SBC8168

Socket 370 Full-size
All-in-One
CPU Card Series

User's Manual

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Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.

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- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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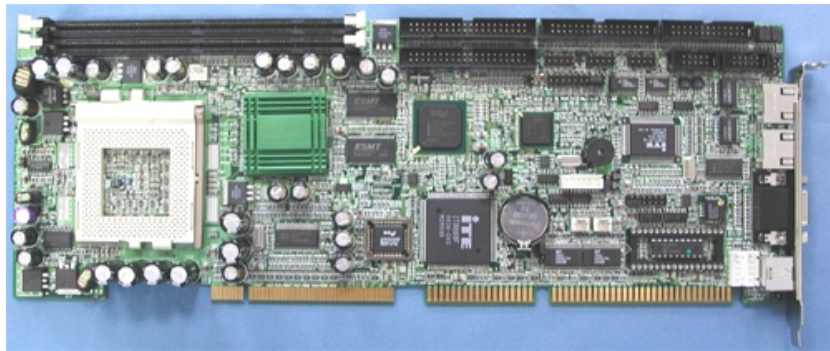
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C h a p t e r 1

Introduction

1.1   General Description

The **SBC8168** CPU card is an industrial grade CPU card incorporating the Intel 815E chipset and the Intel 815GMCH with built-in AGP2x VGA controller, both ensuring its compatibility with PCI bus passive backplanes. Its 6-layer structure reduces signal noise and built-in power management feature. These advanced concepts along with the PCI Local Bus architecture bring outstanding performance to Windows-based applications.

Designed for the professional embedded developers, the Socket 370 all-in-one **SBC8168** CPU card is virtually your ultimate one-step solution to various applications.

1.2   Specifications

● **Chipset:**   Intel 815E chipset

● **CPU Socket:** Socket 370

● **Bus Clock:**   66/100/133 MHz

● **CPU:** Intel Socket 370 Celeron/Pentium III up to 933MHz

● **L2 Cache:**   Integrated in CPU

● **BIOS:** Award 4Mbit PnP Flash BIOS

● **System Memory:**
   ■ 2 x 168-pin DIMM sockets
   ■ Maximum of 256MB unbuffered SDRAM or 512MB (using 2 x 256MB)
   ■ Supports unbuffered, Non-ECC SDRAM only
   ■ Supports PC133 SDRAM module

● **IDE Interface:**   2 bus mastering EIDE up to four devices, Ultra DMA33/66/100 supported

● **FDD Interface:**   Supports up to 2 drives

● **Serial Ports:**   Two 16550 UARTs ports with 16 byte as one RS-232 and one RS-232/422/485

● **Parallel Ports:** One parallel port with ECP/EPP/SPP supported

● **VGA Controller:**
   ■ AGP interface controller integrated in Intel 815 GMCH
   ■ Onboard 4MB SDRAM display cache (optional)
   ■ Supports CRT displays
   ■ Supports up to 1600x1200 8-bit color resolution on non-interlaced CRT monitors

● **Ethernet 1:**
   ■ LAN controller integrated with Intel ICH2
   ■ Intel 82562EM 10/100M Base-T PHY
   ■ Onboard Wake On LAN (via ATX power supply)
   ■ Onboard RJ-45 connector

- **Ethernet 2: (optional)**
  - Intel 82559 PCI Bus 10/100M Base-T
  - Onboard Wake On LAN (via ATX power supply)
  - Onboard RJ-45 connector

- **USB Interface:** 4 USB ports; USB Spec. Rev. 1.1 compliant

- **IrDA:** 1 IrDA pin-header for wireless communication

- **Power Management:** ACPI

- **Hardware Monitoring:** ITE 8712F controller, monitoring for CPU temperature, system voltage, and fan speed

- **Watchdog Timer:**
  - Generates System Reset or Non-Maskable Interrupt (NMI) via jumper selection
  - 64 programmable time interval levels of 0.5~8/5~80/50~800/ 100~1600 seconds

- **SSD:** Supports M-Systems DiskOnChip 2000 series

- **Power Consumption**:
  - +5V @10A, +12V @200mA)
    (Pentium® III 850MHz, 256MB SDRAM)

- **Other Features:**
  - Keyboard/Mouse Wakeup (via ATX power supply)
  - Modem Ring-on (via ATX power supply)
  - STR (Suspend-to-RAM) via ATX power supply

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

- **Storage Temperature:** 20°C~85°C (-4°F~185°F)

- **Operating Humidity:** 5%~95%; non-condensing

- **Storage Humidity:** 5%~75%

- **Dimensions:** 122(W) x 335(L) mm

NOTE: *Specifications are subject to change without notice.*

1.3 Utilities Supported

- Intel Chipset Driver
- Ethernet Utility and Drivers
- CRT Drivers

1.4 Board Dimensions
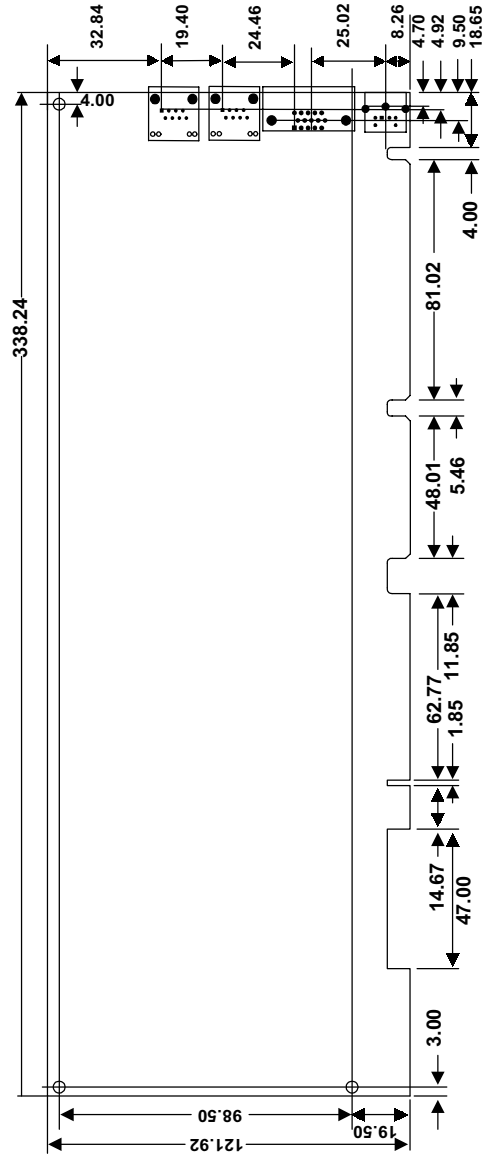
C h a p t e r   2
Jumpers and Connectors

2.1   Board Layout
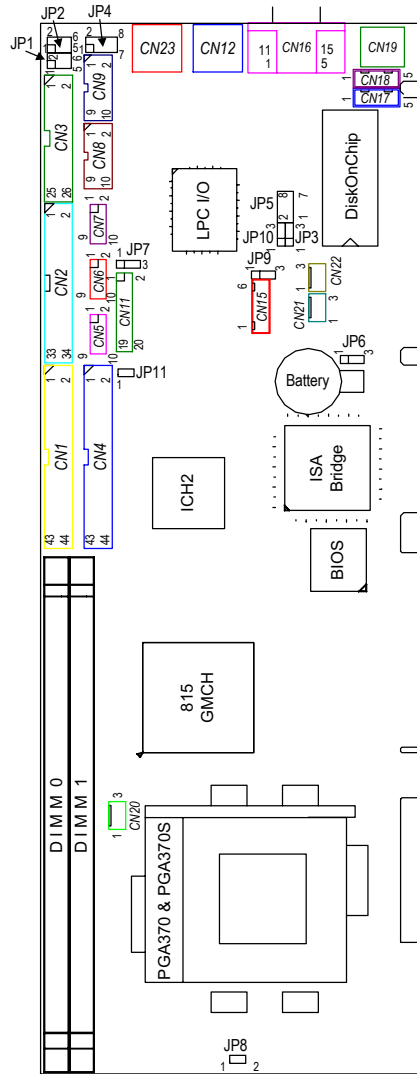
2.2 Jumper Settings

Making the proper jumper settings configures the **SBC8168** to match the needs of your application. The following summary table lists all onboard jumpers and their corresponding functions and/or default settings.

