FabiaTech Corporation

IPC Solution

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Small Cube System

Fanless Series

FX5508 User's Manual

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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 <u>support@fabiatech.com</u>.

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If your board requires servicing, contact the dealer from whom you purchased the product for service information. You can help assure efficient servicing of your product by following these guidelines:

- 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)

For updated BIOS, drivers, manuals, or product information, please visit us at <u>www.fabiatech.com</u>

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Chapter 1 Introducing the FX5508 System

Overview

The FX5508 is an embedded system with Intel® Atom™ Bay-Trail Processor lowpower CPU module inside. This user's manual provides information on the physical features, installation, and BIOS setup of the FX5508.

Built to unleash the total potential of the Intel® Atom[™] E3845 Processor, Able to support 1.91 GHz CPU, this unit supports two 10/100/1000 Base –TX LAN port, audio, four USB-2.0, one USB-2.0/3.0 ports, GPIO-2In/2Out digital I/O, two PCIe mini card socket, one SD/SATA/ CFAST socket, two So-DIMM socket supports up to 8GB DDR3L RAM, support one VGA and one HD display.

Each FX5508 has four ports for I/O communications. Two RS232/ RS422/ RS485, one RS232 and one can select RS232 or CANBUS ports. The CAN (Controller Area Network) is a serial bus system especially suited for networking "intelligent" I/O devices as well as sensors and actuators within a machine or plant. Characterized by its multi-master protocol, real-time capability, error correction, high noise immunity, and the existence of many different silicon components, the CAN serial bus system, originally developed by Bosch for use in automobiles, is increasingly being used in industrial automation.

The FX5508 is perfect for ATM machines, KIOSK, point-of-sales/point-of- information, gaming and infotainment, measurement technology, lotteries, banking and Thin Client and small Embedded Control. The unit is only 203mm (W) X 148mm (D) X 55mm (H).

Series Comparison Table

Model	FX5508
System Processor	Intel ® Atom™ E3845 1.91GHZ
	(Bay Trail)
Memory	DDR3L-1333
204 Pin-DIMM*2	4GB / 8GB (Max.)
Storage	One CFAST Socket
	One SD Socket (SDxC-UHS-I)
	One 2.5' SATA HDD Connector
Display	HD / VGA
Multi I/O	Two RS232/RS422/RS485
	one RS232 and
	One RS232 or CAN (SJA1000)
USB 2.0 / 3.0	Four / One
Audio	Ear-Phone And MIC-In
RJ45 LAN port	Тwo
(10/100/1000 Mbps)	Realtek RTL8111F
PCIe Mini Card Socket	Тwo
SIM Card Socket	One
GPIO	Two- In/Two-Out
Watchdog Timer	Yes
Operating Temperature	-20~+ 70°C (-4~158°F)
Dimensions (Unit: mm)	203(W) x 148 (D) X 55 (H)

Note: The Multi I/O: COM3 is designed for RS232 or CAN Select.

Layout





Specifications

Processor Board –

Intel ® Atom™ E3845 1.91GHZ (2M L2 Cache) Low Power Processor with 4GB DDR3L/1333-RAM

□ I/O Outlets –

Two 10/100/1000 base-TX Ethernet LAN port with RJ45

Supports HD display port and one VGA connector with DB15

Four USB ports with two USB 2.0 and one USB 3.0 ports

Two RS232/RS422/RS485 one RS232 and one RS232/CAN ports with DB9

One Earphone-Out and Microphone-Input connectors

Two PCIe Mini card socket modules, especially for WLAN/GPRS module

2-In and 2-Out Isolated Digital I/O with terminal block

One DC-In terminal block with power button and push button reset switch

CAN BUS -

The CAN bus using the Philips SJA1000 controller, electrically compatible with the PCA82C200 stand-alone CAN controller chip.

- Full CAN-functionality 2.0 B.
- Extended receive buffer (64 byte FIFO).
- 16 MHz CAN Control frequency.

LED Indicator –

One power LED with power button, one hard disk/CF access LED, and two LAN-Access LED $% \left(\mathcal{A}^{\prime}\right) =0$

□ Storage Bay-

CFAST Compact Flash socket for CFAST Compact Flash modules

One SD socket supports SDHC/SDXC-UHS-I Card

One 2.5" SATA hard disk space

Dever requirement -

+12 ~ +24V DC, 2.2 A maximum (1.2 A typical) with 19V input voltage.

Dimensions -

203.0mm(W) x 148.0mm(D) x 55.0mm(H)

Packing List

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

- Unpack and inspect the FX5508 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 FX5508 is not supplied from us, please make sure the specification of the cable(s) is compatible with the FX5508 system.

Note: After you install the FX5508, 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 lists the accessories that may be included in your FX5508 package. Some accessories are optional items that are only shipped upon order.

- One FX5508x embedded system.
- One pack of 2.5" SATA hard disk installation kit with fixed screws.
- Four screws for mini-card installation and one 2-pin apartable terminal block.
- One pack of digital I/O 2*3-pin apartable terminal block.
- One compact disc includes software utility and manual.

Optional:

- AK1006 Half size mini PCIe module adapter kits. (P/N:060610028G)
- FX5501k1 Wall mounting fixers and 4 screws. (P/N:0606010009G-20)
- FX5501k2 Rack mounting fixers and 4 screws. (P/N:0606010010G-20)
- FX5504k1 Panel mounting fixers and 2 screws (VESA 75*75 /100 * 100).(P/N:0606010012G)
- FX5407K3 LCD mounting fixers and 10 screws (50*50/75*75/100*100). (P/N: 0606010038R)
- FX5507K2 2U Rack mounting fixers and 5 screws. (P/N: 0606010029G)
- FX5507K3 Dust cover kit and 4 screws. (P/N: 0606010031R)

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 following descriptions.

- 1. Before removing the cover, shut down the operation System and disconnect power cord and (or) unplug DC-In cable.
- 2. Install any connector, CFAST Compact Flash, and hard disk is sure that the power is disconnected or power switch to off from the system. If not, this may damage the system.
- 3. The ESD (Electricity Static Discharge) may be created from human body that touches the board. It may do damage to the board circuit.

To install hardware- remove the bottom Cover

If you are installing following hardware items, you can remove the bottom cover. The following figure will guide you how to install SATA 2.5" HDD, CFAST Compact Flash modules, mini PCIe WLAN or GPRS module, DDR3L RAM module to the FX5508 and how to install the FX5508 fixers. (Please see the spots circled.)

