FEB-7100

Mini-ITX
Industrial Motherboard

User's Manual

Revision 1.00

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How to Use This Manual

The manual describes how to configure your FEB-7100 series system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Board Computer.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single board computer.

Chapter 2: Hardware Configuration. To shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various useful tips to quickly get FEB-7100 series running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane/riser card setup, BIOS setting, and OS diagnostics.

The content of this manual and EC declaration document is subject to change without prior notice. These changes will be incorporated in new editions of the document.

Chapter 1
System Overview

1.1 Introduction

FEB-7100 is a newly designed supporting VIA CX700M with high performance and high integration computing platform. It is positioned at innovation, high integration and high quality Embedded System Board in the embedded computing market.

The board is based on VIACX700M chipset and supports 800/400 Mhz C7 Processor, chipset that support high speed DDR II SDRAM, high-performance graphic controller with dual display/Panel and fast Ethernet connection. The on-board two SATA ports and one IDE interface; Super I/O Chipset integrates six serial ports, one keyboard controller, hardware monitoring and one parallel port. Besides, six USB (Universal Serial Bus) ports provide high-speed data communication between peripherals and PC. FEB-7100 series can provide most versatile Embedded System Board (ESB) functionality in the market.

All in all, FEB-7100 series are designed to meet all kinds of embedded computing application. With VIA most advance mainstream chipset for CX700M, FEB-7100 is aiming at the most wide range of multimedia and networking applications in the market.

Its compact design with standard Mini-ITX form factor makes it the most favorable solution for high-density server. High reliability, compact size and easy-to-use features fulfill the demand for critical embedded application including ATM, Kiosk, POS, gaming and medical equipment... ,etc.

Key Features:

- **Mini-ITX form factor to fit in most wide range of system architecture**
- **VIA new generation chipset VIA CX700M powered by C7 processor,**
- **Dual independent on-board display support CRT, LVDS**
- **On-board standard I/O, dual display, panel option, network and audio to meet the requirements of communication and multimedia platforms**
- **On-board 10/100BASE-TX Ethernet**
- **Up to 2GB high performance 240 pin DIMM DDR II SDRAM allows to run versatile embedded programs**

1.2 Check List

The FEB-7100 package should cover the following basic items:

- ✓ FEB-7100 Mini-ITX Industrial Motherboard x 1
- ✓ Installation Resources CD-Title x 1
- ✓ Internal Serial Port Cable (option)
- ✓ Internal USB Cable (option)
- ✓ SATA HDD Cable (option)
- ✓ IDE 44 pins to 80 pins HDD Cable (option)

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Processor**
  - Support 800/400MHz VIA C7 Processor
  - L2 Cache built-in

- **Chipset**
  - VIA CX700M Integrated UniChrome Pro II 3D / 2D Graphics & Video Processor Unified Video Decoding Accelerator Integrated and LVDS Transmitter
  - Winbond W83627EHG Super I/O Controller.

- **System Memory**
  - Two 240 pin DDR II socket
  - Support DDR II SDRAM 400/533MHz up to 2GB.
    Supports 64Mb / 128Mb / 256Mb / 512Mb (x8 / x16 / x32)
    Supports 1Gb (x16)
- **On-board VGA**
  - CX700M Integrated 3D / 2D / Video Processors
  - Pixel resolution Up to 1920x1400
  - Support D-Sub 15Pin connector.

- **On-board LVDS**
  - CX700M Integrated 3D / 2D / Video Processors
  - Panel support Up to 1600x1200 (UXGA)
  - Support Single and Dual (18bit/24bit) LVDS output.

- **Ethernet**
  - Realtek RTL8100C 10/100M Base-T Ethernet Controller.
  - Support Boot-on-LAN function.
  - Support Wake-on-LAN function.
  - Support RJ45 Jack connector.

- **Audio**
  - VIA VT1708B HD Audio CODEC.
  - Support Line-Out with Phone Jack.
  - Support 6W Amplified stereo output with Wafer Header

- **SATA Interface**
  - CX700M Integrated Serial ATA Host Controller
  - Support two Serial ATA ports, data transfer rates up to 3.0 Gb/s (300 MB/s)

- **IDE Interface**
  - Support Ultra ATA 33/66/100, BMIDE and PIO modes.
  - One 2.0mm pitch 2x22pin IDE connector shares the secondary IDE channel with Compact Flash socket.

- **USB Interface**
  - Support six ports for high-speed I/O peripheral devices

- **Serial Ports**
  - Support six ports high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs.

- **Parallel Port**
  - Support one parallel port with SPP, EPP and ECP modes.
  - Support D-Sub 25Pin connector.

- **PS/2 Mouse and Keyboard Interface**
  - Support one PS/2 Keyboard and Mouse with mini-DIN connector.

- **Real Time Clock/Calendar (RTC)**
  - Support Y2K Real Time Clock/Calendar with battery backup for 5-year data retention.

- **Watchdog Timer**
  - Support software programming for enable/disable and interval setting.
  - Generate system reset from 1sec/min to 255sec/min.

- **High Driving GPIO**

- Support 5 high driving capabilities for GPIO (2 GPI and 3 GPO)
- Support RJ11 connector for 1 GPI and 2 GPO (Support +12V device)
- Support Pin Header for 1 GPI and 1 GPO

- **Cooling Fans**
  - Support two 3-pin headers for CPU and System Fans.
  - Support Smart-Fan mode function.(option)

- **System Monitoring Feature**
  - Monitor CPU temperature, system temperature and major power sources, etc.

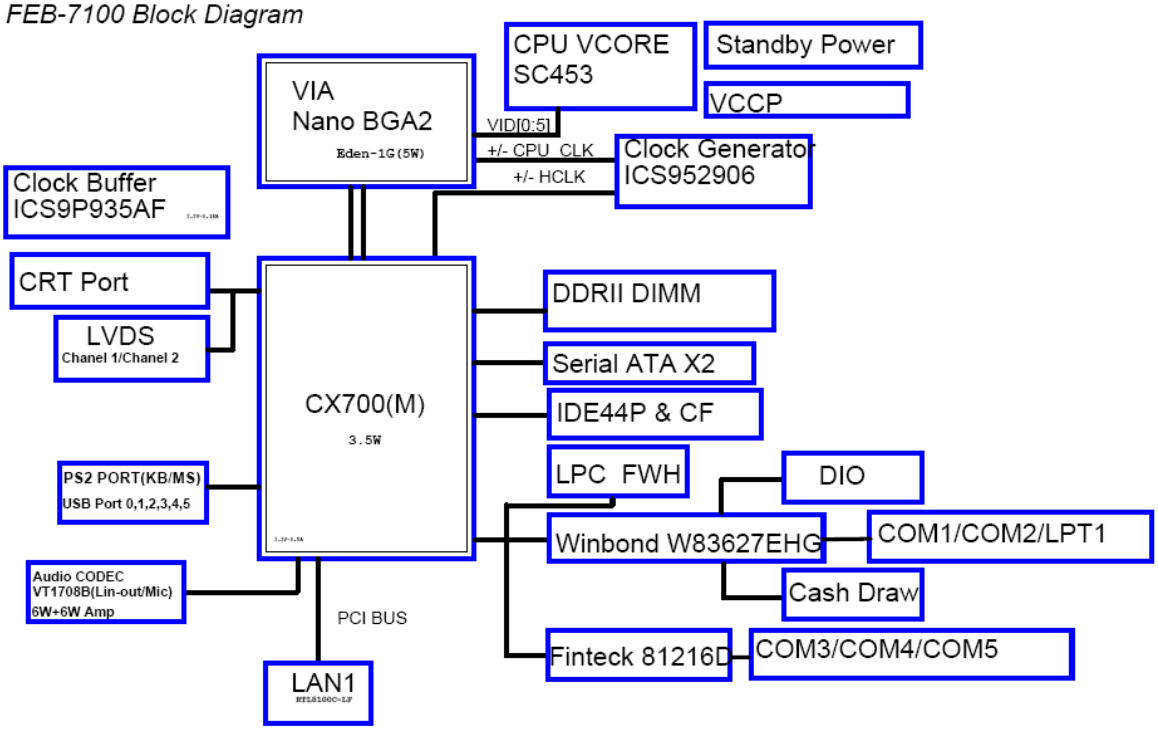
- **Power Management**
  - Support ACPI 2.0 APM V1.2 Compliant
  - Support for APM-based legacy power management