Jumper	Default Setting	Jumper Setting
JP1	COM2 RS-232/422/485 Setting: RS232	Short 3-5, 4-6
JP2	COM2 RS-232/422/485 Setting: RS232	Short 3-5, 4-6
JP3	Reserved	Short 1-2
JP4	COM2 RS-232/422/485 Setting: RS232	Short 1-2
JP5	DiskOnChip Memory Segment: Disabled	Open
JP6	CMOS Clear Setting: Normal	Short 1-2
JP7	Reserved	Short 2-3
JP8	Reserved	Open
JP9	Keyboard/Mouse Wakeup Function Setting: Disabled	Short 1-2
JP10	Watchdog Timer Mode Setting: Disabled	Open
JP11	Reserved	Open

2.2.1 COM2 RS232/422/485 Settings: JP1,JP2,JP4

COM2	JP1	JP2	JP4
RS-232 (default)	Short 3-5, 4-6	Short 3-5, 4-6	Short 1-2
RS-422	Short 1-3, 2-4	Short 1-3, 2-4	Short 3-4
RS-485	Short 1-3, 2-4	Short 1-3, 2-4	Short 5-6, 7-8

JP4

2　4　6　8

1　3　5　7

JP1 and JP2

1　2
3　4
5　6
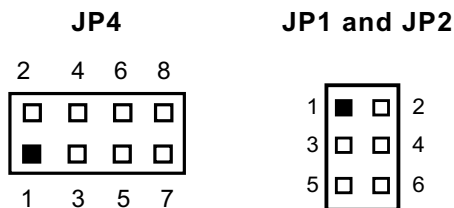
2.2.2 DiskOnChip Memory Segment: JP5
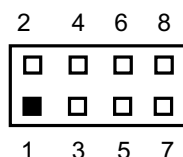
Options	Settings
D0000 – D1FFF	Short 1-2
D2000 – D3FFF	Short 3-4
D4000 – D5FFF	Short 5-6
D6000 – D7FFF	Short 7-8
Disabled	Open (default)

2.2.3 CMOS Clear Jumper: JP6

Options	Settings
Normal	Short 1-2 (default)
Clear CMOS	Short 2-3

JP6

2.2.4 Keyboard/Mouse Wakeup Function Setting: JP9

Options	Settings
Disabled	Short 1-2 (default)
Enabled	Short 2-3

JP9

2.2.5 Watchdog Trigger Mode Setting: JP10

The watchdog timer is an indispensable feature of the **SBC8168**. It has a sensitive error detection function and a report function. When the CPU processing comes to a halt, the watchdog either generates a NMI or resets the CPU.
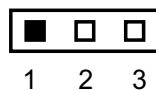
Options	Setting
NMI	Short 1-2
RESET	Short 2-3
Disabled (default)	Open

2.3   Connectors

The connectors allow the CPU card to connect with other parts of the system. Some problems encountered by your system may be a result from loose or improper connections. Ensure that all connectors are in place and firmly attached. The following table lists the function of each connector on the **SBC8168**. Their corresponding pin assignments are described in Chapter 4 and Appendix B.

Connectors	Label	Connectors	Label
Secondary IDE Connector	CN1	ACPI Connector	CN15
FDD Connector	CN2	VGA Connector	CN16
Printer Port Connector	CN3	PS/2 Mouse Connector	CN17
Primary IDE Connector	CN4	PS/2 Keyboard Connector	CN18
USB 1 Connector	CN5	Keyboard/Mouse Connector	CN19
USB 2 Connector	CN6	Fan Power Connector 1	CN20
IrDA Connector	CN7	Fan Power Connector 3	CN21
COM1 Connector	CN8	Fan Power Connector 2	CN22
COM2 Connector	CN9	Ethernet 2 RJ-45 Connector	CN23
Flat Panel Connector	CN11	DiskOnChip® Socket	U31
Ethernet 1 RJ-45 Connector	CN12		

C h a p t e r 3
Installation

This chapter describes the hardware installation procedures on the **SBC8168** all-in-one Socket 370 CPU card. The following is a list of typical peripherals required to build a minimum system:

- Power supply and passive backplane (optional)
- IBM™ PC/AT keyboard
- Display monitor
- Floppy or hard disk with MS-DOS or Flash Disk emulator

3.1 System Memory

The **SBC8168** industrial CPU card supports two 168-pin DIMM (Dual In-line Memory Module) socket for a maximum total memory of 512MB unbuffered SDRAMs. The memory module can come in sizes of 16MB, 32MB, 64MB, 128MB and 256MB SDRAMs.

NOTE: *Use SDRAM modules with PC100 or PC133 specification when running 66/100MHz CPU bus speed. With 133MHz CPU bus speed, SDRAM modules with PC133 specification can be used. You have to install the Intel Celeron or Pentium III processor before installing the memory modules.*

3.2 CPU Installation

1. Align pin one (e.g., white dot) of the CPU with pin one of the socket. Pin one of the CPU socket may either be marked on the board or indicated by an arrow head symbol on one corner of the socket. Normally, its diagonal corner distinguishes pin one on the socket.
2. To complete the CPU installation, gently press the CPU into place.
3. Double-check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.

3.3   Ultra DMA 66/100 Drive Installation

To accommodate the fast transfer rate of Ultra DMA 66/100, an 80-conductor cable (with 40 pin connectors on both ends) is necessary when installing Ultra DMA/66 drives. The **SBC8168**, on this aspect, can support a total of 4 Ultra DMA/66 drives. It is through the IDE Connector (**CN1** and **CN4**) where the 80-conductor cable is connected. The diagram below illustrates the proper installation procedure, including color coding of connectors, of the 80-conductor cable.

