

EMB-820T

AMD® Geode NX Processor,

Up to 1.4 GHz

Mini-ITX

Realtek 8100C for 10/100Mbps

Realtek 8110S for GbE Ethernet

AC 97 Audio & Mini PCI

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Packing List

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

- 1701400453 40-pin ATA100 Cable
- 1709100201 USB Cable
- 1701100207 COM Port Cable
- 1701340700 FDD Cable
- 1700080180 TV-out Cable
- 1700140164 Audio Cable
- M20852T000 Metal I/O Bracket
- P90657B000 CFD Cover
- 9657666600 Jumper Cap
- Quick Installation Guide
- Utility CD
- EMB-820T

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

As a leading Industrial PC (IPC) and Embedded Computing Boards provider, AAEON proudly announces a value positioned Mini-ITX Embedded Motherboard to satisfy the increasing demands for performance in cost competitive market segments.

The EMB-820T adopts the SiS741CX/964 chipset to support the AMD NX series CPU's, creating the ideal combination of performance and cost. This motherboard supports two SATA-150 interfaces for storage while still maintaining an ATA133 interface for your optical drive requirements. The integrated graphics of the SiS chipset supports hardware decoding of MPEG 1 and 2 video streams offering enhanced data transmission and excellent display performance. Another outstanding feature of the EMB-820T is its support of dual channel LVDS, differentiating this board from others in its class. In addition, the EMB-820T utilizes the SiS964 chipset for support of 184-pin DDR 266/333 SDRAM DIMM up to 2GB. Also featured is a 6 channel AC 97 Audio Codec to support your demanding multimedia applications.

The EMB-820T is equipped with 8 USB 2.0 ports, an excellent feature for flexible expansion. This product can also be optionally configured with 4/5/8 Wire Resistive Touch Screen controller. In addition, two 2x5 pin box headers and two D-sub connectors constitute four COM ports on the EMB-820T for

multiple device connection demands.

The EMB-820T provides the highest level of expansion capability to meet the requirements of Gaming, Transportation and Medical applications. Control your budget without compromising performance with the EMB-820T.

1.2 Features

- Supports AMD Geode NX1250/1500/1750
- Supports CRT/ LVDS/ TV Display
- Supports 10/100Base-TX or 10/100/1000Base-TX Ethernet
- AC 97 3D Surround 5.1 Channel Audio
- Supports Type II CompactFlash
- PCI x 1/ Mini PCI x 1
- COM x 4/ USB 2.0 x 8/ Digital I/O Ports
- Supports 4/5/8 Wire Resistive Touch Screen Panel (Optional)

1.3 Specifications

System

- Processor AMD Geode NX Series CPU up to 1.4GHz
- System Memory 184-pin DDR 266/333 DIMM x 2, Max. 2GB
- Chipset SiS 741 CX + 964
- I/O Chipset ITE 8712 KX + Fintek F81216D
- Ethernet Realtek 8100C for 10/100Mbps (Default) And Realtek 8110S for GbE co-layout, RJ-45 X 1
- BIOS Award Plug & Play BIOS - 512KB ROM
- Watchdog Timer Generates a time-out system reset
- H/W Monitor Chipset Supports power supply voltages, fan speed and temperature monitoring
- RTC ITE 8712 KX
- Solid Storage Disk Type II CompactFlash™
- Expansion Interface One PCI slot, One Mini PCI socket
- Power Requirement AT/ ATX
- Board Size 6.7"(L) x 6.7"(W) (170mm x

170mm)

- Operating Temperature 32°F~ 140°F (0°C ~ 60°C)

Display

- VGA Controller Integrated on SiS Chipset, 128MB display memory shared
- LCD Controller SiS 302LV, Supports 18/24-bit LVDS

I/O

- MIO UDMA 100/133 x 1, SATA x 2, Floppy Disk Drive x 1, PS/2 Keyboard x 1, PS/2 Mouse x 1
- Audio SiS 964 Integrated, supports 5.1 channel AC 97 Codec
- USB Eight USB 2.0 Ports
Three 5x2 pin header support six USB ports for Internal,
Two Type-A USB connector for External
- Parallel Port Supports SPP/ EPP/ ECP mode
- Serial Port Four COM ports: (Two 5x2-pin headers, two D-sub onboard)
COM1/3/4: RS-232, COM 2: RS-232/422/485

- TouchScreen (Optional) DMC9000. Firmwa:
E2.1(ATmega8)
AAEON P/N: 14S8900000
- K/B and Mouse One Mini-DIN PS/2 Keyboard
and one Mini-DIN PS/2 Mouse
connector
- Digital I/O Up to 16 in or 16 out

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!

