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XpressROM™ Users Guide

Revision History

Revision	Date	Comments
1.0	11/10/99	First Version
1.2	1/14/02	Second Revision
1.4	6/23/03	Third Revision
1.6	8/10/04	Fourth Revision
1.8	9/6/05	Fifth Revision
1.9	10/25/05	Post review

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Overview

The following document is a users guide for Insyde's XpressROM™ firmware for the AMD Geode™ processors including the AMD Geode™ NX, LX, GX ,SC1200, SC2200, SC3200, and GX1 processors. The user guide will show you the menu systems for the firmware and a mechanism for flashing the BIOS on your platform. Insyde has been working with AMD on the XpressROM™ firmware since 1999 and maintains a development relationship with AMD. Insyde also supports the entire line of AMD products including AMD Alchemy™ , AMD Athlon™, AMD Opteron™ ,AMD Turion™ AMD Sempron™ processors.

The Users Guide is applicable to all the AMD Geode™ processor reference designs with the following part numbers

LX/CS5536	GX/CS5536	GX/CS5535	SC1200/SC1201, SC2200,SC3200	SC1100	GX1
LX DB800	Geode GX SBC RDK	GX DB533	SP4SC30	SP4SC40	SP2GX10
		SP4GX22	SP4SC31	DBSC1100	
		Geode GX Thin Client	SP2SC20		
			DBSC1200		

Quick Start

1) Download the latest Evaluation Copy of XpressROM™
With reference platform from AMD, the next step is to load the latest XpressROM™ for the platform. To find the latest XpressROM™ for evaluation on the reference platform go to:

http://www.insydetech.com/productcenter/amd/geodesite/index.cfm

This website contains the latest released version of the XpressROM™ binary as well as a location to download boot loaders for the reference platforms.

2) Flash latest version of XpressROM™ on AMD platform
Now that you have the latest evaluation copy of XpressROM™, you must flash it onto your system by using either a flash prom burner or using a flash utility supplied by Insyde Software

If you do not have a copy of the flash utility, the website listed above contains a copy. Boot your system to DOS and then the command line to flash a xpress.rom image (256KB) of any size flash part (256/512/1024) is:

flashrom /D /sFFFC0000 xpress.rom

Where xpress.rom is the name of the binary you downloaded in step 1.

3) Clear CMOS
The next step is to boot your board and clear the CMOS. To clear the CMOS boot the platform and enter the setup by pressing F1 as the system is booting.

Select **L. Load Defaults** on the main menu
Next select **X. Save Values and Exit.**

4) Install OS and test system
The final step is to load the system with your operating system and test out the functionality.

Setup Menu Screens and Navigation

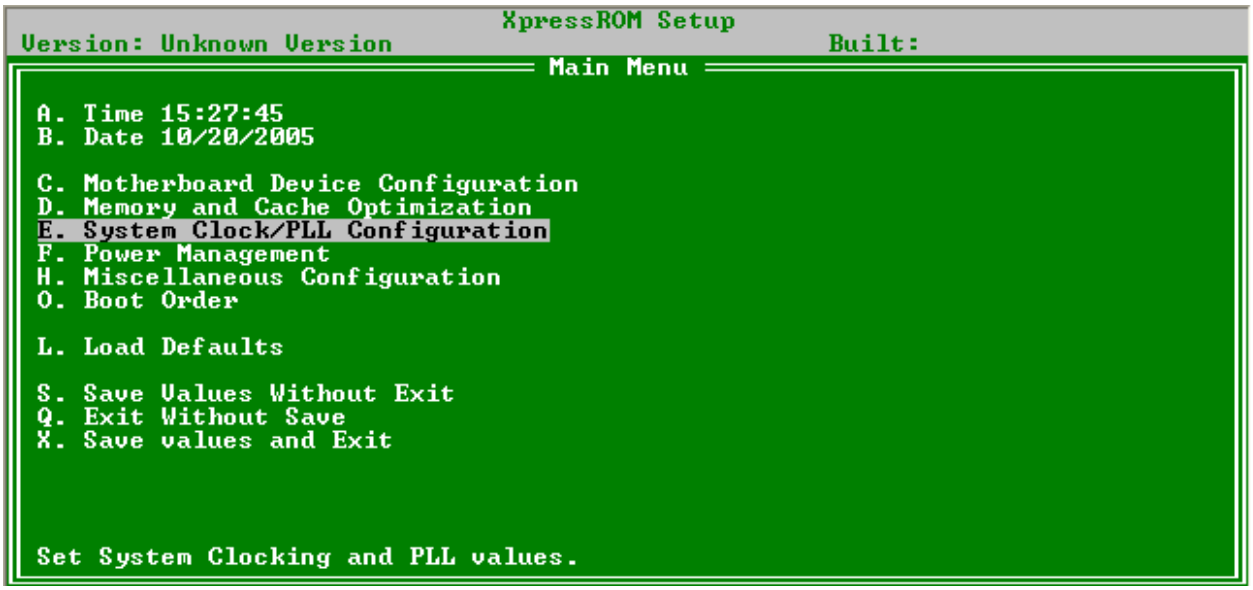
The XpressROM™ Setup Menu contains a number of features and options. It is recommend to evaluate the menu options prior to shipment of your platform to ensure the removal of options that could have a negative consequence if users change the items.

