AIV-HM76V1FL Series

An in-vehicle computer designed for comprehensive mobile applications

3rd Generation Intel Core i7, i3, or Celeron Processor with Intel PCH HM76 Chipset

User Manual

Acrosser Technology Co., Ltd.
www.acrosser.com

Disclaimer

For the purpose of improving reliability, design and function, the information in this document is subject to change without prior notice and does not represent a commitment on the part of Acrosser Technology Co., Ltd.

In no event will Acrosser Technology Co., Ltd. be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Copyright

Trademarks

The product names appear in this manual are for identification purpose only. The trademarks and product names or brand names appear in this manual are the property of their respective owners.

Purpose

This document is intended to provide the information about the features and use of the product.

Audience

The intended audiences are technical personnel, not for general audiences.

To read this User Manual on your smart phone, you will have to install an APP that can read PDF file format first. Please find the APP you prefer from the APP Market.

Table of Contents

1. System Introduction

The AIV-HM76V1FL Series is a fanless In-Vehicle Computer designed to perform multiple in-car applications. These designs include smart power management, high efficient thermal module, and diversity of integrated communication technology such as CAN bus, WiFi, 3.5G wireless WAN, Bluetooth, and GPS.

1.1. Specifications

System

CPU	• **AIV-HM76V1FLCi7:** Intel Core i7-3517UE Processor (4M Cache, 1.7GHz) • **AIV-HM76V1FLCi3:** Intel Core i3-3217UE Processor (3M Cache, 1.6GHz) • **AIV-HM76V1FLCE1:** Intel Celeron 1047UE Processor (2M Cache, 1.4GHz)
Chipset	• Intel HM76
Memory	• DDR3 1333/1600MHz, support up to 16GB • 2 x 204-pin SO-DIMM sockets (non-ECC) • 2G+2G / 4G+4G / 8G+8G (option)
BIOS	• Support SPI BIOS
BIOS function	• Support SSID (only for Acrosser user)
Graphic Controller	• Integrated within HM76

Display

VGA	• COMBO Connector • Analog RGB Display Output (2048x1152)
HDMI	• HDMI Port Output (1920x1200)

Storage

CF	• 1 x Compact Flash socket (Only Master Mode) supporting UDMA
SATA	• 1 x SATA III connector • 1 x SATA power (JST2.54mm, 1x4 pin)
Disk Bay	• 1 x Swappable 2.5” HDD bay with Anti-vibration / Anti-shock solution

Communication and I/O

Ethernet Chip	• Intel 82574L PCIe LAN
Ethernet	• 2 x PCIE*1 Intel GbE chip via RJ-45 connector
USB Port	• 3 x External USB3.0 connectors • 2 x Mini PCIe slot for 3.5G WiFi module • 1 x for proprietary Bluetooth -> (1 x 5-pin 1.0mm WTB Connector 180°) • 1 x for proprietary GPS -> (1 x 5-pin 1.0mm WTB Connector 180°)
Serial Port	• COM1~3: Internal Pin Header (RS-232) • COM4: Internal Pin Header (RS-422/485 Selected By GPIO)
CANBUS	• Use GPIO DB15 connection 1. Support both CAN 2.0A and 2.0B protocol 2. Programmable baud rate: from 5K bps Maximum 1M bps or user-defined baud rate 3. Time stamp of CAN message 4. API library for user development 5. CAN bus device status query
GPIO	• GPIO 4-in / 4-out, DB15 male • Connector Input: 1. 4-input isolated channels 2. Max. voltage: 32V 3. Signal type: A. Open/Ground switch input B. Digital Logic Logic High: 3V ~ 32V Logic Low: 0V ~ 0.7V • Maximum input frequency: 10KHz (duty = 50%) • Output: 1. 4 channels 2. Output type: Open drain MOSFET driver 3. Output voltage range: 5V ~ 28V 4. Sink current: maximum 500mA each channel 5. Power on initial state: MOSFET off 6. Use clamped diode protection 7. Output default set: Low
SIM	• SIM card slot
Power Output	• Output power from COMBO connector
LED	• Status indicator, 1 x 3 LED • Green: PIC Status, Green: HDD, Yellow: Power
MiniPCIe Slot	• MiniPCIe1 for 3.5G card (Reserve SIM interface) • MiniPCIe2 for WiFi card

Other Features

Audio	• Realtek audio codec ALC662
CMOS	• RTC (+/- 2 seconds for 24 hours) • Lithium battery (3V) for CMOS data backup
Hardware Monitoring	• RTC battery voltage • CPU and system temperature • CPU voltage • Voltage (12V, 5V, 3.3V)

Antenna

Antenna Type	• 5 x SMA (1x for GPS, 1x for Bluetooth, 1x for 3.5G, 2x for WiFi)

Smart In-Vehicle Power Management

Input Voltage	• 9 ~ 32 VDC
Protection	• Over current protection • Over voltage protection • Polarity reversed protection
Input Connector	• 3-pin terminal block, 5.08mm pitch
Fuse Connector	• Blade-type fuse holder
Dimension	• 162.9 x 30 mm

Software

OS Support	• Windows 7 (32/64 bit), 7 Embedded (32 bit), Fedora 17 (32/64 bit), Ubuntu 12.10 (32/64 bit)
WatchDog Timer	• Software programmable 0 ~ 255 seconds, 0 = disable timer.

Mechanical & Environment

Thermal Design	• Fanless (heatsink)
Chassis	• Sheetmetal (Silver printing color with Acrosser Logo)
Chassis Dimension	• 290 x 190 x 35 mm
Vibration	• IEC 60068-2-64, 5~500Hz, 3GRMS (CF/SSD) (for SSD only)
Shock	• IEC 60068-2-27, 50G 500m/s2 11MS (for SSD only)
Operating Temperature	• 0 ~ 60°C
Storage Temperature	• -40 ~ 80°C

Storage Humidity	• 0 ~ 60%
Certification	• CE / FCC class B / E Mark 13

Optional Modules

GPS	• WIESON ZYM-5020,RF Cable
Bluetooth	• 2.1 Qcom QBTM400-01, RF Cable
3.5G	• Sierra MC8705, RF cable (use mini PCIe 1)
WiFi	• Intel Centrino 6205ANHMW WiFi module 802.11 a/b/g/n, RF Cable (use mini PCIe 2)

1.2. Packing List

Check if the following items are included in the package.

- ☐ 1 x AIV-HM76V1FL System
  (AIV-HM76V1FLCE1, AIV-HM76V1FLCi3, or AIV-HM76V1FLCi7)
- ☐ 1 x Quick Guide
- ☐ 1 x Driver CD
- ☐ 1 x Screw Pack (2.5” HDD bracket: 4pcs)
- ☐ 1 x Terminal Block Female 3-pin (For power input)
- ☐ 1 x Spare Fuse 10A
- ☐ 1 x Remote Switch Cable
- ☐ 1 x One-to-many Video Combo Cable (Combo to VGA/USB/Audio/DC Cable)
- ☐ 1 x GPIO/CAN/Driver ID Cable

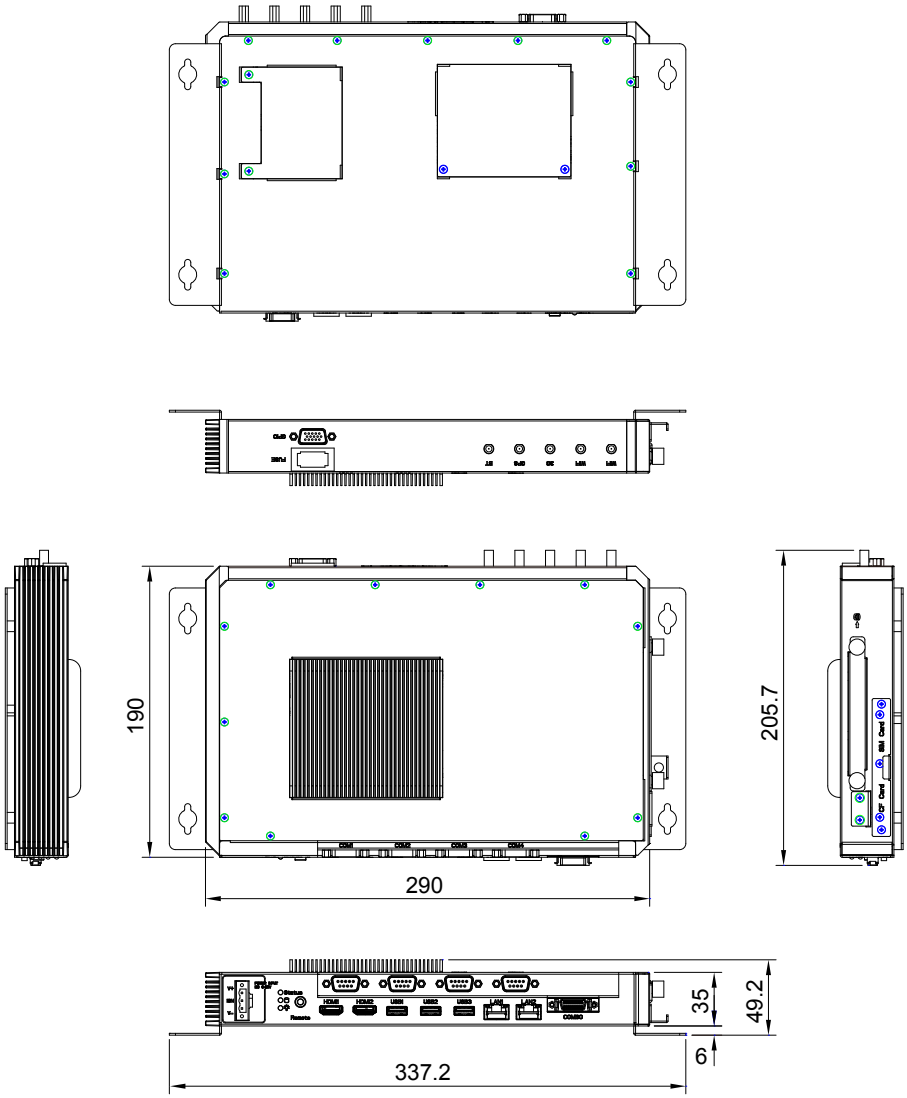
1.3. Features

- Rugged fanless design
- Support Intel 3rd generation Core i3/i7 CPU + HM76 chipset
- 2 x DDR3 SO-DIMM, up to 16GB
- Support CAN 2.0A/2.0B protocol and I-Button for driver ID
- VGA / HDMI output
- Diverse Wireless Communication
- Combo connector to simplify touch monitor installation

1.4. System Dissection

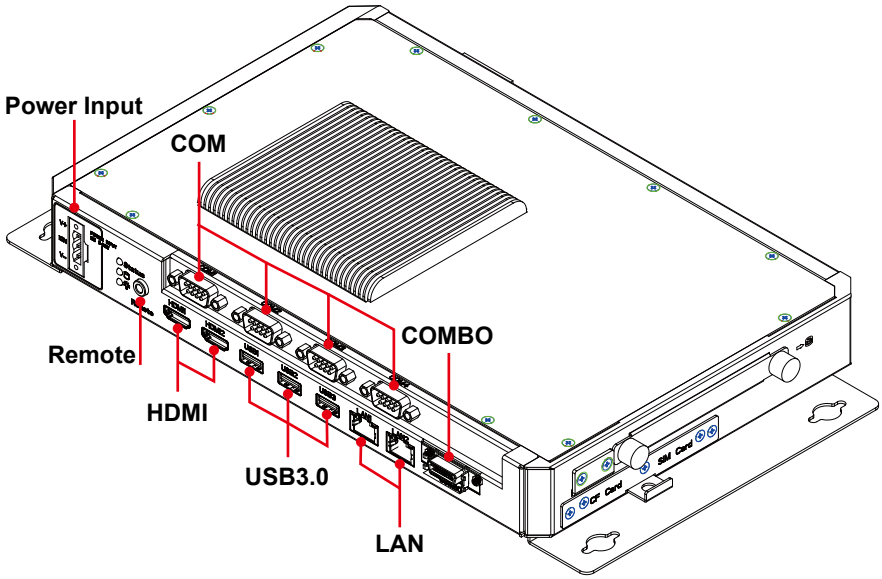
1.4.1. Dimensions

(Unit: mm)

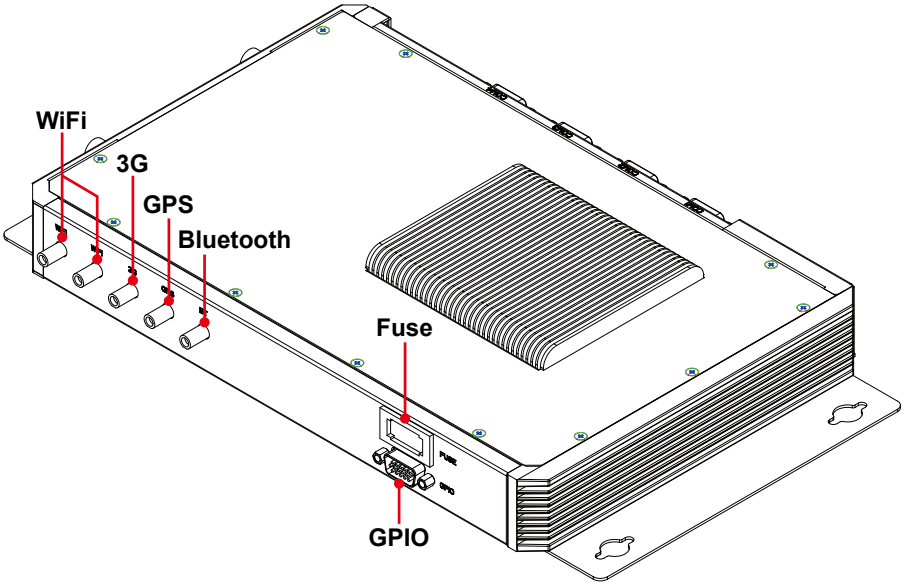


1.4.2. I/O Panel

Front IO



Rear I/O



Status/HDD/Power LED Display

	LED	Light	Display
	G	Green	Status
	G	Green	HDD
	Y	Yellow	Power LED

Status LED Flashing Status:

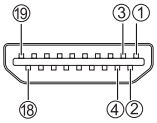
A Status LED is used to indicate the status of the system. In normal condition, the LED will flash a number of blink to state the status. Each blink remains 200 ms ON followed by a 200 ms OFF. Each Cycle will have a 2-second OFF in between.

LED Flashing Numbers	Status
0 (Constant On)	Power output runs normally.
1	Standby Mode (System off)
3	Power On Delay
5	Boot Up Delay
6	Soft Off Delay
4	Shutdown Delay
2	Hard Off Delay

If abnormal condition occur, the LED will flash a 1.5-second pulse followed by numbers of 200 ms pulse to indicate the error status.

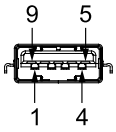
LED Flashing Numbers	Error Status
1 Long, 1 Short	System cannot be turned on or was turned off because battery voltage is below the Battery Low Voltage.
1 Long, 2 Short	System on/off fail. When motherboard cannot turn on or turn off after retry.

