

ETX-821

Intel® Pentium® M/
Celeron® M Processors

ETX CPU Module
With LCD, Ethernet,
Audio, PCI, ISA

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 ETX-821 CPU Module
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

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Chapter

1

**General
Information**

1.1 Introduction

We are appreciating your purchase of AAEON's Embedded Technology EXtended (ETX) product – **ETX-821**.

Being an ETX compatible module, the ETX-821 was designed specially to improve the quality and speed of your product development. It will provide a more compact size and more flexibility for your various applications.

The features of the ETX-821 are based on the Intel® Pentium® M/ Celeron® M processor combined with Intel® 852GM and ICH4 chipset. It has one 200-pin SODIMM socket that allows a system memory capacity up to 1GB with DDR SDRAM module. Hence, the ETX-821 can provide common PC peripheral functions such as graphics, USB, serial, parallel ports, keyboard/mouse, Ethernet, and IDE. The baseboard designer can optimize exactly which and how these functions are implemented physically.

All of AAEON's ETX modules have a standard form factor and a standard connector layout that carry a specified set of signals. By adopting this standardization, the designers can create a single system of baseboard that can accept present and future ETX modules. The baseboard designer can optimize exactly how each of these functions is implemented physically. Designers can place

connectors precisely where needed for the application on a baseboard designed to optimally fit a system's packaging.

AAEON's ETX system is your stepping-stone to a whole new world of embedded product development. Once again, thank you for your purchase of this AAEON product and we trust that your product development will be swift, sure and successful!

1.2 Features

- Intel® Pentium® M/ Celeron® M Processors
- Intel® 852GM+ICH4 Chipset
- Non-ECC DDR 200/266 Memory
- CRT/ LVDS LCD / TV
- 10/100Base-TX Ethernet
- AC97 Audio CODEC
- +5V Operation Voltage

1.3 Specifications

System

- CPU: Intel® Pentium® M/ Celeron® M Processors 【Pentium M 1.6GHz (.13 μ m process, Banias core) may not be supported】
- Memory: One 200-pin DDR SODIMM supports DDR 200/266 up to 1GB
- Chipset: Intel® 852GM+ICH4
- Ethernet: Intel® 82562ET, 10/100 Base-TX
- BIOS: Award Plug & Play BIOS
- Watchdog Timer: Generates a Time-out System Reset
- H/W Status Monitoring: Supports Power Supply Voltages, Fan Speed and Temperatures Monitoring
- Expansion Interface: ISA, PCI
- Power Supply Voltage: +5V DC
- Board Size: 4.5"(L) x 3.75"(W) (114mm x 95mm)
- Gross Weight: 0.66lb (0.3kg)
- Operating Temperature: 32°F~140°F (0°C~60°C)

Display

- Chip: Intel® 852GM integrated
- Memory: Shared Memory Up to 64MB with DVMT
- Resolutions: Up to 1600 x 1200 (UXGA) @85Hz for CRT; Up to 1280 x 1024 (SXGA) for LCD
- LCD Interface: Up to 18/36-bit dual channel LVDS
- TV-out: Supports NTSC and PAL

I/O

- Chip: ITE IT8712
- MIO: EIDE x 2, Keyboard + Mouse x 1, Parallel port x 1, COM port x 2
- IrDA: One IrDA Tx/Rx Header
- Audio: 2-ch AC97 CODEC
- USB: 4 USB 2.0 ports

Chapter

2

**Quick
Installation
Guide**

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

Warning!

