IB704

AMD Geode LX800
PC/104-Plus CPU Module

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The IB704 PC/104 Plus module features the AMD Geode CS5536 companion device that is optimized to work with the AMD Geode LX 800@0.9W processor. With a compact 90mm x 96mm footprint standard, the IB704 is suited for space-constraint applications in factory automation, military, security, transportation and POS. The board does not require a fan and features extended temperature operation that enables it to perform in harsh environment..

The IB704 delivers the highest power/performance ratio available in the industry and comes with advanced graphics, connectivity and expansion features. On board is one SO-DIMM socket supporting up to 1GB of DDR SDRAM. The integrated VGA controller supports for CRT and LVDS LCD displays. Connectivity interfaces include the PC/104+ connector and a 10/100 BaseT Ethernet, four USB 2.0 and two serial ports.

FEATURES

- Embedded AMD Geode LX700 (433MHz) / LX800 (500MHz)
- DDR SO-DIMM x 1, Max. 1GB
- Realtek RTL8100C 10/100 BaseT Ethernet
- Integrated LX800/LX700 2D VGA controller, supports CRT and LVDS interfaces
- 4 x USB 2.0, 2 x COM, Watchdog timer
- PC/104+ connector (PCI+ISA)
- Extended Temperature (-20C ~ 80C)

Remarks: In installing the PC/104 Plus CPU board into a chassis, it is recommended that the CPU board be placed on the topmost level of the PC/104 board layers. The chassis environment should be designed in such a way that there is good airflow to ventilate the system.

Checklist

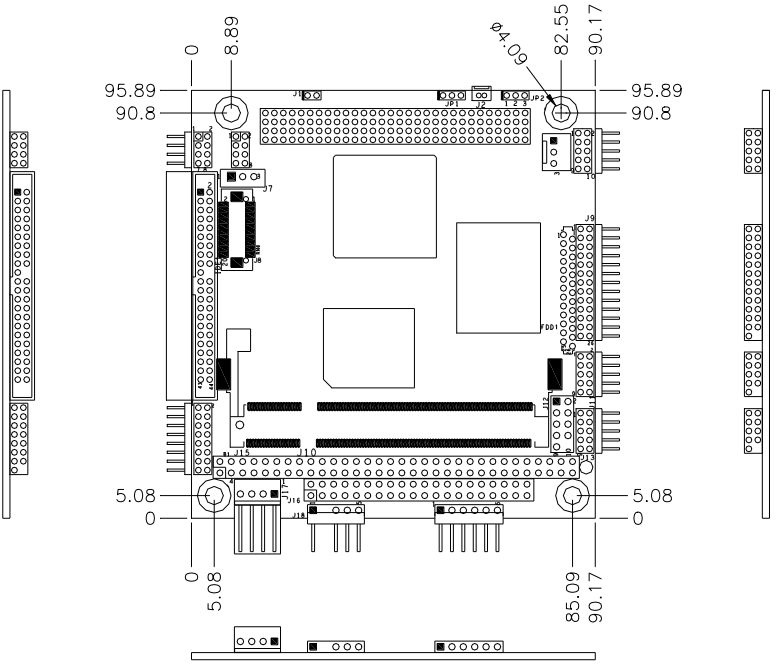
Your IB704 package should include the items listed below. Damaged or missing items should be reported to your supplier.

- The IB704 CPU Module
- This User's Manual
- One Driver CD
- Optional cable kit (IDE7, IDE6, PK3-2, PS2G, VGA8, RJ45A2, USB2-2, PK1-12, FF2)