HDMI1, HDMI2



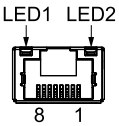
Pin #	Signal	Pin #	Signal
1	DATA2+	2	GND
3	DATA2-	4	DATA1+
5	GND	6	DATA1-
7	DATA0+	8	GND
9	DATA0-	10	CLK+
11	GND	12	CLK-
13	NC	14	NC
15	DDCCL	16	DDCDA
17	GND	18	+5V
19	HPD		

USB1, USB2, USB3



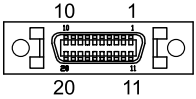
Pin #	Signal	Pin #	Signal
1	5V	5	SS_RX -
2	Data -	6	SS_RX +
3	Data +	7	GND
4	GND	8	SS_TX -
		9	SS_TX +

LAN1, LAN2



LED	Light	Status
LED1	Off	10Mbps
	Green	100Mbps
	Orange	1000Mbps
LED2	Yellow	Link/Active
	Off	LAN Off

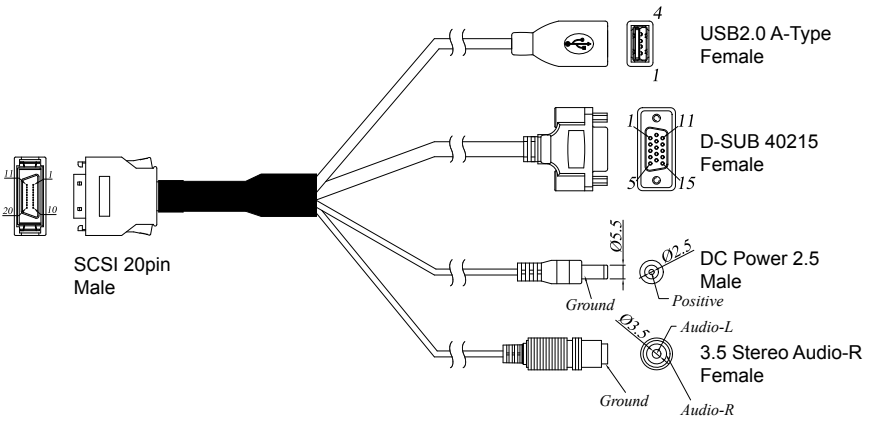
COMBO



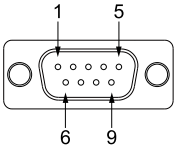
COMBO Connector

Pin #	Signal	Pin #	Signal
1	USB+	11	DDCCL
2	USB-	12	VCC12
3	GND	13	GND
4	VCC5	14	Audio_R
5	GND	15	GND
6	Red	16	MIC_B
7	Green	17	Audio_L
8	Blue	18	MIC_T
9	HSYNC	19	NC
10	VSYNC	20	DDCDA

COMBO Cable

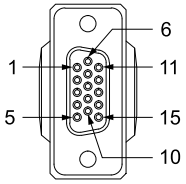


COM1, COM2, COM3, COM4



COM1~3		COM4	
Pin #	Signal	Pin #	Signal
1	DCD	1	TX4+
2	SIN	2	TX4-
3	SOUT	3	NC
4	DTR	4	NC
5	GND	5	GND
6	DSR	6	NC
7	RTS	7	NC
8	CTS	8	RX4-
9	RI	9	RX4+

GPIO

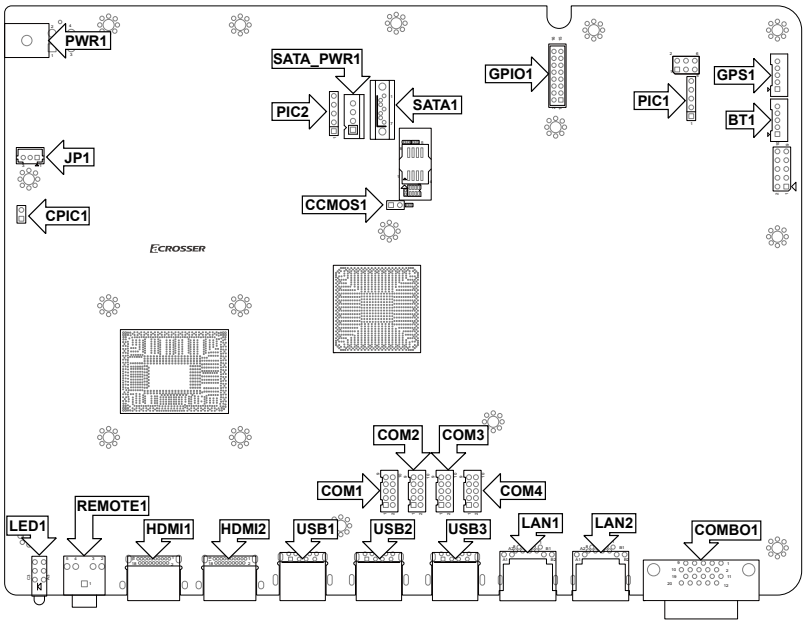


GPIO DB15 Cable

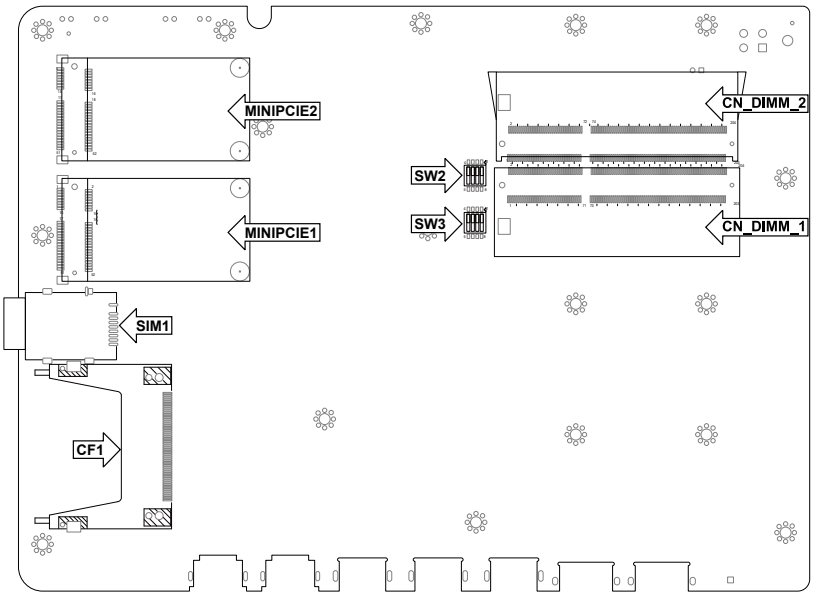
Pin #	Definition	Wire Color	Pin #	Definition	Wire Color
1	GPO0	Brown	2	GPO1	Orange
3	GPO2	Green	4	GPO3	Blue
5	GND	Black	6	GND	Glay
7	CAN_H	Red/White	8	CAN_L	White
9	GND	Red	10	i-Button	Purple
11	GPI4	Light Green	12	GPI5	Light Blue
13	GPI6	Pink	14	GPI7	Brown/ White
15	VCC12A	Yellow			

1.4.3. Mainboard

Top View

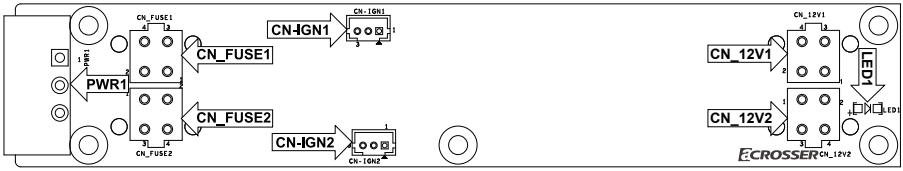


Bottom View



1.4.4. Power Board

Top View



2. Components Assembly

2.1. 2.5” SATA SSD Installation

Step 1: Loosen the two disk-tray screws by fingers.

Step 2: Pull out the disk-tray and install your 2.5” SATA disk.

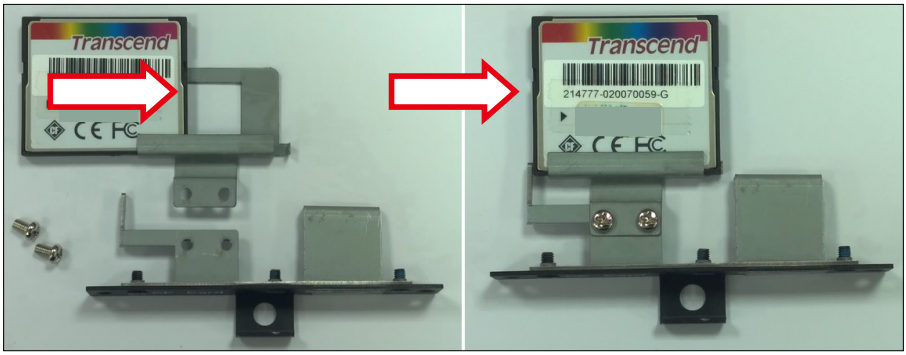
Step 3: Fasten the disk with 4 screws provided in the package.

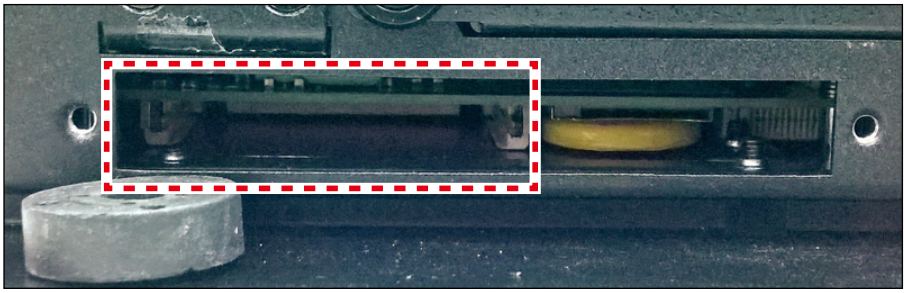
Step 4: Firmly push the disk-tray back into the disk compartment. The disk is now connected with the system.

Step 5: Push in the disk-tray and fasten the two disk-tray screws by your screw driver or fingers.

Step 6: Complete.

2.2. CF Card Installation





Step 1: Loosen the two card-tray screws by your screw driver.

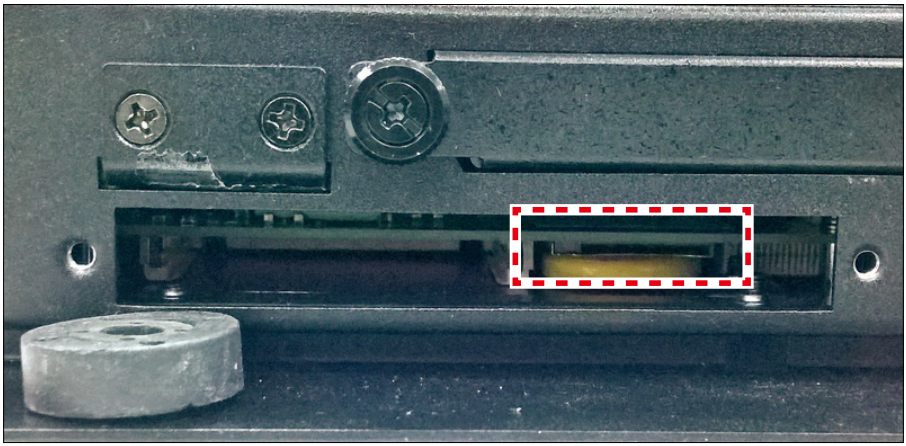
Step 2: Pull out the card-tray. Loosen the two screws that locks the card holder. Slide your CF card into the card holder. Screw back the card holder.

Step 3: If there is no need to install the SIM card, push in the card-tray and fasten the two card-tray screws by your screw driver.

Step 4: Complete.

2.3. SIM Card Installation

Before completing the CF card installtion, you may want to install the SIM card accroding to your system configuration.



Step 1: Leave the CF card-tray on table.

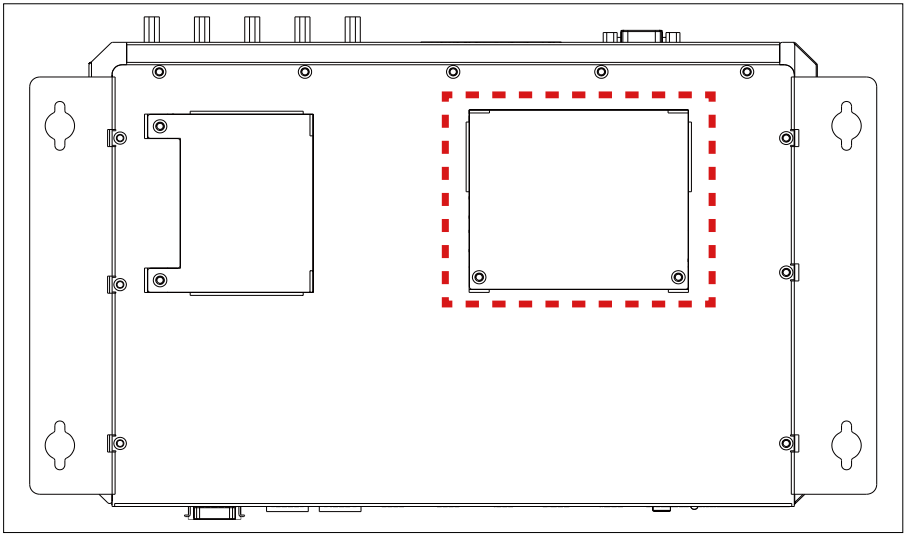
Step 2: Use a clip to install your SIM card into the **SIM1** slot on the mainboard. Pay attention to its orientation, and do not scratch the contacts.

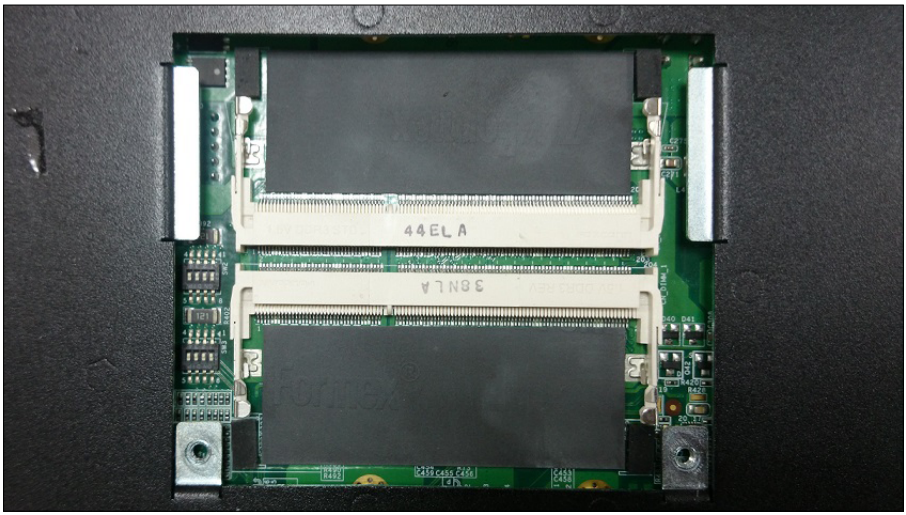
Step 3: Push in the card-tray and fasten the two card-tray screws by your screw driver.