The controls for the setup menu are:

ESC	Back up menus or escape from a menu
Arrow Keys ↑↓	Scroll up and down menus and change radio boxes
Arrow Keys ←→	Scroll left and right in menus
<Enter> or <Return>	Select items in the menu or change status

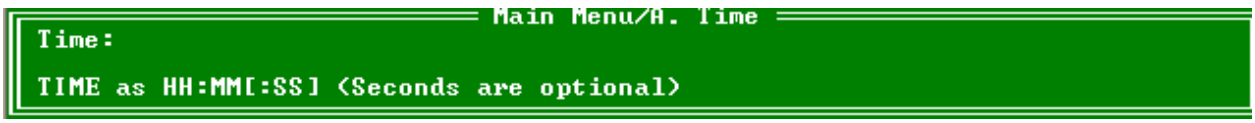
Main Menu

The main menu is the first screen that appears from when a user selects **F1** during the boot process. Below is a screen shot of the main menu. Press the letter or use the arrow keys to select an option.



A. Changing the Time

To change the time select **A** from the main menu. You will be prompted with the following submenu



Enter the time in the format listed as an example: 11:30:01 then hit <enter>

B. Changing the Date

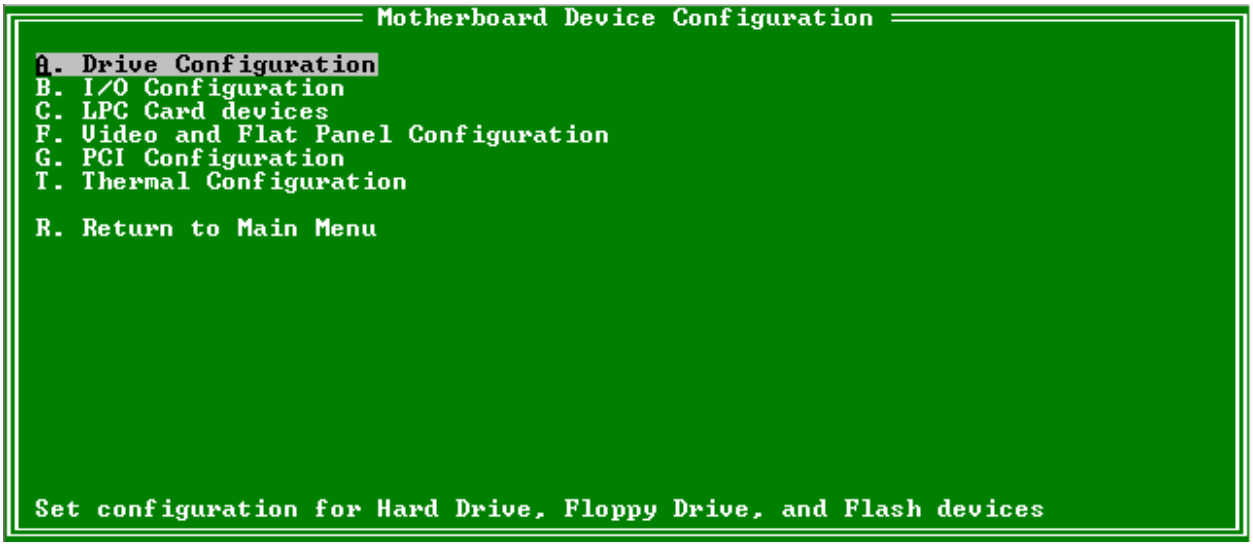
To change the date select B form the main menu. You will be prompted with the following submenu:

Enter the date in the format listed as an example: 12/16/2005 then hit <enter>

C. Mother Board Device Configuration

The Mother Board Device configuration contains the only sub menu system of the setup screens. The choices are

Drive Configuration: Allows the configuration of the IDE drive
I/O Configuration: Allows for the configuration of the serial ports on the CS5535/CS5536
LPC card devices: Allows for the configuration of the serial and parallel ports on an LPC Card
Video and Flat Panel Configuration: Allows for the configuration of flat panels and video memory
PCI Configuration: Allows for the configuration of PCI devices (IRQ,USB)
Thermal Configuration: Allows for the configuration of the Thermal limits.



D. Memory and Cache Optimizations

The Memory and Cache Optimizations screen should not be left in a shipping system. Miss configuring the memory can render the system unable to boot. If the system is configured incorrectly, it may be necessary to short CMOS to get the system to boot.

Cache Enable: Allows the configuration of the Cache of the system to be either Enabled or Disabled
Cache Mode: Allows the selection of the Cache mode either Write-Back or Write-Through
DIMM 0 or 1:

Memory Optimization DIMM 0 or 1: Allows the memory to be configured by Auto or Manual. If Auto is selected DIMM Page Size, DIMM Size, DIMM Module Banks, and DIMM Component Banks will be grayed out.

DIMM 0 or 1 Page Size: Allows selections of Not Installed, 1,2 ,4 ,8,16 KB
DIMM 0 or 1 Size: Allows for the configuration of the Memory size to be 8M, 16M, 32M, 64M 128M, 256M, 512M
Module Banks: Allows for the configuration of the number of module banks. Options are 1 or 2
DIMM Component Banks: Allows for the configuration of the component banks Options 2 or 4

CAS Latency (SDR/DDR): Allows the configuration Column Address Select latency. The options are Auto, 2CLK/1.5CLK, 3CLK/2CLK, 4CLK/ 2.5CLK, 5CLK/3CLK and 6CLK/NA

DDR/SDR: Allows the selection of the memory type options include Auto, DDR and SDR
Refresh rate: Allows the setting of the memory refresh rate. Options include: auto, 3us, 7us, 15us, 31us, 62us and 125us
Interleave selection: Allows the setting of the interleaving to either LOI (Low Order Interleaving) to HOI (High Order Interleaving)

XOR MB0, BA0 or BA1: Allows the enable or disable of the XORing of module bank BA1or BA0 with upper GLIU address bit. Options are Enable and Disable.

