

IB906

**Intel® Sandy Bridge / PCH
3.5-inch Disk Size SBC**

USER'S MANUAL

Version 1.0

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Introduction

Product Description

The IB906 3.5-inch disk size SBC is based on the latest Intel® HM65 chipset. The platform supports 2nd generation Intel® Core processor family with BGA1023 package and features an integrated one-channel DDR3 memory controller as well as a graphics core.

The latest Intel® processors provide advanced performance in both computing and graphics quality. This meets the requirement of customers in the gaming, POS, digital signage and server market segment.

The Intel® HM65 is made with 32 nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The IB906 SBC utilizes the dramatic increase in performance provided by this Intel's latest cutting-edge technology. Measuring 102mm x 148mm, IB906 offers fast 6Gbps SATA support (2 ports), USB3.0 (2 ports) and interfaces for, DVI-I, LVDS displays. IB906 features Intel Active Management Technology 7.0.

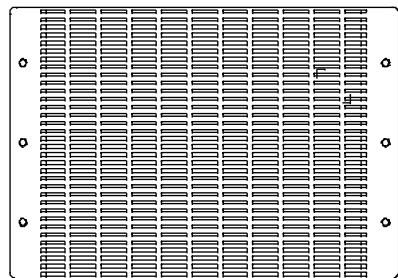
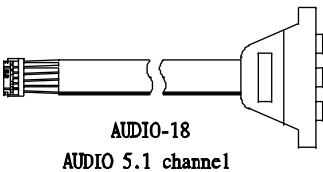
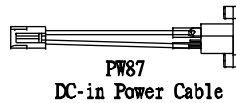
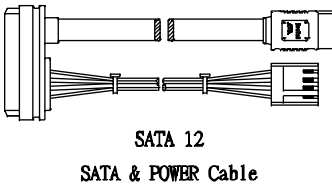
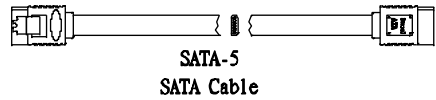
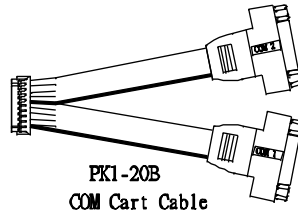
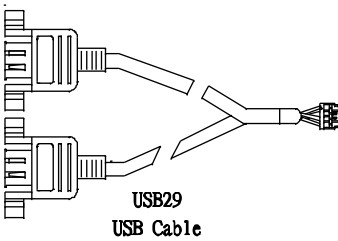
IB906 FEATURES:

- Supports Intel® 2nd Generation Celeron mobile processors (BGA Type)
- One DDR3 SoDIMM, 1066/1333MHz, Max. 8GB memory
- Dual Intel® PCI-Express Gigabit LAN
- Integrated Graphics for DVI-I/LVDS displays
- 2x SATA 3.0, 6x USB 2.0, USB 3.0 (2 ports), 2x COM, Watchdog timer
- 1x Mini PCI-E
- Digital I/O, LPC/Smart battery interface/iSMART

Checklist

Your IB906 package should include the items listed below.

- The IB906 3.5-inch disk size SBC
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Optional SATA-5; Audio-18; USB29; SATA-12; PK1-20B; PW87 cable
- Optional HSIB906-BGA Heat Sink