Step 4: Complete.

Note: *To remove the card, first you have to push it in, and then pull it out.*

2.4. DIMM Card Installation





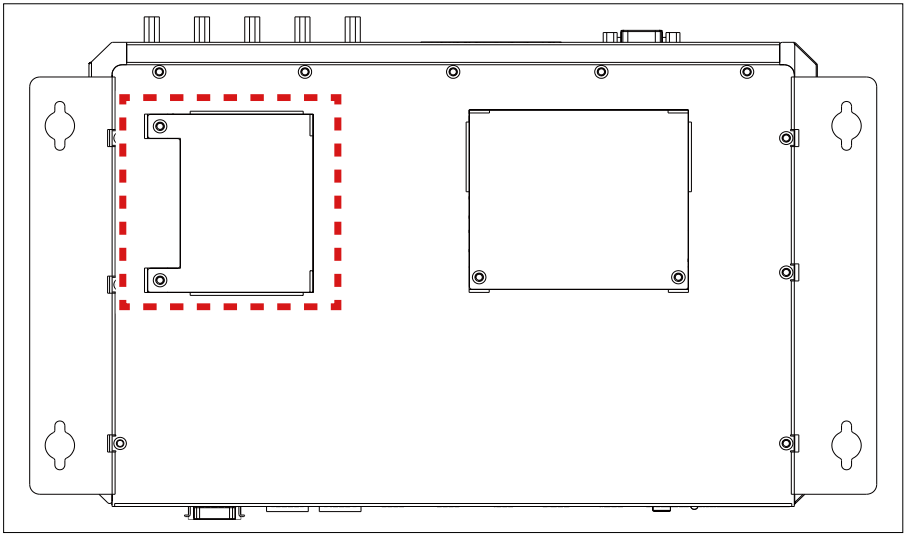
Step 1: Use your screw driver to remove the DIMM card cover plate located at the chassis bottom.

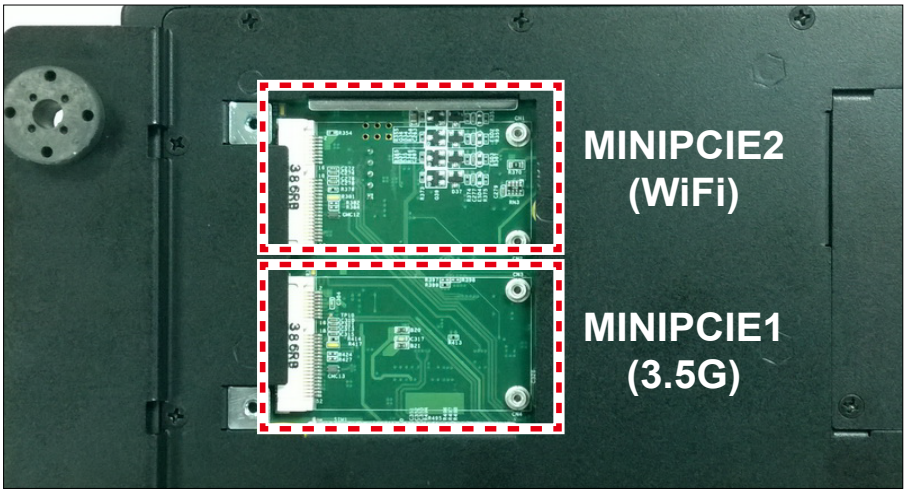
Step 2: Install your DIMM card into the **CN_DIMM1** or **CN_DIMM2** slot on the mainboard. Pay attention to its orientation, and do not scratch the contacts.

Step 3: Place back the DIMM card cover plate and have it fastened.

Step 4: Complete.

2.5. 3.5G / WiFi Module Installation





Step 1: Use your screw driver to remove the cover plate located at the chassis bottom.

Step 2: For **3.5G** module, install to the **MINIPCIE1** slot on the mainboard.
For **WiFi** module, install to the **MINIPCIE2** slot on the mainboard.
Pay attention to its orientation, and do not scratch the contacts.

Step 3: Attch the RF plug from the system to your module.

Step 4: Place back the cover plate and have it fastened.

Step 5: Complete.

2.6. Antenna Connection

Connect your antenna needed according to your system configuration.

2.7. Power Connection

Connect your power cable.

	Pin #	Signal
9V ~ 32V DC input connector Terminal Block: 3 pin Pitch: 5.08mm	V+	9V ~ 32V DC Power Input
	IGN	Ignition On (Hi Active)
	V-	GND

2.8. Blade-type Fuse Holder

Power-input fuse suggestion:

Output: 12V/100W (Input: 9V~32V/111W, Efficiency: 90%)

Car Battery	Blade-type fuse suggestion	Remarks
12V System	CONQUER ATQ-10	Voltage Rating: 32V; Current Rating: 10A
24V System	CONQUER ATQ-5	Voltage Rating: 32V; Current Rating: 5A

Note: *You may have to use a needle-nose pliers to grip on the fuse and pull it out.*

3. BIOS Settings

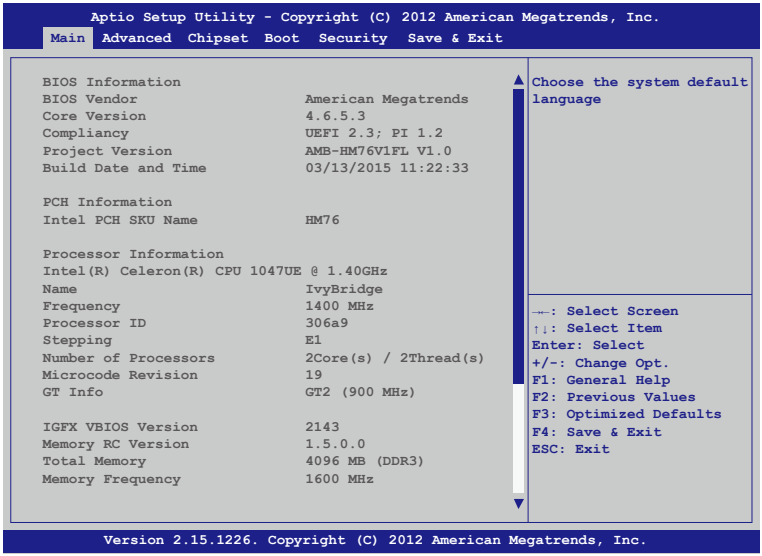
This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up and running. It also gives detailed explanation of the elements found in each of the BIOS menus. The following topics are covered:

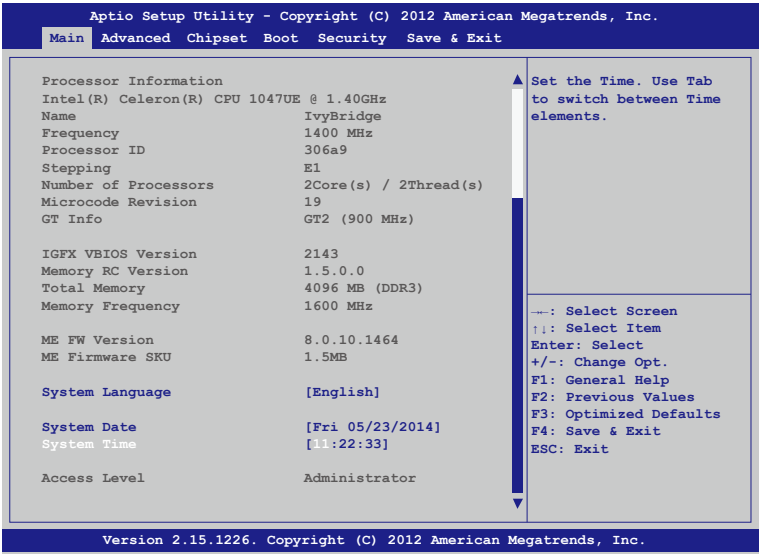
- Main Setup
- Advanced Setup
- Chipset Setup
- Boot Setup
- Security Setup
- Save & Exit Setup

Once you enter the Award BIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to highlight the item and then use the <Pg Up> <Pg Dn> keys to select the value you want in each item.

3.1. Main Setup

The BIOS setup main menu includes some options. Use the [Up/Down] arrow key to highlight the option, and then press the [**Enter**] key to select the item and configure the functions.

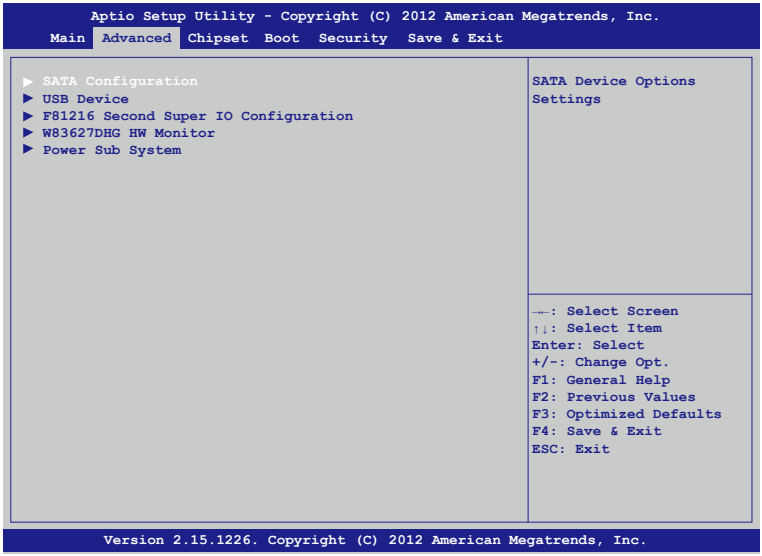




Note: *Listed at the bottom of the menu are the control keys. If you need any help with the item fields, you can press <**F1**> key, and it will display the relevant information.*

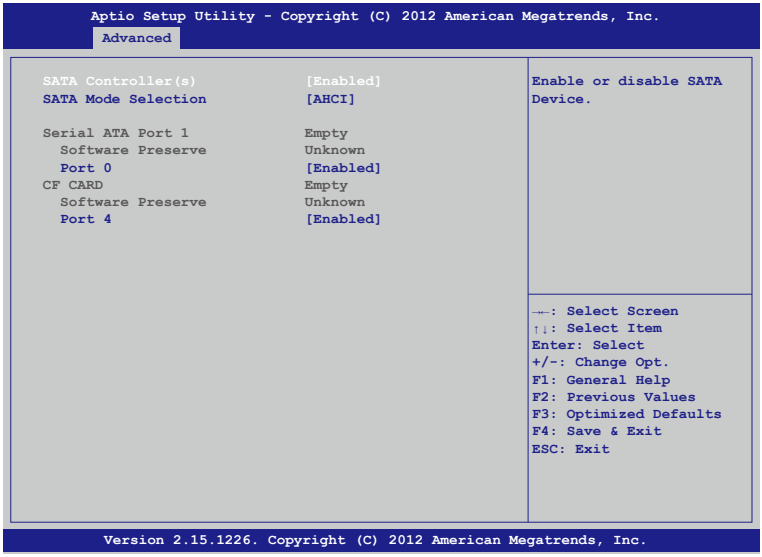
- **System Language**
  Choose the system default language.
- **System Date**
  Set the system date. Note that the 'Day' automatically changes when you set the date.
- **System Time**
  Set the system time.

3.2. Advanced Setup



3.2.1. SATA Configuration

SATA device options settings.



- **SATA Controller(s)**

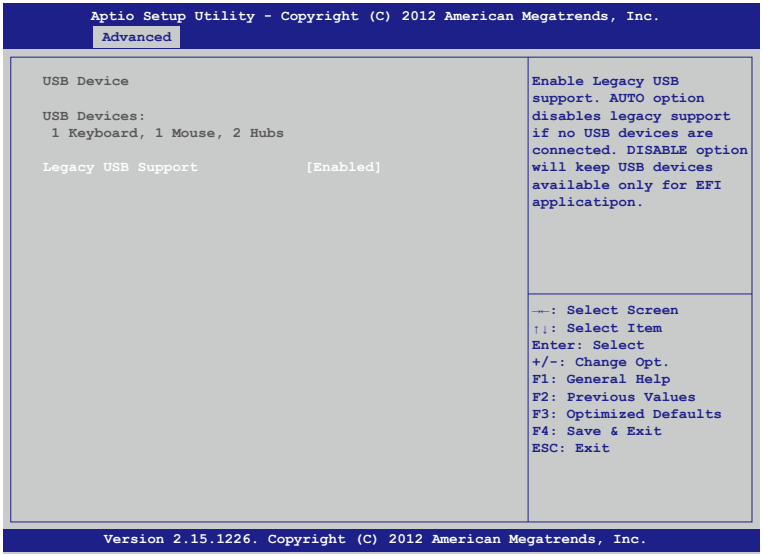
Options	Description
Enabled / Disabled	Enable or disable SATA device.

- **SATA Mode Selection**

Options	Description
IDE / AHCI	Determines how SATA controller(s) operate.

3.2.2. USB Device

USB configuration parameters.

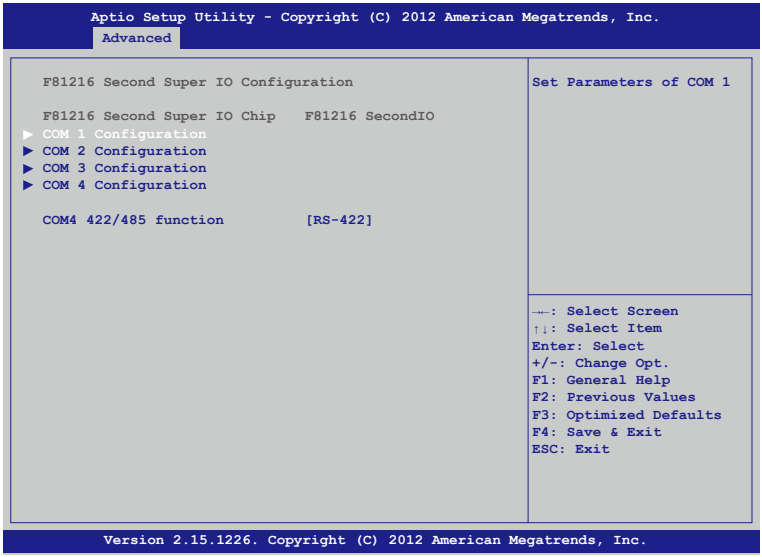


- **Legacy USB Support**

Options	Description
Enabled	Enables Legacy USB support.
Disabled	Keep USB devices available only for EFI applications.
Auto	Disables legacy support if no USB devices are connected.