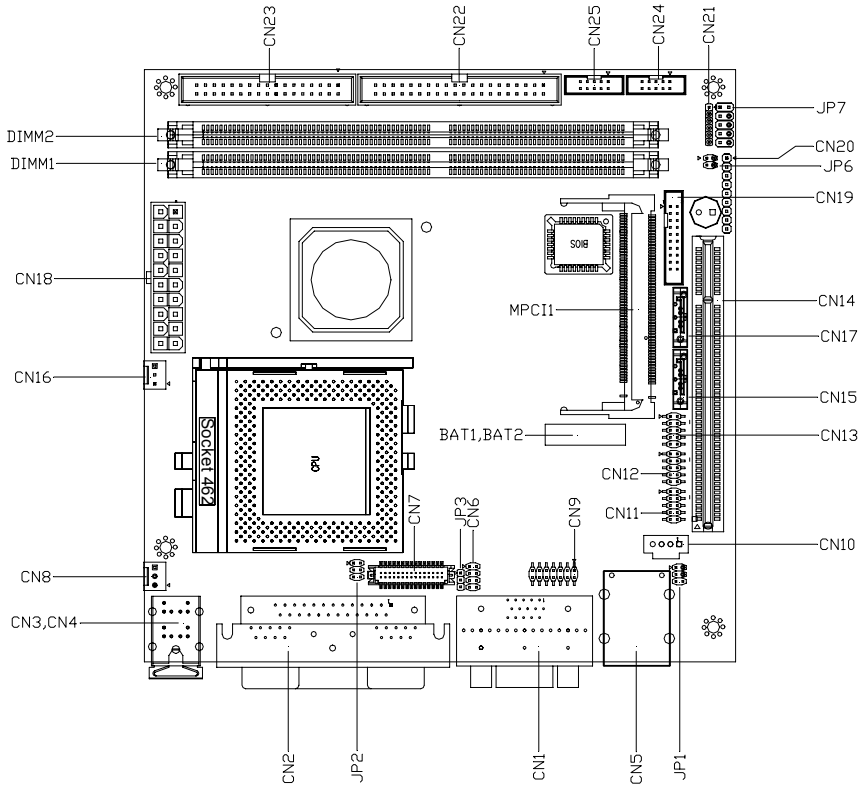
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not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

Note:

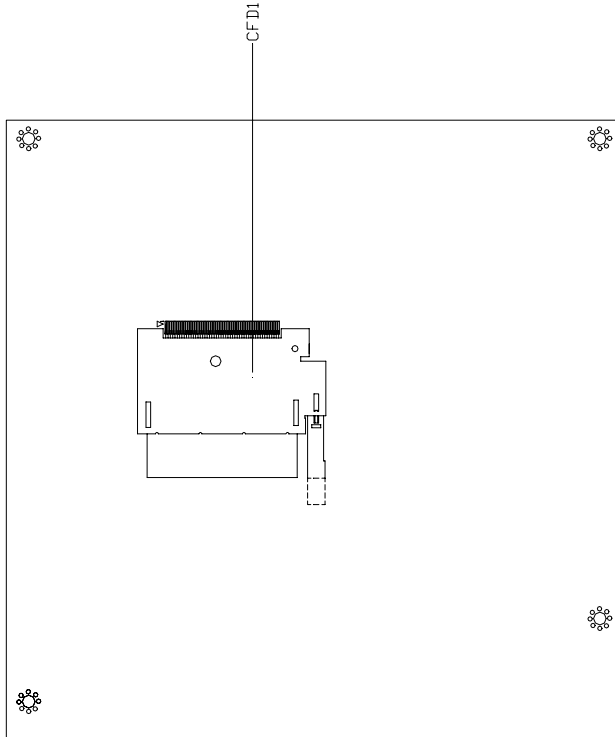
For preventing from the overheating of North Bridge, the ventilator of CPU cooler has to face the North Bridge for heat spreading.

