

# **IB884T**

**Intel® Atom  
Poulsbo XL Chipset  
3.5" Disk Size SBC**

## **USER'S MANUAL**

**Version 1.0**

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# Introduction

## Product Description

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The IB884T 3.5" disk-size board incorporates the Mobile Intel® Poulso XL Chipset for Embedded Computing, consisting of the Intel® single-chip system controller hub (SCH), an optimized integrated graphics solution with a 533MHz and 400MHz front-side bus. Dimensions of the board are 102mm x 147mm.

The integrated powerful 3D graphics engine, based on Intel® Graphics Media Accelerator) architecture 500, operates at core speeds of up to 200 MHz. It features a low-power design, With DDR2 533/400MHz one SO-DIMM socket on board, the board supports up to 2GB of DDR2 system memory.

Intel® Graphics supports a unique intelligent memory management scheme called Dynamic Video Memory Technology (DVMT). DVMT handles diverse applications by providing the availability of system memory for general computer usage, while supplying additional graphics memory when a 3D-intensive application requests it. The Intel graphics architecture also takes advantage of the high-performance Intel processor. Intel graphics supports Dual Independent Display technology.

The main features of the board are:

- Supports Intel® Atom Z510 (1.1GHz), Z520 (1.33GHz)
- Supports up to 533MHz FSB
- One DDR2 SDRAM SO-DIMM, Max. 2GB memory
- Onboard Intel Gigabit LAN
- Integrated VGA supports RGB / LVDS displays
- 1x IDE, 6x USB 2.0, 4x COM, Watchdog timer

### **Checklist**

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Your IB884T package should include the items listed below.

- The IB884T 3.5” disk-size SBC
- This User’s Manual
- 1 CD containing chipset drivers and flash memory utility
- Options:
  - Cable kit
  - Heatsink

## IB884T Specifications

<b>Product Name</b>	<b>IB884T-11(Z510PT) / IB884T-13(Z520PT)</b>
<b>Form Factor</b>	3.5"
<b>CPU Type</b>	Intel® Atom™ – Silverthorne XL (-40~ +85 degree C) Z510PT/Z520PT(TDP=2.2W) Package = 22mm x 22mm, FCBGA437, 45nm
<b>CPU Speed</b>	1.1GHz(Z510PT) / 1.33GHz(Z520PT)
<b>CPU FSB</b>	400MHz FSB (Z510PT) / 533 MHz FSB(Z520PT)
<b>L2 Cache</b>	512KB(Z510PT) / 1MB(Z520PT)
<b>Chipset</b>	Intel® SCH Poulsbo XL (-40~ +85 degree C) US15WPT(TDP=2.3W) , Package = 37.5mm x 37.5mm
<b>BIOS</b>	Phoenix BIOS, support ACPI Function
<b>Memory</b>	DDR2-800 SO-DIMM x 1, 2GB Max. (single channel, Non-ECC)
<b>VGA</b>	Chrontel 7022A x1 for CRT thru SDVO (-20~ +85 degree C)
<b>LVDS</b>	US15WPT SCH built-in 24-bit LVDS (single channel)
<b>LAN</b>	Intel 82574IT GbE x 1 (-40~ +85 degree C)
<b>USB</b>	US15WPT SCH built-in USB 2.0 host controller, 6 ports 2 ports thru edge I/O connector; 4 ports thru onboard pin-header type
<b>Serial ATA</b>	JMB362 PCI-e to SATA Bridge, SATA II x2 (0~+85 degree C)
<b>Parallel IDE</b>	US15WPT SCH built-in IDE controller
<b>Audio</b>	US15WPT SCH built-in Audio controller w/ Realtek <b>ALC269</b> support 2-channel audio out + 2W amplifier (0~ +70 degree C)
<b>LPC I/O</b>	<b>Fintek F81865-I</b> (-40~ +85 degree C) COM1 (RS232/422/485), COM2/COM3/COM4 (RS232 only) , Hardware Monitor (3 thermal inputs, 4 voltage monitor inputs & 1 Fan header) **pin-9 with power for COM 1 ( 500 mA)
<b>Digital IO</b>	4 in & 4 out
<b>Keyboard/Mouse</b>	Thru onboard pin-header
<b>Edge Connectors</b>	COM1, USB1/USB2, CRT, LAN
<b>Onboard Header/ Conn.</b>	LVDS, USB3~USB6, IDE, audio, speaker, COM2, COM3, COM4, 2x SATA, KBMS pin header
<b>Power</b>	DC-in (+12V~19V)
<b>Watchdog Timer</b>	Yes (256 segments, 0, 1, 2...255 sec/min)
<b>RTC/CMOS</b>	Onboard Lithium Battery (Do not locate under SO-DIMM) [Cable-type is preferred]
<b>RoHS</b>	Yes
<b>Board Size</b>	102 mm x 147 mm [4"x5.8"]
<b>Wide -Range Operating</b>	-40 ~ +75 degree C [-40 ~ ±167 degree F] for board level