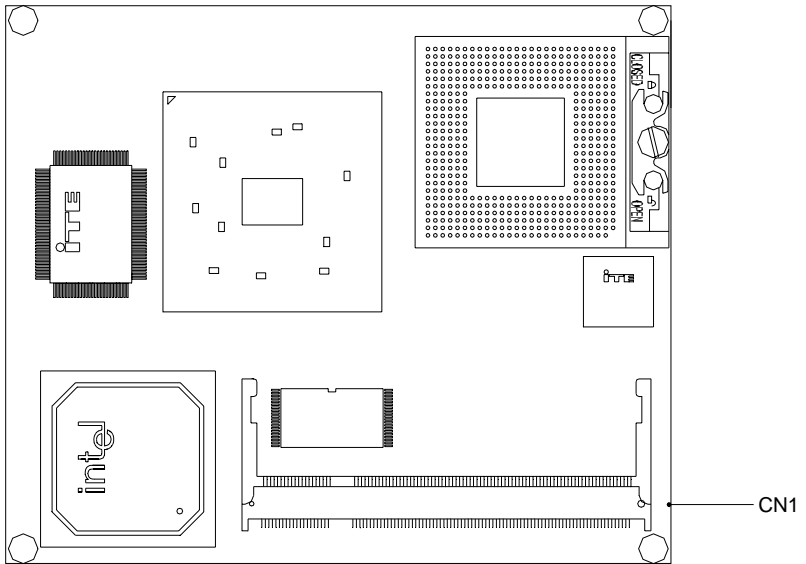
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