> a. Unscrew bottom cover

Use a cross-head screwdriver to remove twelve screws that secure the bottom cover.





> b. Installing SD & CFAST Compact Flash Card

Note: The SD socket supports SDHC/SDXC-UHS-I card.

> c. Installing Memory: So-DIMM Socket for DDR3L RAM Modules

If you may extend additional memory to system, see as following figure. The 204 pin So-DIMM socket supports 2GB to 4GB of DDR3L RAM modules. Installing memory module to So-DIMM socket of down side, when only one memory module. We recommend that installing dual channel RAM module made by the same part number and manufacturer.



> d. Installing hard disk: SATA Hard disk or SSD

Fasten screws up the Hard disk device to bottom inside HDD metal frame and connect the SATA HDD cable and power cable. See as following figure and rear pictures.



♦ d1. Fasten screw the SATA HDD

♦ d2. Installing SATA Cable



Note: Be careful with the pin orientation when installing connectors and the cables.CN4 is used to connect a SATA 2.5" HDD with included SATA cable, CN5 is for SATA power connector. (The CN5 support +5V Voltage only)

> e. Installing PCIe Mini Card Module

FX5508 supports 2 PCIE mini card sockets, one is right- down side(1) and other one is left-down side (2); you may extend additional PCIe mini card module(1) and SIM card to FX5508. Connect the antenna cable from backside antenna hole to GPRS or Wireless LAN module and installing the SIM card for GPRS. See as following figure and rear pictures.

♦ e1. Installing PCIe Mini Card and SIM card



- Note: 1. When installing PCIe GPRS Mini card on FX5508 system these is need the installing the SIM Card to system board.
 2. Open the cover with SIM socket then insert SIM card into the SIM card hold. Make sure that the SIM card is properly inserted and that golden contact area on the card is facing downwards.
- ♦ e2. Installing Half Size Mini PCIe module kit (Optional)



> f. Installing the universal fixers on FX5508

Please refer to the down side figure for installing the FX5508 with universal fixers.

f1. FX5501K1 - Wall Mounting.



f3. FX5501K2 - Rack Mounting.



f2. FX5504K1 - Panel Back Mounting (VESA Mount 75*75 / 100*100).



f4. FX5507K3 - Dust Cover Kit.



f5. FX5507K2 - 2U Rack Mount Kit (Front side View)



f5-1. FX5507K2-2 - 2U Rack Mount Kit (Rear side View)





f6. FX5407K3 – Panel Back Mounting (VESA Mount 50*50 / 75*75 / 100*100).

□ LED Indicators

The Power and HDD LED's has two distinctive statuses: Off for inactive operation and blinking light for activity. And the 2 LED's for LAN ports. The LAN1 and LAN2 LED's (Green) indicate on-line/access status of LAN1 and LAN2 respectively.



□ I/O Peripheral Connectors

View from the rear side, if you are connecting the monitor, LAN, COM, CAN, Digital I/O, Audio, USB, HD and VGA to the FX5508. See following figure and a side pictures.



1. Connecting the Display-1: VGA (CRT)



DB15	Signal	
1	Red	
2	Green	
3	Blue	
13	Hsync	
14	Vsync	
12	DDC Data(*)	
15	DDC Clock(*)	
5 & 10	Digital Ground	
6,7,8	Analog Ground	
Others	Not Used	

2. Connecting the Display-2: HD port



3. Connecting the COM port

The DB9 COM1~COM4 is standard RS232 serials port, and the COM1~COM3 is designed for multiple proposes. The COM1~COM2 can select RS232/RS422/RS485 by <u>BIOS CMOS</u> setting and COM3 can select RS232 or CAN by jump setting. The following tables show the signal connections of these connectors.





DB-9	RS-232	RS-422	RS-485
1	-DCD		
6	-DSR		
2	RXD	RX-	485-
7	-RTS	TX-	
3	-TXD	RX+	485+
8	-CTS	TX+	
4	-DTR		
9	-RI		
5	Ground		
Metal	Case Ground		

4. Connecting the CAN BUS Port

The CANBUS is use DB9 standard connector. The following tables show the CANBUS signal connections of this connector.

CAN



DB-9	CANBUS	CANBUS
CANBUS	Signal	Description
1	N.C	-
6	N.C	-
2	CAN-L	Dominant Low
7	CAN-H	Dominant High
3	CAN-Ground	Isolated Ground
8	N.C	-
4	N.C	-
9	N.C	-
5	Ground	Digital Ground
Case	Case Ground	

Note: The CANBUS DB9-pin out conforms to the ISO 11898/2 standard specification.

5. Connecting the LAN ports

The RJ45 connector with 2 LED's for WAN/LAN. The right side LED (orange) indicates data is being accessed and the left side LED (green) indicates on-line status. (On indicates on-line and off indicates off-line)The following lists the pin assignment of RJ45.



6. Connecting the USB Ports

The system supports a five port USB connector. Any USB device can be attached to USB ports as plug-and-play function is supported. The rear panel of up side port USB #1 can support USB2.0/3.0, and down side USB # 2~5 support USB 2.0.



7. Connecting the Audio Microphone In/ EAR-Phone



8. Digital I/O Connector

The FX5508 provides 2-in and 2-out isolated digital I/O, output port is an open collector, you will need connections external voltage of Digital (+) and digital (-) connector.



DI/O	Signal	Bit Location
IN-1	DGI1	Please refer to
IN-0	DGI0	Chapter 4-
OUT-1	DGO1	Digital I/O -
OUT-0	DGO0	<u>Software</u>
+	Digital Voltage	programming
-	Digital Ground	<u>example</u>

Note: Digital inputs accept DC12~24V Signal with isolated input. Digital outputs are active-low open collector output, and can drive up to 60V/400mA maximum.

□ Connecting the DC Power and Power Button

Power is supplied through an external power DC In. See following figure and a side pictures.

1. DC Power Connector: Use external 2-pin apartable terminal block.



2. Power Button & Reset Push Button: Pushing the Power button once will switch the FX5508 on and off, And Reset push button is switcher for system reset; Push and release the button will cause hard ware reset of FX5508 and restart system booting.





Power button: On/Off

Reset Push Button: Restart

Switch and Jumper Setting

The COM1, COM2, and COM3 Serial port is designed for multiple proposes, Use H_SW1/H_SW2 selects RS-232, RS-422 or RS-485 of COM1 and COM2, H_JP2 and H_JP3 is to select RS485 terminator resistor, use H_JP5 and H_JP6 select RS-232 or CAN Bus of COM3, H_JP4 is to select CAN bus terminator resistor. J1 used to clear CMOS data.