Memory Latencies: Allows the manual or auto configuration of the memory latencies

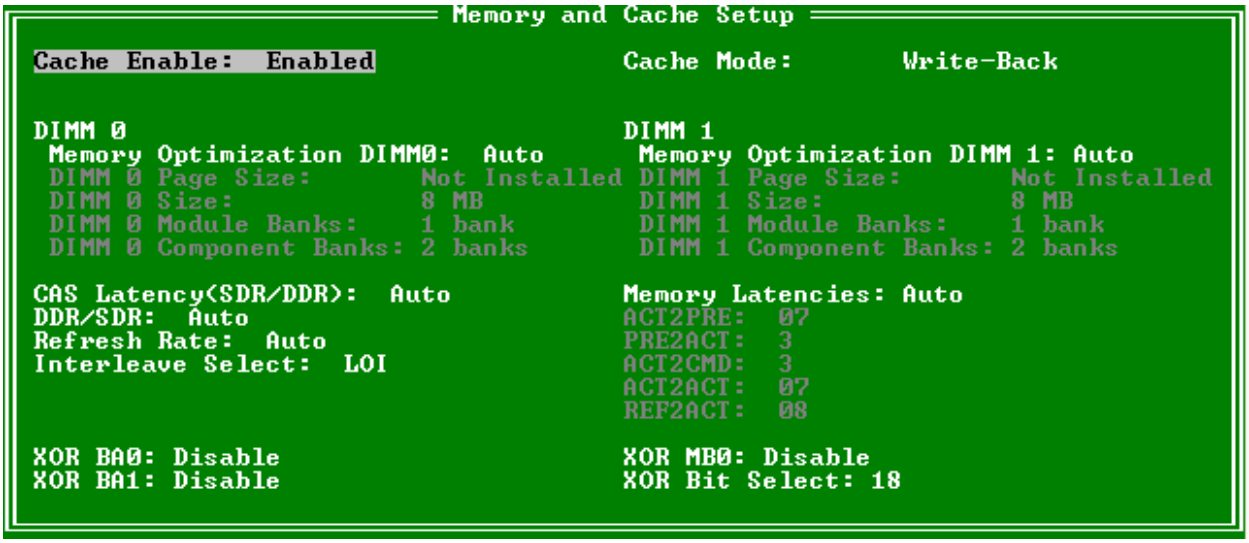
ACT2PRE: ACT to PRE Period (tRAS). Minimum number of clocks from the ACT to PRE commands on the same component bank

PRE2ACT: Pre to ACT period (tRP). Minimum number of SDROM clocks between PRE and ACT commands

ACT2CMD: Delay time from ACT to Read/Write (tRCD). Minimum number of SDRAM clocks between ACT and Read/Write Commands

ACT2ACT: ACT(0) to ACT(1) Period (tRRD). Minimum number of SDRAM clocks between ACT and ACT commands to two different component banks within the same module bank.

REF2ACT: Refresh to Activity Delay (tRFC). Minimum number of SDCLKS 90-31) between refresh and next command, usually an activate



E. System Clock/PLL and Clock Gating Configuration

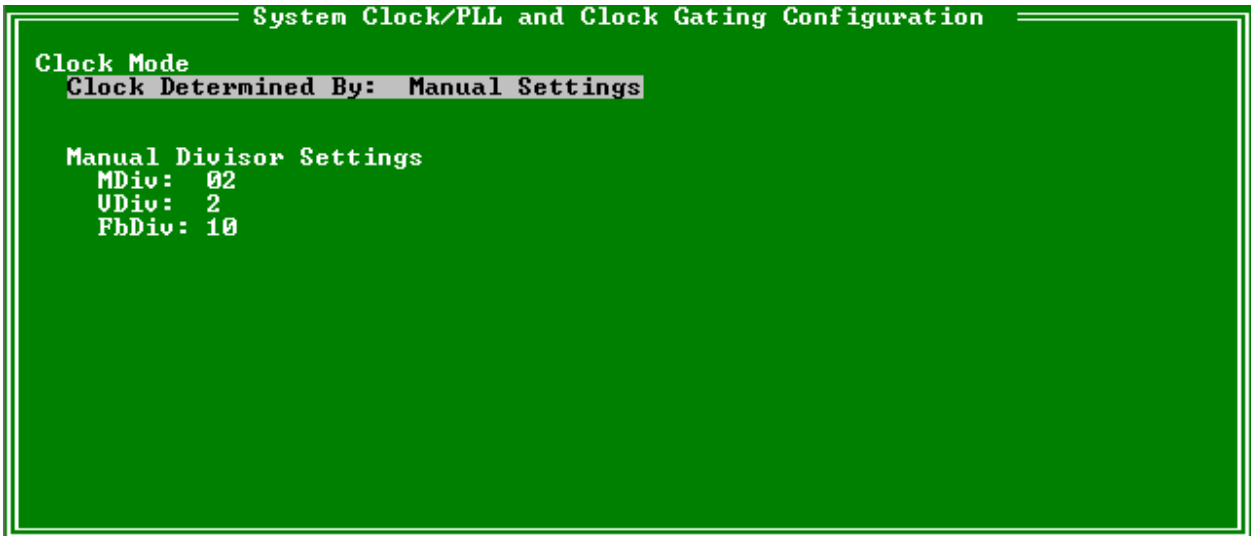
The system clock/PLL allows the setting of the clocks for the AMD Geode™ system.

Clock Mode: Allows the clock speed to either be determined by the hardware strapping or manual settings. If the H/W strapping option is selected, then the manual divisor settings will be grayed out.