3.2.3. F81216 Second Super IO Configuration

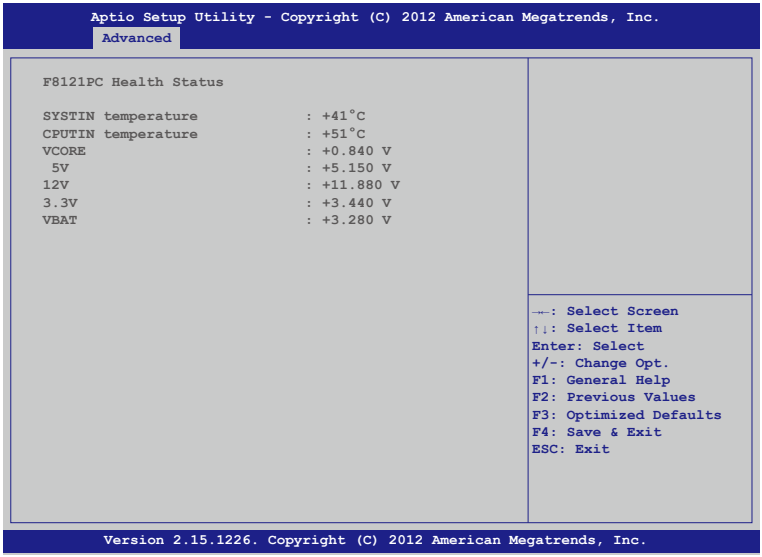
System second super IO chip parameters.



- **COM 1 ~ COM 4 Configuration**
  This option sets the parameters of COM1 ~ COM4.
- **COM4 422/485 function**
  This option sets the COM4 function to RS-422 or RS-485.

3.2.4. W83627DHG HW Monitor

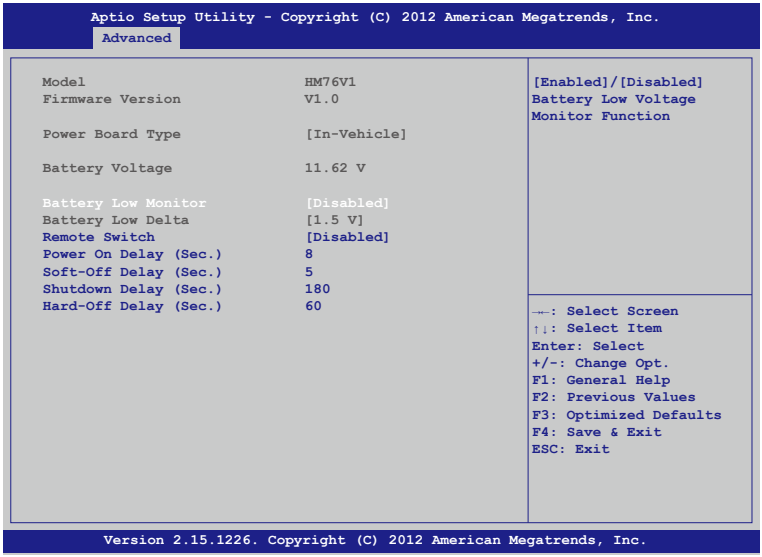
Monitor hardware status.



- **SYSTIN temperature**
  This item displays the system temperature.
- **CPUTIN temperature**
  This item displays the CPU temperature.
- **5V**
  This item displays the 5V voltage level.
- **12V**
  This item displays the 12V voltage level.
- **3.3V**
  This item displays the 3.3V voltage level.
- **VBAT**
  This item displays the battery voltage level.

3.2.5. Power Sub System

Power Sub System.



- **Power Board Type**

Options	Description
In-Vehicle / Embedded	Displays the power board type.

- **Battery Voltage**

  Detects and display the battery voltage level.

Note: *The following items apper only if the "Power Board Type" is [In-Vehicle].*

- **Battery Low Monitor**

Options	Description
Enabled / Disabled	Enables or disables the monitor function of low battery voltage.

- **Battery Low Delta**

Options	Description
0.5 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0	Sets the battery delta level. Once the battery voltage drops below this level, the battery will be detected as battery low.

- **Remote Switch**

Options	Description
Enabled / Disabled	Enables or disables the function of remote switch.

- **Power On Delay (Sec.)**

Options	Description
2 ~ 60	The delay between power on and system work.

- **Soft-Off Delay (Sec.)**

Options	Description
0 ~ 3600	The delay before system shutdown.

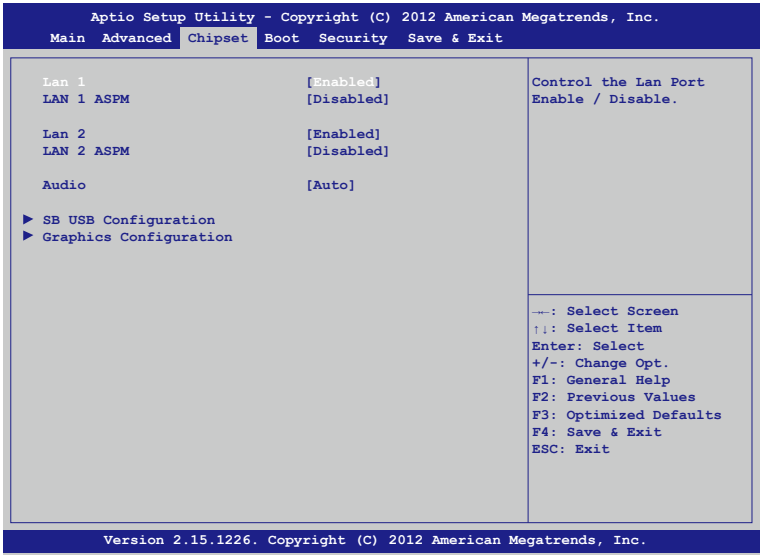
- **Shutdown Delay (Sec.)**

Options	Description
120 ~ 3600	The delay between system shutdown and system off.

- **Hard-Off Delay (Sec.)**

Options	Description
0 ~ 3600	The delay before all power off.

3.3. Chipset Setup



- **Lan 1, Lan 2**

Options	Description
Disabled / Enabled	Control the LAN Port Enable / Disable.

- **LAN 1 ASPM, LAN 2 ASPM**

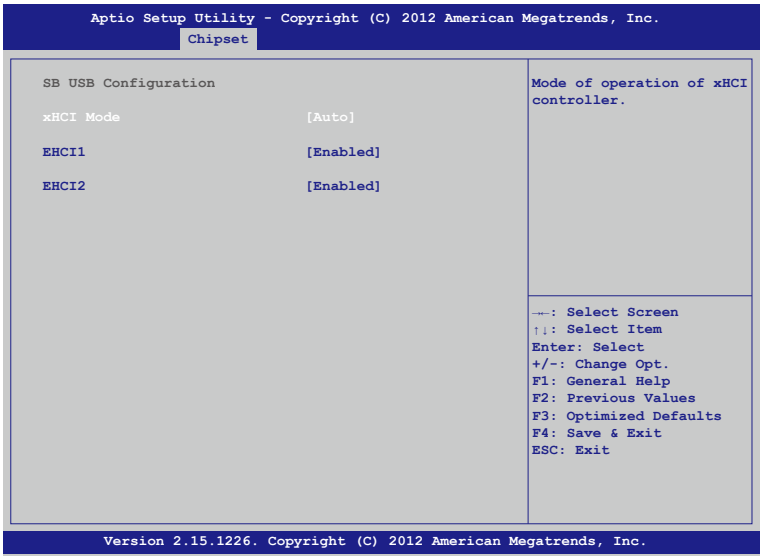
Options	Description
L0s, L1, L0sL1, Auto, Disabled	Sets the ASPM (Active State Power Management Settings) level for LAN1 and LAN2.

- **Audio**

Control detection of the Azalia device.

Options	Description
Disabled	Azalia will be unconditionally disabled.
Auto	Azalia will be enabled if present, disabled otherwise.

3.3.1. SB USB Configuration



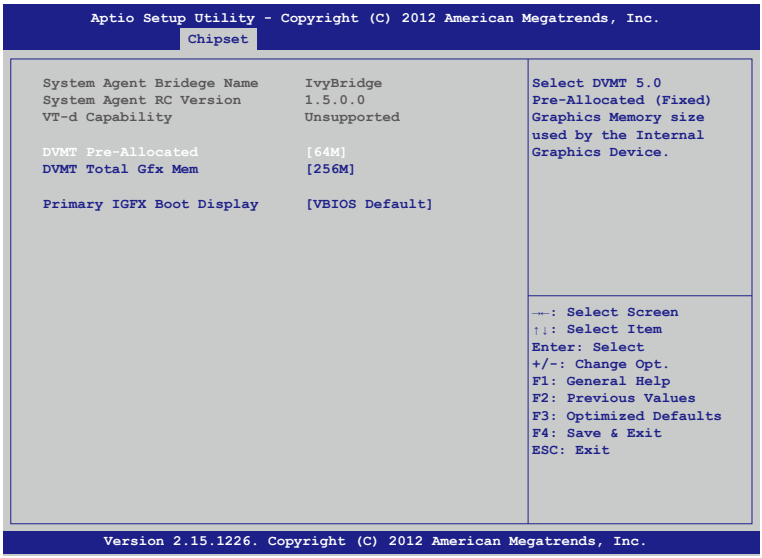
- **xHCI Mode**

Options	Description
Disabled / Auto / Smart Auto	Select the operation mode of xHCI controller.

- **EHCI1, EHCI2**

Options	Description
Enabled / Disabled	Control the USB EHCI functions. One EHCI controller must always be enabled.

3.3.2. Graphics Configuration



- **DVMT Pre-Allocated**

Options	Description
32M / 64M / 96M / 128M / 160M / 192M / 224M / 256M / 288M / 320M / 352M / 384M / 416M / 448M / 480M / 512M / 1024M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

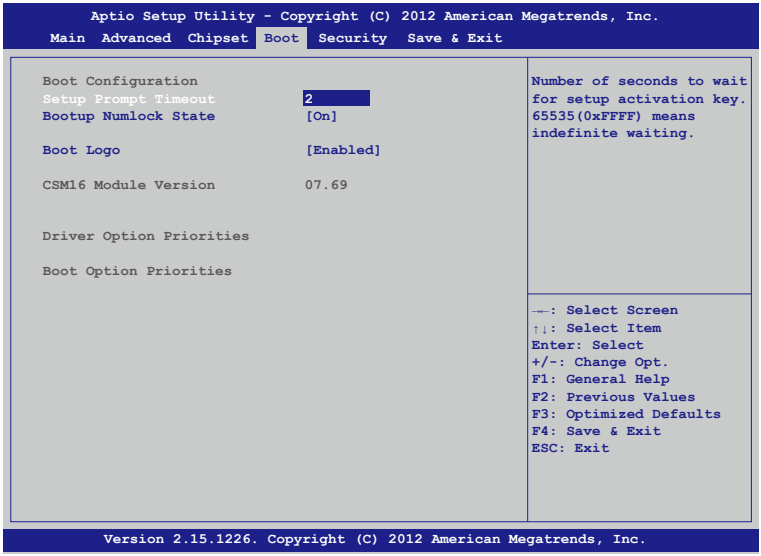
- **DVMT Total Gfx Mem**

Options	Description
128M / 256M / MAX	Select DVMT 5.0 Total Graphics Memory size used by the Internal Graphics Device.

- **Primary IGFX Boot Display**

Options	Description
VBIOS Default / D_SUB / HDMI 1 / HDMI 2	Select which video device will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. The VGA modes will be supported only on primary display.

3.4. Boot Setup



- **Setup Prompt Timeout**

Options	Description
N/A	The number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State**

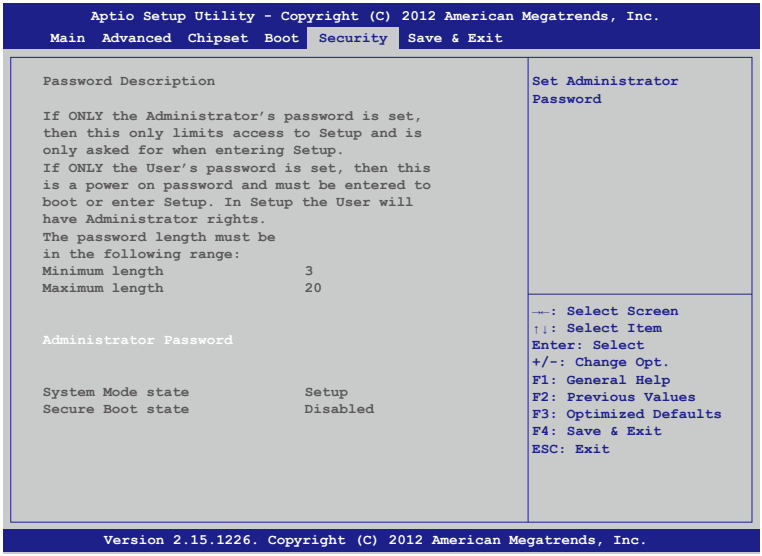
Options	Description
On / Off	Select the keyboard NumLock state.

- **Boot Logo**

Options	Description
Enabled / Disabled	Enables or disables Quiet Boot option.

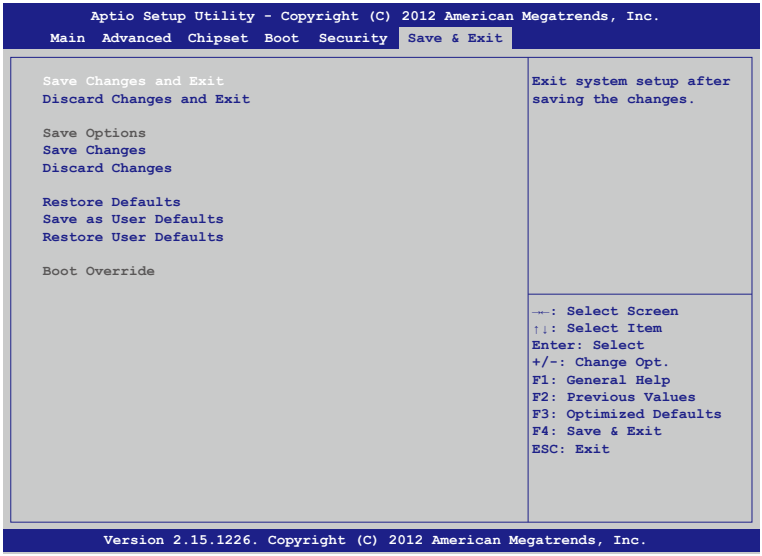
- **CSM16 Module Version**
  This item shows the information of the CSM16 Module Version.
- **Driver Option Priorities**
  This item enables adding, deleting, or selecting the drive options to be shown in the setup sequence.
- **Boot Option Priorities**
  Set the system boot order.

3.5. Security Setup



- **Administrator Password**
  Set Administrator Password
- **System Mode state**
  This item shows whether the password has been set or not.
- **Secure Boot state**
  Decide whether a password is needed before boot up.

3.6. Save & Exit Setup



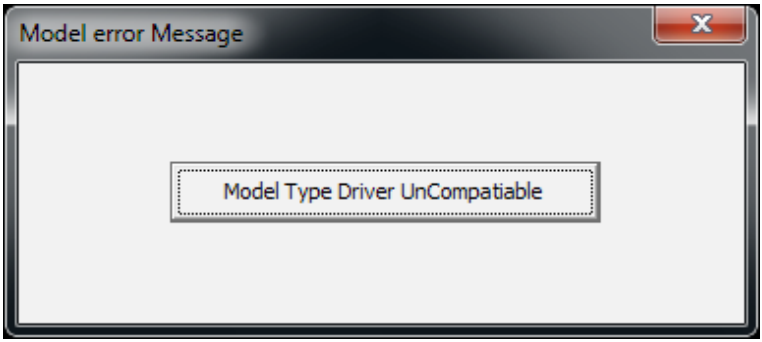
- **Save Changes and Exit**
  Exit system setup after saving the changes.
- **Discard Changes and Exit**
  Exit system setup without saving any changes.
- **Save Options**
  Save the options that have been made so far.
- **Save Changes**
  Save Changes done so far to any of the setup options.
- **Discard Changes**
  Discard Changes done so far to any of the setup options.
- **Restore Defaults**
  Restore/Load Default 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**
  Select the boot device.

