FabiaTech Corporation

IPC Solution

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PC/104 CPU Board

Low Power Series

FB2710 User's Manual

OCT 2017
Version: 1.1
Part Number: FB2710

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If you have problems or difficulties in using the system or setting up the relevant devices, and software that are not explained in this manual, please contact our service engineer for service, or send email to support@fabiatech.com.

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- A list of your name, address, telephone, facsimile number, or email address where you may be reached during the day
- Description of you peripheral attachments
- Description of your software (operating system, version, application software, etc.) and BIOS configuration
- Description of the symptoms (Extract wording any message)

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Chapter 1 Introducing the FB2710 CPU Board

Overview

The FB2710 is an AMD® G-Serial T16R low power all–in-one PC/104 CPU board. This user's manual provides information on the physical features, installation, and BIOS setup.

Built to unleash the total potential of the AMD® G-Serial T16R Processor, the FB2710 is a single board computer capable of handling today's demanding requirements. Able to support 615MHz CPU, this unit supports 10/100/1000 Base –TX interface network port, audio, SATA/CFAST socket, and 1 DIMM socket supports up to 4GB DDR3L RAM, three USB2.0 ports, and a VGA controller.

Each FB2710 has two ports for I/O communications. One RS232 and one RS232/ RS422/RS485 port are available. There is also a watchdog timer that can be configured from software to automatically reset the system.

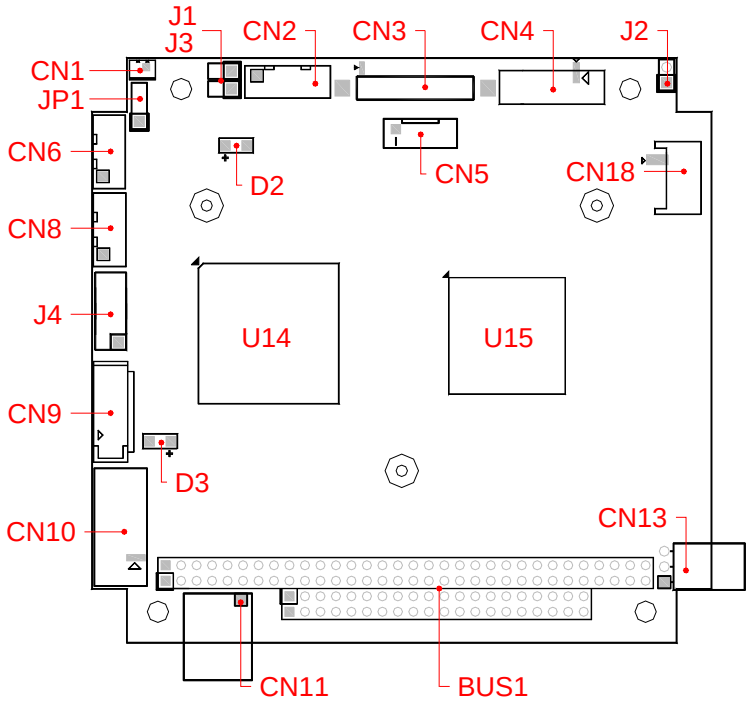
The CPU board perfect for POS and POI applications, network systems, panel / MMI's, order entry kiosks and test equipment. The unit is only 101.6x95.9mm.

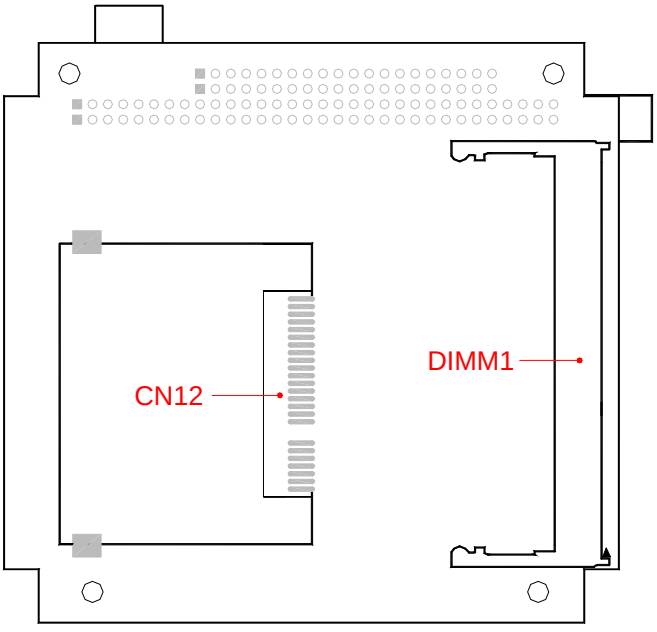
Series Comparison Table

Model	FB2710
Processor	AMD® G-Serial T16R 615MHZ
Memory *204 Pin So-DIMM*1*	*DDR3L-1066* *4GB (Max.)*
Display	*VGA/LVDS*
S-Chipset	AMD Fusion Controller HUB A55E
Multi I/O Port	*One RS232 &* *One RS232/RS422/RS485*
USB 2.0 Port	*3*
Storage	*SATA Port*
	CFAST Socket
*Audio**	*Line -Out And MIC-In*
RJ45 LAN port *(100/1000Mbps)*	*Realtek RTL8111F*
Watchdog Timer	Yes
Bus	*PC/104*
Operating Temperature	0~+ 50℃ (32~122℉)
Storage Temperature	-20~+70℃(-4~158℉)
Dimensions (Unit: mm)	*101.6(D) x 95.9(W)*

* Audio Function is optional.
* The ISA bus can't support DMA.

Layout


J1
J3
CN2
CN3
CN4
J2
CN1
JP1
CN6
D2
CN5
CN18
CN8
J4
U14
U15
CN9
D3
CN10
CN13
CN11
BUS1


CN12
DIMM1

Specifications

- ***Processor & Memory –***

  AMD® G-Serial T16R 615MHZ (512KB L2 Cache) Low Power Processor

  One 204 pin So-DIMM socket for up to 4GB DDR3L/1066 RAM

- ***I/O Outlets –***

  One 10/100/1000 base-TX Ethernet LAN port

  VGA and LVDS LCD Connector

  Three USB ports (2.0) and providing one AC97 audio function

  One RS-232 and one RS-232/RS422/RS485 port

- ***LED Indicator –***

  Providing power LED and hard disk access LED.

- ***Storage –***

  CFAST Compact Flash socket for CFAST Compact Flash module

  One SATA hard disk connector

- ***Power requirement –***

  +5V DC only, 3.94A maximum (2.5A Typical) / Supports AT and ATX mode function

- ***Dimensions -***

  PC/104 form factor, *101.6mm x 95.9* mm (4.00” x 3.775”)

Packing List

Upon receiving the package, verify the following things. If any of the mentioned happens, contact us for immediate service.

- Unpack and inspect the FB2710 package for possible damage that may occur during the delivery process.
- Verify the accessories in the package according to the packing list and see if there is anything missing or incorrect package is included.
- If the cable(s) you use to install the FB2710 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FB2710 system.

Note: After FB2710 is installed, it is recommended that you keep the diskette or CD that contains drivers and document files, and keep the document copies, or unused cables in the carton for future use.

The following list the accessories that may be included in your FB2710 package. Some of the accessories are optional shipped only upon order.

- FB2710 All-In-One PC/104 CPU board.
- 1 VGA adapter cable. (L:150mm)
- 2 serial port adapter cables. (L:150mm)
- 2 Dual USB adapter cable with bracket. (L:300mm)
- 1 LAN adapter cable with FB4760x board.
- 1 Compact disc containing manual file in PDF format and necessary drivers and utilities.

Optional:

- FB4706 Audio/USB adapter board with cables. (PN: 0103020022G-21)
- One USB adapter cable. (L:270mm) (PN:7002020013G)

Chapter 2 Hardware Installation

This chapter introduces the system connectors & jumper settings, and guides you to apply them for field application.

Before Installation

Before you install the system, make sure you follow the below descriptions.

1. Before removing the board from its anti-static bag, wear an anti-static strap to prevent the generation of Electricity Static Discharge (ESD). The ESD may be generated by man's physical touch. It may do damage to the board circuit.

2. Install any connector, module, or add on card, be sure that the power is disconnected from the system board. If not, this may damage the system board components, module, or the add-on-card.

3. When you connect the connectors and memory modules, be careful with the pin orientations.

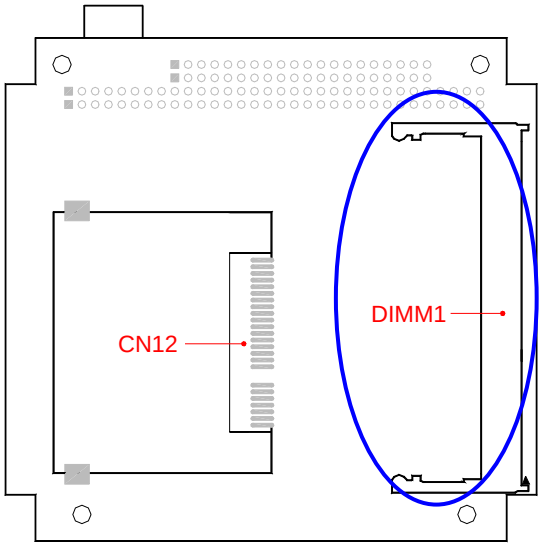
Hardware Features

The following list is for the setup of the connectors and jumpers of the FB2710.

Item	Description
CN1	Battery Header (JST 2-Pin 2.0mm)
CN2	RJ45-LAN 2.0mm connector (JST 12-Pin 2.0mm)
CN3	LVDS LCD connector (DF13 30-Pin 1.25mm)
CN4	VGA connector (IDC10-Pin 2.0mm)
CN5	Power connector for LVDS LCD Backlight (JST 5-Pin 2.0mm)
CN8, CN6	RS-232 port connector (JST 10-Pin 2.0mm)
CN9	SATA Connector
CN10	AC97 signals for Audio function (IDC 12-Pin 2.0mm)
CN11	Power connector (JAE 4-Pin 2.54mm)
CN12	CFAST Compact Flash Socket
CN13	Case/CPU Cooling FAN header (JST 3-Pin 2.54mm)
CN18	USB connector header (JST 4-Pin 2.0mm)
J1	Reset header (2-Pin 2.54mm)
J2	External speaker header (2-Pin 2.54mm)
J3	Power Button header (2-Pin 2.54mm)
J4	USB connector header (10-Pin 2.54mm)
JP1	Clear CMOS data header
D2-LED	Power LED
D3-LED	SATA/CFAST Access LED
BUS1	PC-104 Connector
DIMM1	DDR3L So-DIMM Socket 204-pin

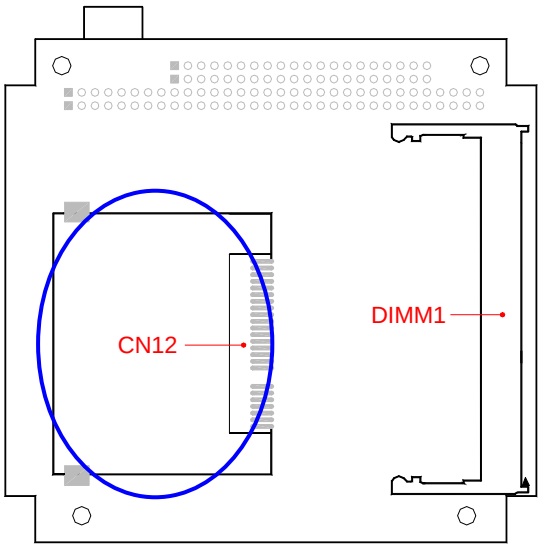
□ DIMM1: So-DIMM Socket

The DIMM1 socket on the solder side accepts 2GB to 4GB of DDR3L RAM module.

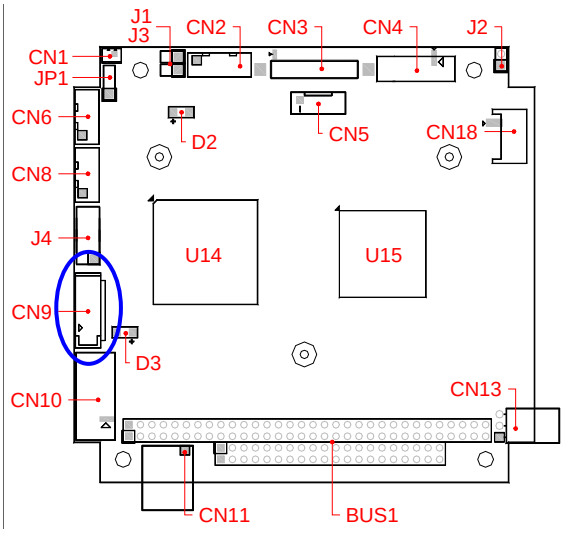


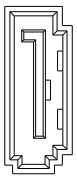
□ CN12: CFAST Compact Flash Socket

The CFAST Compact Flash socket CN12 (on the solder side) is support CFAST Compact Flash



□ CN9: Serial ATA hard Disk Connector

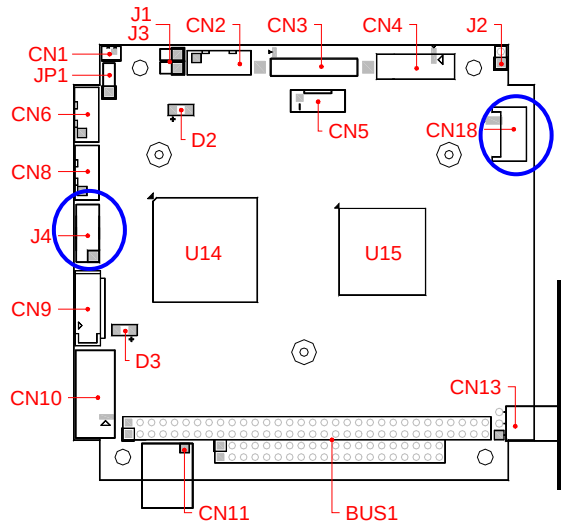


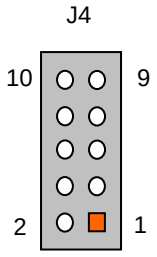


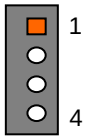
Pin	Signal
1	Ground
2	TX-DP
3	TX-DN
4	Ground
5	RX-DN
6	RX-DP
7	Ground

□ J4 & CN18: USB Connector Header

The CPU board supports three USB port. Any USB device can be attached to USB ports with plug-and-play supported, J4 is10-pin connector and CN18 is 4-pin connector header. Use the USB adapter cable and/or FB4706 Audio board, you can attach up to 3 USB devices.



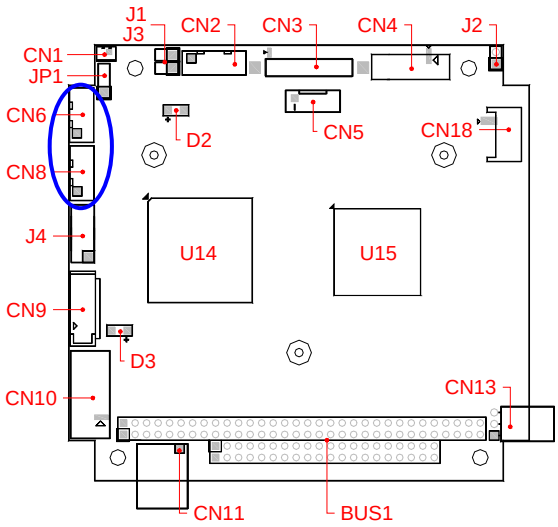




J4	Signal	J4	Signal	CN18	Signal
1	USBV0	2	Ground	1	Ground
3	USBD0-	4	USBG1	2	USBD2+
5	USBD0+	6	USBD1+	3	USBD2-
7	USBG0	8	USBD1-	4	USBV2
9	Ground	10	USBV1	-	-

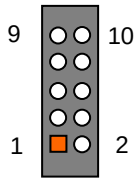
□ CN6 & CN8: Serial Port Connectors

The Serial port 0 (CN8) is designed for multiple proposes. It could be RS-232, RS-422 or RS-485 by BIOS CMOS setting. Use the included serial cables for transferring 10-pin IDC to 9-pin D-sub connector. The following tables show the signal connections of these connectors.

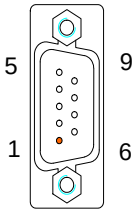


Mode/Serial	Port0	Port1
RS-232	CN8	CN6
RS-422	CN8	-
RS-485	CN8	-
Mode Select	BIOS	-

CN6 & CN8



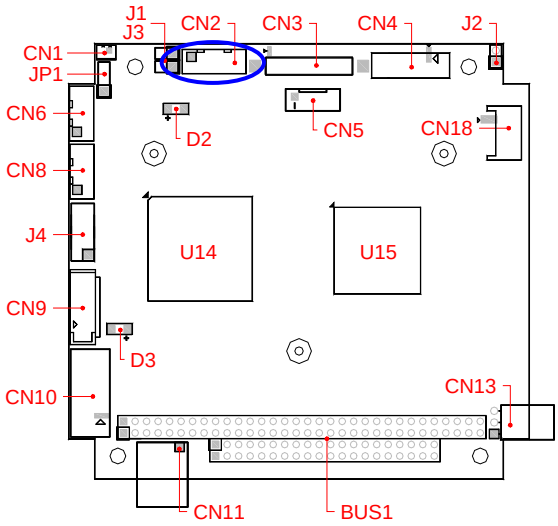
DB9



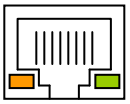
Pin	RS-232	DB9	RS-422	RS-485
1	-DCD	1	TX-	485-
2	-DSR	6	-	-
3	RXD	2	TX+	485+
4	-RTS	7	-	-
5	-TXD	3	RX+	-
6	-CTS	8	-	-
7	-DTR	4	RX-	-
8	-RI	9	-	-
9	GROUND	5	-	-
10	GROUND	Shield	-	-

□ CN2: RJ45 LAN /Adapter Connector and LED indicators

The CN2 provide LAN signals to FB4760 adapter board with cable. FB4760 is a RJ45 connector with 2 LED; the left side LED (orange) indicates data which is being accessed and the right side LED (green) indicates on-line status.