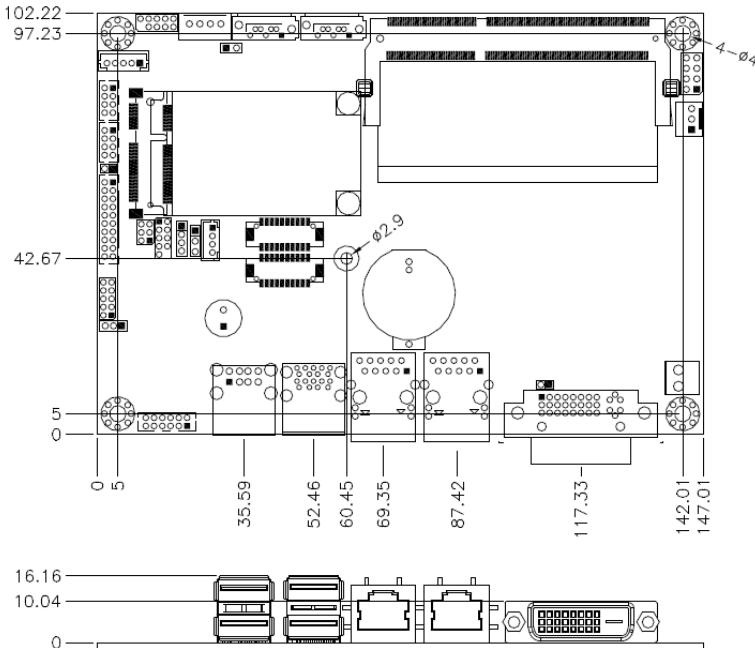
IB906 Specifications

Product Name	IB906F
Form Factor	3.5" disk-size SBC
CPU Type	- Intel® 2 nd Generation Celeron mobile processor - BGA1023 package size, 31 x 24 mm - TDP = 10W [807UE]
CPU Speed	1GHz
Cache	1.5MB
CPU type	FCBGA1023 @ solder side
Chipset	Intel® BD82HM65 @ solder side 25 x 25 mm package size, TDP=3.9W
BIOS	AMI BIOS, support ACPI Function
Memory	Intel® 2 nd generation /Celeron mobile processor integrated memory controller DDRIII 1066/1333MHz SO-DIMM x1 (w/o ECC, 1.5V), Max. 8GB
VGA	Intel® 2 nd Gen. mobile processor integrated Gfx DVI-I x 1 (thru Level shifter ASM1442) [<u>Thru Digital Port B</u>]
LVDS	24-bit dual channels LVDS interface w/DF13 socket x2
LAN	1. Intel® 82579V GbE PHY as 1 st LAN 2. Intel® 82583V PCIe GbE as 2 nd LAN
USB	1. Intel® HM65 integrated USB 2.0 controller, supports 7 ports: 2-port in the rear panel + 4-ports onboard pin header (DF11 connector) 2. USB 3.0 host controller [<u>ASM1042</u>], support 2 ports in the rear panel [Not support DOS boot function]
Serial ATA Ports	Intel® HM65 PCH built-in SATA controller, supports 2 x SATA 3.0 (6Gbps)
Audio	Intel® HM65 PCH built-in High Definition Audio controller + Realtek ALC662, supports 5.1-channel
LPC I/O	<u>Fintek F81866AD-I [128-pin LQFP, 14 mmx 14mm]</u> COM1 (RS232 only) COM2 (RS232/422/485) support ring-in with power @500 mA (jumper selectable for 5V or 12V) [Hardware Monitor]: 2x thermal inputs, 2x voltage monitoring, 1x fan speed DC control
Digital IO	4 in & 4 out
IAMT (7.0)	N/A
Expansion Slots	Mini PCI-e socket x 1, Full-sized type [USB device support]
Edge Connector	DVI-I x1, RJ45 x2 for LAN 1 & 2 USB 3.0 stack connector x 1 for USB1 ~2 [Blue color] USB 2.0 stack connector x 1 for USB3 ~4

INTRODUCTION

Onboard Header/Connector	2 ports x SATA III [Blue color] 2x4 pins header x 2 for 4 USB 2.0 ports[DF11] DF13-20 socket connector x 2 for 24-bit dual channel LVDS 2x6 pins box header x1 for Audio [DF11] 2x10 pins box header x 1 for COM1/ COM2 [DF11] 2x5 pins headers x 1 for LPC (Debug purpose only) Mini PCI-e(1x) connector x 1 [Full-sized] 5 pins box header x 1 for smart battery 4 pins box header x 1 for backlight/brightness control 4 pins power connector x 1 for SATA HDD 2 pins power connector x 1 for DC-in [180 degree vertical type]
Watchdog Timer	Yes (256 segments, 0, 1, 2...255 sec/min)
Power Connector	+12~+24V DC-in
Board Size	102mm x 147mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB906 in order to set up a workable system. The topics covered are:

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Setting the Jumpers.....	7
Connectors on IB906.....	10

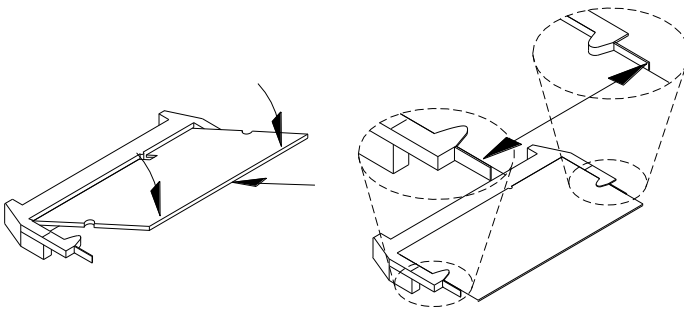
Installing the Memory

The IB906 board supports one DDR3 memory socket for a maximum total memory of 4GB in DDR3 SO-DIMM memory type.

Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR3 module so that the key of the DDR3 module aligns with that on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
2. To seat the memory module into the socket, apply firm and even pressure to each end of the module until you feel it slip down into the socket.
3. With the module properly seated in the socket, rotate the module downward. Continue pressing downward until the clips at each end lock into position.
4. To remove the DDR3 module, press the clips with both hands.