4. Driver and Utility Installation

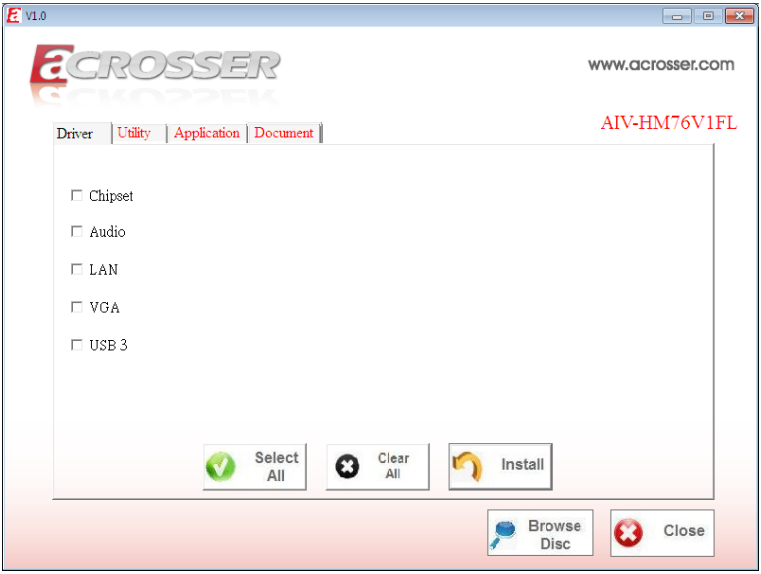
4.1. Driver CD Interface Introduction

Acrosser provides a Driver CD compiled with all the drivers, utilities, applications and documents this product may need.

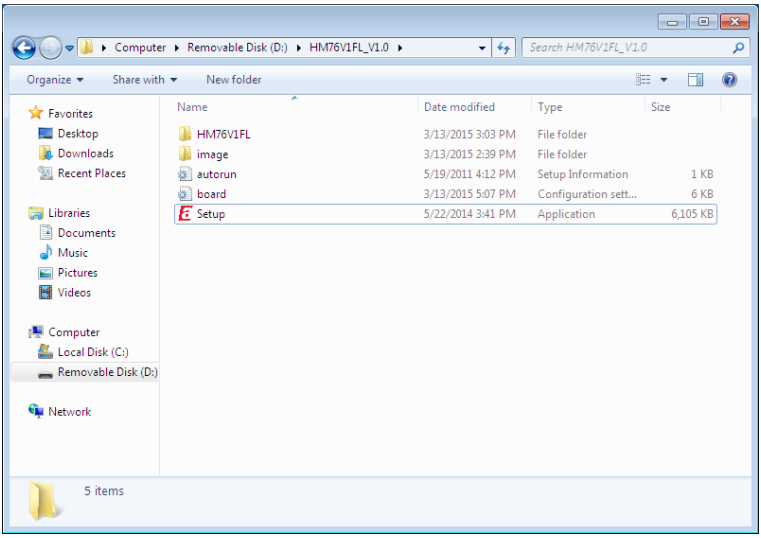
Put the Driver CD into your CD-ROM drive. The Driver CD will automatically detect the mainboard information to see if they are matched. The following error messages appear if you use an incorrect Driver CD version with your mainboard. Please find the correct Driver CD to proceed.



Put the correct Driver CD of your mainboard into your CD-ROM drive. The following installation screen should appear.

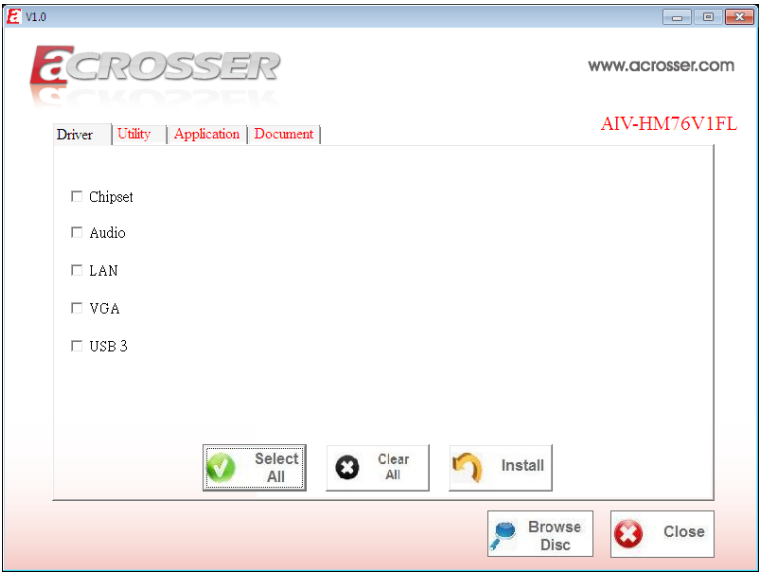


If not, enter the root folder of the Driver CD, run the excution file "**Setup.exe**".

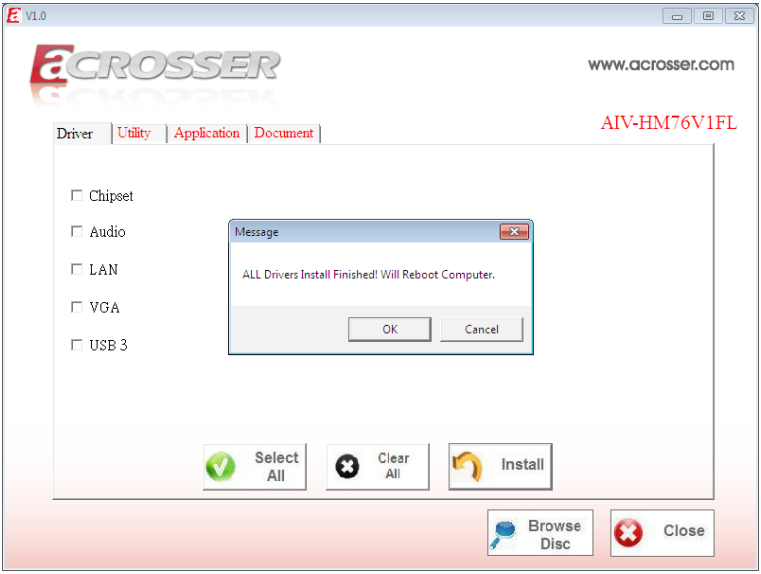


4.2. Driver Installation Page

Step 1: Select the “**Driver**” tab. Click the “**Select All**” button to select all the driver checkboxes, and then click “**Install**” button to start installing all the selected drivers.



Step 2: The driver installation completeed. The configuration will be valid after reboot.



Note: *Select the "**Clear All**" button will clear all the selections, and then you can select the driver you want to install one by one, but the "**Chipset**" driver has to be installed before installing all the others.*

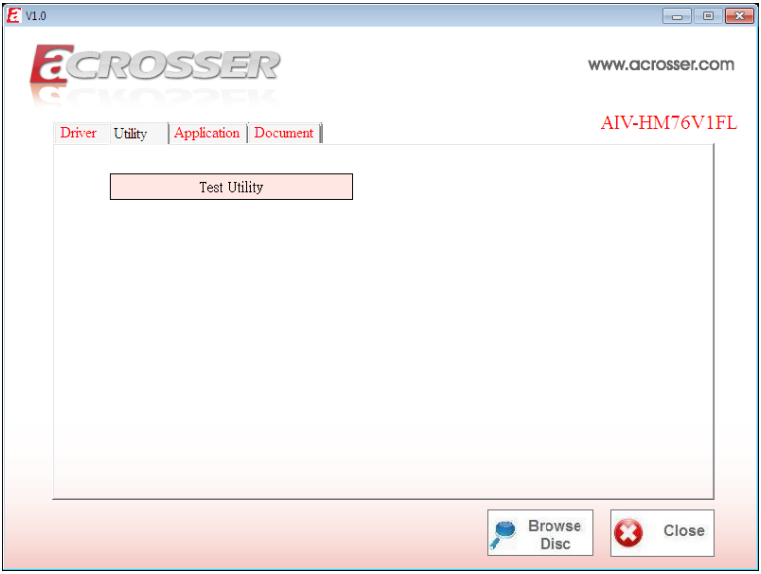
4.3. Utility Installation Page

Before launching the utility, you should install "**Driver**" to initiate peripherals, e.g. GPIO and WatchDog.

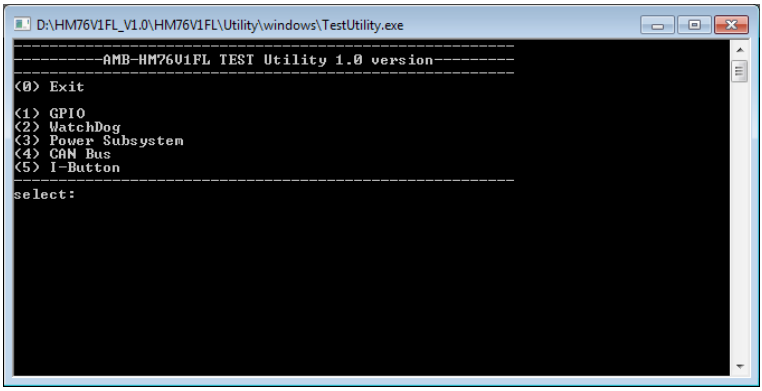
This "Test Utility" can be used to verify both system GPIO and WatchDog features.

Note: *To run the Testing Utility completely, you should do it at test-signed kernel-mode under Windows 7 x64 by the command "BCDEdit /set testsigning on".*
For more information, please refer to MSDN by the following URL http://msdn.microsoft.com/en-us/library/windows/hardware/ff542202(v=vs.85).aspx

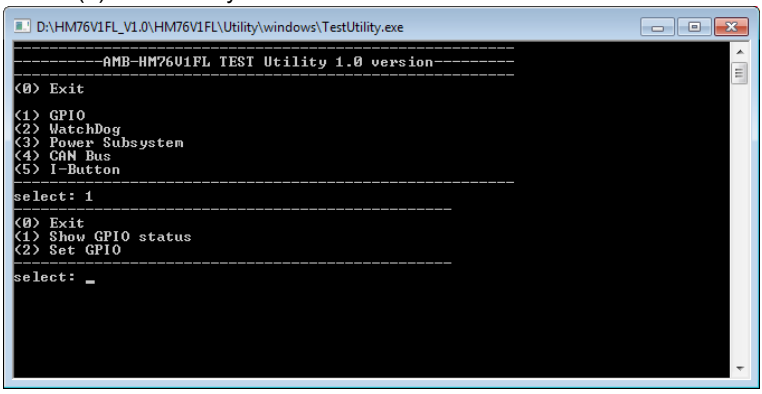
Step 1: Select the "**Utility**" tab. Click the "**Test Utility**" box.



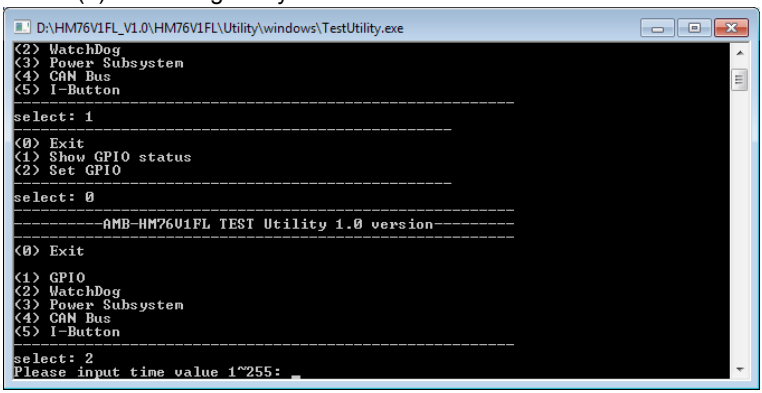
Step 2: The “Test Utility” screen appears.



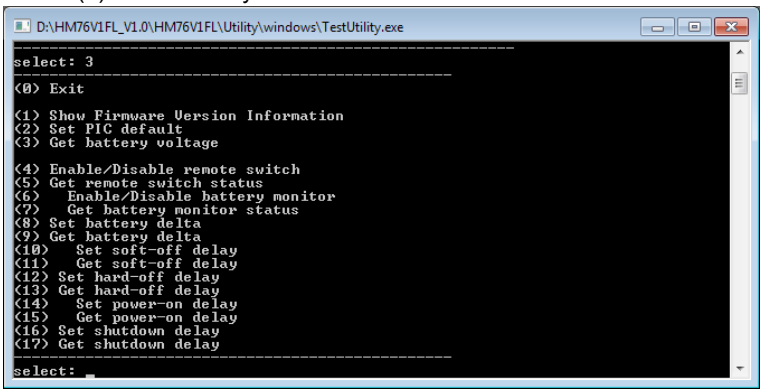
Select (1) GPIO Utility:



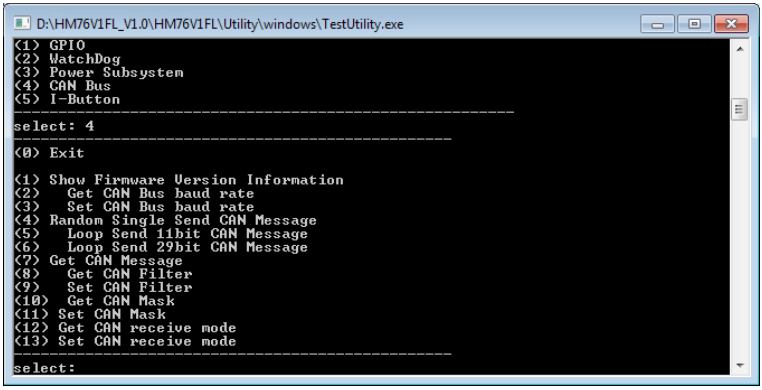
Select (2) WatchDog Utility:



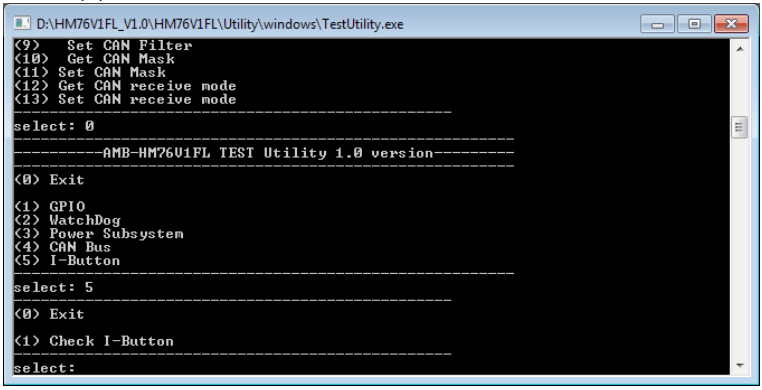
Select (3) Power Subsystem:



Select (4) Can Bus:



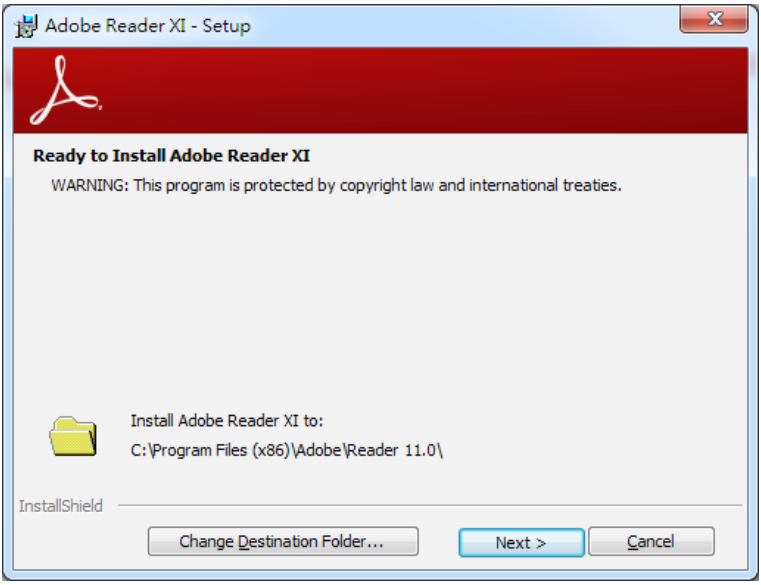
Select (5) I-Button:



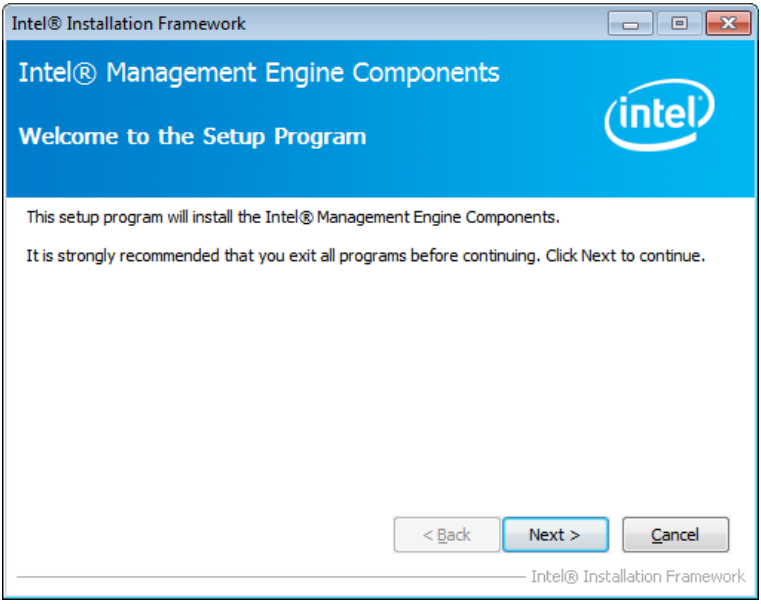
4.4. Application Installation Page

Step 1: Select the "**Application**" tab. Click the "**Acrobat Reader**" box.

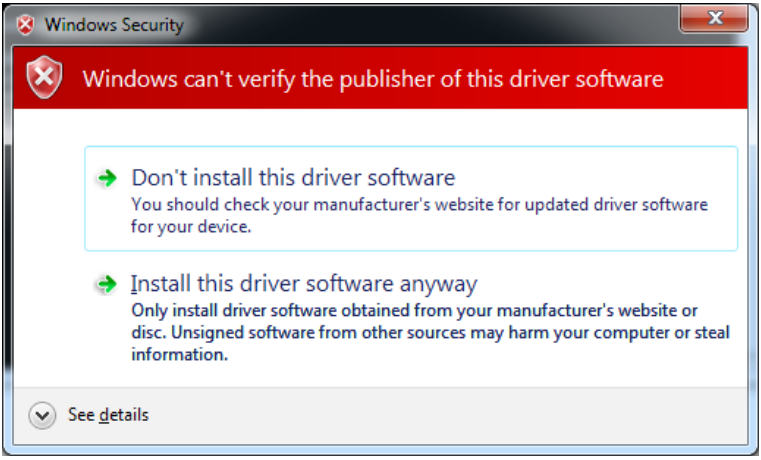
Step 2: Please install "**Acrobat Reader**". This application is needed for reading the User Manual in PDF format.



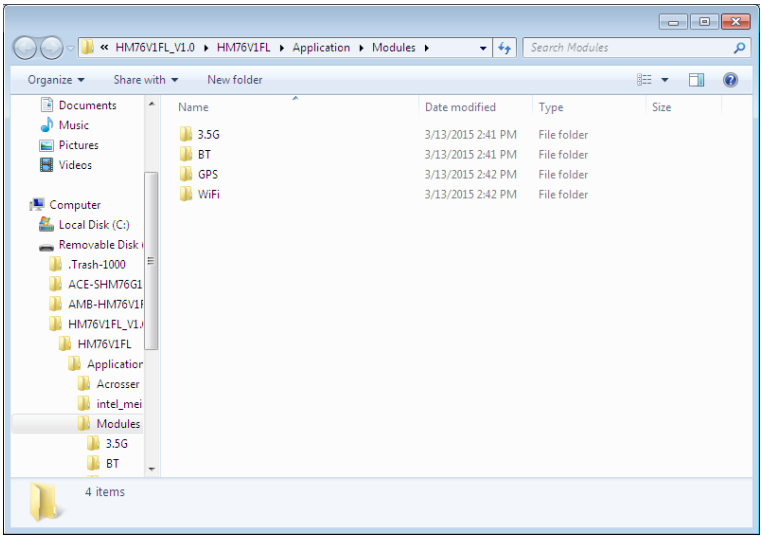
Step 3: Please install “**Intel_MEI**” and “**Acrosser Driver**” into the system. Windows OS will create “**AcroDev**” device.



Step 4: If the “**Windows Security**” warning message appears, select “**Install this driver software anyway**” to go on next step.

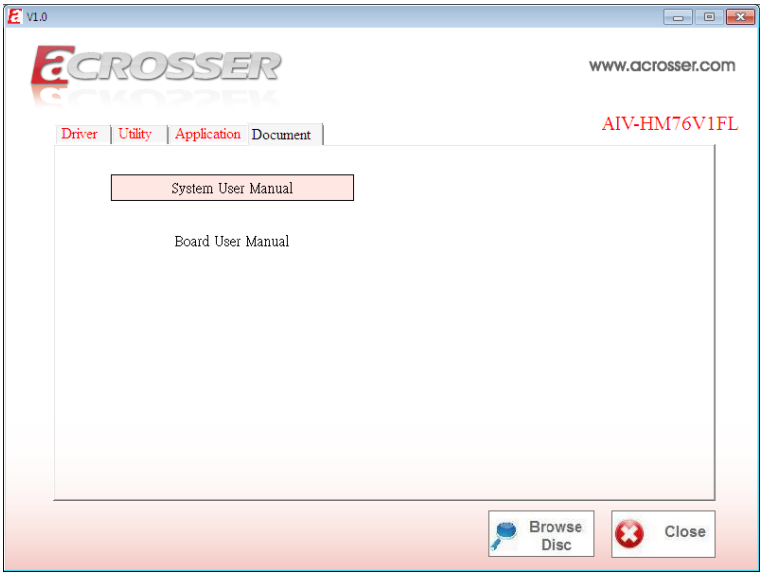


Step 5: Install “**Drivers for Optional Modules**”.



4.5. Document Page

The user manual is stored in the "**Document**" folder.



*Note: To read the PDF file, you will have to install "**Acrobat Reader**" first. Please refer to the "**Application Installation Page**".*

5. Software Installation and Programming Guide

5.1. Introduction

5.1.1. CAN Bus

5.1.1.1. Overview

The CAN bus APIs provide interfaces to CAN bus subsystem. By invoking these APIs, programmers can implement the applications which have the functions listed below:

1. Set the BAUD rate.
2. Send the CAN packages over the CAN bus.
3. Receive the CAN packages via the CAN bus hardware interface.
4. Set the CAN package filter to selectively receive CAN packages with specific ID.
5. Set the mask bits to selectively make some filter bits take effect.

In the folder 'HM76V1FL\Utility' on the CD, we provide:

1. API header file.
2. API library in static library format and shared library format.
3. Test utility.

5.1.1.2. CAN Message Format

```
// TYPE DEFINITION
        typedef  char               i8;
        typedef  unsigned char      u8;
        typedef  short              i16;
        typedef  unsigned short     u16;
        typedef  unsigned long      u32;
        typedef  int                i32;

struct CanMsg {
        u32  id;
        u8   id_type;
        u8   length;
        u8   data[8];
        }
```

To transmit a CAN packet, the programmer has to fill in the fields in the variable of type CanMsg and pass this CanMsg variable as an argument to invoke the APIs. The fields in CAN message are described below:

id:

This field holds the ID information of the CAN packet. In a ‘Standard Data Frame’ CAN packet, the ID field consists of 11 bits of binary digitals. In an ‘Extended Data Frame’ CAN packet, the ID field consists of 29 bits of binary digitals. That the CAN packet is a ‘Standard Data Frame’ packet or an ‘Extended Data Frame’ packet is determined by the ‘id_type’ field in the CanMsg variable.

The ‘id’ field in the CanMsg variable is a 32-bit long space. If a CanMsg variable is configured as a ‘Standard Data Frame’ CAN packet, the bit[0] ~ bit[10] in the ‘id’ field is the ID of the CAN packet. The bit[11] ~ bit[31] are ignored when the APIs in the library processing the CanMsg variable.

'id' field in the CanMsg variable

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	0	0	1	1	1	0	1	0	1	1

If a CanMsg variable is configured as an ‘Extended Data Frame’ CAN packet, the bit[0] ~ bit[28] in the ‘id’ field is the ID of the CAN packet. The bit[29] ~ bit[31] are ignored when the APIs in the library processing the CanMsg variable.

'id' field in the CanMsg variable

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X	X	X	1	0	0	1	0	0	1	0	1	1	1	0	0	1	0	1	1	0	1	0	0	1	1	1	0	1	0	1	1

id_type:

This field identifies that the CAN packet is a ‘Standard Data Frame’ CAN packet or a ‘Extended Data Frame’ CAN packet:

```
struct CanMsg canMsg;
canMsg.id_type = EXT_ID;   // A ‘Extended Data Frame’ packet
canMsg.id_type = STD_ID;   // A ‘Standard Data Frame’ packet
```

length:

This field identifies the number of data bytes in the next field ‘data[8]’ which are filled with effective data. Because the ‘data’ field is an 8-byte long array, the range of this field ‘length’ is 0 ~ 8.

data[8]:

This array of data will be filled with effective data.

For example:

```
struct CanMsg msg;

msg.data[0] = 0xa1;
msg.data[1] = 0xb2;
```

```
msg.data[2] = 0xc3;

msg.length = 3;
```

5.1.2. GPIO and Watchdog

5.1.2.1. Overview

This model provides both a GPIO interface and a Watchdog timer. Users can use the GPIO and Watchdog APIs to configure and to access the GPIO interface and the Watchdog timer. The GPIO has four input pins and four output pins. The Watchdog timer can be set to 1~255 seconds. Setting the timer to zero disables the timer. The remaining seconds of the timer to reboot can be read from the timer.

5.1.2.2. Installing Device Driver

Before executing the applications which invoke the GPIO or Watchdog APIs, users should make sure that the Linux device driver or the Windows device driver has been installed.

On Linux platform, after successfully installing the device driver, a character device node named “/dev/AcroDev” will be created automatically. The APIs open the device node “/dev/AcroDev” implicitly so acquiring a file descriptor of “/dev/AcroDev” is not ncecssary.

On Windows platform, after successfully installing the device driver, there is a device which shows ‘Acrosser Device’ in the ‘Device Manager’. The APIs on Windows platform open this device implicitly.

5.1.3. Power Subsystem

5.1.3.1. Overview

The Power Subsystem APIs can be used to get and set the configuration of power subsystem. By invoking the Power Subsystem APIs, users can:

1. Get the firmware version number of the Power Subsystem.
2. Set all the settings of the Power Subsystem to the default values.
3. Get/Set the status of the remote switch(ENABLE or DISABLE).
4. Get the battery voltage.
5. Get/set the status of the battery monitor (ON or OFF).
6. Get/set the delta value which identifies how much the battery voltage can be lower than the nominal voltage. When the voltage is lower than the tolerable voltage, the power subsystem turns off the system.
7. Get/set the Soft Off deley.
8. Get/set the Hard Off delay.
9. Get/set the Power On delay.
10. Get/set the Shutdown delay.

The power subsystem connects to the main system via the COM port. On the Linux platform, the actual port number to which the Power Subsystem connects is determined by the Linux. The default supported COM interfaces on Linux are COM1~COM4. Users must take extra steps to configure Linux kernel in order to support COM ports which do not fall into the range COM1 ~ COM4. Please refer to Appendix A for more information. Users don't need extraordinary setup on Windows platform to support COM ports.

5.1.4. I-Button Function

In the API library, we provide a set of I-Button functions. Users can use the functions to:

1. Reset the I-Button.
2. Read data from the I-Button.
3. Write data to the I-Button.

5.2. API List and Descriptions

5.2.1. CAN Bus

Syntax:	**i32 getCanFwVer(PicInfo *ver)**
Description:	This function gets the version information of the CAN Bus firmware.

Parameters:	The definition of struct 'PicInfo' is:
	struct PicInfo {
	u8 info[12];
	}
	This API returns the version information and store the information in the memory which is pointed at by the pointer 'ver'.

Return Value:	If this function gets the version information successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 getCanBaudRate(u8 *baud)
Description:	This function gets the current setting of the Baud Rate of the CAN Bus. This function gets an 'unsigned char' to represent the Baud Rate. Here is the table for the Baud Rate:

Unsigned Char	Baud Rate
1	10K
2	20K
3	50K
4	100K
5	125K
6	250K
7	500K
8	800K
9	1000K

Users can use the macros listed below to set the Baud Rate:

```
/* Baud Rate */
#define BAUD_RATE_10K      1
#define BAUD_RATE_20K      2
#define BAUD_RATE_50K      3
#define BAUD_RATE_100K     4
#define BAUD_RATE_125K     5
#define BAUD_RATE_250K     6
#define BAUD_RATE_500K     7
#define BAUD_RATE_800K     8
#define BAUD_RATE_1000K    9
```

Parameters:	This function gets a number which represents the specific Baud Rate and stores it at the memory which is pointed at by the pointer 'baud'.
Return Value:	If this function gets the baud rate successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 setCanBaudRate(u8 baud)
Description:	This function sets the Baud Rate of the CAN Bus.
Parameters:	It takes an 'unsigned char' as the parameter and sets the Baud Rate according to the value stored at the parameter 'baud'. The correspondence between the Baud rate and the value to set to the function is the same as the table listed in the previous API 'getCanBaudRate( )'
Return Value:	If this function sets the baud rate successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 sendCanMessage(struct CanMsg *buffer, u8 count)
Description:	This function sends out CAN packages over the CAN bus.
Parameters:	If there is more than one CAN packet to send, these CAN packages are stored in an array of type 'CanMsg'. This function sends out packets in a sequential fashion. The memory address of the first CAN packet to be sent is pointed at by the parameter 'buffer'. The number of CAN packets to be sent is indicated by the parameter 'count'.

