IB835F

Intel® Cedar Trail + NM10
PICMG1.0 Full Size CPU Card

USER'S MANUAL

Version 1.0

Acknowledgments

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Introduction

IB835F is a PICMG1.0 Full Size CPU Card that comes with the Intel Atom D2550 processor running 1.86GHz and with a 1MB L2 cache. The board is based on the Intel® CG82NM10 PCH chipset and supports two SODIMM with a maximum memory capacity of 4GB.

IB835F features the integrated GMA3650 Intel graphics controller and supports both CRT and DVI-D video display interface, as well as a 24-bit dual channel interface with the help of NXP PTN3460BS device.

Onboard functional connections are available for two SATA ports, four COM ports, seven USB 2.0 ports, audio and a PS/2 keyboard/mouse connector. Additional expansion comes in one Mini PCI-e(x1) slots.

Checklist

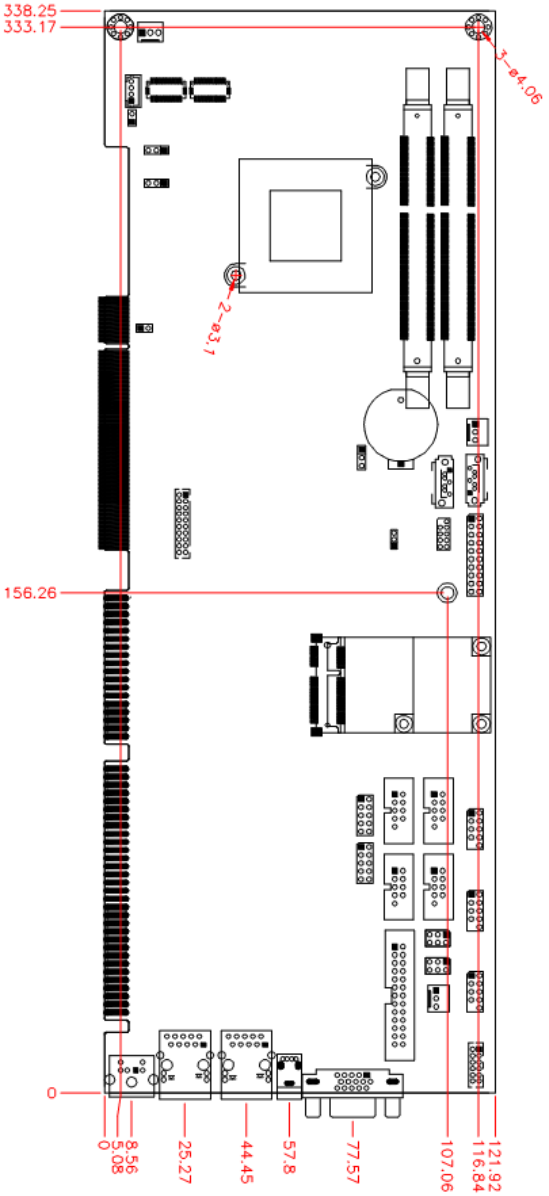
Your IB835F package should include the items listed below.

- The IB835F PICMG1.0 Full Size CPU Card
- This User's Manual
- I/O bracket
- 1 DVD containing chipset drivers and flash memory utility

IB835F Specifications

Form Factor	Full Size CPU Card (PICMG 1.0)
CPU Type	Intel® Atom™ DC D2550 /1MB cache /1.86 GHz [TDP=10W] Package = FCBGA559 Type[22 mm x 22 mm] ; Cores / Threads = 2 / 4
BIOS	AMI BIOS, support ACPI Function
Chipset	Intel® CG82NM10 PCH [TDP =2.1W], package = BGA360, 17mmx17mm
Memory	Intel® Atom™ Processor integrated memory controller 2x DDR3-1066 SO-DIMM, Non-ECC, Un-buffered, 1.5V, Max. 4GB
Display Interface	Intel® GMA 3650 (Gfx freq @ 640MHz) for D2550 Supports DirectX 9 Graphic , OpenGL 3.0 VGA x 1 (via D2550) DVI x 1(via D2550 w/ level shifter ASM1442K) LVDS, support 24-bit dual channel (via eDP thru NXP PTN3460) [I2C]
LAN	Intel I211AT PCI Express Gigabit LAN controller x 2
USB	NM10 built-in USB 2.0 host controller, support 8 ports 6 x USB 2.0 thru onboard pin-headers 1 x USB2.0 @ I/O edge connector 1 x USB 2.0 for MiniPCIe
Serial ATA Ports	NM10 built-in SATA controller, supports 2 ports 2 x SATA; 1 x CFast (Share with SATA port #1 via SATA switch)
PCI to ISA bridge	ITE IT8888G x1 for high drive ISA bus thru NM10 PCI lane
PCIe to PCI	ITE IT8892 x 1 for PCIe(x1) to 4 x PCI slots **Derived to PICMG gold finger**
Audio	NM10 built-in audio controller w/ Realtek ALC662-VD0 Codec Supports 5.1 CH audio (Line-out, Line-in & MIC);
LPC I/O	Fintek F81846AD-I COM1(RS232/422/485),COM2 ~ COM4 (RS232 only) PS/2 Keyboard & Mouse, Parallel x 1 Hardware monitor (3 thermal inputs, 4 voltage monitor inputs, VID0-4 & 2 Fan Headers)
Digital IO	4 in & 4 out
Expansion Slots	Mini PCIe socket x1@ component side
Edge Connector	DB15 x1 for VGA USB 2.0 x 1 RJ45 x2 for LAN #1, #2 PS/2 Connector x1 for keyboard/mouse
Onboard Header/ Connector	DF20 20-pin header x2 for LVDS 4 pins box header x 1 for LCD brightness control [Thru Super I/O FAN# 2] DF11-20 pins box-header x1 for DVI-D DF11 2x13 pins box-header x1 for printer DF11 2x10 pins box-header x2 for COM1~COM4 3 pins pin-header x1 for CPU fan [Support smart FAN] 3 pins pin-header x1 for system fan [12V & GND only, No detect function] 2x5 pins pin-header x3 for 6 ports USB2.0 SATA connector x 2 ports CFast slot x 1@solder side
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec/min)
System Voltage	+5V, +3.3V, +12V, -12V & 5VSB
RoHS	Yes
Expansion Slots	Mini PCIe socket x1@ component side
Certification	CE/ FCC Class B / LVD
OS support	- Windows 8/8.1 - Windows 7 (32-bit only) - Linux (Fedora ; Ubuntu)
Board Size	338mm x 122mm (13.31” x 4.8”)

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the IB835F in order to set up a workable system. The topics covered are:

Installing the Memory 6
Setting the Jumpers 7
Connectors on IB835F 12

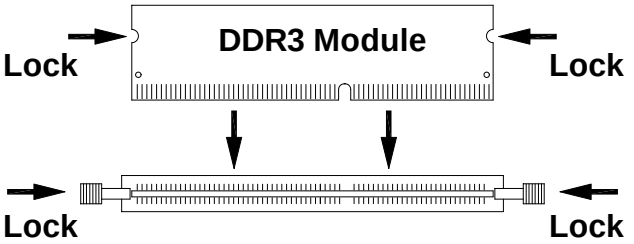
Installing the Memory

The IB835F board supports two DDR3-1066 memory modules.

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 aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.