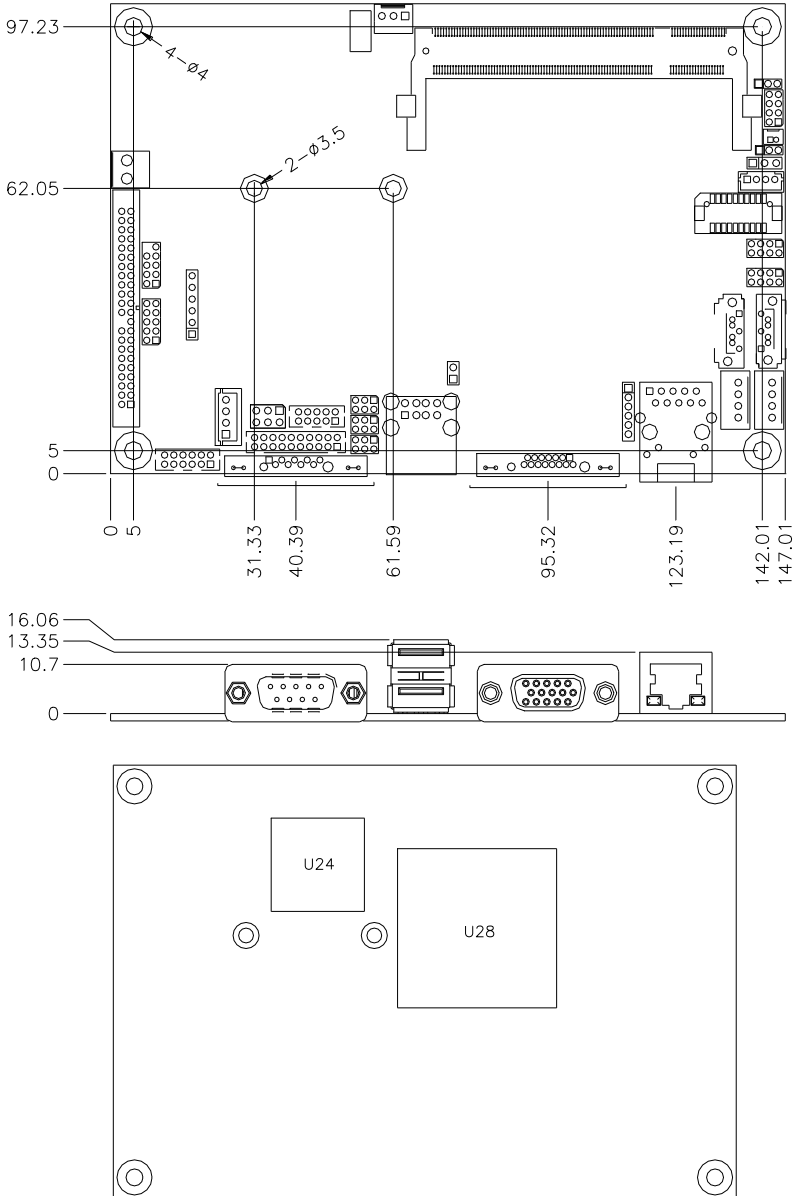
## ***INTRODUCTION***

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Temp.	
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**Board Dimensions**



## **Installations**

This section provides information on how to use the jumpers and connectors on the IB884T in order to set up a workable system. The topics covered are:

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## **Installing the Memory**

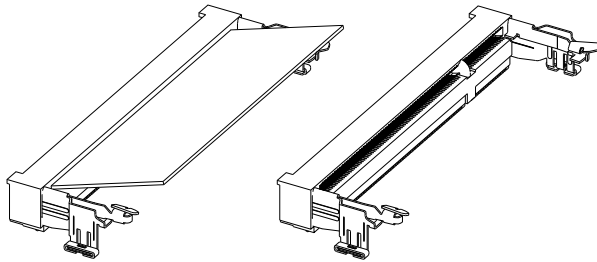
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The IB884T board supports a DDR2 memory socket for a maximum total memory of 2GB in DDR2 533/400 memory type.

### **Installing and Removing Memory Modules**

To install DDR2 modules, locate the memory socket on the board and perform the following steps:

1. Hold the DDR2 module so that the keys of the DDR2 module align with those on the memory slot.
2. Gently push the DDR2 module in an angle as shown in the picture below until the clips of the sockets lock to hold the DDR2 module in place when the DDR2 module touches the bottom of the socket.
3. To remove the DDR2 module, press the clips with both hands.