Return Value:	If this function sends the CAN packet successfully, it returns 0, any other returned value stands for error.
	Here is an example:
	If the CAN packets in the array 'canAry[]' have been initialized. The code listed below will send out the CAN packets in the 'canAry[]' over the CAN bus.
	unsigned int result = 0;
	struct CanMsg canAry[30];
	/* …
	Initialize the CAN packages in the canAry[30]
	*/
	result = sendCanMessages(canAry, 30);
	if(result != 0)
	fprintf(stderr, "Send CAN package error!\n");

Syntax:	i32 getCanMessage(struct CanMsg *buffer, u8 count)
Description:	This function receives CAN packets from the CAN bus subsystem.
Parameters:	This function stores received CAN packages sequentially at an array of type 'CanMsg'. The number of packages to receive is indicated by the parameter 'count'.

Return Value:	If this function receives the CAN packet successfully, it returns 0, any other returned value stands for error.
	Here is an example:
	If the array 'canAry[]' of type 'CanMsg' has been declared and allocated. The code listed below will receive 30 CAN packages from the CAN bus subsystem and stores the packages in the 'canAry[]'.
	unsigned int result = 0;
	struct CanMsg canAry[30];
	
	result = getCanMessage(canAry, 30);
	if(result != 0)
	fprintf(stderr, "Fail to receive CAN packets!\n");

Syntax:	i32 getCanMask(struct CanMask *mask)
Description:	This function gets the current setting of the acceptance masks. Masks are used to determine which bits in the ID field of the CAN packet are examined with the filters. There are two acceptance masks (mask0 and mask1) and six acceptance filters (filter0 ~ filter5) in the CAN Bus subsystem. Filter0 ~ filter1 are associated with mask0. Filter2 ~ filter4 are associated with mask1. Here is the Mask/Filter truth table:

Mask bit n	Filter bit n	Message ID bit n	Accept or reject bit n
0	x	x	Accept
1	0	0	Accept
1	0	1	Reject
1	1	0	Reject
1	1	1	Accept

Note: x = don't care

Parameters:

This parameter 'mask' is a pointer to a variable of type 'CanMask'. Users use the field 'maskId' to indicate the mask they want and the API put the setting of the mask in the 'mask' field.

```
struct CanMask {
u8 maskId; // 0 or 1
u32 mask;
}
```

Return Value:

If this function receives the mask setting successfully, it returns 0, any other returned value stands for error.

For example:

```
struct CanMask a_mask;
a_mask.maskId = 0;  // indicate the mask0
i32 result;
result = getCanMask(&a_mask);  // The setting of the
    mask is put at
    // a_mask.mask
if( result != 0)
printf("Fail to get mask!\n");
```

Syntax:	i32 setCanMask(struct CanMask mask)
Description:	This function sets the bit patterns to the indicated mask. The target mask is indicated by the 'maskId' field in a CanMask variable.

Parameters:	This functions takes a variable of type 'CanMask'. User set the bit patterns they want to the 'mask' field in a 'CanMask' variable.
	struct CanMask {
	u8 maskId; // 0 or 1
	u32 mask;
	}
	For example:
	struct CanMask varMask;
	i32 result;
	
	varMask.maskId = 1;
	varMask.mask = 0x12345678;
	result = setCanMask(varMask);

Return Value:	If this function sets the mask setting successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 getCanFilter(struct CanFilter *varFilter)
Description:	This function gets the current setting of the acceptance filter. Use the 'filterId' field in a 'CanFilter' variable to indicate the filter you want and the API puts the setting of the indicated filter in the 'filter' field in the CanFilter variable 'varFilter'.

Parameters:	This function takes a pointer to a 'CanFilter' type variable.
	For example:
	struct CanFilter varFilter;
	i32 result;
	result = getCanFilter(&varFilter);
	if(result != 0)
	printf("Fail to get the filter!\n");

Return Value:	If this function gets the filter successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 setCanFilter(struct CanFilter *varFilter)

Description:	This function sets the bit pattern to the filter. By indicating the 'filterType' field in the 'varFilter' variable, the bit pattern in the 'filter' field will be taken as an 'Standard ID' filter or 'Extended ID' filter.
	struct CanFilter {
	u8 filterId; // There are six filters so the filterId = 0 ~ 5
	u8 filterType; // filterType = STD_ID or filterType = EXT_ID
	u32 filter;
	}
	If a filter is configured as a 'Standard ID' filter, only bit18 ~ bit28 in the mask take effect when filtering the CAN packet.

Parameters:	This function takes a pointer to a variable of type 'CanFilter' as the parameter. Users set up the 'filterId'. There are six filters so the 'filterId' could be 0 ~ 5. Filter0 and filter1 are associated with mask0. Filter2 ~ filter5 are associated with mask1.
	By setting up 'filterType', users indicate the type of the filter. Filter type could be 'STD_ID' or 'EXT_ID'.
	Depending on the filter type, the 'filter' field in the CanFilter variable could be 0x0 ~ 0x7FF (11 bits) when filter type is 'STD_ID'. If the filter type is 'EXT_ID', the 'filter' field in the CanFilter variable could be 0x0 ~ 0x1FFFFFFF (29 bits).
	For example:
	struct CanFilter varFilter;
	i32 result;
	varFilter.filterId = 3;
	varFilter.filterType = STD_ID;
	varFilter.filter = 0x555;
	
	result = setCanFilter(&varFilter);
	if(result != 0)
	printf("Fail to set up the filter!\n");

Return Value:	If this function sets the filter successfully, it returns 0, any other returned value stands for error.

5.2.2. GPIO and Watchdog

5.2.2.1. GPIO

Syntax:	i32 getChLevel(u8 *val)
Description:	Get the status of GPIO input pins and output pins, and put the value at *val.

Parameters:	This function takes a pointer to an unsigned char variable as the parameter.
	The bit0 ~ bit3 in the pointed variable '*val' is the status of the output pins. The bit4 ~ bit7 in the pointed variable '*val' is the status of the input pins.
	For example:
	u8 val;
	i32 result;
	
	result = getChLevel(&val);
	if(result != 0)
	printf("Fail to get GPIO status!\n");

Return Value:	If the function gets the value successfully, it returns 0, any other returned value stands for error.

Syntax:	i32 setChLevel(u8 val)
Description:	Set the status of GPIO Output pins.

Parameters:	This function takes an unsigned char as the parameter. The bit0 ~ bit3 in variable 'val' represent the status of the output pins. The bit3 ~ bit7 in the variable 'val' are of no use and can be neglected.
	For example:
	u8 val = 0xf;
	i32 result;
	
	result = setChLevel(val);
	if(result != 0)
	printf("Fail to set GPIO!\n");

Return Value:	If the function sets the values successfully, it returns 0, any other returned value stands for error.

5.2.2.2. Watchdog

Syntax:	u8 getWtdTimer(void)
Description:	This function read the value of the watchdog time counter and returns it to the caller.
Parameters:	None.
Return Value:	This function returns the value of the time counter and returns it to the caller as an unsigned character.

Syntax:	void setWtdTimer(u8 val)
Description:	This function sets the watchdog timer register to the value 'val' and starts to count down. The value could be 0 ~ 255. The unit is second. Setting the timer register to 0 disables the watchdog function and stops the countdown.
Parameters:	The parameter 'val' is the value to set to watchdog timer register. The range is 0 ~ 255.
Return Value:	None.

5.2.3. Power Subsystem

Syntax:	i32 getPwrFwVer(struct PicInfo *ver)
Description:	This function gets the version information of the firmware of the Power Subsystem.

Parameters:	The definition of struct 'PicInfo' is:
	struct PicInfo {
	u8 info[12];
	}
	This API returns the version information and store the information in the memory which is pointed at by the pointer 'ver'.

Return Value:	None.

Syntax:	i32 setPicDefault(void)
Description:	The function restores the Power Subsystem to the default values. After calling this API, the items listed below are restored to its default value: Remote Switch → Default: Disabled Battery Monitor → Default: Disabled Battery Voltage Delta Value → Default: 1.5V System Soft Off Delay → Default: 5 seconds System Hard Off Delay → Default: 1 minute System Power On Delay → Default: 2 seconds OS Shutdown Delay → Default: 3 minutes
Parameters:	None.
Return Value:	If this function works successfully, the function will return 0, any other value standards for error.

Syntax:	i32 getRemoteSwitch(u8 *val)
Description:	The function gets the status of the Remote Switch.

Parameters:	This function takes a pointer to an unsigned char variable as the parameter. After calling this function, the status of the Remote Switch will be put at the memory which is pointed by the parameter 'val'. If the Remote Switch is enabled, '*val' is 0x5A. If the Remote Switch is disabled, the '*val' is 0xA5. Users can use the macros 'ENABLED' (0x5A) and 'DISABLED'(0xA5) to test the status value '*val'.
	For example:
	u8 val;
	i32 result;
	
	result = getRemoteSwitch(&val);
	if(result == 0) {
	if(val == ENABLED)
	printf("Remote Switch is enabled.\n");
	else if(val == DISABLED)
	printf("Remote Switch is disabled.\n");
	}

Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 setRemoteSwitch(u8 val)
Description:	The function sets the status of the Remote Switch.
Parameters:	This function takes an unsigned char as the parameter. The value of this parameter can be 'ENABLED' (0x5A) or 'DISABLED'(0xA5).
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 getBattValt(float *vol)
Description:	This function gets the battery voltage ant put it in the memory which is pointed at by the pointer 'vol'.
Parameters:	This function takes a pointer to a 'float' variable as the parameter. The reading of the battery voltage is put at the memory which is pointed at by the parameter 'vol'.
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 getBattMonitor(u8 *val)
Description:	The function gets the status of the Battery Monitor.
Parameters:	This function takes a pointer to an unsigned char variable as the parameter. After calling this function, the status of the Battery Monitor will be put at the memory which is pointed by the parameter 'val'. If the Battery Monitor is enabled, '*val' is 0x5A. If the Battery Monitor is disabled, the '*val' is 0xA5. Users can use the macros 'ENABLED' (0x5A) and 'DISABLED'(0xA5) to test the status value '*val'.
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 setBattMonitor(u8 val)
Description:	The function sets the status of the Battery Monitor.
Parameters:	This function takes an unsigned char as the parameter. The value of this parameter can be 'ENABLED' (0x5A) or 'DISABLED'(0xA5).
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 getBattDelta(float *val)
Description:	This function gets the delta value. The delta value is the maximum voltage deviation of the power from its nominal voltage. If the function of Battery Monitor is ON, the Power Subsystem shuts the system down when the voltage deviation of the power is larger than the delta value.
Parameters:	This function takes a pointer to a float variable as the parameter. The delta value will be put at the memory which is pointed by the parameter 'val'.
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 setBattDelta(float val)
Description:	This function sets the voltage delta value. The range is 0.5V ~ 3.0V. The granularity is 0.5V.
Parameters:	This function takes a float variable as the parameter.
Return Value:	If this function works successfully, it returns 0, any other value standards for error.

Syntax:	i32 setSoftOffDelay(u32 setTime)
Description:	The Soft Off Delay is the interval between that the system receives a power off signal and that the system generates a power off signal. This function sets up the interval in seconds.
Parameters:	The parameter is of the type of unsigned long. The value of the parameter ranges from 3~3600. The unit of the value of the parameter is seconds.
Return Value:	If this function works successfully, it returns 0, any other value stands for error.

Syntax:	i32 setHardOffDelay(u32 setTime)
Description:	The Hard Off Delay is the interval between that the system is off and that the power 5VSB is off. This functions set up the interval in seconds.
Parameters:	The parameter is of the type of unsigned long. The value of the parameter ranges from 3~3600. The unit of the value of the parameter is seconds.
Return Value:	If the function works successfully, it returns 0, any other value stands for error.

Syntax:	i32 getSoftOffDelay(u32 *Time)
Description:	The Soft Off Delay is the interval between that the system receives a power off signal and that the system generates a power off signal. This function gets the interval.
Parameters:	The parameter is a pointer which points to an unsigned long variable. The returned value is stored at this variable. The unit of the returned value is in seconds.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 getHardOffDelay(u32 *Time)
Description:	The Hard Off Delay is the interval between that the system is off and that the power 5VSB is off. This function gets the interval.
Parameters:	The parameter is a pointer which points to an unsigned long variable. The returned value is stored at this variable. The unit of the returned value is in seconds.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 getPowerOnDelay(u32 *val)
Description:	This function gets the Power On delay.
Parameters:	This function takes a pointer to an unsigned long variable as the parameter. The delay time will be put at the memory which is pointed by the ‘val’.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 setPowerOnDelay(u32 val)
Description:	This function sets the Power On delay.
Parameters:	This function takes an unsigned long variable as the parameter. The range of the Power On delay is 8 ~ 60 seconds.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 getShutdownDelay(u32 *val)
Description:	This function gets the Shutdown delay.
Parameters:	This function takes a pointer to an unsigned long variable as the parameter. The delay time will be put at the memory which is pointed by the parameter 'val'.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 setShutdownDelay(u32 val)
Description:	This function sets the Shutdown delay.
Parameters:	This function takes an unsigned long variable as the parameter. The range of the delay is 120 ~ 3600 seconds.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

5.2.4. I-Button

Syntax:	i32 resetIbutt(void)
Description:	This function resets the I-Button.
Parameters:	None
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 readIbutt(u8 *data)
Description:	This function reads data from the I-Button.
Parameters:	This function takes a pointer to an unsigned char variable. The data to be read from the I-Button is put at the memory which is pointed by the parameter 'data'.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	i32 writeIbutt(u8 data)
Description:	This function writes command to the I-Button.
Parameters:	This function takes an unsigned char variable as the parameter. The command to be written to the I-Button is the value of the parameter 'data'.
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

5.3. Appendix A

Users have to modify the boot loader configuration to support COM port. Take the grub configuration file as an example. Add '8250.nr_uarts=XX noirqdebug' at the setting of kernel. Here, XX represents the number of COM ports the system will support. Because the power subsystem connects to main system via COM port, the XX must be greater or equal to 6.

1. Modify the grub.conf.

   [root@linux ~]# vi /boot/grub/grub.conf

   default=0

   timeout=5

   splashimage=(hd0,0)/grub/splash.xpm.gz

   hiddenmenu

   title Fedora Core (2.6.27.5.117.FC10)

   root (hd0,0)

   kernel /vmlinuz-2.6.27.5.117.FC10 ro root=/dev/hda2 rhgb quiet

   8250.nr_uarts=6 noirqdebug

   initrd /initrd-2.6.27.5.117.FC10.img

2. List the status of the COM ports in the system.

   # setserial -g /dev/ttyS*

   /dev/ttyS0, UART: 16550A, Port: 0x03f8, IRQ: 4

   /dev/ttyS1, UART: 16550A, Port: 0x02f8, IRQ: 3

   /dev/ttyS2, UART: 16550A, Port: 0x03e8, IRQ: 11

   /dev/ttyS3, UART: 16550A, Port: 0x02e8, IRQ: 10

   /dev/ttyS4, UART: 16550A, Port: 0x04f8, IRQ: 11

   /dev/ttyS5, UART: 16550A, Port: 0x04e8, IRQ: 10

   The node '/dev/ttyS5' corresponds to COM port. The IO port is 0x4e8, IRQ 10.

