User Manual

FES2213: Fanless Embedded System Atom N2600
Dual Core 1.6GHz Processor

ACNODES
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Copyright

Trademarks

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Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Shielded interface cables must be used in order to comply with the emission limits.

Static Electricity Precautions

It is quite easy to inadvertently damage the system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build up.

1. To prevent electrostatic build up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacting all modules and connectors. Hold modules or connectors by their ends.

Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range to reduce the risk of electric shock.
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

Warranty

1. Warranty does not cover damages or failures caused by misuse of the product, inability to use the product, unauthorized replacement or any kind of alterations of components and product specifications.
2. The warranty is voided if the product has been exposed to physical abuse, improper installation, any kind of modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product himself, whether the product is still covered by warranty or not. It must be returned to the place it was purchased at, the factory or an authorized service agency for any repair work.
4. We will not be liable for any indirect, special, incidental or consequent damages to the product that has been modified or altered.

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Chapter 1: Introduction

1-1 Overview

Acnodes' FE S2213 is the latest released model with outstanding size along with reliable functionality embedded system in low power and low operating temperature.

FES2213is equipped with Atom N2600 Dual-core 1.6 GHz processor with supported by the NM10 South Bridge chipset. I t pro vides to r each t he maximum memory size up to 4 GB DDR 3- 800 with one SODIMM. FES2213 supports for VGA display function in 1920 x 1200 (1080p) resolution while as 18/ 24b-bit 1366 x 768 LVDS features reserved internally.

In order to meet t he network stability, FES2213uses one 82583V 100/ 1000 Mbps LAN wit h Wake-On LAN & DMI 2500 VDC isolation protected. It provides 2.5" SATA HDD and 1Mini-PCI-E mSATA for fulfilling the storage. FES2213enables for expansion flexibility for one half size of Mini-PCI-E expansion slot even with its easy- to-carry and mini size of W66.5mm x H130mm x D100mm. GPI O feature is reserved internally by t he SMSCSCH3114 controller, which provides 8bit programming GPI O with TTL level. The system designed with two DB-9 for supporting for RS-232 interface, and each port supports for 16 Byte FIFO (optional 5V DC output). I t also provides a software programming Watchdog (WDT) wit h timer range from 1 to 255 seconds.

The power supply is capable for DC power input of 12V or 24V (optional). The power consumption is able to r each up to 10W in maximum. The construction of FES2213is designed as DIN Rail Heavy-duty steel embedded platform. The system is valuable for all t he embedded applications, and also well support with the Window 7, Windows XP and Linux Operation system.

FES2213is the latest embedded system from Acnodes' wit h low power consumption, low operating temperature, and particularly with its extraordinary size of total weight of 1.5kg. Acnodes is proud to announce and welcome you to experience our mini -sized but stable functionalized FES2213.

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1-2 Product Specification

Processor & Chipset
- Support Atom N2600 Dual-core 1.6 GHz Processor
- NM10 South Bridge Chipset

Graphic Engine
- Graphic core 400 Mhz
- Support AVC/ H.264, VC1/ WMV9, MPEG2 HW engine
- HDCP 1.3 ans PAVP 1.1C content protection support
- Support Microsoft DXVA 2.0 and Overlay DD
- MS COPP and PVP-OPM support
- Enabling Key ISVs-Corel, CyberLink, ArcSoft
- Supports OpenGL 3.0 and Microsoft DirectX 9

Display Function
- VGA support 1920 x 1200 (1080P) resolution
- Internal reserved 18/24bit 1366 x 768 LVDS feature

System Memory
- 1 SODIMM Socket, up to 4GB 800 MHz DDR3 Memory

BIOS
- AMI EFI BIOS. Support Power On after Power Failure

Expansion
- 1 half size Mini-PCI-E expansion slot

Ethernet
- 1 8253V 100/1000 Mbps LAN with Wake-On LAN & DMI 2500VDC isolation protection

Disk Drive Storage
- 2.5" SATA HDD
- 1 Mini-PCI-E mSATA

Internal Reserved Audio Feature
- Audio feature, ALC892 HD Codec support
- Audio Mic-in, Line-Out, Line-In feature

Watchdog Time
- Programmable WDT from 1 to 255 seconds/minutes
- Setup by software

Power Management
- Full ACPI 3.0
- Support S1, S3, S4, S5
- Support Wake on LAN

Internal Reserved GPIO Feature
- Controller: SMSC SCH3114
- 8 bit Programming GPIO with TTL level

RS-232 Supports

- 2 DB-9 for RS-232 with auto-flow control

  Each port support 16 Byte FIFO, optional 5V DC output

Front Panel Extend I/O Ports

- Screw-Lock DC power input connector
- 2 male DB-9 for 2 RS-232
- DB-15 VGA display interface
- 2 USB, 1 RJ-45 100/1000 Mbit LAN connector
- Power, HDD led, Power button
- Reserved 2 DB-9/15 (top & bottom panel) for optional expansion

Internal Reserved Feature

- Audio Mic-in, Line-out, Line-in
- 18/24 bit LVDS
- 8 bit GPIO

  Those reserved feature may optional support by request

Power Supply

- DC 12V input or optional DC 24V input.
- 24VDC/ 0.85A, 12VDC/1.7A, AT/ATX power type
- Power adapter : AC to DC , DC 12V/5A 60W (Optional)

Power Consumption (with HDD)

- Typical Power Consumption: 7W
- Maximum Power Consumption: 10W

Environment

- Operation Temperature:
  - With extend temperature HDD: -20°C~45°C
  - With extend temperature SSD: -20°C~60°C
- Storage Temperature: -20°C~80°C
- Relative Humidity: 10%~90% (Non-condensing)

Mechanical

- Dimension W x H x D : 66.5mm x 130 mm x 100mm
- Mounting: Din Rail mount
- Construction: DIN Rail Heavy-Duty Steel Embedded Platform
- Weight (Net/ Gross): 1.5KG / 2.2KG