Specifications

Form Factor	PC/104+
CPU Type	AMD Geode LX processor
CPU Operating Frequency	LX800 @500MHz (IB704F) LX700 @433MHz (IB704)
Green / APM	APM1.2
BIOS	Award BIOS (4MB FWH)
Chipset	AMD CS5536 I/O companion multi-function south bridge
Memory	One DDR SODIMM socket, Max. Up to 1GB
Graphics	LX800/LX700 built-in high performance 2D graphic controller, supports LVDS LCD & CRT display
LAN Controller	Realtek RTL8100C-LF 10/100Mbps
IDE	CS5536 built-in one channel UDMA100 IDE
USB	CS5536 built-in USB2.0 controller, support 4 ports
LPC I/O	Winbond W83627HG: KB/Mouse controller, Parallel, IrDA, Floppy, COM1, COM2 (RS232) & Hardware monitor (3 thermal inputs, 4 voltage monitor inputs)
RTC/CMOS	Geode CS5536 built-in w/ on board Lithium battery
PCI Arbiter	ITE IT8209R PCI arbiter/clock buffer chip, extend PCI devices (master) from 1 to 3
PCI to ISA Bridge	ITE IT8888G
Watchdog Timer	Yes (256 segments, 0, 1, 2…255. sec/min)
On Board header	PC/104+ (PCI + ISA) connector set x1 2x8 pin-header x1 for VGA 2x13 pin-header x1 for parallel port 2x5 pin-header x2 for COM1, 2 2x4 pin-header x2 for USB 2x22 box-header x1 for IDE 2x5 pin-header x1 for LAN DF13-20 connector x1 for LVDS 6-pin pin-header x1 for PS/2 KB&MS 5-pin pin-header x1 for IrDA 4-pin FDD power connector x1 for system power input.
Operating Temperature	-20°C ~ 70°C (68°F ~158°F)
Board Size	96mm x 90mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB704 in order to set up a workable system. The topics covered are:

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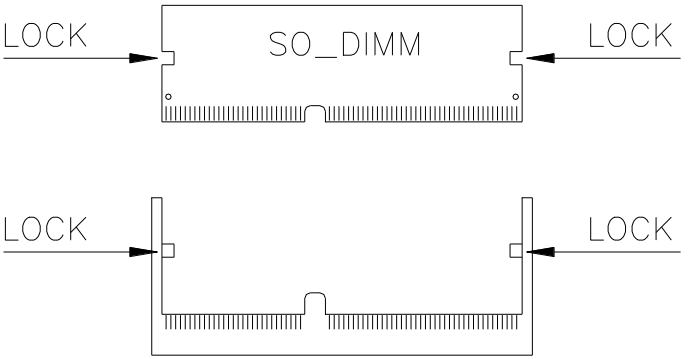
Installing the Memory (SODIMM)

The IB704 has a 144-pin SODIMM socket. The SODIMM socket supports a maximum total memory of 1GB.

Installing and Removing DIMMs

To install the SODIMM, locate the memory slot on the CPU module and perform the following steps:

1. Hold the SODIMM so that the two keys of the DIMM align with those on the memory slot.
2. Gently push the SODIMM in an upright position until the clips of the slot close to hold the DIMM in place when the SODIMM touches the bottom of the slot.
3. To remove the SODIMM, press the clips with both hands.