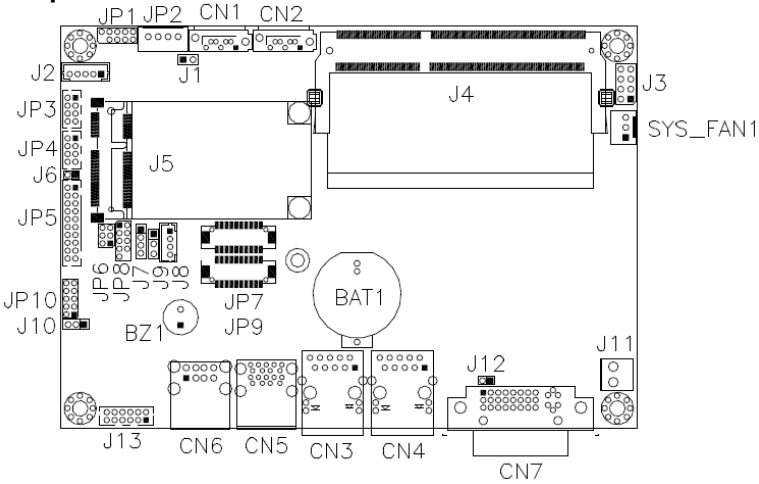


Setting the Jumpers

Jumpers are used on IB906 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 IB906 and their respective functions.

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J9: LCD Panel Power Selection	9
J1: Flash Descriptor Security Override (Factory use only)	9
J10: Clear CMOS Contents.....	9

Jumper Locations on IB906

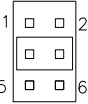


Jumpers on IB906.....	Page
J1: Flash Descriptor Security Override (Factory use only)	9
JP6: COM2 RS232 RI/+5V/+12V Power Setting.....	9
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

J1: Flash Descriptor Security Override (Factory use only)

J1	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled



JP6: COM2 RS232 RI/+5V/+12V Power Setting

JP6	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI
	Pin 5-6 Short/Closed	+5V

J9: LCD Panel Power Selection

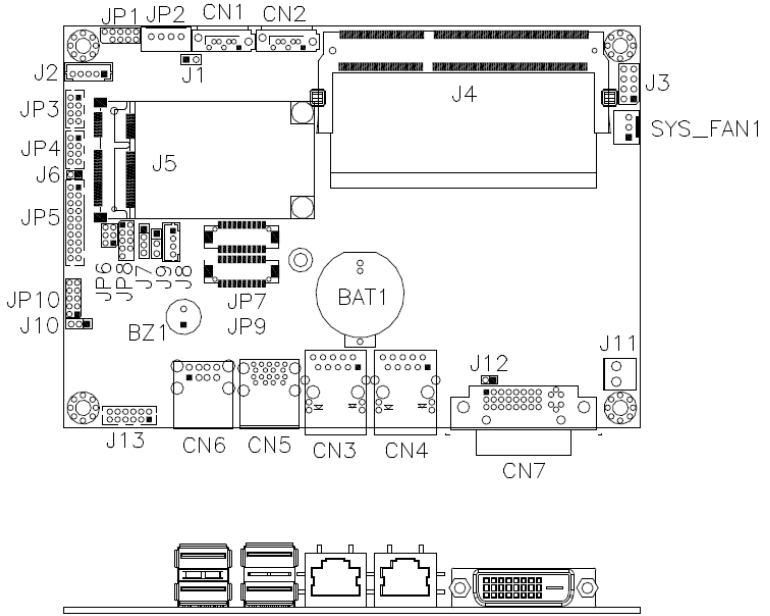
J9	LCD Panel Power
	3.3V
	5V

J10: Clear CMOS Contents

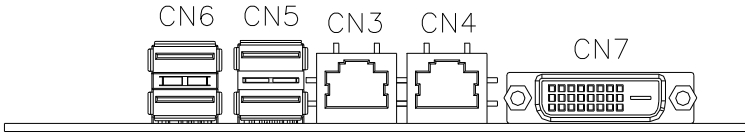
J10	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

Connectors on IB906

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INSTALLATIONS



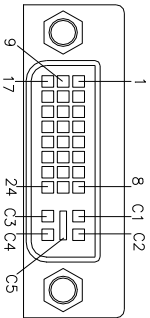
CN6: USB2.0 Connector

CN5: USB3.0 Connector

CN3: Gigabit LAN (Intel 82583V)

CN4: Gigabit LAN (Intel 82579LM)