RJ45

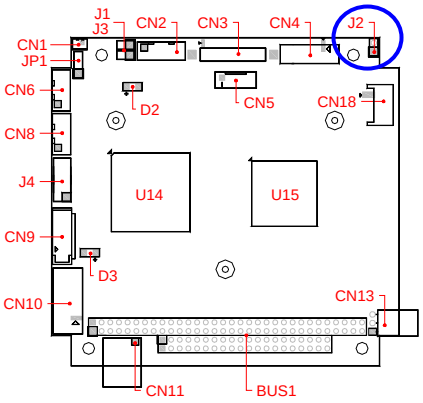


1 8

(Front View)

RJ45	Signal	RJ45	Signal
1	MDI0+	5	MDI2-
2	MDI0-	6	MDI1-
3	MDI1+	7	MDI3+
4	MDI2+	8	MDI3-

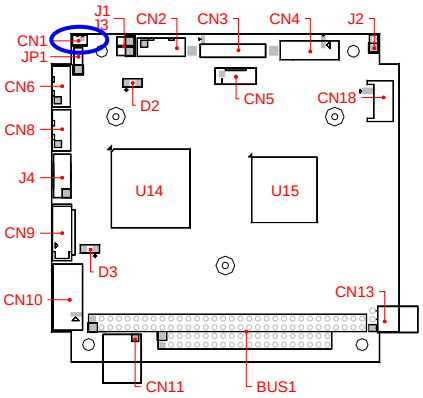
□ J2: External Speaker Header



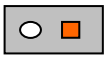
J2

PIN	Signal
1	Speaker+
2	Speaker-

□ CN1: External Battery heade



CN1



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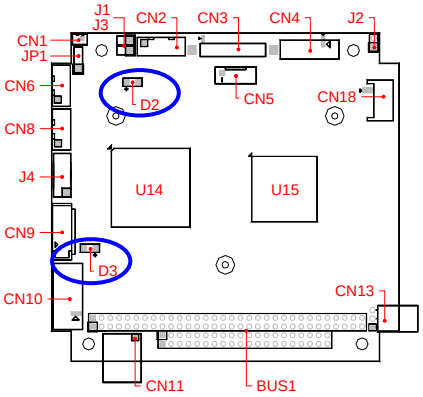
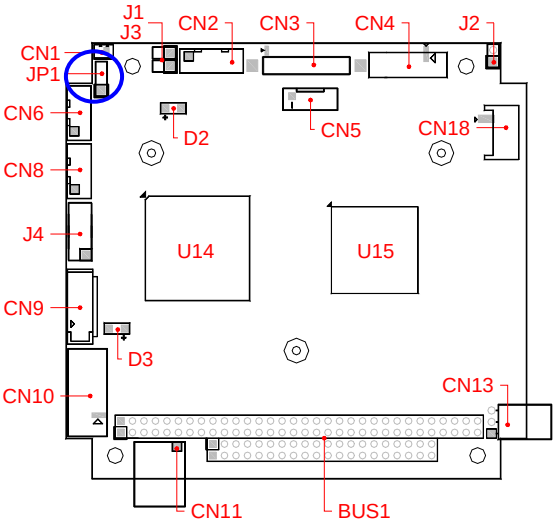
PIN	Signal
1	Battery +
2	Battery -

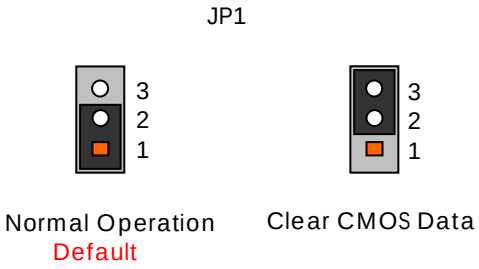
□ D2: Power LED, D3: SATA and CFAST Access LED indicator



□ JP1: Clear CMOS Data

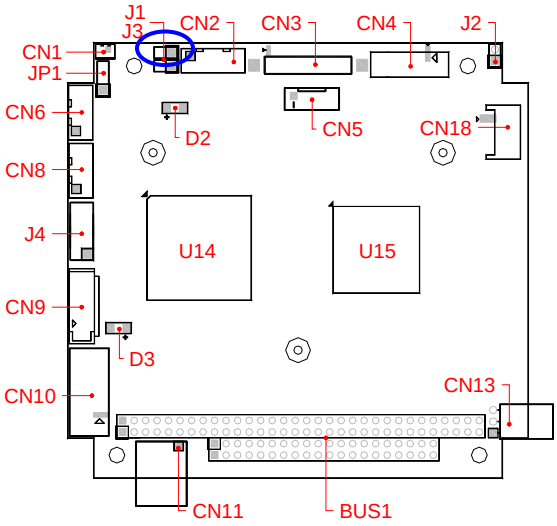
You can use JP1 to clear CMOS data. The CMOS stores information like system date, time, boot up device, password, IRQ... which are set up with the BIOS. To clear the CMOS, set JP1 to 2-3 closed and wait 3~5 sec then return to open before powers is off. The default setting is 1, 2 closed.

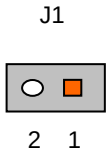




□ J1: Reset Header

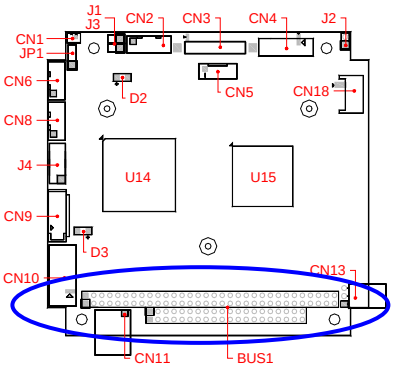
J1 is a 2-pin header for connecting to system reset button. Shorting the circuit of the 2 pins makes the hardware reset and FB2710 restart system. It is similar to power off the system and then power it on again.

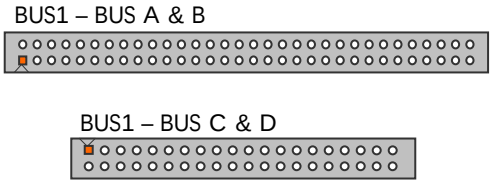




PIN	Signal
1	Reset +
2	Reset -

□ BUS1: PC/104 Bus Connectors





PC/104 A&B Pin

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	-IOCHK	A17	SA14	B1	Ground	B17	--
A2	SD7	A18	SA13	B2	RSTDRV	B18	--
A3	SD6	A19	SA12	B3	+5V	B19	-Refresh
A4	SD5	A20	SA11	B4	IRQ9	B20	BUSCLK
A5	SD4	A21	SA10	B5	--	B21	IRQ7
A6	SD3	A22	SA9	B6	--	B22	IRQ6
A7	SD2	A23	SA8	B7	--	B23	IRQ5
A8	SD1	A24	SA7	B8	-ZWS	B24	IRQ4
A9	SD0	A25	SA6	B9	+12V	B25	IRQ3
A10	IORDY	A26	SA5	B10	KEY	B26	--
A11	AEN	A27	SA4	B11	-SMEMW	B27	TC
A12	SA19	A28	SA3	B12	-SMEMR	B28	ALE
A13	SA18	A29	SA2	B13	-IOW	B29	+5V
A14	SA17	A30	SA1	B14	-IOR	B30	OSC
A15	SA16	A31	SA0	B15	--	B31	Ground
A16	SA15	A32	Ground	B16	--	B32	Ground

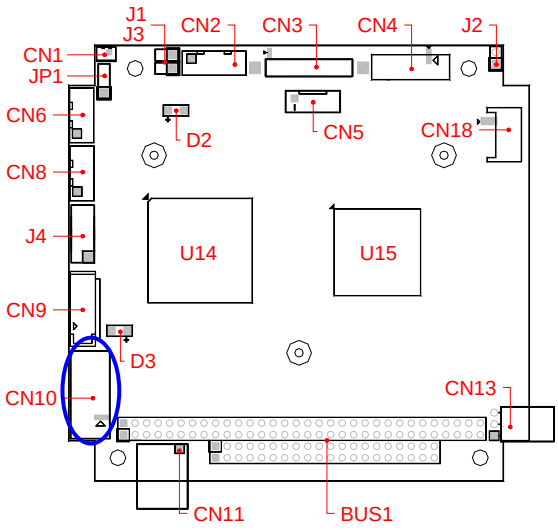
PC/104 C& D Pin

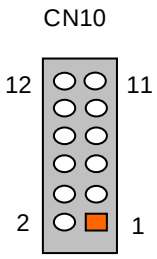
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
C1	GND	C11	MEMW#	D1	Ground	D11	--
C2	SBHE	C12	SD8	D2	MEMCS16#	D12	--
C3	LA23	C13	SD9	D3	IOCS16#	D13	--
C4	LA22	C24	SD10	D4	IRQ10	D14	--
C5	LA21	C25	SD11	D5	IRQ11	D15	--
C6	LA20	C26	SD12	D6	IRQ12	D16	--
C7	LA19	C27	SD13	D7	IRQ15	D17	VCC
C8	LA18	C28	SD14	D8	IRQ14	D18	-
C9	LA17	C29	SD15	D9	--	D19	GND
C10	MEMR#	C20	KEY	D10	--	D20	GND

Note: The FB2710 does not support ISA-DMA mode. The PC/104 and ISA can't automatically get accessed to I/O Port resource; when set ITE8888 ISA Decode is Positively decode, if you add on the I/O card or memory card to FB2710.You can refer to Chapter 6 Technical Reference " Configure Positively Decode I/O port & Memory " for setting up the I/O port address and Memory resource

□ CN10: Audio Connector

CN10 is a 12-pin 2.0mm IDC connector with AC97 signals for Audio I/O. Use the included Audio cable and FB4706x adapter board for your Audio applications.

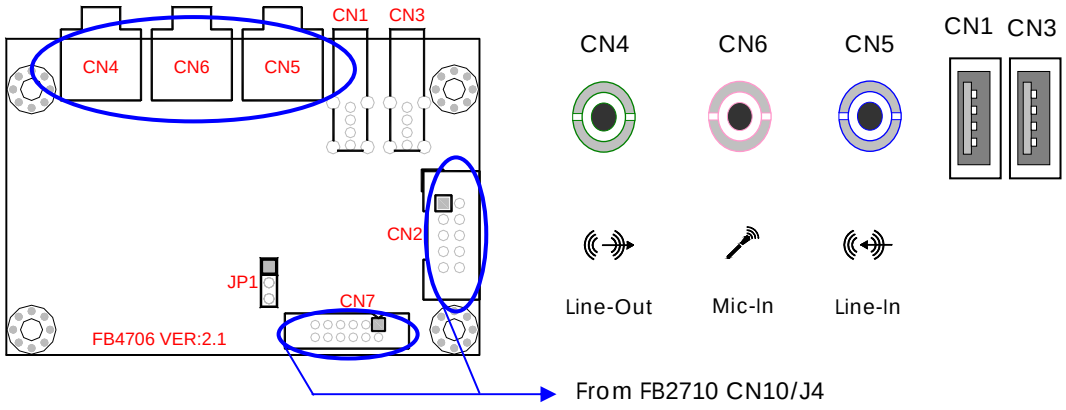




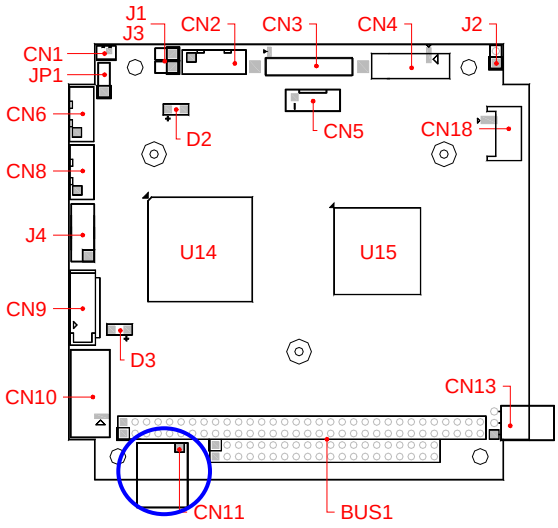
PIN	Description	PIN	Description
1	BITCLK	2	N.C
3	+5V	4	SYNC
5	Ground	6	Ground
7	+3.3V	8	ACRST#
9	SDOUT	10	SPKR
11	SDIN	12	SDIN2

➢ FB4706x (Optional): Provides Audio and USB Board

The CN4, CN6, and CN5 connectors on FB4706x are 2-way Line-In, mono Microphone input, and 2-way Lineout respectively. You can connect CN7 (Audio), CN2 (USB) cable from FB2710 CN10 and J4. The following figure shows these Audio connectors on FB4706x board:



□ CN11: Power Connector (4-pin 2.54mm JAE)



CN11

4 1

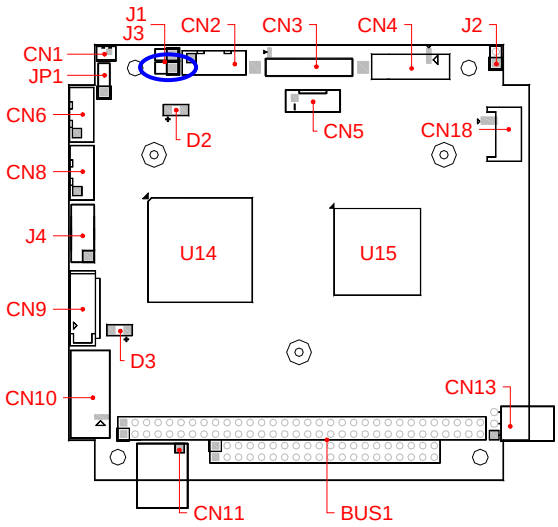
PIN	Signal
1	VCC (+5V)
2	Ground
3	Ground
4	VDD (+12V)

Note: VDD+12V Only Support For LCD Module

Note: Be careful with the pin orientation when installing power connector. A wrong connection can easily destroy the FB2710 board.

➢ J3: Power Button header

The J3 is a 2 pin connecting to Power Button Switch; It's Pushing the PWR-SW button once will switch the FB2710 on or off. It's depending on system BIOS (South Bridge > Restore on AC Power Lose) or OS setting.

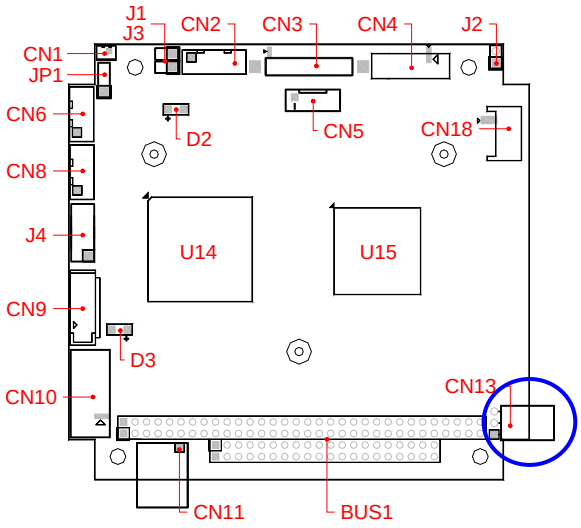


J3

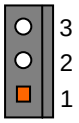
2 1

PIN	Signal
1	Power Button +
2	Power Button -

□ CN13: CPU or System Fan Connector



CN13



Pin	Signal
1	Ground
2	+12V
3	+ 5V

Chapter 3 Installing VGA & LCD Display

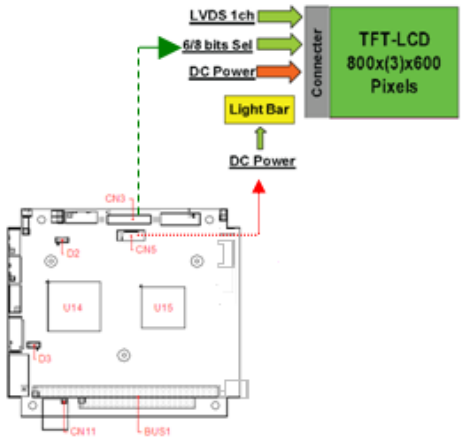
This chapter describes the configuration and installation procedure of LVDS LCD modules and VGA monitor displays. Both VGA monitor and LVDS LCD module may be used at the same time. However, each type of LVDS LCD modules requires BIOS Setting. This section describes the configuration and installation procedure using LCD module. Skip this section if you are using VGA monitor only.

- LVDS LCD Module Display
- VGA monitor & LVDS LCD Module Display

LVDS LCD FLAT PANEL DISPLAY

Using the BIOS setting for different types of LVDS LCD module, then set your system properly and configures BIOS setting for the right type of LVDS LCD module you are using.

The following shows the block diagram of using FB2710 for LVDS LCD module.



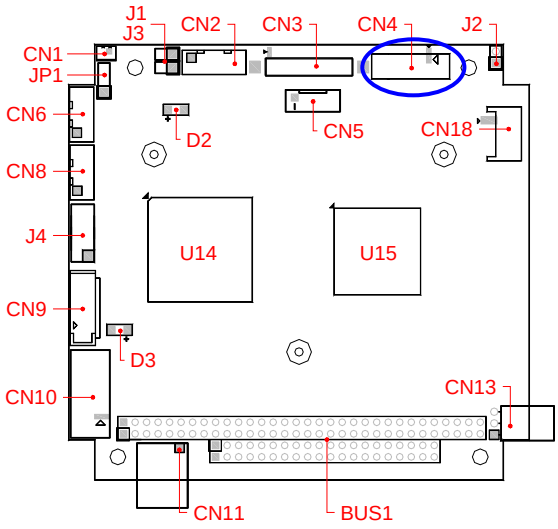
LCD Panel Block Diagram

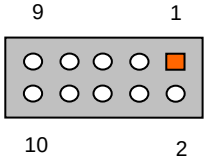
The diagram shows that FB2710 needs components to be linked with a LCD Module.

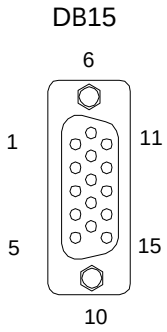
NOTE: Be careful with the pin orientation when installing connectors and the cables. A wrong connection can easily destroy your LCD module. The pin 1 of the cable connectors is indicated with a sticker and the pin1 of the ribbon cable usually has a different color.

VGA Display (CN4)

The FB2710 supports a VGA colored monitor. It can be connected to create a compact video solution for the industrial environment. 254MB simulated VRAM allows a maximum VGA resolution of 1920X1080 with 32 bit at 60Hz. The following table and figure illustrate the pin definition of CN4 and D-sub 15-pin on the VGA adapter cable:





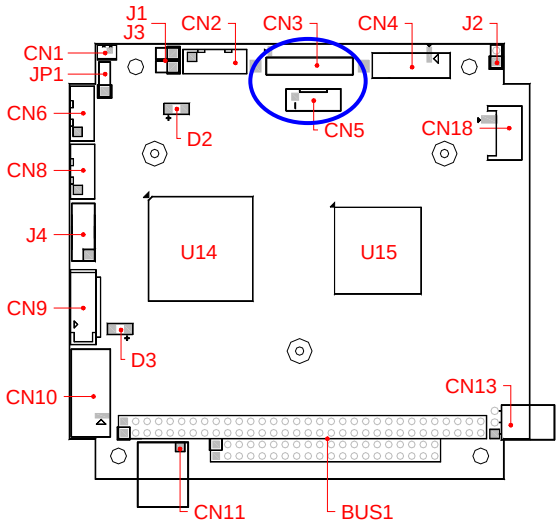


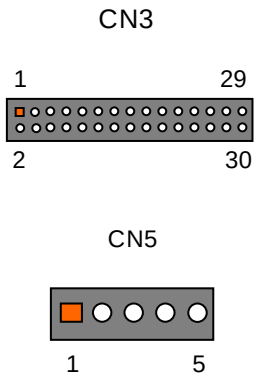
Pin	Signal	DB-15	Pin	Signal	DB15
1	RED	1	2	Case Ground	Case
3	GREEN	2	4	Digital Ground	5,10
5	BLUE	3	6	Analog Ground	6,7,8
7	VSYNC	14	8	DDC Data	12
9	HSYNC	13	10	DDC Clock	15

NOTE: Be careful with the pin orientation when installing VGA connector and the cable.

□ CN3 & CN5: LVDS Connector and Power Connector

CN3 (DF13) is a 24-bit LCD interface connector and CN5 is the LCD power connector for backlight of LCD. The pin assignments are listed in the following table.





CN3	Signal	CN3	Signal
1	Ground	2	LVDS_FP0 +
3	LVDS_FP0 -	4	Ground
5	LVDS_FP1+	6	LVDS_FP1 -
7	Ground	8	LVDS_FP2 +
9	LVDS_FP2 -	10	Ground
11	LVDS_CK +	12	LVDS_CK -
13	Ground	14	LDP0_AUX +
15	LTDP0_AUX -	16	Ground
17	LTDP0_HP0	18	N.C
19	Ground	20	N.C
21	N.C	22	Ground
23	N.C	24	N.C
25	Ground	26	Ground
27	LVDS_+3.3V	28	LVDS_+3.3V
29	LVDS_+3.3V	30	LVDS_+3.3V

CN5	Signal
1	+12V
2	Ground
3	ENVDD
4	N.C.
5	ENABLK

NOTE: If any trouble occurs when connecting FB2710 with LCD panels, you could contact technical support division of FabiaTech Corporation.

Chapter 4 BIOS Setup

This chapter describes the BIOS setup.

Overview

BIOS are a program located on a Flash memory chip on a circuit board. It is used to initialize and set up the I/O peripherals and interface cards of the system, which includes time, date, hard disk drive, the ISA bus and connected devices such as the video display, diskette drive, and the keyboard. This program will not be lost when you turn off the system.

