

**ETX-821**

Onboard Intel® LV Pentium® M/  
ULV Celeron® M Processor  
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

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We are appreciating your purchase of AAEON's Embedded Technology EXtended (ETX) product – the **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® Ultra Low Voltage Celeron® M or LV Pentium® M processor combined with Intel® 852/855 (GM/GME) and ICH4 chipsets. 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 “baseboards” 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

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- Onboard Intel® Celeron® M 600MHz(w/o L2 on-die cache, w/ 852GM), Celeron® M 1.3GHz(w/ 852GM) and LV Pentium® M 1.1GHz(w/ 855GME)
- 266MHz Memory Bus Supports One 200-pin DDR SO-DIMM up to 1GB(852GM), 333MHz Memory Bus Supports One 200-pin DDR SO-DIMM up to 1GB(855GME)
- Supports 2 Channel LVDS LCD and TV-out
- Supports 10/100Mbps Ethernet
- Supports AC97 Audio CODEC
- Supports 2 COM / 1 Parallel / 4 USB2.0

## 1.3 Specifications

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### System

- CPU: Onboard Intel® Celeron® M 600MHz (w/o L2 on-die cache), Celeron® M 1.3GHz, and LV Pentium® M 1.1GHz
- Memory: 266MHz memory bus supports one 200-pin DDR SO-DIMM up to 1GB (852GM), 333MHz memory bus supports one 200-pin DDR SO-DIMM up to 1GB (855GME)
- Chipset: Intel® 852GM or 855GME/ICH4
- Ethernet: Intel® 82562ET, 10/100 Base-TX
- BIOS: Award Plug & Play BIOS
- Watchdog Timer: Generate 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 or 855GME/ICH4
- Memory: Shared Memory Up to 64MB with DVMT
- Resolutions: Up to 1600 x 1200
- LCD Interface: Up to 24-bit Dual Channel LVDS TFT LCD
- TV-out: Supports NTSC and PAL Standard

**I/O**

- MIO: EIDE x 2, Keyboard + Mouse x1, Parallel x 1, RS-232 x 2
- IrDA: One IrDA Tx/Rx Header
- Audio: 2CH 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

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**Warning!**

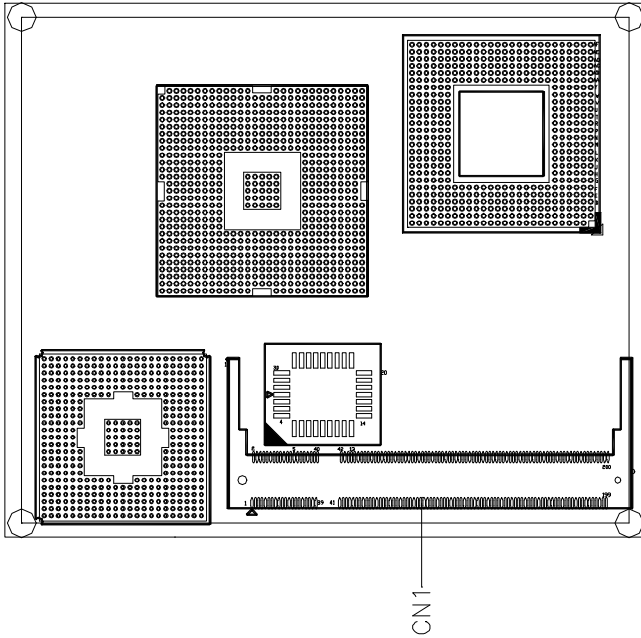
*Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