> H_SW1 (COM2), H_SW2 (COM1), H_JP2, H_JP3: RS232/422/485 Selection

H_SW1/H_SW2



Factory Preset: BIOS Cntl. SW2-COM1/SW1-COM2

SW1/SW2-2	SW1/SW2 -1	Signal
Off	Off	RS-232
Off	On	RS-485
On	Off	RS-422
On	On	BIOS Cntl.

♦ H_JP2 (COM1), H_JP3 (COM2): RS-485 Terminator Setting

H_JP2/H_JP3

0	3
0	2
	1

RS-485 Terminator Disabled Factory Preset



RS-485 Terminator Enabled

> H_JP4, H_JP5, and H_JP6: COM3-RS232 and CAN Bus Selection Setting



♦ H_JP4: CAN Bus Terminal Resistor Selection

The JP4 is the CAN bus termination jumper. Only two termination jumpers should be closed at the endpoints of the CAN bus.



J1: Clear CMOS Setting

You can use J1 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 J1 to 1-2 closed and wait 3~5 sec then return to open before system powers off. The default setting is opened.



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Chapter 3 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 [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.

Aptio Setup Utility – Copyright (C) 2013 American Main Advanced Chipset Security Boot Save & Exit	n Megatrends, Inc.
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Options Save Changes Discard Changes	Exit system setup after saving the changes.
Restore Defaults Save as User Defaults Restore User Defaults	
Boot Override UEFI: Generic STORAGE DEVICE 1.01 UEFI: Generic STORAGE DEVICE 1.01	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.1242. Copyright (C) 2013 American M	Megatrends, Inc.

□ BIOS Functions

On the menu, you can perform the following functions

- 1. Main
- 2. Advanced
 - > ACPI Settings
 - > Hardware Monitor
 - ► IT8760 Super IO Configuration
 - Serial Port Console Redirection
 - CPU Configuration
 - IDE Configuration
 - Miscellaneous Configuration
 - SCC Configuration
 - Network Stack Configuration
 - CSM Configuration
 - USB Configuration
 - Security Configuration
- 3. Chipset
 - ➢ Host Bridge
 - 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:

Кеу	Function
[↑][↓]	The Up and Down keys allow you to select item.
$[\leftarrow][\rightarrow]$	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.

Aptio Setup Main Advanced Chipset	Utility – Copyright (C) 2013 American Security Boot Save & Exit	Megatrends, Inc.
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time	American Megatrends 5.009 UEFI 2.3; PI 1.2 6712B 0.80 x64 11/27/2014 14:20:16	Choose the system default language
CPU Configuration Microcode Patch BayTrail SoC	901 D0 Stepping	
Memory Information Total Memory	4096 MB (LPDDR3)	++: Select Screen
TXE Information Sec RC Version TXE FW Version	00.05.00.00 01.01.00.1089	t∔: Select Item Enter: Select +/-: Change Opt. E1: Cenenal Halm
System Language	[English]	F1: General Help F2: Previous Values F3: Optimized Defaults
System Date System Time	[Thu 12/04/2014] [08:17:53]	F4: Save & Exit ESC: Exit
Access Level	Administrator	
Version 2 1	6.1242. Conveight (C) 2013 American M	egatrends. Inc.

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

Aptio Setup Utility – Copyright (C) 2013 American Main Advanced Chipset Security Boot Save & Exit	Megatrends, Inc.		
ACPI Settings Hardware Monitor IT8760 Super ID Configuration Serial Port Console Redirection CPU Configuration IDE Configuration Miscellaneous Configuration SCC Configuration SCC Configuration SCC Configuration SCC Configuration SCC Configuration SCC Configuration Scutter Stack Configuration Security Configuration Realtek PCIE GBE Family Controller (MAC:00:E0:4C:68:00:71) Realtek PCIE GBE Family Controller (MAC:00:E0:4C:68:00:72)	System ACPI Parameters. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2 16 1242 Convergent (C) 2013 American Medatrends Inc			

□ ACPI settings

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

Aptio Setup Utili Advanced	ty – Copyright (C) 2013 Ameri	can Megatrends, Inc.
ACPI Settings		Enables or Disables System
Enable Hibernation ACPI Sleep State	[Enabled] [Suspend Disabled]	Sleep State). This option may be not effective with some OS.
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.124	2. Copyright (C) 2013 America	n Megatrends, Inc.

> 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, and S3 (Suspend to RAM)

Default setting: Suspend Disabled

Hardware Monitor Configuration

On the Hardware Monitor Setup screen, you can monitor the system, VCC3V voltage, and VBAT voltage...

Aptio Setup Advanced	Utility – Copyright	(C) 2013 American	Megatrends, Inc.
Pc Health Status			
SYSTEM Temperature	: +50 °c		
VCC3V VBAT	: +3.280 : +3.232	V V	
			<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.	16.1242. Copyright (C) 2013 American Mo	egatrends, Inc.

□ IT8760 Super IO Configuration

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

Aptio Setup Utility Advanced	– Copyright (C) 2013 America	n Megatrends, Inc.
IT8760 Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
<pre>Super IO Chip > Serial Port 1 Configuration > Serial Port 2 Configuration > Serial Port 3 Configuration > Serial Port 4 Configuration</pre>	IT8760	
		 ↔: Select Screen ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242.	Copyright (C) 2013 American	Megatrends, Inc.

Serial Port 1/2 Configuration

These fields select the I/O port address for Serial port 1/2.


♦ Serial Port

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

Available Options: Enabled, and Disabled.

Default setting: Enabled

Change Settings

This item allows users to select the port address and IRQ...

<u>Available Options:</u> Auto, IO=3F8; IRQ=IRQ4, IO=3F8; IRQ=IRQ3/4/5/7/9/10/11/12, IO=2F8; IRQ=IRQ3/4/5/7/9/10/11/12, IO=3E8; IRQ=IRQ3/4/5/7/9/10/11/12, and IO=2E8; IRQ=IRQ3/4/5/7/9/10/11/12

Default setting: Auto; Device Setting COM1-3F8/IRQ4/COM2-2F8/IRQ3

COM1/2 Port Set Select

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

Available Options: RS-232, RS-422, and RS485

Default setting: RS-232

Serial Port 3/4 Configuration



♦ Serial Port

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

Available Options: Enabled, and Disabled.

Default setting: Enabled

Change Settings

This item allows users to select the port address and IRQ...