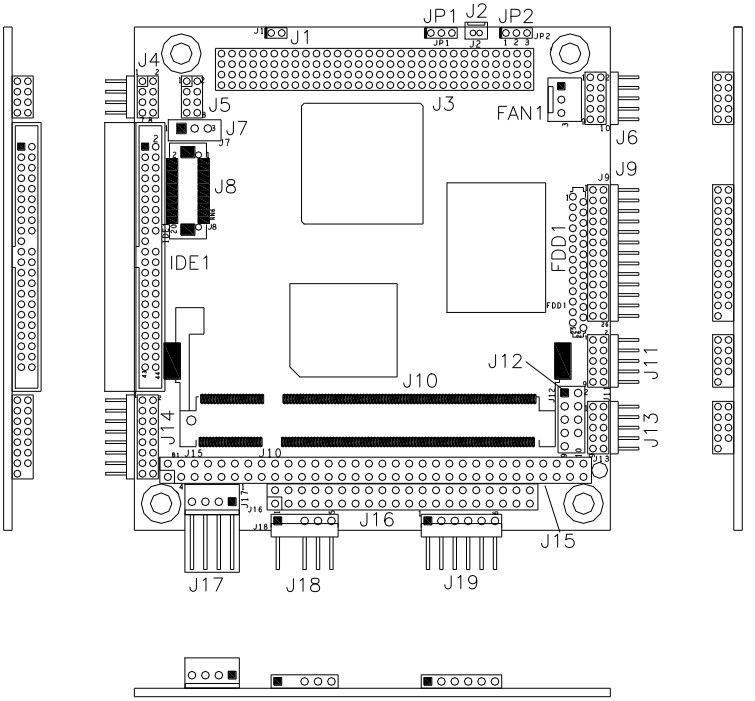
Top View of SODIMM Socket

Jumpers and Connector on IB704

Jumpers are used on the IB704 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB704 and their respective functions.

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Jumper and Connector Locations on IB704

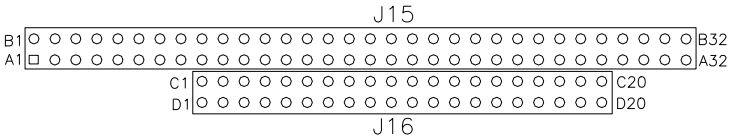


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J15 & J16: PC/104 Connector

J15 and J16 are dual-in-line pin headers that support PC-104 modules. J15 consists of 64 pins and J16 has 40 pins.

J15				J16			
Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHK	B1	GND	C1	GND	D1	GND
A2	D7	B2	REST	C2	SBHE	D2	MEMCS16
A3	D6	B3	VCC	C3	LA23	D3	IOCS16
A4	D5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	D4	B5	-5V	C5	LA21	D5	IRQ11
A6	D3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	D2	B7	-12V	C7	LA19	D7	IRQ15
A8	D1	B8	OWS	C8	LA18	D8	IRQ14
A9	D0	B9	+12V	C9	LA17	D9	DACK0
A10	IOCHRDY	B10	GND	C10	MEMR	D10	DRQ0
A11	AEN	B11	SMEMW	C11	MEMW	D11	DACK5
A12	A19	B12	SMEMR	C12	D8	D12	DRQ5
A13	A18	B13	IOW	C13	D9	D13	DACK6
A14	A17	B14	IOR	C14	D10	D14	DRQ6
ZA15	A16	B15	DACK3	C15	D11	D15	DACK7
A16	A15	B16	DRQ3	C16	D12	D16	DRQ7
A17	A14	B17	DACK1	C17	D13	D17	VCC
A18	A13	B18	DRQ1	C18	D14	D18	MASTER
A19	A12	B19	REFRESH	C19	D15	D19	GND
A20	A11	B20	CLK	C20	KEY PIN	D20	GND
A21	A10	B21	IRQ7				
A22	A9	B22	IRQ6				
A23	A8	B23	IRQ5				
A24	A7	B24	IRQ4				
A25	A6	B25	IRQ3				
A26	A5	B26	DACK2				
A27	A4	B27	TC				
A28	A3	B28	BALE				
A29	A2	B29	VCC				
A30	A1	B30	OSC				
A31	A0	B31	GND				
A32	GND	B32	GND				

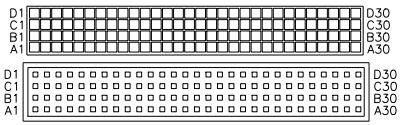


PC/104-Plus Bus Signal Assignments

J3/P3				
Pin	**A**	**B**	**C**	**D**
1	GND/5.0V KEY[2]	Reserved	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1*	AD15	+3.3V
9	SERR*	GND	SB0*	PAR
10	GND	PERR*	+3.3V	SDONE
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3V	C/BE2*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0*	GND	REQ1*	VI/O
24	GND	REQ2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	Reserved	Reserved	GND/3.3V KEY[2]

* The shaded area denotes power or ground signals.