Manual divisor settings
Mdiv: Options from 2 to 17
Vdiv: Options from 2 to 9
FbDiv: Options from 6 to 61

The formula for the Mdiv, VDiv, and FbDiv is as follows

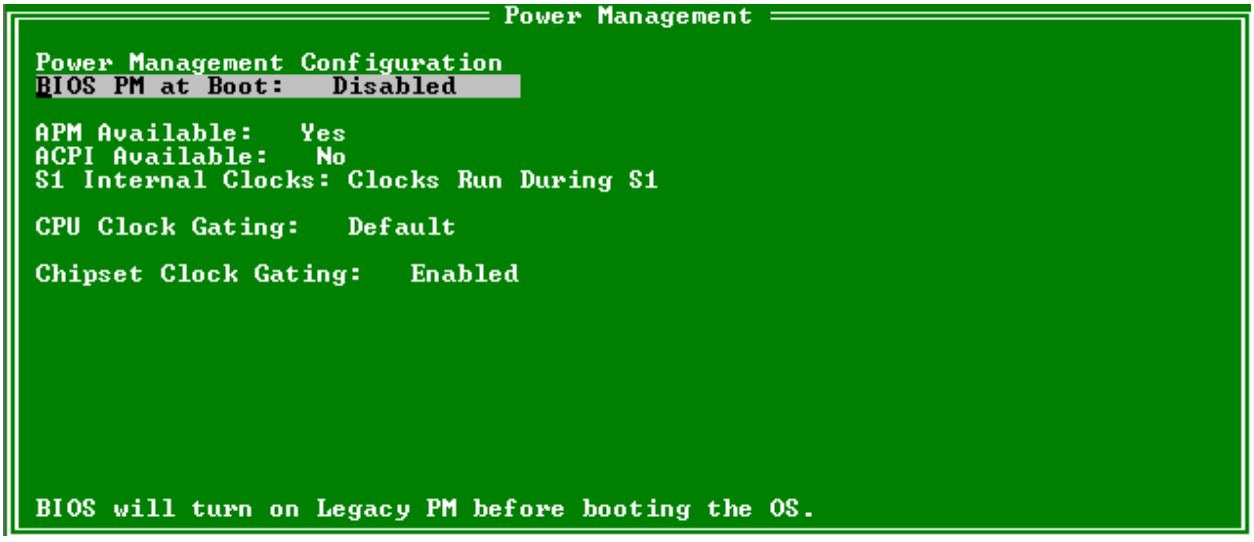
(PCI*FbDiv)/VDiv = CPU speed and (PCI*FbDiv)/MDiv = GeodeLink™ speed.



F. Power Management

The Power Management menu is for configuration of the BIOS's power management with relation to the OS on the platform.

BIOS PM at Boot: The BIOS PM allows setting of legacy power management mode prior to booting the system
APM Available: Allows the system to configure if the APM interface is available. The options are Yes or No
ACPI Available: Allows the system to configure if the ACPI interface is available. The options are Yes or No
S1 Internal Clock: Allows the configuration of the clocks to either run or not during S1. The options are Clocks Run During S1 or Clocks Off During S1
CPU Clock Gating: Allows the configuration of the processor clocks during power management. The options are Default, Performance, All Off, or All on
Chipset Clock Gating: Allows the configuration of the chipset clocks with the options being Enabled or Disabled



H. Miscellaneous Configuration

The Miscellaneous configuration screen focuses on a variety of functions, Use the (↑↓) to select the function and <enter> to change the value

Splash Screen Configuration

Splash Screen: Allows the configuration to have the splash screen displayed or not. The options are Enable or Disable

Clear Splash Screen: Allows the system to leave the splash screen on up until the operating systems clears the screen. The options are Enable or Disable

Splash Screen Timeout: Sets the time for how long the splash screen is displayed. The time is in milliseconds and goes from 0 to 65535. Enter the amount and select <enter>

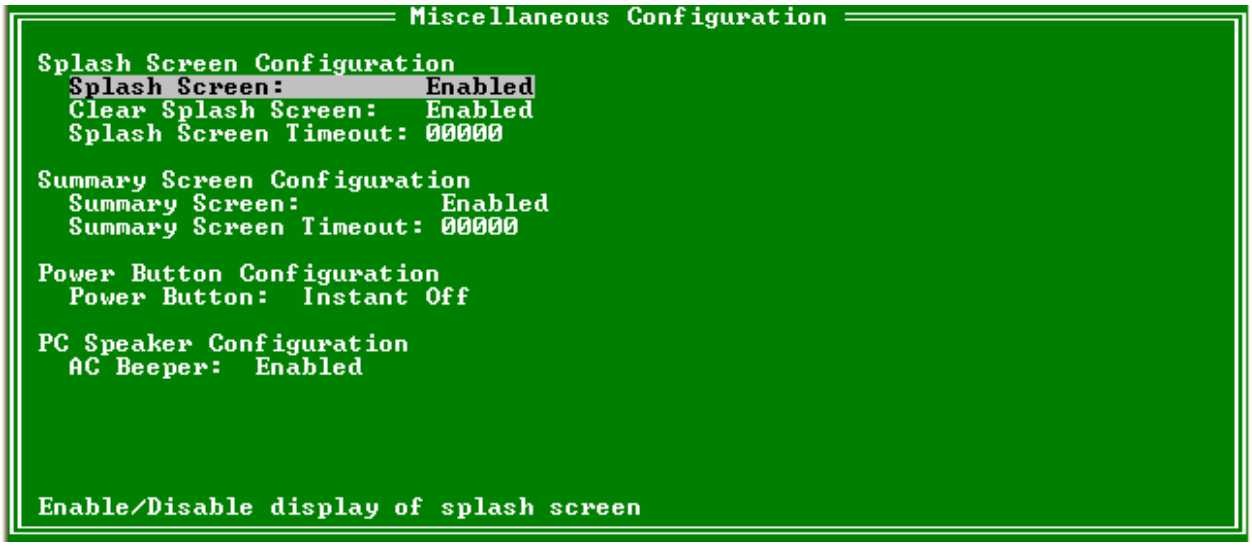
Summary Screen Configuration

Summary Screen: Allows the summary screen to be either displayed or not on boot. The options are Enable or Disable