Available Options: Auto, IO=3F8; IRQ=IRQ4, IO=3E8; IRQ=IRQ3/4/5/7/9/10/11/12, IO=2E8; IRQ=IRQ3/4/5/7/9/10/11/12, IO=2F0; IRQ=IRQ3/4/5/7/9/10/11/12, and IO=2E0; IRQ=IRQ3/4/5/7/9/10/11/12

Default setting: Auto; Device Setting COM3-3E8/IRQ11/COM4-2E8/IRQ10

Serial Port Console Redirection

This option turns on console redirection support in the BIOS and is the default setting. The remote access feature requires the use of the COM1 connector located at the rear panel of the FX5508.

Aptio Setup Utility - C Advanced	Copyright (C) 2013 American	Megatrends, Inc.
COM1 Console Redirection Console Redirection Settings Serial Port for Out-of-Band Managemer Windows Emergency Management Services Console Redirection Console Redirection Settings	[Disabled] ht/ ; (EMS) [Disabled]	Console Redirection Enable or Disable.
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.1242. Cop	oyright (C) 2013American M	egatrends, Inc.

> COM1 - Console Redirection

This field is select console redirection Enable or disable.

Available Options: Enabled, and Disabled

Default setting: Disabled

Aptio Setup Utility - Advanced	Copyright (C) 2013 American	n Megatrends, Inc.
COM1 Console Redirection Settings Terminal Type Bits per second Data Bits Parity Stop Bits Flow Control VT-UTF8 Combo Key Support Recorder Mode Resolution 100x31 Legacy OS Redirection Resolution Putty KeyPad Redirection After BIOS POST	[ANSI] [115200] [8] [None] [1] [None] [Enabled] [Disabled] [Disabled] [80x24] [VT100] [Always Enable]	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. ++: Select screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. C	opyright (C) 2013American M	Megatrends, Inc.

♦ Console Redirection Setting

Terminal Type

This field is selecting the target terminal type.

Available Options: VT100, vt100+, VT-UTFB, and PC_ANS1

Default setting: VT100

Bits per Second

This field is select Serial ports can use baud rate. Just keep in mind that speed must match terminal setting.

<u>Available Options:</u> 9600, 19200, 57600, and 115200

Default setting: 115200

Data Bit

This field is select Serial ports can use data bit. Just keep in mind that the data bits must match terminal setting.

Available Options: 7 Bots, and 8 Bits

Default setting: 8 Bits

Parity

This field is select Serial ports can use parity mode. Just keep in mind parity must match terminal setting.

Available Options: None, Even, Mark, and Spcae

Default setting: None

Stop Bit

This field is select Serial ports can use any mode. Just keep in mind that the bits per second and stop bits must match terminal setting.

Available Options: 1 Bit, and 2 Bit

Default setting: 1 Bit

Flow Control

This field is Serial ports can use flow control for console redirection.

Available Options: None, and Hardware RTS/CTS

Default setting: None

VT-UTF8 Combo Key Support

This field is select VT-UTF8 combination key support for ANSI/VT100 terminals.

Available Options: Enabled and Disabled

Default setting: Enabled

Recorder Mode

On this mode enabled only text will be sent. This is to capture Terminal data.

Available Options: Enabled and Disabled

Default setting: Disabled

Resolution 100x31

This item is select Enables or disables extended terminal resolution

Available Options: Enabled and Disabled

Default setting: Disabled

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection

Available Options: 80x24, and 80x25

Default setting: 80x24

Putty KeyPad This item is select FunctionKey and KeyPad on Putty

Available Options: VT100, LINUX, XTERMR6, SCO, ESCN and VT400

Default setting: VT100

Redirection After BIOS Post

These fields is select redirection is active during post and during boot loader or always active or off active. (Some Oss may not work if set to Always)

Available Options: Boot Loader and Always Enable

Default setting: Always Enable

Console Redirection (OBM/EMS)

This field is select console redirection Enable or disable. Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Available Options: Enabled and Disabled

Default setting: Disabled

Console Redirection Setting – Out of Band Mgmt Port

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.



Terminal Type

This field is Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes..

Available Options: VT100, vt100+, VT-UTFB, and PC_ANS1

Default setting: VT100

Bits per Second

This field is select Serial ports can use baud rate. Just keep in mind that speed must match terminal setting.

<u>Available Options:</u> 9600, 19200, 57600, and 115200

Default setting: 115200

Flow Control

The flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Available Options: None, Hardware RTS/CTS , and Software Xon/Xoff

Default setting: None

CPU Configuration

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.

Aptio Setup Utility — (Advanced	Copyright (C) 2013 American	Megatrends, Inc.
CPU Configuration		Socket specific CPU Information
 Socket 0 CPU Information CPU Thermal Configuration 		
CPU Speed 64-bit	1918 MHz Supported	
Limit CPUID Maximum Execute Disable Bit Hardware Prefetcher Adjacent Cache Line Prefetch Intel Virtualization Technology	[Disabled] [Enabled] [Enabled] [Enabled] [Enabled]	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Co	pyright (C) 2013American M	egatrends, Inc.

Limit CPUID Maximum

This field allows users to enable or disable limit CPUID maximum, to disable this item when Windows XP.

Available Options: Disabled, and Enabled

Default setting: Disabled

Execute Disable Bit

This field allows users to enable or disable the No-Execution page protection. XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS. (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3 Update 3.x)

Available Options: Disabled, and Enabled

Default setting: Enabled

> Hardware Prefetcher

This field allows the users to enable or disable the Mid Level Cache (L2) streamer prefetcher.

Available Options: Disabled, and Enabled

Default setting: Enabled

> Adjust Cache Line Prefetch

This field allows the users to enable or disable the Mid Level Cache (L2) prefetching of adjacent cache lines.

Available Options: Disabled, and Enabled

Default setting: Enabled

> Intel Virtualization Technology

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

Available Options: Disabled, and Enabled

Default setting: Enabled

Socket CPU 0 information

Display CPU Information, like CPU speed and L1/L2 cache and support function.