* The KEY pins are to guarantee proper module installation. Pin-A1 will be removed and the female side plugged for 5.0V I/O signals and Pin-D30 will be modified in the same manner for 3.3V I/O. It is recommended that both KEY pins (A1 and D30) be electrically connnected for GND for shielding.



PC/104 Bus Signal (Reference Only)

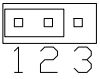
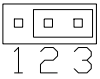
J16		
Pin	**Row D**	**Row C**
0	GND	GND
1	MEMCS16*	SBHE*
2	IOCS16*	LA23
3	IRQ10	LA22
4	IRQ11	LA21
5	IRQ12	LA20
6	IRQ15	LA19
7	IRQ14	LA18
8	DACK0*	LA17
9	DRQ0	MEMR*
10	DACK5*	MEMW*
11	DRQ5	SD8
12	DACK6*	SD9
13	DRQ5	SD10
14	DACK7*	SD11
15	DRQ7	SD12
16	+5V	SD13
17	MASTER*	SD14
18	GND	SD15
19	GND	KEY

J15		
Pin	**Row A**	**Row B**
1	IOCHCHK*	GND
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	KEY
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW
14	SA17	IOR
15	SA16	DACK3*
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH*
20	SA11	SYSCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2*
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	GND
32	GND	GND

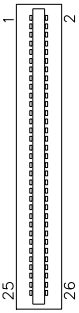
JP1: Clear CMOS Content

JP1	Setting	Function
	Pin 1-2 Short/Closed	Normal Operation
	Pin 2-3 Short/Closed	Clear CMOS Content

JP2: Panel Power Setting

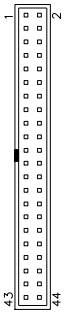
JP2	Setting	Function
	Pin 1-2 Short/Closed	+5V
	Pin 2-3 Short/Closed	+3.3V

FDD1: Floppy Drive Connector



Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	INDEX
VCC	3	4	DRV_SEL
VCC	5	6	DSK_CH
NC	7	8	NC
NC	9	10	MOTOR
DINST	11	12	DIR
NC	13	14	STEP
GND	15	16	WDATA
GND	17	18	EGATE
GND	19	20	TRACK
NC	21	22	WPROT
GND	23	24	RDATA
GND	25	26	SIDE

IDE1: IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

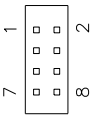
J1: Buzzer Connector



Pin	Signal Name
1	Buzzer+
2	Buzzer-

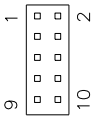
J3: PC/104+ PCI

J4, J5: USB Connector



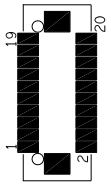
Signal Name	Pin	Pin	Signal Name
USB Power	1	2	Ground
D-	3	4	D+
D+	5	6	D-
Ground	7	8	USB Power

J6: LAN Connector



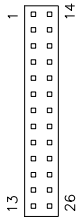
Signal Name	Pin	Pin	Signal Name
Link LED+	1	2	Link LED-
RX+	3	4	RX-
Active LED-	5	6	No connect
Active LED+	7	8	No connect
TX+	9	10	TX-

J8: LVDS Connector



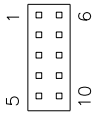
Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J9: Parallel Port Connector



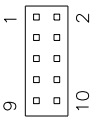
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J11, J13: COM1 and COM2 Connectors



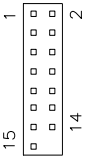
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
3	RXD, Receive data
5	TXD, Transmit data
7	DTR, Data terminal ready
9	Ground
2	DSR, Data set ready
4	RTS, Request to send
6	CTS, Clear to send
8	RI, Ring indicator
10	No Connect.