Certification

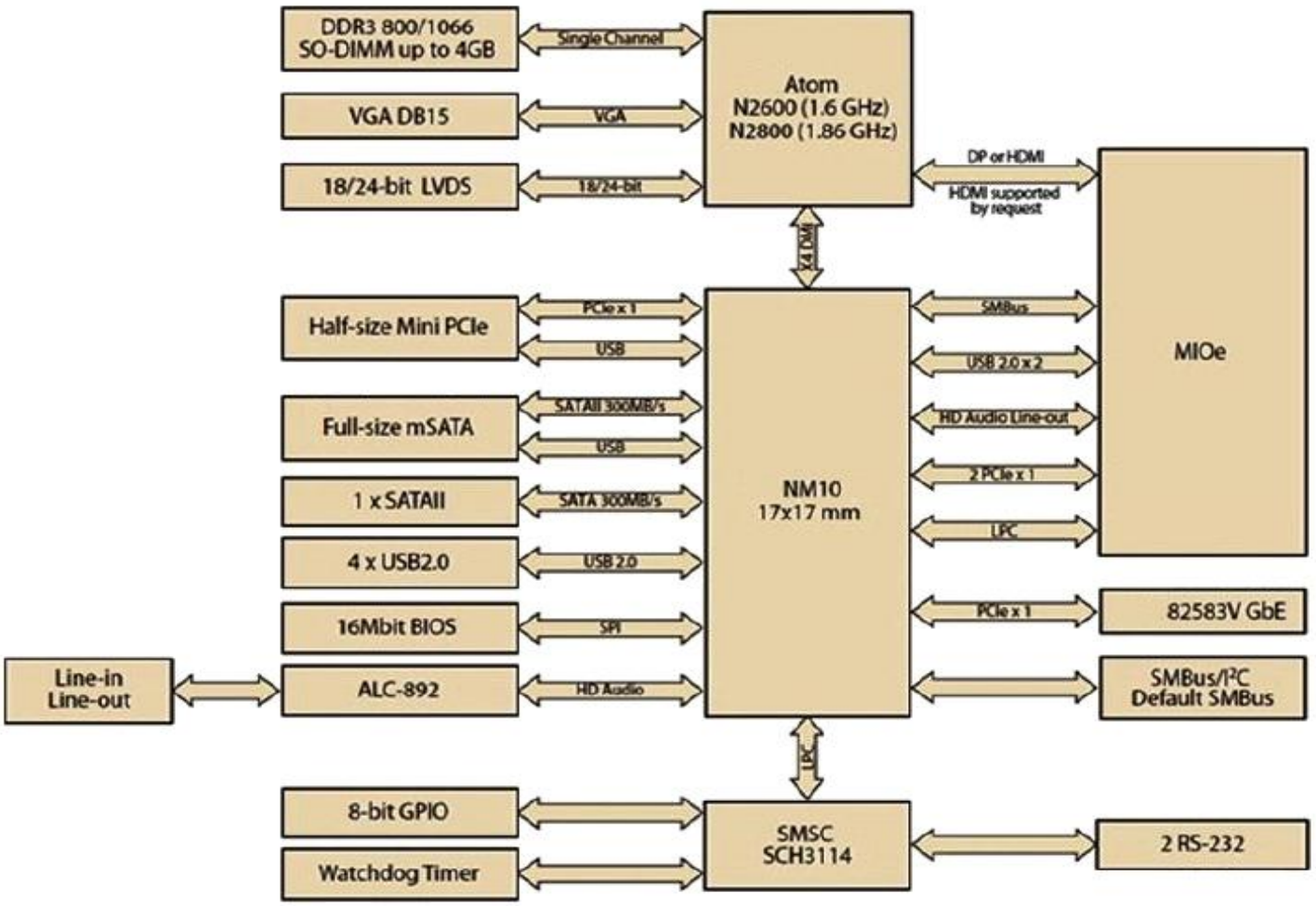
- CE/FCC Class A

OS Supports

- Windows 7, Win XP, Linux

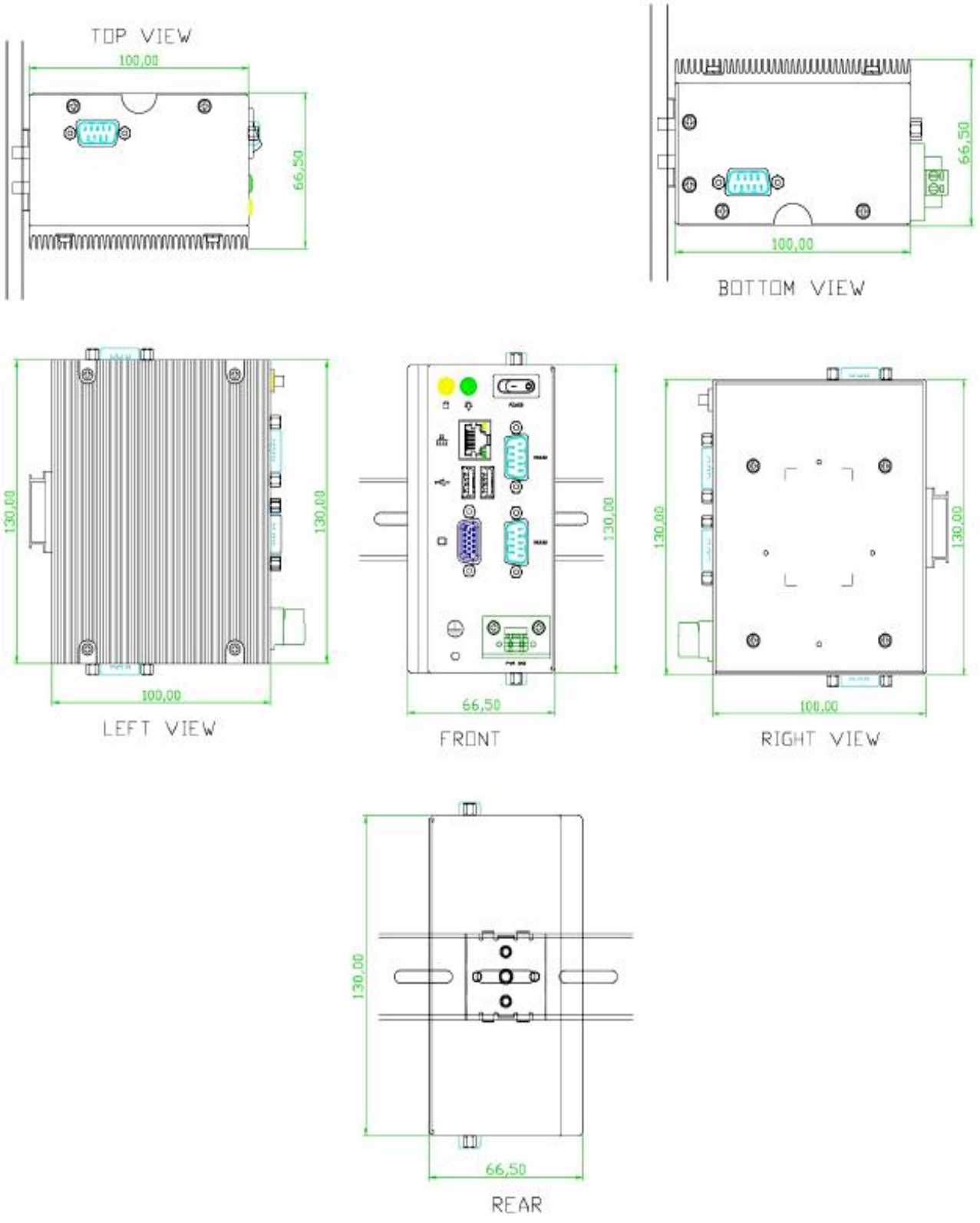
1-3 System Block Diagram

FES 2213



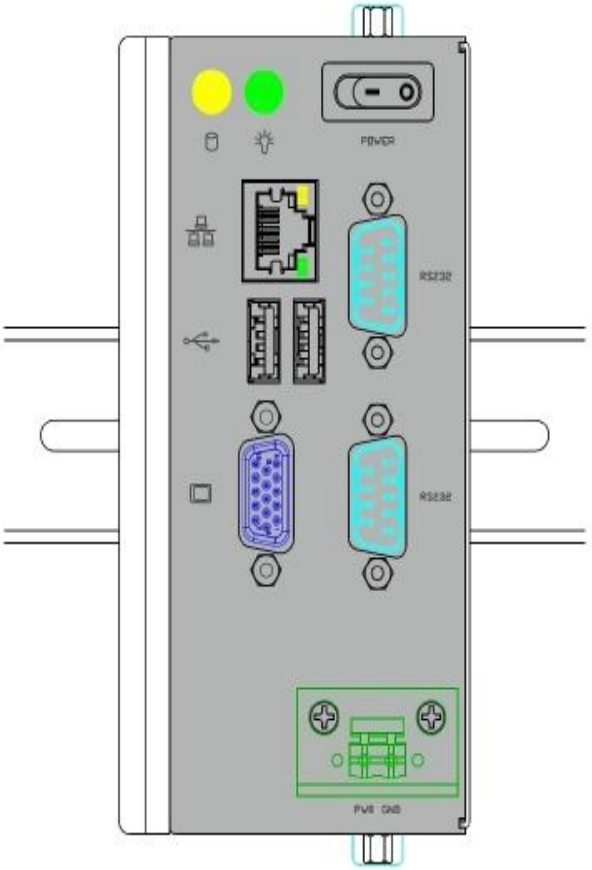
1-4 Mechanical Diagrams

FES 2213

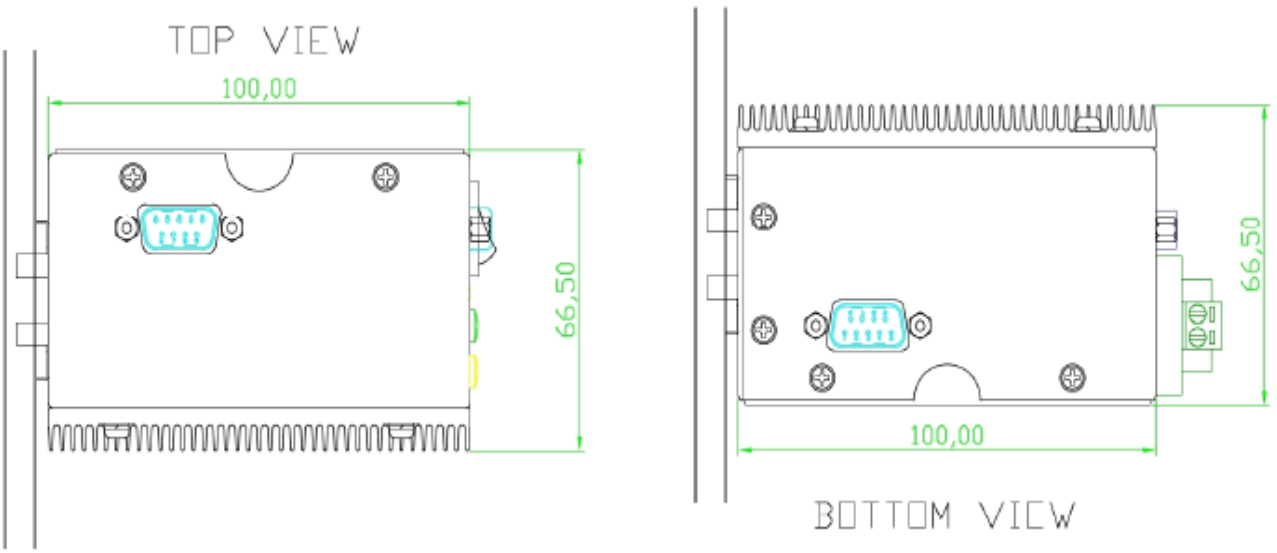


1-5 Front I/O

- **Front Panel**



- **Top & Bottom Panel**



Chapter 2: Pin Definition & Jumper Settings

2-1 Front Panel Pin Definition

1. **Power Switch**

2. **LAN port**

3. **Two RS-232 ports (COM1 & COM2)**

Pin	Definition	Pin	Definition
1	DCD	2	RX
3	TX	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

4. **Two USB ports**

Pin	Definition
1	5V
2	D-
3	D+
4	GND

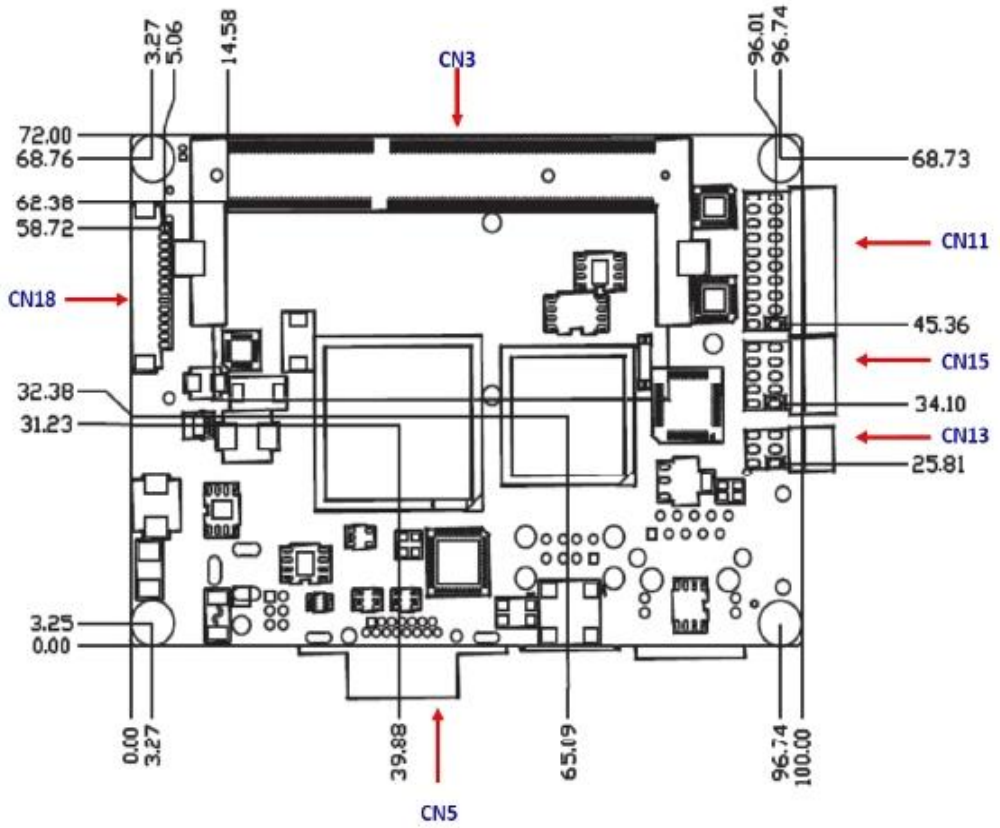
5. **Power & HDD ON/Off LED**
   - Power LED indicator would light when power is on.
   - HDD LED indicator for hard disk access is an active low signal.