CN7: DVI-I Connector



Signal Name	Pin #	Pin #	Signal Name
DATA 2-	1	16	HOT POWER
DATA 2+	2	17	DATA 0-
Shield 2/4	3	18	DATA 0+
DATA 4-	4	19	SHIELD 0/5
DATA 4+	5	20	DATA 5-
DDC CLOCK	6	21	DATA 5+
DDC DATA	7	22	SHIELD CLK
Anlog-Vsync	8	23	CLOCK -
DATA 1-	9	24	CLOCK +
DATA 1+	10	C1	Anlog-Red
SHIELD 1/3	11	C2	Anlog-Green
DATA 3-	12	C3	Anlog-Blue
DATA 3+	13	C4	Anlog-Hync
DDC POWER	14	C5	A GROUND2
A GROUND 1	15	C6	A GROUND3

CN1, CN2: SATA Connectors

JP2: HDD Power Connector



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

J2: Smart Battery Interface Connector

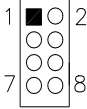
E-CALL 0110-161-050

Mating connector: JST PHR-5



Pin #	Signal Name
1	RST
2	EXTSMI
3	Ground
4	DATA
5	CLK

J3: Front Panel Connector

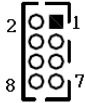


Signal Name	Pin #	Pin #	Signal Name
Power BTN	1	2	Power BTN
HDD LED+	3	4	HDD LED-
Reset BTN	5	6	Reset BTN
Power LED+	7	8	Power LED-

JP3, JP4: USB3~USB6 Connector (DF11 Connector)

Haoguo DF11-8S-PA66H

Mating connector: Hirose DF11-8DS-2C

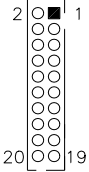


Signal Name	Pin #	Pin #	Signal Name
Ground	2	1	Vcc
D4+	4	3	D3-
D4-	6	5	D3+
Vcc	8	7	Ground

JP5: COM1, COM2 Serial Port (DF11 Connector)

Haoguo DF11-20S-PA66H

Mating connector: Hirose DF11-20DS-2C



Signal Name	Pin #	Pin #	Signal Name
DSR1 Data set ready	2	1	DCD1 Data carrier detect
RTS1 Request to send	4	3	RXD1 Receive data
CTS1 Clear to send	6	5	TXD1 Transmit data
RI1 Ringing indicator	8	7	DTR1 Data terminal ready
Not used	10	9	Ground
DSR2	12	11	DCD2
RTS2	14	13	RXD2
CTS2	16	15	TXD2
RI2	18	17	DTR2
Not used	20	19	Ground

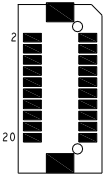
COM2 is BIOS selectable for RS-232, RS-422 and RS-485.

Pin #	Signal Name		
	RS-232	R2-422	RS-485
11	DCD	TX-	DATA-
13	RX	TX+	DATA+
15	TX	RX+	NC
17	DTR	RX-	NC
19	Ground	Ground	Ground
12	DSR	NC	NC
14	RTS	NC	NC
16	CTS	NC	NC
18	RI	NC	NC
20	NC	NC	NC

JP7, JP9: LVDS1, LVDS2 Connectors (1st/2nd channel)

Hirose DF13-20DP-1.25V

Mating connector: DF13-20DS-1.25C



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

* Remarks: These connectors support 24-bit. JP7 is 1st channel. JP9 is 2nd channel. J9 can be used to set 1-2 3.3V or 2-3 5V.

J8: LCD Backlight Connector (DC type)

E-CALL 0110-161-040

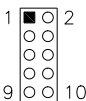
Mating connector: JST PHR-4



Pin #	Signal Name
1	+12V
2	Backlight Enable
3	*Backlight Adj (DC type)
4	Ground

* LCD backlight brightness can be adjusted by the OS or in the BIOS setup. In the BIOS setup, both backlight enable/disable and backlight brightness can be configured. Also, the backlight voltage can be set to 3.3V or 5V.

JP10: Digital I/O



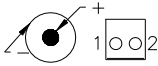
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	VCC
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

INSTALLATIONS

J11: DC-IN +12V~24V Power Connector

Haoguo WAFER396-2S-WV

Mating connector: JST VHR-2N

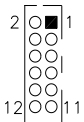


Pin #	Signal Name
1	DC in (+12~24V)
2	Ground

J13: Audio Connector (DF11 Connector)

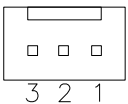
Haoguo DF11-12S-PA66H

Mating connector: Hirose DF11-12DS-2C



Signal Name	Pin #	Pin #	Signal Name
LINEOUT_R	2	1	LINEOUT_L
Ground	4	3	JD_FRONT
LINEIN_R	6	5	LINEIN
Ground	8	7	JD_LINEIN
MIC-In	10	9	MIC L
Ground	12	11	JD_MIC1

SYS_FAN1:DC-system Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection

J5: Mini-PCIE Connector

JP8: LPC Debug Connector (Factory use only)

JP1: SPI Flash Connector (Factory use only)

J7: iSMART Flash Connector (Factory use only)

BIOS Setup

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

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Boot Settings	35
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Security Settings.....	37
Save & Exit Settings.....	38

BIOS Introduction

The 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 provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The 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 BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the 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 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.