J12: Front I/O Connector



Signal Name	Pin	Pin	Signal Name
HDD LED+	1	2	Power LED+
HDD LED-	3	4	Power LED-
Reset-	5	6	No connect
Reset+	7	8	No connect
No connect	9	10	No connect

J14: VGA Connector



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	+5V
Green	3	4	GND
Blue	5	6	N.C.
N.C.	7	8	DDC_data
GND	9	10	HSYNC
GND	11	12	VSYNC
GND	13	14	DDC_clk
GND	15		

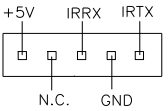
J15, J16: PC/104+ ISA

J17: Power Connector



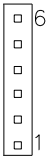
Pin	Signal Name
1	Vcc
2	Ground
3	Ground
4	+12V

J18: IrDA Connector



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

J19: Keyboard/Mouse Connector



Pin #	Signal Name
1	Keyboard Data
2	Keyboard Clock
3	Mouse Data
4	Mouse Clock
5	Ground
6	Vcc

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

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Load Optimized Defaults 33
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Save & Exit Setup 33
Exit Without Saving 33

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports various processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports 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.

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.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features Advanced BIOS Features Advanced Chipset Features Integrated Peripherals Power Management Setup PnP/PCI Configurations PC Health Status	Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Set User Password Save & Exit Setup 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. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended 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. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice 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.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Fri, Jun 30, 2006	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level >
IDE Primary Master	None	Change the day, month,
IDE Primary Slave	None	Year and century
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All, But keyboard	
Base Memory	640K	
Extended Memory	514816K	
Total Memory	515584K	

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 describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1999 to 2099**

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 : 00 to 23**
Minute : 00 to 59
Second : 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 HDDs / IDE Secondary HDDs

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".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDING ZONE :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Remarks: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 2 / 3 Master.

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:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

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

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
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 be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

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.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	Disabled	ITEM HELP
CPU Internal Cache	Enabled	Menu Level >
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Small Logo (EPA) Show	Disabled	

Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU Internal 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.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *ZIP100*, *USB-FDD*, *LAN*, *USB-CDROM*, *USB-HDD* and *Disable*.

Boot Other Device

These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. 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
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a 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. Settings are from 6 to 30 characters per second.

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

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

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

Small Logo (EPA) Show
The EPA logo appears at the right side of the monitor screen when the system is boot up.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

CPU Frequency	Auto	ITEM HELP
Memory Frequency	Auto	Menu Level >
CAS Latency	Auto	
Interleave Select	LOI	
XOR BA0	Disabled	
XOR BA1	Disabled	
XOR BA2	Disabled	
XOR BA3	Disabled	
XOR Bit Select	18	
Video Memory Size	8M	
Output Display	CRT	
Flat Panel Configuration	Press Enter	
Onboard USB1.1	Enabled	
Onboard USB2.0	Enabled	
Onboard IDE	Enabled	
Overcurrent Reporting	Disabled	
Port 4 Assignment	Host	
Memory Hole At 15M-16M	Disabled	

CPU Frequency
This options for this field are ***Auto***, ***433MHz*** and ***500MHz***.

Memory Frequency
This default setting for this field is ***Auto***.

CAS Latency Time
You can configure CAS latency time in HCLKs as ***1.5, 2, 2.5, 3*** or ***3.5***. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Video Memory Size
The default setting for this field is ***8M***. The options are from ***8M*** to ***254M***.

Output Display
The default setting for this field is ***CRT***.

Flat Panel Configuration
This options for this field are ***Flat Panel***, ***CRT*** and ***Panel & CRT***. For flat panel, configuration settings include Flat Panel Type, Resolution (320x240 up to 1600x1200), Data Bus Type, Refresh Rate (60~100Hz), HSYNC Polarity, VSYNC Polarity, SHFCLK Active Period and LP Active Period.

Onboard USB 1.1
The default setting for this field is ***Enabled***.

Onboard USB 2.0
The default setting for this field is ***Enabled***.

Onboard IDE
The default setting for this field is ***Enabled***.

Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

Master Drive PIO Mode	Auto	ITEM HELP
Slave Drive PIO Mode	Auto	Menu Level >
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
IDE DMA transfer access	Enabled	
IDE HDD Block Mode	Enabled	
Onboard LAN Boot ROM	Disabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
Onboard Parallel Port	387/IRQ7	
Parallel Port Mode	SPP	

Master Drive / Slave Drive PIO Mode

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

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.