## **Setting the Jumpers**

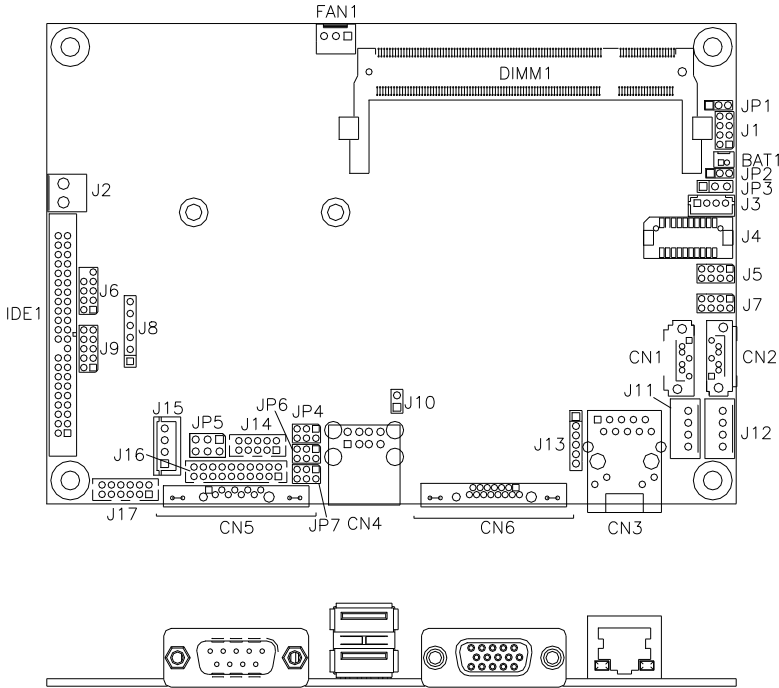
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

Jumpers are used on IB884T 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 IB884T and their respective functions.

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**Jumper Locations on IB884T**





**JP2: Clear CMOS Setting**

JP2	Setting
	Normal
	Clear CMOS

Note: Please remove the lithium battery before setting the jumper.

**JP3: LCD Panel Power Selection**

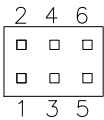
JP3	LCD Panel Power
	3.3V
	5V

**JP4, JP6, JP7: RS232/422/485 (COM1) Selection**

COM2, COM3, COM4 are fixed for RS-232 use only.

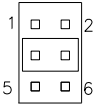
COM1 is selectable for RS232, RS-422 and RS-485.

The following table describes the jumper settings for COM1 selection.



COM1 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP4: 1-2	JP6: 3-4	JP7: 5-6
	JP8: 3-5 & 4-6	JP8: 1-3 & 2-4	JP8: 1-3 & 2-4
	JP10: 3-5 & 4-6	JP10: 1-3 & 2-4	JP10: 1-3 & 2-4

**JP5: COM1 RS232 +5V/+12V Power Setting**

<b>JP5</b>	<b>Setting</b>	<b>Function</b>
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	Normal
	Pin 5-6 Short/Closed	+5V

**Connectors on IB884T**

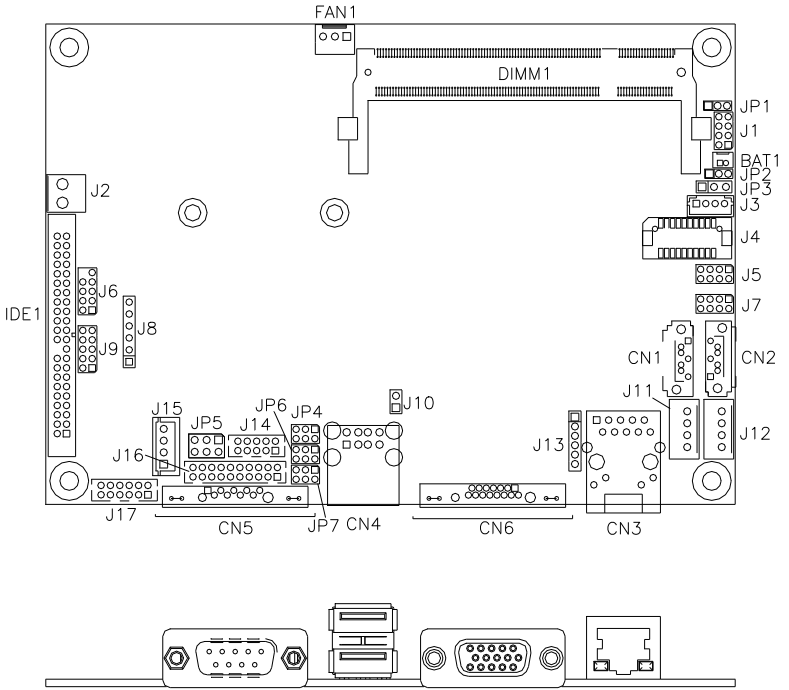
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**Connector Locations on IB884T**