- **Operating Temperature:** -5°C ~ 60°C (23°F ~ 140°F)
- **Storage Temperature:** -20°C ~ 80°C
- **Relative Humidity:** 0% ~ 95%, non-condensing
- **Relative Humidity:** 0% ~ 95%, non-condensing
- **Board Dimension (L*W):** 170x170 mm

1.4 System Architecture

The most up-to-date system architecture of FEB-7100 includes VIA CX700M chip, supports VIA 800/400 MHz C7 processor, DDR II SDRAM, 2D/3D graphic display, and supports SATA interface,ACPI compliant power management, USB port, SMBus communication, and Ultra DMA/33/66/100 IDE Master. W83627EHG (I/O Controller) is responsible for PS/2 Keyboard/Mouse, UARTs, Hardware Monitor, Parallel, Watchdog Timer, GPIO interface. And the F81216D supports four UARTs.

FEB-7100 Block Diagram



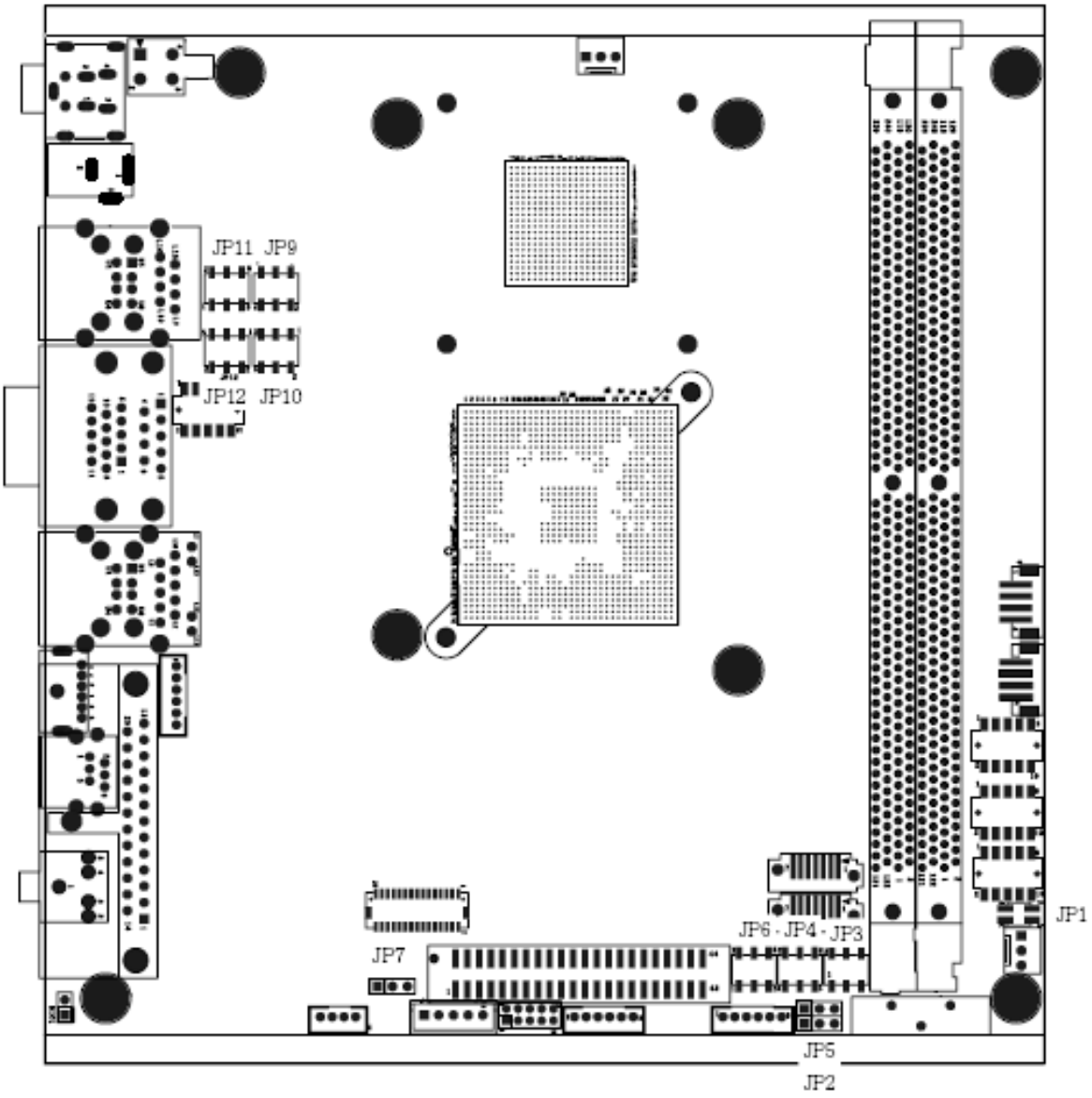
Chapter 2 Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers of FEB-7100 are in the proper position. The default settings shipped from factory are marked with a star (★).

2.1Jumper Setting

For users to customize FEB-7100's features, in the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. User can refer to Figure 2-1 for the Jumper locations.

2.1.1Jumper Allocation



2.1.2Jumper Function List:

Jumper	Function	Remark
JP1	COM4 Mode Selection	
JP2	CMOS Clear	
JP3	COM3 RI function Selection	
JP4	COM4 RI function Selection	
JP5	Compact Flash Master/Slave Selection	
JP6	COM6 RI function Selection	
JP7	Panel Mode Selection	
JP9	COM5 RI function Selection	
JP10	COM2 RI function Selection	
JP11	COM5 Mode Selection	
JP12	COM1 RI function Selection	

2.1.3Jumper Setting

JP1: COM4 Mode Selection

JP1	Mode
1-2, 3-4 short	VFD Mode
1-2, 3-4 open	RS-232 Mode ★

JP2: CMOS Clear

JP2	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

JP3: COM3 RI function Selection

JP3	Function
1-2 short	+5V ★
3-4 short	Ring In
5-6 short	+12V

JP4: COM4 RI function Selection

JP4	Function
1-2 short	+5V ★
3-4 short	Ring In
5-6 short	+12V

JP5: Compact Flash Master/Slave Selection

JP5	Function
1-2	Compact Flash set to master on IDE secondary channel (share secondary IDE channel with 44 pin IDE connector).
2-3	Compact Flash set to slave on IDE secondary channel ★ (share secondary IDE channel with 44 pin IDE connector).