2-2 Top & Bottom Panel Pin Definition

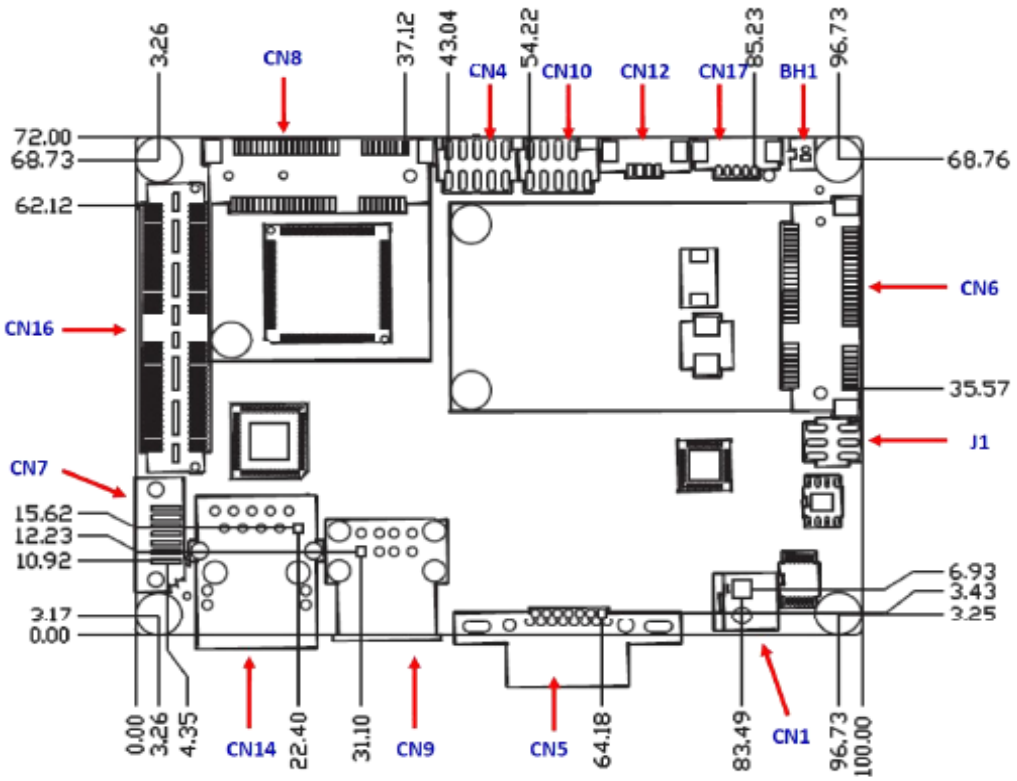
1. **One DR-9 reserved for Top & Bottom panel as optional expansion.**

2-3 Internal Pin Definition & Jumper Settings

2-3.1 Main Board Top View



2-3.2 Main Board Bottom View



2-3.3 Main Board Pin Definition

CN1	12 V Power Input
CN2	DC JACK (by request)
CN3	DDR3 SO-DIMM
CN4	GPIO
CN5	VGA
CN6	mSATA
CN7	SATA
CN8	Mini PCIe
CN9	External USB
CN10	Internal USB
CN11	COM1/COM2
CN12	SMBus (or I^2C, by request)
CN13	Front Panel
CN14	Gigabit Ethernet
CN15	HD Audio
CN16	MIOe
CN17	Inverter Power/Internal SATA Power
CN18	24 bits LVDS Panel
BH1	Battery

1. **Battery Connector [refer to BH1]**
   MIO-2261 supports Lithium 3V/210 mAH CR2032 battery with wire via battery connector (BH1).

   Note: How to clear CMOS: (Must follow below steps)
   (1) Turn off system power
   (2) Unplug CR2032 battery cable on BH1
   (3) Waiting for 15sec or short BH1 pin1-2
   (4) Connect battery cable on BH1
   (5) Turn on system power

2. **12V Power Input Connector [refer to CN1]**
   Main power connector supports single 12V input, and there is an optional choice of DC/ Jack (CN2, co-layout with 2pin power connector).

3. **DDRIII SODIMM Socket [refer to CN3]**
   One 204-pin/ H9.2 mm DDRIUII DIMM socket supports DDR3 800 MHz (N2600)/ 1066 MHz (N2800) up to 4GB.

4. **GPIO (General Purpose Input Output) [refer to CN4]**
   The board supports 8-bit GPIO (5V tolerance) through GPIO pin header. The 8 digital inputs and outputs can be programmed to read or control devices, with each input or output defined.

5. **VGA/ LVDS Interface Connections [refer to CN5 and CN18]**
   The MIO-2261's VGA interface can drive conventional CRT displays and is capable of driving a wide range of flat panel displays, including passive LCD and active LCD displays. The board has two connectors to support these displays: one for standard CRT VGA monitors and one for LVDS type LCD panels.

   CRT display connector [refer to CN5]
   The CRT display 15pins connector is a rear I/O connector on coastline used for conventional CRT displays. Resolution: up to 1920 x 1200 (WUXGA).

   LVDS LCD panel connector [refer to CN18]
   The board supports single channel 18/24-bit LVDS LCD panel displays via 14*1pin wafer box. Resolution: up to 1366 x 768 (WXGA).

6. **mSATA Connector [refer to CN6]**
   MIO-2260 provides a mini-PCIe socket which integrates USB and SATAII signals, supports either mSATA or USB interface modules.

7. **SATA Connector [refer to CN7]**
   MIO-2261 features one high performance Serial ATA interfaces. Data transfer rates up to 300 MB/s enabling very fast data and file transfer, and independent DMA operation on two ports.

8. **Mini PCIe Connector [refer to CN8]**
   MIIO-2261 supports a half size mini PCI2 slot. PCI Express Mini Card (also known as Mini PCI Express, Mini PCI2, and Mini PCI-E) is a replacement for the Mini PCI form factor based on PCI Express. It is developed by the PCI-SIG. The host device supports both PCI Express and USB 2.0 connectivity.

9. **USB Connectors [refer to CN9 and CN10]**
   The board provides four USB (Universal Serial Bus) ports, two are rear I/O on coastline (CN9); and the other two are internal USB ports (CN10). These gives complete Plug and Play, and hot attach/ detach for up to 127 external devices. The USB interfaces comply with USB specification Rev 2.0 which support 480 Mbps transfer rate and are fuse protected.

10. COM Port Connectors [refer to CN11]

MIO-2261 provides 2 x RS-232 serial ports in 10*2pin pin header. It provides connections for serial devices or a communication network. The pin assignments for the COM port connector can be found in Jumper Setting.

11. SMBus Connector [refer to CN12]

MIO-2261 provides SMBus connector for customer connection to SMBus protocol embedded device. It can be configured to I²C by customer's request.

12. Front Panel Connector [refer to CN13]

MIO-2261 integrates below functions as front panel 6pin connector.

Power Button

Supports power on/off button in ATX mode.

Reset

If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset.

Power LED

Power LED indicator would light when power is on.

HDD LED

HDD LED indicator for hard disk access is an active low signal.

13. Gigabit Ethernet Connector [refer to CN14]

MIO-2261 uses Intel®82583C Ethernet chip (10/100/1000 Mbps) lined to dedicated PCI2 x 1 lane via RJ-45 connector.

14. High Definition Audio Interface [refer to CN15]

MIO-2261 provides one 5x2pin box header for audio device. It can support high definition audio stereo by customized audio module that has codec onboard.

15. Front Panel Connector [refer to CN13]

MIO-2261 supports MIO2 connector to extend flexible I/Os.

Interface

2 x USB 2.0, 2 x PCIe x 1, LPC, HD Audio line-out, SMBus, DP (or HDMI, supported by request), 5 Vsb/12 Vsb power.

Total peripheral power supply output

5V @ 3A for CPU board and MI/O Extension module totally, 12V @ 2A for MI/O Extension module.

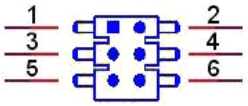
16. Inverter Power/ Internal SATA Power Connector [refer to CN17]

The LCD inverter is connected to CN17 via a 5-pin connector to provide +5V/ +12V power to the LCD display, and 5V power can be provided for 2.5" SATA HDD via CN17.

SATA power's current is only sufficient for 2.5" HDD, and LVDS inverter's current is 5V @ less than 1A, 12V @500mA.