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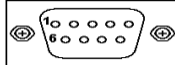
**CN1, CN2: SATA Connectors**

**CN3: Gigabit LAN RJ45 Connector**

**CN4: USB 0/1 Connector**

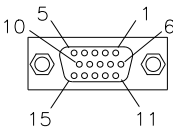
**CN5: COM1 Serial Ports Connector**

CN5 (COM1) is a DB-9 connector.



Pin #	Signal Name		
	RS-232	RS-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC
10	NC	NC	NC

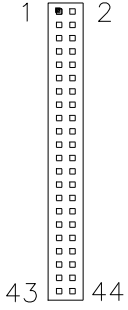
**CN6: VGA Connector**



**VGA**

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

**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	Protect pin
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	Cable Detect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
+5V	41	42	+5V
Ground	43	44	NC

**J1 (F\_PANEL): System Function Connector**

J1 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J1 is an 8-pin header that provides interfaces for the following functions.



**ATX Power ON Switch: Pins 1 and 2**

This 2-pin connector is an “ATX Power Supply On/Off Switch” on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.

### Power LED: Pins 3 and 4

Pin #	Signal Name
3	LED(+)
4	LED(-)

### Hard Disk Drive LED Connector: Pins 5 and 6

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.

Pin #	Signal Name
5	LED(+)
6	LED(-)

### Reset Switch: Pins 7 and 8

The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.

### J2: Board Input Power Connector



Pin #	Signal Name
1	GND
2	+12V/+19V

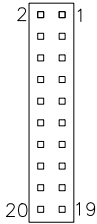
### J3: LCD Backlight Connector



Pin #	Signal Name
1	+12V
2	Backlight Enable
3	ADJ
4	Ground

**J4: LVDS Connectors (DF13 Connector)**

The LVDS connector supports single-channel 18-bit or 24-bit displays.



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
DDC_DATA	20	19	DDC_CLK

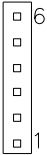
**J5, J7: USB2~USB5 Connectors**



Signal Name	Pin	Pin	Signal Name
Vcc	1	2	Ground
USB2-	3	4	USB3+
USB2+	5	6	USB3-
Ground	7	8	Vcc

**J6: LPC Connector (factory use only)**

**J8: Keyboard/Mouse Connector**

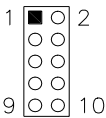


Pin #	Signal Name
1	Keyboard Data
2	Keyboard Clock
3	Mouse Data
4	Mouse Clock
5	Ground
6	VCC

## INSTALLATIONS


### J9: Digital I/O Connector (4 in, 4 out)

This 10-pin digital I/O connector supports TTL levels and is used to control external devices requiring ON/OFF circuitry.




Signal Name	Pin #	Pin #	Signal Name
Ground	1	2	+5V
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0

### J10: Buzzer Connector



Pin#	Signal Name
1	Buzzer+
2	Buzzer-

### J11, J12: HDD Power Connector



Pin #	Signal Name
1	+5V
2	Ground
3	Ground
4	+12V

### J13: CPLD Connector (factory use only)

### J14: COM2/RS232 Serial Port



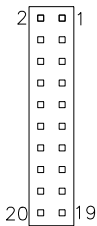
Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	2	RXD, Receive data
TXD, Transmit data	3	4	DTR, Data terminal ready
GND, ground	5	6	DSR, Data set ready
RTS, Request to send	7	8	CTS, Clear to send
RI, Ring indicator	9	10	Not Used

**J15: Amplify Connector**



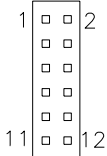
Pin #	Signal Name
1	OUTL+
2	OUTL-
3	OUTR-
4	OUTR+

**J16: COM3, COM4 Serial Port (DF11 Connector)**



Signal Name	Pin #	Pin #	Signal Name
DSR3	2	1	DCD3
RTS3	4	3	RXD3
CTS3	6	5	TXD3
RI3	8	7	DTR3
NC	10	9	Ground
DSR4	12	11	DCD4
RTS4	14	13	RXD4
CTS4	16	15	TXD4
RI4	18	17	DTR4
NC	20	19	Ground

**J17: Audio Connector**



Signal Name	Pin #	Pin #	Signal Name
LINE-OUT_L	1	2	LINE-OUT_R
JD-OUT	3	4	Ground
LINE-IN_L	5	6	LINE-IN R
JD-IN	7	8	Ground
Mic-In L	9	10	Mic-In R
JD-Mic	11	12	Ground

# 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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## **BIOS Introduction**

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel 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.