JP6: COM6 RI function Selection

JP6	Function
1-2 short	+5V
3-4 short	Ring In ★
5-6 short	+12V

JP7: Panel Mode Selection

JP7	Mode
1-2 short	High
2-3 short	Low ★

JP9: COM5 RI function Selection

JP9	Function
1-2 short	+5V
3-4 short	Ring In ★
5-6 short	+12V

JP10: COM2 RI function Selection

JP10	Function
1-2 short	+5V
3-4 short	Ring In ★
5-6 short	+12V

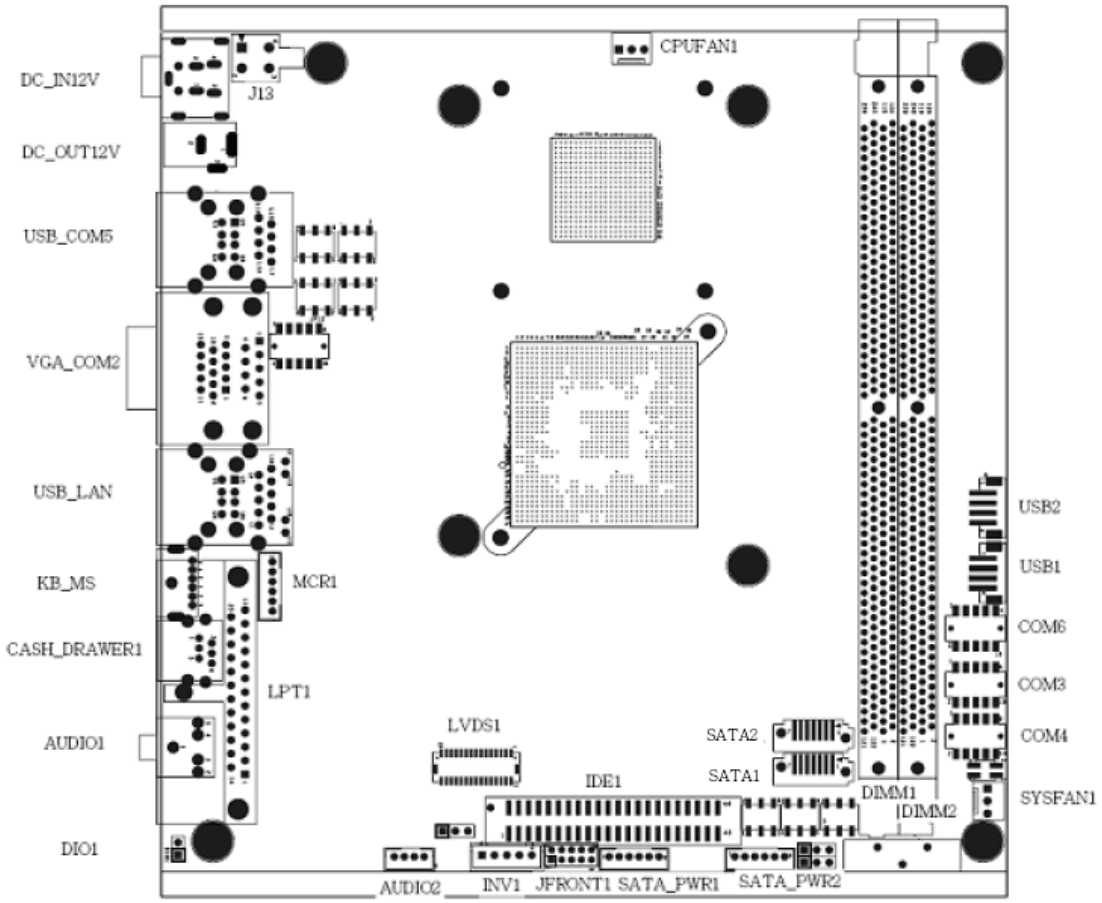
JP11: COM5 Mode Selection

JP11	Mode
1-2, 3-5, 4-6 short	VFD Mode
1-3, 2-4 short	RS-232 Mode★

JP12: COM1 RI function Selection

JP12	Function
1-2 short	+5V
3-4 short	Ring In ★
5-6 short	+12V

2.2Connector Allocation



2.2.1Connector Function List:

Connector	Function	Remark
Audio1	Line-out with Phone Jack	
Audio2	Speaker out Connector	
SYSFAN1, CPUFAN1	Fan 3Pin Connectors	
Cash_Drawer1	Digital I/O with RJ-11 Connector	
CF1	Compact Flash Connector	
COM 2	Serial port with D-sub 9Pin	
COM 1,3, 4, 6	Serial port with Wafer Connectors	
COM 5	Serial port with RJ45 Connectors	
DIO1	Digital I/O with 2Pin Connector	
KB_MS	PS2 Keyboard & Mouse Connector	
MCR1	External Keyboard Connector	
INV1	LVDS Inverter Power Connector	
LVDS1	LVDS LCD Panel Connector	
JFront1	Front Panel Connector	

LAN	RJ45 LAN Connector	
LPT	Parallel port with D-sub 25Pin	
SATA1,SATA2	SATA Connector	
SATA_PWR1&2	SATA Power Connector	
J13	12V 2x2 Power Input Connector	
DC_IN12V	12V DC Power Input Connector	
DC_OUT12V	12V DC Power Output Jack	
USB1,USB2	USB dual port Connectors	
USB3,USB4	USB port with Wafer Connectors	
VGA1	D-Sub15P CRT Connector	

2.2.2Pin Assignments:

AUDIO1: Line-out with Audio Phone Jack

PIN No.	Signal Description
1	Audio Ground
2	Audio-out-L
3	Audio Ground
4	Jack Plugged detect
5	Audio-out-R

AUDIO2: Speaker Output with Wafer Connector (2.0mm)

PIN No.	Signal Description
1	Speaker output Right
2	Speaker Audio Ground
3	Speaker Audio Ground
4	Speaker output Left

CPUFAN1/SYSFAN1: Fan Connector

PIN No.	Signal Description
1	Ground
2	Fan Power (+12V)
3	Speed Sense

Cash_Drawer1: DIO with RJ-11 Connector

PIN No.	Signal Description
1	Ground

2	DIO Out 0
3	DIO IN 0
4	+12V
5	DIO Out 1
6	Ground

CF1: Compact Flash Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	26	Ground
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	Select 0	32	Select 1
8	Ground	33	N/C
9	Ground	34	IO Read
10	Ground	35	IO Write
11	Ground	36	Pull Up to +5V
12	Ground	37	IRQ 15
13	+5V	38	+5V
14	Ground	39	Slave/Master# Select
15	Ground	40	N/C
16	Ground	41	Reset
17	Ground	42	IORDY
18	SA2	43	DMA REQ
19	SA1	44	DMA ACK#
20	SA0	45	IDE Active
21	Data 0	46	Pull Up to +5V
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	Pull Up to +5V	49	Data 10
25	Ground	50	Ground

COM2: Serial Port 1/2 Connector with D-Sub9P

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI /+12V/+5V

5	Ground	10	NC

COM1/COM3/COM4/COM6: Serial port with Wafer Connectors (2.0mm)

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI/+5V/+12V
9	Ground	10	RI/+5V/+12V

DIO1: DIO Connector with Pin Header (2.54mm)