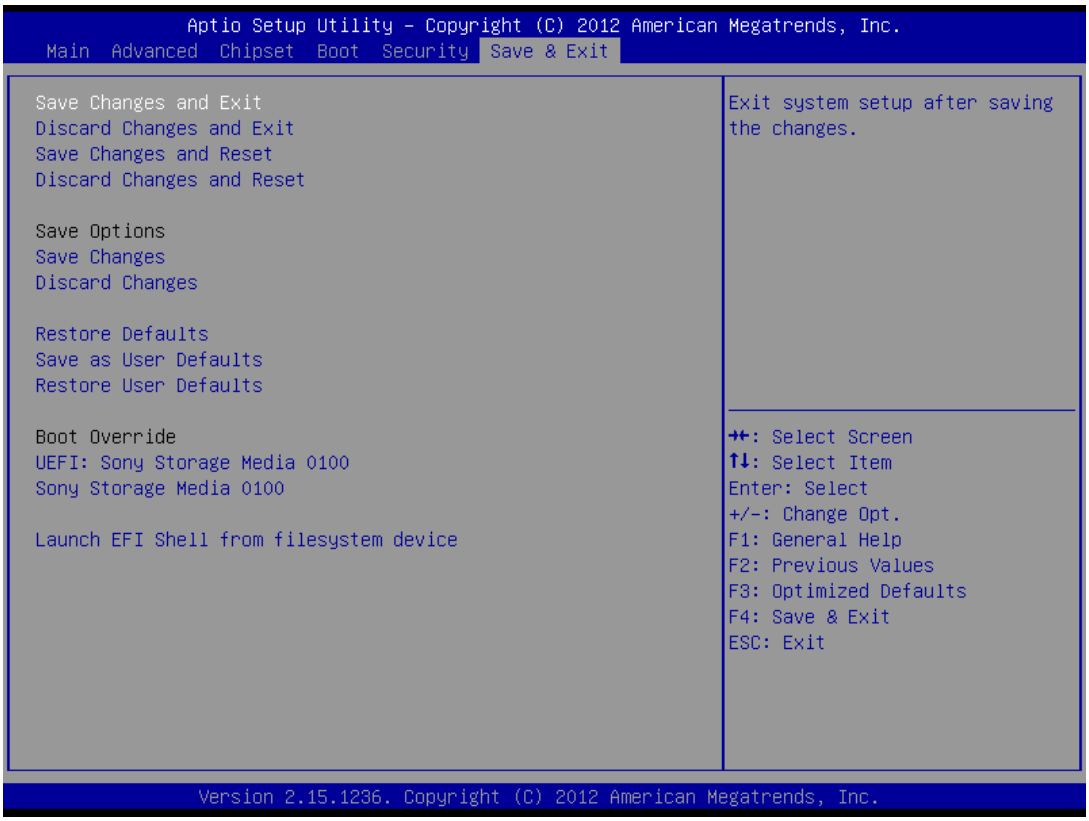
The BIOS provides a menu-driven interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

All the changes you make will be saved in the system RAM and will not be lost after power-off.

When you start the system, the BIOS will perform a self-diagnostics test called Power On Self Test (POST) for all the attached devices, accessories, and the system. Press the [ESC] or [DEL] key to enter the BIOS Setup program, and then the main menu will show on the screen.

Note: Change the parameters when you fully understand their functions and subsequence.



□ BIOS Functions

On the menu, you can perform the following functions

1. Main
2. Advanced
   - ACPI Settings
   - CPU Configuration
   - IDE Configuration
   - USB Configuration
   - SMART Settings
   - Super IO Configuration
   - WAKE Configuration
   - IT8888 Configuration
3. Chipset
   - North Bridge
   - North Bridge LVDS Config Select
   - South Bridge
4. Security
5. Boot
6. Save & Exit

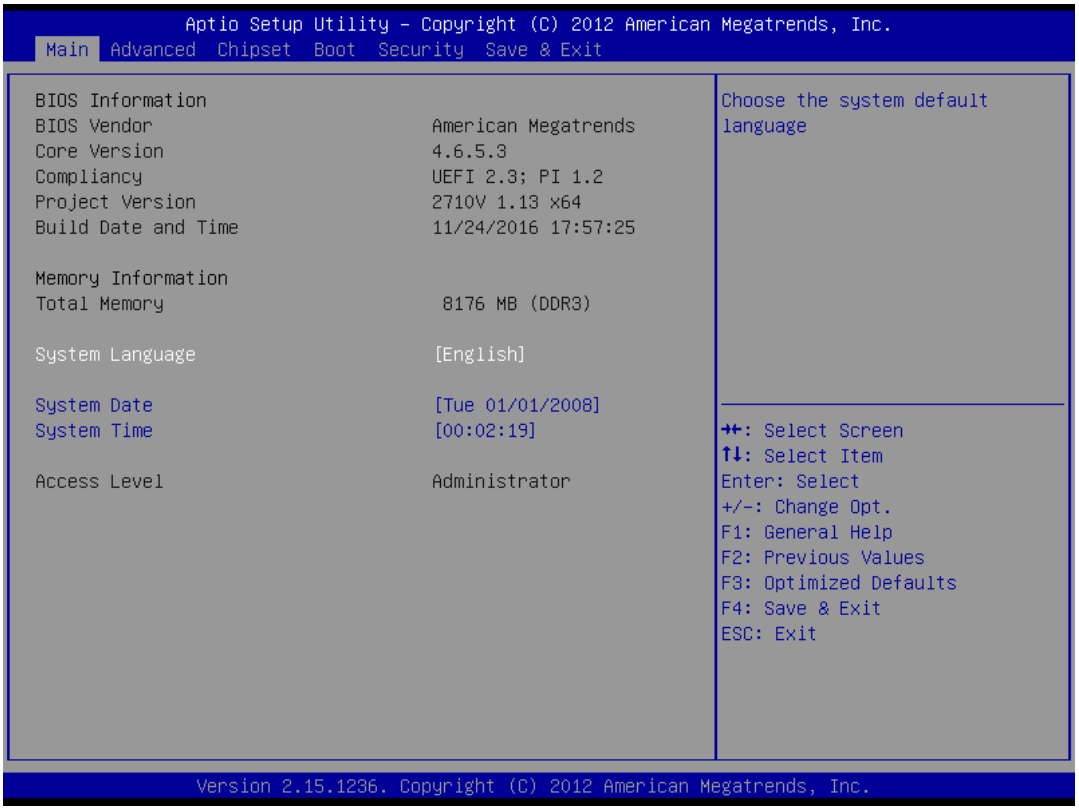
- **Keyboard Convention**

On the BIOS, the following keys can be used to operate and manage the menu:

Key	Function
[↑][↓]	The Up and Down keys allow you to select item.
[←][→]	The Left and Right keys allow you to select screen.
[Enter]	The Enter key allows the user to select an option to edit its value or access a sub menu.
[+]/[-]	The Plus and Minus keys allow you to change the field value of a particular setup item.
[F1]	General Help.
[F2]	Previous Values.
[F3]	Optimized Defaults.
[F4]	Save current configuration and exit.
[ESC]	To exit the current menu or message.

Main Setup

This section describes BIOS version information and basic system hardware configuration. If the CPU board is already installed in a working system, you will not need to select this option anymore.



➢ **System Date & Time Setup**

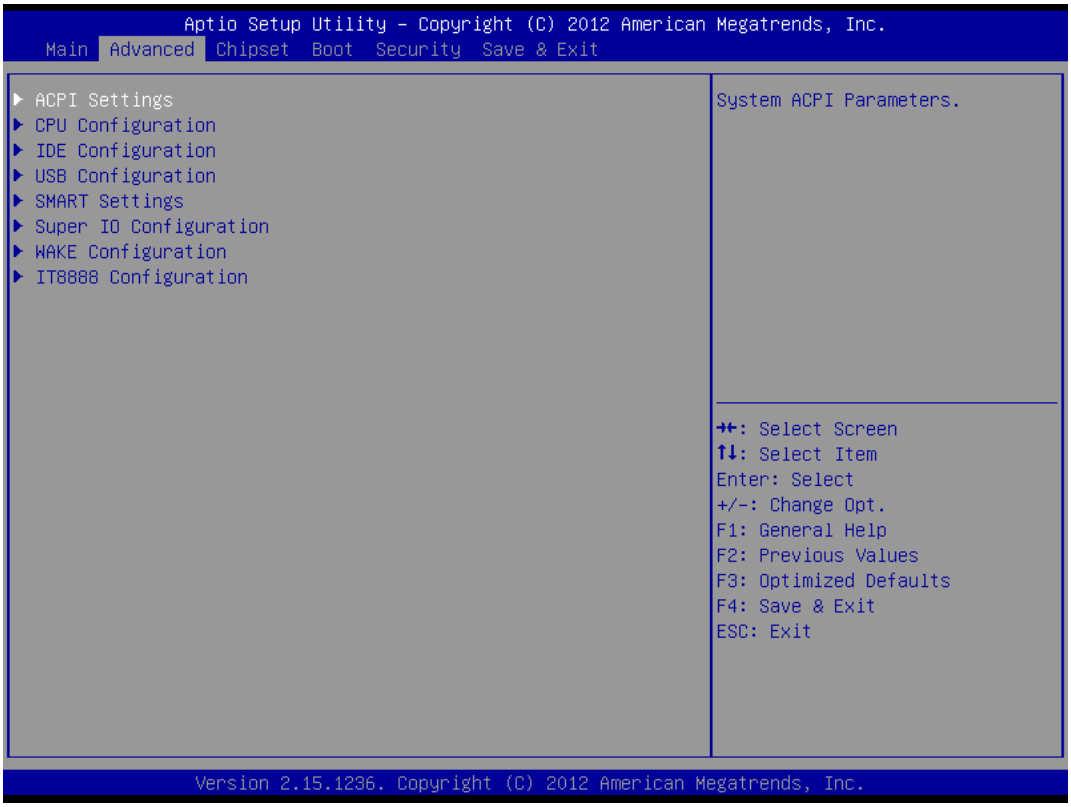
Highlight the <Date> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [+]/ [-] keys or enter new values to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

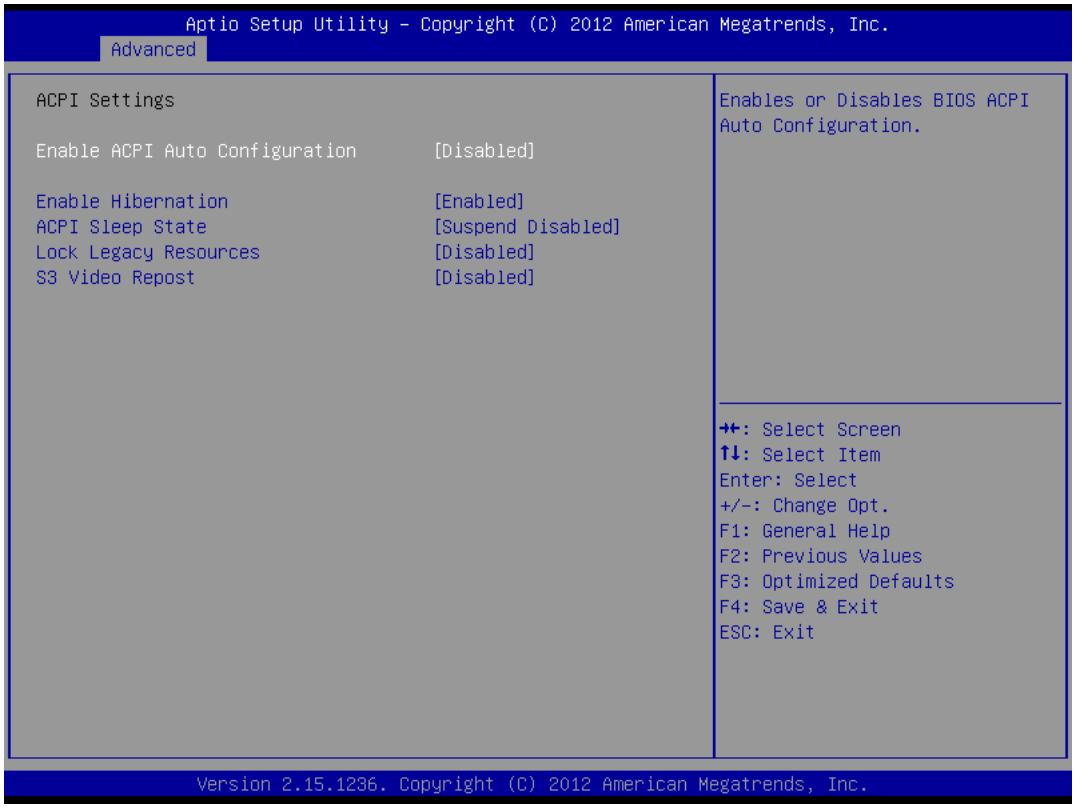
Advanced Setup

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as USB Configuration, to go to the sub menu for that item. You 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 screen is shown below. The sub menus are described on the following pages



❑ ACPI settings

This filed specifies allow you set this value to utilize the ACPI (Advanced Configuration and Power Interface) specification.



➢ Enabled ACPI Auto Configuration

This item allows users to enable or disable BIOS ACPI Auto Configuration.

Available Options: Disabled, Enabled

Default setting: Disabled

✧ *Enable Hibernation*

This item allows users to enable or disable system ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

Available Options: Disabled, Enabled

Default setting: Enabled

✧ ***ACPI Sleep State***

This item allows users to select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

Available Options: Suspend Disabled, S1 Only (CPU Stop Clock)

Default setting: Suspend Disabled

✧ ***Lock Legacy Resources***

This item allows users to enable or disable Lock of Legacy Resources.

Available Options: Disabled, Enabled

Default setting: Enabled

✧ ***S3 Video Report***

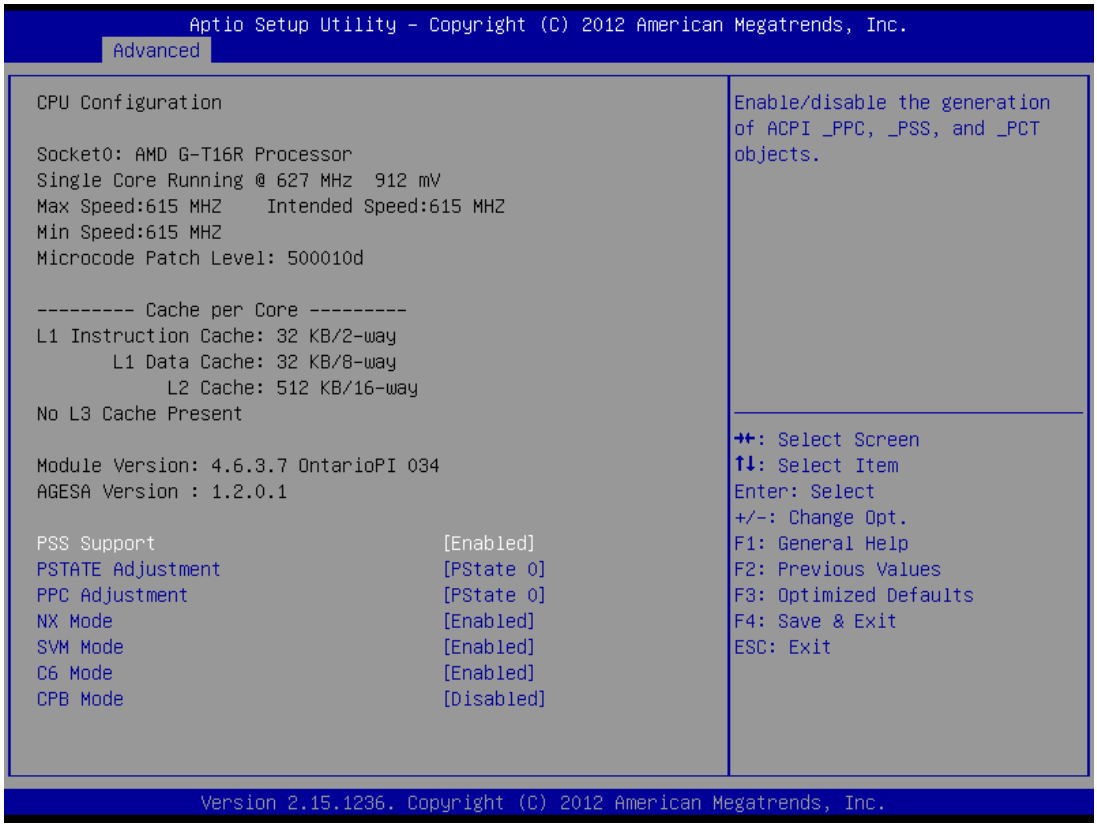
This item allows users to enable or disable S3 Video Report.

Available Options: Disabled, Enabled

Default setting: Enabled

❑ CPU Configuration

The Item Display CPU Information, like CPU speed and L1/L2 cache and support function, you can use this screen to select options for the CPU information. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



➢ PSS Support

This field allows users to enable or disable the generation of ACPI_PPC, _PSS, and _PCT objects.

Available Options: Disabled, and Enabled

Default setting: Enabled

➢ PSTATE Adjustment

This field provides to adjust start-up P-state level.

Available Options: PSTATE0 ~ PSTATE7

Default setting: PSTATE0

- **PPC Adjustment**

This field provides to adjust _PPC objects.

Available Options: PSTATE0, and PSTATE2

Default setting: PSTATE0

- **NX Mode**

This field allows the users to enable or disable the No-executed page Protection functions.

Available Options: Disabled, and Enabled

Default setting: Enabled

- **SVM Mode**

When SVM (Secure Virtual Machine) enabled, a CPU Virtualization can utilize the additional hardware capabilities.

Available Options: Disabled, and Enabled

Default setting: Enabled

- **C6 Mode**

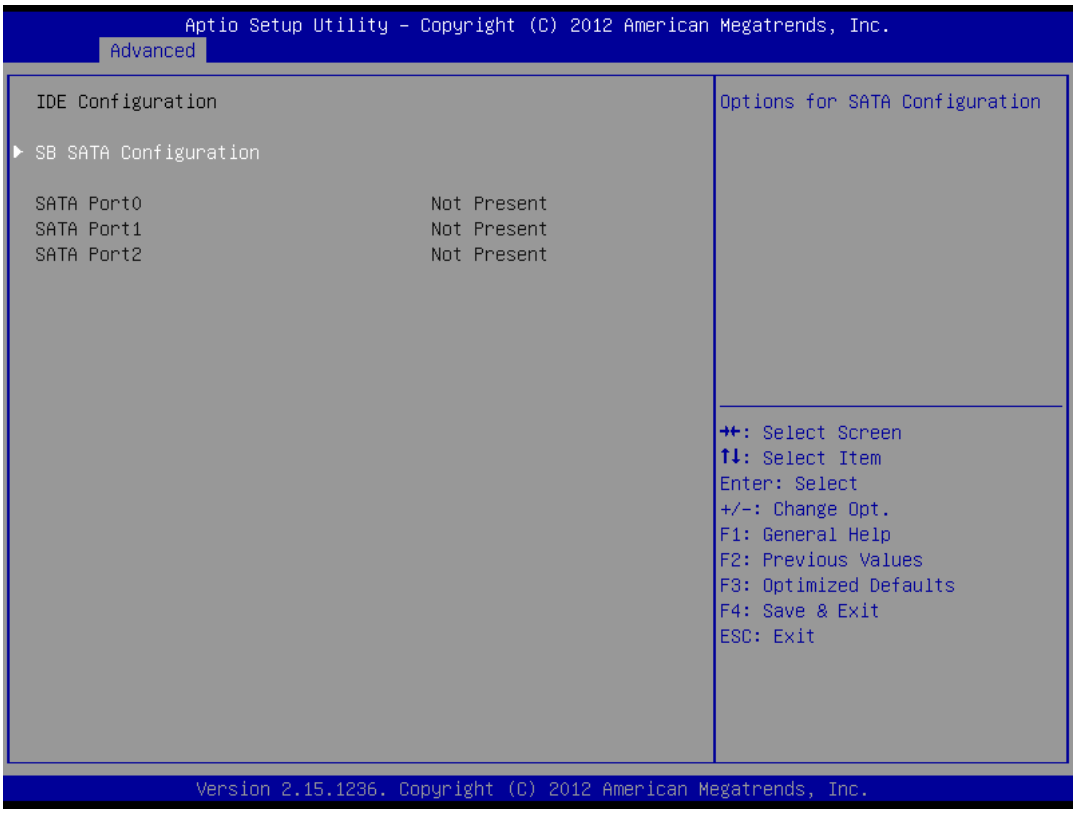
This field allows the users to enable or disable CPU *C6* is a power state available to the processor as a power-saving measure.