2.2 Location of Connectors and Jumpers

Component Side

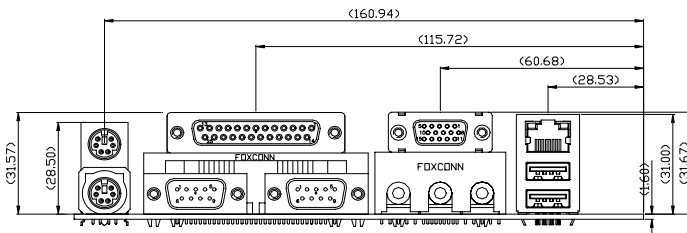
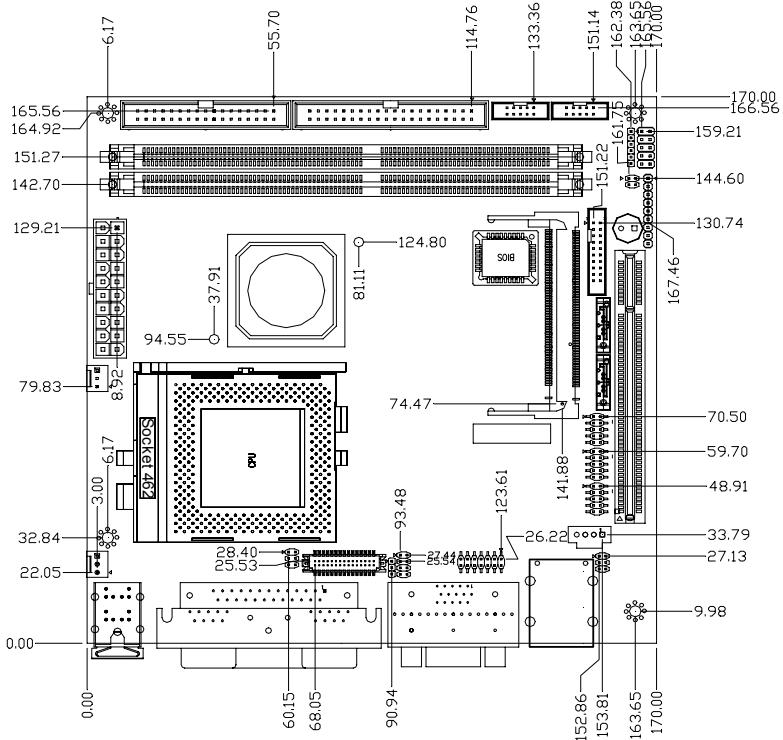


Solder Side



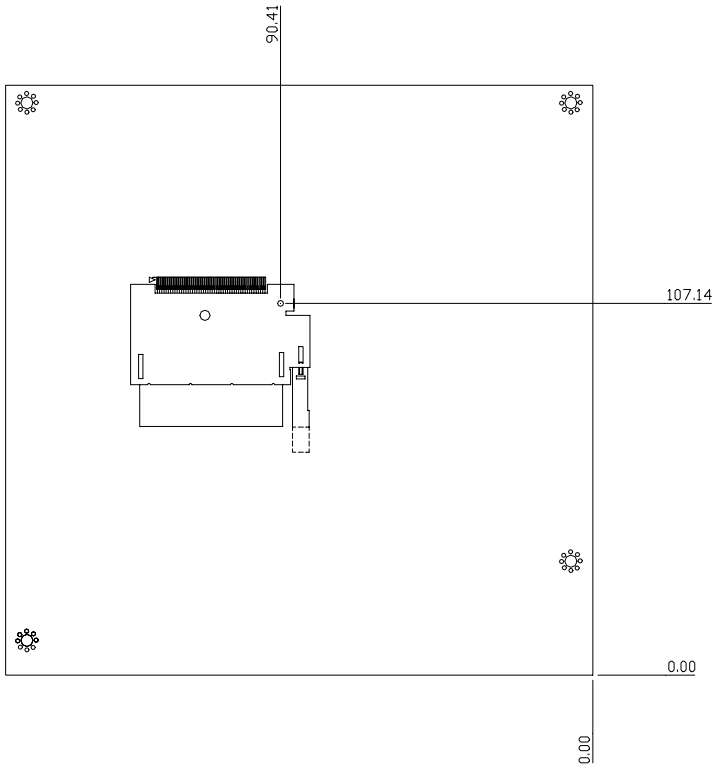
2.3 Mechanical Drawing

Component Side



NOTE:
The Height of Cooling System Depends on Customer Cooling Device.

Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	Audio Amplifier Switch
JP2	COM2 RI/+5V/+12V Selection
JP3	LCD Voltage Selection
JP4	Clear CMOS
JP5	TV Mode Selection (Optional)
JP6	Touch Screen Operating Mode Selection
JP7	Front Panel

2.5 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 of the board's connectors:

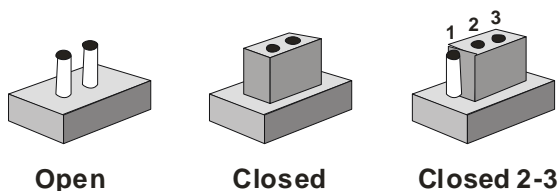
Label	Function
CN1	CRT Display and Audio Connector
CN2	Serial Port 1&2 and Parallel Port Connector
CN3	Mini-Din PS/2 Connector
CN4	Keyboard and Mouse Pin Header (Optional)
CN5	RJ-45 and External USB Port 1&2 Connector
CN6	TV-Out Connector
CN7	Dual Channel LVDS Connector
CN8	System Fan Connector
CN9	5.1 Audio and SPDIF Connector
CN10	CD-in Connector
CN11	Internal USB Port 7&8 Connector
CN12	Internal USB Port 5&6 Connector
CN13	Internal USB Port 3&4 Connector
CN14	PCI Slot
CN15	SATA 1 Connector
CN16	CPU Fan Connector
CN17	SATA 2 Connector
CN18	ATX Power Connector
CN19	Digital I/O Connector
CN20	Touch Screen Connector
CN21	IrDA Connector
CN22	IDE Hard Drive Connector
CN23	Floppy Connector
CN24	Serial Port 4 Connector
CN25	Serial Port 3 Connector

MPC1	Mini-PCI Slot
CFD1	Compact Flash Disk Slot
BAT1	Internal Battery
BAT2	External Battery (Optional)

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change. Generally, you simply need a standard cable to make most connections.

2.7 Audio Amplifier Switch (JP1)

w/o Amplifier			√ w/ Amplifier		
1	3	5	1	3	5
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	4	6	2	4	6

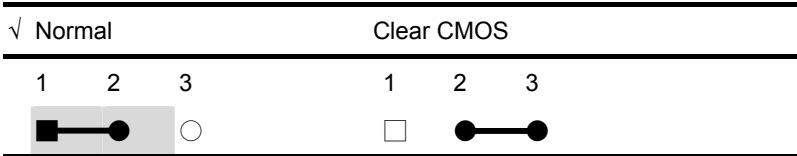
2.8 COM2 RI/ +5V/ +12V Selection (JP2)

√ RI			+5Volt.			+12Volt.		
1	3	5	1	3	5	1	3	5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	4	6	2	4	6	2	4	6

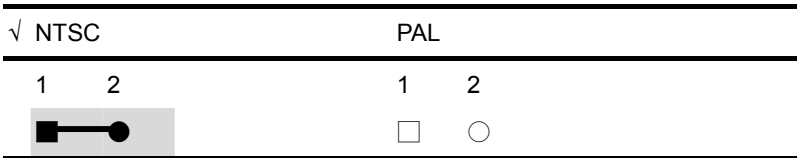
2.9 LCD Voltage Selection (JP3)

+5 Voltage			√+ 3.3 Voltage		
1	2	3	1	2	3
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

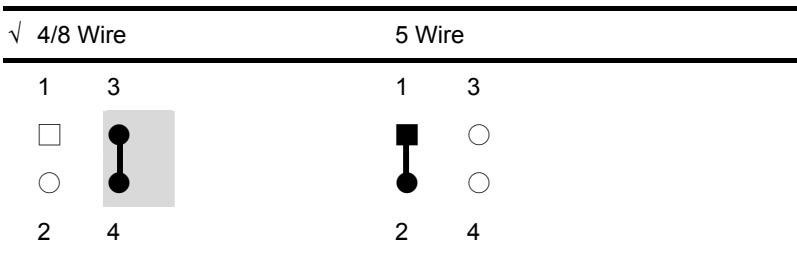
2.10 Clear CMOS (JP4)



2.11 TV Mode Selection (JP5) (Optional)



2.12 TouchScreen Operating Mode Selection (JP6)



2.13 Front Panel (JP7)

Pin	Signal
(-) 1-2 (+)	ATX Power-on Button
(-) 3-4 (+)	HDD Active LED
(-) 5-6 (+)	External Speaker
(-) 7-8 (+)	Power LED / or EXTSMI# (Optional)
(-) 9-10 (+)	System Reset Button

2.14 CRT Display and Audio Connector (CN1)

CRT Display Connector

Pin	Signal	Pin	Signal
1	RED	9	5 Volt.
2	GREEN	10	Ground
3	BLUE	11	N/C
4	N/C	12	SDA
5	Ground	13	HSYNC
6	Ground	14	VSYNC
7	Ground	15	SCL
8	Ground		

Audio Phone-Jack: Line-out (Green)