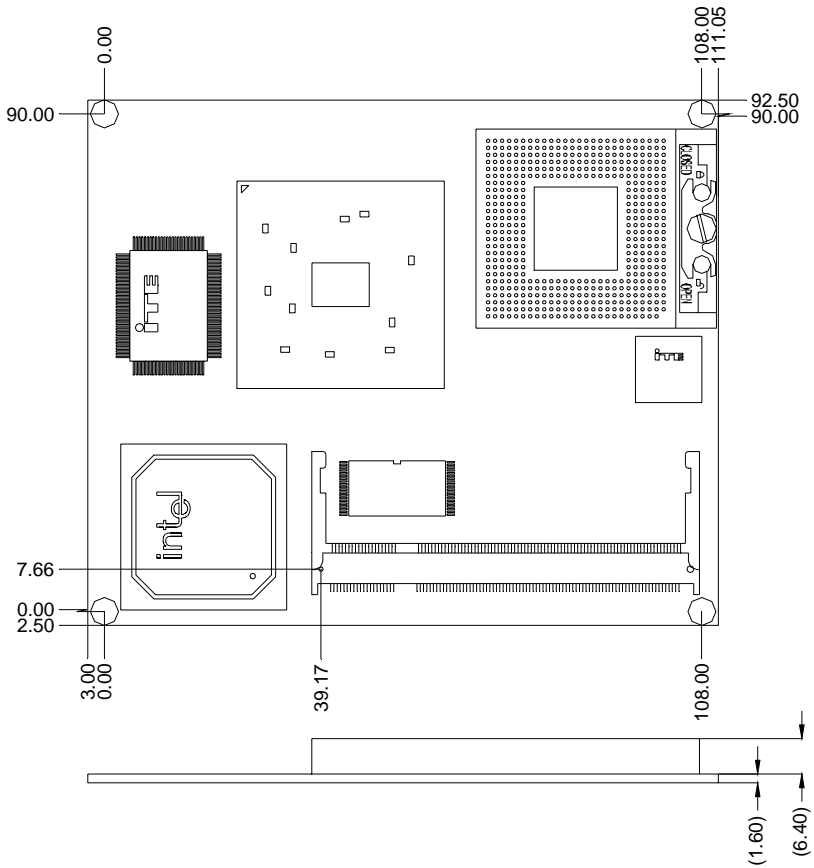


Solder Side

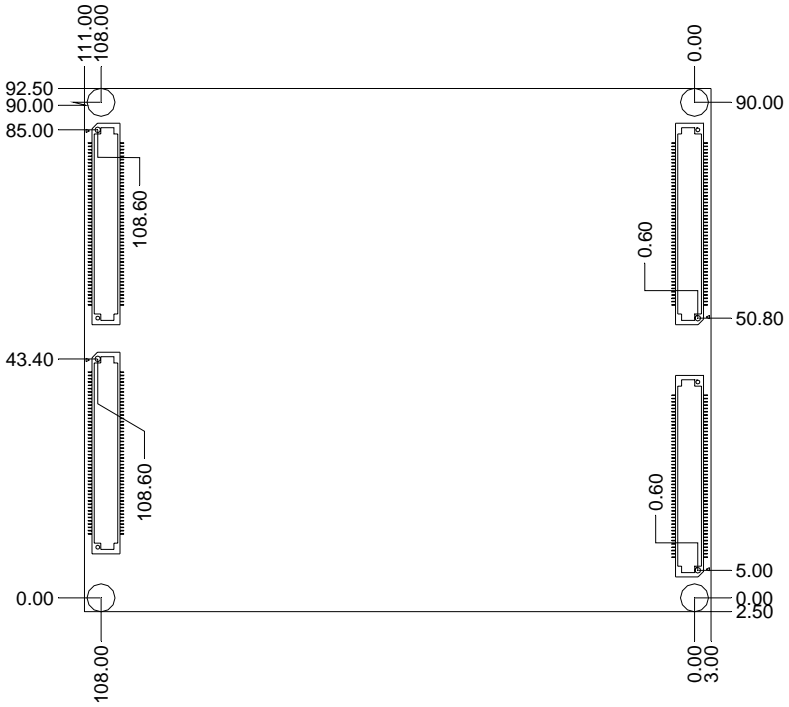


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Connectors

Label	Function
ETX 1	PCI / USB / Audio
ETX 2	ISA
ETX 3	VGA / LCD / TV-out / COMs / LPT / FDD / IrDA / Mouse / Keyboard
ETX 4	IDE 1 / IDE 2 / Miscellaneous
CN 1	DDR SODIMM

Caution:

In order to properly clear the CMOS when using this ETX module with ECB-901A, please ensure to turn off the main switch on the power supply before taking actions. That should include both AT and ATX power supply. Fail to turn off the main switch of power supply might result in unsuccessful CLEAR CMOS action.

2.5 ETX 1

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	PCICLK3	4	PCICLK4	53	PAR	54	SERR#
5	GND	6	GND	55	PERR#	56	NC
7	PCICLK1P	8	PCICLK2	57	PCI_PME#	58	USB2#
9	REQ3#	10	GNT3#	59	PLOCK#	60	DEVSEL#
11	GNT2# NC	12	3V	61	TRDY#	62	USB3#
13	REQ2#	14	GNT1#	63	IRDY#	64	STOP#
15	REQ1#	16	3V	65	FRAME#	66	USB2
17	GNT0#	18	NC	67	GND	68	GND
19	VCC	20	VCC	69	AD16	70	CBE2#
21	DREQ2 / SERIRQ	22	REQ0#	71	AD17	72	USB3
23	AD0	24	3V	73	AD19	74	AD18
25	AD1	26	AD2	75	AD20	76	USB0#
27	AD4	28	AD3	77	AD22	78	AD21
29	AD6	30	AD5	79	AD23	80	USB1#
31	CBE0#	32	AD7	81	AD24	82	CBE3#
33	AD8	34	AD9	83	VCC	84	VCC
35	GND	36	GND	85	AD25	86	AD26
37	AD10	38	LIN_L	87	AD28	88	USB0
39	AD11	40	MIC_IN	89	AD27	90	AD29
41	AD12	42	LIN_R	91	AD30	92	USB1
43	AD13	44	VCCAUD	93	PCIRST#	94	AD31
45	AD14	46	LOUT_L	95	INTC#	96	INTD#
47	AD15	48	GNAUD	97	INTA#	98	INTB#
49	CBE1#	50	LOUT_R	99	GND	100	GND