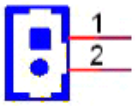
2-3.4 Jumper Settings

1. LCD Power/ Auto Power ON [refer to J1]



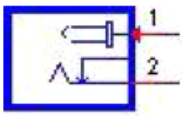
Setting	Function
(1-2)	＋5V
(3-4) (default)	＋3.3 V
(5-6) (default)	Auto Power On

2. 12V Power Input [refer to CN1]



PIN	PIN Name
1	＋12V
2	GND

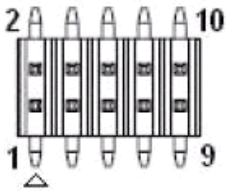
3. DC JACK (by request) [refer to CN2]



PIN	PIN Name
1	＋VIN
2	GND

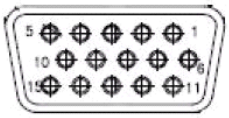
4. DDR3 SO-DIMM [refer to CN3]

5. GPIO [refer to CN4]



PIN	PIN Name
1	＋5V
2	GPIO4
3	GPIO0
4	GPIO5
5	GPIO1
6	GPIO6
7	GPIO2
8	GPIO7
9	GPIO3
10	GND

6. VGA [refer to CN5]

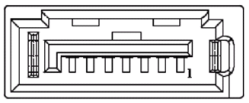


PIN	PIN Name
1	RED
2	GREEN
3	BLUE
4	NC
5	GND
6	GND
7	GND
8	GND
9	NC
10	GND
11	NC
12	DDAT
13	HSYNC
14	VSYNC
15	DCLK

7. mSATA [refer to CN6]

PIN	PIN Name	PIN	PIN Name
1	NC	27	GND
2	+3.3 V	28	+1.5V
3	NC	29	GND
4	GN A	30	SMB_CLK
5	NC	31	A−
6	+1.5 V	32	SMB_DAT
7	NC	33	A+
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB D−
11	NC	37	GND
12	NC	38	USB D+
13	NC	39	+3.3V
14	NC	40	GND
15	GND	41	+3.3V
16	NC	42	NC
17	NC	43	NC
18	GND	44	NC
19	NC	45	NC
20	NC	46	NC
21	GND	47	NC
22	NC	48	+1.5V
23	B+	49	NC
24	+3.3 V	50	GND
25	B−	51	NC
26	GND	52	+3.3V

8. SATA [refer to CN7]

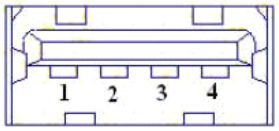


PIN	PIN Name
1	GND
2	TX＋
3	TX－
4	GND
5	RX－
6	RX＋
7	GND

9. Mini PCIe [refer to CN8]

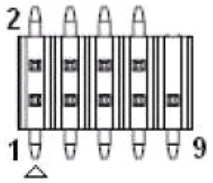
PIN	PIN Name	PIN	PIN Name
1	WAKE#	27	GND
2	＋3.3VSB	28	＋1.5V
3	NC	29	GND
4	GND	30	SMB_CLK
5	NC	31	PETn0
6	＋1.5 V	32	SMB_DAT
7	NC	33	PETp0
8	NC	34	GND
9	GND	35	GND
10	NC	36	USB D－
11	REFCLK－	37	GND
12	NC	38	USB D＋
13	REFCLK＋	39	＋3.3 VSB
14	NC	40	GND
15	GND	41	＋3.3 VSB
16	NC	42	NC
17	NC	43	GND
18	GND	44	NC
19	NC	45	NC
20	NC	46	NC
21	GND	47	NC
22	PERST#	48	＋1.5V
23	PERn0	49	NC
24	＋3.3VSB	50	GND
25	PERp0	51	NC
26	GND	52	＋3.3VSB

10. External USB [refer to CN9]

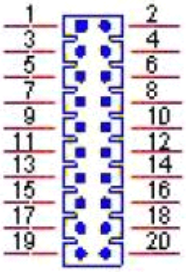


PIN	PIN Name
1	＋5V
2	D－
3	D＋
4	GND

11. Internal USB [refer to CN10]

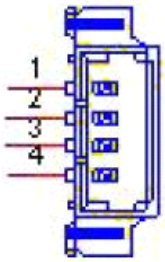


PIN	PIN Name
1	＋5V
2	＋5V
3	A_D－
4	B_D－
5	A_D＋
6	B_D＋
7	GND
8	GND
9	GND



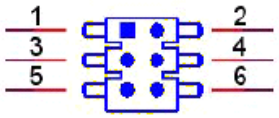
PIN	PIN Name	PIN	PIN Name
1	DCD1#	11	DCD2#
2	DSR1#	12	DSR2#
3	RXD1	13	RXD2
4	RTS1#	14	RTS2#
5	TXD1	15	TXD2
6	CTS1#	16	CTS2#
7	DTR1#	17	DTR2#
8	RI1#	18	RI2#
9	GND	19	GND
10	GND	20	GND

13. SMBus (or I²C, by request) [refer to CN12]



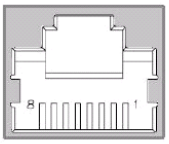
PIN	PIN Name
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5V

14. Front Panel [refer to CN13]



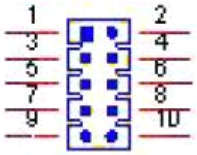
PIN	PIN Name
1	Power Button Pin1
2	Power LED＋
3	Power/ Reset Button Pin2
4	HDD LED ＋
5	Reset Button Pin1
6	HDD LED－

15. Gigabyte Ethernet [refer to CN14]



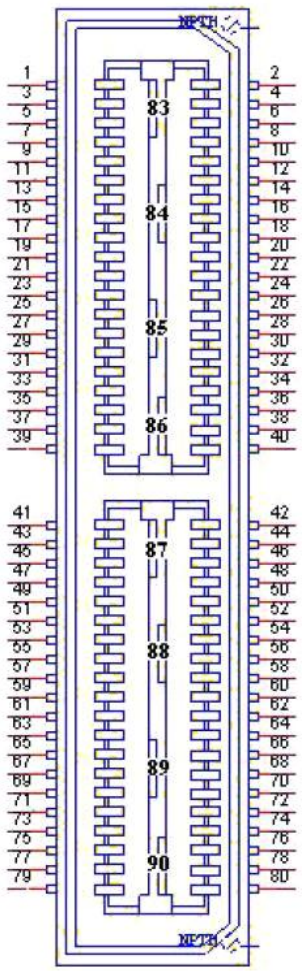
PIN	PIN Name
1	BI_DA＋(GHz)
2	BI_DA－(GHz)
3	BI_DB＋(GHz)
4	BI_DC＋(GHz)
5	BI_DC－(GHz)
6	BI_DB－(GHz)
7	BI_DD＋(GHz)
8	BI_DD－(GHz)
H3	GND
H4	GND

16. HD Audio [refer to CN15]



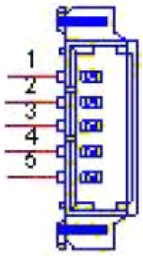
PIN	PIN Name
1	LOUTR
2	LINR
3	GND
4	GND
5	LOUTL
6	LINL
7	NC
8	NC
9	NC
10	NC

17. MIOe [refer to CN16]



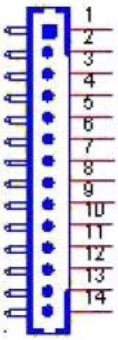
PIN	PIN Name	PIN	PIN Name	PIN	PIN Name
1	GND	36	NC	71	GND
2	GND	37	PCIE_WAKE#	72	USB2_D＋/ USB_SSRX＋
3	PCIE_RX0＋	38	NC	73	DDP_D3＋
4	PCIE_TX0＋	39	RESET#	74	USB2_D—/ USB_SSRX—
5	PCIE_RX0—	40	NC	75	DDP_D3—
6	PCIE_TX0—	41	SLP_S3#	76	GND
7	GND	42	CLK33M	77	GND
8	GND	43	NC	78	USB_OC#
9	PCIE_RX1＋	44	LPC_AD0	79	＋12VSB
10	PCIE_TX1＋	45	DDP_HPD	80	＋12VSB
11	PCIE_RX1—	46	LPC_AD1	83	GND
12	PCIE_TX1—	47	GND	84	GND
13	GND	48	LPC_AD2	85	GND
14	GND	49	DDP_AUX＋	86	GND
15	PCIE_RX2＋	50	LPC_AD3	87	＋5VSB
16	PCIE_TX2＋	51	DDP_AUX—	88	＋5VSB
17	PCIE_RX2—	52	LPC_DRQ#0	89	＋5VSB
18	PCIE_TX2—	53	GND	90	＋5VSB
19	GND	54	LPC_SERIRQ		
20	GND	55	DDP_D0＋		
21	PCIE_RX3＋	56	LPC_FRAME#		
22	PCIE_TX3＋	57	DDP_D0—		
23	PCIE_RX3—	58	GND		
24	PCIE_TX3—	59	GND		
25	GND	60	USB0_D＋		
26	GND	61	DDP_D1＋		
27	PCIE_CLK＋	62	USB0_D-		
28	LOUTL	63	DDP_D1—		
29	PCIE_CLK—	64	GND		
30	LOUTR	65	GND		
31	GND	66	USB1_D＋/ USB_SSTX＋		
32	AGND	67	DDP_D2＋		
33	SMB_CLK	68	USB1_D—/ USB_SSTX—		
34	NC	69	DDP_D2—		
35	SMB_DAT	70	GND		

18. Inverter Power/ Internal SATA Power [refer to CN17]



PIN	PIN Name
1	＋12V
2	GND
3	ENABKL
4	VBR
5	＋5V

19. 24 bits LVDS Panel [refer to CN18]



PIN	PIN Name
1	GND
2	GND
3	LCDS0_CLK－
4	LCDS0_CLK＋
5	LCDS0_D3－
6	LCDS0_D3＋
7	LCDS0_D2－
8	LCDS0_D2＋
9	LCDS0_D1－
10	LCDS0_D1＋
11	LCDS0_D0－
12	LCDS0_D0＋
13	＋5V or ＋3.3V
14	＋5V or ＋3.3V

Chapter 3: BIOS Setup

3-1 Introduction

AMIBIOS has been integrated into many motherboards for over a decade. With the AMIBIOS Setup program, user can modify BIOS settings and control various system features. This chapter describes the basic navigation of the MIO-2261 BIOS setup screens.

Figure 3.1 Setup program initial screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This Information is stored in flash ROM so it retains the Setup information when the power is turned off.