Aptio Setup Utility Advanced	– Copyright (C) 2013 Ame	erican Megatrends, Inc.
Aptio Setup Utility Advanced Socket 0 CPU Information Intel(R) Atom(TM) CPU E3845 @ 1.9 CPU Signature Microcode Patch Max CPU Speed Min CPU Speed Processor Cores Intel HT Technology Intel VT-x Technology L1 Data Cache L1 Code Cache L2 Cache L3 Cache	- Copyright (C) 2013 Ame 1GHz 30679 901 1910 MHz 500 MHz 4 Not Supported Supported 24 kB x 4 32 kB x 4 1024 kB x 2 Not Present	++: Select Screen ++: Select Item Enter: Select
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2 46 4242	Conuciabt (C) 2012 Amon	can Merrataands Inc

> CPU Thermal Configuration

Aptio Setup Uti Advanced	ility – Copyright (C) 2013 Ameri	ican Megatrends, Inc.
Cpu Thermal Configuration DTS	[Disabled]	Enabled/Disable Digital Thermal Sensor.
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1	1242. Copyright (C) 2013 America	an Megatrends, Inc.

\diamond DTS

This field allows the users to enable or disable the Digital Thermal Sensor.

Available Options: Disabled, and Enabled

Default setting: Disabled

□ IDE Configuration

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



Serial-ATA (SATA)

This item allows users to enable or disable SATA Controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

SATA Test Mode

This item allows users to enable or disable SATA test mode.

Available Options: Disabled, and Enabled

Default setting: Disabled

SATA Speed Support

This item allows users can select SATA speed.

Available Options: Gen1, and Gen2

Default setting: Gen2

> SATA ODD Port

Select a SATA ODD is Port0 or Port1 configuration.

Available Options: NO ODD, Port 0 ODD, and Port 1 ODD

Default setting: No ODD

SATA Mode

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 IDE mode, you do not need to pre-install.

Available Options: IDE, and AHCI

Default setting: AHCI

SATA Port0/Port1

The system CFast socket corresponding SATA port 0, SATA pot 1 is SATA HDD, this item allows users to enable or disable SATA port 0 or SATA port1.

Available Options: Disabled, and Enabled

Default setting: Enabled

SATA Port0/Port1 HotPlug

The system SATA CFAST/HDD corresponding SATA port 0/1 hot plug, this item allows users to enable or disable SATA port 0/1.

Available Options: Disabled, and Enabled

Default setting: Disabled

Aptio Setup Util Advanced	lity – Copyright (C) 2013 Ama	erican Megatrends, Inc.
Miscellaneous Configuration		OS Selection
OS Selection	[Windows 7] OS Selection Windows 8.X Android Windows 7	<pre>**: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.12	242. Copyright (C) 2013 Amer	ican Megatrends, Inc.

Miscellaneous Configuration

> OS Selection

The Item is Select OS configuration, When Install Windows 8 or 8.1 need select to use Windows 8.X. If using the Android OS, please refer https://01.org/android-ia.

Available Options: Windows 8.X, Android, and Windows 7

Default setting: Windows 7

Note: This is impartment "OS Selection", Different OS be selected through *OS Selection*". *The default is Windows* 7, *which needs to be changed when Windows* 8.X or Android OS is installed.

SCC Configuration

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



SCC SD Card Support

This item allows users to enable or disable SD card control.

Available Options: Disabled, and Enabled

Default setting: Enabled

Network Stack Configuration

Aptio Setup Advanced	Utility – Copyright (C) 2013 Ameri	ican Megatrends, Inc.
Network Stack Ipv4 PXE Support Ipv6 PXE Support PXE boot wait time	[Enabled] [Enabled] [Enabled] 0	Enable/Disable UEFI Network Stack
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.1	6.1242. Copyright (C) 2013 America	an Megatrends, Inc.

Network Stack

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

Available Options: Disabled, and Enabled

Default setting: Disabled

> IPV4/IPV6 Support

This field specifies the Enable Ipv4 or Ipv6 PXE Boot Support.

Available Options: Disabled, and Enabled

Default setting: Enabled

PXE boot wait time

This field specifies the Wait time to press ESC key to abort the PXE boot.

Default setting: 0

CSM Configuration

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



> CSM Support

This item allows users to enable or disable CSM.

Available Options: Disabled, and Enabled

Default setting: Enabled

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 Filter

This option controls Legacy/UEFI ROMs priority.

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

Default setting: UEFI and Legacy

> Network

Controls the execution of UEFI and Legacy PXE OpROM

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

Default setting: UEFI only

> Video

Controls the execution of UEFI and Legacy Video opROM

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

Default setting: Legacy only

> Video > Select "UEFI Only"

Controls the execution of UEFI only, you can use this screen "AMI Graphic Output Protocol Policy" to select Monitor Output Configuration.

Aptio Setup Utility – Copyright (C) Main Advanced Chipset Security Boot Save &	2013 American Megatrends, Inc. Exit
 ACPI Settings H83627 Super IO Configuration Hardware Monitor Serial Port Console Redirection CPU Configuration IDE Configuration Miscellaneous Configuration SEC Configuration 	User Select Monitor Output by Graphic Output Protocol
 Soc configuration AMI Graphic Output Protocol Policy Network Stack Configuration CSM Configuration USB Configuration Security Configuration 	
▶ Realtek PCIe GBE Family Controller (MAC:00:00:00: 	00:00:03) 11 : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Copyright (C) 2	013 American Megatrends, Inc.

♦ AMI Graphic Output Protocol Policy

The User can select monitor output by graphic output protocol.



Output Select

This field specifies allows you to select the Graphics Controller Intel® GDP driver which will be activated during POST.

Available Options: HD1 (DISPLAY-2), and CRT1 (Display-1)

Default setting: HD1 (DISPLAY-2)

USB Configuration

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

USB Configuration Ena AUT USB Module Version 8.11.02 Sup USB Devices: Kee 1 Drive, 1 Keyboard, 1 Mouse, 1 Hub onl Legacy USB Support [Enabled] XHCI Hand-off [Disabled] EHCI Hand-off [Disabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs:	egatrends, Inc.
USB Module Version 8.11.02 Sup USB Devices: 1 Drive, 1 Keyboard, 1 Mouse, 1 Hub Legacy USB Support [Enabled] XHCI Hand-off [Enabled] EHCI Hand-off [Disabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs:	nables Legacy USB support.
USB Devices: kee 1 Drive, 1 Keyboard, 1 Mouse, 1 Hub onl Legacy USB Support [Enabled] XHCI Hand-off [Enabled] EHCI Hand-off [Disabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs:	upport if no USB devices are onnected. DISABLE option will
Legacy USB Support [Enabled] XHCI Hand-off [Enabled] EHCI Hand-off [Disabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs:	eep USB devices available hly for EFI applications.
USB hardware delays and time-outs:	
USB transfer time-out [20 sec] ++:	-: Select Screen
Device reset time-out [20 sec]	Select Item
Device power-up delay [Auto]	nter: Select / : Change Opt
Mass Storage Devices:	/ Undige opt. 1: General Heln
Generic STORAGE DEVICE 1.01 [Auto] F2: F3: F4: ESC	2: Previous Values 3: Optimized Defaults 4: Save & Exit SC: Exit