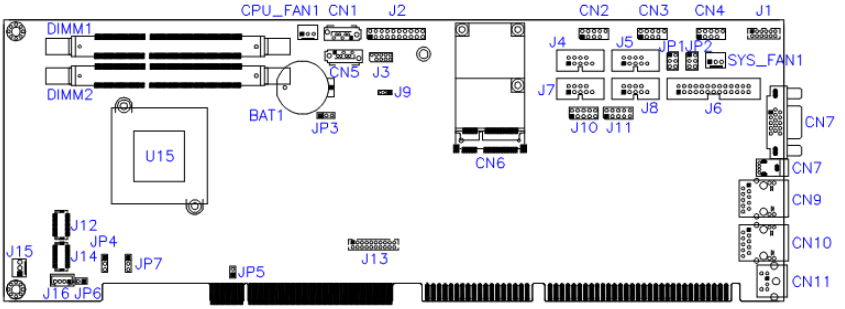


Setting the Jumpers

Jumpers are used on IB835F 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 IB835F and their respective functions.

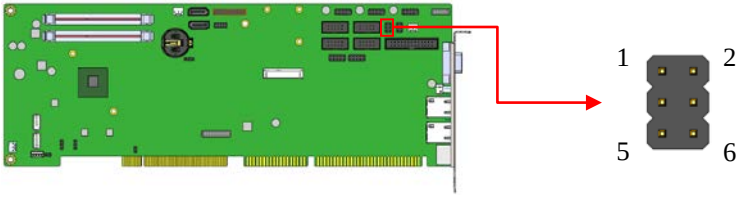
Jumper Locations on IB835F 8
JP1: COM1 RS232 RI/+5V/+12V Power Setting 9
JP2: COM2 RS232 RI/+5V/+12V Power Setting 9
JP3: Clear CMOS Setting 10
JP4: LCD Panel Power Selection 10
JP6: LCD BackLight Control Output Level 10
JP7: LVDS function mode Setting 11

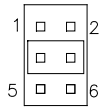
Jumper Locations on IB835F



Jumper Locations on IB835F.....Page
JP1: COM1 RS232 RI/+5V/+12V Power Setting..... 10
JP2: COM2 RS232 RI/+5V/+12V Power Setting..... 10
JP3: Clear CMOS Setting 10
JP4: LCD Panel Power Selection 11
JP6: LCD BackLight Control Output Level 11
JP7: LVDS function mode Setting 12

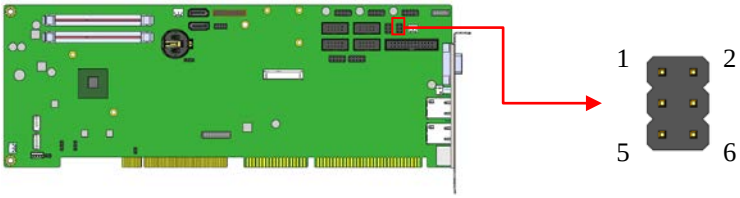
JP1: COM1 RS232 RI/+5V/+12V Power Setting

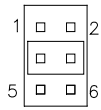


JP1	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI*
	Pin 5-6 Short/Closed	+5V

*COM1: J5

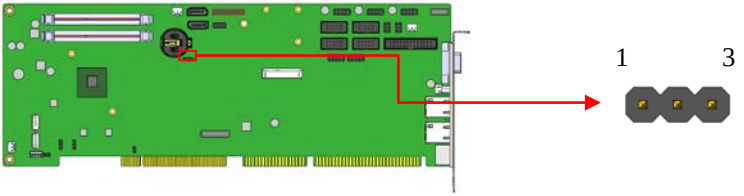
JP2: COM2 RS232 RI/+5V/+12V Power Setting



JP2	Setting	Function
	Pin 1-2 Short/Closed	+12V
	Pin 3-4 Short/Closed	RI*
	Pin 5-6 Short/Closed	+5V

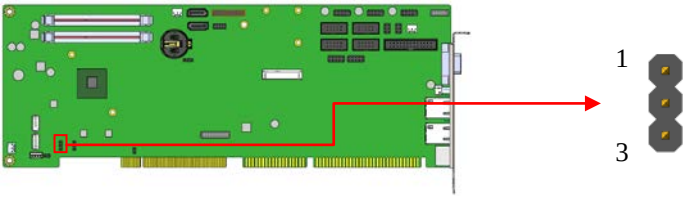
*COM2: J8

JP3: Clear CMOS Setting



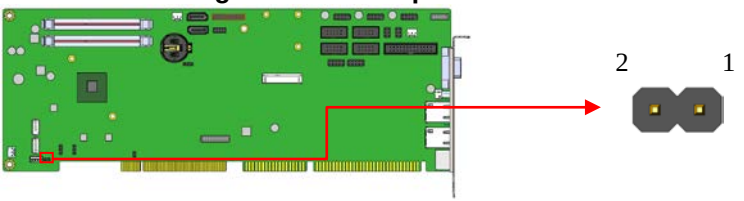
JP3	Setting
	Normal*
	Clear CMOS

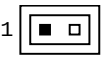
JP4: LCD Panel Power Selection



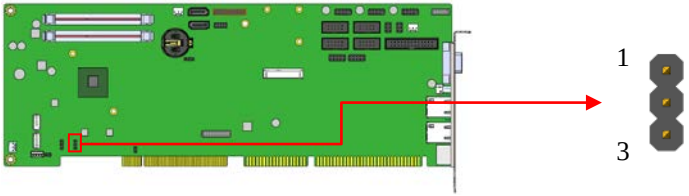
JP4	LCD Panel Power
	+3.3V*
	+5V

JP6: LCD BackLight Control Output Level



JP6	Setting
	+3.3V*
	+5V

JP7: LVDS function mode Setting



JP7	Setting
	ON*
	OFF

*Default

Connectors on IB835F

The connectors on IB835F allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on IB835F and their respective functions.

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CN2, CN3, CN4: USB 2.0 Connectors 14
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CN9, CN10: Gigabit LAN (Intel I211AT) 15
CN11: PS/2 Keyboard & Mouse 15
CN12: CFast (Share with SATA port CN5 via SATA switch) 15
J1: External Audio Connector 16
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J5, J4, J7: COM 1/3/4 RS232 Serial Port 17
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CPU_FAN1: CPU Fan Power Connector 21
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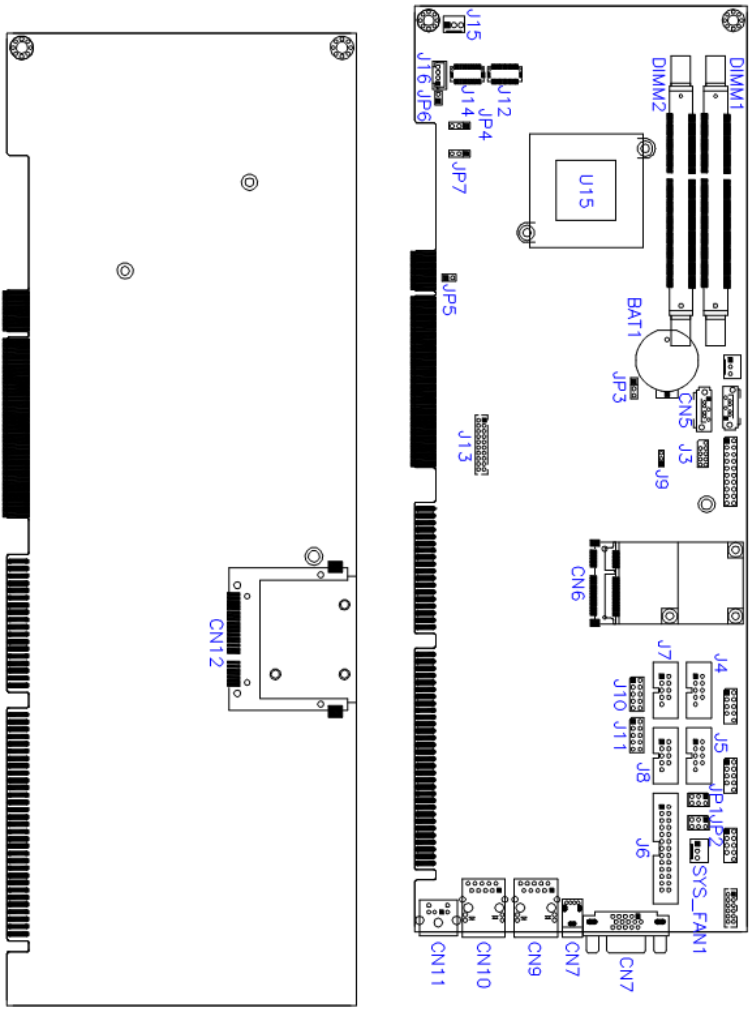
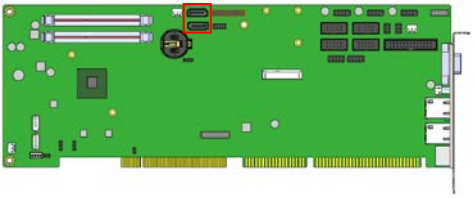
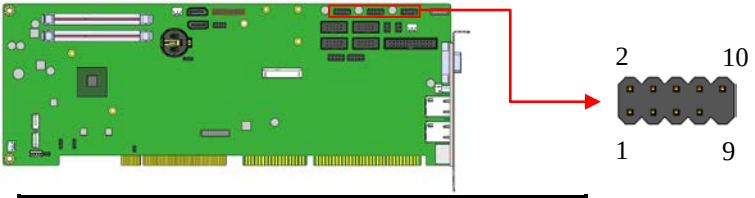
Connector Locations on IB835F