Pin	Signal	Pin	Signal
1	Ground	2	L
3	N/C	4	Plug-in Detection
5	R		

Audio Phone-Jack: Line-in (Blue)

Pin	Signal	Pin	Signal
1	Ground	2	L
3	N/C	4	Plug-in Detection
5	R		

Audio Phone-Jack: MIC (Pink)

Pin	Signal	Pin	Signal
1	Ground	2	Mono / Stereo
3	N/C	4	Plug-in Detection
5	Stereo		

2.15 Serial Port 1 & 2 and Parallel Port Connector (CN2)**COM 1**

Pin	Signal	Pin	Signal
1	DCDA	2	RXA
3	TXA	4	DTRA
5	Ground	6	DSRA
7	RTSA	8	CTSA
9	RIA	10	N/C

COM 2/ RS-232/422/485

Pin	Signal	Pin	Signal
1	DCDB/TXD-	2	RXB/RXD+
3	TXB/TXD+	4	DTRB/RXD-
5	Ground	6	DSRB

Mini ITX**EMB-820T**

7	RTSB	8	CTSB
9	RIB/ +5V/ +12V	10	N/C

Parallel Port

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	D0	4	ERR#
5	D1	6	PINIT#
7	D2	8	SLIN#
9	D3	10	Ground
11	D4	12	Ground
13	D5	14	Ground
15	D6	16	Ground
17	D7	18	Ground
19	ACK#	20	Ground
21	BUSY	22	Ground
23	PE	24	Ground
25	SLCT	26	N/C

2.16 Mini-DIN PS/2 Connector (CN3)**Keyboard & Mouse Connector**

Pin	Signal	Pin	Signal
1	Keyboard Data	2	Mouse Data
3	Ground	4	+5 Volt.
5	Keyboard Clock	6	Mouse Clock

7	Mouse Data	8	N/C
9	Ground	10	+5 Volt.
11	Mouse Clock	12	N/C

2.17 Keyboard & Mouse Pin Header (CN4) (Optional)

Pin	Signal	Pin	Signal
1	Keyboard Data	2	Keyboard Clock
3	Ground	4	+5 Volt.
5	Mouse Data	6	Mouse Clock

2.18 RJ-45 and External USB Port 1 & 2 (CN5)

Ethernet RJ-45 Connector

Pin	Signal	Pin	Signal
1	TCT	2	TD+/MDI0+
3	TD-/MDI0-	4	RD+/MDI1+
5	RD-/MDI1-	6	MDI2+
7	MDI2-	8	MDI3+
9	MDI3-	10	RCT
11-12	Link/Active LED	13-14	Speed LED

USB Port 1 (Down)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	Data1 +
3	Data1 -	4	Ground

USB Port 2 (Up)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	Data2 +
3	Data2 -	4	Ground

2.19 TV-out Connector (CN6)

Pin	Signal	Pin	Signal
1	Y	2	CVBS
3	Ground	4	Ground
5	C	6	N/C
7	Ground	8	N/C

2.20 18/24-bit LVDS Connector (CN7)

Pin	Signal	Pin	Signal
1	Back-Light Enable	2	Back-Light Control
3	LCD Volt.	4	Ground
5	TXLCLK#	6	TXLCLK
7	LCD Volt.	8	Ground
9	TXL0#	10	TXL0
11	TXL1#	12	TXL1
13	TXL2#	14	TXL2
15	TXL3#	16	TXL3
17	LVDS_DATA	18	LVDS_CLK
19	TXU0#	20	TXU0
21	TXU1#	22	TXU1

23	TXU2#	24	TXU2
25	TXU3#	26	TXU3
27	LCD Volt.	28	Ground
29	TXUCLK#	30	TXUCLK

2.21 System Fan Connector (CN8)

Pin	Signal	Pin	Signal
1	Ground	2	+12 Volt.
3	FAN Sense		

2.22 5.1 Audio and SPDIF Connector (CN9)

Pin	Signal	Pin	Signal
1	Line-out R	2	Ground
3	Line-out L	4	Ground
5	Surround R	6	Ground
7	Surround L	8	Ground
9	LEF	10	Ground
11	Center	12	Ground
13	SPDIF Out	14	SPDIF In

2.23 CD-in Connector (CN10)

Pin	Signal	Pin	Signal
1	R	2	Ground
3	Ground	4	L

2.24 Internal USB Port 7 & 8 Connector (CN11)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	Ground
3	Data7 -	4	Ground
5	Data7 +	6	Data8 +
7	Ground	8	Data8 -
9	Ground	10	+5 Volt.