**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



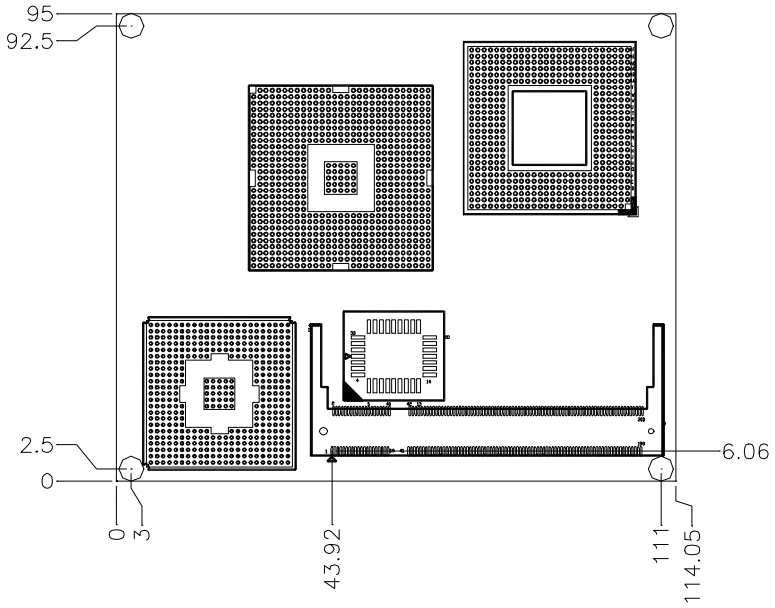
Solder Side



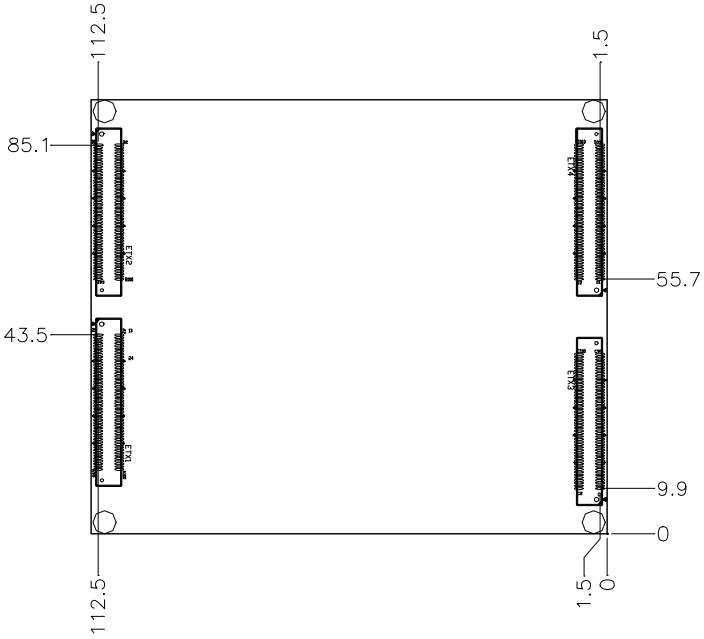


### 2.3 Mechanical Drawing

#### Component Side



Solder Side



## 2.4 List of Connectors

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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 / Video out / COMs / LPT / FDD /<br>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   | PCICLK1           | 8   | PCICLK2 | 57  | PCI_PME# | 58  | USB2#   |
| 9   | REQ3#             | 10  | GNT3#   | 59  | PLOCK#   | 60  | DEVSEL# |
| 11  | GNT2#             | 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 /<br>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_<br>DDCCLK | 57  | NC     | 58  | PD7    |
| 9   | NC                | 10  | CRT_<br>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_<br>DDCPDATA | 42  | DVOCVSY<br>NC  | 91  | DSR1#  | 92  | MSCLK  |
| 43  | LVDS_<br>DDCPCLK  | 44  | LVDS_<br>BKLEN | 93  | CCTS1# | 94  | MSDAT  |
| 45  | LVDS_<br>BKLCTL   | 46  | LVDS_<br>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 /<br>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/<br>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    |
| 41  | S66DET/<br>NC     | 42  | NC        | 91  | RXD#     | 92  | PIDE_D8   |

**ETX CPU Module****ETX-821**

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|    |           |    |            |    |      |     |         |
|----|-----------|----|------------|----|------|-----|---------|
| 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     |

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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

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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 <Del> 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/](http://www.microsoft.com/hwdev/usb/).

## 4.1 Installation

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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

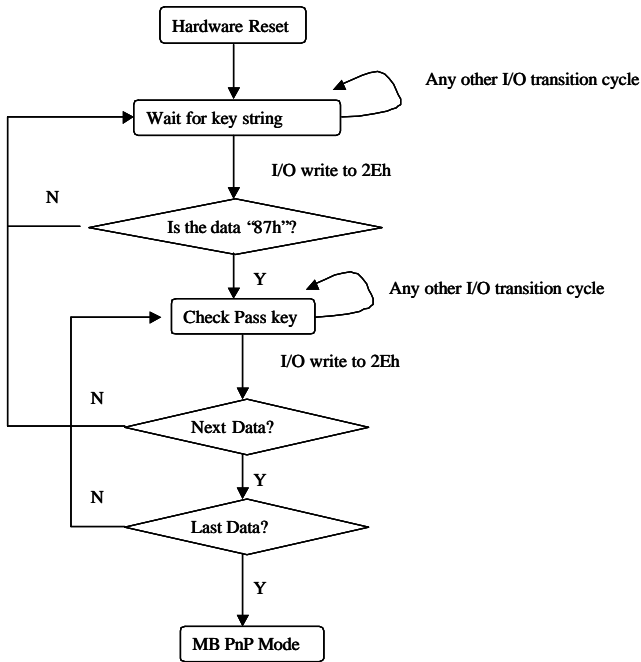
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ETX-821 utilizes ITE 8712 chipset as its watchdog timer controller.