Available Options: Disabled, and Enabled

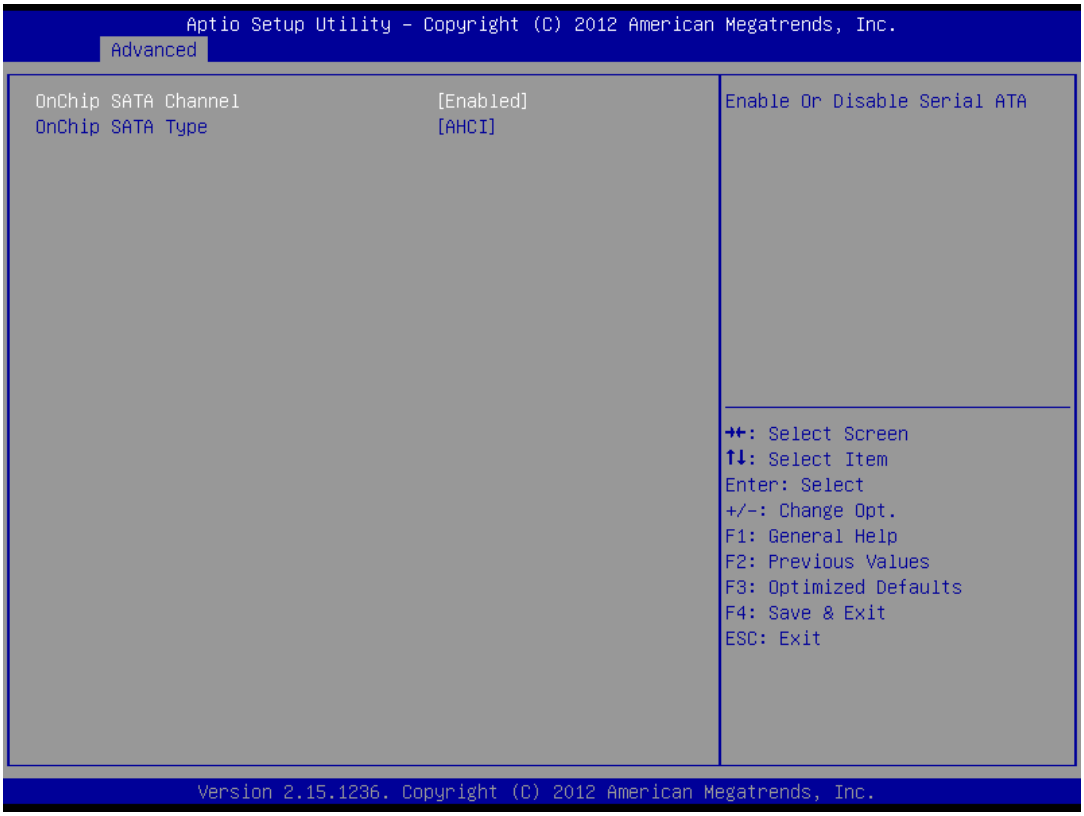
Default setting: Enabled

❑ IDE Configuration

You can use this screen to select options for the SB SATA Configuration.



➢ **SB SATA Configuration**



✧ ***OnChip SATA Channel***

This item allows users to enable or disable SATA Controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

✧ ***OnChip SATA Type***

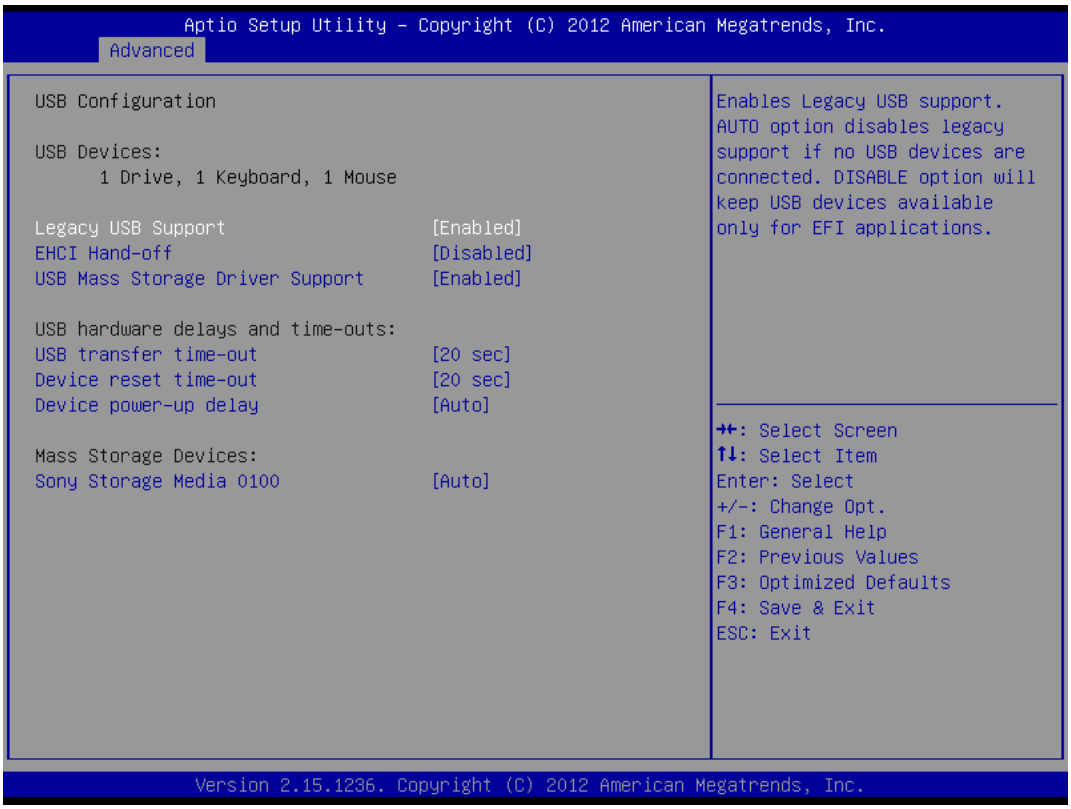
Select a configuration for SATA controller. Install Windows XP in AHCI mode need to use the F6 Method pre-installed AHCI driver, if you select Legacy IDE mode, you do not need to pre-install.

Available Options: AHCI, and Legacy IDE

Default setting: AHCI

❑ USB Configuration

You can use this screen to select options for the USB Configuration.



➢ Legacy USB Support

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled; any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to Enabled or Disabled the Legacy USB Support.

Available Options: Disabled, Auto, and Enabled

Default setting: Enabled

➢ EHCI Hand-Off

This is a workaround for OS without EHCI Hand-Off support. The EHCI ownership change should claim by EHCI driver.

Available Options: Disabled, and Enabled

Default setting: Disabled

- **USB Mass Storage Driver Support**

Mass storage device emulation type. If the emulation FDD, recommended formatted as FAT32 format.

Available Options: Disabled, and Enabled

Default setting: Enabled

- **USB transfer time-out**

The time-out value for control, bulk, and interrupt transfers.

Available Options: 1 sec, 5 sec, 10 sec, and 20 sec

Default setting: 20 sec

- **Device reset time-out**

USB mass storage device start unit command time-out.

Available Options: 10 sec, 20 sec, 30 sec, and 40 sec

Default setting: 20 sec

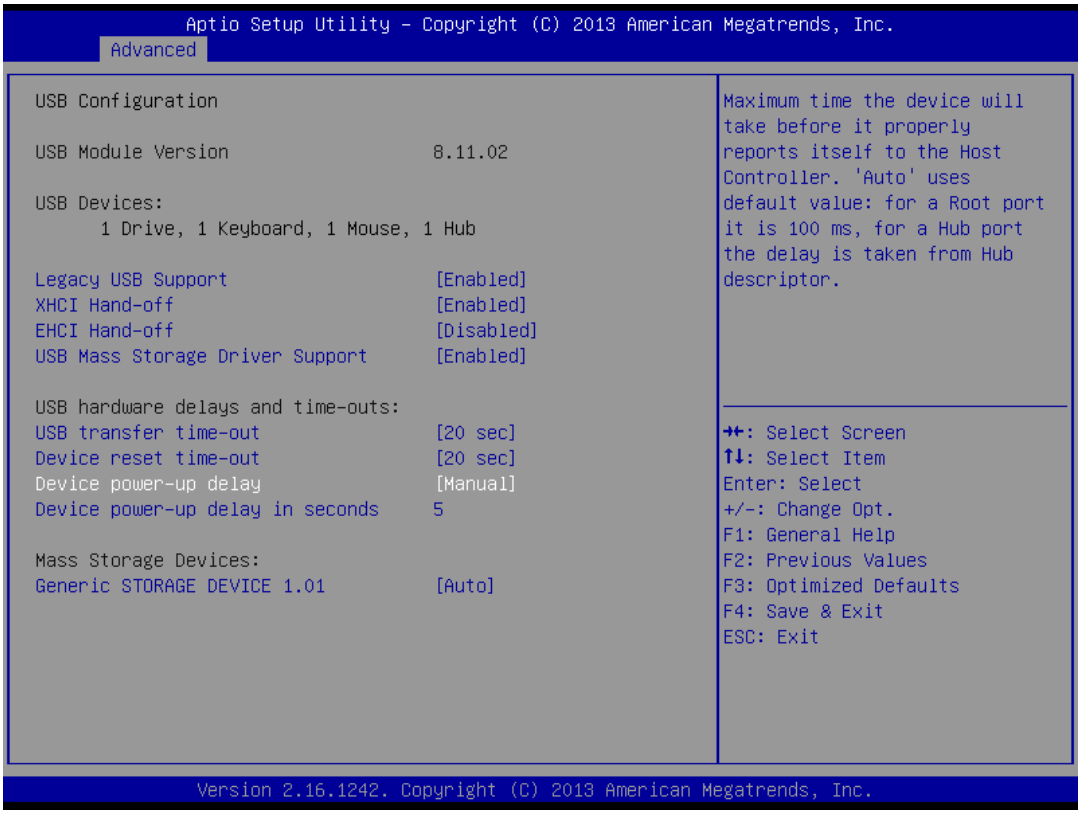
- **Device power-up delay**

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

Available Options: Auto, and manual

Default setting: Auto

➢ **Device power-up delay > Select "Manual"**



✧ ***Device Power-Up delay in second***

Delay range is 1...40 seconds, in one second increments

Available Options: 1, 5, 10, 20, 30, and 40 Sec

Default setting: 5 Sec

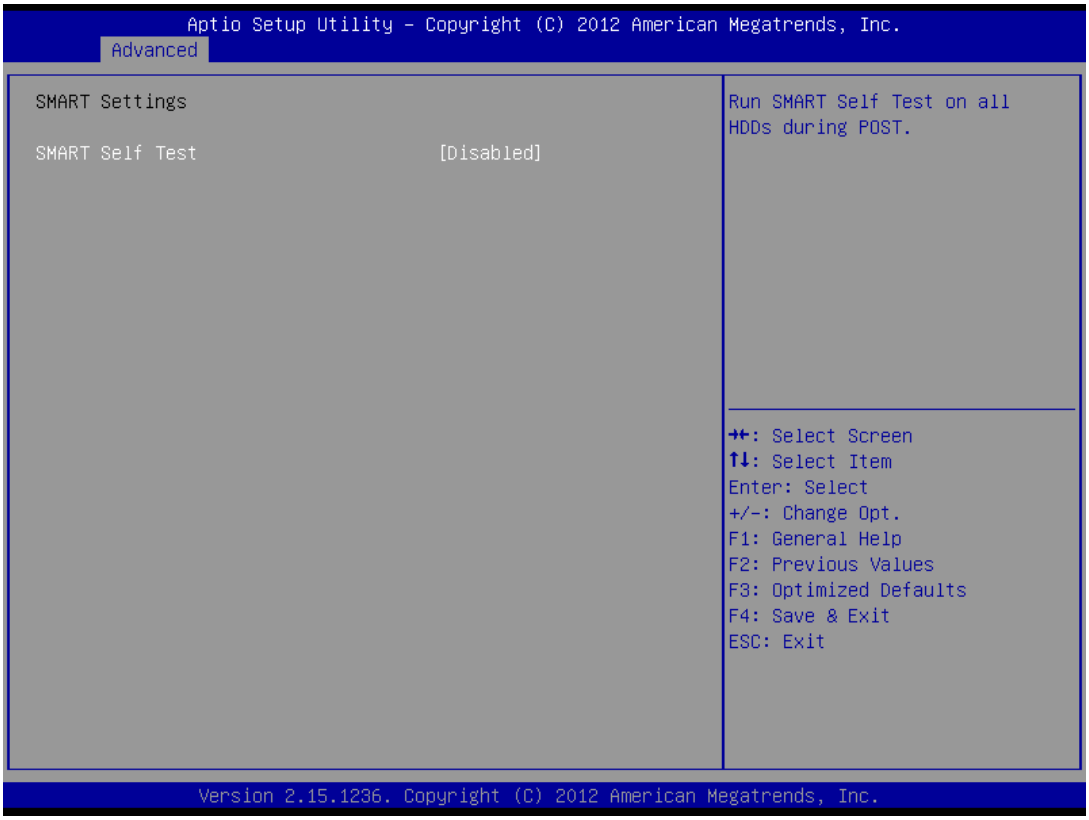
➢ **Generic Storage Device 1.01**

Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM'; drives with no media will be emulated according to a drive type.

Available Options: Auto, Floppy, Forced FDD, Hard Disk, and CD-ROM

Default setting: Auto

❑ SMART Settings



➢ SMART Self TEST

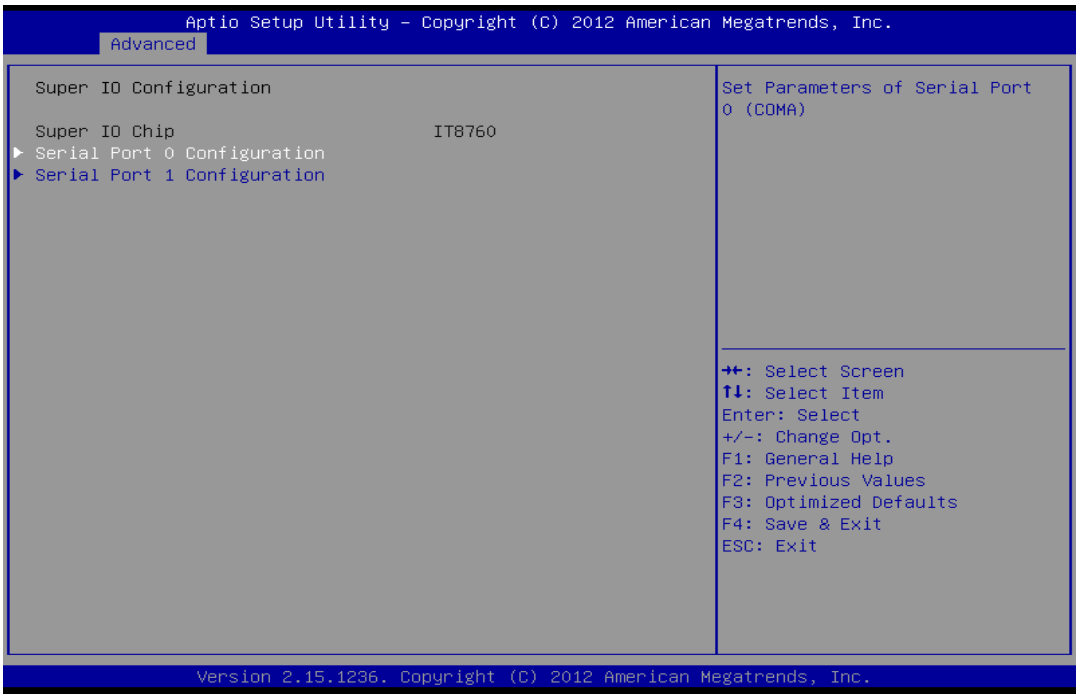
Run SMART Self TEST on all HDD during POST.

Available Options: Disabled, and Enabled

Default setting: Disabled

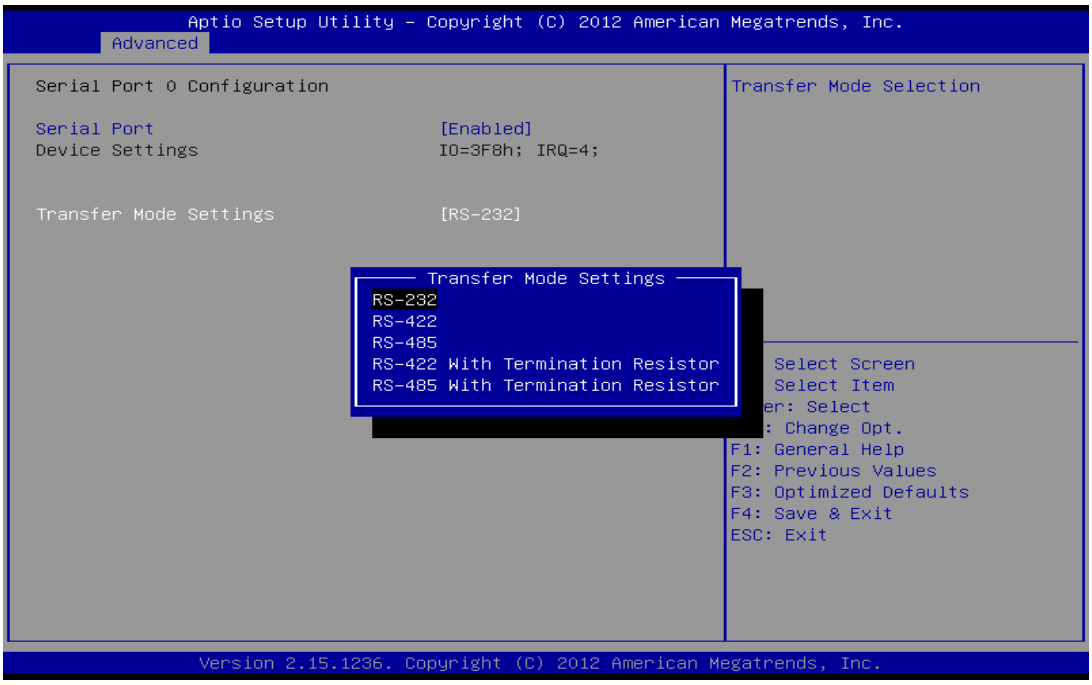
❑ Super IO Configuration

This section describes the function of Super I/O settings.



➢ Serial Port 0 Configuration

These fields select the I/O port address for Serial port 0.



✧ ***Serial Port 0***

This item allows users to select the enable or disable Serial port.

Available Options: Enabled, and Disabled.