Blue ATAS™ for system board's 40-pin IDE connector

Black ATAS™ for Master Drive

80-pin Ultra DMA/66 cable

Red stripe represents pin 1 of cable

Grey ATAS™ for Slave Drive

ATA/33 cable with 40 conductors

ATA/66 cable with 80 conductors
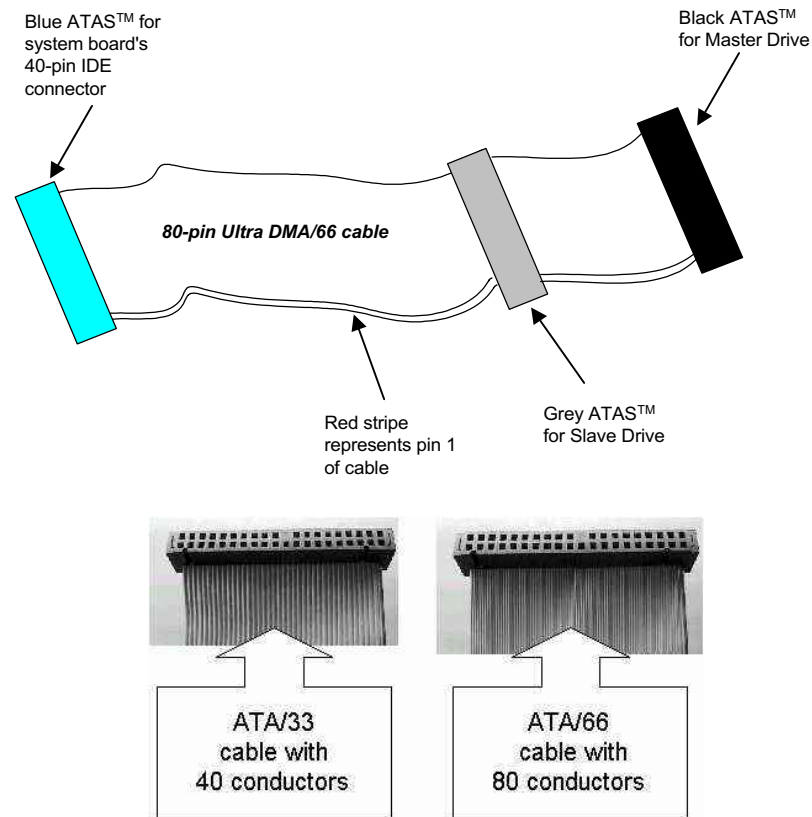
3.4   Completing Installation

To complete the installation, follow the steps listed below.

1. Make sure the power is OFF.
2. Set the configuration jumpers according to the jumper settings on Chapter 2.
3. Install the **SBC8168** CPU card into one of the slots on the passive backplane. You may allow the **SBC8168** to stand alone as a single board computer.
4. Connect the I/O cables and peripherals, i.e. floppy disk, hard disk, monitor, keyboard, power supply and etc. to the CPU board.

    NOTE: *The color of pin one is usually red or blue, while others are gray.*

5. Turn ON the system power.

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C h a p t e r   4

Hardware Description

This chapter gives a detailed explanation of the hardware features onboard the **SBC8168** all-in-one Socket 370 CPU card.

4.1   Microprocessors

The **SBC8168** supports Intel Celeron or Pentium III CPUs. Systems based on these CPUs can be operated under UNIX, OS/2, Linux, Windows NT/2000, Windows 95/98/Me and MS-DOS environments. The system's performance depends on the installed CPU on the board. When installing a new CPU, the jumpers including CPU type, CPU Clock, CPU Voltage and Bus Clock may need to be adjusted. Make sure all the settings are correct for the installed CPU to prevent any damage to the CPU.

4.2   BIOS

The system BIOS used in **SBC8168** is Award Plug and Play BIOS. The **SBC8168** contains a single 4Mbit Flash EPROM. For more detailed information, refer to Chapter 7 for a complete description of the BIOS setup utility and the available features accompanying it.

4.3   I/O Port Address Map

The CPU card communicates via I/O ports. It has a total of 1KB port addresses that can be assigned to other devices via I/O expansion cards.

Address	Devices
000-01F	DMA controller #1
020-03F	Interrupt controller #1
040-05F	Timer
060-06F	Keyboard controller
070-07F	Real time clock, NMI
080-09F	DMA page register
0A0-0BF	Interrupt controller #2
0F0	Clear math coprocessor busy signal
0C0-0DF	DMA controller #2
0F1	Reset math coprocessor
0F8-0FF	Math processor
120-121	Watchdog function
1F0-1F8	Fixed disk controller
200-207	Game port
300-31F	Prototype card
360-36F	Reserved
378-37F	Parallel port #1
3B0-3BF	MDA video card (including LPT1)
3C0-3CF	EGA card
3D0-3DF	CGA card
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port #1 (COM1)
2F8-2FF	Serial port #2 (COM2)

4.4   Interrupt Controller

The **SBC8168** is a fully PC compatible control board. It consists of 16 ISA interrupt request lines and 4 of the 16 can be either ISA or PCI. The mapping list of the 16 interrupt request lines is shown below;

NMI	Parity check error
IRQ0	System timer output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial port #2
IRQ4	Serial port #1
IRQ5	Reserved
IRQ6	Floppy disk controller
IRQ7	Parallel port #1
IRQ8	Real time clock
IRQ9	Reserved (USB)
IRQ10	Reserved (VGA)
IRQ11	Reserved (USB, LAN)
IRQ12	PS/2 Mouse
IRQ13	Math coprocessor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE Channel

NOTE: *The table above displays the standard mapping list of the interrupt controller fpr reference. The displayed mapping list varies for **SBC8168V**, **SBC8168VE**, and **SBC8168VEE** board.*

4.5 Flat Panel Bezel Connector

CN11

```
19  17  15  13  11   9   7   5   3   1
┌─────────────────────────────────────┐
│  ○   ○   ○   ○   ○   ●   ●   ○   ○   ○  │
│  ○   ○   ○   ○   ○   ○   ○   ○   ○   ○  │
└─────────────────────────────────────┘
20  18  16  14  12  10   8   6   4   2
```
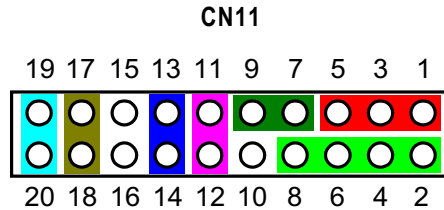
Power LED

This 3-pin connector, designated at *Pins 1, 3,* and *5* of *CN11*, connects the system power LED indicator to its respective switch on the case. *Pin 1* is +, and *pin 5* is assigned as -. The Power LED lights up when the system is powered ON.

Keyboard Lock

Pins 7 and *9 of CN11* connect to the case's keyboard lock connector. When connecting the keyboard lock connector onto *CN11*, *pin 7* is designated as positive (+) pole and *pin 9* as the negative (-) pole.

External Speaker and Internal Buzzer Connector

Pins 2, 4, 6, and *8 of CN11* connect to the case-mounted speaker unit or internal buzzer. *Short pins 4-6* when connecting the CPU card to an internal buzzer. When connecting an external speaker, set these jumpers to *Open* and install the speaker cable on *pin 8* (+) and *pin 2* (-).

External SMI Button Switch

This switch enables the connection between the **SBC8168**-based system and the installed hardware. *Pins 11* & *12* of *CN11* support the SMI switch function.

ATX Power On/Off Button

This 2-pin connector, designated at *Pins 13* & *14* of *CN11*, connects the ATX power button of the front panel to the **SBC8168** CPU card - allowing user to control the power on/off state of the ATX power supply. This jumper is only useful when installing an ATX power supply and *CN15* cable to the system.

System Reset Switch

Pins 17 & ***18*** of ***CN11*** connect to the case-mounted reset switch and allow rebooting of your computer instead of turning OFF the power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply.

HDD Activity LED

This connector extends to the hard drive activity LED on the control panel. This LED will flash when the HDD is being accessed. ***Pins 19*** & ***20 of CN11*** connect the hard disk drive and the front panel HDD LED. ***Pins 19*** is -, and ***pin 20*** is assigned as +.

Reserved pins

Pins 10, 15, and ***16*** of ***CN11*** are reserved pins.

4.6   Enhanced IDE Interface Connector

The **SBC8168** includes a PCI bus enhanced IDE controller that can support master/slave mode and post write transaction mechanisms with 64-byte buffer, and master data transaction. This feature, connected via connector **CN1** and **CN4**, allows the **SBC8168** to handle 4 IDE drives. Refer to Appendix B for the pinout assignments of **CN1** and **CN4**.

4.7   VGA Interface

4.7.1   CRT Interface Controller

The built-in Intel 815 GMCH is a high-performance super VGA display controller with onboard 4M bytes VGA RAM (optional). It is capable of driving a wide array of CRT displays. It can also support CRT at a maximum resolution of up to 1600x1200 with 8-bit colors.