CN1, CN5: SATA 2.0 Connectors

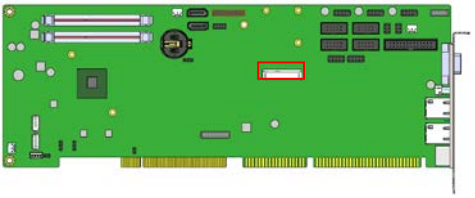


CN2, CN3, CN4: USB 2.0 Connectors

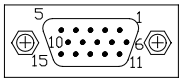


Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	VCC
D-	3	4	D-
D+	5	6	D+
Ground	7	8	Ground
KEY	9	10	NC

CN6: Mini PCIE Connector



CN7: DB-15 VGA Connector



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		

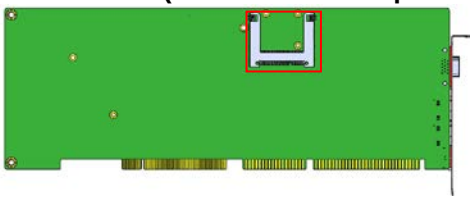
CN8: USB2.0 Connector

CN9, CN10: Gigabit LAN (Intel I211AT)

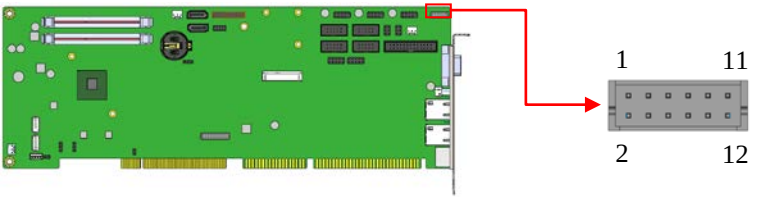
CN11: PS/2 Keyboard & Mouse

Signal Name	Pin	Pin	Signal Name
Keyboard data	1	7	N.C.
Mouse data	2	8	Mouse clock
GND	3	9	N.C.
N.C.	4	10	N.C.
+5V	5	11	N.C.
Keyboard clock	6	12	N.C.

CN12: CFast (Share with SATA port CN5 via SATA switch)

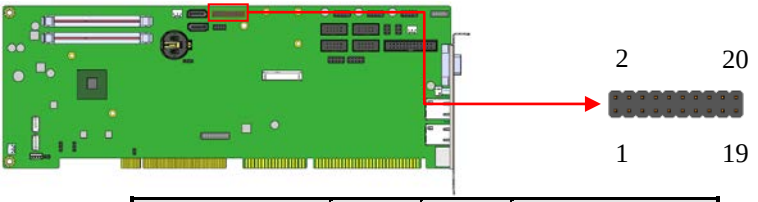


J1: External Audio Connector



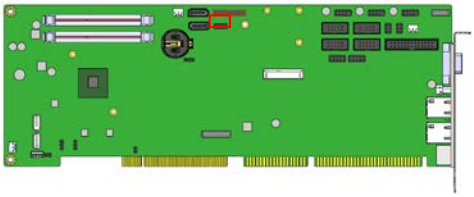
Signal Name	Pin #	Pin #	Signal Name
LINE OUT_L	1	2	LINE OUT_R
JD_FRONT	3	4	Ground
LINE IN_L	5	6	LINE IN R
JD LINE IN	7	8	Ground
MIC-L	9	10	MIC-R
JD MIC1	11	12	Ground

J2: Front Panel Function Connector

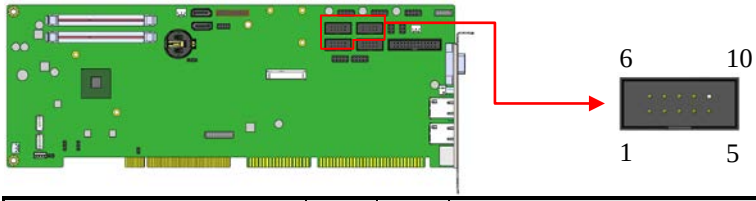


Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	Speaker Out
NC	3	4	NC
Ground	5	6	Ground
NC	7	8	VCC
Ground	9	10	NC
Ground	11	12	NC
Ground	13	14	PWR_SW
NC	15	16	Ground
Ground	17	18	RST
HDD LED +	19	20	HDD LED -

J3: SPI Flash Connector (Factory use only)

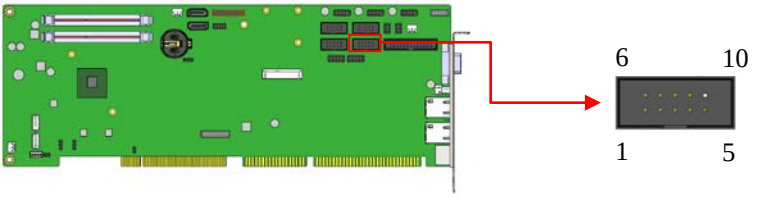


J5, J4, J7: COM 1/3/4 RS232 Serial Port



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

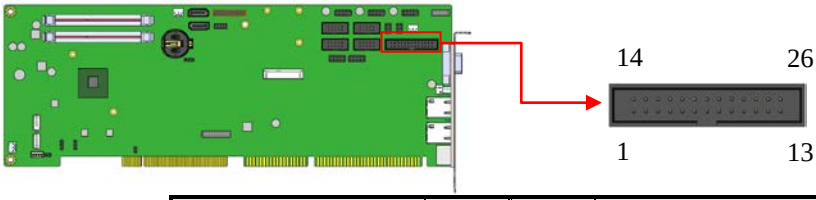
J8: COM2 RS232/422/485



Pin #	Signal Name		
	RS-232	**R2-422**	**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

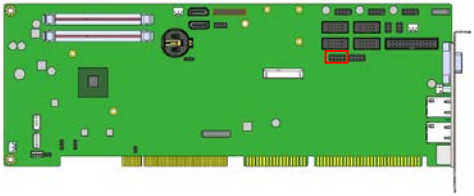
* Pin 9 supports RI/+5V/+12V function.