Splash Screen Timeout: Sets the time for how long the summary screen is displayed. The time is in milliseconds and goes from 0 to 65535. Enter the amount and select <enter>

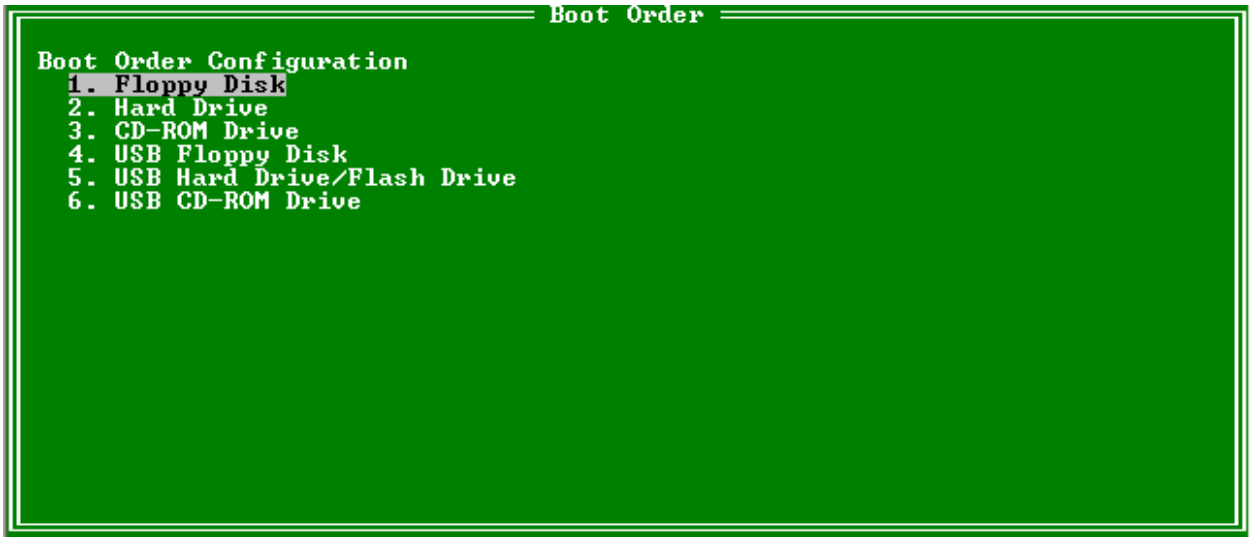
Power Button Configuration: Allows the power button to be configured with ACPI mode or Instant off

PC Speaker Configuration: Allows the PC speaker to beep. The options are Enable or Disable



O. Boot Order

The Boot Order menu allows the alteration of the devices checked for a bootable image. There are six slots for selecting the order. Use the arrow keys to select the order number and then press enter to cycle through the options. The options are None, Floppy Disk, USB Floppy Disk, Hard Drive, CD-ROM Drive, USB CD-ROM Drive, USB Hard Drive/Flash Drive.



Motherboard

C-A Drive Configuration

The drive configuration screen determines the setup for the Hard drives, Floppy, CD-ROM and Flash configurations

Hard Drive Configuration:

IDE BIOS Support: Allows the configuration of the IDE channel. The options are Enable or Disable

80-Conductor Cable Sense: Selects the GPIO that is connected to the IDE –PDIAG sense. The options are GPIO 00-17, None (disabled) , Force to 40-pin conductor cable, Force to 80-pin conductor cable

DMA/UDMA BIOS Support: This enables DMA/UDMA timings. The options are Enable and Disable

Max mode for Drive 1 or 2 : This enables the transfer mode. The options are Auto, PIO 0-4, MDMA 0 or 1, and UDMA 0-4.

Floppy configuration: Allows the Floppy to be either Enabled or Disable

CDROM Configuration: Allows the CD-ROM to be either Enabled or Disabled

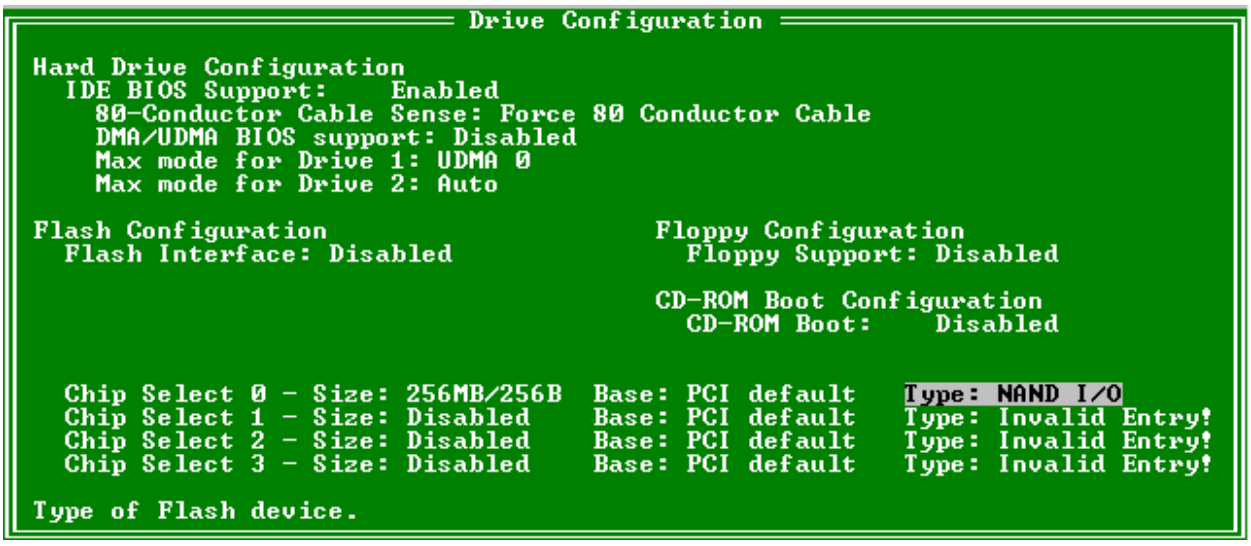
Flash Configuration: Allows the use of a flash device over the IDE. The options are Enable or Disable