Below are the procedures to complete its configuration and the AAeon 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 <sup>Note</sup> 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**

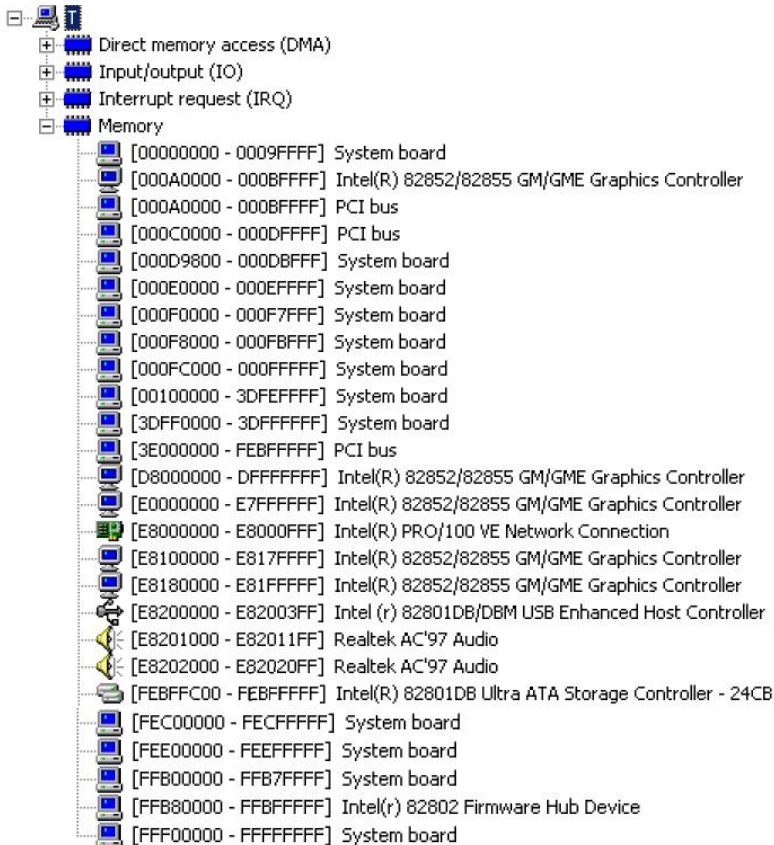
**I/O Information**

## 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                                   |

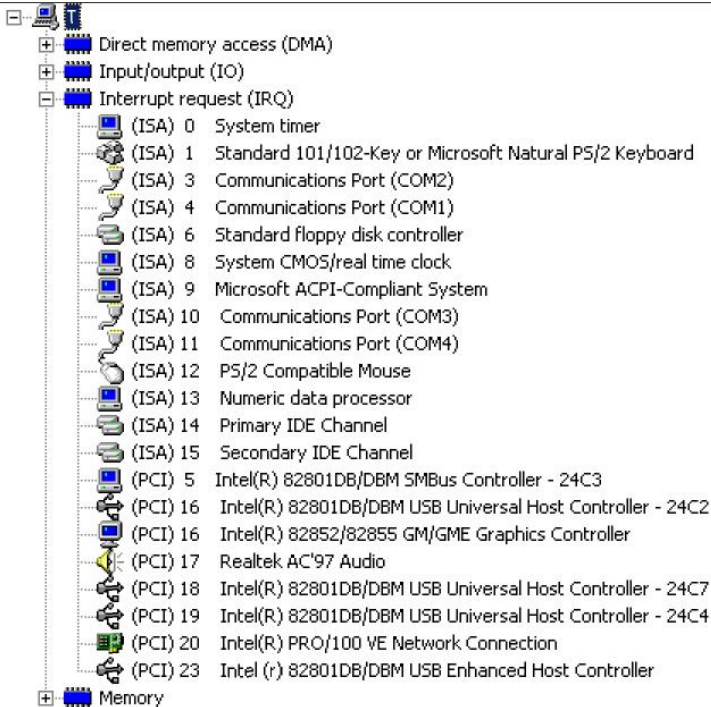
|   |   |
|---|---|
|  | [000003C0 - 000003DF] Intel(R) 82852/82855 GM/GME Graphics Controller           |
|  | [000003E8 - 000003EF] Communications Port (COM3)                                |
|  | [000003F0 - 000003F5] Standard floppy disk controller                           |
|  | [000003F6 - 000003F6] 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 1<sup>st</sup> MB Memory Address Map





### B.3 IRQ Mapping Chart



### B.4 DMA Channel Assignments