4.7.2   Features

● Fully compatible with IBM™ VGA
● CRT monitor can be displayed simultaneously
● Onboard 4M bytes VGA SDRAM (optional)
● Supports non-interlaced CRT monitors with resolutions up to 1600x1200 8-bit colors
● 3D Hyper Pipelined architecture
● Full 2D H/W Acceleration
● Motion Video Acceleration
● Integrated programmable linear address feature accelerates GUI performance
● Hardware Windows acceleration

4.7.3   VGA Connector: CN16

The **SBC8168** has three connectors that support CRT VGA individually or simultaneously. **CN16** is a standard 15-pin pin header connector commonly used for the CRT VGA display. Configuration of the VGA interface is done via the software utility and no jumper setting is required. The following table is the pin assignments for the CRT/VGA connector.

CN16: CRT/VGA Connector Pin Assignment

Pin	Description	Pin	Description	Pin	Description
1	Red	2	Green	3	Blue
4	N/A	5	GND	6	AGND
7	AGND	8	AGND	9	N/A
10	GND	11	N/A	12	DDC DAT
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK

4.8   Ethernet Connector

The RJ-45 connector is used for Ethernet. To connect the **SBC8168** to 10-Base-T or 100-Base-T hub, just plug one end of the cable into the **CN23** and connect the other end (phone jack) of the cable to a 10-Base-T hub.

4.9   Floppy Disk Controller

The **SBC8168** provides a 34-pin header type connector, **CN2**, supporting up to two floppy drives. The floppy drives may be any one of the following types: 5.25" 360KB/1.2MB and 3.5" 720KB/1.44MB/2.88MB. The **CN2** pin assignment is listed in Appendix B.

4.10   Parallel Port Interface

The **SBC8168** onboard **CN3** is a multi-mode parallel port able to support:

- **Standard mode:**   IBM PC/XT, PC/AT and PS/2^{TM} compatible with bi-directional parallel port

- **Enhanced mode:**   Enhance parallel port (EPP) compatible with EPP 1.7 and EPP 1.9 (IEEE 1284 compliant)

- **High speed mode:**   Microsoft and Hewlett Packard extended capabilities port (ECP) IEEE 1284 compliant

The address select of the onboard parallel port in LPT1 (3BCH) or disabled is done by BIOS CMOS setup.

4.11   Serial Port Interface

The serial interface onboard **SBC8168** consists of COM1 port (**CN8**) supports RS-232 and COM2 (**CN9**) provide RS-232/422/485 connectivity.

4.11.1 Serial Ports IRQ Selection

SBC8168 uses a 10-pin connector for COM2 **(CN9)** and COM1 **(CN8)** with onboard Ethernet CPU card. Interrupt Requests on COM1 and COM2 are selected via IRQ4 and IRQ3 respectively. Additionally, both ports can be enabled or disabled via BIOS setting. The RS-232 pin assignments for COM1 and COM2 along with the RS-485 pin assignments for COM2 are in Appendix B.

4.12   Keyboard and PS/2 Mouse Connectors

The **SBC8168** provides a PS/2 keyboard **(CN18)** and PS/2 mouse **(CN17)** interface with a 5-pin connector. **CN19** is a DIN connector for PS/2 keyboard connection.

CN17/18

Clock	1 ■	
Data	2 □	
No Connection	3 □	
GND	4 □	
Power	5 □	

CN19

Mouse Clock — 6 — Keyboard Clock
VCC — 4 — GND
Mouse Data — 2 1 — Keyboard Data
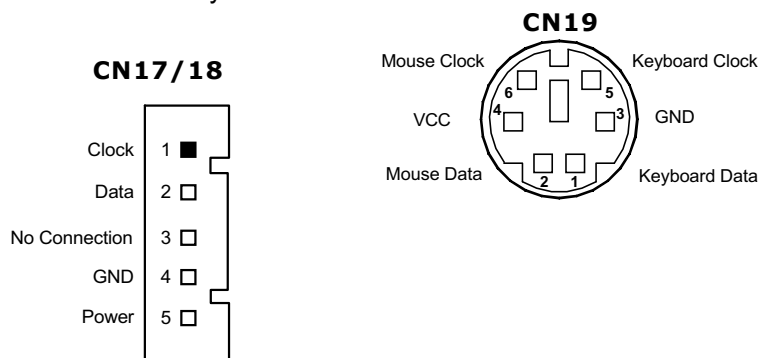
4.13   USB Connector

The Universal Serial Bus (USB) connector on the **SBC8168** is for installation of peripherals supporting the USB interface. **CN5** and **CN6** are 10-pin USB pin-headers on the **SBC8168**.

CN5/CN6

No connector	USB GND	USB P0/P2 +	USB P0/P2 -	USB Power
9 □	□	□	□	■ 1
10 □	□	□	□	□ 2

No connector / USB GND / USB P1/P3 + / USB P1/P3 - / USB Power
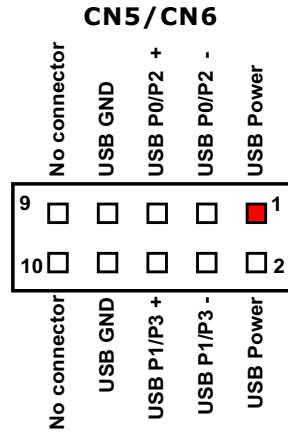
4.14   IrDA Connector

CN7 is a 10-pin IrDA pin-header for wireless communication.

CN7

IRTX	GND	IRRX	No connector	+5V
9	7	5	3	1
□	□	□	□	■
□	□	□	□	□
10	8	6	4	2

No connector / No connector / +5V / CIRRX / No connector
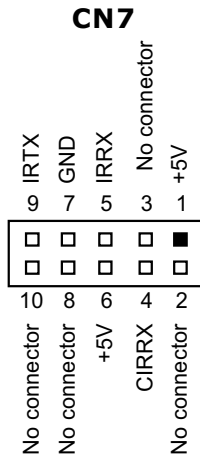
4.15   ACPI Connector

Advanced Configuration and Power Interface (ACPI) defines a flexible and extensible interface that allows system designers to select appropriate cost/feature trade-offs for power management. The interface enables and supports reliable power management through improved hardware and operating system coordination. The specification enables new power management technology to evolve independently in operating systems and hardware while ensuring that they continue to work together.

CN15 on the **SBC8168** is a 6-pin header connector that provides ACPI interface.

CN15

1	2	3	4	5	6
E	G	P	G	P	S
X	N	W	N	W	B
T	D	-	D	-	5
S		P		O	V
M		N		N	
I					
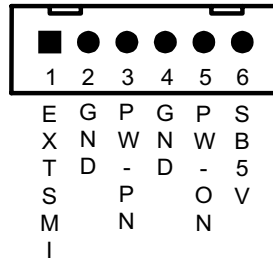
Chapter 5
Display Drivers

5.1   Introduction

The Intel 815 GMCH includes a highly integrated graphics accelerator. Its architecture consists of dedicated multi-media engines executing in paralle to deliver high performance 3D, 2D, and motion compensation video capabilities. The 3D and 2D engines are managed by a 3D/2D pipeline preprocessor allowing a sustained flow of graphics data to be rendered and displayed. The deeply pipelined 3D accelerator engine provides 3D quality graphics and performance via per-pixel 3D renderign and parallel data paths which allow each pipeline stage to simultaneously operate on different primitives or portions of the same primitive. The Intel 815 GMCH graphics accelerator engine supports perspective-correct texture mapping, trilinear and anisotropic Mip-Map filtering, Gouraund shading, alpha-blending, fogging and Z-buffering. A rich set of 3D instructions permits these features to be independently enabled or disabled.