2.25 Internal USB Port 5 & 6 Connector (CN12)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	Ground
3	Data5 -	4	Ground
5	Data5 +	6	Data6 +
7	Ground	8	Data6 -
9	Ground	10	+5 Volt.

2.26 Internal USB Port 3 & 4 Connector (CN13)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	Ground
3	Data3 -	4	Ground
5	Data3 +	6	Data4 +
7	Ground	8	Data4 -
9	Ground	10	+5 Volt.

2.27 PCI Slot (CN14)

Standard Specification

2.28 SATA 1 Connector (CN15)

Pin	Signal	Pin	Signal
1	Ground	2	TX1+
3	TX1-	4	Ground
5	RX1-	6	RX1+
7	Ground		

2.29 CPU Fan Connector (CN16)

Pin	Signal	Pin	Signal
1	Ground	2	+12 Volt.
3	FAN Sense		

2.30 SATA 2 Connector (CN17)

Pin	Signal	Pin	Signal
1	Ground	2	TX2+
3	TX2-	4	Ground
5	RX2-	6	RX2+
7	Ground		

2.31 ATX Power Connector (CN18)

Pin	Signal	Pin	Signal
1	N/C	2	N/C
3	Ground	4	+5 Volt.
5	Ground	6	+5 Volt.
7	Ground	8	N/C
9	+5 Volt. Standby	10	+12 Volt.
11	N/C	12	-12 Volt.
13	Ground	14	PSON#
15	Ground	16	Ground
17	Ground	18	-5 Volt.
19	+5 Volt.	20	+5 Volt.

2.32 Digit I/O Connector (CN19)

Pin	Signal	Pin	Signal
1	Port 1	2	Port 2
3	Port 3	4	Port 4
5	Port 5	6	Port 6
7	Port 7	8	Port 8
9	+5Volt.	10	Ground
11	Port 9	12	Port 10
13	Port 11	14	Port 12
15	Port 13	16	Port 14
17	Port 15	18	Port 16
19	+5Volt.	20	Ground

DIO Address is 801H:

BIOS Setting	Connector Definition	Address	IT8712 GPIO Setting
Port 1	CN19. pin 1	Bit 7	U19. pin 20 (GPIO27)
Port 2	CN19. pin 2	Bit 6	U19. pin 21 (GPIO26)
Port 3	CN19. pin 3	Bit 5	U19. pin 22 (GPIO25)
Port 4	CN19. pin 4	Bit 4	U19. pin 23 (GPIO24)
Port 5	CN19. pin 5	Bit 3	U19. pin 24 (GPIO23)
Port 6	CN19. pin 6	Bit 2	U19. pin 25 (GPIO22)
Port 7	CN19. pin 7	Bit 1	U19. pin 26 (GPIO21)
Port 8	CN19. pin 8	Bit 0	U19. pin 27 (GPIO20)

DIO Address is 802H:

BIOS Setting	Connector Definition	Address	IT8712 GPIO Setting
Port 9	CN19. pin 11	Bit 7	U19. pin 11 (GPIO37)
Port 10	CN19. pin 12	Bit 6	U19. pin 12 (GPIO36)
Port 11	CN19. pin 13	Bit 5	U19. pin 13 (GPIO35)
Port 12	CN19. pin 14	Bit 4	U19. pin 14 (GPIO34)

DIO Address is 800H:

BIOS Setting	Connector Definition	Address	IT8712 GPIO Setting
Port 13	CN19. pin 15	Bit 4	U19. pin 31 (GPIO14)
Port 14	CN19. pin 16	Bit 3	U19. pin 32 (GPIO13)
Port 15	CN19. pin 17	Bit 2	U19. pin 33 (GPIO12)
Port 16	CN19. pin 18	Bit 1	U19. pin 34 (GPIO11)

2.33 TouchScreen Connector (CN20)

Pin	Signal	Pin	Signal
1	SX+	2	SX-
3	SY-	4	SY-/ SENSE
5	Y-	6	X-
7	Y+	8	X+
9	Ground		

2.34 IrDA Connector (CN21)

Pin	Signal	Pin	Signal
1	+5 Volt.	2	N/C (CIR Tx for optional)
3	Rx	4	Ground
5	Tx	6	N/C (CIR_Rx for Optional)

2.35 IDE Hard Drive Connector (CN22)

Pin	Signal	Pin	Signal
1	IDERST#	2	Ground
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	Ground	20	N/C
21	DREQ	22	Ground