J6: Parallel Port

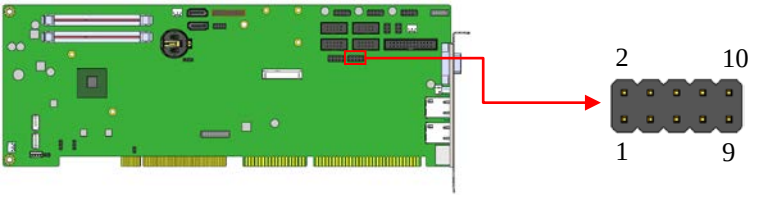


Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	26	Ground

J10: Debug 80 Port

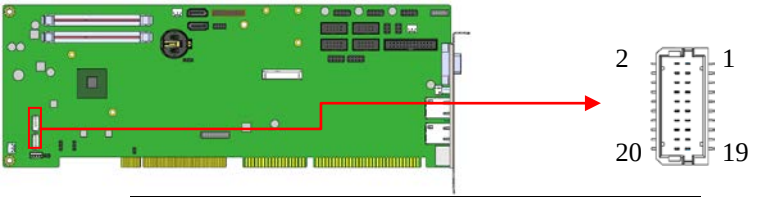


J11: Digital I/O



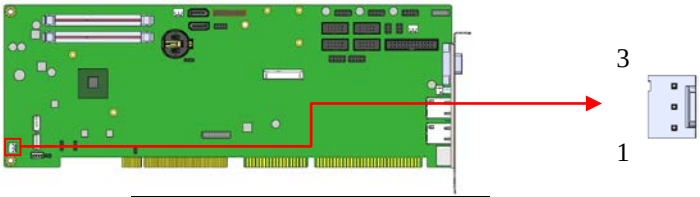
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	+5V
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

J12, J14: CH1, CH2: LVDS Connectors



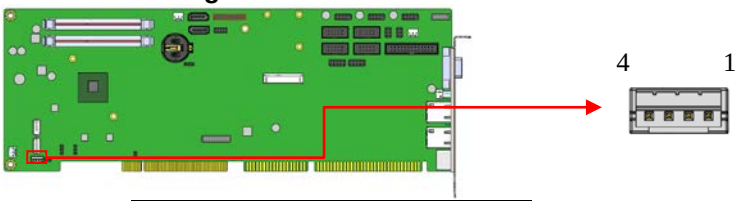
Signal Name	Pin #	Pin #	Signal Name
LD0+	1	2	LD0-
GND	3	4	GND
LD1+	5	6	LD1-
GND	7	8	GND
LD2+	9	10	LD2-
GND	11	12	GND
CLK+	13	14	CLK-
GND	15	16	GND
LD3+	17	18	LD3-
LCD_PWR	19	20	LCD_PWR

J15: External ATX Power Connector



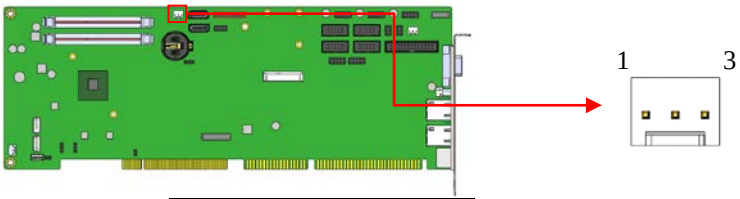
Pin #	Signal Name
1	Ground
2	PS-ON (soft on/off)
3	5VSB (Standby +5V)

J16: LCD Backlight Connector



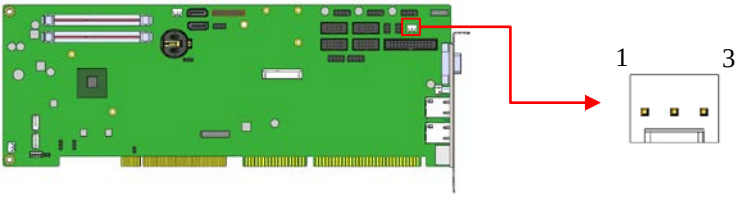
Pin #	Signal Name
1	+12V
2	Backlight Enable
3	Brightness Control
4	Ground

CPU_FAN1: CPU Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	Control

SYS_FAN1: System Fan Power Connector



Pin #	Signal Name
1	Ground
2	+12V
3	NC

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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Security Settings 39
Save & Exit Settings 40