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI 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.*

Main Settings

Aptio Setup Utility – Copyright © 2011 American Megatrends, Inc.

Main	Advanced	Chipset	Boot	Security	Save & Exit
BIOS Information				Choose the system default language	
System Language		[English]		→ ← Select Screen	
System Date		[Tue 01/20/2009]		↑ ↓ Select Item	
Access Level		Administrator		Enter: Select	
				+- Change Field	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Default	
				F4: Save ESC: Exit	

System Language

Choose the system default language.

System Date

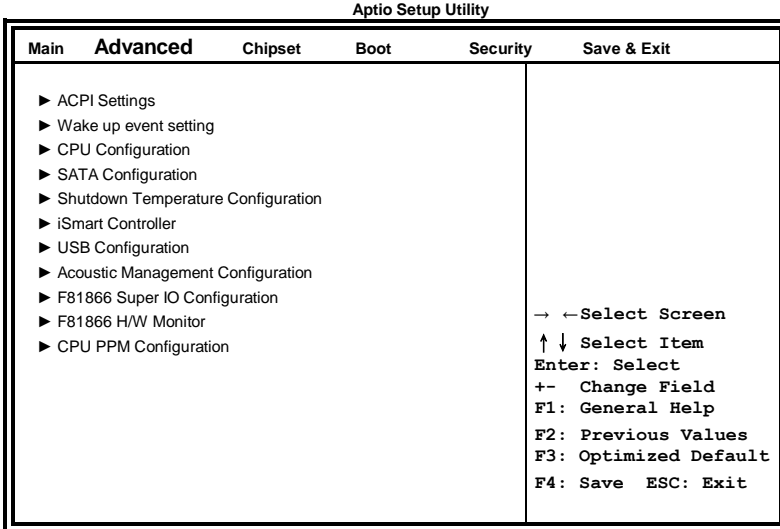
Set the Date. Use Tab to switch between Data elements.

System Time

Set the Time. Use Tab to switch between Data elements.

Advanced Settings

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



ACPI Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Settings					→ ← Select Screen
Enable Hibernation			Enabled		↑ ↓ Select Item
ACPI Sleep State			S3 (Suspend to R...)		Enter: Select
Lock Legacy Resources			Disabled		+ - Change Field
S3 Video Repost			Disabled		F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources

Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost

Enable or disable S3 Video Repost.

Wake up event settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
			Wake system with Fixed Time	Disabled	
			Wake up hour	0	
			Wake up minute	0	
			Wake up second	0	
			Wake on PCI PME	Disabled	→ ← Select Screen
			Wake on PCIE Wake Event	Disabled	↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Wake system with Fixed Time

Enables or Disables System wake on alarm event. When enabled, System will wake on the hr::min:: sec specified.

Wake on PCIE PME Wake Event

The options are Disabled and Enabled.

CPU Configuration

This section shows the CPU configuration parameters.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU Configuration					
Intel® Celeron(R) CPU 807UE @1.0GHz					
CPU Signature			206a7		
Microcode Patch			26		
Max CPU Speed			1000 MHz		
Min CPU Speed			800 MHz		
CPU Speed			1000 MHz		
Processor Cores			1		
Intel HT Technology			Not Supported		
Intel VT-x Technology			Supported		
Intel SMX Technology			Not Supported		
64-bit			Supported		
Limit CPUID Maximum			Disabled		→ ← Select Screen
Execute Disable Bit			Enabled		↑ ↓ Select Item
Intel Virtualization Technology			Disabled		Enter: Select
Hardware Prefetcher			Disabled		+ - Change Field
Adjacent Cache Line Prefetch			Enabled		F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, Re33dHat Enterprise 3 Update 3.)

Intel Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher

To turn on/off the Mid level Cache (L2) streamer Prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

SATA Configuration

SATA Devices Configuration.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
		SATA Controller(s)	Enabled		
		SATA Mode Selection	AHCI		
		Aggressive LPM Support	Enabled		
		SATA Controller Speed	Gen3		
		SATA Port0	Empty		→ ← Select Screen
		Software Preserve	Unknown		↑ ↓ Select Item
		SATA Port1	Empty		Enter: Select
		Software Preserve	Unknown		+ - Change Field
		SATA Port2	Empty		F1: General Help
		Software Preserve	Unknown		F2: Previous Values
		SATA Port3	Empty		F3: Optimized Default
		Software Preserve	Unknown		F4: Save ESC: Exit
		SATA Port4	Empty		
		Software Preserve	Unknown		
		SATA Port5	Empty		
		Software Preserve	Unknown		

SATA Controller(s)

Enable / Disable Serial ATA Controller.

SATA Mode Selection

- (1) IDE Mode.
- (2) AHCI Mode.