Onboard LAN Boot ROM

This feature allows users to enable or disable the onboard LAN boot ROM. The default setting is *Disabled*

Onboard FDC Controller
Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select
This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode
This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

Power Management	APM	ITEM HELP
** PM Timers **		Menu Level >
Standby Mode	Disabled	
Suspend Mode	Disabled	
MODEM Use IRQ	N/A	
Soft-Off by PWR-BTTN	Instant-Off	
Power-On by Alarm	Disabled	
Time (hh:mm:ss) Alarm	0	
IRQ Wakeup Events	Press Enter	

Power Management

The options for the power management setting are ***Disabled***, ***Legacy*** and ***APM***.

PM Timers and IRQ Wakeup Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

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.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

		ITEM HELP
PNP OS Installed	No	Menu Level
Init Display First	PCI Slot	
Reset Configuration Data	Disabled	Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.
Resources Controlled By	Auto (ESCD)	
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
Memory Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

PNP OS Installed

If your OS supports Plug & Play (PnP), select **Yes** so that it can take over the management of device resources. If you are using a non-PnP-aware OS or not all of the operating systems you are using support PnP, select **No** to let the BIOS handle it instead.

Init Display First

This field refers to the primary video or primary video adapter. The default setting is ***PCI Slot***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP OS system such as Windows 95.

PCI/VGA Palette Snoop

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

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	Menu Level >
System Temp.	45°C/113°F	
CPU Temp	30°C/86°F	
Vcore(V)	1.18 V	
Vmem	2.57V	
Vcc3(V)	3.39V	
+5V	5.13 V	
+12V	11.12 V	
-12V	-12.19 V	
VBAT	3.21 V	
5VSB	4.92 V	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

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.

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.

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.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

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.

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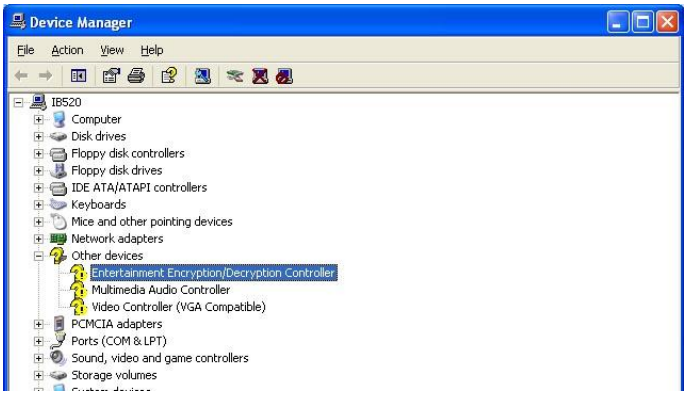
Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

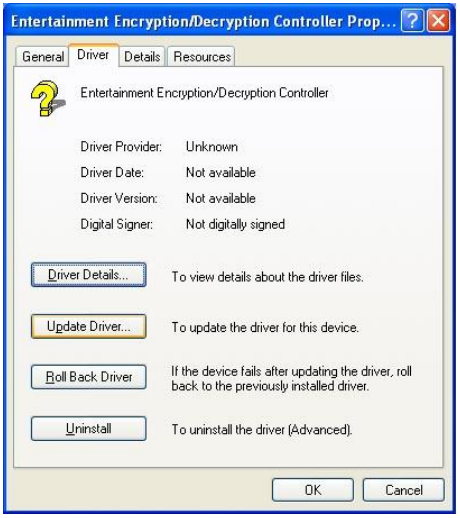
Entertainment Encryption/Decryption Controller Driver 36
VGA Drivers Installation 38

Entertainment Encryption/Decryption Controller Driver

1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Entertainment Encryption/Decryption Controller** under **Other devices**.