5.2   Features

- AGP interface controller with onboard 4MB SDRAM (optional)
- Supports CRT displays
- Display memory supports up to 1600x1200 8 bit-color resolution on non-interlaced CRT monitors
- 3D Hyper Pipelined architecture
- Full 2D H/W Acceleration
- Motion Video Acceleration

5.3   Drivers Supported

The Intel 815 GMCH is fully compatible with the VGA graphics standard at the register, gate, and BIOS levels. The manufacturer supplies fully VGA-compatible BIOS, end-user utilities and drivers for common application programs (e.g., Microsoft Windows). ATI's drivers for Windows include a Big Cursor setting and fast panning / scrolling capabilities.

Make sure you know the version of the application for which you are installing drivers. Your *Display Driver Diskettes* contain drivers for several versions of certain applications. For your driver to operate properly, you must install the driver for your version of the application program.

NOTE: *Before you begin the driver software installation, please see the detail of installation procedure from the driver utility in CD-ROM.*

C h a p t e r   6
Ethernet

6.1   Introduction

The **SBC8168** is equipped with two high performance Plug and Play Ethernet interfaces which are fully compliant with the IEEE 802.3 standard, and consisting of a RJ-45 connector **(CN12** and **CN23)**.

6.2   Features (Ethernet 1 and Ethernet 2)

● 10Mb/s and 100Mb/s operations
● Supports 10Mb/s and 100Mb/s N-Way auto negotiation
● Full duplex capability
● Full compliance with PCI Revision 2.1
● PCI Bus Master data transfers
● Backward compatible software with 82557, 82558, and 82559

6.3   Drivers Supported (Ethernet 1 and Ethernet 2)

Bundled with popular software drivers, the **SBC8168** Ethernet interface allows great flexibility to work with all major networking operating systems including Novell NetWare v2.x, v3.x, v4.x, Microsoft LAN Manager, Win3.1, Win NT/2000, Win95/98/Me, IBM LAN Server, SCO UNIX or other ODI, NDIS and Packet drive compliant operating systems.

NOTE: *Before you begin the driver software installation, please see the detail of installation procedure from the driver utility in CD-ROM and be sure to make installation and backup copies of the Ethernet Driver Diskettes.*

This page does not contain any information.

C h a p t e r 7
Award BIOS Utility

Chapter 7 describes the different settings available in the Award BIOS that comes with the **SBC8168** CPU card. Also contained here are instructions on how to set up the BIOS configuration.

7.1   BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Celeron processors in a standard IBM-AT compatible I/O system. The BIOS provides critical low-level support for standard devices such as disk drives, serial and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

7.2   BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn ON the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system OFF and back ON again. The following message will appear on the screen:

Press <DEL> to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

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

The section below the setup items of the Main Menu displays the control keys for this menu. Another section located at the bottom of the Main Menu, just below the control keys section, displays information on the currently highlighted item in the list.

NOTE: *If you find that your computer cannot boot after making and saving system changes with Setup, the Award BIOS, via its built-in override feature, resets your system to the CMOS default settings.*

We strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability.

7.3 Standard CMOS Features

"Standard CMOS Setup" allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

```
CMOS Setup Utility-Copyright © 1984-2000 Award Software
                   Standard CMOS Features
```

Date (mm:dd:yy)	Mon, Feb 21 2000	Item Help
Time (hh:mm:ss)	2 : 31 : 24	
		Menu Level ▶
▶ IDE Primary Master	Press Enter None	
▶ IDE Primary Slave	Press Enter None	Change the
▶ IDE Secondary Master	Press Enter None	Day, month,
▶ IDE Secondary Slave	Press Enter None	Year and
		century
Drive A	1.44M, 3.5 in.	
Drive B	None	
Floppy 3 Mode Support	Disabled	
Video	EGA/VGA	
Halt On	All, But Keyboard	
Base Memory	640K	
Extended Memory	63488K	
Total Memory	64512K	

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

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following pages describe each item of this menu.

● **Date**
The date format is:

Day	the day of week, from Sun to Sat, determined by the BIOS, is read only
Month	the month, Jan (1) through Dec (12)
Date	the date, from 1 to 31 (or the maximum allowed in the month), can key in the numerical / function key
Year	the year, from 1994 to 2079

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

● **Time**
The time format is:

Hour	From 00 to 23
Minute	From 00 to 59
Second	From 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

● **IDE Primary/Secondary Master/Slave** *Hard Drives*
The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".
To enter the specifications for a hard disk drive, you must select first a "Type". There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Types 1 to 45 are predefined. Type "User" is user-definable. For the Primary Master/Slave as well as Secondary Master/Slave, you can select "Auto" under the TYPE and MODE fields. This will enable auto detection of your IDE drives and CD-ROM drive during POST. Press <PgUp>/<PgDn> to select a numbered hard disk type or type the number and press the <Enter> key. The hard disk will not work properly if you enter incorrect information for this field. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually. If you select Type User, the utility will ask you to enter the information on the following table.

CYLS	number of cylinders
HEAD	number of read/write heads
PRECOMP	write precompensation
LANDZ	landing zone
SECTOR	number of sectors
SIZE	Automatically adjust according to the configuration
MODE (for IDE HDD only):	Auto Normal (HD < 528MB) Large (for MS-DOS only) LBA (HD > 528MB and supports Logical Block Addressing)

NOTE: *The specifications of your drive must match with the drive table. The hard disk will not work properly if you enter incorrect information in these fields. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.*

● **Drive A / Drive B**
These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360K, 5.25 in	5.25 inch PC-type standard drive; 360Kb capacity
1.2M, 5.25 in	5.25 inch AT-type high-density drive; 1.2MB capacity
720K, 3.5 in	3.5 inch double-sided drive; 720Kb capacity
1.44M, 3.5 in	3.5 inch double-sided drive; 1.44MB capacity
2.88M, 3.5 in	3.5 inch double-sided drive; 2.88MB capacity

● **Floppy 3 Mode Support**
This option avails you the features and functions of a Japanese-standard *3Mode* floppy disk drive. The available settings are:

Disabled	None installed (default)
Drive A	Drive A is a 3Mode floppy disk drive
Drive B	Drive B is a 3Mode floppy disk drive
Both	Both Drive A and Drive B are 3Mode floppy disk drives

- **Video**
  This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	For Hercules or MDS adapters, includes high resolution monochrome adapters

- **Halt On**
  This field determines whether the system will halt if an error is detected during power up.

No errors	The system boot will halt on any error detected. (default)
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

7.4   Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

CMOS Setup Utility-Copyright © 1984-2000 Award Software Advanced BIOS Features		
Virus Warning	Disabled	Item Help
CPU Internal Cache	Enabled	
External Cache	Enabled	Menu Level ▶
CPU L2 Cache ECC Checking	Enabled	Allows you to
Processor Number Feature	Enabled	choose the VIRUS
Quick Power On Self Test	Enabled	Warning feature
First Boot Device	HDD-0	for IDE Hard disk
Second Boot Device	SCSI	boot sector
Third Boot Device	LS120	protection. If this
Boot Other Device	Enabled	function is enable
Swap Floppy Drive	Disabled	and someone
Boot Up Floppy Seek	Enabled	Attempts to write
Boot Up NumLock Status	On	data into this area,
Gate A20 Option	Fast	BIOS will show
Typematic Rate Setting	Disabled	a warning
Typematic Rate (Chars/Sec)	6	message on
Typematic Delay (Msec)	250	screen and alarm
Security Option	Setup	beep
OS Select for DRAM >64MB	Non-OS2	
Video BIOS Shadow	Enabled	
C8000-CBFFF	Disabled	
CC000-CFFFF	Disabled	
D0000-D3FFF	Disabled	
D4000-D7FFF	Disabled	
D8000-D8FFF	Disabled	
DC000-DFFFF	Disabled	
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

● **Virus Warning**
 This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

> **NOTE:** *Many disk diagnostic programs, which attempt to access the boot sector table, can cause the virus warning. If you will run such a program, disable the Virus Warning feature.*

- **CPU Internal Cache / External Cache**
  Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these are *Enabled*.