3-2 Entering BIOS

Turn on the computer and then press <F2> or <DEL> to enter Setup menu.

3-2.1 Main Setup

When user first enter the BIOS Setup Utility, users will enter the Main setup screen. Users can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

- **System time/ System date**
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3-2.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIO-520 setup screen to enter the Advanced BIOS Setup screen. Users can select any item in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. Users can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.

Figure 3.3 Advanced BIOS features setup screen

- **Launch PXE OpROM**
  This item allows users to enable or disable launch PXE OpROM if available.
- **Launch Storage OpROM**
  This item allows users to enable or disable launch storage OpROM if available.

3-2.2.1 Advanced BIOS Update V1.3

This item allows users to flash BIOS.

3-2.2.2 ACPI Settings

Figure 3.4 ACPI Setting

- **Enable ACPI Auto Configuration**
  This item allows users to enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  This item allows user to enable or disable hibernation.
- **ACPI Sleep State**
  This item allows users to set the ACPI sleep state.
- **Lock Legacy Resources**
  This item allows users to lock legacy devices' resources.
- **S3 Video Report**
  This item allows users to enable or disable S3 resume for VBIOS.

3-2.2.3 TPM Configuration

Figure 3.5 TPM Configuration

- **TPM Support**
  Disable/ Enable TPM if available.

3-2.2.4 CPU Configuration

Figure 3.6 CPU Configuration

- **Hyper Threading Technology**
  This item allows users to enable or disable Intel Hyper Threading technology.
- **Execute Disable Bit**
  This item allows users to enable or disable the No-Execution page protection.
- **Limit CPUID Maximum**
  This item allows users to enable or disable limit CPUID maximum for Windows XP.

3-2.2.5 SATA Configuration

Figure 3.7 SATA Configuration

- **SATA Controller(s)**
  This item allows users to enable or disable the SATA controller(s).
- **SATA Mode Selection**
  This item allows users to select mode of SATA controller(s).

3-2.2.6 Intel Fast Flash Standby

Figure 3.8 Intel Fast Flash Standby

- **IFFS Support**
  This item allows users to enable or disable iFFs.

3-2.2.7 USB Configuration

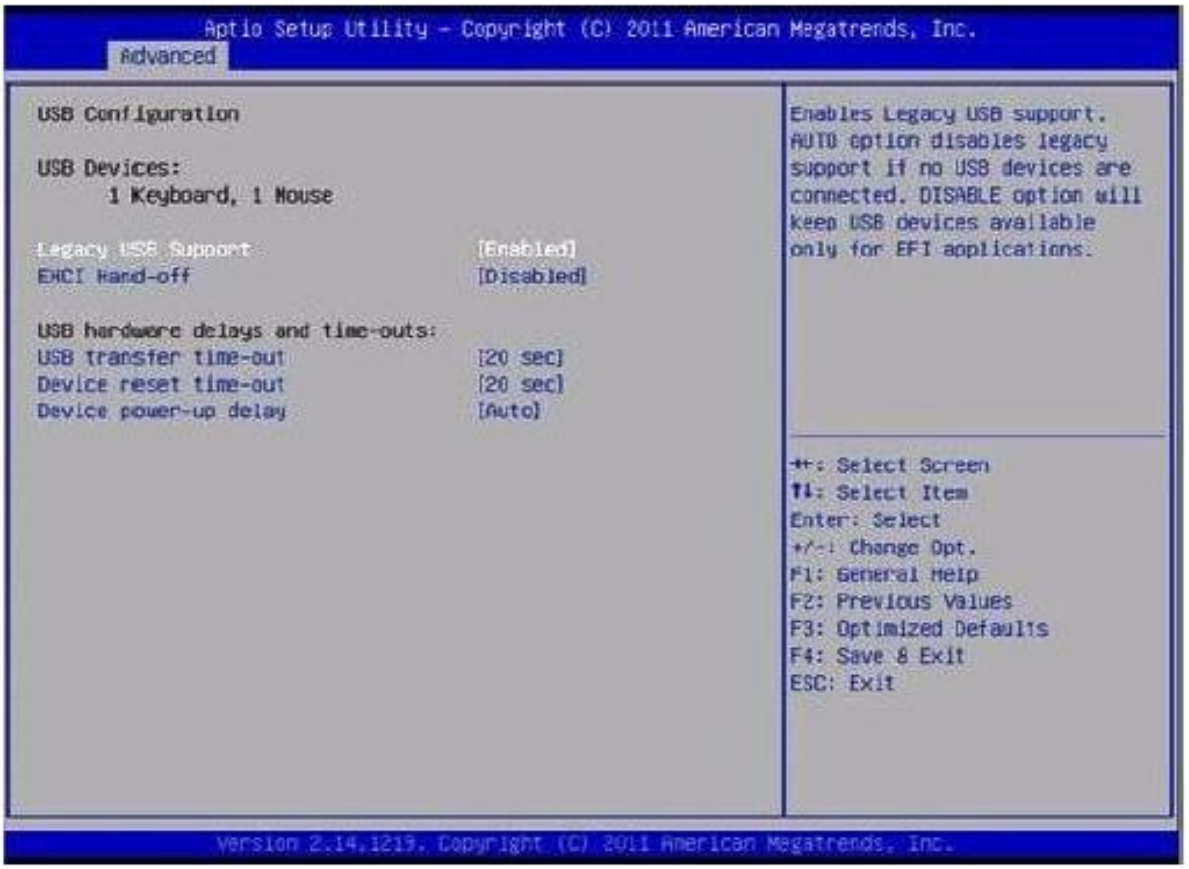


Figure 3.9 USB Configuration

- **Legacy USB Support**
  Enable the support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
  This is a workaround for the OS without EHCI hand-off support. The EHCI ownership change should claim by EGCI driver.
- **USB transfer time-out**
  Set the time-out value for Control, Bulk, and Interrupt transfers.
- **Device reset time-out**
  Set USB mass storage device Start Unit command time-out value.
- **Device power-up delay**
  Sets the maximum time the device will take before it properly reports itself to the Host Controller. "Auto" uses a default value: for a Root port it is 100 ms, for a Hub port the delay is taken from the Hub descriptor.

3-2.2.8 Super IO Configuration

Figure 3.10 Super IO Configuration

- **Serial Port 1 Configuration**
  This item allows users to configure serial port 1.
- **Serial Port 2 Configuration**
  This item allows users to configure serial port 2.
- **Watch Dog Function Configuration**
  This item allows users to configure watch dog settings
- **Backlight Configuration**
  This item allows users to configure backlight control settings.

3-2.2.9 H/W Monitor Configuration

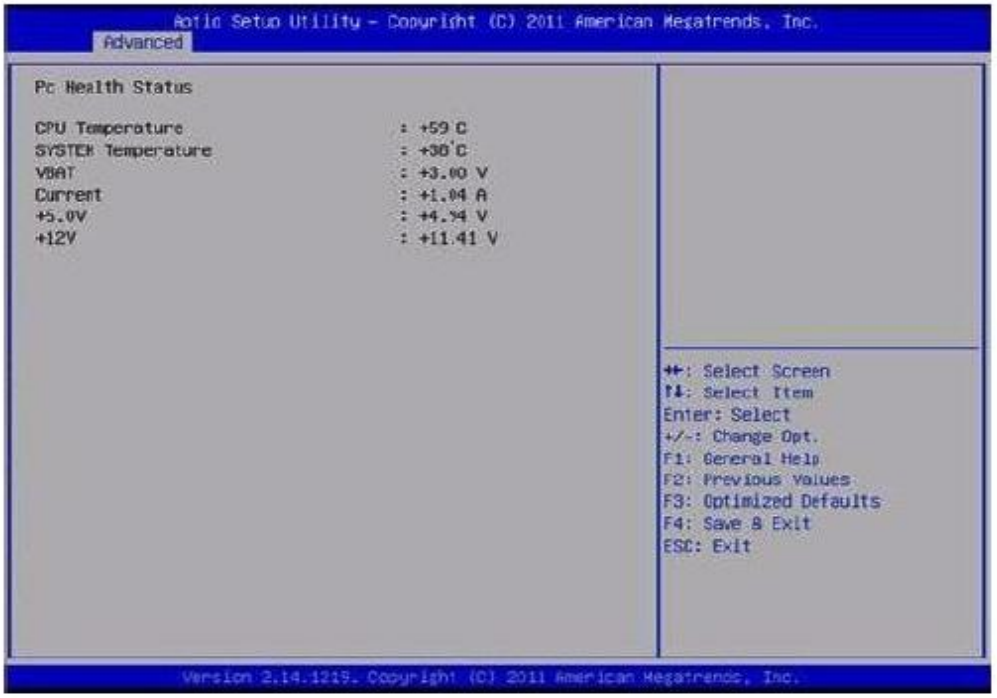


Figure 3.11 HW Monitor Configuration

This page display all information about system Temperature/ Voltage/ Current.

3-2.2.10 AOAC Configuration

Figure 3.12 AOAC Configuration

- **AOAC Configuration**
  This item allows users to enable or disabled AOAC function.

3-2.2.1 1 PPM Configuration

Figure 3.13 PPM Configuration

- **EIST**
  This item allows users to enable or disabled Intel SpeedStep function.
- **CPU C state Report**
  This item allows users to enable or disabled CPU C state report to OS.
- **Enhanced C state**
  This item allows users to enable or disabled Enhanced CPU C state.
- **CPU Hard C4E**
  This item allows users to enable or disabled CPU Hard C4E function.
- **CPU C6 state**
  This item allows users to enable or disabled CPU C6 state.
- **C4 Exit Timing**
  This item allows users to control a programmable time for the CPU voltage to stabilize when exiting from a C4 state.
- **C-state POPDOWN**
  This item allows users to enable or disabled Intel C-state POPDOWN function.
- **C-state POPUP**
  This item allows users to enable or disabled Intel C-state POPUP function.

3-2.3 Chipset

Select the Chipset tab from the MIO-2661 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section.