Shutdown Temperature Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
ACPI Shutdown Temperature			Disabled		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

ACPI Shutdown Temperature

The default setting is Disabled.

iSmart Controller

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
iSmart Controller					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Power-On after Power failure		Disable			
Schedule Slot 1		None			
Schedule Slot 2		None			

iSmart Controller

Setup the power on time for the system.

Schedule Slot 1 / 2

Setup the hour/minute for system power on.

USB Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
USB Devices:					
2 Hubs					
Legacy USB Support					Enabled
USB3.0 Support					Enabled
XHCI Hand-off					Enabled
EHCI Hand-off					Enabled
Port 60/64 Emulation					Enabled
USB hardware delays and time-outs:					
USB Transfer time-out					20 sec
Device reset time-out					20 sec
Device power-up delay					Auto
					→ ← Select Screen
					↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Legacy USB Support

Enables Legacy USB support.

AUTO option disables legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSES without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Port 64/60 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSES.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

Device reset tine-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. ‘Auto’ uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

F81866 Super IO Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Super IO Configuration					
F81866 Super IO Chip			F81866		→ ← Select Screen
▶ Serial Port 0 Configuration					↑ ↓ Select Item
▶ Serial Port 1 Configuration					Enter: Select
F81866 ERP Support			All Enable		+ - Change Field
LVDS BackLight Voltage			3V		F1: General Help
LVDS Backlight Level Control			Level1-5		F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Serial Port Configuration

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

F81866 H/W Monitor

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PC Health Status					
CPU temperature			+41 C		
SYS temperature			+35 C		
SYS_FAN1 Speed			2115 RPM		
Vcore			+1.000 V		
VCC5V			+5.213 V		
VCC12V			+12.408 V		
+1.5V			+1.544 V		→ ← Select Screen
VCC3V			+3.424 V		↑ ↓ Select Item
SYS_Fan1 Smart Fan Control			Disabled		Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

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.

Fan1 Smart Fan Control

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

CPU PPM Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
CPU PPM Configuration					
EIST			Enabled		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

EIST

Enable/Disable Intel SpeedStep.

Chipset Settings

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

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
<ul style="list-style-type: none"> ▶ PCH-IO Configuration ▶ System Agent (SA) Configuration 					
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
		Intel PCH RC Version	1.1.0.0		
		Intel PCH SKU Name	HM65		
		Intel PCH Rev ID	O5/B3		
		▶ USB Configuration			
		▶ PCH Azalia Configuration			
		PCH LAN Controller	Enabled		
		Wake on LAN	Enabled		
		Board Capability	SUS_PWR_DN_ACK		
		High Precision Event Timer Configuration			
		High Precision Timer	Enabled		→ ← Select Screen
		SLP_S4 Assertion Width	4-5 Seconds		↑ ↓ Select Item
					Enter: Select
					+ - Change Field
					F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

USB Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
EHC11			Enabled		
EHC12			Enabled		
USB Ports Per-Port Disable Control			Disabled		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

EHC11/2

Control the USB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

PCH Azalia Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCH Azalia Configuration					
Azalia			Auto		→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Azalia

Control Detection of the Azalia device.

Disabled = Azalia will unconditionally disabled.

Enabled Azalia will be unconditionally enabled.

Auto = Azalia will enabled if present, disabled otherwise.

System Agent (SA) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
▶ Graphics Configuration ▶ Memory Configuration					
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Graphics Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Graphics Configuration					
IGFX VBIOS Version			2132		
IGfx Frequency			350 MHz		
Primary Display			Auto		
Internal Graphics			Auto		
GTT Size			2MB		
Aperture Size			256MB		
DVMT Pre-Allocated			64M		
DVMT Total Gfx Mode			256MB		
▶ LCD Control					
				→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit	

Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics

Keep IGD enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem

Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Primary IGFX Boot Display (LCD Control)

Select the Video Device that will be activated during POST. This has no effect if external graphics present. Secondary booty display selection will appear based on your selection. VGA modes will be supported only on primary display.

Memory Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Memory Information					
		Memory Frequency	1333 MHz		
		Total Memory	2048 MB (DDR3)		
		DIMM#0	2048 MB (DDR3)		
		CAS Latency (tCL)	9		→ ← Select Screen
		Minimum delay time			↑ ↓ Select Item
		CAS to RAS (tRCDmin)	9		Enter: Select
		Row Precharge (tRPmin)	9		+ - Change Field
		Active to Precharge (tRASmin)	24		F1: General Help
					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Boot Settings

This section allows you to configure the boot settings.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Boot Configuration					
Setup Prompt Timeout			1		
Bootup NumLock State			On		
Quiet Boot			Disabled		
Fast Boot			Disabled		
CSM16 Module Version			07.69		→ ← Select Screen
GateA20 Active			Upon Request		↑ ↓ Select Item
Option ROM Messages			Force BIOS		Enter: Select
INT19 Trap Response			Immediate		+ - Change Field
Boot Option Priorities					F1: General Help
▶ CSM parameters					F2: Previous Values
					F3: Optimized Default
					F4: Save ESC: Exit

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables/Disables Quiet Boot option.