- **CPU L2 Cache ECC Checking**
  When enabled, this allows ECC checking of the CPU's L2 cache. By default, this field is *Enabled*.

- **Processor Number Feature**
  When a Pentium® III CPU is installed, the system automatically detects it and displays this item.

- **Quick Power On Self Test**
  When enabled, this field speeds up the Power On Self Test (POST) after the system is turned ON. If it is set to Enabled, BIOS will skip some items.

- **First/Second/Third Boot Device**
  These items allow the selection of the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.

- **Boot Other Device**
  This item allows the user to enable/disable the boot device not listed on the First/Second/Third boot devices option above. The default setting is *Enabled*.

- **Swap Floppy Drive**
  This allows you to determine whether to enable Swap Floppy Drive or not. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled.*

- **Boot Up Floppy Seek**
  When enabled, the BIOS seeks for number of track (40 or 80) of the installed floppy drive. 360K type has 40 tracks while 760K, 1.2M and 1.44M have 80 tracks. By default, this field is set to *Enabled.*

- **Boot Up NumLock Status**
  This activates the NumLock function after powering up the system. By default, the system boots up with *NumLock* ON.

- **Gate A20 Option**
  This you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB. The default setting is *Fast.*

- **Typematic Rate Setting**
  When disabled, continually holding down any key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to *Disabled.*

- **Typematic Rate (Chars/Sec)**
  When the typematic rate is enabled, the system registers repeated keystrokes speeds. You can select speed range from 6 to 30 characters per second. By default, this item is set to *6.*

- **Typematic Delay (Msec)**
  When typematic rate is enabled, this item allows you to set the time interval between the display of the first and second characters. By default, this item is set to *250msec*.

- **Security Option**
  This allows you to limit access to the System and Setup. The default value is *Setup*. When set to *System,* the system prompts for the User Password every boot up. Selecting *Setup* always boots up and prompts for Supervisor Password only when Setup utility is called up.

- **OS Select for DRAM > 64MB**
  This allows system to access more than 64MB of DRAM memory when used with OS/2 depends on certain BIOS calls to access memory. The default setting is *Non-OS/2*.

- **Video BIOS Shadow**
  This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

- **C8000 - CBFFF Shadow/DC000 - DFFFF Shadow**
  Shadowing ROM reduces available memory between 640KB and 1024KB. These fields determine whether optional ROM is copied to RAM or not.

7.5   Advanced Chipset Features

This Setup menu controls the configuration of the motherboard chipset.

CMOS Setup Utility-Copyright © 1984-2000 Award Software Advanced Chipset Features		
SDRAM CAS Latency Time	3	Item Help
SDRAM Cycle Time Tras/Trc	7/9	
SDRAM RAS-to-CAS Delay	3	Menu Level ▶
SDRAM RAS Precharge Time	3	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Memory Hole at 15M-16M	Disabled	
CPU Latency Timer	Enabled	
Delayed Transaction	Enabled	
AGP Graphics Aperture Size	64MB	
Display Cache Frequency	100MHz	
System Memory Frequency	Auto	
On-Chip Video Window Size	64MB	
Onboard Display Cache Setting		
Initial Display Cache	Enabled	
CAS# Latency	3	
Paging Mode Control	Open	
RAS-to-CAS Override	by CAS# LT	
RAS# Timing	Fast	
RAS# Precharge Timing	Fast	
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

- **SDRAM CAS Latency Time**
  When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer. The default setting is *3*.

- **SDRAM RAS-to-CAS Delay**
  During DRAM refresh, both rows and columns are addressed separately. This field allows you to determine the timing of transition from Row Address Strobe (RAS) to Column Address Strobe (CAS). The default setting is *3*.

- **SDRAM RAS Precharge Time**
  The precharge time is the number of cycles for the RAS to accumulate its charge before DRAM refreshes. If time is insufficient, refresh may be incomplete and the DRAM may fail to retain data. The default setting is *3*.

- **System BIOS Cacheable**
  When enabled, access to the system BIOS ROM addressed at F0000H-FFFFFH is cached, provided that the cache controller is disabled.

- **Video BIOS Cacheable**
  When enabled, access to video BIOS addressed at C0000H to C7FFFH is cached, provided that the cache controller is disabled.

- **Memory Hole at 15MB - 16MB**
  In order to improve performance, certain space in memory can be reserved for ISA cards. This field allows you to reserve 15MB to 16MB memory address space to ISA expansion cards. This makes memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. By default, this field is set to *Disabled*.

- **Passive Release**
  When enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

- **Delayed Transaction**
  The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1. The default setting is *Disabled*.

- **AGP Graphics Aperture Size**
  The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The options available are 32M and 64M. The default setting is *64M*.

- **Display Cache Frequency**
  This option specifies the clock speed of the onboard video RAM (in MHz). The settings are 100MHz or 133MHz. The default setting is ***100MHz***.

- **System Memory Frequency**
  This option specifies the clock speed of the unbuffered SDRAM modules installed onboard. The settings are 100MHz, 133MHz, or Auto. The default setting is ***Auto***.

- **On-Chip Video Window Size**
  This item defines the amount of system memory shared to the video features of the board in order to display the apporpriate Windows screen. The options available are 32M and 64M. The default setting is ***64M***.

7.6   Integrated Peripherals

This option sets your hard disk configuration, mode and port.

CMOS Setup Utility-Copyright © 1984-2000 Award Software Integrated Peripherals		
On-Chip Primary PCI IDE	Enabled	Item Help
On-Chip Secondary PCI IDE	Enabled	
IDE Primary Master PIO	Auto	Menu Level ▶
IDE Primary Slave PIO	Auto	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
POWER ON Function	Button ONLY	
X KB Power ON Password	Enter	
X Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
X UR2 Duplex Mode	Half	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
PWRON After PWR-Fail	Soft-Off	

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

● **On-Chip Primary/Secondary PCI IDE**
    The integrated peripheral controller contains an IDE interface
    with support for two IDE channels. Select *Enabled* to activate
    each channel separately.

- **IDE Primary/Secondary Master/Slave PIO**
  The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. The options available are Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

- **IDE Primary/Secondary Master/Slave UDMA**
  Ultra DMA 66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software support Ultra DMA 33/66/100, select Auto to enable BIOS support. The options available are Auto, Mode 0, Mode 1, and Mode 2.

- **USB Controller**
  This field allows you to enable or disable the USB function integrated on the ICH2 controller. The default setting is **Enabled**.

- **USB Keyboard Support / USB Mouse Support**
  Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard / USB mouse. The options available are Enabled, Disabled.

- **Init Display First**
  This item allows you to decide to active whether PCI Slot or AGP first. The options available are PCI Slot, AGP.

- **IDE HDD Block Mode**
  This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

- **POWER ON Function**
  - ■ X KB Power ON Password
  - ■ X Hot Key Power ON

  This option allows users to select the type of power ON sequence for the system to follow. The default value is *"Button-Only"*.

