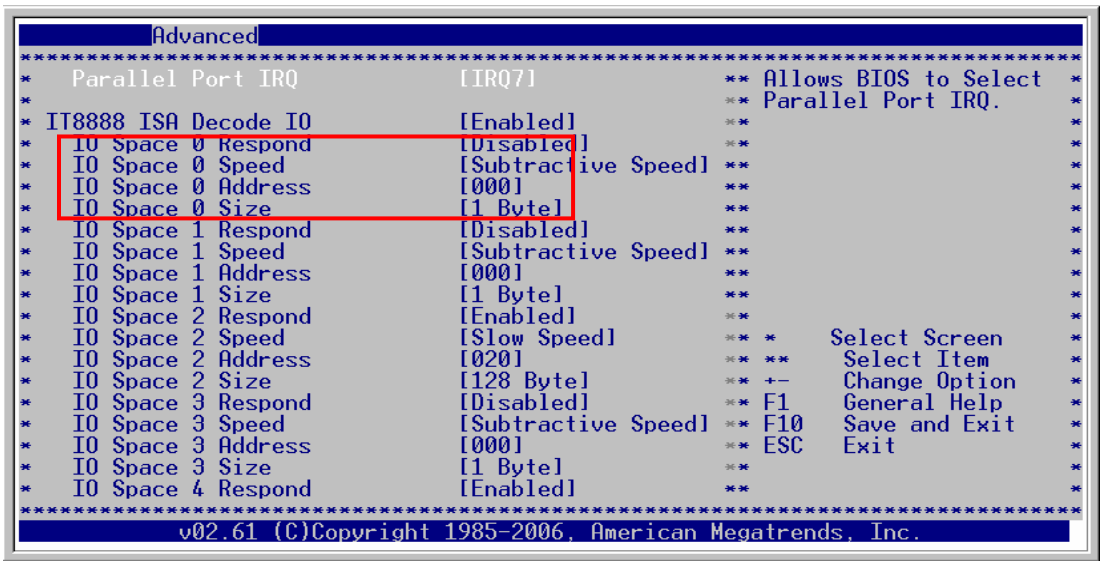
## How to configure I/O port resource

Prepare your I/O or ROM/RAM add-on card, adjust the I/O port and memory address(Please refer to Chapter 5 "I/O Port address Map", to ward off the IO Port address) , if the I/O port of your add-on card is 170H~177H and ROM/RAM memory space is D000:0 ~D3FF:0 (16K)Segment, the following steps are for you to set up the I/O or memory resources manually.

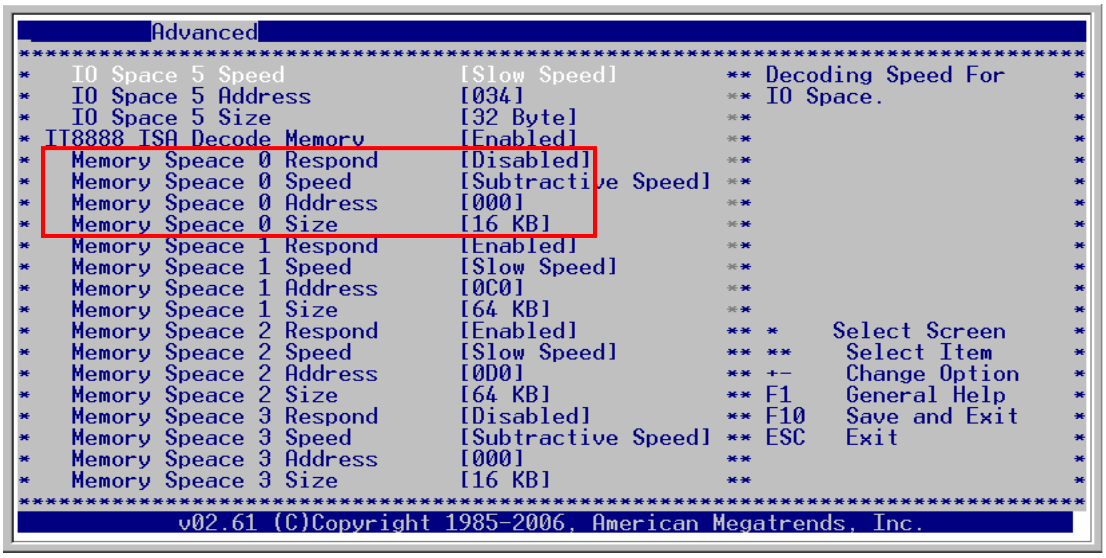
1. Booting the FB2505 CPU board and get into the BIOS CMOS SETTUP >Select the Integrated Peripherals >, and then select IT8888 ISA Decode IO.