6. FAQ

Q 1. Why the Linux operating system can not re-install by the same storage device?

- Make sure to clean up the original data on the storage device before installation.
- It is recommended to format the storage device before installation.

Q 2. Why the monitor display abnormally on screen during Linux installation?

- Change another monitor and try to install again.
- Install the OS in "**basic graphics mode**".

Q 3. Why the display resolution only for 800x600 and 1024x768 at X Window under Basic Graphics Mode?

- Make sure the Vender and Project of monitor detected correctly on the Display configuration.
- Contact your monitor vender to get the driver for Linux.
- Adjust the settings in XORG.CONF:
  - Determine the interval between the two frequencies (Max. and Min.) for both horizontal scanning and vertical scanning your monitor supported.
    For example:
    HorizSync: 30.0 ~ 80
    VertRefresh: 50 ~ 75
  - Add the frequencies in XORG.CONF for that "vesa" device and monitor.
  - Reboot system.

Q 4. Does my system support Windows 8?

- The system is designed and verified with Windows 7, Fedora 17 and Ubuntu 12.10. Acrosser did not verify this system with Windows 8. Please contact Acrosser local sales representative or authorized channels to help you confirm whether a new Windows 8 driver is provided.

Q 5. Why do we get error message when we execute utility program?

- Make sure all the drivers have been installed correctly.
- If the problem still exist, please contact Acrosser FAE or authorized sales channels.

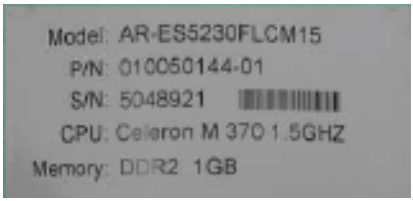
Q 6. No display when power on?

- Make sure all cables are connected correctly and the power has been turned on:
- Restore CMOS default setting via CMOS headers, then reboot the system.
- If the problem still exist, please keep the necessary components (e.g. CPU, memory, keyboard and HDD) for testing:

- If the system could power on well with the above configuration, please plug back the other components one by one to find out which one may cause this problem.
- If the system still could not power on, please listen if there is any warning beeps.
  - Memory issue:
    - Clean the Golden Finger of memory.
    - Clean the memory slots.
    - Leave only one memory stick to test.
    - If convenient, please change different memory modules to test again.
  - CPU issue:
    - Check whether the CPU is in our supported CPU.
    - Check whether there are any damagers of your CPU or CPU socket.
    - Check whether the CPU fan is correctly connected.
  - If the problem still exist, please contact Acrosser FAE or authorized sales channels.

Q 7. Where is the serial number located on my system?

- The serial number (S/N) is an alpha-numeric character located on the bottom or side chassis.



(for reference only)

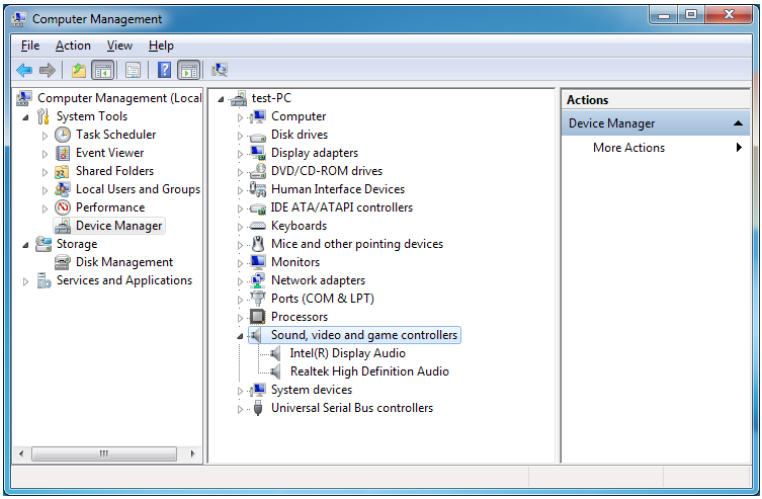
Q 8. How do I connect the second monitors to my system?

- Basically, there are “duplicate” and “extend” mode for the second monitor.
  - “duplicate” mode – you will see the same contents on both monitors.
  - “extend” mode – your monitors display different contents, and you can drag your contents between the first and second monitor.
- Ensure the display device setting is correct and monitor cables are connected well.
  - For device setting, it could be different because of different operating systems and S/W version.
  - You can search from “Google” as reference setting.
- If the problem still exist, please contact Acrosser FAE or authorized sales channels.

Q 9. My system has audio problem?

- Make sure to enable the on-board audio function in BIOS menu.

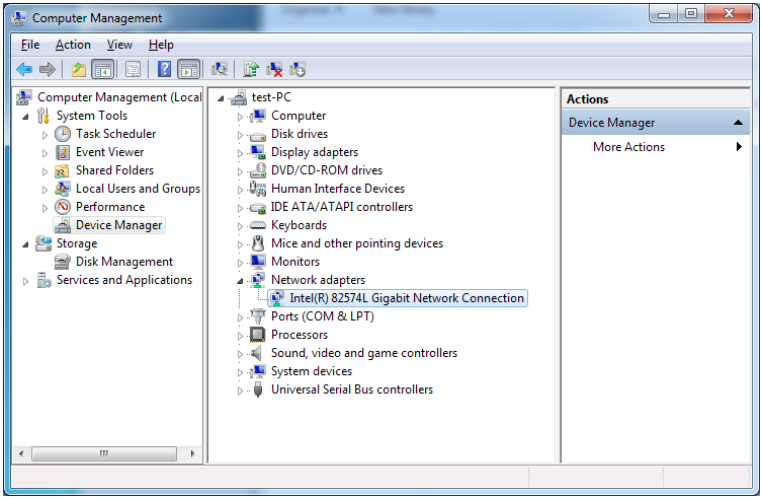
- Make sure the audio driver and device was installed successfully.



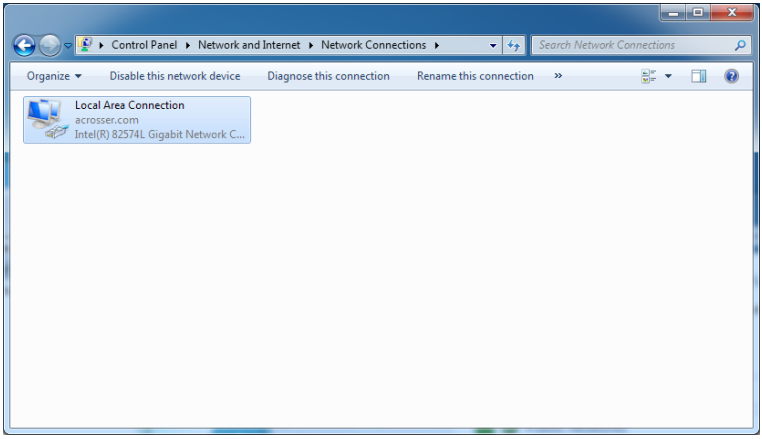
- Make sure the speaker is connected to the correct connector.
- Check if the audio function is set to “MUTE”.
- Please adjust the audio volume louder.
- If the problem still exist, please contact Acrosser FAE or authorized sales channels.

Q 10. My system can not connect to Internet?

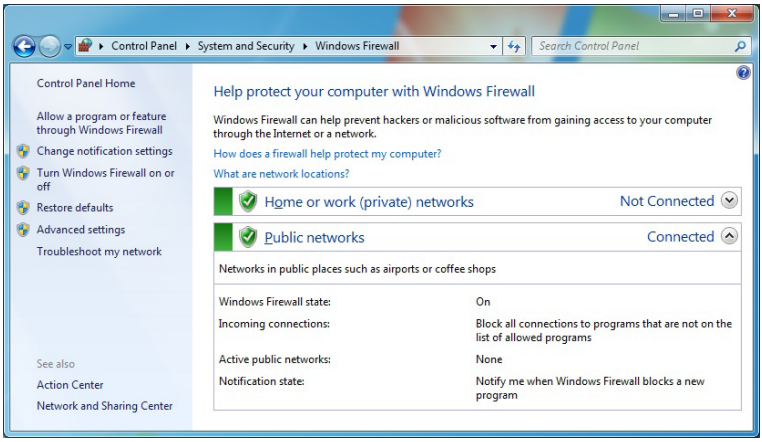
- Make sure the network adapter can be recognized in Device Manager.
- If there is question mark or exclamation mark in the network adapter, please re-install the network driver.
- If the problem still exist, please contact Acrosser FAE or sales representative for testing.



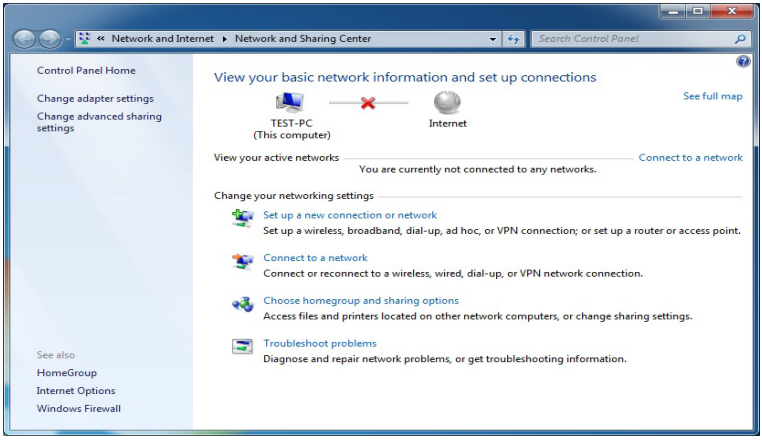
- Make sure the Network Connections/Local Area Connection is enabled (right click and choose “Enable”).



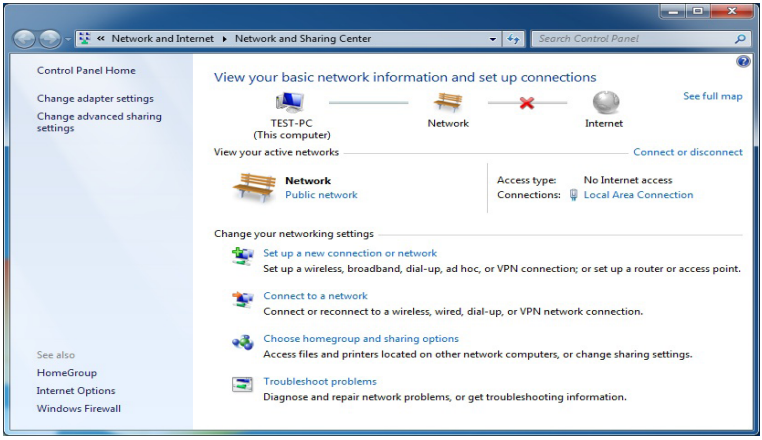
- If the problem still exist, please shut down the firewall and anti-virus software.



- If the Network Connections/Local Area Connection show “no connection”, please check your network cable connection.



- If the Network Connections/Local Area Connection show “limited connection”, please disable and enable your connection to fix this problem. Or, you can unplug and plug the LAN cable to fix the problem.



- If the problem still exist, please contact your MIS whether there are any DHCP or IP configuration or ISP/WAN setting limitation.

Q 11. Why my optional module 3.5G connection fail in Fedora 17 x86/x64 system?

- Although there is no need to install driver for 3.5G optional module in Fedora 17 x86/x64 system, the following procedure need to be performed to ensure a successful connection:
  1. Enter terminal
  2. Use root
  3. gedit /etc/modprobe.d/blacklist.conf.
  4. add blacklist sierra.
  5. poweroff.
  6. Turn on power and enter Fedora 17
  7. Enter terminal
  8. Use root.
  9. modprobe sierra.
  10. nm-connection-editor &
  11. setting Mobile Broadband.

Technical Support Form

We deeply appreciate your purchase of Acrosser products. Please find the "**tech_form.doc**" file in our utility CD. If you have any questions or problems about Acrosser products, please fill in the following information. We will answer your questions in the shortest time possible.

Describe Your Info and Acrosser System Info

- Your Company Name: _____
- Your Contact Info: _____ Phone Number: _____
- Your E-Mail Address: _____
- Your Company Address: _____

  _____
- Acrosser Model Name: _____
- Acrosser Serial Number: _____

Describe System Configuration

- CPU Type: _____
- Memory Size: _____
- Storage Device (e.g. HDD, CF, or SSD): _____
- Additional Peripherals (e.g. Graphic Card): _____
- Operating System & Version (e.g. Windows 7 Embedded): _____
- Special API or Driver: _____

  (If yes, please provide it for debug.)
- Running Applications: _____
- Others: _____

Describe Your Problems or Questions:

Send the above information to one of the following Acrosser contacts:

- Acrosser Local Sales Representative
- Acrosser Authorized Sales Channels
- Acrosser Inquiry --- http://www.acrosser.com/inquiry.html
- Acrosser FAX Number --- 886-2-29992887

To Make Your
Embedded
Idea a Reality

Acrosser Headquarters
241新北市三重區光復路一段61巷26號10樓
10F., No.26, Ln. 61, Sec. 1, Guangfu Rd., Sanchong Dist., New Taipei City 241, Taiwan, R.O.C.
TEL: +886-2-29999000
FAX: +886-2-29992887

Acrosser Taichung Office
408台中市南屯區河南路四段162號12樓之6
12F.-6, No.162, Sec. 4, Henan Rd., Nantun Dist., Taichung City 408, Taiwan, R.O.C.
TEL: +886-4-22510659
FAX: +886-4-22546079

Acrosser China Subsidiary
深圳市欣扬通电子有限公司
深圳市福田区车公庙泰然九路21号
皇冠科技园3栋2楼 (邮编: 518040)
2F., 3rd Building, Crown Science Park, No. 21, Tai-Ran 9th Rd., Che Gong Miao, Futian Dist., Shenzhen, China (Postal:518040)
TEL: +86-755-83542210
FAX :+86-755-83700087

Acrosser Shanghai Office
欣扬通电子有限公司 上海分公司
上海市徐汇区零陵路631号爱乐大厦12E (邮编: 200085)
12E, Aile Building, No.631, Ling-ling Road, Xu-Hui Dist., Shanghai, China (Postal:200085)
TEL: +86-21-64288853
FAX: +86-21-64288854

Acrosser Beijing Office
欣扬通电子有限公司 北京分公司
北京市海淀区安宁庄西三条9号
宜品上层2-703 (邮编: 100085)
Room 2-703, Yipinshangceng, No.9, Xisantiao, Anning Zhuang, Haidian Dist., Beijing, China (Postal:100085)
TEL: +86-10-82359009
FAX: +86-10-82359003

Acrosser USA Inc.
11235 Knott Ave. Suite A, Cypress, CA 90630, USA
Toll Free: +1-866-401-9463
TEL: +1-714-903-1760
FAX: +1-714-903-5629