This Plug and Play BIOS Setup screen is shown below.

Figure 3.14 Chipset Setup

3-2.3.1 Host Bridge / Intel IGD Configuration

Figure 3.15 Intel IGD Configuration

- **Auto Disable IGD**
  This item allows users to auto disable IGD upon external GFX detected.
- **IGFX-Boot Type**
  This item allows users to select which output device during POST.
- **LCD Panel Type**
  This item allows users to select LCD panel by internal graphic device.
- **Panel Scaling**
  This item allows users to select LCD panel scaling by internal graphic device.
- **Backlight Control**
  This item allows users to select backlight control setting.
- **Active LFP**
  This item allows users to select the active LFP configuration.
- **IGD Clock Source**
  This item allows users to select IGD clock.
- **Fixed Graphics Memory Size**
  This item allows users to configure fixed graphic memory size.
- **ALS Support**
  This item allows users to select ASL support for ACPI.
- **Backlight Control Support**
  This item allows users to select backlight control support.
- **BIA**
  This item allows users to select BIA with selected aggressiveness level.

3-2.3.2 South Bridge

Figure 3.16 South Bridge

- **PCI Express Root Port 0/1/2**
  This item allows users to configure PCIe port 0/1/2 settings.
- **DMI Link ASPM Control**
  This item enables or disables control of active state power management on both NB and SB side of DMI link.
- **SLP_S4 Assertion Width**
  This item allows users to set a delay of sorts.
- **Restore AC Power Loss**

Figure 3.17 TPT Device

- **Azalia Controller**
  Enables or disables the azalea controller.
- **Select USB Mode**
  Select USB mode by controllers or ports.
- **SMBus Controller**
  Enables or disables the onchip SMBus controller.
- **SIRQ Logic**
  Enables or disables the SIRQ logic.
- **MSATA/PCIe Switch**
  Enables for MSATA disables for PCIe.
- **LAN1 Controller**
  This item allows users to enables or disables LAN device.
- **PCI Express PME**
  This item allows users to enables or disables PCIe PME function.

3-2.4 Boot Settings

Figure 3.18 Boot Setup Utility

- **Setup Prompt Timeout**
  This item allows users to select the number of seconds to wait for setup activation key.
- **Bootup NumLock State**
  Select the Power-on state for Numlock.
- **Quick Boot**
  If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, and OEM Logo is shown instead of POST messages.
- **Option ROM Message**
  Set display mode for option ROM.
- **Interrupt 19 Capture**
  This item allows option ROMs to trap interrupt 19.
- **1^{st}/ 2^{nd}/ 3^{rd}/ 4^{th}/ 5^{th}/ 6^{th}/ 7^{th} Boot**
  This item allows users to set boot device priority.

3-2.5 Security Setup

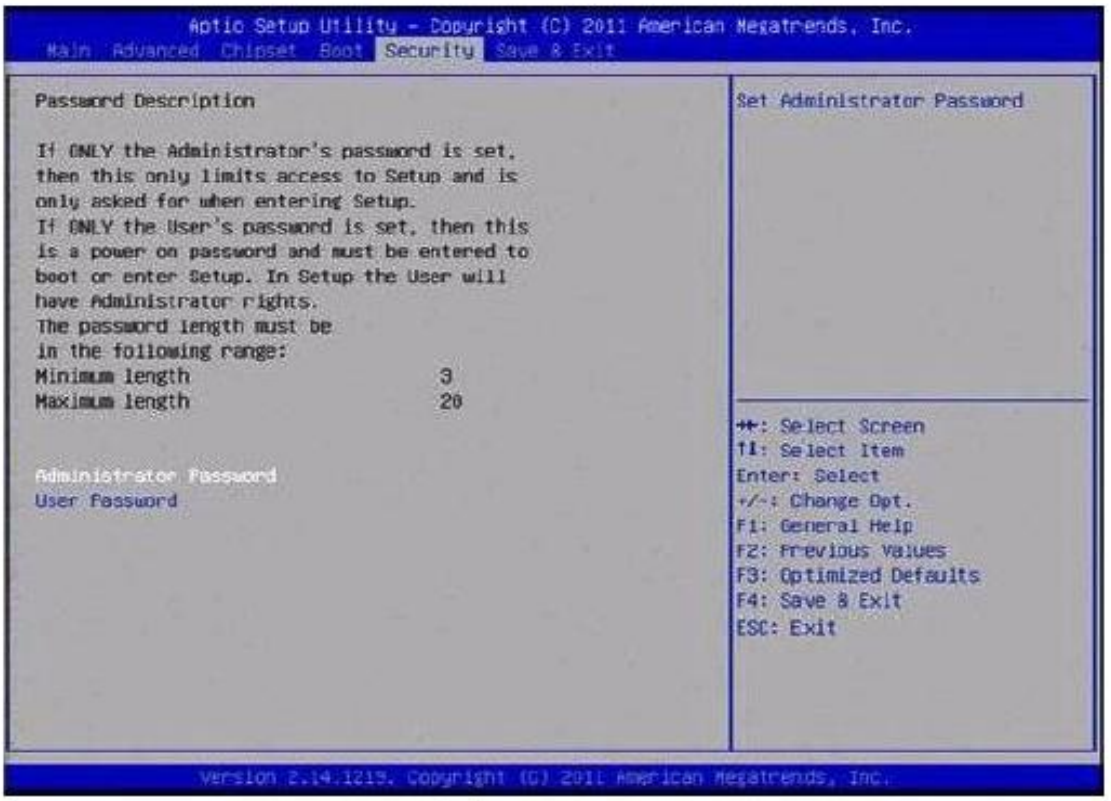


Figure 3.19 Password Configuration

Select Security Setup from the MIO-2261 Setup main BIOS setup menu. All Security Setup options, such as password protection is described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- **Change Administrator/ User Password**
  Select this option and press <ENTER> to access the sub menu, and then type in the password.

3-2.6 Save & Exit

Figure 3.20 3.22 Save & Exit

3-2.6.1 Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer if necessary to take effect of all system configuration parameter.

3-2.6.2 Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

3-2.6.3 Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect of all system configuration parameters.

3-2.6.4 Discaard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer.

3-2.6.5 Save Changes

When users have completed system configuration, select this option to save changes, without exiting the BIOS setup menu.

3-2.6.6 Discard Changes

Select this option to discard any current changes and load previous system configuration.

3-2.6.7 Restore Defaults

The MIO-2261 automatically configures all setup items to optimal settings when users select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if the user's computer is experiencing system configuration problems.

3-2.6.8 Save User Defaults

When users have completed system configuration, select this option to save changes as user defaults without exit the BIOS setup menu.

3-2.6.9 Restore User Defaults

The users can select this option to restore user defaults.

3-2.6.10 Boot Overridde

You select device you want to do boot override.

Chapter 4: Software Support

4-1. Software Applications

4-1.1 The GPIO Application

General purpose Input/ Output is a flexible parallel interface that allows of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. A programmable GPIO allows developers to dynamically set the GPIO input or output status.

4-1.2 The I²C Application

I²C is a bi-directional two-wire bus that was developed by Philips for use in their televisions in the 1980s and nowadays in used in various types of embedded systems.

4-1.3 The SMBus Application

The System Management Bus (SMBus) is a two-wire interface defined by Intel Corporation in 1995. It is based on the same principles of operation of I²C and is used in personal computers and servers for low-speed system management communications.

4-1.4 The Display Control Application

There are two kinds of VGA control applications, backlight on/off control and brightness control. Backlight on/off control allows a developer to turn on or off the backlight, and to control brightness smoothly.

- Brightness Control
  The brightness control application allows a developer to interface with an embedded device to easily control brightness.
- Backlight Control
  The backlight application allows a developer to control the backlight (screen) on/off in an embedded device.

4-1.5 The Watchdog Application

A watchdog timer (abbreviated as WDT) is a hardware device which triggers an action, e.g. rebooting the system, if the system does not reset the timer within a specific period of time. The WDT application provides developers with functions such as starting the timer, resetting the timer, and setting the timeout value if the hardware requires customized timeout values.

4-1.6 The Hardware Monitor Application

The hardware monitor (abbreviated as HWM) is a system health supervision capability achieved by placing certain I/O chips along with sensors for inspecting the target of interests for certain condition indexes, such as fan speed, temperature and voltage etc.

4-1.7 The Power Saving Application

- CPU Speed

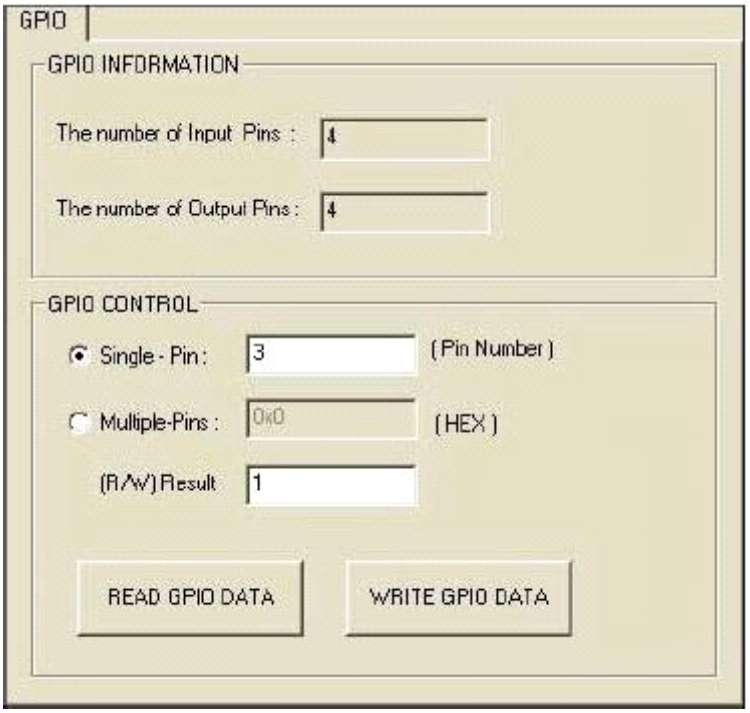
  Make use of Intel SpeedStep technology to reduce power consumption. The system will automatically adjust the CPU speed depending on system loading.