Default setting: Enabled

Device Settings

Serial Port0: IO=3F8; IRQ=IRQ4

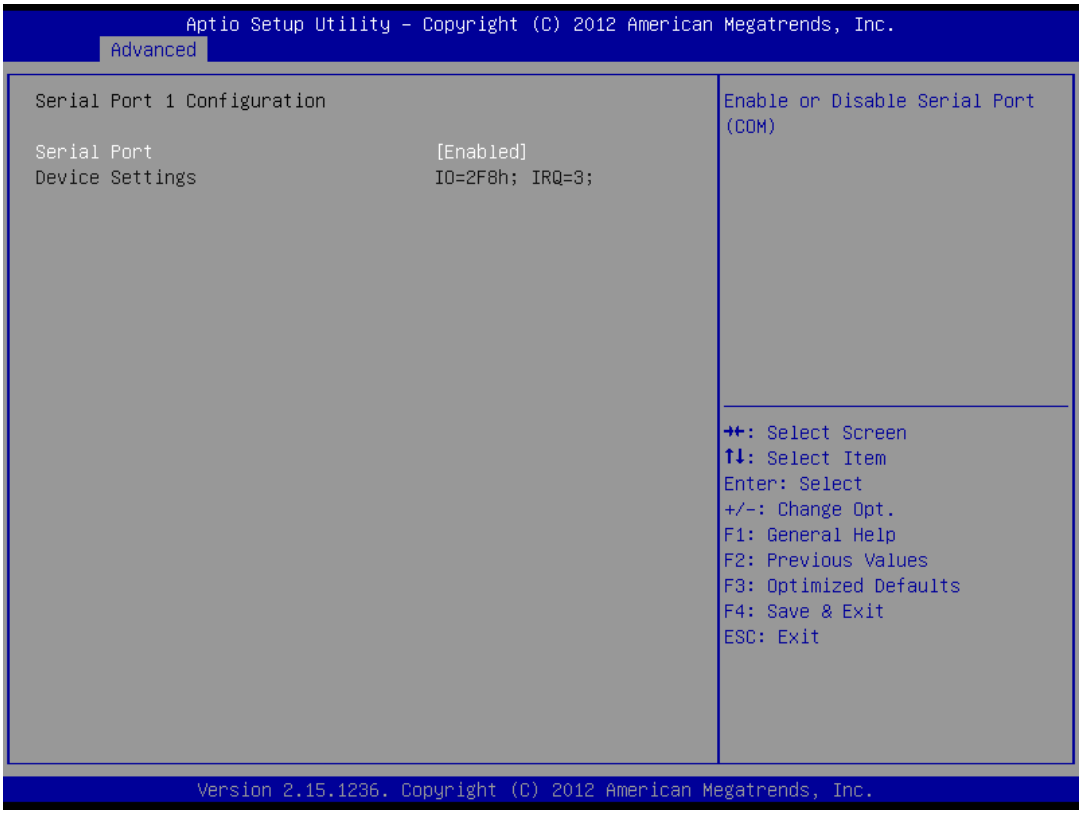
Transfer Mode Setting

This item allows users can select RS-232, RS-422 and RS-485 of select COM1.

Available Options: RS-232, RS-422, RS-485, RS-422 with Termination Resister, and RS-485 with Termination Resistor

Default setting: RS-232

➢ Serial Port 1 Configuration



✧ *Serial Port 1*

This item allows users to select the enable or disable Serial port.

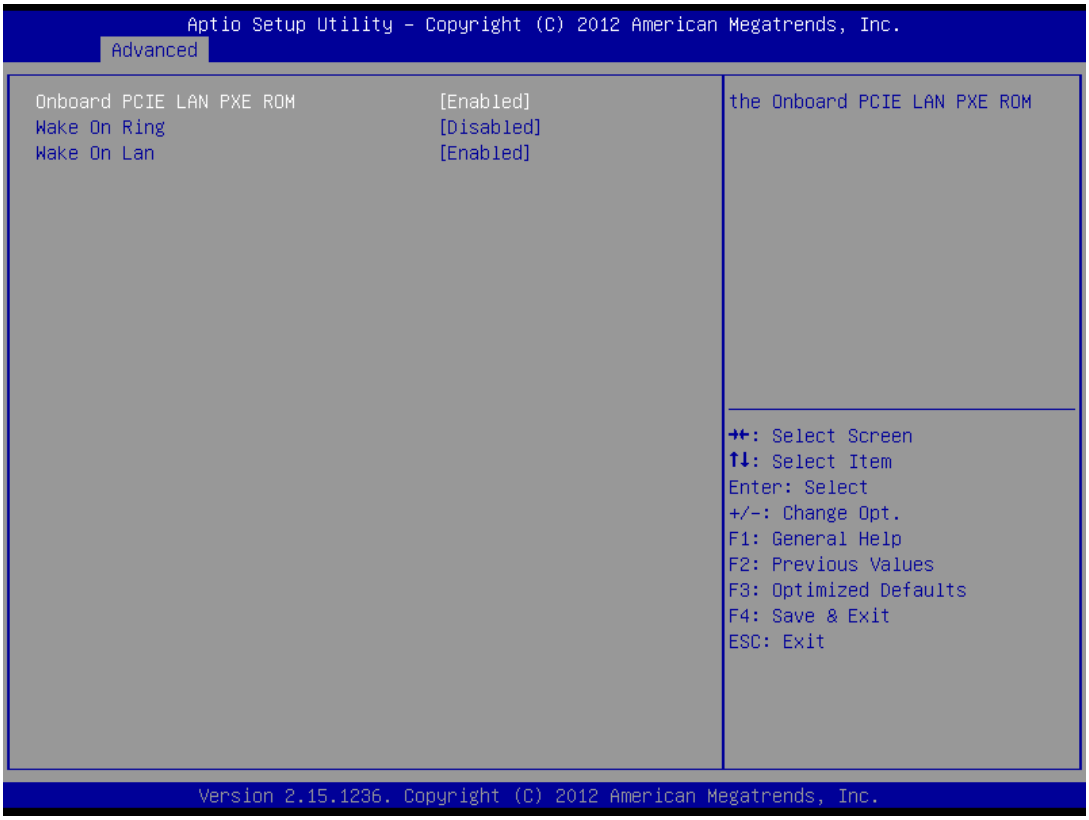
Available Options: Enabled, and Disabled.

Default setting: Enabled

Device Settings

Serial Port1: IO=2F8; IRQ=IRQ3

❑ Wake Configuration



➢ Onboard PCIE LAN PXE ROM

This field specifies the PXE boot ROM of the onboard LAN chip.

Available Options: Disabled, and Enabled

Default setting: Disabled

➢ Wake ON Lan

This item is can select Enabled to integrated LAN to wake up the system.

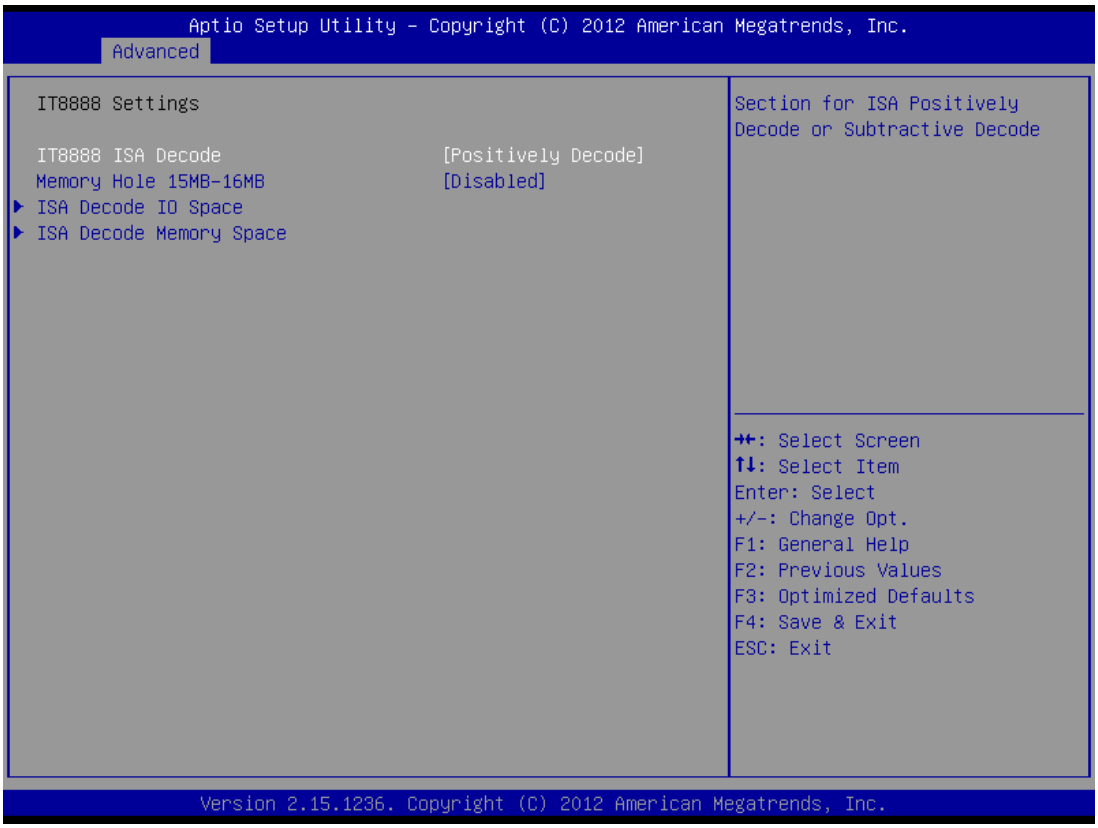
Available Options: Disabled, and Enabled

Default setting: Enabled

❑ Realtek PCIe GBE Family Controller (MAC)

On the LAN Information screen, you can see the LAN Chipset information, when setting the Launch PXE OpROM Policy to UEFI Only of CSM Boot.

☐ ITE8888 Setting



➢ ITE 8888 ISA Decode

These fields are used for the Select Subtractive or positive decode IO Space.

Available Options: Subtractive Decode, Positively Decode

Default setting: Subtractive Decode

➢ Memory Hole 15MB- 16MB

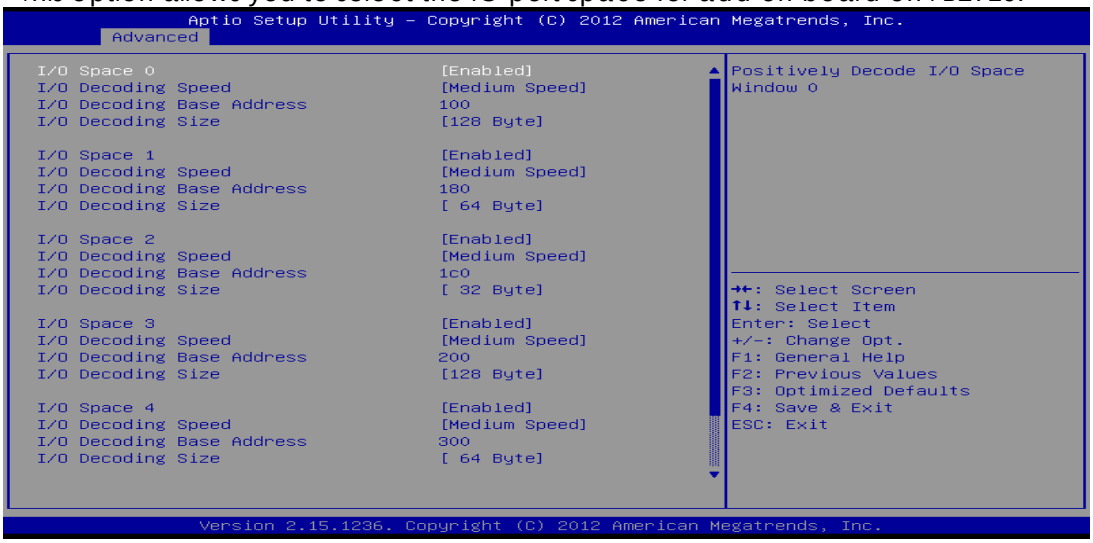
This field specifies the location of an area of memory that cannot be addressed on the ISA bus.

Available Options: Enabled and Disabled

Default setting: Disabled

➢ **ISA IO Decode Space**

This option allows you to select the IO port space for add on board on FB2710.



✧ ***Decode I/O Space 0~5***

These fields are used for the enable configuration and the positive decode IO Space.

Available Options: Disabled and Enable

Default setting: Disable

✧ ***Decode I/O Speed 0~5***

This field is used for the decoding speed for IO Space.

Available Options: Subtractive Speed, Medium Speed, Slow Speed and Fast Speed.

Default setting: Subtractive Speed

✧ ***Decode I/O Addr. 0~5 [15:0]***

These fields is used for the configuration IO Space

Available Options: Min= (001) ~Max (FFF)

Default setting: (100), (180), (1C0), (200), (300), (340),

✧ ***Decode I/O Size 0~5***

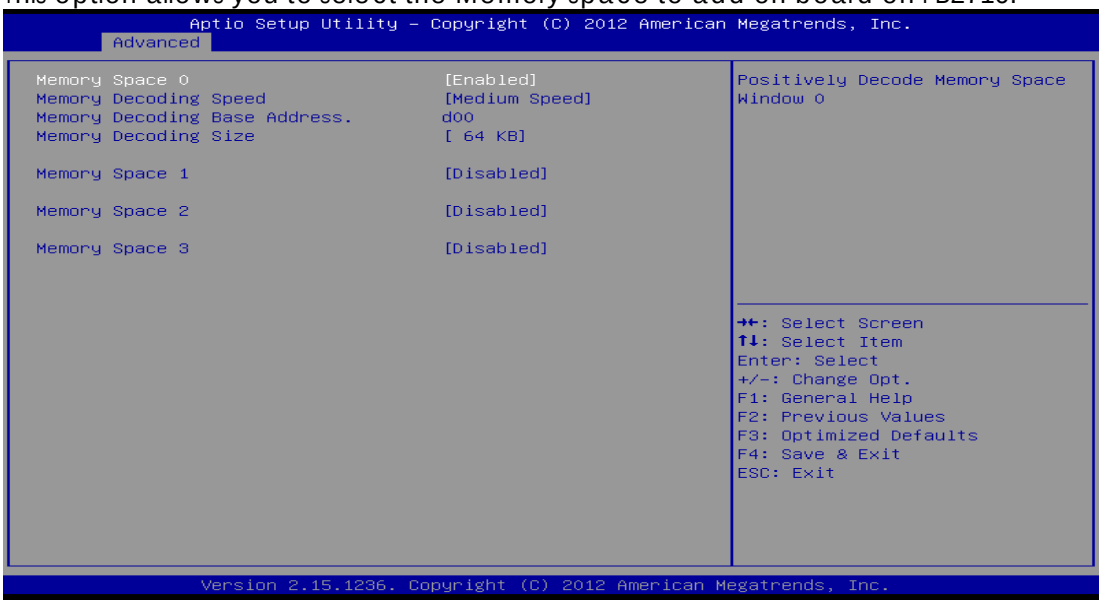
This field is used for the configuration IO Space size.

Available Options: 1 Byte, 2 Byte, 4 Byte, 8 Byte, 16 Byte, 32 Byte, 64 Byte and 128Byte.,

Default setting: (128 Byte), (64 Byte), (32 Byte), (128 Byte), (64 Byte), (32 Byte)

➢ **ITE8888 ISA Decode Memory**

This option allows you to select the Memory space to add on board on FB2710.



✧ ***Decode Memory Space 0~3***

These fields are used for the enable configuration and the positive decode Memory Space.

Available Options: Disabled and Enable

Default setting: Disable

✧ ***Decode Memory Speed 0~3***

This field is used for the decoding speed for memory Space.

Available Options: Subtractive Speed, Medium Speed, Slow Speed and Fast Speed.

Default setting: Medium Speed

✧ ***Decode Memory Addr. 0~4 [23:12]***

These fields are used for the configuration Memory Space.

Available Options: Min= (001) ~Max (FFF)

Default setting: (d00)

✧ ***Decode Memory Size 0~4***

This field is used for the configuration memory Space size.

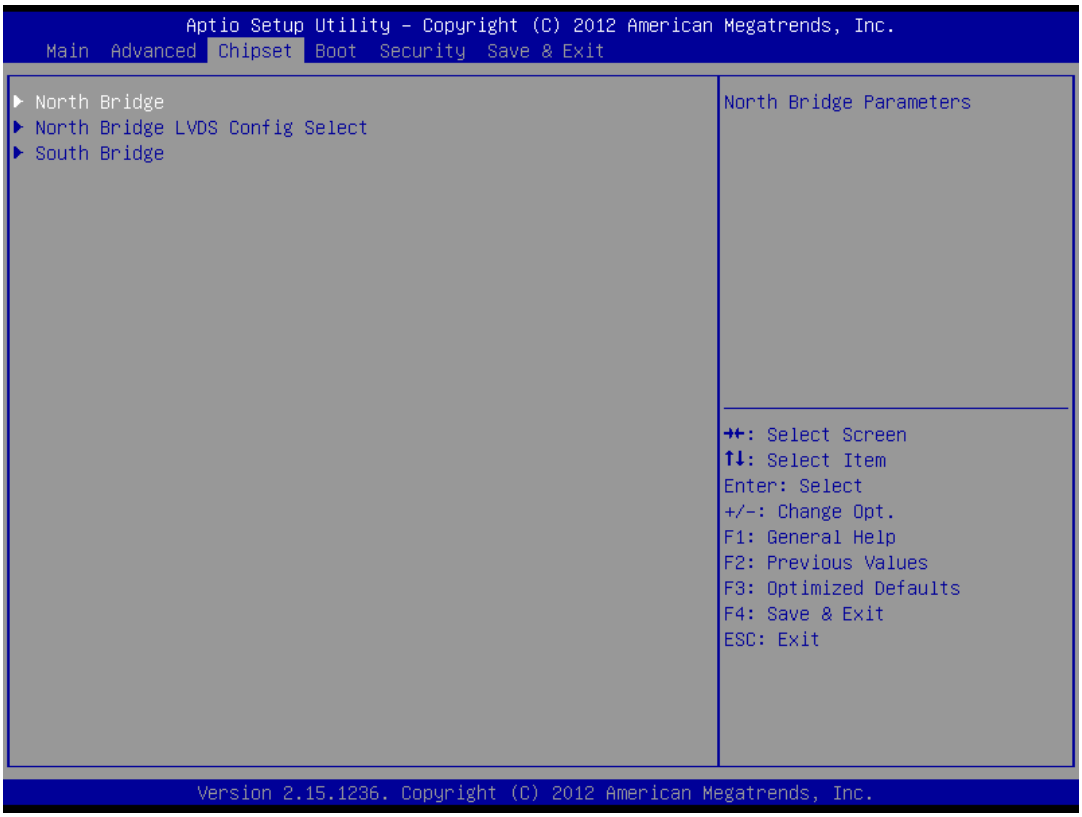
Available Options: 16 KB, 32 KB, 64 KB, 128 KB, 256 KB, 512 KB,1 MB and 2 MB

Default setting: 64 KB

Chipset

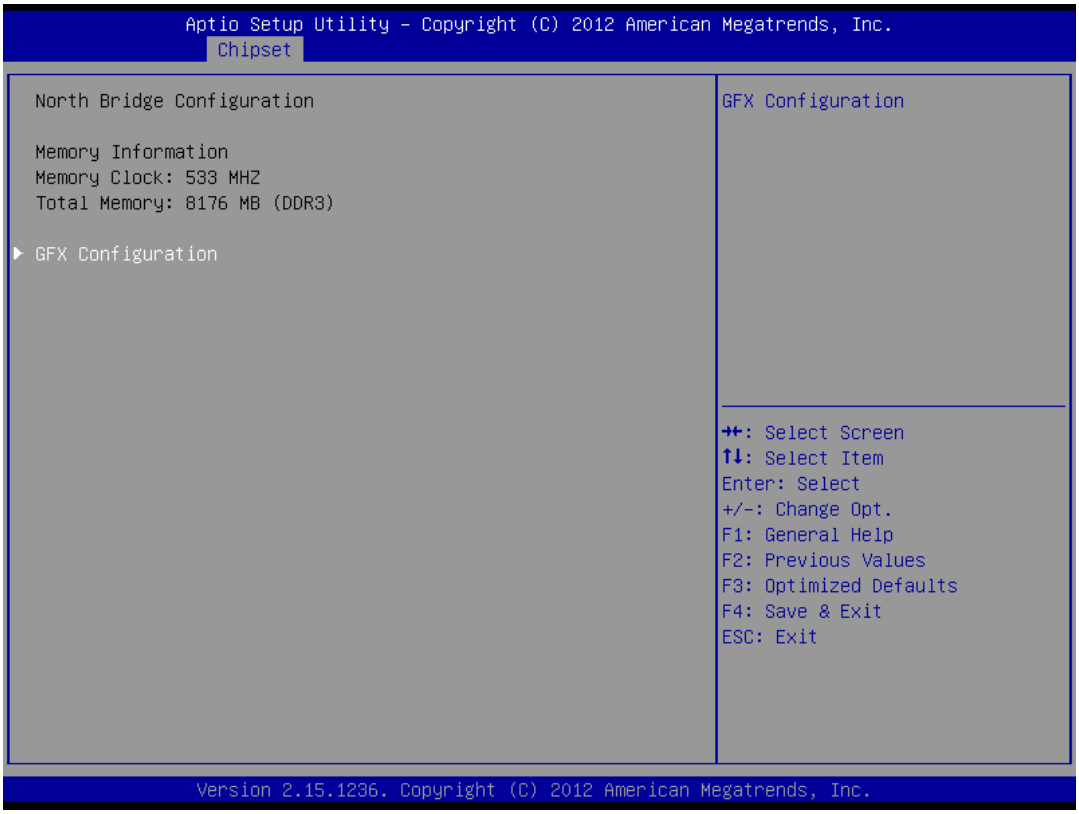
This section describes the configuration of the board's chipset features.