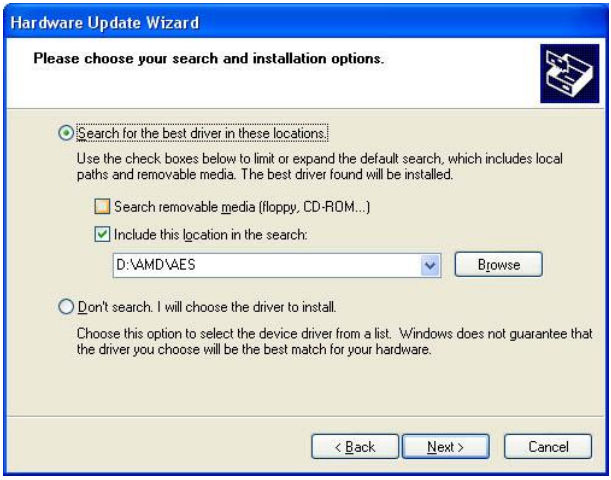


3. In the following window, click the **Driver** tab and click **OK** to continue.



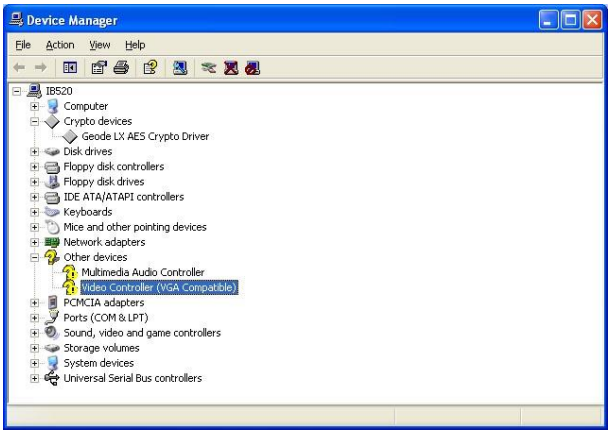
4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**. Click **Browse** to find the driver's path in the CD provided - **\AMD\AES**. Then, click **Next** to start the drivers installtion. Then click **Finish** after the wizard has finished installing the software for ***Geode LX AES Crypto Driver***.



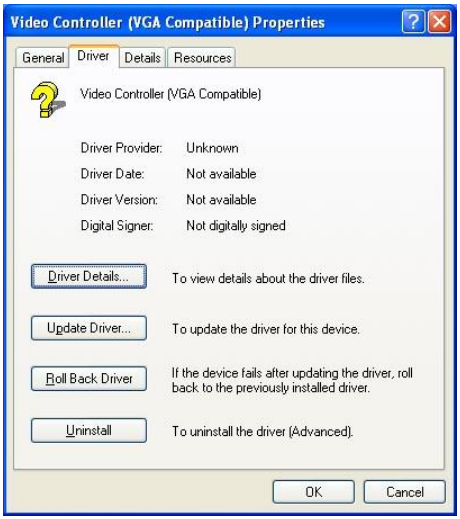


VGA Drivers Installation

1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Video Controller (VGA Compatible** under **Other devices**.

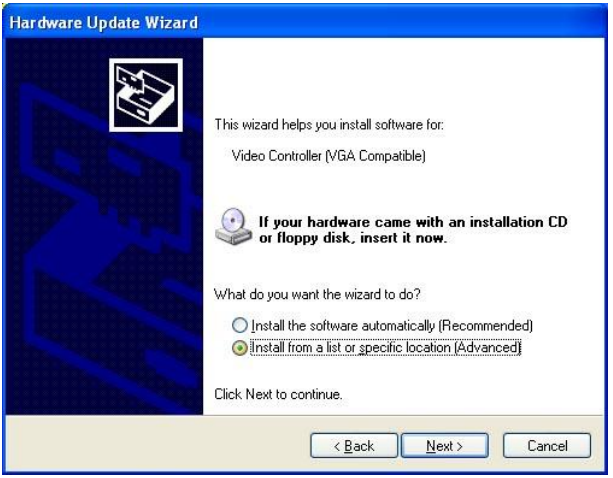


3. In the following window, click the **Driver** tab and click **OK** to continue.



4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**.