BUTTON-ONLY	Follows the conventional way of turning OFF system power (via power button).
Password	Upon selecting this option, the KB POWER ON Password line appears. Press <Enter> and you'll be prompted to enter and confirm a password of your choice. After setting the password, succeeding attempts to power ON the system will result to null. For system to activate, user must input the password via keyboard then press <Enter>.
Hot KEY	This option is very similar with that of Password. Hot-key combinations range from Ctrl-F1 to Ctrl-F12. User may define this combination from the Hot key Power ON option.
Mouse Left	This allows system to POWER ON by clicking the left mouse button. To enable, user must reboot and allow system to finish booting up otherwise the setting will not take effect.
Mouse Right	This allows system to POWER ON by clicking the right mouse button. To enable this setting, user must reboot and allow system to finish the boot up process otherwise the setting will not take effect.

- **Onboard FDC Controller**
  Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. The options available are Enabled, Disabled.

- **Onboard Serial Port 1/Port 2**
  Select an address and corresponding interrupt for the first and second serial ports. The options available are 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled, Auto.

- **UART Mode Select**
  The second serial port offers these infrared interface modes:
  - ➢ IrDA
  - ➢ ASKIR   IrDA-compliant serial infrared port
  - ➢ Normal (default value)

  NOTE: *The UART Mode Select will not appear on the menu once you disable the setting of Onboard Serial Port 2.*

  When UART Mode Select is set as ASKIR or IrDA, the options RxD, TxD Active and IR Transmittion delay will appear.

- **Onboard Parallel Port**
  This item allows you to determine access onboard parallel port controller with which I/O address. The options available are 378H/IRQ7, 278H/IRQ5, 3BC/IRQ7, Disabled.

● **Parallel Port Mode**
   Select an operating mode for the onboard parallel (printer) port.
   Select Normal unless your hardware and software require one of
   the other modes offered in this field. The options available are
   EPP1.9, ECP, SPP, ECPEPP1.7, EPP1.7.

7.7   Power Management Setup

The Power Management Setup allows you to save energy of
your system effectively. It will shut down the hard disk and turn
OFF video display after a period of inactivity.

CMOS Setup Utility-Copyright © 1984-2000 Award Software Advanced Chipset Features		
ACPI Function	Disabled	Item Help
ACPI Suspend Type	S1(POS)	
Power Management	User Define	Menu Level ▶
Video Off Method	DPMS	
Video Off in Suspend	Yes	
Suspend Type	Stop Grant	
MODEM Use IRQ	4	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-off	
Wake Up On LAN2	Enabled	
Power On Ring	Enabled	
USB KB Wake From S3	Disabled	
Resume by Alarm	Disabled	
X Date (of Month) Alarm	Everyday	
X Time (hh:mm:ss) Alarm	0 0 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D]#	Disabled	
↑↓→← : 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). The options available are Enabled, Disabled.

● **ACPI Suspend Type**
  This item allows you to select the type of ACPI suspend mode that your system will follow. It can either be set on the power-on standby mode "S1(POS)" with the ATX power supply on full power, or suspend to RAM "S3(STR)" mode with the ATX power supply running on 5VSB. The default setting is *S1(POS)*.

● **Power Management**
  This category allows you to select the type (or degree) of power saving and is directly related to the following modes:
  ■ HDD Power Down
  ■ Doze Mode
  ■ Suspend Mode

  There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU'S**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Define	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

NOTE: *In order to enable the CPU overheat protection feature, the Power Management field should not be set to Disabled.*

- **Video Off Method**
  This determines the manner in which the monitor is blanked.

V/H SYNC + Blank	This causes the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
DPMS	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.
Blank Screen	This option only writes blanks to the video buffer.

- **Modem Use IRQ**
  This field names the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity on the selected IRQ always awakens the system. The available choices are 3, 4, 5, 7, 9, 10, 11, and NA. By default, the IRQ is set to *3*.

- **Suspend Mode**
  When enabled, and after the set time of system inactivity, all devices except the CPU will be shut OFF.

- **HDD Power Down**
  When enabled, and after the set time of system inactivity, the hard disk drive is powered down while all other devices remain active.

- **Soft-Off by PWR-BTTN**
  This only works with systems using an ATX power supply. It also allows tser to define the type of soft power OFF sequence the system will follow.

Instant-Off (default)	This option follows the conventional manner systems perform when power is turned OFF. Instant-Off is a soft power OFF sequence requiring only the switching of the power supply button to OFF.
Delay 4 Sec.	Upon turning OFF system from the power switch, this option will delay the complete system power OFF sequence by approximately 4 seconds. Within this delay period, system will temporarily enter into Suspend Mode enabling you to restart the system at once.

- **Wake Up On LAN2**
  An input signal on the network 2 awakens the system from a soft-off state.

- **Power On Ring**
  An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

● **Resume by Alarm**
When *Enabled,* your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

7.7.1 Reload Global Timer Events

When *Enabled*, an event occurring on each device listed below restarts the global time for Standby mode.

● **Primary IDE 0**   The default value is *"Disabled"*.
   Primary IDE 1   The default value is *"Disabled"*.
   Secondary IDE 0   The default value is *"Disabled"*.
   Secondary IDE 1   The default value is *"Disabled"*.
   FDD, COM, LPT Port   The default value is *"Disabled"*.
   PCI PRIQ[A-D]#   The default value is *"Disabled"*.

7.8 PnP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility-Copyright © 1984-2000 Award Software PnP/PCI Configurations		
PNP OS Installed	On	Item Help
Reset Configuration Data	Disabled	
		Menu Level ▶
Resources Controlled By	Auto (ESCD)	
X IRQ Resources	Press Enter	When resources are
X DMA Resources	Press Enter	controlled manually, assign each system
		interrupt a type,
PCI/VGA Palette Snoop	Disabled	depending on the type of dervice using the interrupt
↑↓→← : 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**
This item allows you to determine install PnP OS or not. The options available are Yes and No.

- **Reset Configuration Data**
  Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot. The options available are Enabled and Disabled.

- **Resources Controlled By**
  The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows®95. The options available are Auto and Manual.

- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default value is *"PCI/ISA PnP"*.

- **DMA Resources**
  When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

  1. **Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.**
  2. **PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.**

  The default value is *"PCI/ISA PnP"*.

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

7.9   PC Health Status

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility-Copyright © 1984-2000 Award Software PC Health Status		
VCORE	1.600 V	Item Help
VGTL	1.500 V	
VCC3	3.450 V	Menu Level ▶
+ 5V	5.053 V	
+12V	12.160V	
-12V	(-)12.280 V	
- 5V	(-)5.05 V	
5VSB(V)	5.026V	
VBAT(V)	3.168V	
Current CPU Temperature	50ºC	
FAN1 Speed	5443 RPM	
FAN2 Speed	0 RPM	
FAN3 Speed	0 RPM	
↑↓→← : Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

- **Vcore/VGTL/VCC3/+5V/+12V/-12V/-5V/5VSB(V)/VBAT(V)**
  These optional and read-only fields show the current voltages in the voltage regulators and power supply as monitored by the hardware monitoring IC.

- **Current CPU Temperature**
  These read-only fields reflect the functions of the hardware thermal sensor that monitors the chip blocks and system temperatures to ensure the system is stable.

- **Fan1/Fan2/Fan3 Speed**
  These optional and read-only fields show the current speeds in RPM (revolution per minute) for the CPU fan and chassis fan as monitored by the hardware monitoring IC.

7.10   Frequency/Voltage Control

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

CMOS Setup Utility-Copyright © 1984-2000 Award Software Frequency/Voltage Control		
Auto Detect DIMM/PCI Clk	Enabled	Item Help
Speed Spectrum Modulated	[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		

● **Auto Detect DIMM/PCI Clk**
This item automatically detects the clock speeds of the system memory installed as well as the PCI interface. The options available are Enabled and Disabled. The default setting is *Enabled*.