- North Bridge
- North Bridge LVDS Config Select
- South Bridge



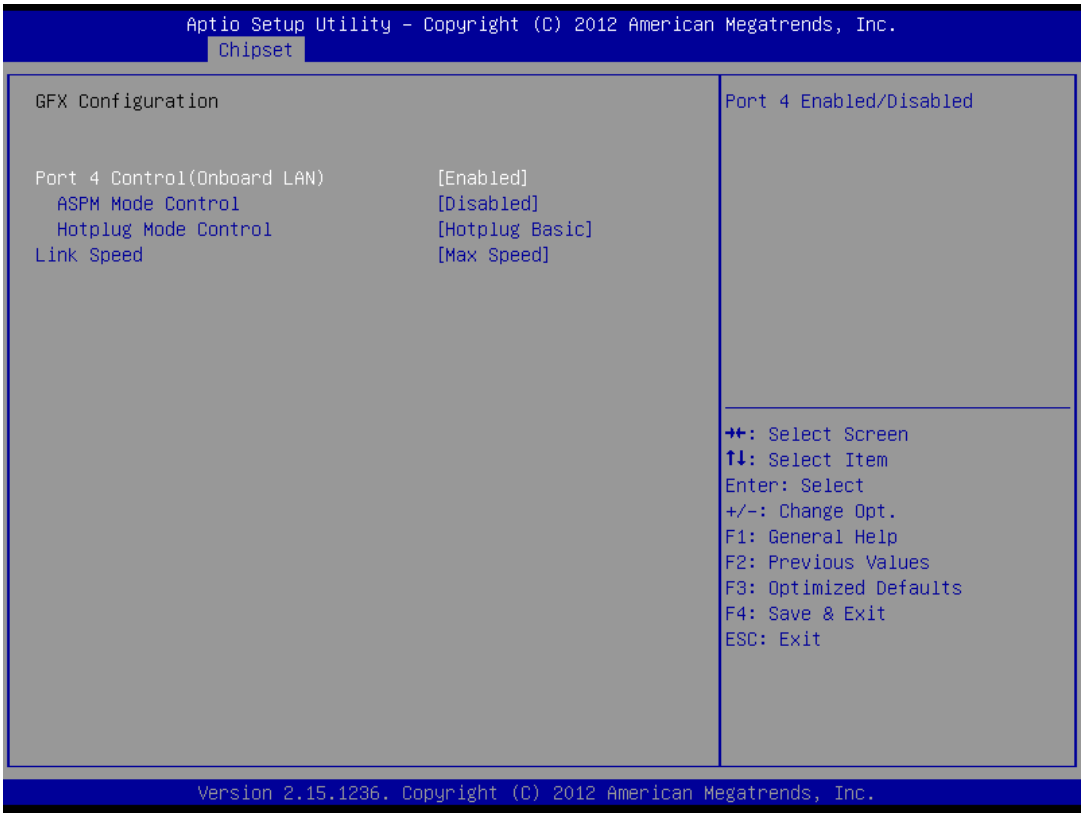
❑ North Bridge

You can use this screen to select options for the North Bridge Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



➢ **GFX Configuration**

On the Socket 0 Information screen, you can see the system memory information.



✧ ***Port 4 Control (Onboard LAN)***

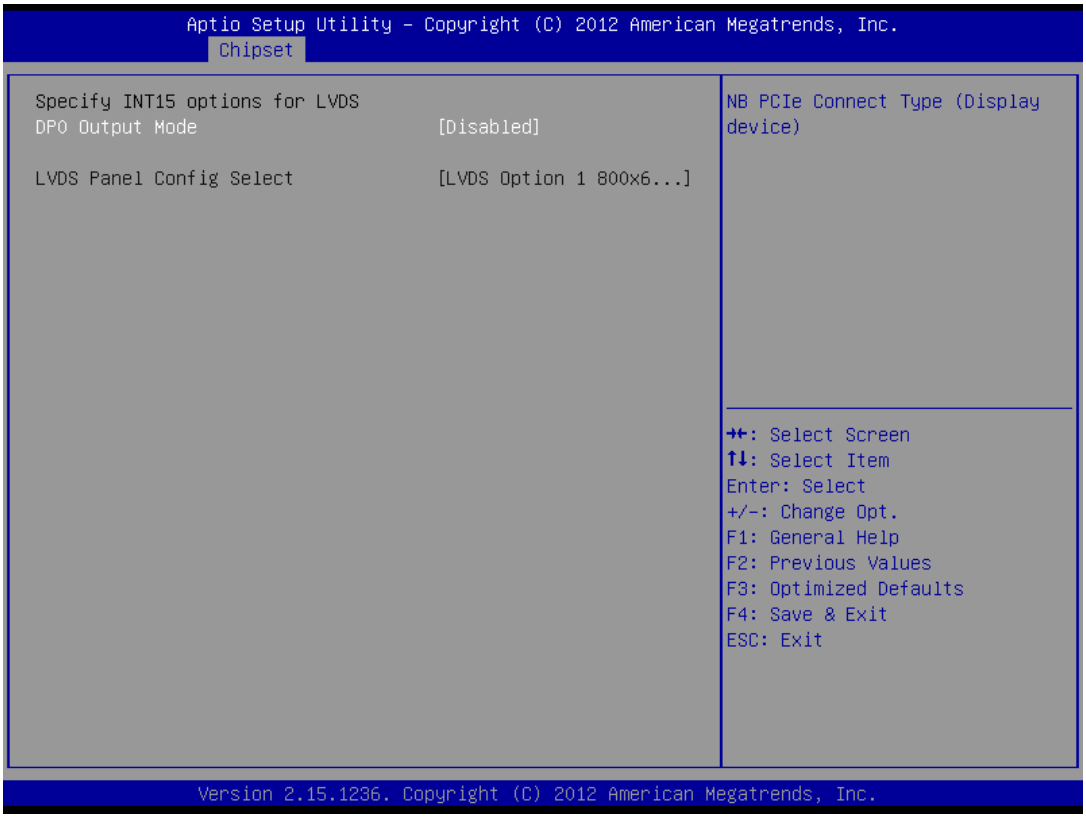
The onboard LAN corresponding PCI Express port 4, the item allows users to enable or disable on board PCIe LAN.

Available Options: Disabled, and Enabled

Default setting: Enabled

❑ **North Bridge LVDS Config Select**

You can use this screen to select options for the Host Bridge Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



➢ **DP0 Output Mode**

This field specifies which LVDS display will be used when the system is boot. You can select LVDS or disable booting on the LVDS Display.

Available Options: Disabled and LVDS

Default setting: Disabled

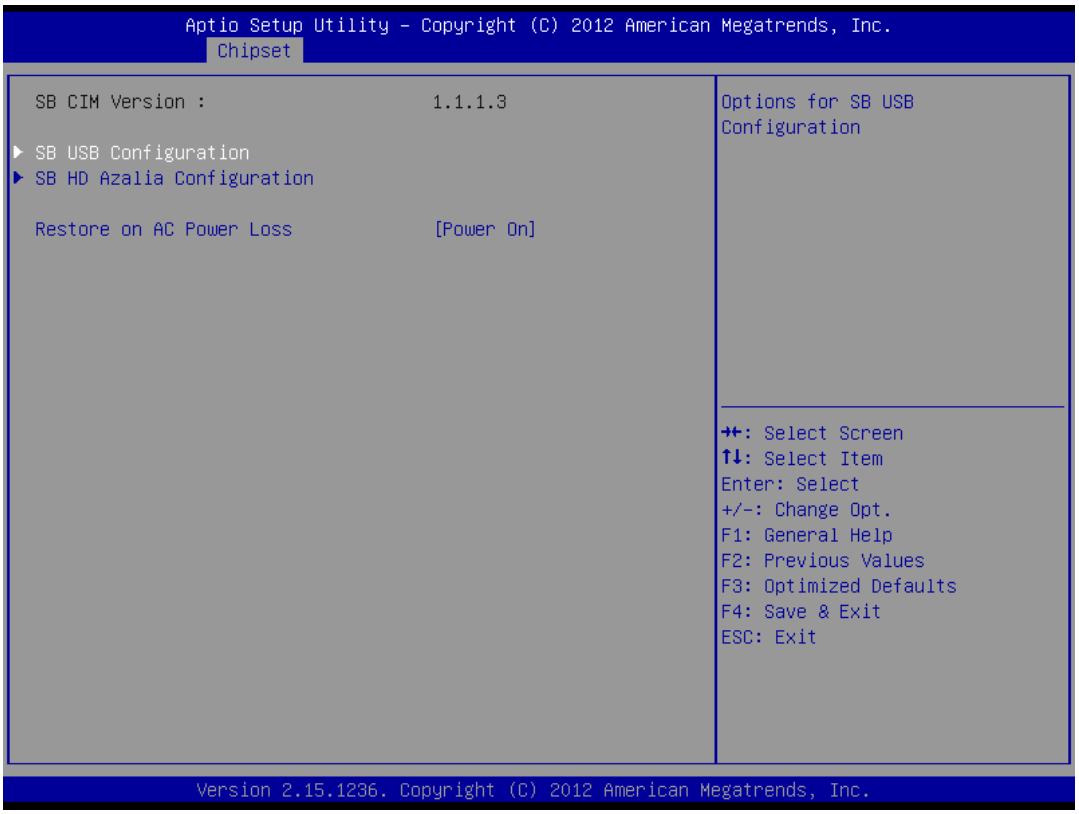
✧ ***LVDS Panel Config Select***

When use the LCD the field specifies which select display resolution for different LVDS TFT LCD display type.

Available Options: See the BIOS LVDS Panel Display Table.

❑ South Bridge

You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the USB, and audio function.



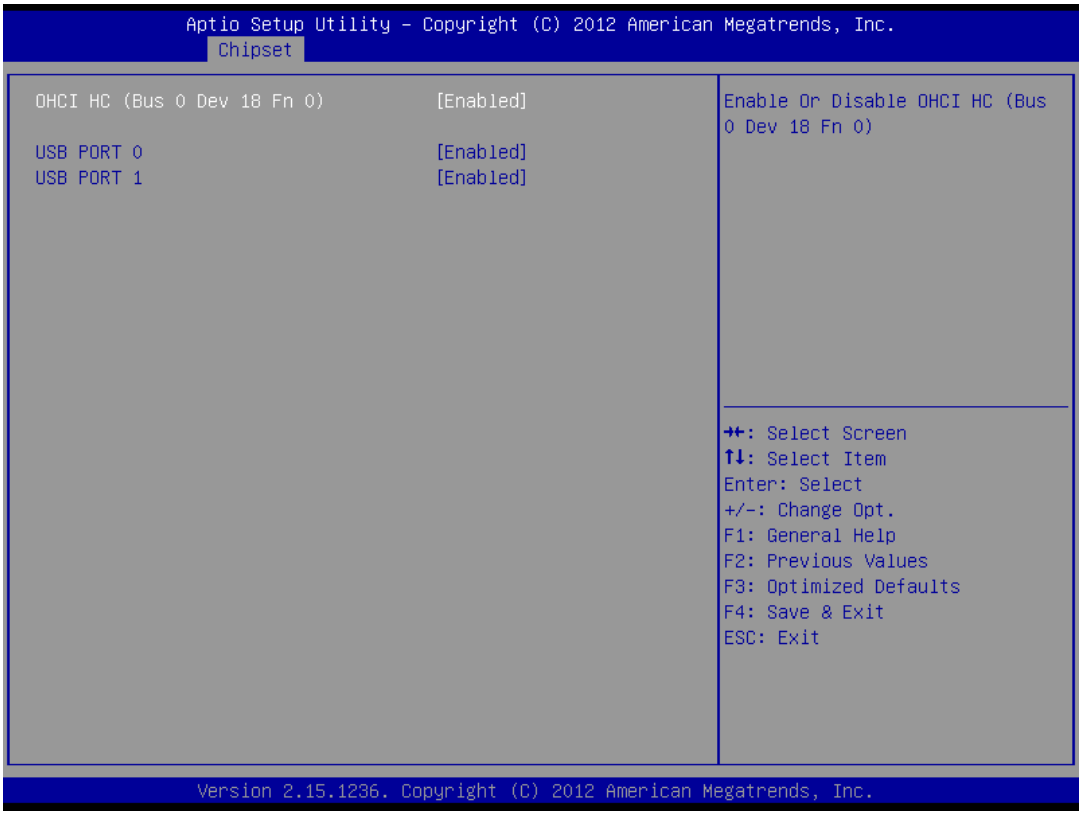
➢ Restore On AC Power Lose

This field specifies the option controls how the PC will behave once power is restored following a power outage (or other unexpected or ungraceful shutdown). The "Last State" option returns the PC to the state in effect at the time the power outage or shutdown occurred. Assign this option the "Power On" value to reboot automatically; assign the "Power Off" value to leave the machine powered down.

Available Options: Power Off, Power On, and Last State

Default setting: Last State

➢ **USB Configuration**



✧ ***OHCI HC (Bus 0 Dev 18 FN 0)***

The USB OHCI HOST Control each of the USB ports (0~1). Enable: Enable USB 0, 1 port; Disable: Use USB port 0, 1 setting

Available Options: Disabled, and Enabled

Default setting: Enabled

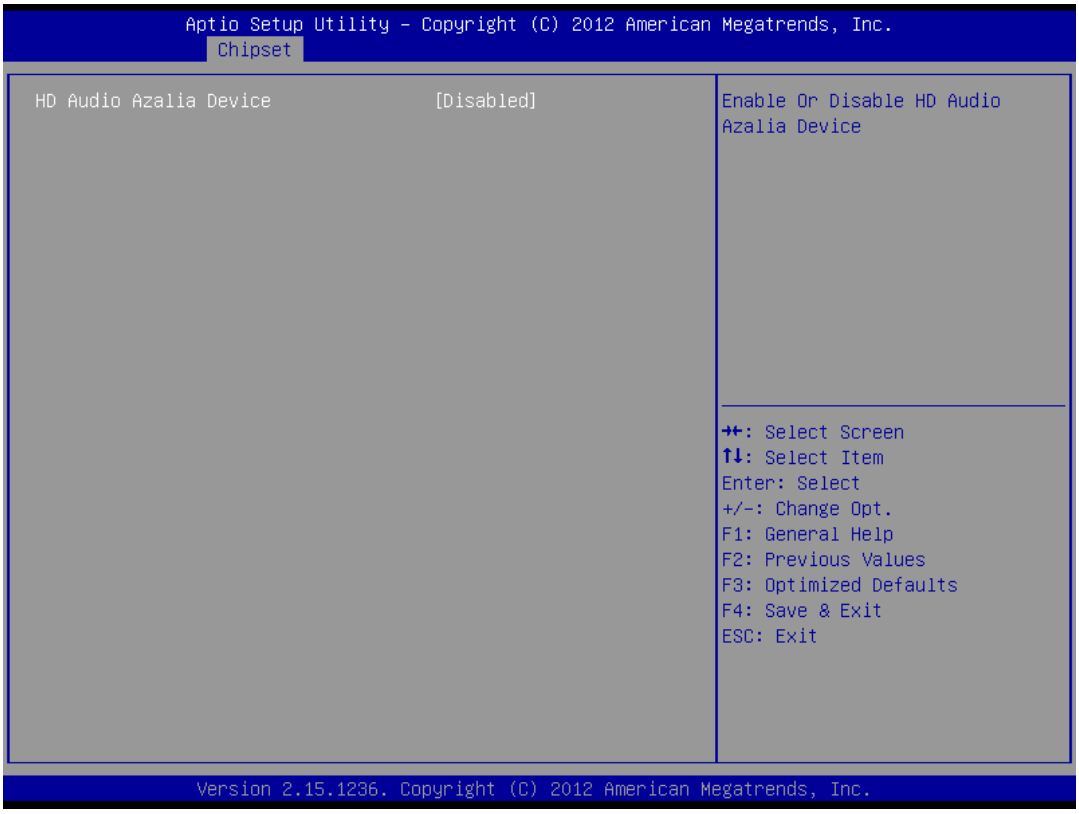
✧ ***USB Port 0/1***

The USB Control each of the USB ports (0~1).

Available Options: Disabled, and Enabled

Default setting: Enabled

➢ Azalia HD Audio



✧ *Audio Controller*

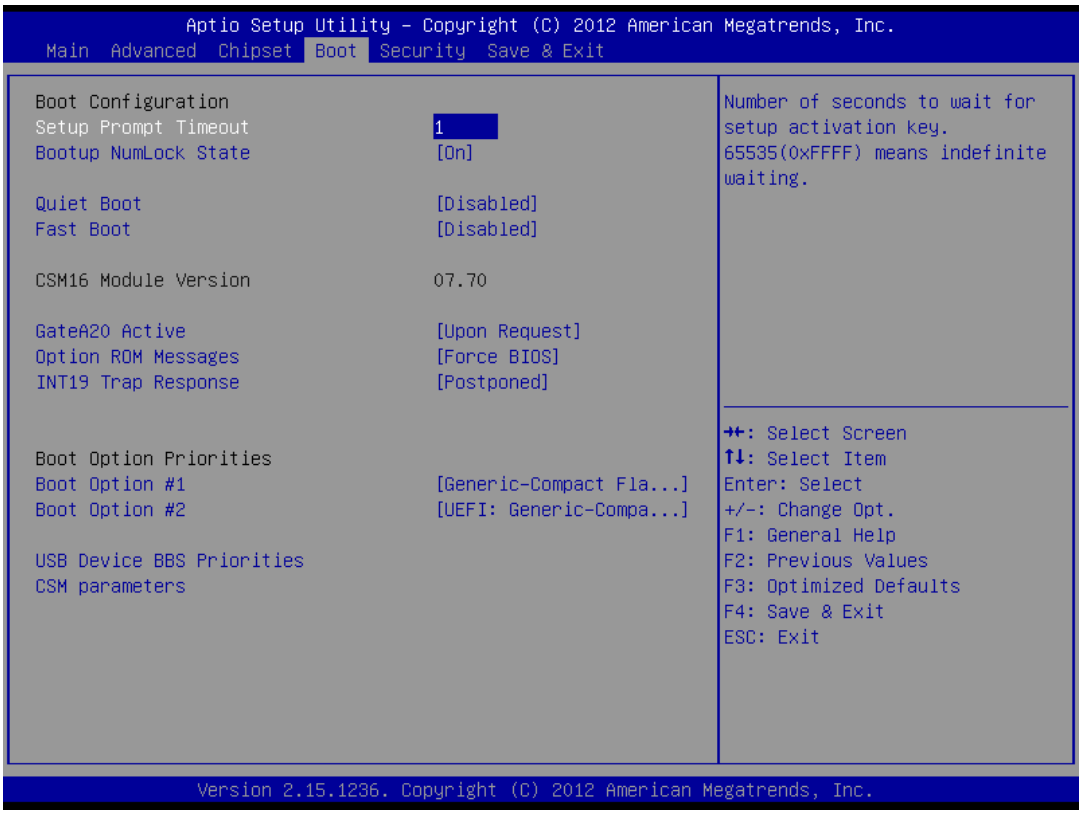
This item allows users to enable or disable Azalia Controller.