Chip Select 0- 3

Size: Allows the configuration of the flash chips to be disabled, 8K/16B, 16K/32B, 128K/64B, 512K/128B, 4M/256B, 8M/256B, or 256M/256B where it is Memory size / I/O size

Base: Allows the configuration of the base address. The options are PCI defaults, D2000, D4000, D6000

Type: Allows the selection of the type of flash memory. The options are Nor Mem, or NAND I/O

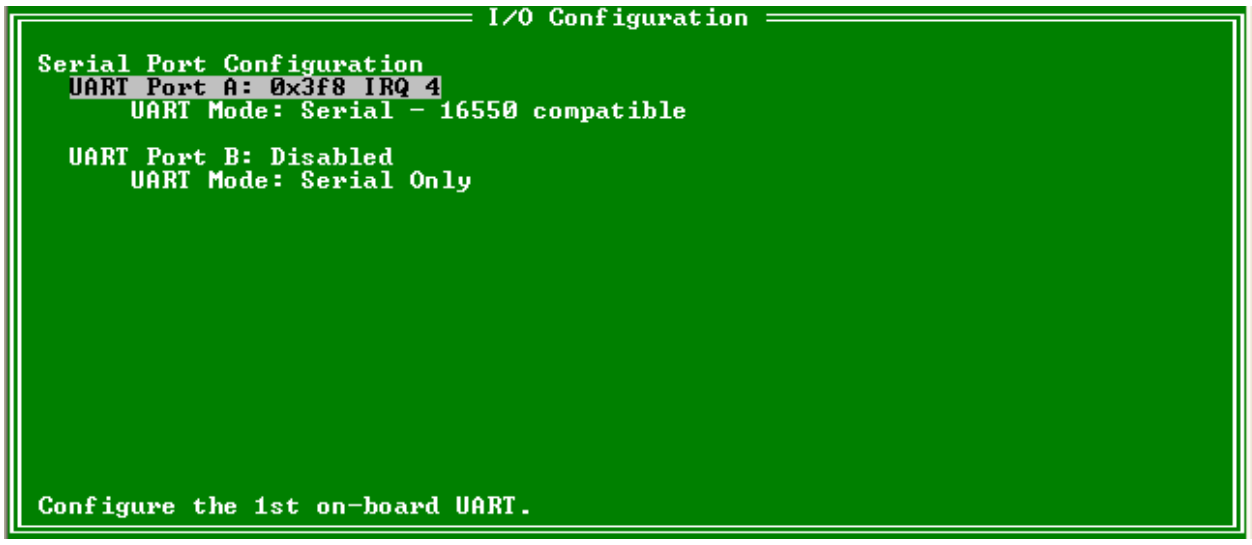


C-B I/O Configuration

The I/O configuration menu enables the configuration of the serial ports on the CS5535/CS5536 parts. To select the option use the arrow keys and press enter.

UART Port A or B: Allows the selection for the address of the UART port. The options are Disabled, 0x3F8 IRQ 4, 0x2F8 IRQ 3, 0x3E8 IRQ 4, 0x2E8 IRQ3

UART Mode: Allows the selection for the mode of operation of the serial port. The options are CIR, Serial – 16550 Compatible, or Serial Extended