PIN No.	Signal Description
1	DIO-In
2	DIO-Out

KB/MS: PS2 Keyboard & Mouse with Mini-DIN Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	KBDATA	2	MSDATA
3	Ground	4	+5V
5	KBCLK	6	MSCLK

MCR1: Internal Keyboard with Wafer Connector (2.0mm)

PIN No.	Signal Description	PIN No.	Signal Description
1	+V5	2	KCLK_CON
3	KCLK_KBC	4	KDAT_CON
5	KDAT_KBC	6	Ground

INV1: Panel Inverter Power with Wafer Connector (2.5mm)

PIN No.	Signal Description
1	+12V
2	+12V
3	Ground
4	Ground
5	Back Light Enable

LVDS1: LVDS Panel Signals With Wafer Connector (1.0mm)

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Ground
3	Data A3+	4	Data A3-
5	Clock A+	6	Clock A-
7	Data A2+	8	Data A2-
9	Data A1+	10	Data A1-
11	Data A0+	12	Data A0-
13	Ground	14	Ground
15	Data B3+	16	Data B3-
17	Clock B+	18	Clock B-
19	Data B2+	20	Data B2-
21	Data B1+	22	Data B1-
23	Data B0+	24	Data B0-
25	Ground	26	Ground
27	LVDS VDD	28	LVDS VDD
29	LVDS VDD	30	Panel Bit Select

JFRONT1: Front Panel Connector (2.0mm)

PIN No.	Signal Description	PIN No.	Signal Description
1	Power LED	2	5VSB LED
3	Ground	4	Power switch
5	5VSB (470 Ohm)	6	LAN TX/RX LED
7	+5V (470 Ohm)	8	HDD LED
9	Ground	10	Reset Switch

LPT: Parallel Port Connector with D-Sub25P

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select		

SATA1/2: SATA Connector

PIN No.	Signal Description
1	Ground
2	TXD+
3	TXD-
4	Ground
5	RXD-
6	RXD+
7	Ground

SATA_PWR1&2: SATA Power with Wafer Connector (2.0mm)

PIN No.	Signal Description
1	+5V
2	+5V
3	Ground
4	Ground
5	+12V
6	+12V

J13: 12V 2x2 Power Input Connector (4.2mm)

PIN No.	Signal Description
1	Ground
2	Ground
3	+12V DC-In
4	+12V DC-In

DC_IN12V:12V DC Power Input Connector

PIN No.	Signal Description
1	+12V DC-In
2	Ground
3	+12V DC-In
4	Ground

DC_OUT12V:12V DC Power Input Jack

PIN No.	Signal Description
1	+12V DC-In
2	Ground
3	Ground

USB_LAN: USB 1/2 & LAN Connector with Dual USB& Ethernet RJ-45

PIN No.	Signal Description	PIN No.	Signal Description
U1	+5V	U5	+5V
U2	USBDATA0-	U6	USBDATA1-
U3	USBDATA0+	U7	USBDATA1+
U4	Ground	U8	Ground
L1	TXD+	L5	NC
L2	TXD-	L6	RXD-
L3	RXD+	L7	NC
L4	NC	L8	NC

USB2_COM5: USB 3/4 Connector & COM5 with Dual USB& RJ-45

PIN No.	Signal Description	PIN No.	Signal Description
U1	+5V	U5	+5V
U2	USBDATA2-	U6	USBDATA3-
U3	USBDATA2+	U7	USBDATA3+
U4	Ground	U8	Ground
L1	RI/+5V/+12V	L5	DTR
L2	CTS/+5V/+12V	L6	DSR
L3	Ground	L7	TXD
L4	RTS/ Ground	L8	RXD

USB: USB1/2 Ports with Wafer Connector (2.0mm)

PIN No.	Signal Description
1	USB +5V
3	USBDATA-
5	USBDATA+
7	USB Ground

VGA: CRT Connector with D-Sub15P

PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	GREEN
3	BLUE	4	ID0
5	Ground	6	Ground
7	Ground	8	Ground
9	CRT Power (+5V)	10	Ground
11	ID1	12	DDCDATA
13	HSYNC	14	VSYNC
15	DDCCLK		

Chapter 3 System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard device and handle WDT operation in software programming.

3.1 Main Memory

FEB-7100 provides two DDR II-SDRAM DIMM slots to support 1.8V DDR II-SDRAM as on-board main memory. The maximum memory size can be up to 2GB. And auto detecting memory clock according to BIOS CMOS settings.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install your DRAM module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

3.2 Installing the Embedded Board Computer

To install your FEB-7100 into standard chassis or proprietary environment, you need to perform the following:

Step 1: Check all jumpers setting on proper position

Step 2: Install and configure CPU and memory module on right position

Step 3: Place FEB-7100 into the dedicated position in your system

Step 4: Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that your FEB-71000 is properly inserted and fixed by mechanism.

Note:
Please refer to section 3-4-1 to 3-4-5 to Chipset/VGA/LAN/Audio drivers.

3.2.1 Chipset Component Driver

VIA CX700M chipset is a new chipset that a few old operating systems might not be able to recognize. **To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 / XP / 2003 / Vista, please Chipset Component driver before any of other Drivers are installed**.

3.2.2 VIA CX700M Graphics Controller

VIA CX700M integrated 200MHz, 128-bit UniChrome Pro II graphics processor is implemented on Unified Memory Architecture with frame buffer size of up to 128MB. 32bpp color depth.

3.2.3 On-Board USB 2.0

FEB-7100 includes three UHCI host controllers that support six external ports, and high-speed USB 2.0 Host Controller that supports all ports.

3.3 Clear CMOS Operation

The Clear CMOS operation is implemented if the system fails to start at least one time.

The following table indicates how to enable/disable CMOS Clear Function hardware circuit by putting jumpers at proper position.

JP2	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS Contents

To correctly operate CMOS Clear function, users must turn off the system, move JP2 jumper to short pin 2 and 3. To clear CMOS, please turn the power back on and turn it off again for AT system, or press the toggle switch a few times for ATX system. Move the JP2 back to 1-2 position (Normal Operation) and start the system. System will then produce a "CMOS Check Sum Error" message and hold up. Users may then follow the displayed message to load BIOS default setting.

3.4 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

FEB-7100 allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627EHG data sheet.

3.4.1 WDT Programming Guide

WDT Programming setting as below steps:

Step 1: CR2D, Bit0→0 (select pin77 to WDTO#)
Step 2: LD8, CR30, Bit0→1 (Active WDTO#)
Step 3: LD8, CRF7, Bit4→Write 0 to clear WDTO# status.
Step 4: LD8, CRF5, Bit3→0: Second mode, 1: Minute mode
Step 5:LD8, CRF6, Bit [7:0] →Set WDTO# Time out value. (WDTO# startup after setting the system time, or setup from step 3 ~ step 5 to restart WDT.)

3.5 SMBus

The CX700M provides an SMBus 2.0 compliant Host controller as well as an SMBus Slave Interface. The Host controller provides a mechanism for the processor to initiate communications with SMBus peripherals (slaves). The CX700M is also capable of operating in a mode in which it can communicate with I^2C compatible devices.

The CX700M can perform SMBus messages with either packet error checking (PEC) enabled or disabled. The actual PEC calculation and checking is performed in hardware by the CX700M.