2.6 ETX 2

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	SD14	4	SD15	53	SA6	54	IRQ5
5	SD13	6	MASTER#	55	SA7	56	IRQ6
7	SD12	8	DREQ7	57	SA8	58	IRQ7
9	SD11	10	DACK7#	59	SA9	60	SYSCLK
11	SD10	12	DREQ6	61	SA10	62	REFSH#
13	SD9	14	DACK6#	63	SA11	64	DREQ1
15	SD8	16	DREQ5	65	SA12	66	DACK1#
17	MEMW#	18	DACK#5	67	GND	68	GND
19	MEMR#	20	DREQ0	69	SA13	70	DREQ3
21	LA17	22	DACK0#	71	SA14	72	DACK3#
23	LA18	24	IRQ14	73	SA15	74	IOR#
25	LA19	26	IRQ15	75	SA16	76	LOW#
27	LA20	28	IRQ12	77	SA18	78	SA17
29	LA21	30	IRQ11	79	SA19	80	SMEMR#
31	LA22	32	IRQ10	81	IOCHRDY	82	AEN
33	LA23	34	IO16#	83	VCC	84	VCC
35	GND	36	GND	85	SD0	86	SMEMW#
37	SBHE#	38	M16#	87	SD2	88	SD1
39	SA0	40	OSC	89	SD3	90	NOWS#
41	SA1	42	BALE	91	DREQ2	92	SD4
43	SA2	44	TC	93	SD5	94	IRQ9
45	SA3	46	DACK2#	95	SD6	96	SD7
47	SA4	48	IRQ3	97	IOCHK#	98	RSTDRV
49	SA5	50	IRQ4	99	GND	100	GND

2.7 ETX 3

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	NC	52	NC
3	R	4	B	53	VCC	54	GND
5	HSY	6	G	55	STB#	56	AFD#
7	VSY	8	CRT_ DDCCLK	57	NC	58	PD7
9	NC	10	CRT_ DDCDAT	59	IRRX	60	ERR#
11	TXCLK1#	12	TXOUT13#	61	IRTX	62	PD6
13	TXCLK1	14	TXOUT13	63	RXD2	64	INIT#
15	GND	16	GND	65	GND	66	GND
17	TXOUT11	18	TXOUT12	67	RTS2#	68	PD5
19	TXOUT11#	20	TXOUT12##	69	DTR2#	70	SLIN#
21	GND	22	GND	71	DCD2#	72	PD4
23	TXOUT03#	24	TXOUT10	73	DSR2#	74	PD3
25	TXOUT03	26	TXOUT10#	75	CTS2#	76	PD2
27	GND	28	GND	77	TXD2#	78	PD1
29	TXOUT02#	30	TXCLK0	79	RI2#	80	PD0
31	TXOUT02	32	TXCLK0#	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	ACK#
35	TXOUT00	36	TXOUT01	85	RTS1#	86	BUSY#
37	TXOUT00#	38	TXOUT01#	87	DTR1#	88	PE
39	VCC	40	VCC	89	DCD1#	90	SLCT#
41	LVDS_ DDCPDATA	42	DVOCVSYNC	91	DSR1#	92	MSCLK
43	LVDS_ DDCPCLK	44	LVDS_ BKLEN	93	CCTS1#	94	MSDAT