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

> XHCI Hand-Off

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

Available Options: Disabled, 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

Aptio Setup Utility – Advanced	Copyright (C) 2013 American	Megatrends, Inc.
USB Configuration		Maximum time the device will
USB Module Version	8.11.02	reports itself to the Host Controller. 'Auto' uses
USB Devices: 1 Drive, 1 Keyboard, 1 Mouse,	1 Hub	default value: for a Root port it is 100 ms, for a Hub port
Legacy USB Support XHCI Hand-off EHCI Hand-off USB Mass Storage Driver Support	[Enabled] [Enabled] [Disabled] [Enabled]	descriptor.
USB hardware delays and time-outs:		
USB transfer time-out Device reset time-out Device power-up delay Device power-up delay in seconds	[20 sec] [20 sec] [Manua1] 5	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
Mass Storage Devices: Generic STORAGE DEVICE 1.01	[Auto]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242. Co	pyright (C) 2013 American M	egatrends, Inc.

> 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

Security Configuration

You can use this screen to select TXE Configuration.

Aptio Setup Utility – Co Advanced	pyright (C) 2013 American	Megatrends, Inc.
Intel(R) TXE Configuration TXE TXE HMRFPO TXE Firmware Update TXE EOP Message TXE Unconfiguration Perform	Enabled] Disabled] Enabled] Enabled]	Send EOP Message Befor Enter OS ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Chipset

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

- Host Bridge
- South Bridge

Aptio Setup Utility — Copyright (C) 2012 American Main Advanced <mark>Chipset</mark> Boot Security Save & Exit	Megatrends, Inc.
▶ Host Bridge ▶ South Bridge	Host Bridge Parameters
	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.15.1226. Copyright (C) 2012 American Me	gatrends, Inc.

Host Bridge

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.

Aptio Setup Utility - Chipset	Copyright (C) 2013 American	Megatrends, Inc.
▶ Intel IGD Configuration		Config Intel IGD Settings.
Memory Information		
Total Memory	8192 MB (LPDDR3)	
Memory Slot0 Memory Slot2	4096 MB (LPDDR3) 4096 MB (LPDDR3)	
Max TOLUD	[Dynamic]	
		↔: Select Screen ↓: Select Item
		Enter: Select +/-: Change Ont
		F1: General Help
		F2: Previous values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version 2.16.1242. Co	pyright (C) 2013 American M	egatrends, Inc.

> Max TOLUD

This field is Max value of TOLUD; Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.

Available Options: Dynamic, 2GB, 2.25GB, 2.5GB, 2.75GB, and 3GB

Default setting: Dynamic

Intel IGD Configuration

Aptio Setup Utilit Chipset	ty – Copyright (C) 2013 Amer	rican Megatrends, Inc.
Intel IGD Configuration DVMT Pre-Allocated DVMT Total Gfx Mem Spread Spectrum clock Primary IGFX Boot Display	[64M] [256MB] [Disabled] [VBIOS Default]	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.16.1242	2. Copyright (C) 2013 Americ	can Megatrends, Inc.

♦ DVMT Pre- Allocated

The Item is select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

<u>Available Options:</u> 64MB, 96MB, 128MB, 160MB, 192MB, 224MB, 256MB, 288MB, 320MB, 352MB, 384MB, 416MB, 448MB, 480MB, and 512MB

Default setting: 64 MB

♦ DVMT Total GFX Mem

This field specifies allows you to select the maximum amount of graphics memory of DVMT 5.0 to be shared with the system memory.

Available Options: 128MB, 256MB, and MAX

Default setting: 256 MB

♦ Primary IGFX Boot Display

This field specifies allows you to select the Video Device which will be activated during POST.

Available Options: CRT, EFP/HD1, and VBIOS Default.

Default setting: VBIOS Default

□ 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, LAN port, 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

Serial IRQ Mode

This item is Configure Serial IRQ Mode.

Available Options: Continuous, and Quiet

Default setting: Continuous

> Azalia HD Audio

Aptio Setup U Chipset	ltility – Copyright (C) 2013 Ame	erican Megatrends, Inc.
Audio Configuration Audio Controller Azalia HDMI Codec HDMI Port B HDMI Port C	[Enabled] [Enabled] [Enabled] [Disabled]	Control Detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally Enabled. Auto = Azalia will be enabled if present disabled otherwise.
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16	.1242. Copyright (C) 2013 Amer.	ican Megatrends, Inc.

♦ Audio Controller

This item allows users to enable or disable Azalia Controller.

Available Options: Disabled, and Enabled

Default setting: Enabled

♦ Azalia HD Codec

This item allows users to enable or disable internal HD codec for Azalia.

Available Options: Disabled, and Enabled

Default setting: Enabled

HD Port B (Display-2)

This item allows users to enable or disable internal HD Port B. (Display-2)

Available Options: Disabled, and Enabled

Default setting: Enabled

> USB Configuration

Aptio Setup Utility - Chipset	Copyright (C) 2013 American	Megatrends, Inc.
USB Configuration		Control the USB EHCI (USB 2.0)
USB 2.0(EHCI) Support XHCI Mode	[Disabled] [Auto]	controller must always be enabled
USB Per Port Control USB Port 0 USB Port 1 USB Port 2 USB Port 3	[Enabled] [Enabled] [Enabled] [Enabled] [Enabled]	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.1242. Co	ppyright (C) 2013 American M	legatrends, Inc.

♦ USB 2.0(EHCI) Support

This item allows users to enable or disable USB 2.0 (EHCI) Support. If an "OS Selection" selected is windows 7, the "XHCI Mode" support would be set to Disabled. (For Windows 7)

Available Options: Disabled, and Enabled

Default setting: Enabled

♦ XHCI Mode

The item XHCI (eXtensible Host Controller Interface) a workaround for specification for Universal Serial Bus 3.0 support. If an "OS Selection" selected is windows 8, the "USB.2.0 (EHCI) support would be set to Disabled. (For Windows 8.x)

Available Options: Disabled, Auto, Smart Auto, and Enabled

Default setting: Disabled

♦ USB Per Port Control

The USB Control each of the USB ports (0~3). Enable: Enable USB per port; Disable: Use USB port X settings

Available Options: Disabled, and Enabled

Default setting: Enabled

♦ USB Port 0/1/2/3

The USB Control each of the USB ports (0~3).