23	IOW#	24	Ground
25	IOR#	26	Ground
27	IORDY	28	Ground
29	DACK#	30	Ground
31	IRQ14	32	N/C
33	A1	34	Cable Detect
35	A0	36	A2
37	CS#1	38	CS#3
39	ACT#	40	Ground

2.36 Floppy Connector (CN23)

Pin	Signal	Pin	Signal
1	Ground	2	DENSEL#
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	INDEX#
9	Ground	10	MOTEA#
11	Ground	12	DRVB#
13	Ground	14	DRVA#
15	Ground	16	MOTEB#
17	Ground	18	DIR#
19	Ground	20	STEP#
21	Ground	22	WDATA#
23	Ground	24	WGATE#
25	Ground	26	TRK0#
27	Ground	28	WPT#
29	N/C	30	RDATA#
31	Ground	32	HDSEL#

33	N/C	34	DSKCHG#
----	-----	----	---------

2.37 Serial Port 4 Connector (CN24)

COM 4

Pin	Signal	Pin	Signal
1	DCDD	2	RXD
3	TXD	4	DTRD
5	Ground	6	DSRD
7	RTSD	8	CTSD
9	RID	10	N/C

2.38 Serial Port 3 Connector (CN25)

COM 3

Pin	Signal	Pin	Signal
1	DCDC	2	RXC
3	TXC	4	DTRC
5	Ground	6	DSRC
7	RTSC	8	CTSC
9	RIC	10	N/C

2.39 Mini-PCI Slot (MPC11)

Standard Specification

2.40 CompactFlash Disk Slot (CFD1)

Pin	Signal	Pin	Signal
1	Ground	26	Ground
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	Ground	33	Ground
9	Ground	34	SDIOR#
10	Ground	35	SDIOW#
11	Ground	36	+5 Volt.
12	Ground	37	IRQ15
13	+5 Volt.	38	+5 Volt.
14	Ground	39	CSEL#
15	Ground	40	N/C
16	Ground	41	IDERST#
17	Ground	42	SIORDY
18	SDA2	43	N/C
19	SDA1	44	+5 Volt.
20	SDA0	45	DASP#
21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/C	49	SDD10
25	Ground	50	Ground

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

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 EMB-820T 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 EMB-820T comes with a AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install SiS 741CX Graphics Driver

Step 2 – Install SiS SATA RAID Driver

Step 3 – Install SiS Audio Driver

Step 4 – Install Realtek AC97 codec Driver

Step 5 – Install Realtek Ethernet Driver

Step 6 – Install DMC9000 Touchscreen 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/.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the EMB-820T CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install SiS 741CX Graphics Driver

1. Click on the **Step 1-SiS 741CX Graphics Driver** folder and then double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install SiS SATA RAID Driver

1. Click on the **Step 2-SiS SATA RAID Driver** folder and then double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 3 – Install SiS Audio Driver

1. Click on the **Step 3- SiS Audio Driver** folder and then double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. 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 and then double click on the **wdm_a361.exe** file

2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install Realtek Ethernet Driver

1. Click on the **Step 5- Realtek Ethernet Driver** folder and then double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 6 – Install DMC9000 Touchscreen Driver

1. Click on the **Step 6-DMC9000 Touchscreen** folder
2. If your OS is Windows 2000/ XP, please select **Windows 2000-xp Driver 04.01** folder and double click on the **Setup.exe** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Note: If your OS is not Windows 2000/XP, please refer to the **PenMount Installation Guide** file in the folder of **Step 6-DMC9000 Touchscreen**.

Appendix

A

**Programming the
Watchdog Timer**

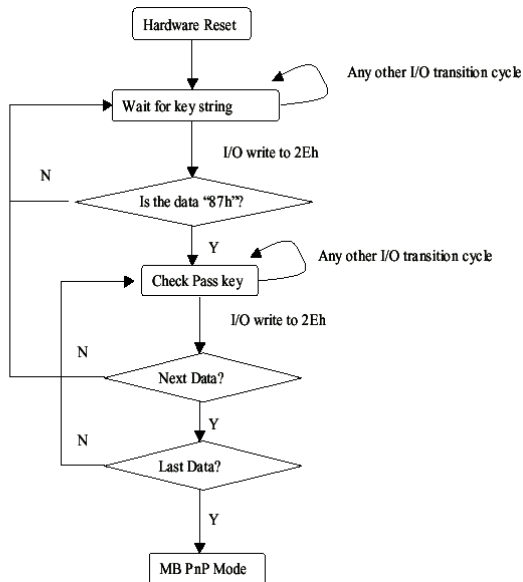
A.1 Programming

EMB-820T utilizes ITE 8712 chipset as its watchdog timer controller. (K version)

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.