5. In the next screen, click **Search for the best driver in these** locations. Check **Include this location in the** search. Click **Browse** to find the driver's path in the CD provided or enter the path directly - **\AMD\Vga**. Then, click **Next** to start the drivers installtion. Then click **Finish** after the wizard has finished installing the software for ***Advanced Micro Devices Win XP Graphics Driver***.





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Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h	Keyboard Controller (1)
0601h	Control Port
064h	Real Time Clock
070h - 07Fh	Keyboard Controller (2)
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h – 00FFh	Coprocessor
01F0h – 01F7h 03F6h	IDE (Primary)
02F8h - 02FFh	Serial Port #2(COM2)
0378h – 037Ah	Parallel Port #1(LPT1)
03C0h – 03DFh	Reserved for VGA
03F0h – 03F5h 03F7h	FDD Controller
03F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	PIC2 (IRQ8-15)
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	For PCI
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	For PCI
IRQ10	For PCI
IRQ11	For PCI
IRQ12	PS/2 Mouse
IRQ13	Coprocessor
IRQ14	Primary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]=============================================
; Name      : Enable_And_Set_Watchdog
; IN   : AL - 1sec ~ 255sec
; OUT       : None
;[]=============================================
Enable_And_Set_Watchdog       Proc  Near
            push ax                 ;save time interval
            call   Unlock_Chip

            mov  cl, 2Bh
            call   Read_Reg
            and   al, NOT 10h
            call   Write_Reg        ;set GP24 as WDTO

            mov  cl, 07h
            mov  al, 08h
            call   Write_Reg        ;switch to LD8
            mov  cl, 0F5h
            call   Read_Reg
            and   al, NOT 08h
            call   Write_Reg        ;set count mode as second

            pop   ax
            mov  cl, 0F6h
            call   Write_Reg        ;set watchdog timer

            mov  al, 01h
            mov  cl, 30h
            call   Write_Reg        ;watchdog enabled
```

```
            call   Lock_Chip
            ret
Enable_And_Set_Watchdog      Endp

;[]=============================================
; Name     : Disable_Watchdog
; IN   : None
; OUT      : None
;[]=============================================
Disable_Watchdog    Proc  Near
            call   Unlock_Chip

            mov  cl, 07h
            mov  al, 08h
            call   Write_Reg       ;switch to LD8

            xor   al, al
            mov  cl, 0F6h
            call   Write_Reg       ;clear watchdog timer

            xor   al, al
            mov  cl, 30h
            call   Write_Reg       ;watchdog disabled

            call   Lock_Chip
            ret
Disable_Watchdog    Endp
;[]=============================================
; Name     : Unlock_Chip
; IN   : None
; OUT      : None
;[]=============================================
Unlock_Chip    Proc  Near
            mov  dx, 4Eh
            mov  al, 87h
            out   dx, al
            out   dx, al
            ret
Unlock_Chip    Endp
;[]=============================================
; Name     : Lock_Chip
; IN   : None
; OUT      : None
```

```
;[]================================================
Unlock_Chip     Proc  Near
                mov  dx, 4Eh
                mov  al, 0Aah

                out   dx, al
                ret
Unlock_Chip     Endp
;[]================================================
; Name      : Write_Reg
; IN   : CL - register index
;         AL - Value to write
; OUT       : None
;[]================================================
Write_Reg Proc  Near
                push ax
                mov  dx, 4Eh
                mov  al,cl
                out   dx,al
                pop   ax
                inc   dx
                out   dx,al
                ret
Write_Reg Endp
;[]================================================
; Name      : Read_Reg
; IN   : CL - register index
; OUT       : AL - Value to read
;[]================================================
Read_Reg Proc  Near
                mov  al, cl
                mov  dx, 4Eh
                out   dx, al
                inc   dx
                in     al, dx
                ret
Read_Reg Endp
;[]================================================
```

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