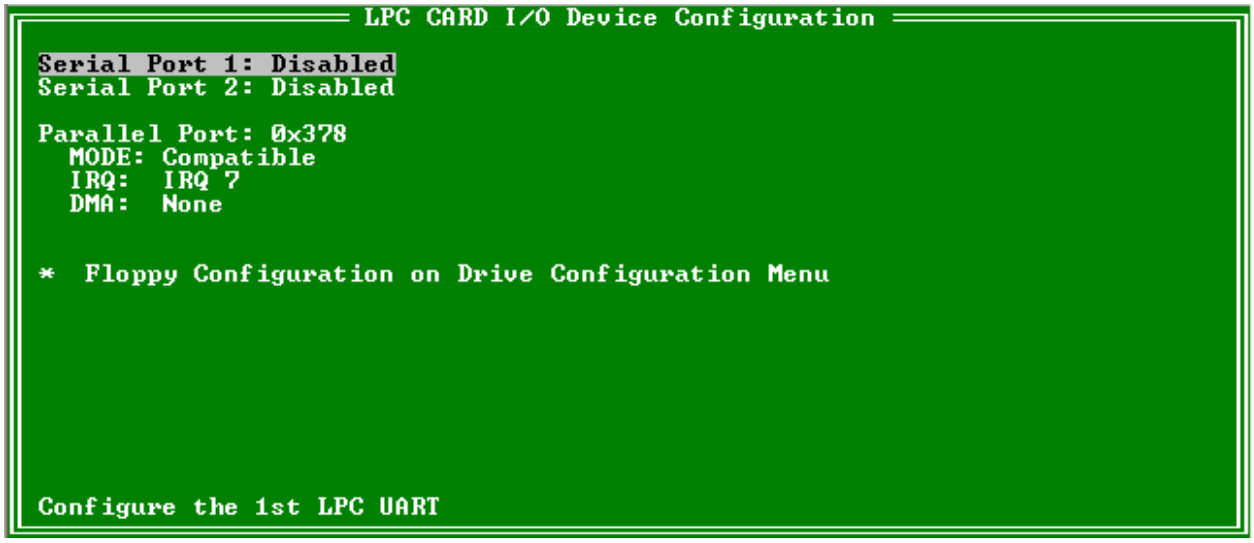
C-C LPC Card Configuration

The LPC card configuration enables the configuration of each serial port and the parallel port on the LPC. To change the serial port configuration use the arrow keys (↑↓) to select the serial port and hit <enter> to change the state the choices are Disabled, 0x3F8 IRQ 4, 0x2F8 IRQ 3, 0x3E8 IRQ 4, 0x2E8 IRQ3

Parallel Port: Allows the selection of the parallel port address. The choices are disabled, 0x378, 0x278, 0x3BC.

Mode: Allows changing the parallel port mode. The options are Compatible, PS/2 Bi-directional, EPP 1.7, EPP 1.0 ECP

IRQ: Allows the configuration of the IRQ for the parallel port. The options are IRQ Disable, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11
DMA: Allows the configuration of the DMA for the parallel port with the options none, Channel 1, or Channel 3



C-F. Video and Flat Panel Configuration

The following menu allows you to configure video settings for the system. To change an option, select the field using the arrow keys and then select <enter> to change the value of the field. The menu system will also display the bond out option for the parts either flat panel or CRT.

Video Memory – Allows you to select the amount of video memory to reserve on the system. The options are <none> or 4MB to 16 MB

Multi-monitor Configuration – Allows the selection of the mode for the video controller when an external monitor is present. The choices include Disabled, Primary and Secondary

Flat Panel Configuration – Enables the auto or manual configuration of the flat panel.

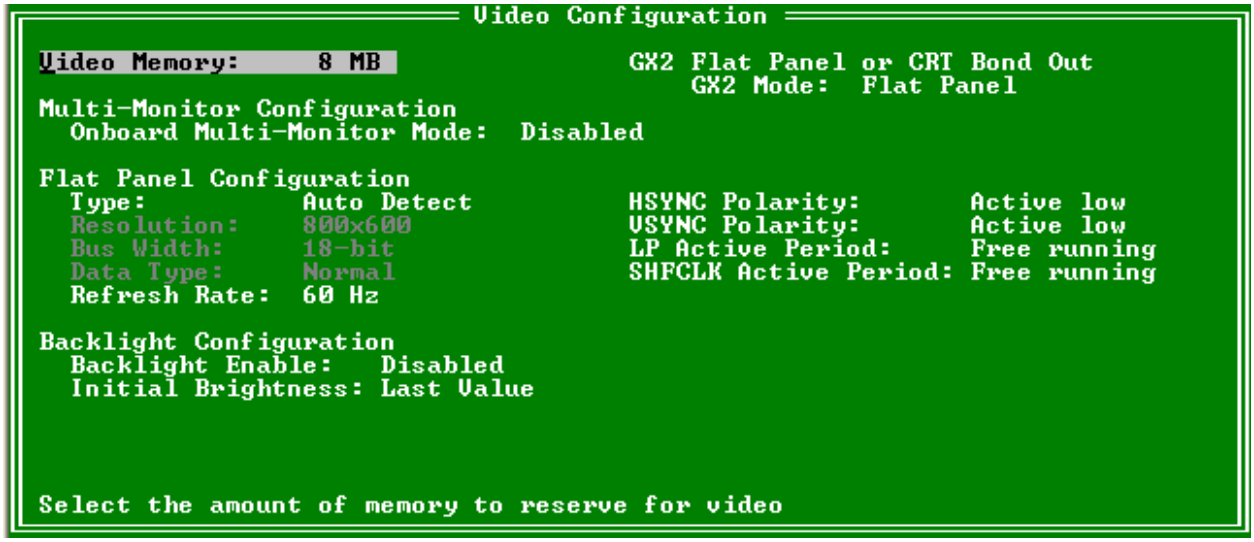
Type: This enables the selection of the type of flat panel the choices are Auto Detect, SSTN, DSTN, TFT, LVDS. Typically the Auto Detect is recommended. (If Auto Detect is selected, then the Resolution, Bus Width and Data type will be grayed out.)
Resolution: Allows the setting of the resolution of the panel. The choices are (640x480, 800x600, 1024x768, 1152x864, 1280x1024. (Only active if Auto Detect is not selected.)
Bus Width: Allows the selection of the bus width for the panel. The options are 8, 9, 12, 16, 18, 24 – bits. (Only active if Auto Detect is not selected.)
Data Type: Allows the selection of the data type for the panel. The options are Normal or 2x. (Only active if Auto Detect is not selected.)
Refresh Rate: Allows the selection of the monitors refresh rate. The options are 60, 70, 72, 75, and 85Hz
HSYNC Polarity: Selects the active polarity of the HSYNC signal to the panel. The options are Active Low or Active High
VSYNC Polarity: Selects the active polarity of the VSYNC signal to the panel. The options are Active Low or Active High
LP Active Period: Selects the active period of the LDE/MOD (LP) signal. The options are Free Running and Active Only

SHFCLK Active Period: Selects the active period of the SHFCHK signal. The options are Free Running and Active Only

Backlight Configuration: Allows the configuration of the backlight

Backlight Enable: Selects the if the backlight is Enabled or Disabled

Initial Brightness: Selects the initial brightness of the panel. The options are Last Value, 0%(off), 10%, 20%, 30%, 40%,50%, 60%, 70%, 80%, 90%, 100% (full on)



C-G PCI Configuration

The following menu system allows the configuration of the PCI interrupts. Select the PCI interrupt desired to change and hit <enter> to cycle through the IRQs.