Available Options: Disabled, and Enabled

Default setting: Enabled

PCI Express Configuration

Aptio Setup Chipset	Utility – Copyright (C) 2013	American Megatrends, Inc.
PCI Express Configuration PCI Express Port 0 Hot Plug Speed Extra Bus Reserved Reseved Memory Reseved Memory Alignment Prefetchable Memory Prefetchable Memory Alignm Reserved I/0	[Enabled] [Enabled] [Auto] 1 10 1 10 nent 1 4	▲ Enable or Disable the PCI Express Port 0 in the Chipset.
PCIe Port 1- GLAN CTL Hot Plug Speed Extra Bus Reserved Reseved Memory Reseved Memory Alignment Prefetchable Memory Alignm Reserved I/O PCI Express Port 2 Hot Plug Speed Extra Bus Reserved	rent (Enabled) [Enabled] [Auto] 0 10 10 1 1 10 4 4 (Enabled] [Enabled] [Auto] 0	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.1	16.1242. Copyright (C) <u>2013</u> Am	erican Megatrends, Inc.

♦ PCI Express Port 0>Mini Card/1>GLAN/2> Reserved

The onboard Mini card /LAN corresponding PCI Express port 0/1, the PCIe port 0/1 item allows users to enable or disable on board PCIe Mini card and LAN.

Available Options: Disabled, and Enabled

Default setting: Enabled

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.

Aptio Setup Utilit Main Advanced Chipset Securi	y – Copyright (C) 2013 American ty Boot Save & Exit	Megatrends, Inc.
Password Description		Set Administrator Password
If ONLY the Administrator's pass then this only limits access to only asked for when entering Set If ONLY the User's password is s is a power on password and must boot or enter Setup. In Setup th have Administrator rights. The password length must be in the following range: Minimum length	word is set, Setup and is up. .et, then this be entered to e User will 3	
Maximum length	20	→+: Select Screen
Administrator Password		†↓: Select Item Enter: Select
User Password		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
▶ Secure Boot menu		F4: Save & Exit ESC: Exit
Version 2.16.1242	. Copyright (C) 2013 American M	egatrends, Inc.

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.



Security Boot menu

Customizable Secure Boot settings

Aptio	Setup Utility – Copyright Security	(C) 2013 American	Megatrends, Inc.
System Mode Secure Boot Secure Boot Secure Boot Mode ▶ Key Management	Setup Not Activ [Enabled] [Standard	e]	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled
			<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Vens.	ion 2.16.1242. Copyright (C) 2013 American M	egatrends, Inc.

♦ Secure Boot

Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled

Available Options: Disabled, and Enabled

Default setting: Disabled

♦ Secure Boot Mode

Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys.

Available Options: Standard, and Customer

Default setting: Standard

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

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.

Save & Exit

Aptio Setup Utility – Copyright (C) 2013 American Main Advanced Chipset Security Boot Save & Exit	Megatrends, Inc.
Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	Exit system setup after saving the changes.
Save Options Save Changes Discard Changes	
Restore Defaults Save as User Defaults Restore User Defaults	
Boot Override UEFI: Generic STORAGE DEVICE 1.01 UEFI: Generic STORAGE DEVICE 1.01	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.16.1242. Copyright (C) 2013 American Me	egatrends, Inc.

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.

FabiaTech Corporation

Chapter 4 Software Installation

The enclosed CD diskette includes FX5508 VGA, System, Audio, LAN and USB driver. To install and configure you FX5508 system, you need to perform the following steps.

Select you <u>OS configuration</u> to BIOS, when you Install Windows 7, Windows 8 or 8.1 need select <u>BIOS</u> setting.

System Driver

WIN 7/8 Driver

Installs Atom E3845 Chipset, Core PCI, PCIe, SATA, USB, ISAPnP and IDE/ATA Device Drive.

- Step 1: To install the Atom E3845 driver, insert the CD ROM into the CD ROM device, and enter DRIVER>SysChip>E3845>WIN7 or >WIN8.
- Step 2: Execute SetupChipser.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.

VGA Driver

WIN 7/8 x86/x64 Driver

Step 1: To install the VGA driver, insert the CD ROM into the CD ROM device, and enter DRIVER>VGA>E3845 >WIN7> or >WIN8>.

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.

Note: In the DRIVER>VGA>E3845>WIN7 or >WIN8 directory, a Readme.txt file is included to provide installation information.

Audio Driver

WIN 7/8 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 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. If your system is not equipped with a CD ROM device, copy the LAN driver from the CD ROM to CF.
- Step 2: Execute setup.exe file.

USB 3.0 Driver

WIN7 X86/X64 Driver

- Step 1: To install the USB 3.0 XHCI driver, insert the CD ROM into the CD ROM device, and enter DRIVER>USB>E3845>WIN7.
- 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. Read License Agreement and click "Yes" to proceed.

Review Readme File Information and click "Next" to proceed.

When the "Setup Progress" is complete click "Next" to proceed.

Lastly, the "Setup Complete" screen appears so click "Finish" to restart your computer.

Note: In the DRIVER> USB>E3845 >WIN7 directory, a Readme.txt file is included to provide installation information.

TXE Driver

WIN7 X86/X64 Driver

- Step 1: To install the TXE driver, insert the CD ROM into the CD ROM device, and enter DRIVER>TXE>E3845>WIN7 or >WIN8.
- Step 2: Execute SETUPTXE.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. Read License Agreement and click "Yes" to proceed.

Review Readme File Information and click "Next" to proceed.

When the "Setup Progress" is complete click "Next" to proceed.

Lastly, the "Setup Complete" screen appears so click "Finish" to restart your computer.

Note: In the DRIVER>TXE>E3845 >WIN7 or >WIN8 directory, a Readme.txt file is included to provide installation information. For Windows 7, it is necessary to install Windows update <u>KB2685811</u> before installing TXE driver.

BEFI BIOS Flash Utility

In the <UTILITY> directory, there is the fpt64.zip EFI BIOS flash tool (Include fpt64.efi and fparts.txt file), Follow these steps to upgrade BIOS:

- Step 1: Uncompress the fpt64.zip BIOS flash tool and copy new BIOS file to the root directory of USB-Stick.
- Step 2: Press [F11] after system start-up to enter Boot Menu, Select UEFI: Jetxxx (USB-Stick).