45	LVDS_ BKLCTL	46	LVDS_ DIGON	95	TXD1	96	KBCLK
47	CVBS	48	Y	97	RI1#	98	KBDAT
49	CSYNC	50	C	99	GND	100	GND

2.8 ETX 4

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	SIDE_LOW	52	PIDE_IOR#
3	5V_SB	4	RSTIN#	53	SIDE_DRQ	54	PIDE_LOW
5	PS_ON	6	SPEAKER	55	SIDE_D15	56	PIDE_DRQ
7	PWRBTN#	8	BAT	57	SIDE_D0	58	PIDE_D15
9	FAN_TAC	10	LILED	59	SIDE_D14	60	PIDE_D0
11	WDT_RST	12	ACTLED	61	SIDE_D1	62	PIDE_D14
13	NC	14	SPEEDLED	63	SIDE_D13	64	PIDE_D1
15	NC	16	SMBCLK	65	GND	66	GND
17	VCC	18	VCC	67	SIDE_D2	68	PIDE_D13
19	DACK2 / OVCR#	20	GPIO0	69	SIDE_D12	70	PIDE_D2
21	EXTSMI#	22	SMBDATA	71	SIDE_D3	72	PIDE_D12
23	SMBCLK	24	SMBDATA	73	SIDE_D11	74	PIDE_D3
25	SIDE_CS3#	26	CPUFAN/NC	75	SIDE_D4	76	PIDE_D11
27	SIDE_CS1#	28	VCC	77	SIDE_D10	78	PIDE_D4
29	SIDE_A2	30	PIDE_CS3#	79	SIDE_D5	80	PIDE_D10
31	SIDE_A0	32	PIDE_CS1#	81	VCC	82	VCC
33	GND	34	GND	83	SIDE_D9	84	PIDE_D5
35	P66DET/ S66DET	36	PIDE_A2	85	SIDE_D6	86	PIDE_D9
37	SIDE_A1	38	PIDE_A0	87	SIDE_D8	88	PIDE_D6
39	SIDE_INTR	40	PIDE_A1	89	RING#	90	P66DET

ETX CPU Module**ETX-821**

41	S66DET/ NC	42	NC	91	RXD#	92	PIDE_D8
43	SIDE_AK#	44	PIDE_INTRQ	93	RXD	94	SIDE_D7
45	SIDE_RDY	46	PIDE_AK#	95	TXD#	96	PIDE_D7
47	SIDE_IOR#	48	PIDE_RDY	97	TXD	98	HDRST#
49	VCC	50	VCC	99	GND	100	GND

Chapter

3

**Award
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The ETX-821 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press immediately. This will allow you to enter Setup.



Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu allows you to set the shutdown temperature for your system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

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

Load Optimized Defaults

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

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the "AAEON BIOS Item Description.pdf" file in the CD for the meaning of each setting in this chapter.

Chapter

4

**Driver
Installation**

The ETX-821 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

In addition, you can activate the installation items through Auto-run program which will install each driver directly. If your system do not support Auto-run program or you cannot install drivers successfully, please read instructions below for further detailed installations.

Follow the sequence below to install the drivers:

Step 1 – Install Intel® INF Driver

Step 2 – Install Intel® VGA Driver

Step 3 – Install Intel® LAN Driver

Step 4 – Install Realtek AC97 codec Driver

USB 2.0 Drivers are available for download using Windows Update for both Windows XP and Windows 2000. For additional information regarding USB 2.0 support in Windows XP and Windows 2000, please visit www.microsoft.com/hwdev/usb/.

4.1 Installation

Insert the ETX-821 CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

Step 1 – Install Intel® INF Driver for Windows

1. Click on the Step-1 **Intel® INF** folder.
2. Double click on **the exe. file.**
3. Follow the instructions that the window shows.
4. The system will help you install the driver automatically.
5. Please re-start your computer.

Step 2 – Install Intel® VGA Driver

1. Click on the Step-2 **Intel® VGA Driver** folder.
2. Double click on **the exe. file.**
3. Follow the instructions that the window shows.
4. The system will help you install the driver automatically.
5. Please re-start your computer.

Remark: You can choose the different display ways by pressing below hot key,

C+A+F1=CRT, C+A+F3=LCD, C+A+F12=Graphic Control Panel

(C=Ctrl, A=Alt)

Step 3 – Install Intel® LAN Driver

1. Click on the Step-3 **Intel® LAN Driver** folder.
2. Choose the OS your system is.

3. Double click on **the exe. file** located in each OS folder.
4. Follow the instructions that the window shows.
5. The system will help you install the driver automatically.