- System Throttling

  Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. Applications allow the user to lower the clock from 87.5% to 12.5%.

4-2. Installation Guide

4-2.1 GPIO



When the application is executed, it will display GPIO information in the GPIO INFORMATION group box. It displays the number of input pins and output pins. You can click the radio button to choose to rest either the single pin function or multiple pin functions.

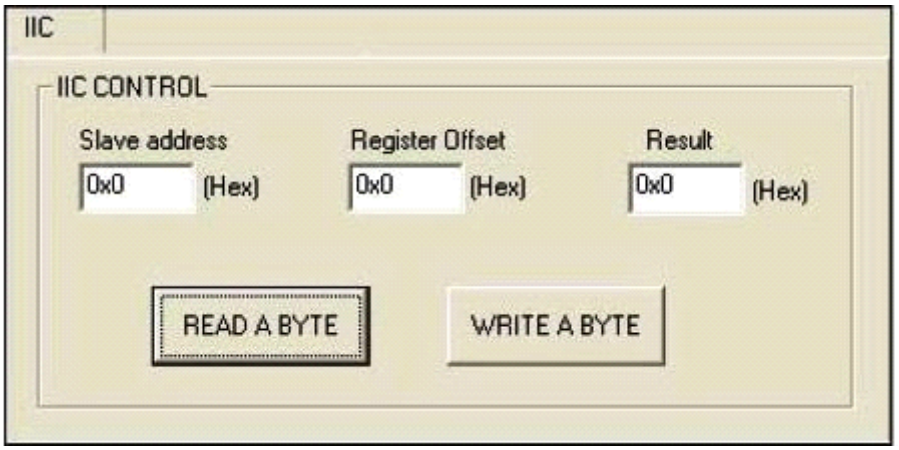
- Test Read Single Input Pin
  - Click the radio button-Single-Pin.
  - Key in the pin number to read the value of the input pin. The Pin number starts from "0".
  - Click the READ GPIO DATA button and the status of the GPIO pin will be displayed in (R/W) Result field.

- Test Read Multiple Input Pins
  - Click the radio button-Multiple-Pins.
  - Key in the pin number from "0x01" to "0x0F" to read the value of the input pin. The pin numbers are ordered bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, etc. For example, if you want to read pin 0, 1 and 3, the pin numbers should be "0x0B".
  - Click READ GPIO DATA button and the statuses of the GPIO pins will be displayed in (R/W) Result field.

- Test Write Single Output Pin
  - Click the radio button-Single-P in.
  - Key in the pin numbers you want to write. Pin numbers start from “0”.
  - Key in the value either “0” or “1” in (R/W) Result field to write the output pin you chose above step.
  - Click the WRITE GPIO DATA button to write the GPIO output pin.

- Test Write Multiple Output Pins
  - Click the radio button-M ultiple-Pins.
  - Key in the pin number from “0x01” to “0x0F” to choose the multiple pin numbe rs to write the value of the output pin. The pin numbers are ordered bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, etc. For exam ple, if you want to write pin 0, 1, and 3, the pin numbe rs should be “0x0B”.
  - Key in the value in (R/W) Result field from “0x01” to “0x0F” to write the value of the output pin. The pin numbers are orde red bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO1, etc. For example, if you want to set pin 0 and 1 high, 3 to low, the pin numbe r should be “0x0B/, and then you should key in the value “0xxA” to write.
  - Click the WRITE GPIO DATA button to write the GPIO output pins.

4-2.2 I²C

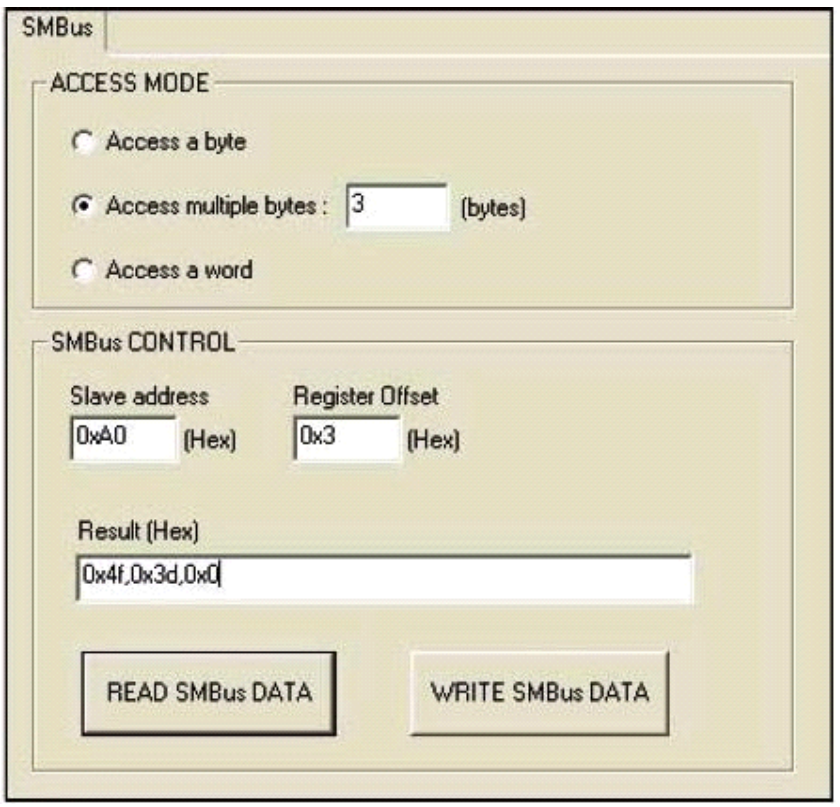


When the application is executed, you can read or write a byte of data through I²C devices. All data must be read or written in hexadecimal system.

- Read a byte
  - Key in the slave device address in Salve address field.
  - Key in the register offset in Register Offset field.
  - Click the READ A BYTE button and then a bute of data from the device will be shown on the Result field.

- Write a byte
  - Key in the slave device address in Salve address field.
  - Key in the register offset in Register Offset field.
  - Key in the desirous of data in Result field to write to the device.
  - Click the WRITE A BYTE button and then the data will be written to the device though I²C.

4-2.3 SMBus



When the application has executed, you can click the radio button to choose to test each access mode, i.e. Access a byte, Access Multiple bytes and Access a word. All data must be read or written in hexadecimal except the numbers for radio button: Access multiple bytes mode must be written in decimal. You can test the functionalities of the watchdog as follows:

- Read a byte
  - Click the radio button-Access a byte.
  - Key in the salve device address in the Salve address field.
  - Key in the register offset in the Register Offset field.
  - Click the READ SMBus DATA button and a byte of data from the device will be shown on the Result field.

- Click the radio button-Access a byte.
- Key in the salve device address in the Salve address field.
- Key in the register offset in the Register Offset field.
- Click the WRITE SMBus DATA button and then the data will be written to the device through SMBus.

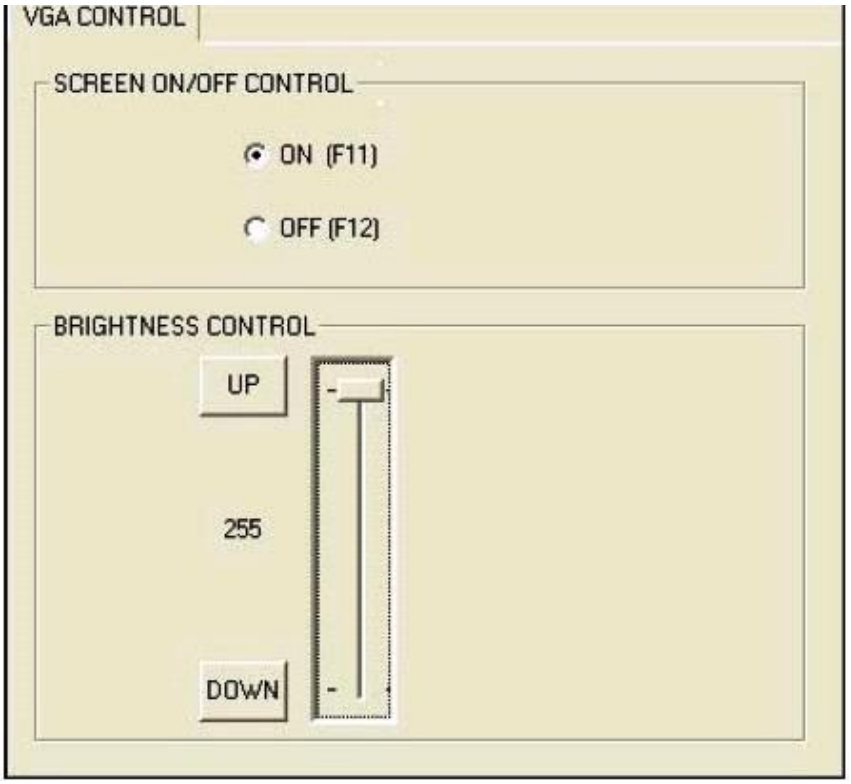
- Read a word
  - Click the radio button-Access a word.
  - Key in the salve device address in the Salve address field.
  - Key in the register offset in the Register Offset field.
  - Click the READ SMBus DATA button and a then a word of data from the device will be shown on the Result field.

- Write a word
  - Click the radio button-Access a word.
  - Key in the salve device address in the Salve address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired data, such as 0x1234, in the Result field to write to the device.
  - Click the WRITE SMBus DATA button and the data will be written to the device through the SMBus.

- Read multiple bytes
  - Click the radio button-Access multiple bytes.
  - Key in the salve device address in the Salve address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired number of bytes, such as 3, in the right side field of radio button-Access multiple bytes. The number must be written in decimal.
  - Click the READ SMBus DATA button and then all data from the device will be divided from each other by commas and be shown in the Result field.