The System Management Bus is a two-wire interface through which simple power related chips can communicate with rest of the system. It uses I^2C as its backbone. A system using SMBus passes messages to and from devices instead of tripping individual control lines. With the SMBus, a device can provide manufacturer information, tell the system what its model/part number is, save its state for a suspend event, report different types of errors, accept control parameters, and return its status
The SMBus may share the same host device and physical bus as ACCESS bus components provided that an appropriate electrical bridge is provided between the internal SMBus devices and external ACCESS bus devices

3.6 Display Output

VIA CX700M chipset is the result of new design approach to optimize the shared memory architecture while maintaining the cost benefits of integration.
With no additional video adaptor, this onboard video will be the system display output.

3.7 GPIO

The FEB-7100 provides 1 input and 2 output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

3.7.1 Pin assignment

Cash_Drawer1: DIO with RJ-11 Connector

PIN No.	Signal Description
1	Ground
2	DIO-Out 0
3	DIO-In 0
4	+12V
5	DIO-Out 1
6	Ground

DIO1: DIO Connector with Pin Header (2.54mm)

PIN No.	Signal Description
1	DIO-In 3
2	DIO-Out 3

3.7.2 FEB-7100 GPIO Programming Guide

Access CASH_DRAWER1 GPIO port

There are two PNP I/O port addresses that can be used to configure GPIO ports,

1) 0x2E - **EFER** (Extended Function Enable Register, for entering Extended Function Mode)
   - **EFIR** (Extended Function Index Register, for identifying CR index number)

2) 0x2F - **EFDR** (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIOs.

// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);

// Assign Pin121-128 to be GPIO port 1
outp(0x002E, 0x29);
outp(0x002F, inp(0x002F) | 0x01);

// Select Logic Device 7
outp(0x002E, 0x07);
outp(0x002F, 0x07);

// Active Logic Device 7
outp(0x002E, 0x30);
outp(0x002F, 0x01);

// Select Inversion Mode
outp(0x002E, 0xF2);
outp(0x002F, 0x83);

// Select I/O Mode
// Bit0~bit3 output and bit4~bit7 input
outp(0x002E, 0xF1);
outp(0x002F, 0x00);

// Access GPIO ports
outp(0x002E, 0xF0);
outp(0x002F, 0x7C);

// Exit Extended Function Mode
outp(0x002E, 0xAA);

Definitions of Variables:
Each bit in the lower nibble of each Register represents the setting of a GPIO port.
Bit0 vs. GPIO DIO-Out 0
Bit1 vs. GPIO DIO-Out 1
Bit7 vs. GPIO DIO-Out 3
Bit4 vs. GPIO DIO-In 0
Bit3 vs. GPIO DIO-In 3

Value of **Inversion Register**:
Only lower nibble is available for this function.
When set to a '1', the incoming/outgoing port value is inverted.
When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of **I/O Selection Register:**
Only lower nibble is available for this function.
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.

Value of **Output Data / Input Data**:
Only lower nibble is available for this function.
If a port is assigned to be an output port, then its respective bit can be read/write.
If a port is assigned to be an input port, then its respective bit can be read only.

Note:
Some other functions may occupy the high nibble of the registers. Altering any content in high nibble will be undesired.

Chapter 4 BIOS Setup Information

FEB-7100 is equipped with the AWARD BIOS stored in FWH Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, FEB-7100 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

● Entering Setup

Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

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

Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓ → ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.1 Main Menu

Once you enter FEB-7100 AWARD BIOS CMOS Setup Utility, you should start with the Main Menu. The Main Menu allows you to select from fourteen setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix- AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features ▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations ▶ PC Health Status	▶Frequency/Voltage Control Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑↓→← : Select Item
Time, Date, Hard Disk Type …	

Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

▲Standard CMOS Features
This setup includes SBC parameter as Time , Date , Hard Disk Type ……

▲Advanced BIOS Features
For choice special enhance feature .

▲Advanced Chipset Features
This setup include display and onboard device setup.

▲ Integrated Peripherals
This setup include on board peripheral setup.

▲Power Management Setup
This setup can be set SBC power management.

▲PnP/PCI Configurations
This setup can be set PCI configuration & resource..

▲PC Health Status
This setup can display SBC health state as voltage , board temperature … etc.

▲Frequency/Voltage Control
This setup can control CPU clock and frequency ratio.

▲Load Fail-Safe Defaults
This setup contain BIOS all item default setup in safe mode.

▲Load Optimized Default
This setup contain BIOS all item default setup in best performance mode.

▲Set Supervisor Password
Set password to allow access into the BIOS setup for supervisor.

▲Set User Password
This setup can set password to allow access into the BIOS limit setup.

▲Save & Exit Setup
Save BIOS setup value to CMOS and exit setup.

▲Exit Without Saving
Exit setup and keep last time setup value.

4.2 Standard CMOS Setup Menu

This setup page includes all the items in a standard compatible BIOS. Use the arrow keys to highlight the item and then use the <PgUp>/<PgDn> or <+>/<-> keys to select the value or number you want in each item and press <Enter> key to certify it.

Follow command keys in CMOS Setup table to change **Date**, **Time**, and IDE item**.**

Phoenix- AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Thu, Jul 6 2007	Item Help
Time (hh:mm:ss)	11 : 29 : 50	
▶ IDE Primary 0 Master	[HDS728080PLAT20]	Menu Level ▶
▶ IDE Primary 0 Slave	[None]	
▶ IDE Secondary 1 Master	[None]	Change the day, month, year and century
▶ IDE Secondary 1 Slave	[None]	
Video	[EVG/VGA]	
Halt On	[All, But Keyboard]	
Base Memory	640K	
Extended Memory	980992K	
Total Memory	980992K	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲Date
The data format : [week],[month],[day],[year].

▲Time
The time format : [hour],[minute],[second].

▲IDE Primary 0 Master
Auto detect IDE device on channel 0,
Press "Enter" for automatic device detection.

▲IDE Primary 0 Slave
Auto detect IDE device on channel 0,
Press "Enter" for automatic device detection.

▲IDE Primary 1 Master
Auto detect IDE device on channel 1,
Press "Enter" for automatic device detection.

▲IDE Primary 1 Master

Auto detect IDE device on channel 1,
Press "Enter" for automatic device detection.

▲Video

Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically.

EGA/VGA	Enhance Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA40	Color Graphics Adapter, power up in 40 column mode.
CGA80	Color Graphics Adapter, power up in 80 column mode.
MONO	Monochrome adapter, includes high resolution monochrome adapters.

▲Halt On

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

No errors	POST does not stop for any errors.
All errors	If the BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.
All, But keyboard	POST does not stop for a keyboard error, but stops for all other errors.

▲Base Memory

Typically 640 KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

▲Extended Memory

Above the 1-MB boundary. Early IBM personal computers could not use memory above 1MB, but current PCs and their software can use extended memory.

▲Total Memory

Total system memory available area.

4.3 Advanced BIOS Features

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

Phoenix- AwardBIOS CMOS Setup Utility
Advanced BIOS Features

►CPU Feature	[Press Enter]	Item Help
►Hard Disk Boot Priority	[Press Enter]	
Virus Warning	[Disabled]	Menu Level ►
CPU L1 & L2 Cache	[Enabled]	
CPU L2 Cache ECC Checking	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot Device	[USB-CDROM]	
Second Boot Device	[Hard Disk]	
Third Boot Device	[USB-FDD]	
Boot Other Device	[Enabled]	
Boot up NumLock Status	[On]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/sec)	6	
X Typematic delay (Msec)	250	
Security Option	[Setup]	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
Video BIOS Shadow	[Enabled]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲CPU Feature
Display CPU parameter information.