2. Select the "Decode I/O Space 0 "; enable this function and adjust the "Decode I/O Speed 0" function. And then select the medium speed and adjust the "Decode I/O Addr. 0 [15:4] fill the 017h (170h Port), then set "Decode I/O Size" in option of the 8 bytes.



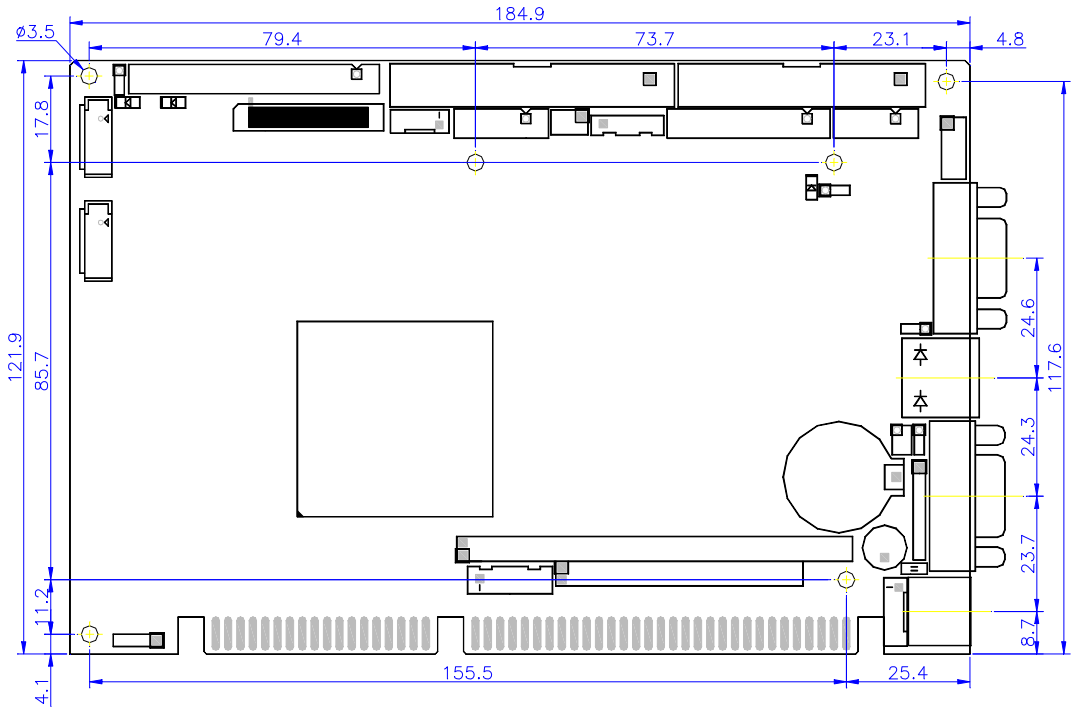
3. Return to Integrated Peripherals >then select IT8888 ISA Decode Memory screen, Select the “Decode Memory Space 0 Respond “; enable this function and adjust the “Decode Memory Speed 0” function. And then select the medium speed and then adjust the “Decode Memory Addr. 0 [23:12] fill the 0D0h (D000:0 Memory Segment), then set “Decode Memory Size” in the option of 16 K8.




4. Save above BIOS CMOS SETUP (F10), and restart the system.

5. Add you add-on card to the FB2505 CPU Board

**Note**: If the wrong selection of I/O ports or memory space conflicts on the FB2505 system board, you can clean CMOS setup by the JP5.

# Appendix

## Dimension