Step 3: Using the "map" shell command will list device mapping table. To change the current file system to the mapped fs0 file system: "fs0:" (Select to USB stick removable storage, if only plug USB Stick, use "fs0" shell command)



- Step 4: Use the "fpt64 -f xxxxVxx.bin" program to update the new BIOS.
- Step 5: Power off the system or use "reset" shell command, when BIOS update is successful the message will show "FPT Operation Passed".
- Step 6: Restores BIOS default, when updates the BIOS and reboots the system at the first time.

Watchdog Timer

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

The system is equipped with a programmable time-out period watchdog timer. You can use your own program to enable 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 Time-Out Period (Seconds) (Minutes)	
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
и	Ш	Ш
и	Ш	Ш
Ш	Ш	ш
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 an Assemble program, which demonstrates how to enable the watchdog timer and set the time-out period at 28 seconds.

; Enter	the extended	d function mode
Mov Mov Out Nop	dx, 2eh al, 87h dx,al	; Enter to extended function mode
Nop Mov Out Nop	al,01h dx,al	
Mov Out Nop	al,55h dx,al	
Mov Out Mov Out	al,55h dx,al al,22 dx,al	
Mov Mov Out	dx,2fh al,00h dx,al	
; Logic	al device 7, c	configuration registers Index 72h-Bit 7, 73H (LSB)/74H (MSB)
Mov Mov Out	dx,2fh al,07h dx,al	; Select Logical Device 7 of watchdog timer
Mov Out Mov	al,72h dx,al dx,2fh	;Index 72h- Time-Out Value and Watchdog Register
Or ;Or Out Moy	al,90h al,10h dx,al dx 2eh	;Set Bit 7 is 1: Second and Bit4: Enabled Watchdog. ;Set Bit 7 is 0: Minute.
Mov Out Mov Mov Out Mov	al,74h dx,al dx,2fh al,00h dx,al dx,2eh	; Set Timer counter 0100~FF00 (MSB)
Mov Mov	al,73h dx,2fh	; Set Timer counter 0001~00FF (LSB)

Mov Out	al,28h dx,al	; Set timeout interval as 28seconds and start counting
; Exit ex	tended fu	nction mode
Mov	dx,2eh	
Mov	al,01h	
Out	dx,al	

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			
Mov Mov	dx,2fh al,07h	; Select Logical Device 7 of watchdog timer	
Out Mov	dx,al dx,2eh	Index 72h Time Out Value and Watchdog Pagister	
Out	dx,al dx 2fh	, index 7211- fille-Out value and watchdog Register	
And Out	al,00h dx,al	;Set Bit4 to '0': Disabled Watchdog.	

Digital I/O programming

The following is an Assembly program, which demonstrates how to read and write the data of GPIO. The I/O ports need use the 32bit operands read and write. ; Configuration the Digital IO port is 50Ah-(GPI) Bit0, Bit1/50Bh-(GPO) Bit 0, Bit 1. ; 50Ah-Bit0/ Bit1 (GPI-0 ~ GP1-1, Only Read data port) Its respective bit only read. ; 50Bh-Bit0/Bit1 (GPO-0 ~ GPO-1, Only Write data port) When set to a "1", respective GPO port is programmed as 'High'. When set to a "0", respective GPO port is programmed as 'Low'. dx,508h ; Digital I/O port 508h (32bit) Mov eax,03000000h; set GPO-0(Bit0) ~ GPO-1(Bit1) value is "x3xxxxxh" Mov eax,01000000h; set GPO-0(Bit0) to High /GPO-1(Bit1) to Low ;Mov eax,02000000h; set GPO-0(Bit0) to Low /GPO-1(Bit1) to High ;Mov Out ; Set GPO-0 ~ GPO-1 value dx,eax Mov dx,508h In eax,edx ; read GPI-0 (Bit-0) ~ GPI-1 (Bit-1) value is "xxffxxxxh" eax,00030000h ; Read I/O Port 50AH,Bit0/Bit1 status. and

The CD includes a GPIO demo file. In the GPIO/E3845 /TurboC: Library and Test Program written in Turbo C^++

Note: In the GPIO/E3845 directory, README.TXT file is included to provide demo program information.

CANBUS

This section describes how to program and use the CAN BUS. it provides a Description of the I/O memory map of the chip and discussion of the internal registers to aid you in programming your CAN controller chip.



Defined Memory Mapping And Interrupt

The CANBUS occupies 2 bytes of FX5508 memory space. You can set the base address and access to the internal resources of the SJA1000 CAN controller chip. The SJA1000 chip access is multiplexed in such a way that the host must first write to 300h the internal address of the CAN chip and after that perform a write to address 301h with the actual data to be written into the desired memory location. Address 302h is a hardware-reset function of the SJA1000. Performing a read or write to this address will cause a hardware reset to the CAN controller. You may need to reset the chip in case of an unrecoverable error in the CAN controller chip. And your can use interrupt the main processor when a message is received or transmitted if interrupts are enabled on the FX5508. By using interrupts you can write powerful code to CAN.

Description	Factory Setting
Base Address	300H
Data Of Address	301H
Hardware Reset Of SJA1000 Chips	302H
Interrupt Require Quest	11

Example Programming

Write 300H to the CAN controller Control byte located in the on-chip address 0.The Example is listed below:

Outportb (0x300,0x00) ; Write CAN Address 0 (Control Register) Outportb (0x301,0x78) ; Write Data of CAN Address 0 (Control Register)

Note: In the DRIVER/CANBUS/SJA1000 directory a demo file is included to provide CAN control information and Turbo-C DEMO program. And Please see "SJA1000.pdf" on your CD-ROM for further information on the SJA1000 chip.

Chapter 5 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
- Dimension

Technical Reference

Physical and Environmental

Temperature: Operating -20°C ~ 70°C

Relative humidity 5 % to 95 % non-condensing

Surface Temperature of Chassis:

5°C to 45°C (W/HDD)/ -20°C to 70°C (W W.T/CFAST card or SSD)

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.

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

The following table is a summary of each ACE accessible register

> 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)

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

Bit 1: Word Length Select Bit 1 (WLS1)

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)

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

\triangleright	Divisor	Latch	(LS.	MS)

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

Appendix

Dimension

a. FX5508





b. FX5501K1 Wall Mount universal fixers

c. FX5501K2 Rack Mount universal fixers



d. FX5504K1 Panel Mount universal fixers



e. FX5407K3 Panel Back Mount universal fixers





f. FX5507K2 2U Rack Mount universal fixers