▲Hard Disk Boot Priority
Select boot sequence for HDD type device.

▲Virus Warning
If item enabled, When try to write on the boot sector.
An alarm message will be displayed on the screen.

▲CPU L1 & L2 Cache
CPU L1 & L2 function Enabled/Disabled.

▲CPU L2 Cache ECC Checking
CPU L2 cache ECC function Enabled/Disabled.

▲Quick Power On Self Test
If item Enabled, It will skip some POST function to speed up system turn on.

▲First Boot Device
Select boot device1. Ex : HDD , CDROM ….

▲Second Boot Device2
Select boot device. Ex : HDD , CDROM …

▲Third Boot Device
Select boot device3. Ex : HDD , CDROM …

Note : If boot device 1-3 setup as CD-ROM,HDD,USBFDD ,
System will follow setup to boot system.

▲Boot Other Device
If item Enabled, System will search boot device after First/Second/Third Boot Device.

▲Boot up NumLock Status
If item Enabled, System will active the NumLock function after power on.

▲Typematic Rate Setting
Set keyboard character repeat rate. If item "Diasbled",
Continue holding down a key on your keyboard will generate only one instance.
If item "Enabled" , will have 2 item as below for setting.

▲Typematic Rate (Chars/sec)
If item Enabled, Set system registers repeated keystrokes speeds.

▲Typematic delay (Msec)
If item Enabled, allows you set the time interval for displaying the first and second characters.

▲Security Option
You can setup Setup/System when setup password.
Setup : In boot picture will show "Enter Password" message.
System : Into BIOS setup figure will show "Enter Password" message.

▲MPS Version Control For OS
This item is specifies the MPS version for your system.
MPS V1.4 added extend configuration tables to improve support for multiple PCI bus configurations and improve support future expandability.

▲OS Select For DRAM > 64MB
This item set the system to access greater than 64MB of DRAM memory when Used with OS/2 that depends on certain BIOS calls to access memory.

▲Video BIOS Shadow
This item set a Video BIOS shadow for used.

▲Small Logo(EPA) Show
Enabled/Disabled Small Logo function.

Phoenix- AwardBIOS CMOS Setup Utility
CPU Feature

Thermal Monitor Bus Ratio [4 X] Thermal Monitor Bus VID [0.700V]	Item Help
	Menu Level ▶
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

▲Thermal Monitor Bus Ratio
CPU internal thermal monitor ratio value.

▲Thermal Monitor Bus VID
CPU internal thermal monitor VID value.

Phoenix- AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority

1. Ch0 M. : Hitachi HDS721680PLA38 2. Bootable Add-in Cards	Item Help
	Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲Hard Disk Boot Priority
Boot device priority setup ,
Number 1. is the first boot device of hard disk type device.

4.4 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the VIA CX700M Chipset. This Chipset manages bus speeds and access to system memory resources, such as DRAM (DDR2 SDRAM) and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced Chipset Features

► DRAM Clock/Drive Control	[Press Enter]	Item Help
► AGP & P2P Bridge Control	[Press Enter]	
Memory Hole	[Disabled]	Menu Level ►
System BIOS Cacheable	[Enabled]	
Video RAM Cacheable	[Disabled]	
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

▲DRAM Clock/Drive Control
Some parameter of DRAM set up.

▲AGP & P2P Bridge Control
Some parameter of AGP set up.

▲Memory Hole
If item "enabled" , system will keep 15M-16M for special device resource used.

▲System BIOS Cacheable
This item allow caching of system BIOS ROM at F0000h-FFFFFh,resulting in better system performance.

▲Video RAM Cacheable
If This item "Enabled" , will speed up system display.

Phoenix- AwardBIOS CMOS Setup Utility
DRAM Clock/Drive Control

Current FSB Frequency	100Mhz	Item Help
Current DRAM Frequency	266Mhz	
DRAM Clock	[By SPD]	Menu Level ▶
DRAM Timing	[Auto By SPD]	
X SDRAM CAS Latency [DDR/DDR	2.5/ 4	
X Bank Interleave	Disabled	
X Precharge to Active(Trp)	4T	
X Active to Precharge (Tras)	07T	
X Active to CMD (Trcd)	4T	
X REF to ACT/REF (Trfc)	25T	
X ACT(0) to ACT(1) (TRRD)	3T	
Read to Precharge (Trtp)	[2T]	
Write to Read CMD (Twtr)	[1T/2T]	
Write Recovery Time (Twr)	[4T]	
DRAM Command Rate	[2T Command]	
RDSAIT mode	[Auto]	
X RDSAIT selection	03	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲Current FSB Frequency
Setup FSB frequency , default : 100M.

▲Current DRAM Frequency
Setup DRAM frequency , default : 266M.

▲DRAM Clock
Setup DRAM clock , default : [By SPD].

▲DRAM Timing
Setup DRAM timing , default : [Auto By SPD].

▲SDRAM CAS Latency [DDR/DDR

Setup SDRAM CAS Latency , default : 2.5/ 4.

▲Bank Interleave
Setup Bank Interleave , default : Disabled.

▲Precharge to Active(Trp)
Setup Precharge to Active(Trp) , default : 4T.

▲Active to Precharge (Tras)
Setup Active to Precharge (Tras) , default : 07T.

▲Active to CMD (Trcd)
Setup Active to CMD (Trcd) , default : 4T.

▲REF to ACT/REF (Trfc)
Setup REF to ACT/REF (Trfc) , default : 25T.

▲ACT(0) to ACT(1) (TRRD)
Setup ACT(0) to ACT(1) (TRRD) , default : 3T.

▲Read to Precharge (Trtp)
Setup Read to Precharge (Trtp) , default : 2T.

▲Write to Read CMD (Twtr)
Setup Write to Read CMD (Twtr)). default : [1T/2T].

▲Write Recovery Time (Twr)
Setup Write Recovery Time (Twr), default : [4T].

▲DRAM Command Rate
Setup DRAM Command Rate , default : [2T Command].

▲RDSAIT mode
Setup RDSAIT mode , default : [Auto].

▲RDSAIT selection
Setup RDSAIT selection, default : 03.

Phoenix- AwardBIOS CMOS Setup Utility
AGP & P2P Bridge Control

VGA Share Memory Size	[64M]	Item Help
Select Display Device	[CRT+LCD]	
Panel Type	[01 800x600]	Menu Level ▶
Output Port	[DI0]	
Dithering	[Enabled]	
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

▲VGA Share Memory Size
Setup internal VGA Share Memory Size, default : 64M.

▲Select Display Device
Setup Select Display Device, default : [CRT+LCD].
Choice: [Auto]; [CRT]; [LCD]; [CRT+LCD].

▲Panel Type
Setup Panel Type, default : [01 800x600].
Choice: [01 800x600-18]; [02 800x600-24]; [03 1024x768-18]; [04 1024x768-24].

▲Output Port
Setup Output Port. default : [DI0]

▲Dithering
Setup Dithering function, default : [Enabled].