## BIOS SETUP

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Load Fail-Safe Defaults
Advanced BIOS Features	Load Optimized Defaults
Advanced Chipset Features	Set Supervisor Password
Integrated Peripherals	Set User Password
Power Management Setup	Save & Exit Setup
PnP/PCI Configurations	Exit Without Saving
PC Health Status	
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
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 Features

“Standard CMOS Features” choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the board 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

		Item Help
Date (mm:dd:yy)	Tue, May 24 2011	Menu Level >
Time (hh:mm:ss)	16 : 00 : 00	
IDE Channel 0 Master	None	Change the day, month, Year and century
IDE Channel 0 Slave	None	
Video	EGA/VGA	
Halt On	No Errors	
Base Memory	639K	
Extended Memory	1038336K	
Total Memory	1039360K	

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

## **BIOS SETUP**

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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 Channel Master/Slave**

The onboard PCI IDE connector provides Primary and Secondary channels for connecting up to two IDE hard disks or other IDE devices.

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.

**Capacity** :           Capacity/size of the hard disk drive  
**Cylinder** :           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

**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

**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

		ITEM HELP
CPU Feature	Press Enter	
Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level >
CPU L1 & L2 Cache	Enabled	
CPU L3 Cache	Enabled	
Hyper-Threading Technology	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	USB-FDD	
Second Boot Device	Hard Disk	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Boot Up NumLock Status	On	
Typeomatic Rate Setting	Disabled	
Typeomatic Rate (Chars/Sec)	6	
Typeomatic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Small Logo (EPA) Show	Disabled	

**CPU Feature**

Press Enter to configure the settings relevant to CPU Feature.

**Hard Disk Boot Priority**

With the field, there is the option to choose, aside from the hard disks connected, "Bootable add-in Cards" which refers to other external devices.

**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.

**CPU L1 / L2 / L3 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 items are enabled.

**Hyper-Threading Technology**

By default, this function is enabled.

**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 fields determine the drive that the system searches first for an operating system. The options available include *LS120*, *Hard Disk*, *CDROM*, *ZIP100*, *USB-FDD*, *USB-ZIP*, *USB-CDROM* and *Disabled*.

**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.

**Boot Up NumLock Status**

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

**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.

### **APIC Mode**

APIC stands for Advanced Programmable Interrupt Controller. The default setting is *Enabled*.

### **MPS Version Control for OS**

This option specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is *1.4*.

### **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. The default setting is *Disabled*.



## Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility  
Advanced Chipset Features

DRAM Timing Selectable	By SPD	ITEM HELP
SLP_S4# Assertion Width	4 to 5 Sec	Menu Level >
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
** VGA Setting **		
On-Chip Frame Buffer Size	8MB	
Boot Type	CRT	
LCD Panel Type	1024x768 generic	
Panel Scaling	AUTO	

### DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is *By SPD*.

### SLP\_S4# Assertion Width

The default setting is *4 to 5 Sec*.

### System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

### Video BIOS Cacheable

The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. By default, this field is disabled.

### VGA Setting

The fields under the VGA Setting and their default settings are:

- On-Chip Frame Buffer Size: 8MB
- Boot Type: CRT
- LCD Panel Type: 1024x768 generic
- Panel Scaling: Auto

## 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

OnChip IDE Device	Press Enter	ITEM HELP
Onboard Device	Press Enter	Menu Level >
PCI Express Root Function	Press Enter	
Onboard Lan Boot ROM	Disabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
Onboard Serial Port 3	3E8/IRQ5	
Onboard Serial Port 4	2E8/IRQ7	
USB Device Setting	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility  
OnChip IDE Device

IDE HDD Block Mode	Enabled	ITEM HELP
IDE Primary Master PIO	Auto	Menu Level >
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	

Phoenix - AwardBIOS CMOS Setup Utility  
Onboard Device

Intel HD Audio Controller	Auto	ITEM HELP
		Menu Level >

Phoenix - AwardBIOS CMOS Setup Utility  
PCI Express Root Function

PCI Express Port 1	Auto	ITEM HELP
PCI Express Port 2	Auto	

Phoenix - AwardBIOS CMOS Setup Utility  
USB Device Setting

USB 1.0 Controller	Enabled	ITEM HELP
USB 2.0 Controller	Enabled	Menu Level >
USB Operation Mode	High Speed	
USB Keyboard Function	Enabled	
USB Storage Function	Enabled	
*** USB Mass Storage Device Boot Setting ***		

**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.

**On-chip Primary 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 Master/Slave PIO**

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 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*.