Step 4 – Install Realtek AC97 codec Driver

1. Click on the Step-4 **Realtek AC97 codec Driver** folder
2. Choose the OS your system is.
3. Double click on **the exe. file** located in each OS folder.
4. Follow the instructions that the window shows.
5. The system will help you install the driver automatically.

Note:

Under the Window OS environment, if the CRT connector is connected to display monitor by the data switch device, the user need to set the color and resolution from Intel Graphic utility (VGA driver) instead of setting from the control panel in case of the wrong display appearance.

Appendix

A

Programming the Watchdog Timer

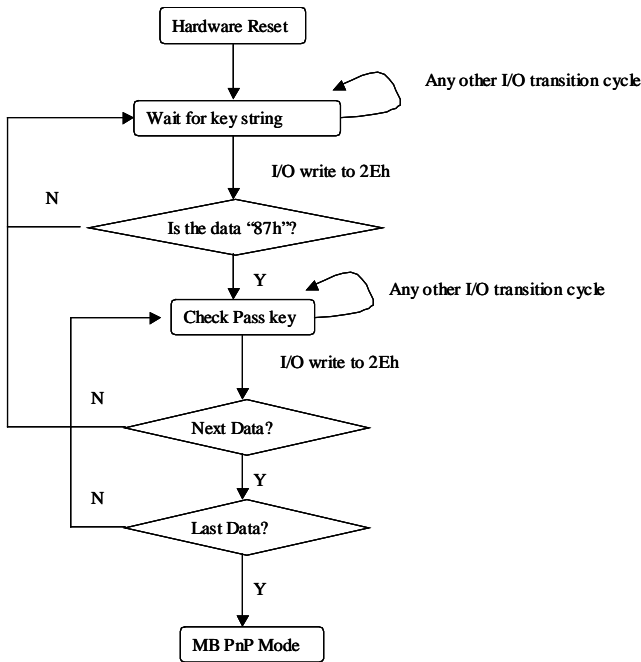
A.1 Programming

ETX-821 utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAEMON initial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports

(2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to

say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit Description

7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h,Default=00h)

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level ^{Note} for WDT

WatchDog Timer Time-out Value Register (Index=73h,**Default=00h)**

Bit	Description
7-0	WDT Time-out value 7-0

A.2 IT8712 Watchdog Timer Initial Program

```
.MODEL SMALL
```

```
.CODE
```

Main:

```
CALL Enter_Configuration_mode
```

```
CALL Check_Chip
```

```
mov cl, 7
```

```
call Set_Logic_Device
```

```
;time setting
```

```
mov cl, 10 ; 10 Sec
```

```
dec al
```

Watch_Dog_Setting:

```
;Timer setting
```

```
mov al, cl
```

```
mov cl, 73h
```

```
call Superio_Set_Reg
```

```
;Clear by keyboard or mouse interrupt
```

```
mov al, 0f0h
```

```
mov cl, 71h
```

```
call Superio_Set_Reg
```

```
;unit is second.
```

```
mov al, 0C0H
```

```
mov cl, 72h
```

```
call Superio_Set_Reg
```



```
; game port enable  
mov cl, 9  
call Set_Logic_Device
```

```
Initial_OK:  
CALL Exit_Configuration_mode  
MOV AH,4Ch  
INT 21h
```

```
Enter_Configuration_Mode PROC NEAR  
MOV SI,WORD PTR CS:[Offset Cfg_Port]
```

```
MOV DX,02Eh  
MOV CX,04h  
Init_1:  
MOV AL,BYTE PTR CS:[SI]  
OUT DX,AL  
INC SI  
LOOP Init_1  
RET  
Enter_Configuration_Mode ENDP
```

```
Exit_Configuration_Mode PROC NEAR  
MOV AX,0202h  
CALL Write_Configuration_Data
```

RET

Exit_Configuration_Mode ENDP

Check_Chip PROC NEAR

MOV AL,20h

CALL Read_Configuration_Data

CMP AL,87h

JNE Not_Initial

MOV AL,21h

CALL Read_Configuration_Data

CMP AL,12h

JNE Not_Initial

Need_Initial:

STC

RET

Not_Initial:

CLC

RET

Check_Chip ENDP

Read_Configuration_Data PROC NEAR

MOV DX,WORD PTR CS:[Cfg_Port+04h]

OUT DX,AL

```
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
```

```
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
```

```
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
```

```
Set_Logic_Device proc near
push ax
push cx
xchg al,cl
mov cl,07h
call Superio_Set_Reg
pop cx
pop ax
ret
Set_Logic_Device endp
```

```
;Select 02Eh->Index Port, 02Fh->Data Port
Cfg_Port DB 087h,001h,055h,055h
```

```
DW 02Eh,02Fh
```

END Main

Note: Interrupt level mapping

0Fh-Dh: not valid

0Ch: IRQ12

.

.

03h: IRQ3

02h: not valid

01h: IRQ1

00h: no interrupt selected























Appendix

B

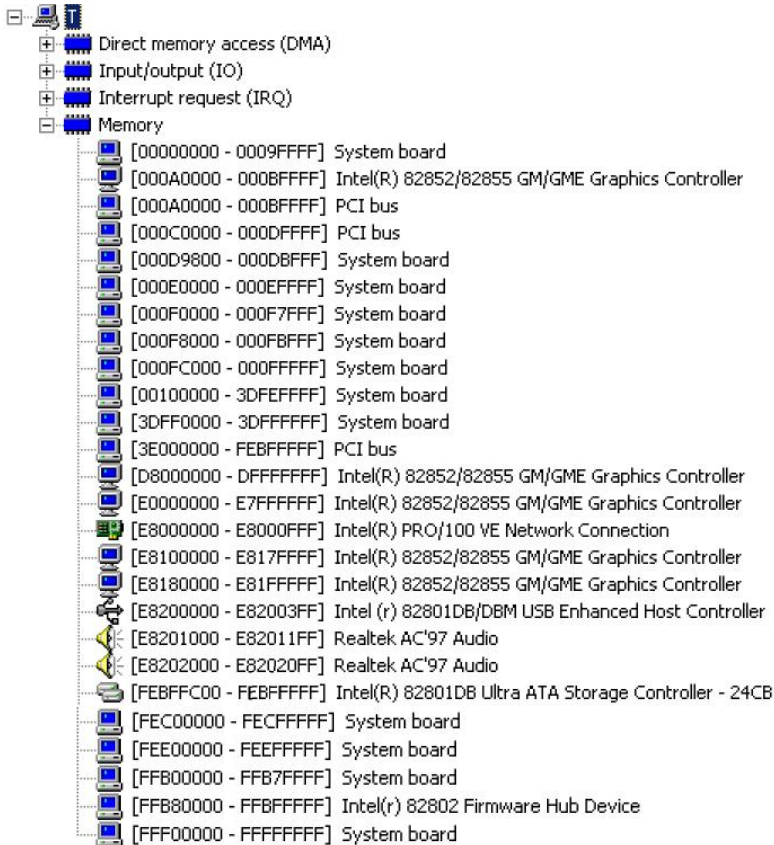
I/O Information

B.1 I/O Address Map

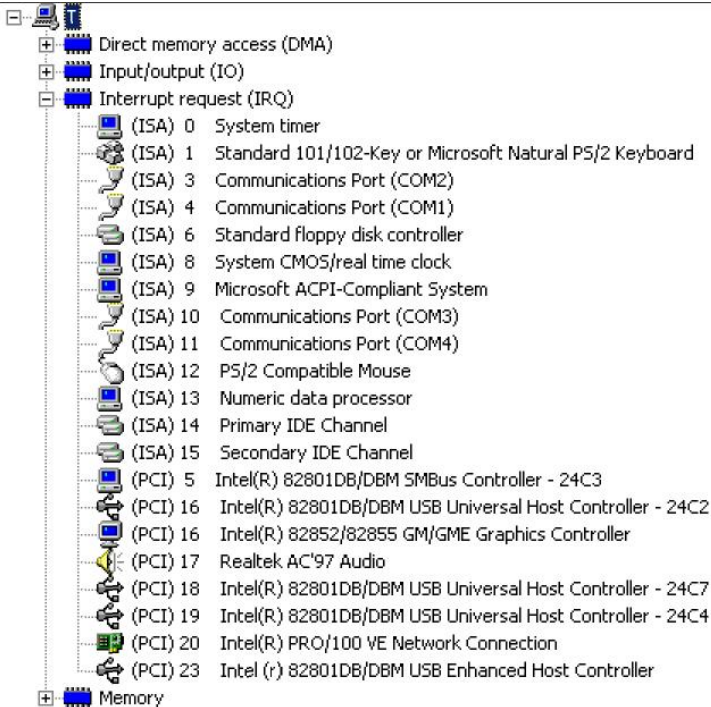
Direct memory access (DMA)	
Input/output (IO)	
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000060 - 00000060]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000061 - 00000061]	System speaker
[00000062 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
[00000065 - 0000006F]	Motherboard resources
[00000070 - 00000073]	System CMOS/real time clock
[00000074 - 0000007F]	Motherboard resources
[00000080 - 00000090]	Direct memory access controller
[00000091 - 00000093]	Motherboard resources
[00000094 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[00000170 - 00000177]	Secondary IDE Channel
[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000278 - 0000027F]	Printer Port (LPT2)
[00000290 - 0000029F]	Motherboard resources
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F8 - 000002FF]	Communications Port (COM2)
[00000376 - 00000376]	Secondary IDE Channel