4.5 Integrated Peripherals

Phoenix- AwardBIOS CMOS Setup Utility
Integrated Peripherals

▶ VIA OnChip IDE Device	[Press Enter]	Item Help
▶ VIA OnChip PCI Device	[Press Enter]	
▶ Super IO Device	[Press Enter]	Menu Level ▶
Power After PWR-fail	[off]	
▶ 2nd Super IO Device	[Press Enter]	
▶ USB Device Setting	[Press Enter]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲VIA OnChip IDE Device
This item for setup on-chip IDE Device .

▲VIA OnChip PCI Device
This item for setup on-chip PCI Device.

▲Power After PWR-fail
This item for setup system power status.
When AC power off until power on.
System will be active on the setup function.

▲2nd Super IO Device
This item can setup 2nd Super IO Device.

▲Super IO Device
This item can setup Super IO Device.

▲USB Device Setting
This item can setup USB Device function.

Phoenix- Award BIOS CMOS Setup Utility
VIA OnChip IDE Device

SATA Controller	[Enabled]	Item Help
SATA Controller Mode	[IDE]	
IDE DMA transfer access	[Enabled]	Menu Level ▶
On-Chip IDE Channel1	[Enabled]	
IDE Prefetch Mode	[Enabled]	If your IDE hard drive Supports block mode Select Enabled for Automatic detection of The optimal number of block read/writes per sector the drive can support
IDE Secondary Master PIO	[Auto]	
IDE Secondary Slave PIO	[Auto]	
IDE Primary Master UDMA	[Auto]	
IDE Primary Slave UDMA	[Auto]	
IDE HDD Block Mode	[Enabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲SATA Controller
Internal SATA Controller. Default : [Enabled].

▲SATA Controller Mode
Set SATA Controller Mode. Default : [IDE]

▲IDE DMA transfer access
Set DMA transfer access function. Default : [Enabled]

▲On-Chip IDE Channel1
Set On-Chip IDE Channel1 function. Default : [Enabled]

▲IDE Prefetch Mode
Set IDE Prefetch Mode. Default : [Enabled]

▲IDE Secondary Master PIO
Set IDE Secondary Master PIO function. Default : [Auto]

▲IDE Secondary Slave PIO
Set IDE Secondary Slave PIO function. Default : [Auto]

▲IDE Primary Master UDMA
Set Primary Master UDMA function. Default : [Auto]

▲IDE Primary Slave UDMA
Set Primary Slave UDMA function. Default : [Auto]

▲IDE HDD Block Mode
Set IDE HDD Block Mode function. Default : [Enabled]

Phoenix- AwardBIOS CMOS Setup Utility
VIA OnChip PCI Device

Azalia HDA Controller	[Auto]	Item Help
LAN Boot ROM	[Disabled]	Menu Level ▶
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

▲Azalia HDA Controller
Set Azalia HDA Controller function. Default : [Auto]

▲LAN Boot ROM
Set LAN Boot ROM function. Default : [Disabled]

Phoenix- AwardBIOS CMOS Setup Utility
Super IO Device

POWER ON Function	[Button ONLY]	Menu Level ▶
X KB Power ON Password	Enter	
X Hot Key Power ON	Ctrl-F1	
Onboard Serial Port 1	[3F8/IRQ4]	
Onboard Serial Port 2	[2F8/IRQ3]	
UART Mode Select	[Normal]	
X RxD , TxD Active	Hi, Lo	
X IR Transmission Delay	Enabled	
X UR2 Duplex Mode	Half	
X Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
X EPP Mode Select	EPP1.7	
X ECP Mode Use DMA	3	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲POWER ON Function
This option is set system power on function as button.

▲Onboard Serial Port 1
This option is set onboard serial port1 address and IRQ.
Default is [3F8/IRQ4].

▲Onboard Serial Port 2
This option is set onboard serial port2 address and IRQ.
Default is [2F8/IRQ3].

▲UART Mode Select
This item is set the UART mode.
Default is [Normal].
UART Setup content as below :
X RxD , TxD Active : Hi, Lo
X IR Transmission Delay : Enabled
X UR2 Duplex Mode : Half

X Use IR Pins : IR-Rx2Tx2

▲Onboard Parallel Port
This option is set onboard parallel port address and IRQ.
Default is [378/IRQ7]].

▲Parallel Port Mode
This item is set parallel port mode
Default : [SPP]
X EPP Mode Select : EPP1.7
X ECP Mode Use DMA : 3

SPP : Standard parallel port.
EPP : Enhanced parallel port.
ECP : Extend Capabilities port.
ECP+EPP : Combination of ECP and EPP capabilities.
Normal : Normal function.

Phoenix- AwardBIOS CMOS Setup Utility
2nd Super IO Device

Onboard Serial Port 3	[3E8h]	Menu Level ▶
Serial Port 3 Use IRQ	[IRQ10]	
Onboard Serial Port 4	[2E8h]	
Serial Port 4 Use IRQ	[IRQ11]	
Onboard Serial Port 5	[4F8h]	
Serial Port 5 Use IRQ	[IRQ5]	
Onboard Serial Port 6	[4E8h]	
Serial Port 6 Use IRQ	[IRQ11]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲Onboard Serial Port 3
This option is set onboard serial port3 address and IRQ.
Default is [3E8/IRQ10].

▲Onboard Serial Port 4
This option is set onboard serial port4 address and IRQ.
Default is [2E8/IRQ11].

▲Onboard Serial Port 5
This option is set onboard serial port5 address and IRQ.

Default is [4F8/IRQ5].

▲Onboard Serial Port 6
This option is set onboard serial port6 address and IRQ.
Default is [4E8/IRQ11].

Phoenix- AwardBIOS CMOS Setup Utility
USB Device Setting

USB 1.0 Controller	[Enabled]	Menu Level ▶
USB 2.0 Controller	[Enabled]	
USB Operation Mode	[High speed]	
USB Keyboard Function	[Enabled]	
USB Mouse Function	[Enabled]	
*** USB Mass Storage Device Boot Setting ***		

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲USB 1.0 Controller
This option is set USB 1.0 Controller function.

▲USB 2.0 Controller
This option is set USB 2.0 Controller function.

▲USB Operation Mode
This option is set USB Operation Mode.

▲USB Keyboard Function
This option is set USB Keyboard Function.

▲USB Mouse Function
This option is set USB Mouse Function.

▲USB Mass Storage Device Boot Setting
This is display type of USB storage.

4.6 Power Management Setup

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

Phoenix- AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	[Enabled]	Item Help
ACPI Suspend Type	[S1(POS)]	
Power Management Option	[User Define]	Menu Level ▶
HDD Power Down	[Disabled]	
Suspend Mode	[Disabled]	
Video off Option	[Suspend -> off]	
Video off Method	[V/H SYNC+Blank]	
Soft-Off by PWR-BTN	[Instant-Off]	
▶ Wake-Up Event Detect	[Press Enter]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲ACPI Function
This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

▲ACPI Suspend Type
The default setting of the ACPI mode is S1(POS).

▲Power Management Option
This category allows you to select the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".
There are three selections for Power Management, three of which have fixed mode settings.

User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.
Min. Power Saving	Minimum power management.
Max. Power Saving	Maximum power management.

▲HDD Power Down
After the selected period of drive inactivity,
the hard disk drive powers down while all other devices remain active.

▲Suspend Mode
After the selected period of system inactivity, all devices except the CPU shut off.

▲Video off Option
This item set the video is off in suspend mode.