Available Options: Disabled, and Enabled

Default setting: Disabled

Boot

Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section.



- **Setup Prompt Timeout**

This item allows users to select the number of seconds to wait for setup activation key.

Available Options: 1~65535

Default setting: 1

- **Bootup NumLock State**

This field is used to activate the Num Lock function upon system boot. If the setting is on, after a boot, the Num Lock light is lit, and user can use the number key.

Available Options: On, and Off

Default setting: On

- **Quiet Boot**

This item allows users to enable or disable Quiet boot option. If Enable, an OEM LOGO is shown instead of POST messages.

Available Options: Disabled, and Enabled

Default setting: Disabled

- **Fast Boot**

This field is used to activate the fast boot function of the system. When set to Enabled, boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

Available Options: Disabled, Enabled

Default setting: Disabled

- **GateA20 Active**

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

Available Options: UPON REQUEST, and ALWAYS

Default setting: UPON REQUEST

- **Option ROM Message**

Set display mode for Option ROM

Available Options: Force BIOS, and Keep Current

Default setting: Force BIOS

- **INT19 Trap**

BIOS reaction on INT19 trapping by Option ROM: IMMEDIATE - execute the trap right away; POSTPONED - execute the trap during legacy boot.

Available Options: Immediate, and Postponed

Default setting: Immediate

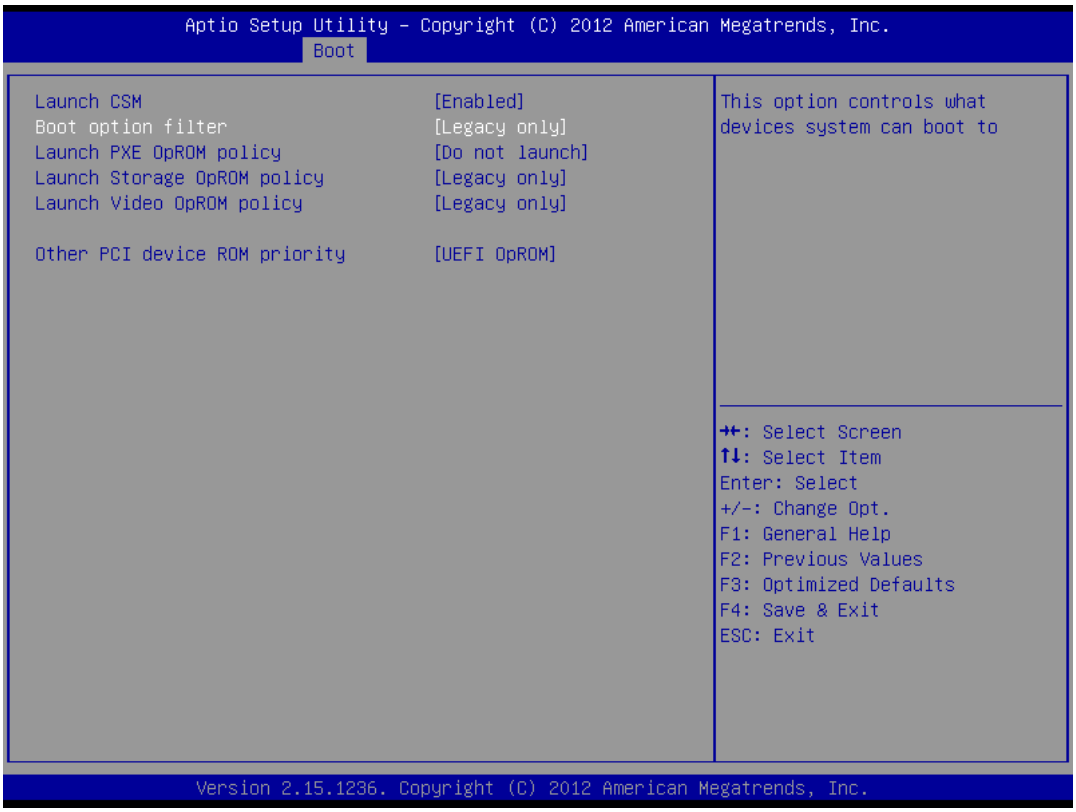
- **Boot Option Priorities**

This item allows users to set boot device priority. Set the boot device options to determine the sequence in which the system checks which device to boot from. The settings are Hard Driver BBS Priorities (*Removable Storage Dev., Hard Drive),* and CD/DVD ROM Driver BBS Priorities (*USB CDROM).*

Note: When you select a boot Option category from the boot menu, a list of devices in that category appears. For example, if the system has hard disk drives and USB storage connected, then the list will show all hard disk drives attached.

- **CSM Parameters**

The CSM (Compatibility Support Module) is Option ROM Execution, boot options filter, etc.



- **Launch CSM**

This item allows users to enable or disable CSM.

Available Options: Disabled, and Enabled

Default setting: Enabled

- **Boot Option Filter**

This option controls Legacy/UEFI ROMs priority.

Available Options: UEFI and Legacy, Legacy only, and UEFI only

Default setting: Legacy only

- **Launch PXE OpROM Policy**

This option Controls the execution of UEFI and Legacy PXE OpROM.

Available Options: Do not Launch, Legacy only, UEFI only, Leach First and UEFI First.

Default setting: Do not Launch

- **Launch Storage OpROM Policy**

This option Controls the execution of UEFI and Legacy Storage OpROM.

Available Options: Do not Launch, Legacy only, UEFI only, Leach First and UEFI First.

Default setting: Legacy only

- **Launch Video OpROM Policy**

This option Controls the execution of UEFI and Legacy Video OpROM.

Available Options: Do not Launch, Legacy only, and UEFI only

Default setting: Legacy only

- **Other PCI Device ROM Policy**

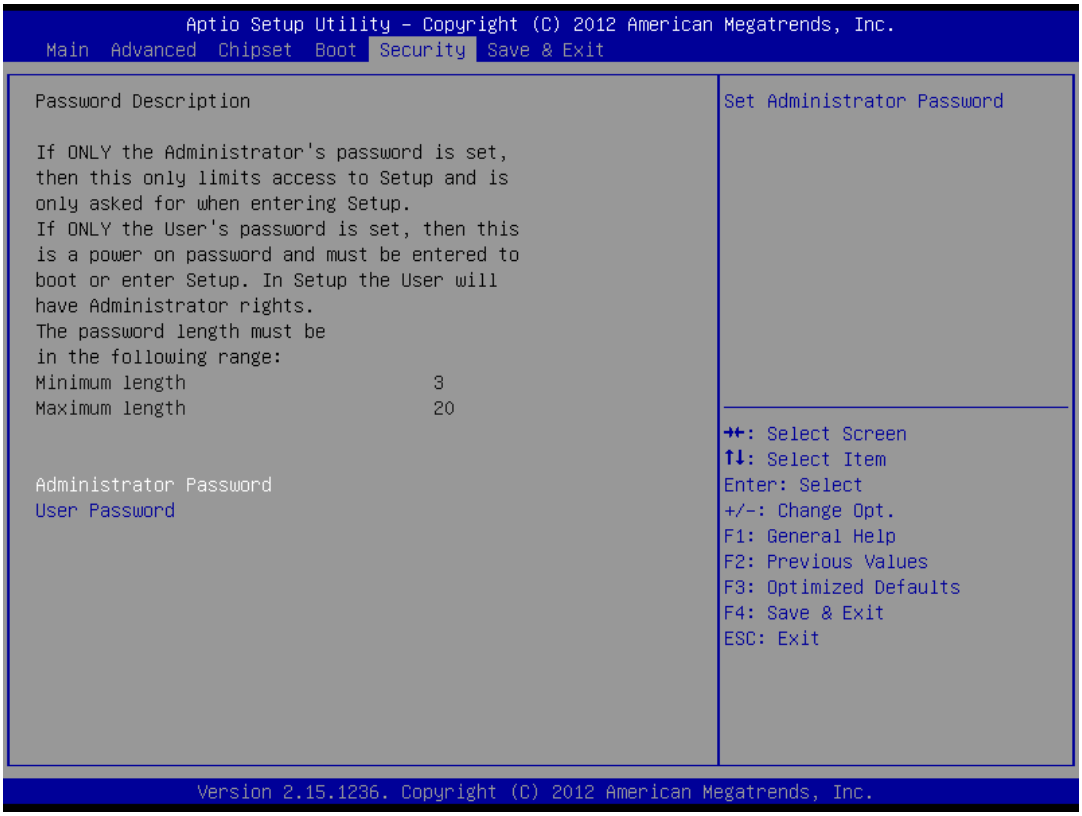
This option controls for PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Available Options: Legacy OpROM, and UEFI OpROM

Default setting: Legacy OpROM

Security

Security Setup provides both Administrator and User password. If you use both passwords, the Administrator password must be set first. The system can be configured so that all users must enter a password every time the system boots or when Setup is executed, using either the Administrator password or User password. The Administrator and User passwords activate two different levels of password security. If you select password support, you are prompted for a three to twenty character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.



➢ **Install Administrator/User Password**

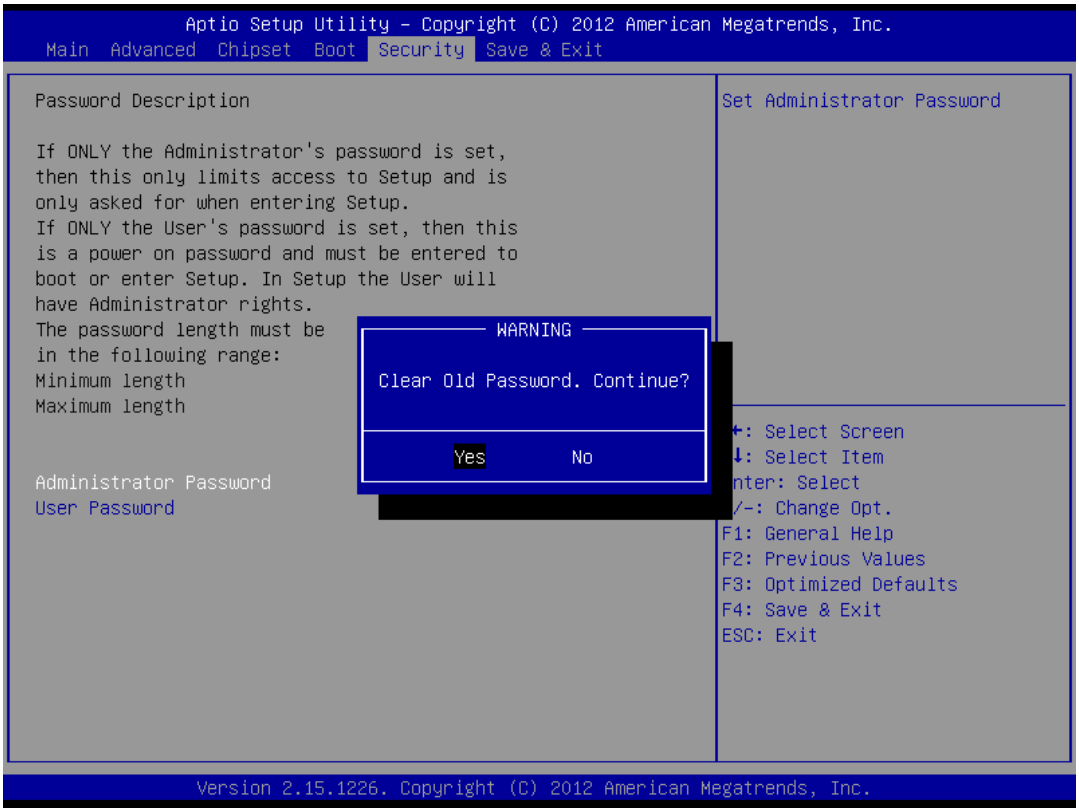
Select Administrator/User Password item, press <Enter> and type new password (up to 3 character length) and confirm new password. The screen does not display the characters entered.

✧ ***Change Administrator/User Password***

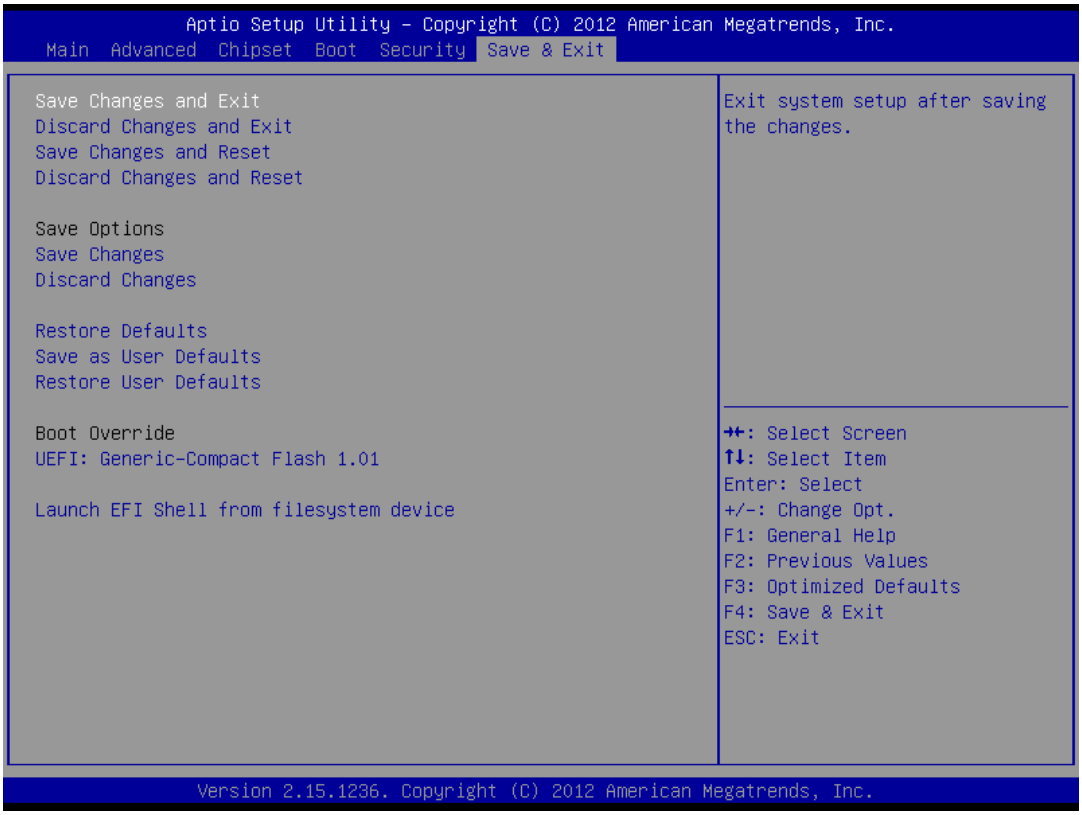
Select Administrator/user password item, press <Enter> and type current password, at the next dialog type new password and confirm new password.

✧ ***Clear Old Password***

Select Administrator/user password item, press <Enter> and type current password, at the next dialog press <Enter> to Clear Old Password.



Save & Exit



- **Save Changes and Exit**

When you have completed the system configuration changes, select this option to save the changes and Exit, so the new system configuration parameters can take effect.

- **Discard Changes and Exit**

Select this option to quit without making any modifications to the system configuration.

- **Save Changes and Reset**

When you have completed the system configuration changes, select this option to save the changes and reboot the system, so the new system configuration parameters can take effect. The following window will appear after selecting the 'Save Changes and Reset' option selected. Reset the system after saving the changes.

- **Discard Changes and Reset**

Select this option to reboot the system without saving the changes done in the setup configuration.

- **Save Changes**

When you have completed the system configuration changes, select this option to save your system configuration and continue. For some of the options it required to reset the system to take effect...

- **Discard Changes**

When you have completed the system configuration changes, select this option to undo the previous changes.

- **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 option.

- **Launch EFI shell from filesystem device**

Attempts to Launch EFI Shell application (Shell.efi /Shellx64.efi/ ShellIA64.efi) from one of the available filesystem devices

Chapter 5 Software Installation

The enclosed CD diskette includes FB2710 VGA, System, Audio, and LAN driver. To install and configure you FB2710 system, you need to perform the following steps.

Install AMD Catalyst ™ Drivers

WIN XP/7 32/64 Driver

To install the AMD T16R driver, insert the DVD ROM into the USB DVD ROM device, and enter DRIVER>VGA>AMD_T40E>WINXP, or >WIN7.

Step 1: Close all opened applications including any live monitoring anti-virus, firewall, remote-access, or webcam software before attempting to install the AMD Catalyst Driver.

Step 2: When the downloaded installation file is run, a security prompt will appear. Click **Run** to start the installation process.
NOTE! The Windows User Account Control (UAC) prompt may appear asking, "Do you want to allow the following program to make changes to this computer?" Select **Yes** to continue with the installation

Step 3: A Catalyst: Installation Folder window will open allowing the user to select the folder to which the installation files will be saved. Click **Install**.
NOTE! AMD recommends using the default location to prevent issues that may occur during installation from files that cannot be found, or are missing.

Step 4: The installation files will be extracted, and saved to the specified location.

Step 5: The AMD - Catalyst Install Manager window will open allowing the user to select the preferred language. Choose the preferred language and click **Next**.

Step 6: The AMD - Catalyst Install Manager will provide a choice to install or uninstall. Choose, **Install**.

Step 7: The AMD - Catalyst Install Manager will provide a choice to complete an Express or Custom installation. Choose **Express**, and click **Next**.
NOTE! AMD recommends an Express installation to ensure all files required for the full functionality of AMD Radeon™ graphics products are installed.

Step 8: The End User License Agreement will appear. Read the End User License Agreement and click **Accept** if you agree to the terms and conditions.

Step 9: The AMD - Catalyst Install Manager will analyze the system, and install the required files.

Step10: The AMD - Catalyst Install Manager will confirm when the installation is complete. Click **Finish**.

Step11: When prompted, Click **Yes** to restart the system and complete the installation process.
NOTE! A system restart is required to complete the installation process.

Note: To install the Windows XP System driver, enter DRIVER>SysChip>A55E

Audio Driver

WIN XP/7 X86/X64 Driver

Step 1: To install the AUDIO driver, insert the CD ROM into the CD ROM device, and enter DRIVER>AUDIO>ALC888_R270>Windows.

Step 2: Execute Setup.exe file.

Step 3: The screen shows the SETUP type. Press any key to enter the main menu.

Step 4: As the setup is completed, the system will generate the message as follows.

Yes, I want to restart my computer now. Installation is done!

No, I will restart my computer later.

System must be restart then complete the installation.

LAN Driver (RTL 8111F)

WIN XP/7 Driver X86/X64 Driver

Step 1: To install the LAN driver, insert the CD ROM into the CD ROM device, and enter DRIVER>LAN>RTL8111F>WIN7 or >WINXP.

Step 2: Execute setup.exe file.

PCI to ISA Bridge Drivers

WINDOWS Driver

Step 1: To install the PCI To ISA Bridge driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SysChip >ITE8888 >WIN. If your system is not equipped with a CD ROM device, copy the PCI To ISA Bridge driver from the CD ROM to a CF.

Step 2: Open Control Panel. [Start->Setting>Control Panel].

Step 3: Click on System button> Select Hardware >click on Device Manager.

Step 4: Click on Other ISA to PCI bridge >Update Driver> Select Specify a location > Browse > Select " ite.inf " file from CD ROM.

Step 5: Select "ITE 8888 PCI to ISA bridge".

Step 6: Click on OK >Next >Yes >Finish

BIOS Flash Utility

In the <UTILITY> directory, there is the AFU301.EXE file.

Step 1: Use the AFU301.EXE xxxxxVxx.rom program to update the BIOS setting.

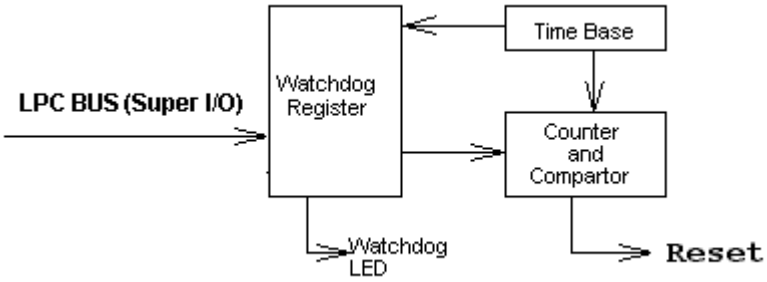
Step 2: And then refer to the chapter "BIOS Setup", as the steps to modify BIOS.