[00000378 - 0000037F]	Printer Port (LPT1)
[000003B0 - 000003BB]	Intel(R) 82852/82855 GM/GME Graphics Controller
[000003C0 - 000003DF]	Intel(R) 82852/82855 GM/GME Graphics Controller
[000003E8 - 000003EF]	Communications Port (COM3)
[000003F0 - 000003F5]	Standard floppy disk controller
[000003F6 - 000003F6]	Primary IDE Channel
[000003F7 - 000003F7]	Standard floppy disk controller
[000003F8 - 000003FF]	Communications Port (COM1)
[00000400 - 000004BF]	Motherboard resources

	[000003C0 - 000003DF] Intel(R) 82852/82855 GM/GME Graphics Controller
	[000003E8 - 000003EF] Communications Port (COM3)
	[000003F0 - 000003F5] Standard floppy disk controller
	[000003F6 - 000003F6] Primary IDE Channel
	[000003F7 - 000003F7] Standard floppy disk controller
	[000003F8 - 000003FF] Communications Port (COM1)
	[00000400 - 000004BF] Motherboard resources
	[000004D0 - 000004D1] Motherboard resources
	[00000500 - 0000051F] Intel(R) 82801DB/DBM SMBus Controller - 24C3
	[00000800 - 00000805] Motherboard resources
	[00000A79 - 00000A79] ISAPNP Read Data Port
	[00000D00 - 0000FFFF] PCI bus
	[0000D000 - 0000D03F] Intel(R) PRO/100 VE Network Connection
	[0000E000 - 0000E01F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C2
	[0000E100 - 0000E11F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C4
	[0000E200 - 0000E21F] Intel(R) 82801DB/DBM USB Universal Host Controller - 24C7
	[0000E300 - 0000E307] Intel(R) 82852/82855 GM/GME Graphics Controller
	[0000E500 - 0000E5FF] Realtek AC'97 Audio
	[0000E600 - 0000E63F] Realtek AC'97 Audio
	[0000F000 - 0000F00F] Intel(R) 82801DB Ultra ATA Storage Controller - 24CB
	Interrupt request (IRQ)
	Memory

B.2 1st MB Memory Address Map



B.3 IRQ Mapping Chart



B.4 DMA Channel Assignments