▲Video off Method
This item set the video off mode.

V/H SYNC+Blank	Blank the screen and turn off vertical and horizontal scanning.
DPMS	Allow BIOS control the video display.
Blank Screen	Writes blanks to the video buffer.

▲Soft-Off by PWR-BTN
This field defines the power-off mode when using an ATX power supply. The "Instant –off" mode allows powering off immediately upon pressing the power button. In the "Delay 4 sec" mode. The system power off when the power button is pressed for more than four seconds or enters the suspend mode when press for less than 4 seconds.

▲Wake-Up Event Detect
This option for set system wale-up event.

Phoenix- AwardBIOS CMOS Setup Utility
Wake-Up Event Detect

	PowerOn by PCI Card	[By OS]
	Modem Ring Resume	[By OS]
	RTC Alarm Resume	[Disabled]
X	Date (of Month)	0
X	Resume Time (hh:mm:ss)	0 : 0 :0

Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲PowerOn by PCI Card
This function is set Wake-On LAN function.

▲Modem Ring Resume
This field for external modem wake-up setting used.

▲RTC Alarm Resume
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the Date and Time.

4.7 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system that allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix- AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	[No]	Item Help
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	Menu Level ▶
X IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	[Disabled]	
Assign IRQ For VGA	[Enabled]	
Assign IRQ For USB	[Enabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲PNP OS Installed
Select Yes. if the system operating environment is Plug-and-Play awares (e.g., Windows 95).

▲Reset Configuration Data
Default is 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 OS cannot boot.

▲Resources Controlled By
BIOS can automatically configure all the boot and plug and play compatible devices. If you choose Auto, you cannot select IRQ DMA and memory base address fields, since BIOS automatically assigns them.

▲PCI/VGA Palette Snoop
Some non-standard VGA display cards may not show colors properly.
This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG/VESA card.

▲Assign IRQ For VGA .
This option is assign IRQ For VGA .

▲Assign IRQ For USB .
This option is assign IRQ For USB .

4.8 PC Health Status

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

		Item Help
Shutdown Temperature	[Disabled]	
CPU Warning Temperature	[Disabled]	
Current System Temperature	46℃/114℉	Menu Level ▶
Current CPU Temperature	48℃/118℉	
CPU Fan Speed	6337 RPM	
System Fan Speed	0 RPM	
CPU Vcore	1.04 V	
+12 V	11.98 V	
+1.5 V	1.56 V	
+1.8 V	1.81V	
+5 V	5.07 V	
VBAT(V)	3.00 V	
3.3 VSB (V)	3.36 V	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲Shutdown Temperature
This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

▲CPU Warning Temperature
This item allows you to set a temperature above which the system will start the beeping warning.

▲Temperatures / Voltages
Hardware monitor PC health state.
Include temperatures and voltages.

4.9 Frequency/Voltage Control

Phoenix- AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

CPU Clock Ratio	[10 X]	Item Help
Auto Detect PCI Clk	[Enabled]	
Spread Spectrum	[Disabled]	Menu Level ▶
CPU Clock	[100MHz]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

▲CPU Clock Ratio
This function is set CPU Clock Ratio.

▲Auto Detect PCI Clk
This option is set auto detection of the PCI clock.

▲Spread Spectrum
The Spread spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curve.

▲CPU Clock
This function is set CPU Clock.

Note : You can get more detail information at www.phoenix.com.

4.10 Default Menu

Selecting "Defaults" from the main menu shows you two options, which are described below,

Load Fail-Safe Defaults

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

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

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

Load Optimized Defaults (Y/N) ? N

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

4.11 Supervisor/User Password Setting

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

Set Supervisor Password: can enter and change the options of the setup menus.

Set User Password: just can only enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

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

PASSWORD DISABLED

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

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

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

4.12 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

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

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving7

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Chapter 5
Troubleshooting

This chapter provides a few useful tips to quickly get FEB-7100 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

Power Connection

FEB-7100 is support DC12V input power please check your adapter pin assignment is match (Please see figure 5-1).

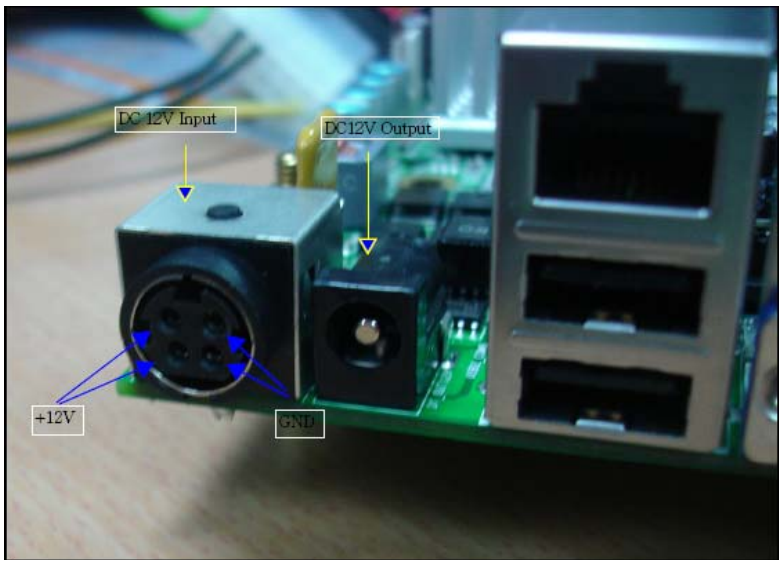


figure 5-1

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the device cables required before turning on ATX power. CPU fan, CPU fan power cable, 200-pin DDR II SDRAM, keyboard, mouse, SATA hard disk, printer, VGA connector, device power cables are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with FEB-7100, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the Default Optimal Setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper Disable Operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the floppy drive, COM1/COM2 ports, parallel port, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Disable COM3 serial port to release IRQ #10
Disable COM4 serial port to release IRQ #11
Disable parallel port to release IRQ #7
Disable PS/2 mouse to release IRQ #12 ,…, etc.

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Unboot Issues

Symptom : After installing cable and all power required, but why my FEB-7100 is still not working ?

Solution : First of all, you might want to double check your power source, because it could be a cause resulting in failure boot of the board.

Symptom : My FEB-7100 just keeps beeping, and nothing has been shown on the screen ?

Solution : As a matter of fact, each beep sound represents different definition of error message. Therefore, please refer to the table as follow,

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Information & Support

Q: How can I connect my FEB-7100 to LVDS panel ?

A: First of all, you need to get the pin assignments of LVDS and Inverter, and then match the pin assignment of LVDS1 and INV1 on FEB-7100 in order to make a cable to connect to LVDS and FEB-7100 .

Q: After installing Compact Flash, why the device on Secondary has been missing ?

A: As a matter of fact, the default setting for Compact Flash at secondary channel is salve. Therefore, you might want to check if your missing device is set to the same as our default setting of Compact Flash. If it is, please either set up Compact flash as master device or your missing device as master device. The jumper to adjust slave or master for compact flash is JP5.

Q: I am building the embedded system, but I cannot find embedded driver on website. Where can I get them ?

A: Indeed, for Intel Chipset, It is available on Intel website; here is hyperlink of Intel website:
http://www.intel.com/design/intarch/software/driver/index.htm . For other devices, please visit their website to download those embedded drivers. However, we will put those drivers on our website in future, and CD.