For the USB 2.0 the options are as follows:

OHCI: Enable or Disable OHCI Controller

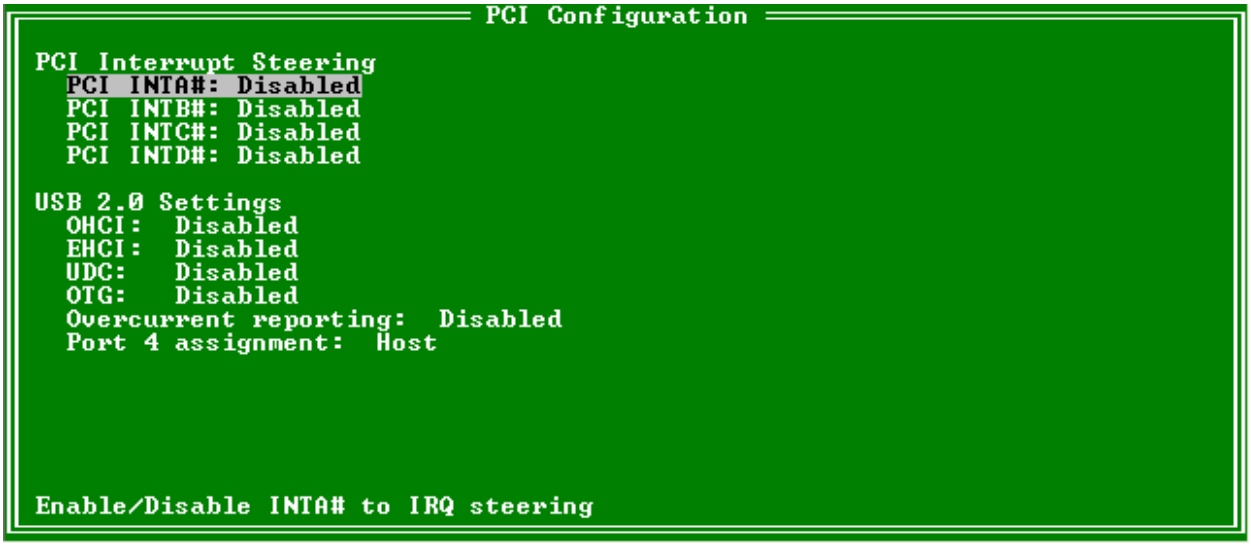
EHCI: Enable or Disable EHCI Controller

UDC: USB Device Controller Enable or Disable

OTG: On-The-GO Enable or Disable

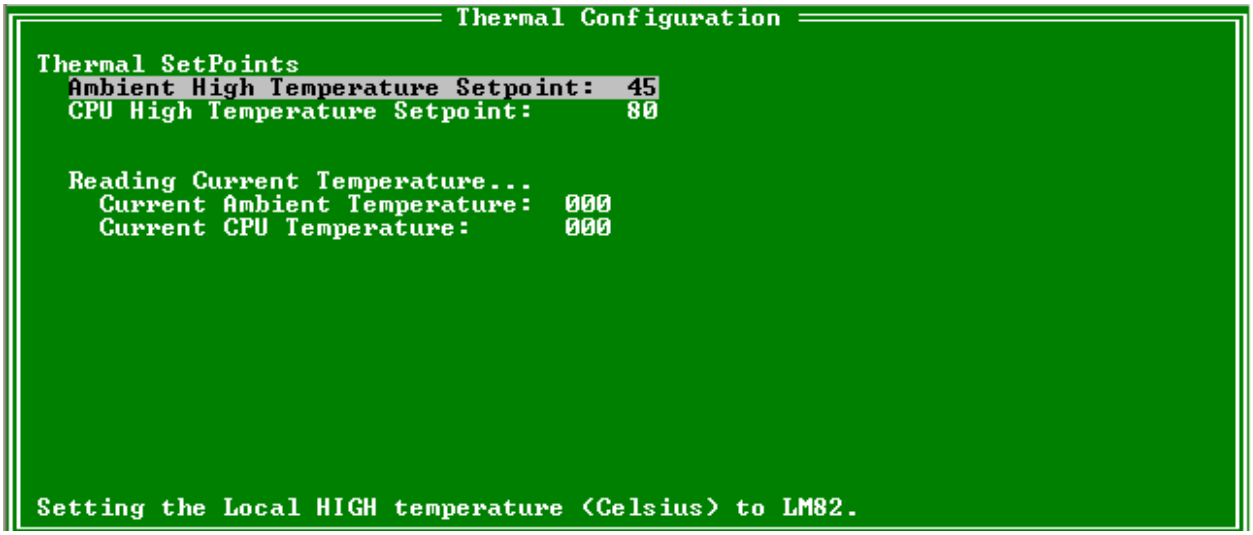
Overcurent Reporting: Enable or Disable over current reporting

Port 4 Assignment: Determines the functionality of the USB port 4. The options are Not Used, Device and Host



C-T Thermal Configuration

The Thermal Configuration screen enables the setting of the ambient and CPU high temperature points as well as reads the current state of the ambient and CPU temperature. The values are in Celsius. To change the temperature set point, use the Arrow keys (↑↓) to select the option and press <enter> . Once selected type in the new Celsius value and press <enter> again.



Conclusion

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