● **Speed Spectrum Modulated**
This item directly relates to the EMI performance of the whole system. When enabled, all system clocks run at slower speeds thereby decreasing the electromagnetic interference to the surrounding environment. Disabling this item improves the system performance but simultaneously increase the EMI. The default setting is *Disabled*.

7.11 Load Fail Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

CMOS Setup Utility-Copyright © Award Software	
▸ Standard CMOS Features	▸ Frequency/Voltage Control
▸ Advanced BIOS Features	Load Fail-Safe Defaults
▸ Advanced Chipset Features	Load Optimized Defaults
▸ Integrated Peripherals	Set Supervisor Password
▸ Power Ma	**Load Fail-Safe Defaults (Y/N)? N**
▸ PnP/PCI C	
▸ PC Health Status	Exit Without Saving
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Load Fail-Safe Defaults	

To load BIOS defaults value to CMOS SRAM, enter "Y". If not, enter "N".

7.12   Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

CMOS Setup Utility-Copyright © Award Software	
▸ Standard CMOS Features	▸ Frequency/Voltage Control
▸ Advanced BIOS Features	Load Fail-Safe Defaults
▸ Advanced Chipset Features	Load Optimized Defaults
▸ Integrated Peripherals	Set Supervisor Password
▸ Power Man	**Load Optimized Defaults (Y/N)? N**
▸ PnP/PCI Co	
▸ PC Health Status	Exit Without Saving
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Load Optimized Defaults	

To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

7.13   Set Supervisor / User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

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

CMOS Setup Utility-Copyright © Award Software	
▸ Standard CMOS Features	▸ Frequency/Voltage Control
▸ Advanced BIOS Features	Load Fail-Safe Defaults
▸ Advanced Chipset Features	Load Optimized Defaults
▸ Integrated Peripherals	Set Supervisor Password
▸ Power Man	**Enter Password:**
▸ PnP/PCI Con	
▸ PC Health Status	Exit Without Saving
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Change / Set/ Disable Password	

7.14   Save & Exit Setup

This allows you to determine whether or not to accept the modifications. Typing "Y" quits the setup utility and saves all changes into the CMOS memory. Typing "N" brigs you back to Setup utility.

CMOS Setup Utility-Copyright © Award Software	
▶ Standard CMOS Features	▶ Frequency/Voltage Control
▶ Advanced BIOS Features	Load Fail-Safe Defaults
▶ Advanced Chipset Features	Load Optimized Defaults
▶ Integrated Peripherals	Set Supervisor Password
▶ Power Man **SAVE to CMOS and EXIT (Y/N)? Y**	
▶ PnP/PCI Con	
▶ PC Health Status	Exit Without Saving
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Save Data to CMOS	

7.15   Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

CMOS Setup Utility-Copyright © Award Software	
‣ Standard CMOS Features	‣ Frequency/Voltage Control
‣ Advanced BIOS Features	Load Fail-Safe Defaults
‣ Advanced Chipset Features	Load Optimized Defaults
‣ Integrated Peripherals	Set Supervisor Password
‣ Power Man	**Quit Without Saving (Y/N)? N**
‣ PnP/PCI Con	
‣ PC Health Status	Exit Without Saving
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Abandon all Datas	

This page does not contain any information.

A p p e n d i x A
Watchdog Timer

Using the Watchdog Function

The **SBC8168** CPU card uses version 2.0 of the watchdog timer. This onboard WDT generates either a system reset or non-maskable interrupt (NMI), depending on the settings made on jumper **JP10** of **SBC8168**. Follow the steps below to enable and program the watchdog function of **SBC8168**.

```
Start
  ↓
Un-Lock WDT        :   OUT 120H 0AH ; enter WDT function
                       OUT 120H 0BH ; enable WDT function
  ↓
Set multiple (1~4) :   OUT 120 0NH ; N=1,2,3 or 4
  ↓
Set base timer (0~F) : OUT 121 0MH ; M=0,1,2,...F
  ↓
WDT counting
  ↓
re-set timer       :   OUT 121 0MH ; M=0,1,2,...F
  ↓
IF No re-set timer :   WDT time-out, generate RESET or NMI
  ↓
IF to disable WDT  :   OUT 120 00H ; Can be disable at any time
```

M	N			
	1	**2**	**3**	**4**
0	0.5 sec.	5 secs.	50 secs.	100 secs.
1	1 sec.	10 secs.	100 secs.	200 secs.
2	1.5 secs.	15 secs.	150 secs.	300 secs.
3	2 secs.	20 secs.	200 secs.	400 secs.
4	2.5 secs.	25 secs.	250 secs.	500 secs.
5	3 secs.	30 secs.	300 secs.	600 secs.
6	3.5 secs.	35 secs.	350 secs.	700 secs.
7	4 secs.	40 secs.	400 secs.	800 secs.
8	4.5 secs.	45 secs.	450 secs.	900 secs.
9	5 secs.	50 secs.	500 secs.	1000 secs.
A	5.5 secs.	55 secs.	550 secs.	1100 secs.
B	6 secs.	60 secs.	600 secs.	1200 secs.
C	6.5 secs.	65 secs.	650 secs.	1300 secs.
D	7 secs.	70 secs.	700 secs.	1400 secs.
E	7.5 secs.	75 secs.	750 secs.	1500 secs.
F	8 secs.	80 secs.	800 secs.	1600 secs.

A p p e n d i x   B

Connector Pin Assignments

40-pin IDE Interface Connector: CN1, CN4

Pin	Description	Pin	Description	Pin	Description
1	Reset #	2	GND	3	Data 7
4	Data 8	5	Data 6	6	Data 9
7	Data 5	8	Data 10	9	Data 4
10	Data 11	11	Data 3	12	Data 12
13	Data 2	14	Data 13	15	Data 1
16	Data 14	17	Data 0	18	Data 15
19	GND	20	No connector	21	No connector
22	GND	23	IOW #	24	GND
25	IOR #	26	GND	27	IOCHRDY
28	No connector	29	No connector	30	GND-Default
31	Interrupt	32	No connector	33	SA1
34	No connector	35	SA0	36	SA2
37	HDC CS0 #	38	HDC CSI #	39	HDD Active #
40	GND				

Floppy Disk Connector: CN2

Pin	Description	Pin	Description	Pin	Description
1	GND	2	Reduce write current	3	GND
4	No connector	5	GND	6	No connector
7	GND	8	Index#	9	GND
10	Motor enable A#	11	GND	12	Drive select B#
13	GND	14	Drive select A#	15	GND
16	Motor enable B#	17	GND	18	Direction#
19	GND	20	STEP#	21	GND
22	Write data#	23	GND	24	Write gate#
25	GND	26	Track 0 #	27	GND
28	Write protect#	29	GND	30	Read data#
31	GND	32	Side 1 select#	33	GND
34	Disk change#				

Parallel Port Connector: CN3

Pin	Description	Pin	Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialize#
4	Data 2	17	Printer Select In#
5	Data 3	18	GND
6	Data 4	19	GND
7	Data 5	20	GND
8	Data 6	21	GND
9	Data 7	22	GND
10	Acknowledge#	23	GND
11	Busy	24	GND
12	Paper Empty#	25	GND
13	Printer Select	26	

Serial Ports Pin Assignment

CN8/9 Pin	Description
1	Data Carrier Detect (DCD)
2	Data Set Ready (DSR)
3	Receive Data (RXD)
4	Request to Send (RTS)
5	Transmit Data (TXD)
6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)
8	Ring Indicator (RI)
9	Ground (GND)
10	GND

CN8 / CN9