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 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 <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
```

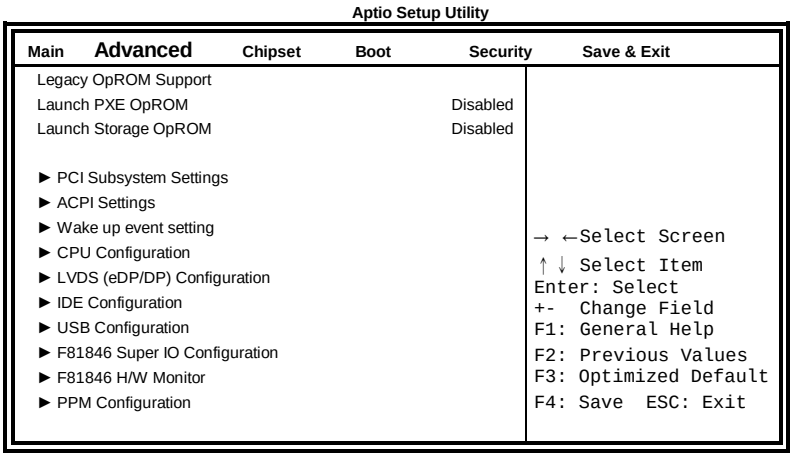
In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

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.

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.*

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.



Launch PXE OpROM

Enable or Disable Boot Option for Legacy Network Devices.

Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

PCI Subsystem Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Bus Driver Version			V 2.05.01		
PCI ROM Priority			Legacy ROM		
PCI Common Settings					
PCI Latency Timer			32 PCI Bus Clocks		
VGA Palette Snoop			Disabled		
PERR# Generation			Disabled		
SERR# Generation			Disabled		

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCI ROM Priority

In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.

PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

VGA Palette Snoop

Enables or Disables VGA Palette Registers Snooping.

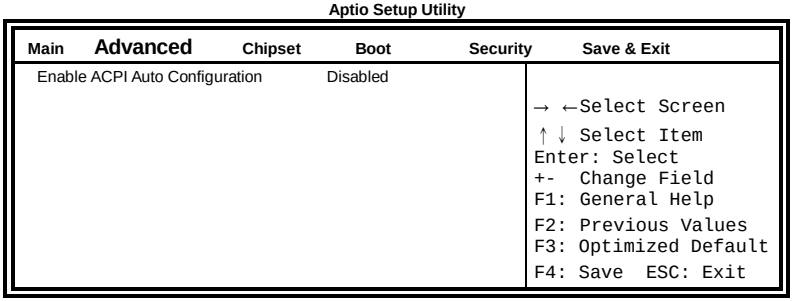
PERR# Generation

Enables or Disables PCI Device to Generate PERR#.

SERR# Generation

Enables or Disables PCI Device to Generate SERR#.

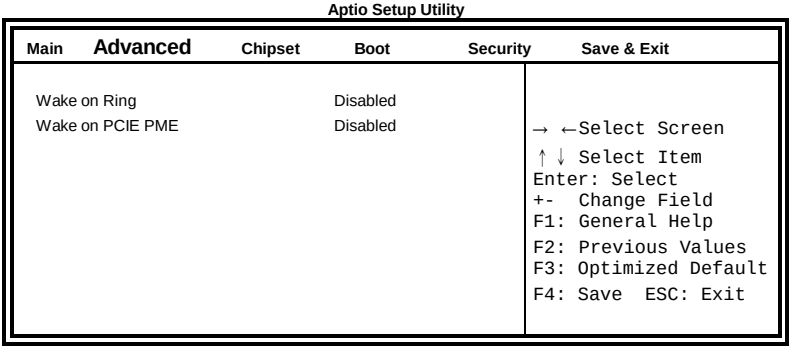
ACPI Settings



Enabled ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration.

Wake up event settings



Wake on Ring

The options are Disabled and Enabled.

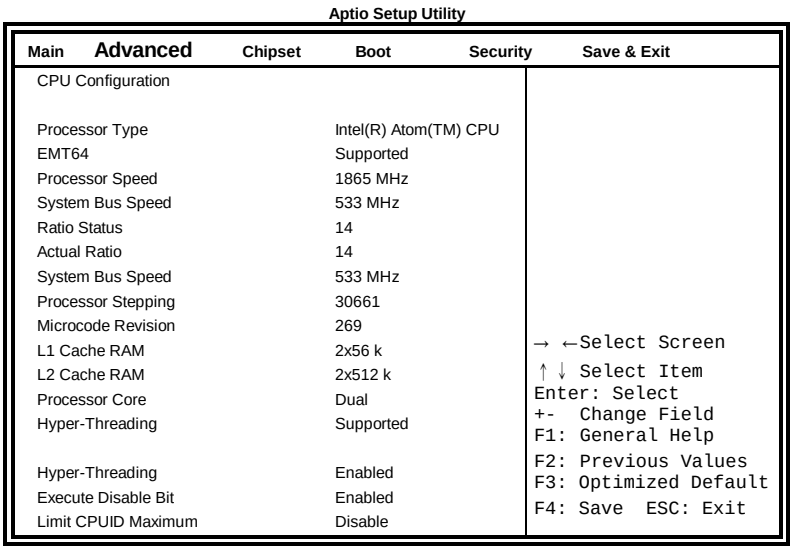
Wake on PCIE PME

The options are Disabled and Enabled.

Remarks: If Wake on LAN is to be supported, this option should be enabled.

CPU Configuration

This section shows the CPU configuration parameters.



Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per enabled core is enabled.

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.)

LVDS (eDP/DP) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
LVDS (eDP/DP) Configuration					
LVDS Protocol			18bit, Single Channel		→ ←Select Screen
Panel Type			800 x 600		↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit

SATA Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
SATA Port0			Not Present		→ ←Select Screen
SATA Port1			Not Present		↑ ↓ Select Item Enter: Select +- Change Field F1: General Help F2: Previous Values F3: Optimized Default F4: Save ESC: Exit
SATA Controller(s)			Enabled		
Configure SATA as			IDE		

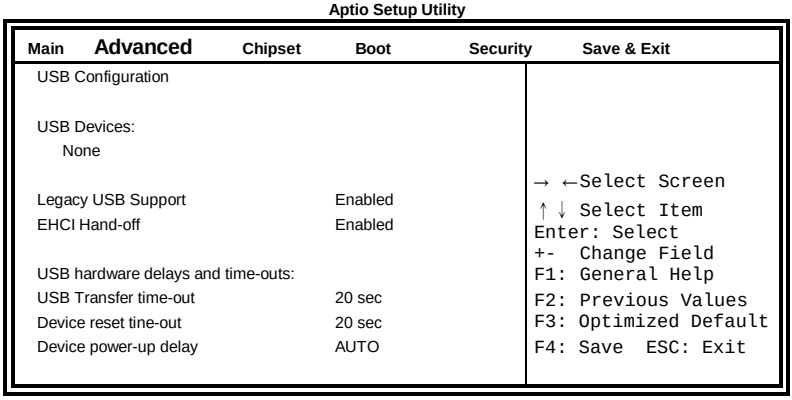
SATA Controller(s)

Enable / Disable Serial ATA Controller.

Configure SATA as

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

USB Configuration



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.

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.

USB Transfer time-out

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

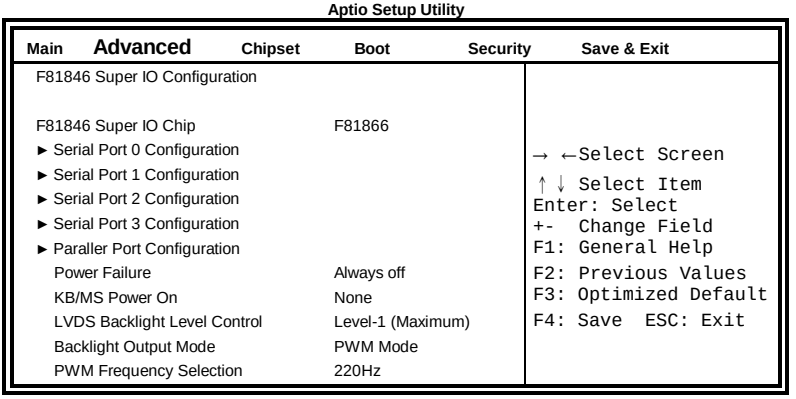
Device reset tine-out

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.

F81846 Super IO Configuration



F81846 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.

LVDS Backlight Level Control

The options are : Level-1 (Maximum) , Level-2 , Level-3 , Level-4 , Level-5 , Level-6 , Level-7 , Level-8 (~0V).

Backlight Output Mode