Fast Boot

Enables/Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM. Options are Force BIOS and Keep Current.

INT19 Trap Response

Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities

Sets the system boot order.

CSM parameters

This section allows you to configure the boot settings.

Aptio Setup Utility					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Launch CSM			Always		
Boot option filter			UEFI and Legacy		
Launch PXE OpROM policy			Do not launch		
Launch Storage OpROM policy			Legacy only		
Launch Video OpROM policy			Legacy only		
Other PCI device ROM priority			Legacy OpROM		
					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

Boot option filter

This option controls what devices system can boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storage OpROM policy

Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy

Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority

For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Save & Exit Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset					→ ← Select Screen ↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
Save Options Save Changes Discard Changes					
Restore Defaults Save as User Defaults Restore User Defaults					

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Restore Defaults

Restore/Load Defaults values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

Drivers Installation

This section describes the installation procedures for software and drivers. 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:

Intel Chipset Software Installation Utility	40
VGA Drivers Installation	41
Realtek HD Audio Driver Installation	42
LAN Drivers Installation.....	43
ASMedia USB 3.0 Drivers.....	45

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 Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

1. Insert the CD that comes with the board. Click **Intel** and then **Intel(R) QM67/Q67 Chipset Drivers**.



2. Click **Intel(R) Chipset Software Installation Utility**.



3. When the Welcome screen to the Intel® Chipset Device Software appears, click **Next** to continue.

4. Click **Yes** to accept the software license agreement and proceed with the installation process.

5. On the Readme File Information screen, click **Next** to continue the installation.

6. The Setup process is now complete. Click **Finish** to restart the computer and for changes to take effect.

VGA Drivers Installation

NOTE: Before installing the *Intel(R) QM67 Chipset Family Graphics Driver*, the Microsoft .NET Framework 3.5 SPI should be first installed.

To install the VGA drivers, follow the steps below.

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.
2. Click *Intel(R) QM67 Chipset Family Graphics Driver*.



3. When the Welcome screen appears, click *Next* to continue.



4. Click *Yes* to to agree with the license agreement and continue the installation.
5. On the Readme File Information screen, click *Next* to continue the installation of the Intel® Graphics Media Accelerator Driver.
6. On Setup Progress screen, click *Next* to continue.
7. Setup complete. Click *Finish* to restart the computer and for changes to take effect.

Realtek HD Audio Driver Installation

Follow the steps below to install the Realtek HD Audio Drivers.

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.

2. Click *Realtek High Definition Audio Driver*.



3. On the Welcome to the InstallShield Wizard screen, click *Yes* to proceed with and complete the installation process.

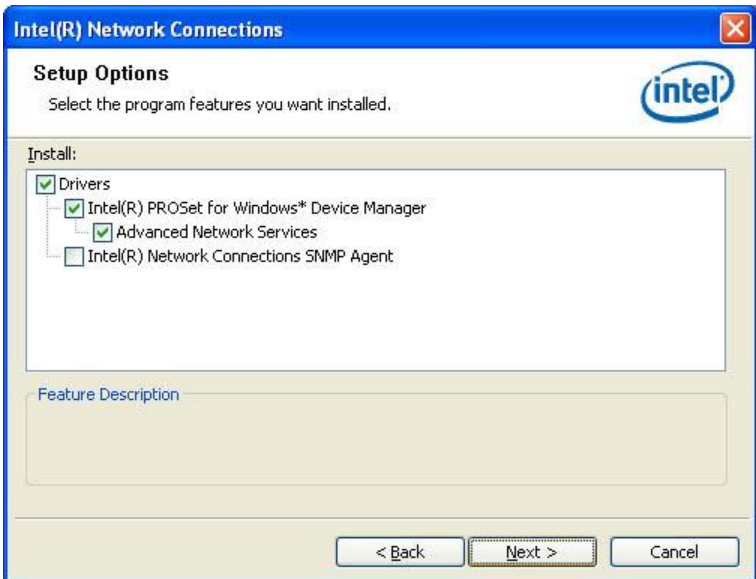


LAN Drivers Installation

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.
2. Click *Intel(R) PRO LAN Network Driver*.



3. When the Welcome screen appears, click *Next*. On the next screen, click *Yes* to agree with the license agreement.
4. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



DRIVER INSTALLATION

5. The wizard is ready to begin installation. Click **Install** to begin the installation.



6. When InstallShield Wizard is complete, click **Finish**.



ASMedia USB 3.0 Drivers

1. Insert the CD that comes with the board. Click *Intel* and then *Intel(R) QM67/Q67 Chipset Drivers*.
2. Click *Intel(R) PRO LAN Network Driver*.