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	Configuration 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 (LSB) Register
07H	74H	R/W	00H	WatchDog Timer Time-out Value (MSB) 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	WDT Time-out value Extra select 1: 4s. 0: Determine by WDT Time-out value select (bit7 of this register)

4	WDT output through PWROK1/PWROK2 (pulse) enable
3	Select the interrupt level ^{note} for WDT

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

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

**WatchDog Timer Time-out Value (MSB) Register (Index=74h,
Default=00h)**

Bit	Description
7-0	WDT Time-out value 15-8

A.2 ITE8712 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

Address	Description	User Address
000-01F	DMA Controller #1	000-000F
020-03F	Interrupt Controller #1, Master	020-021
040-05F	System Time	040-043
060-06F	8042 (Keyboard Controller)	060-064
070-07F	Real time Clock, NMI (non-maskable Interrupt) Mask	070-073
080-09F	DMA Page Register	080-08F
0A0-0BF	Interrupt Controller #2	0A0-0A1
0C0-0DF	DMA Controller #2	0C0-0DF
0F0-0FF	Math Coprocessor	0F0-0FF
1F0-1F7	Primary IDE Channel	1F0-1F7
2E8-2EF	Serial Port 4	2E8-2EF
2F8-2FF	Serial Port 2	2F8-2FF
378-37F	Parallel Printer Port 1	378-37F
3B0-3DF	EGA / VGA card	3B0-3DF
3E8-3EF	Serial Port 3	3E8-3EF
3F8-3FF	Serial Port 1	3F8-3FF
4F8-4FF	Serial Port 5 (Touch Panel)	4F8-4FF

B.2 1st MB Memory Address Map

Memory Address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-CBFFF	VGA BIOS
E0000-FFFFFF	System BIOS

B.3 IRQ Mapping Chart

IRQ0	System Timer	IRQ8	System CMOS / Real time clock
IRQ1	Keyboard	IRQ9	Microsoft ACPI – Compliant system
IRQ2	Cascade to IRQ Controller	IRQ10	COM3
IRQ3	COM2	IRQ11	COM4
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	COM5 (Touch Panel)	IRQ13	FPU
IRQ6	Floppy	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

B.4 DMA Channel Assignments

DMA Channel	Function
0	Available
1	Available
2	Floppy
3	Available

Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	CRT Display and Audio Connector			N/A	N/A
CN2	Serial Port 1&2 and Parallel Port Connector			N/A	N/A
CN3	Mini-Din PS/2 Connector			N/A	N/A
CN4	Keyboard and Mouse Pin Header (Optional)	繼德 Neltron	2026B-06	KB/MS Cable	1700060152
CN5	RJ-45 and External USB Port 1&2 Connector			N/A	N/A
CN6	TV-Out Connector	繼德 Neltron	2026B-08	TV Cable	1700080180
CN7	18/24Bit LVDS Connector			N/A	N/A
CN8	CPU Fan Connector			N/A	N/A

CN9	5.1 Audio and SPDIF Connector	繼德 Neltron	2026B-14	5.1+SPDIF Audio Cable	1700140164
CN10	CD-in Connector			N/A	N/A
CN11	Internal USB Port 7&8 Connector	繼德 Neltron	2026B-10	USB Cable	1709100201
CN12	Internal USB Port 5&6 Connector	繼德 Neltron	2026B-10	USB Cable	1709100201
CN13	Internal USB Port 3&4 Connector	繼德 Neltron	2026B-10	USB Cable	1709100201
CN14	PCI Slot			N/A	N/A
CN15	SATA 1 Connector			N/A	N/A
CN16	System Fan Connector			N/A	N/A
CN17	SATA 2 Connector			N/A	N/A
CN18	ATX Power Connector			N/A	N/A
CN19	Digital I/O Connector			N/A	N/A
CN20	Touch Screen Connector			N/A	N/A
CN21	IrDA Connector			N/A	N/A
CN22	IDE Hard Drive Connector	繼德 Neltron	2226B-40	IDE Cable	1701400453

CN23	Floppy Connector	繼德 Neltron	2226B-34	FDD Cable	1701340700
CN24	Serial Port 4 Connector	繼德 Neltron	2026B-10	UART Cable	1701100207
CN25	Serial Port 3 Connector	繼德 Neltron	2026B-10	UART Cable	1701100207