**Intel HD Audio Controller Select**

This field, by default, is set to *Auto*.

**Onboard Serial 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
Serial Port 3	3E8/IRQ5
Serial Port 4	2E8/IRQ7

**USB 1.0 Controller**

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Enabled*.

### **USB 2.0 Controller**

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Enabled*. In order to use USB 2.0, necessary OS drivers must be installed first.

### **USB Operation Mode**

By default, this field is set to *High Speed*.

### **USB Keyboard/Storage Function**

The options for this field are *Enabled* and *Disabled*. By default, this field is set to *Enabled*.

### **Onboard Lan Boot ROM**

By default, this setting is *Disabled*.

## Power Management Setup

Phoenix - AwardBIOS CMOS Setup Utility  
Power Management Setup

Video Off Method	V/H SYNC+Blank	ITEM HELP
Wake-Up by PCI Card	Disabled	Menu Level >
HPET Feature	Press Enter	

### Video Off Method

This field defines the Video Off features. There are three options.

- V/H SYNC + Blank      Default setting, blank the screen and turn off vertical and horizontal scanning.
- DPMS                      Allows BIOS to control the video display.
- Blank Screen              Writes blanks to the video buffer.

### Wake-Up by PCI card

By default, this field is *Disabled*.

### HPET Feature

HPET means “High Precision Event Timer”. The HPET can produce periodic interrupts at a much higher resolution than the RTC and is often used to synchronize multimedia streams.

**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

Init Display First	Onboard	ITEM HELP
Reset Configuration Data	Disabled	
Resources Controlled By IRQ Resources	Auto (ESCD) Press Enter	Menu Level
PCI/VGA Palette Snoop	Disabled	Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
**PCI Express relative items** Maximum Payload Size	128	

**Init Display First**

The default setting is *Onboard*.

**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 with the use of a PnP operating 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.

**Maximum Payload Size**

The default setting of the PCI Express Maximum Payload Size is 128.

## 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
+12 V	11.83V	Menu Level >
+1.8V	1.79V	
+3.3V VBS	3.34V	
+3.3V VBAT	2.97V	
CPU Temperature	45°C	
SYS Temperature	47°C	
LVDS Back Light Control	7	

## Temperatures/Voltages

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

## LCD Back Light Control

The default setting of the LCD Back Light Control is 7(Max).

### **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 XP, Windows Vista and Windows 7. The software and drivers are included with the board. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Device Software.....	39
VGA Drivers Installation .....	40
Audio Drivers Installation .....	41
LAN Drivers Installation.....	42

### **IMPORTANT NOTE:**

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

## Intel Chipset Device Software

1. Insert the CD that comes with the board. Click *Intel (R)Chipset Software Installation Utility*.



2. When the welcome screen to the setup program for Intel® Chipset Device Software appears, click **Next** to continue.
3. In the next screen, click **Next** to agree with the terms of the license agreement. Then, click **Next** again in the next screen after reading the Readme File Information to continue. After Setup has finished installing the software, click **Finish** to complete the setup process.

### VGA Drivers Installation

---

1. Insert the CD that comes with the board. Click *Intel (R)SCH Chipset Family Graphics Driver*.



2. When the welcome screen to the setup program for Intel® Graphics Media Accelerator 500 appears, click **Next** to continue.

3. In the next screen, click **Yes** to agree with the terms of the license agreement. Then, click **Next** again in the next screen after reading the Readme File Information to continue.

4. Click **Install this driver software anyway** to continue.

5. Click **Next** to continue with the setup operations.

6. When setup is completed, click **Finish** to restart the computer and for changes to take effect.

*Note: After the installation of the Windows XP VGA drivers, when you are using a CRT monitor, and after restarting, the display will jump to MID(LVDS). At this moment, use the hot key (Ctrl+Alt+F1) in order to use the CRT monitor.*

## Audio Drivers Installation

1. Insert the CD that comes with the board. Click *Realtek High Definition Codec Audio Driver*.



2. The Welcome screen to the InstallShield Wizard for Realtek High Definition Audio Driver will appear. At this point, click **Next** to continue the installation process.