This provides PWM duty-cycle output or DAC voltage output.

PWM Frequency Selection

This provides 4 frequency selection.

F81846 H/W Monitor

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Pc Health Status					
CPU temperature			+39 C		
System temperature			+28 C		
CPU Fan Speed			N/A		
Vcore			+1.208 V		
+5V			+4.918 V		
+12V			+12.496 V		
+1.5V			+1.512 V		
+3.3V			+3.376 V		
ACPI Shutdown Temperature			Disabled		
CPU Smart Fan Control			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.

CPU Smart Fan Control

Disabled (default)
50 C
60 C
70 C
80 C

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.

PPM Configuration

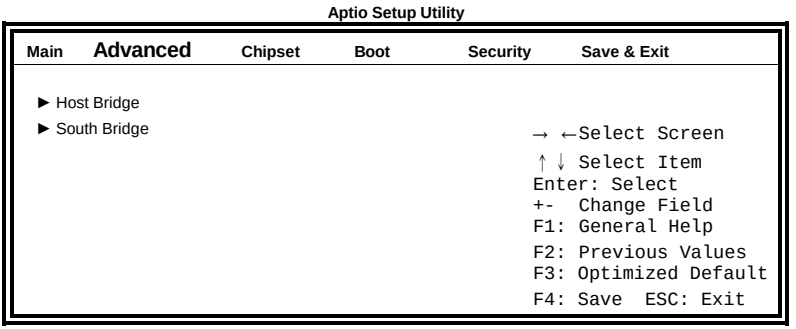
Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
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

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.



Host Bridge

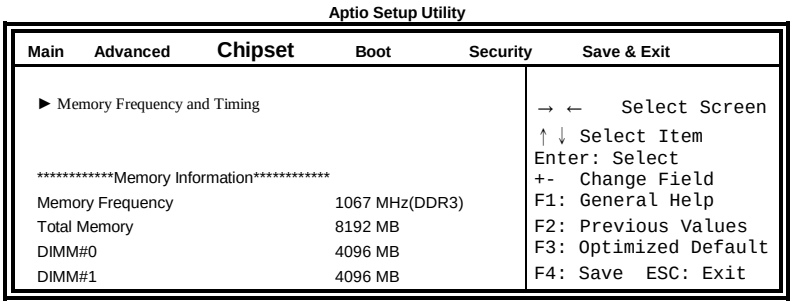
This item shows the Host Bridge Parameters.

South Bridge

This item shows the South Bridge Parameters.

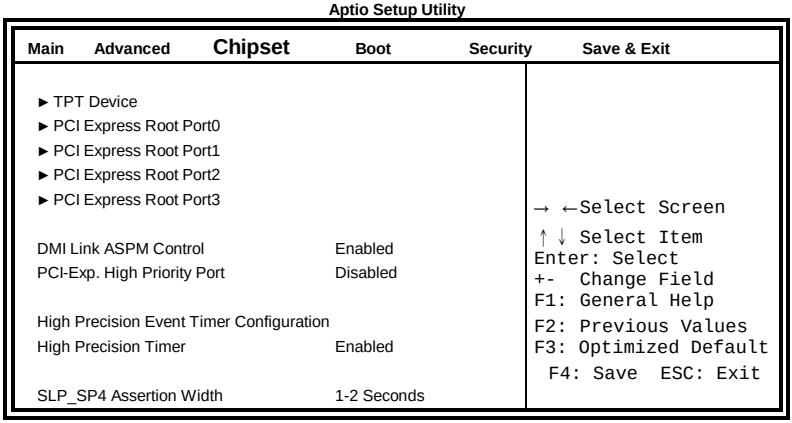
Host Bridge

This section allows you to configure the Host Bridge Chipset.



South Bridge

This section allows you to configure the South Bridge Chipset.



DMI Clink ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI Link.

PCI-Exp. High Priority Port

The options are Disabled, Port1, Port2, Port3, and Port4.

High Precision Event Timer Configuration

Enable/or Disable the High Precision Event Timer.

TPT Device

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

Azalia Controller	HD Audio
Select USB Mode	By Controllers
UHCI #1 (port 0 and 1)	Enabled
UHCI #2 (port 2 and 3)	Enabled
UHCI #3 (port 4 and 5)	Enabled
UHCI #4 (port 6 and 7)	Enabled
USB 2.0(UHCI) Support	Enabled

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCI Express Root Port0

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

PCI Express Port 0	Enabled
Port 0 IOxAPIC	Disabled
Automatic ASPM	Manual
ASPM L0s	Disabled
ASPM L1	Disabled

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCI Express Root Port1

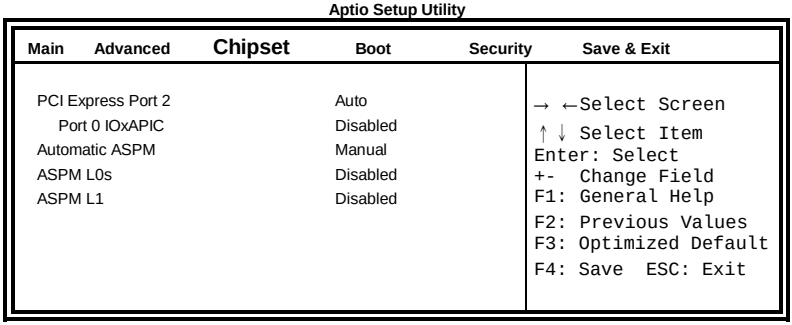
Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

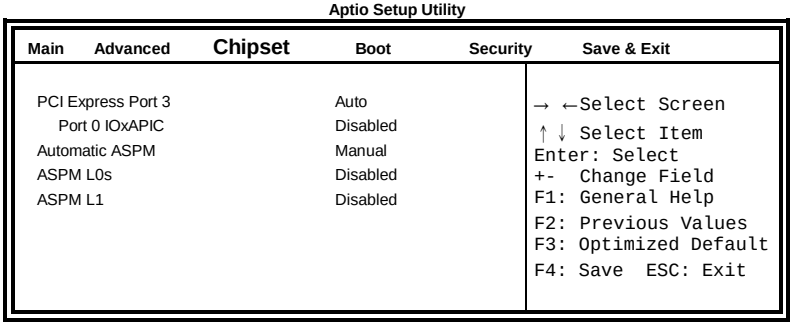
PCI Express Port 1	Auto
Port 0 IOxAPIC	Disabled
Automatic ASPM	Manual
ASPM L0s	Disabled
ASPM L1	Disabled

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCI Express Root Port2



PCI Express Root Port3



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			07.68		
GateA20 Active			Upon Request		
Option ROM Messages			Force BIOS		
Interrupt 19 Canture			Disabled		
CSM Support			Enable		
Driver Option Priorities					
Boot mode select			LEGACY		
FIXED BOOT ORDER Priorities					
Boot Option #1			USB Key		→ ←Select Screen
Boot Option #2			CD/DVD		↑ ↓ Select Item
Boot Option #3			USB Hard Disk		Enter: Select
Boot Option #4			USB CD/DVD		+- Change Field
Boot Option #5			Hard Disk:		F1: General Help
Boot Option #6			USB Floppy		F2: Previous Values
Boot Option #7			Network		F3: Optimized Default
					F4: Save ESC: Exit
Hard Disk Drive BBS Priorities					

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

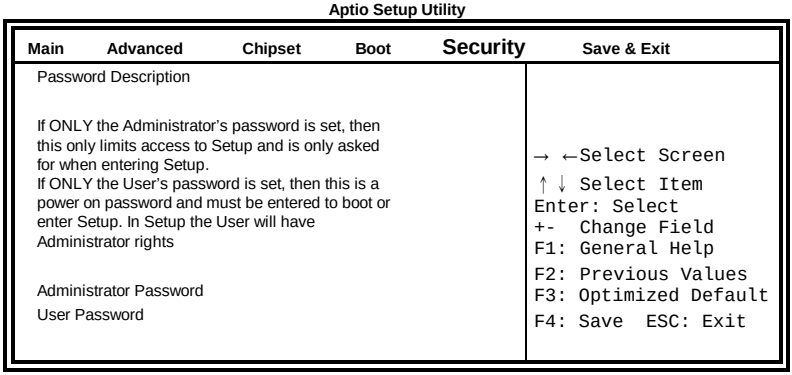
UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

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

Interrupt 19 Capture
Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities
Sets the system boot order.

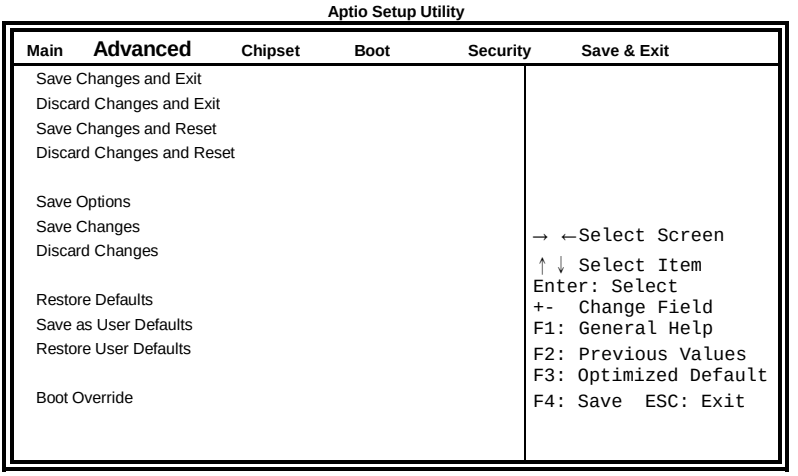
Security Settings
This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



Administrator Password
Set Setup Administrator Password.

User Password
Set User Password.

Save & Exit Settings



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.

Boot Override
Pressing ENTER causes the system to enter the OS.

Launch EFI Shell from filesystem device
Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

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:

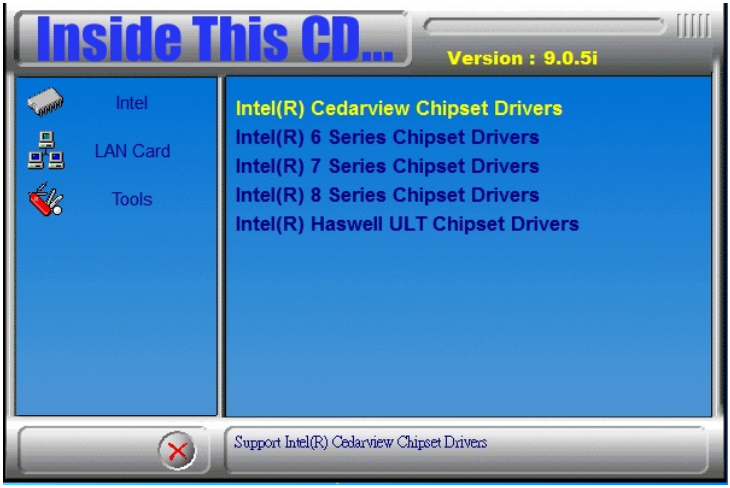
Intel Chipset Software Installation Utility..... 43
VGA Drivers Installation 45
Realtek HD Audio Driver Installation 47
Realtek LAN Controller Drivers Installation 49

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 disc that comes with the board. Click ***Intel*** and then ***Intel(R) Cedar Trail 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.

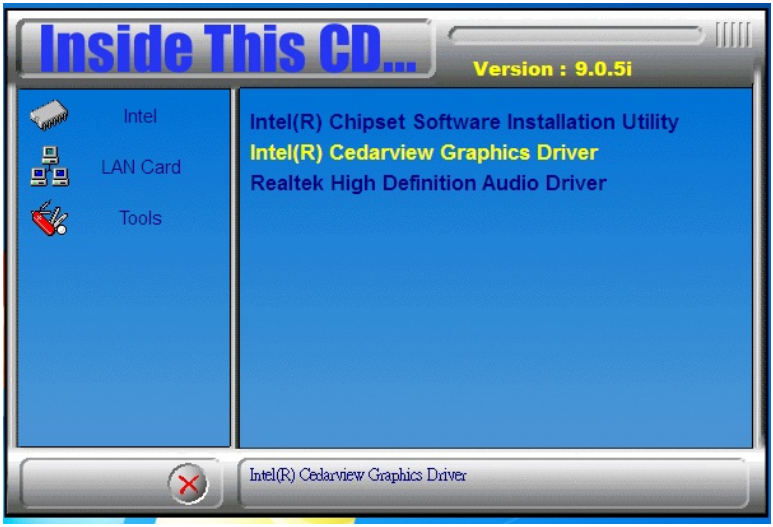
5. On the Readme File Information screen, click ***Next*** to continue the installation.

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

VGA Drivers Installation

1. Insert the disc that comes with the board. Click ***Intel*** and then ***Intel(R) Cedar Trail Chipset Drivers***.

2. Click ***Intel(R) Cedar Trail 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.

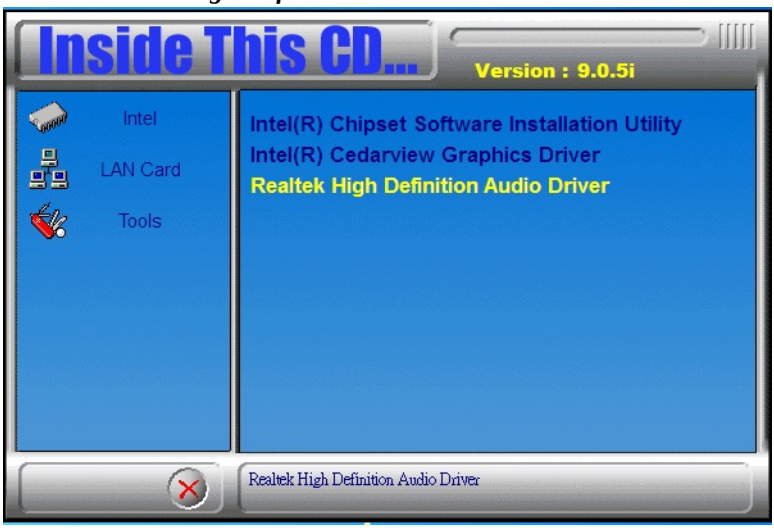
6. On Setup Progress screen, click ***Next*** to continue.

7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

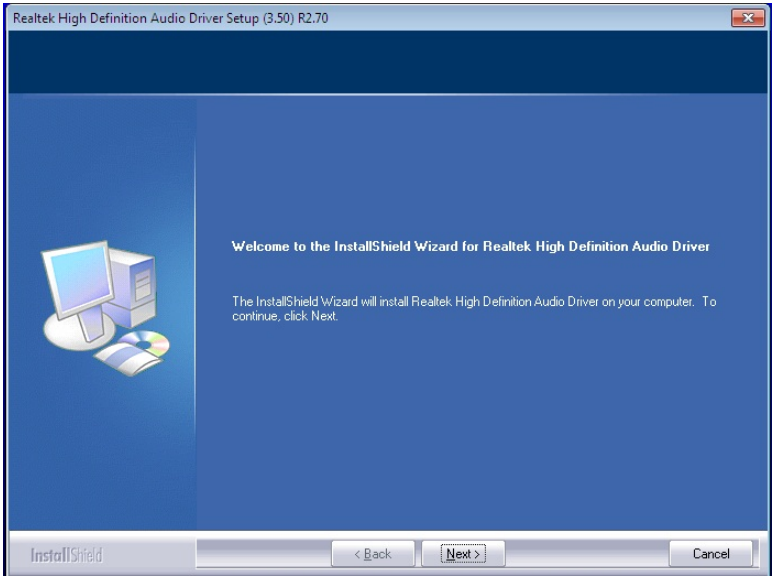
Realtek HD Audio Driver Installation

Follow the steps below to install the Realtek HD Audio Drivers.
1. Insert the disc that comes with the board. Click ***Intel*** and then ***Intel(R) Cedar Trail Chipset Drivers***.

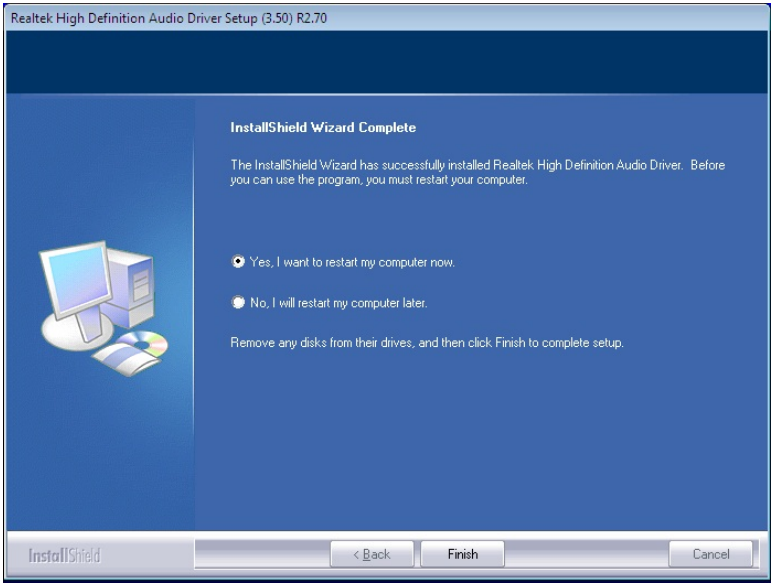
2. Click ***Realtek High Definition Audio Driver.***



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



4. Restart the computer when prompted.

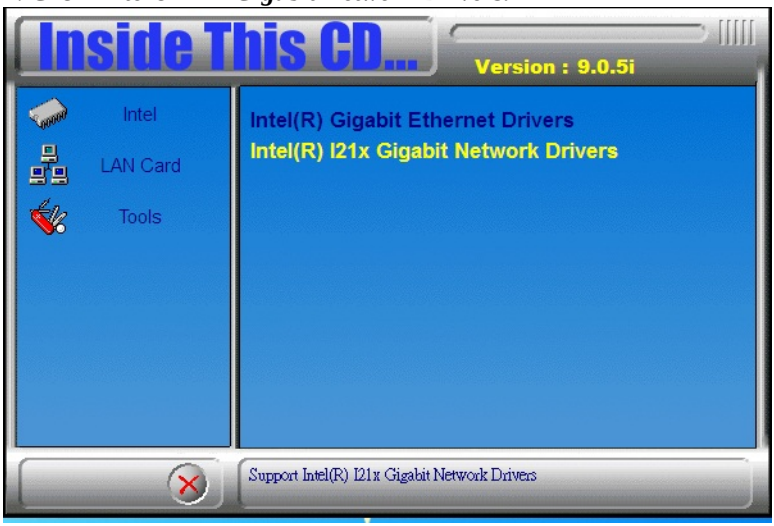


Intel LAN Controller Drivers Installation

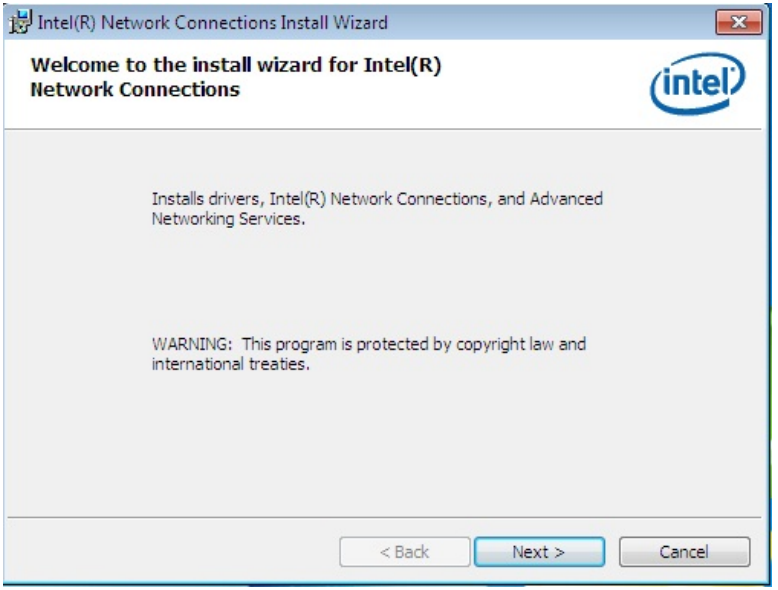
Follow the steps below to install the Realtek LAN Drivers.

1. Insert the CD that comes with the board. Click ***LAN Card,*** and then ***Intel Lan Controller Drivers***.

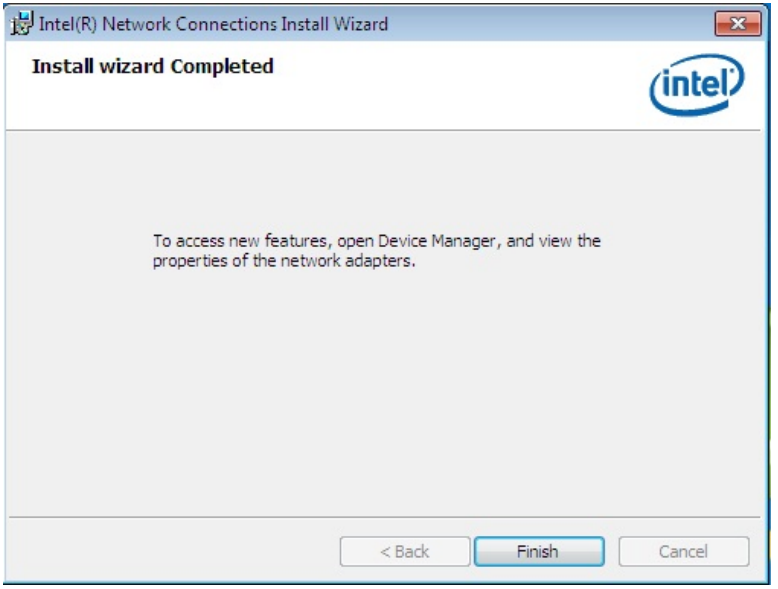
2. Click ***Intel® I21x Gigabit Network Drivers.***



3.When the welcome screen to InstallShield Wizard appears, click ***Next*** to start the installation



4.When the InstallShieldWizard has finished installing the Intel LAN drivers, 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
0000-001F	Direct memory access controller
0000-001F	PCI bus
0020-0021	Programmable interrupt controller
0024-0025	Programmable interrupt controller
0028-0029	Programmable interrupt controller
002C-002D	Programmable interrupt controller
0030-0031	Programmable interrupt controller
0034-0035	Programmable interrupt controller
0038-0039	Programmable interrupt controller
003C-003D	Programmable interrupt controller
0040-0043	System timer