- Write Multiple bytes
  - Click the radio button-Access multiple bytes.
  - Key in the salve device address in the Salve address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired number of bytes, such as 3, in the right side field of the radio button-Access multiple bytes. The number must be written in decimal.
  - Key in all the desired data in the Result field in hexadecimal format, divided by commas, for example, 0x50, 0x60, 0x7A.
  - Click the WRITE SMBus DATA button and all of the data will be written to the device though the SMBus.

4-2.4 Display Control

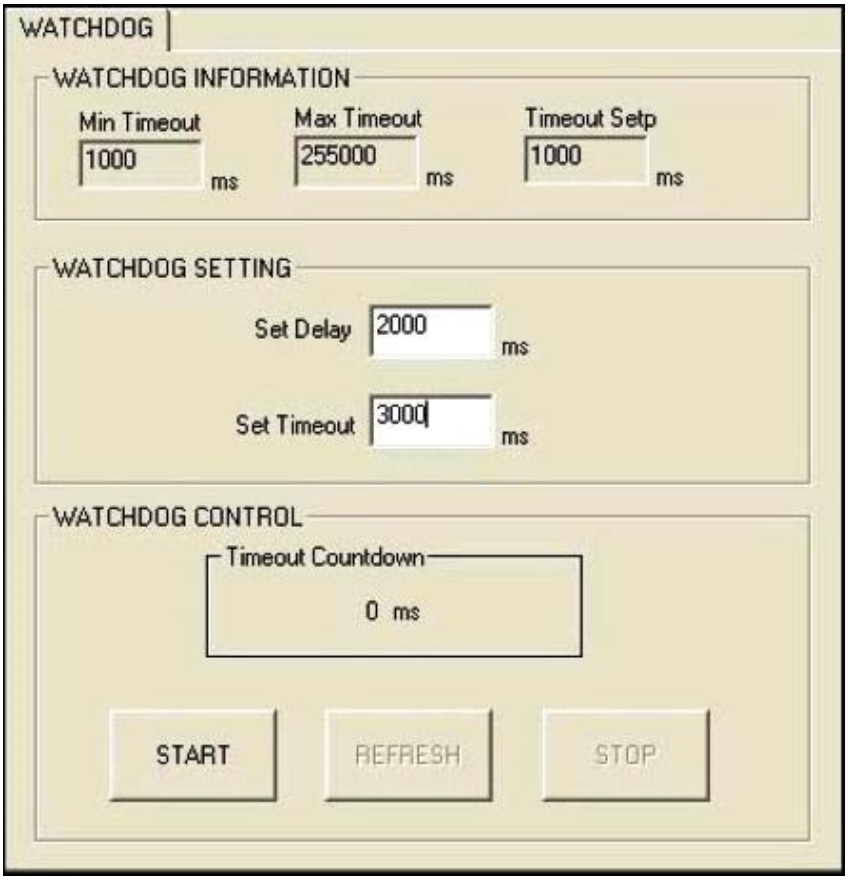


When the application is executed, it will display two blocks of VGA control functions. The application can turn on or turn off the screen shot freely, and it also can tune the brightness of the panels if your platform is being supported. You can test the functionalities of VGA control as follows:

- Screen on/off control
  - Click the radio button ON or push the key F11 to turn on the panel screen.
  - Click the radio button OFF or push the key F12 to turn off the panel screen.
  - The display chip of your platform must be in the support list in jumper setting, or this function cannot work.

- Brightness control
  - Move the slider in increments, using either the mouse or the direction keys, or click the UP button to increase the brightness.
  - Move the slider in decrements, using either the mouse or the direction keys, or click the DOWN button to decrease the brightness.

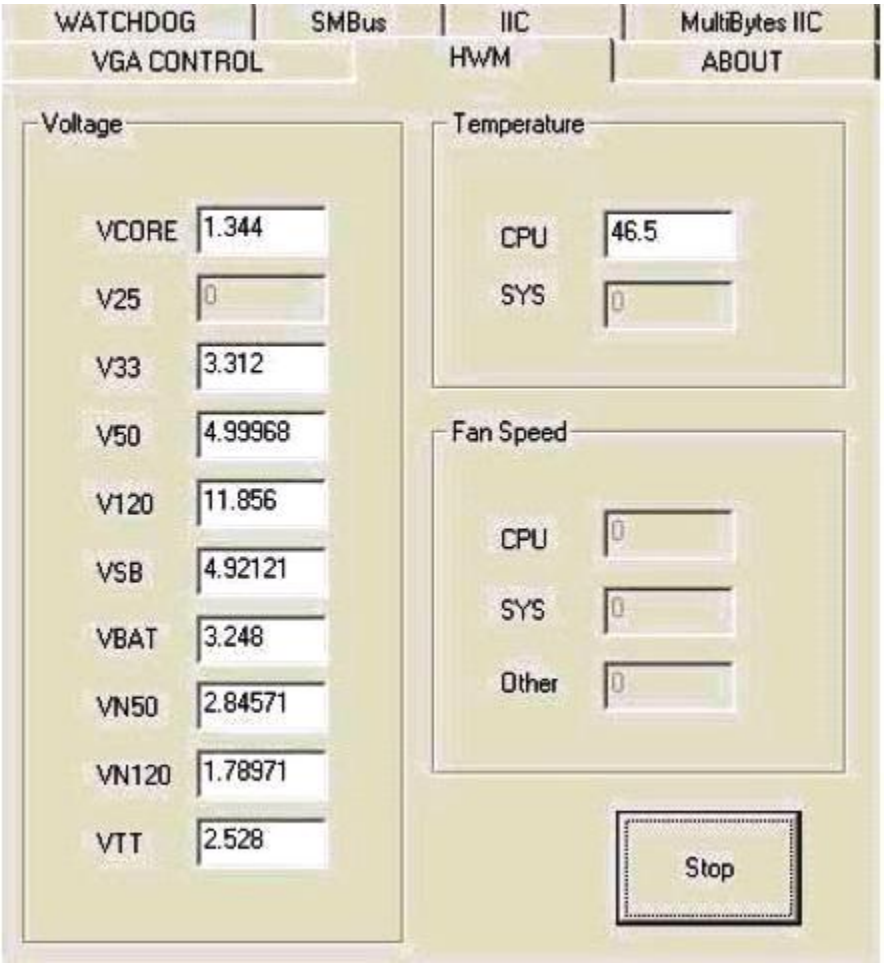
4-2.5 Watchdog Timer



When the application is executed, it will display watchdog information in the WATCHDOG INFORMATION group box. It displays max timeout, min timeout, and timeout steps in milliseconds. For example, a 1~255 seconds watchdog will have 255000 max timeout, 1000 min timeout, and 1000 timeout steps. You can test the functionality of the watchdog as follows:

- Set the time out value 3000 (3 sec.) in the SET TIMEOUT field and set the delay value 2000 (2 sec.) in the SET DELAY field, then click the START button. The Timeout Countdown field will countdown the watchdog timer and display 5000 (5 sec.).
- Before the timer counts down to zero, you can reset the timer by clicking the REFRESH button. After you click this button, the Timeout Countdown field will display the value of the SET TIMEOUT field.
- If you want to stop the watchdog timer, just click the STOP button.

4-2.6 Hardware Monitor



When the Monitor application is executed by clicking the button, hardware monitoring data values will be displayed. If certain data values are not supported by the platform, the correspondent data field will be grayed-out with a value of 0.

APPENDIX A

Watchdog Timer Sample Code

Watchdog function:

```
The SCH3114 Runtime base I/O address is 600h
Setting WatchDog time value location at offset 66h
If set value “0”, it is mean disable WatchDog function.
Superi o_GPIO_P ort= 600h
m ov dx, Superio_GP IO_Port + 66h
m ov al, 00h
.model small
.486p
.stack 256
.data
SCH3114_IO EQU 600h
.code
org 100h
.STARTup
;========== ============================ ========================= =====  ==
;47H
;enable WDT function bit [0]=0 Ch
;========== ============================ ============= ==================
m ov dx, SCH331 14_IO + 47h
m ov al, 0Ch
out dx, al
;========== ============================ ========================= =====  ==
;65H
;bit [1:0]=Reserved
;bit [6:2] Reserve=00000
;bit [7] WDT time-out Value Units Select
;Minutes=0 (default) Seconds=1
;========== ============================ ========================= =====  ==
m ov dx, SCH311 4_IO + 65h;
m ov al, 080h
out dx, al
;========== ============================ ============= ==================
```

```
;66H
;WDT timer time-out value
;bit[7:0]=0~255
;=============== ===== ======================== ===== ========================
mov dx,SCH3114_IO + 66h
mov al, 01h
out dx, al
;============== ============================ ==============================
;bit[0] status bit R/W
;WD timeout occurred =1
;WD timer counting =0
;=============== ===== ======================== ===== ========================
mov dx,SCH3114_IO +68h
mov al, 01h
out dx, al
.exit
END
```

GPIO Sample Code

```
The SCH3114 Runtime base I/O address is 600h
.model small
.486p
.stack256
.data
SCH3114_IO EQU 600h
.code
org 100h
.STARTup
;================ ===== ======================== ===== ======================
; Configuration GPIO as GPI or GPO by below register:
; GPIO0=23H, GPIO4=27H
; GPIO1=24H, GPIO5=29H
; GPIO2=25H, GPIO6=2AH
; GPIO3=26H, GPIO7=2BH
; Set 00H as output type, set 01H as input type
;================ ===== ======================== ===== ======================
;================ ===== ======================== ===== ======================
; Register 4BH configuration GPO value as high or low:
; 1= HIGH
; 0= LOW
;================ ===== ======================== ===== ======================

mov dx,SCH3114_IO +23h      ;GPIO 0
mov al, 00h                 ;Set GPIO 0 as output type
out dx, al

mov dx,SCH3114_IO + 4Bh
mov al, 01h                 ;Set GPIO 0 as high value
out dx, al

.exit
END
```