3. When installation is completed, restart the computer as prompted. Click **Finish**.

## **LAN Drivers Installation**

---

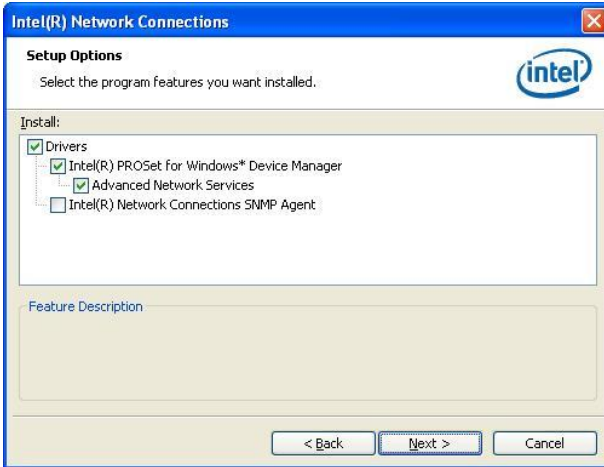
Follow the steps below to start installing the Intel PRO LAN drivers.

1. Insert the CD that comes with the board. Click **LAN** and then click **Intel(R) PRO LAN Drivers**.



2. In the Intel® Network Connections screen, click **Install Drivers and Software**.
3. In the License Agreement screen, click I accept the terms in the license agreement, then click **Next**.

4. In the Setup Options, click the checkbox as shown below and click **Next**.



5. In the InstallShield Wizard screen, click **Install** to begin the installation.

6. InstallShield Wizard is completed. Click **Finish** to exit the Wizard.

## 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.

<b>Address</b>	<b>Device Description</b>
0000h-0CF7h	PCI bus
0000h-0CF7h	Direct memory access controller
0010h-001Fh	Motherboard resources
0020h-0021h	Programmable interrupt controller
0022h-003Fh	Motherboard resources
0040h-0043h	System timer
0044h-005Fh	Motherboard resources
0060h-0060h	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0061h-0061h	System speaker
0062h-0063h	Motherboard resources
0064h-0064h	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0065h-006Fh	Motherboard resources
0070h-0073h	System CMOS/real time clock
0074h-007Fh	Motherboard resources
0080h-0090h	Direct memory access controller
0091h-0093h	Motherboard resources
0094h-009Fh	Direct memory access controller
00A0h-00A1h	Programmable interrupt controller
00A2h-00BFh	Motherboard resources
00C0h-00DFh	Direct memory access controller
00E0h-00EFh	Motherboard resources
00F0h-00FFh	Numeric data processor
0170h-0177h	Secondary IDE Channel
01F0h-01F7h	Primary IDE Channel
0274h-0277h	ISAPNP Read Data Port
0279h-0279h	ISAPNP Read Data Port
02E8h-02EFh	Communications Port (COM4)
02F8h-02FFh	Communications Port (COM2)



<b>Address</b>	<b>Device Description</b>
0376h-0376h	Secondary IDE Channel
03B0h-03BBh	Intel(R) Graphics Media Accelerator 500
03C0h-03DFh	Intel(R) Graphics Media Accelerator 500
03E8h-03EFh	Communications Port (COM3)
03F6h-03F6h	Primary IDE Channel
03F8h-03FFh	Communications Port (COM1)
04D0h-04D1h	Motherboard resources
0800h-0805h	Motherboard resources
0880h-088Fh	Motherboard resources
0900h-09BFh	Motherboard resources
0A79h-0A79h	ISAPNP Read Data Port
0D00h-FFFFh	PCI bus
D000h-DFFFh	PCI standard PCI-to-PCI bridge
DB00h-DB0Fh	Standard Dual Channel PCI IDE Controller
DC00h-DC03h	Standard Dual Channel PCI IDE Controller
DD00h-DD07h	Standard Dual Channel PCI IDE Controller
DE00h-DE03h	Standard Dual Channel PCI IDE Controller
DF00h-DF07h	Standard Dual Channel PCI IDE Controller
E000h-EFFFh	PCI standard PCI-to-PCI bridge
EF00h-EF1Fh	Intel(R) 82574L Gigabit Network Connection
FB00h-FB0Fh	Standard Dual Channel PCI IDE Controller
FC00h-FC1Fh	Standard Universal PCI to USB Host Controller
FD00h-FD1Fh	Standard Universal PCI to USB Host Controller
FE00h-FE1Fh	Standard Universal PCI to USB Host Controller
FF00h-FF07h	Intel(R) Graphics Media Accelerator 500

## **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.

<b>Level</b>	<b>Function</b>
IRQ 0	High precision event timer
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 3	Communications Port (COM2)
IRQ 4	Communications Port (COM1)
IRQ 5	Communications Port (COM3)
IRQ 7	Communications Port (COM4)
IRQ 8	High precision event timer
IRQ 9	Microsoft ACPI-Compliant System
IRQ 12	PS/2 Compatible Mouse
IRQ 13	Numeric data processor
IRQ 16	Intel(R) Graphics Media Accelerator 500
IRQ 16	Microsoft UAA Bus Driver for High Definition Audio
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 16	Intel(R) 82574L Gigabit Network Connection
IRQ 16	Standard Universal PCI to USB Host Controller
IRQ 17	PCI standard PCI-to-PCI bridge
IRQ 17	Standard Dual Channel PCI IDE Controller
IRQ 17	Standard Universal PCI to USB Host Controller
IRQ 18	Standard Universal PCI to USB Host Controller
IRQ 19	Standard Enhanced PCI to USB Host Controller