0050-0053	System timer
0060-0060	Standard PS/2 Keyboard
0064-0064	Standard PS/2 Keyboard
0070-0077	System CMOS/real time clock
0081-0091	Direct memory access controller
0093-009F	Direct memory access controller
00A0-00A1	Programmable interrupt controller
00A4-00A5	Programmable interrupt controller
00A8-00A9	Programmable interrupt controller
00AC-00AD	Programmable interrupt controller
00B0-00B1	Programmable interrupt controller
00B4-00B5	Programmable interrupt controller
00B8-00B9	Programmable interrupt controller
00BC-00BD	Programmable interrupt controller

Address	Device Description
00C0-00DF	Direct memory access controller
00F0-00F0	Numeric data processor
02E8-02EF	Serial Port #4(COM4)
02F8-02FF	Serial Port #2(COM2)
03B0-03BB	Intel Graphics Graphics Media Accelerator 3600 Series
03C0-03DF	Intel Graphics Graphics Media Accelerator 3600 Series
03E8-03EF	Serial Port #3(COM3)
03F8-03FF	Serial Port #1(COM1)
04D0-04D1	Programmable interrupt controller
0D00-FFFF	PCI bus
D000-D0FF	PCI Express Root Port - 27D6
E000-E0FF	PCI Express Root Port - 27D2
F000-F01F	SMBus Host Controller
F020-F03F	USB Universal Host Controller - 27CB
F040-F05F	USB Universal Host Controller - 27CA
F060-F07F	USB Universal Host Controller - 27C9
F080-F09F	USB Universal Host Controller - 27C8
F0A0-F0AF	Serial ATA Storage Controller - 27C0
F0B0-F0B3	Serial ATA Storage Controller - 27C0
F0C0-F0C7	Serial ATA Storage Controller - 27C0
F0D0-F0D3	Serial ATA Storage Controller - 27C0
F0E0-F0E7	Serial ATA Storage Controller - 27C0
F0F0-F0F7	Intel Graphics Graphics Media Accelerator 3600 Series

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
IRQ 0	System Timer Output
IRQ 1	Standard PS/2 Keyboard
IRQ 3	Serial Port #2
IRQ 4	Serial Port #1
IRQ 7	Serial Port #3
IRQ 7	Serial Port #4
IRQ 8	Real Time Clock
IRQ 10	SMBus Controller
IRQ 12	Microsoft PS/2 Mouse
IRQ 13	Numeric data processor
IRQ 16	USB Universal Host Controller - 27CB
IRQ 18	USB Universal Host Controller - 27CA
IRQ 19	USB Universal Host Controller - 27C9
IRQ 19	Serial ATA Storage Controller – 27C0
IRQ 22	High Definition Audio Controller
IRQ 23	USB Universal Host Controller - 27C8
IRQ 23	USB2 Enhanced 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 "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

	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 WDTO 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 WDTO output

	bBuf = Get_F81866_Reg(0xF5);
	bBuf &= ~0x20;
	bBuf |= 0x40;
	Set_F81866_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 "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 81866
	{	goto Init_Finish;	}

	F81866_BASE = 0x2E;
	result = F81866_BASE;

	ucDid = Get_F81866_Reg(0x20);
	if (ucDid == 0x07)                                  //Fintek 81866
	{	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;
}
//-----------------------------------------------------------------------------
```

```
//-----------------------------------------------------------------------------
//
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// PURPOSE.
//
//-----------------------------------------------------------------------------
#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
```