2. When the Welcome screen to the InstallShield Wizard for Intel® Management Engine Components, click *Next*.



3. When InstallShield Wizard is complete, click *Finish*.



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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 - 064h	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
E000-E01F	Network Connection
F060-F07F	Network Connection
F080-F0D7	SATA Storage Controller
2F8h - 2FFh	Serial Port #2(COM2)
3B0h- 3BBh	Graphics adapter Controller
3F8h - 3FFh	Serial Port #1(COM1)
3D0h - 3DFh	CGA adapter

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	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Serial Port #3
IRQ11	Serial Port #4
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE
IRQ19	SATA Storage

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:

```
//-----
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81866.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 81866 watch dog program\n");

    SIO = Init_F81866();
    if (SIO == 0)
    {
        printf("Can not detect Fintek 81866, 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_F81866_Reg(0x2B);
    bBuf &= (~0x20);
    Set_F81866_Reg(0x2B, bBuf); //Enable WDTO

    Set_F81866_LD(0x07); //switch to logic device 7
    Set_F81866_Reg(0x30, 0x01); //enable timer
}
```

APPENDIX

```
bBuf = Get_F81866_Reg(0xF5);
bBuf &= (~0x0F);
bBuf |= 0x52;
Set_F81866_Reg(0xF5, bBuf); //count mode is second

Set_F81866_Reg(0xF6, interval); //set timer

bBuf = Get_F81866_Reg(0xFA);
bBuf |= 0x01;
Set_F81866_Reg(0xFA, bBuf); //enable WDT0 output

bBuf = Get_F81866_Reg(0xF5);
bBuf |= 0x20;
Set_F81866_Reg(0xF5, bBuf); //start counting
}
//-----
void DisableWDT(void)
{
    unsigned char bBuf;

    Set_F81866_LD(0x07); //switch to logic device 7

    bBuf = Get_F81866_Reg(0xFA);
    bBuf &= ~0x01;
    Set_F81866_Reg(0xFA, bBuf); //disable WDT0 output

    bBuf = Get_F81866_Reg(0xF5);
    bBuf &= ~0x20;
    bBuf |= 0x40;
    Set_F81866_Reg(0xF5, bBuf); //disable WDT
}
//-----
```

```

//-----
#include "F81866.H"
#include <dos.h>
//-----
unsigned int F81866_BASE;
void Unlock_F81866 (void);
void Lock_F81866 (void);
//-----
unsigned int Init_F81866(void)
{
    unsigned int result;
    unsigned char ucDid;

    F81866_BASE = 0x4E;
    result = F81866_BASE;

    ucDid = Get_F81866_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81866_BASE = 0x2E;
    result = F81866_BASE;

    ucDid = Get_F81866_Reg(0x20);
    if (ucDid == 0x07) //Fintek 81865
    {
        goto Init_Finish;
    }

    F81866_BASE = 0x00;
    result = F81866_BASE;

Init_Finish:
    return (result);
}
//-----
void Unlock_F81866 (void)
{
    outportb(F81866_INDEX_PORT, F81866_UNLOCK);
    outportb(F81866_INDEX_PORT, F81866_UNLOCK);
}
//-----
void Lock_F81866 (void)
{
    outportb(F81866_INDEX_PORT, F81866_LOCK);
}
//-----
void Set_F81866_LD(unsigned char LD)
{
    Unlock_F81866();
    outportb(F81866_INDEX_PORT, F81866_REG_LD);
    outportb(F81866_DATA_PORT, LD);
    Lock_F81866();
}
//-----
void Set_F81866_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_F81866();
    outportb(F81866_INDEX_PORT, REG);
    outportb(F81866_DATA_PORT, DATA);
    Lock_F81866();
}
//-----
unsigned char Get_F81866_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_F81866();
    outportb(F81866_INDEX_PORT, REG);
    Result = inportb(F81866_DATA_PORT);
    Lock_F81866();
    return Result;
}
//-----

```

APPENDIX

```
//-----  
#ifndef __F81866_H  
#define __F81866_H                1  
//-----  
#define F81866_INDEX_PORT      (F81866_BASE)  
#define F81866_DATA_PORT      (F81866_BASE+1)  
//-----  
#define F81866_REG_LD          0x07  
//-----  
#define F81866_UNLOCK          0x87  
#define F81866_LOCK            0xAA  
//-----  
unsigned int Init_F81866(void);  
void Set_F81866_LD(unsigned char);  
void Set_F81866_Reg(unsigned char, unsigned char);  
unsigned char Get_F81866_Reg(unsigned char);  
//-----  
#endif __F81866_H
```