## 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 sorts 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.
//
//-----
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81865.H"
//-----
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//-----
int main (int argc, char *argv[])
{
    unsigned char bBuf;
    unsigned char bTime;
    char **endptr;

    char SIO;

    printf("Fintek 81865 watch dog program\n");

    SIO = Init_F81865();
    if (SIO == 0)
    {
        printf("Can not detect Fintek 81865, program abort.\n");
        return(1);
    }/if (SIO == 0)

    if (argc != 2)
    {
        printf(" Parameter incorrect!!\n");
        return (1);
    }

    bTime = strtol (argv[1], endptr, 10);
    printf("System will reset after %d seconds\n", bTime);

    if (bTime)
    {
        EnableWDT(bTime); }
    else
    {
        DisableWDT(); }
}
```

```
    return 0;
}
//-----
void EnableWDT(int interval)
{
    unsigned char bBuf;

    bBuf = Get_F81865_Reg(0x2B);
    bBuf &= (~0x20);
    Set_F81865_Reg(0x2B, bBuf);                //Enable WDTO

    Set_F81865_LD(0x07);                       //switch to logic device 7
    Set_F81865_Reg(0x30, 0x01);               //enable timer

    bBuf = Get_F81865_Reg(0xF5);
    bBuf &= (~0x0F);
    bBuf |= 0x52;
    Set_F81865_Reg(0xF5, bBuf);               //count mode is second

    Set_F81865_Reg(0xF6, interval);           //set timer

    bBuf = Get_F81865_Reg(0xFA);
    bBuf |= 0x01;
    Set_F81865_Reg(0xFA, bBuf);               //enable WDTO output

    bBuf = Get_F81865_Reg(0xF5);
    bBuf |= 0x20;
    Set_F81865_Reg(0xF5, bBuf);               //start counting
}
//-----
void DisableWDT(void)
{
    unsigned char bBuf;

    Set_F81865_LD(0x07);                       //switch to logic device 7

    bBuf = Get_F81865_Reg(0xFA);
    bBuf &= ~0x01;
    Set_F81865_Reg(0xFA, bBuf);               //disable WDTO output

    bBuf = Get_F81865_Reg(0xF5);
    bBuf &= ~0x20;
    bBuf |= 0x40;
    Set_F81865_Reg(0xF5, bBuf);               //disable WDT
}
//-----
```

```

//-----
//
// 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.
//
//-----
#include "F81865.H"
#include <dos.h>
//-----
unsigned int F81865_BASE;
void Unlock_F81865 (void);
void Lock_F81865 (void);
//-----
unsigned int Init_F81865(void)
{
    unsigned int result;
    unsigned char ucDid;

    F81865_BASE = 0x4E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x2E;
    result = F81865_BASE;

    ucDid = Get_F81865_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81865_BASE = 0x00;
    result = F81865_BASE;
}

Init_Finish:
    return (result);
}
//-----
void Unlock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
    outportb(F81865_INDEX_PORT, F81865_UNLOCK);
}
//-----
void Lock_F81865 (void)
{
    outportb(F81865_INDEX_PORT, F81865_LOCK);
}
//-----
void Set_F81865_LD( unsigned char LD)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, F81865_REG_LD);
    outportb(F81865_DATA_PORT, LD);
    Lock_F81865();
}
//-----
void Set_F81865_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, REG);
    outportb(F81865_DATA_PORT, DATA);
    Lock_F81865();
}
//-----

```

## APPENDEIX

---

```
unsigned char Get_F81865_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_F81865();
    outportb(F81865_INDEX_PORT, REG);
    Result = inportb(F81865_DATA_PORT);
    Lock_F81865();
    return Result;
}
//-----

//-----
//
// 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.
//
//-----
#ifndef __F81865_H
#define __F81865_H                1
//-----
#define F81865_INDEX_PORT        (F81865_BASE)
#define F81865_DATA_PORT        (F81865_BASE+1)
//-----
#define F81865_REG_LD            0x07
//-----
#define F81865_UNLOCK            0x87
#define F81865_LOCK              0xAA
//-----
unsigned int Init_F81865(void);
void Set_F81865_LD( unsigned char);
void Set_F81865_Reg( unsigned char, unsigned char);
unsigned char Get_F81865_Reg( unsigned char);
//-----
#endif __F81865_H
```