Step 3: Now the CPU board's BIOS loaded with are the newest program; user can use it to modify BIOS function in the future, when the BIOS add some functions.

Watchdog Timer

This section describes how to use the Watchdog Timer, including disabled, enabled, and trigger functions.

The FB2710 is equipped with a programmable time-out period watchdog timer. You can use your own program to Enabled the watchdog timer. Once you have enabled the watchdog timer, the program should trigger the I/O every time before the timer times out. If your program fails to trigger or disable this timer before it times out, e.g. because of a system hang-up, it will generate a reset signal to reset the system. The time-out period can be programmed to be set from 1 to 65535 seconds or minutes.



The CD includes a Watch Dog demo file. In the WATCHDOG/ ITE8760 /TURBOC: Library and Test Program written in Turbo C++

The WATCHDOG includes a demonstration program established for users who would like to configure the Watchdog timer by themselves.

Note: In the WATCHDOG/ITE8760 directory, README.TXT file is included to provide demo program information.

❑ Watchdog Timer Setting

The watchdog timer is a circuit that may be used from your program software to detect system crashes or hang-ups. The watchdog timer is automatically disabled after reset.

Once you have enabled the watchdog timer, your program must trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, it will be set to non-zero value to watchdog counter and start to count down again. If your program fails to trigger the watchdog timer before time-out, it will generate a reset pulse to reset the system.

The factor of the watchdog timer time-out constant is approximately 1 second. The period for the watchdog timer time-out is between 1 to FFFF timer factors.

If you want to reset your system when watchdog times out, the following table listed the relation of timer factors between time-out periods.

Time Factor	Time-Out Period (Seconds)	Time-Out Period (Minutes)
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
“	“	“
“	“	“
“	“	“
FFFF	FFFF	FFFF

❑ Watchdog Timer Enabled

To enable the watchdog timer, you have to output a byte of timer factor to the watchdog register whose address is 2eh and data port is 2fH. The following is a Demo program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

```
;--------------------------------------------------------------------------------
; Enter the extended function mode
;--------------------------------------------------------------------------------
outportb(0x2e,0x87);     // Enter to extended function mode
outportb(0x2e,0x01);
outportb(0x2e,0x55);
outportb(0x2e,0x55);
;-------------------------------------------------------------------------------------------------
; Logical device 7, configuration registers Index 72h-Bit 7, 73H (LSB)/74H (MSB)
;-------------------------------------------------------------------------------------------------
outportb(0x2e,0x72);     // Index 72h- Time and Watchdog Register
outportb(0x2f,0x90);     // Set Bit 7 is 1: Second and Bit4: Enabled Watchdog.
//outportb(0x2f,0x10);   // Set Bit 7 is 0: Minute.

outportb(0x2e,0x74);     // Set Timer Value counter1 0100~FF00 (MSB)
outportb(0x2f,0x00);

outportb(0x2e,0x73);     // Set Timer Value counter0 0001~00FF (LSB)
outportb(0x2f,0x28);     // Set timeout interval as 28seconds and start counting
;--------------------------------------------------------------------------------
; Exit the extended function mode
;--------------------------------------------------------------------------------
outportb(0x2e,0x02);
outportb(0x2f,0x02);
```

❑ Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog before the new time-out period in next trigger.

❑ Watchdog Timer Disabled

To disable the watchdog timer, simply write a 00H to the watchdog register.

```
;-------------------------------------------------------------------------------------------------
; Logical device 7, configuration registers Index 72h Bit 4
;-------------------------------------------------------------------------------------------------
outportb(0x2e,0x72);     // Index 72h- Time and Watchdog Register
outportb(0x2f,0x00);     // Set Bit4 to 0 Disabled Watchdog.
```

Chapter 6 Technical Reference

This section outlines the errors that may occur when you operate the system, and also gives you the suggestions on solving the problems.

Topic include:

- Technical Reference
- How to configuration I/O port resource

Technical Reference

➢ **Physical and Environmental**

Power Supply Voltage: +5V/+-5%, +12V/+-5% (For LVDS Display)

Temperature: Operating 0°C ~ 60°C (32~140°F)

Relative humidity 0 % to 90 % non-condensing

➢ **Real-Time Clock and Non-Volatile RAM**

The FB2710 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed below:

Address	Description
00	Seconds
01	Second alarm
02	Minutes

Address	Description
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown status byte
10	Diskette drive type byte, drive A and B
11	Fixed disk type byte, drive C
12	Fixed disk type byte, drive D
13	Reserved
14	Equipment byte
15	Low base memory byte
16	High base memory byte
17	Low expansion memory byte
18	High expansion memory byte
19-2D	Reserved
2E-2F	2-byte CMOS checksum
30	Low actual expansion memory byte
31	High actual expansion memory byte
32	Date century byte
33	Information flags (set during power on)
34-7F	Reserved for system BIOS

- **CMOS RAM Map**

Register	Description
00h -10h	Standard AT-compatible RTC and Status and Status Register data definitions
11h – 13h	Varies
14h	Equipment Bits 7-6 Number of Floppy Drives 00 1 Drive 01 2 Drives Bits 5-4 Monitor Type 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bits 3 Display Enabled 0 Disabled 1 Enabled Bit 2 Keyboard Enabled 00 Not CGA or MDA 01 40x25 CGA 01 2 Drives 80x25 CGA Bit 1 Math Coprocessor Installed 0 Absent 1 Present Bit 0 Floppy Drive Installed 0 Disabled 1 Enabled
15h	Base Memory (in 1KB increments), Low Byte
16h	Base Memory (in 1KB increments), High Byte
17h	IBM-compatible memory (in 1KB increments), Low Byte
18h	IBM-compatible memory (in 1KB increments), High Byte (max 15 MB)
19h-2Dh	Varies
2Eh	Standard CMOS RAM checksum, high byte
2Fh	Standard CMOS RAM checksum, low byte
30h	IBM-compatible Extended Memory, Low Byte (POST) in KB
31h	IBM-compatible Extended Memory, High Byte (POST) in KB
32h	Century Byte
33h	Reserved. Do not use
34h	Reserved. Do not use
35h	Low byte of extended memory (POST) in 64 KB
36h	High byte of extended memory (POST) in 64 KB
37h-3Dh	Varies
3Eh	Extended CMOS Checksum, Low Byte (including 34h-3Dh)
3Fh	Extended CMOS Checksum, High Byte (including 34h-3Dh)

- **I/O Port Address Map**

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. There is a total of 1K-port address space available. The following table lists the I/O port addresses used on the Industrial CPU Card.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 073h	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
290h – 297h	System Chipset
2E8h – 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

- **Interrupt Request Lines (IRQ)**

There are a total of 15 IRQ lines available on the Industrial CPU Card. Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on the Industrial CPU Card.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	- Reserved -
IRQ6	USB
IRQ7	- Reserved -
IRQ8	Real Time Clock
IRQ9	Display Control
IRQ10	- Reserved -
IRQ11	LAN #1
IRQ12	- Reserved -
IRQ13	FPU
IRQ14	Primary IDE
IRQ15	- Reserved -

- **Serial Ports**

The ACEs (Asynchronous Communication Elements ACE1 to ACE2) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, one and half (five-bit format only) or two stop bits. The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. Also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	Base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	Base + 1	Interrupt enable
X	Base + 2	Interrupt identification (read only)
X	Base + 3	Line control
X	Base + 4	MODEM control
X	Base + 5	Line status
X	Base + 6	MODEM status
X	Base + 7	Scratched register
1	Base + 0	Divisor latch (least significant byte)
1	Base + 1	Divisor latch (most significant byte)

- **Receiver Buffer Register (RBR)**

Bit 0-7: Received data byte (Read Only)

- **Transmitter Holding Register (THR)**

Bit 0-7: Transmitter holding data byte (Write Only)

- **Interrupt Enable Register (IER)**

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

- **Interrupt Identification Register (IIR)**

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

- **Line Control Register (LCR)**

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

- **MODEM Control Register (MCR)**

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

- **Line Status Register (LSR)**

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

- **MODEM Status Register (MSR)**

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

- **Divisor Latch (LS, MS)**

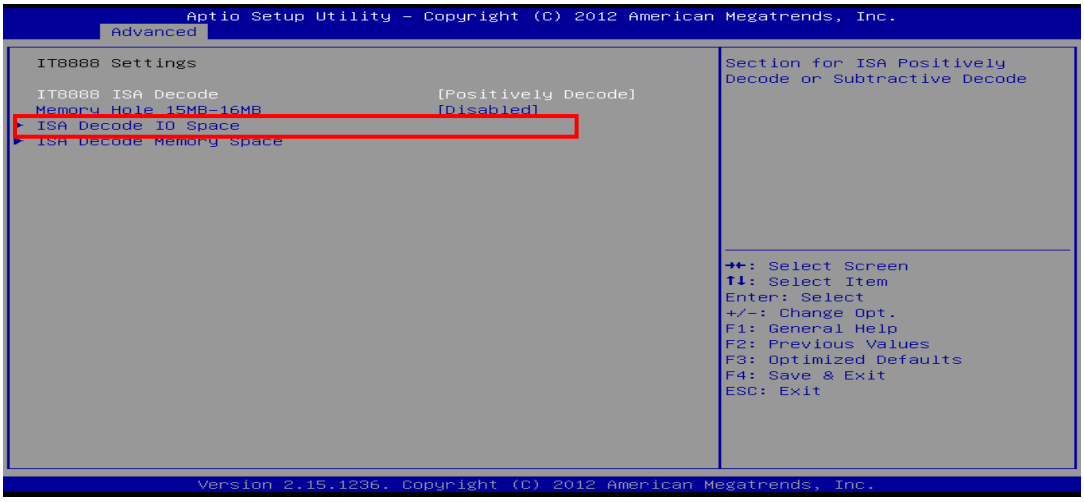
	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

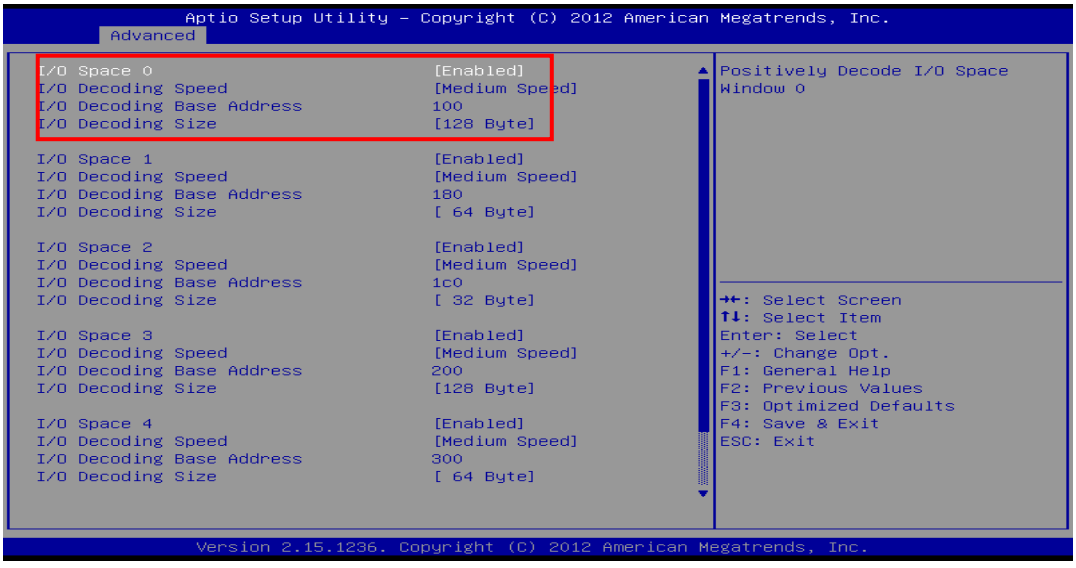
Configure Positively Decode I/O port & Memory

Prepare your I/O or ROM/RAM PC104 Board add-on to FB2710, You must need adjust and set up the I/O ports and memory address (Please refer to Chapter 5 "I/O Port address Map", to ward off the IO Port address), if the I/O port of your add-on card is 170 HEX ~177 HEX space and ROM/RAM memory space is D000:0 ~D3FF:0 (16K), the following steps are for you to set up the I/O or memory resources manually.

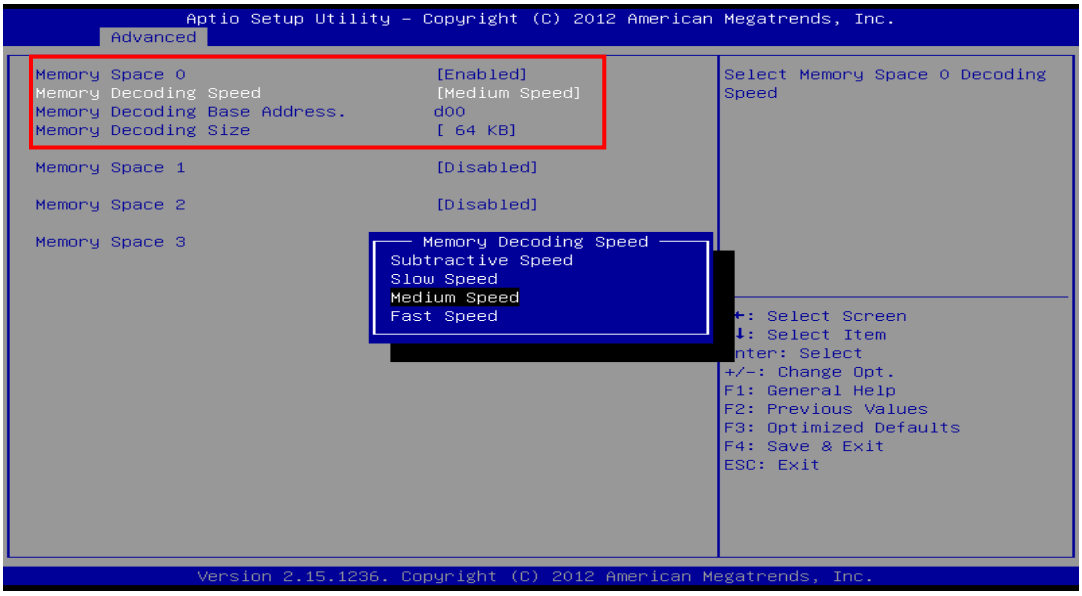
1. Booting the FB2710 CPU board and get into the BIOS CMOS SETTUP > Advanced > IT8888 Settings >, then select ISA Decode IO Space.



2. Select the "I/O Space 0 "; enable this function and adjust the "I/O Decoding Speed 0" function. And then select the "Medium speed" or "Low Speed" and adjust the "I/O Decoding Base Address [15:0] fill the 100h (100 hex), and "I/O Decoding Size" to128 (Dec) bytes (100h ~17F hex I/O port address range).



3. Return to Integrated Peripherals >then select IT8888 ISA Decode Memory screen, Select the “Decode Memory Space 0 “; enable this function and adjust the “Decode Memory Speed 0” function. And then select the medium speed and then adjust the “Decode Memory Addr. 0 [23:8] fill the D00 Hex (D000:0 Memory Segment), then set “Decode Memory Size” in the option of 64 KB (D000~DFFF Memory segment).



4. Save above BIOS CMOS SETUP (F10), and restart the system.

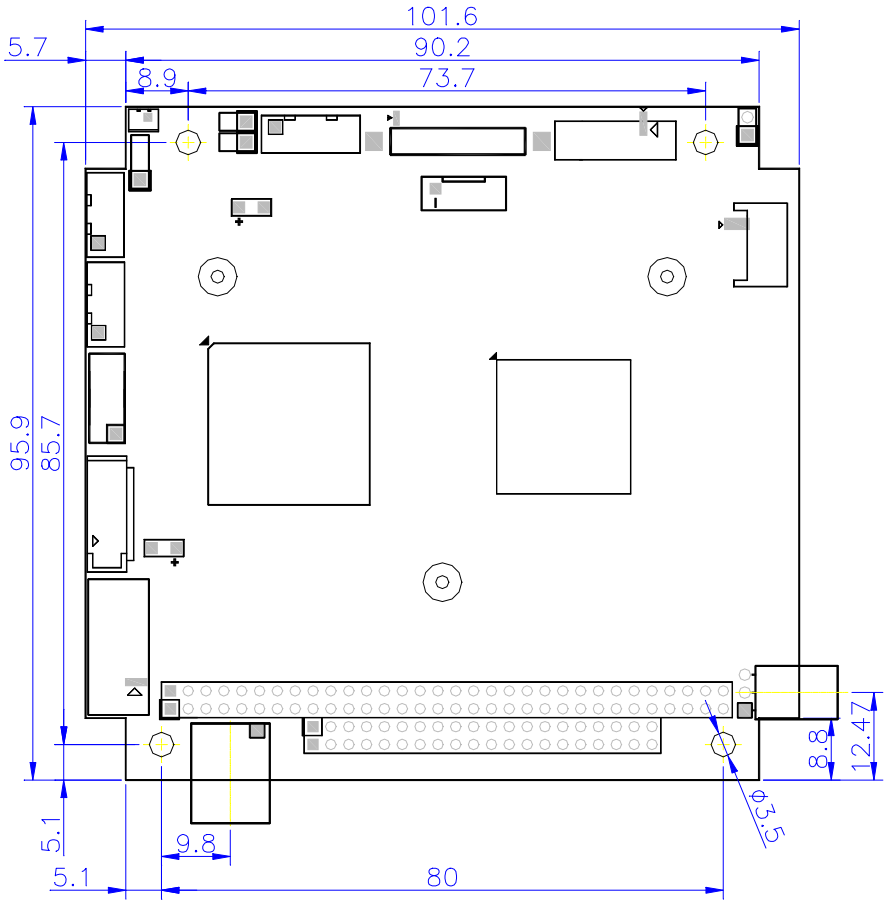
5. Add you add-on card to the FB2710 CPU Board

Note: 1. If the wrong selection of I/O ports or memory space conflicts on the FB2710 system board, you can clean CMOS setup by the JP1.
2. The step1 and Step 2 is for I/O add-on board, and step 3 is for ROM/RAM add-on board.

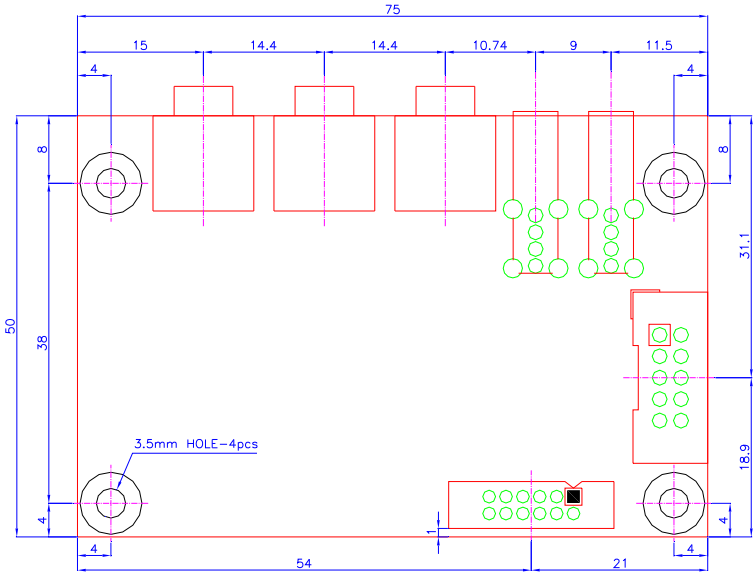
Appendix

Dimension

a. FB2710



b. FB4706


75
15
14.4
14.4
10.74
9
11.5
4
4
8
8
31.1
50
38
3.5mm HOLE-4pcs
18.9
4
4
1
4
4
54
21