

XpressROM™ User's 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
2.0	07/07/06	Update

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Overview

The following document is a user's 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's 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™, and AMD Sempron™ processors.

The User's 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
LX EPIC		SP4GX22	SP4SC31	DBSC1100	
LX ETX		Geode GX Thin Client	SP2SC20		
			DBSC1200		

Quick Start

1) Download the latest Evaluation Copy of XpressROM™

With a 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. The command line to flash an 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 that you 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.

```

XpressROM Setup
Version: Unknown Version                               Built:
----- Main Menu -----
A. Time 10:29:11
B. Date 07/07/2006
C. Motherboard Device Configuration
D. Memory and Cache Optimization
E. System Clock/PLL Configuration
F. Power Management
H. Miscellaneous Configuration
I. ISA I/O and Memory Configuration
O. Boot Order

L. Load Defaults

S. Save Values Without Exit
Q. Exit Without Save
X. Save values and Exit

Set System Clocking and PLL values.
  
```

A. Changing the Time

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

```

----- Main Menu/A. Time -----
Time:
TIME as HH:MM[:SS] <Seconds are optional>
  
```

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:

```

----- Main Menu/B. Date -----
Date: _
Date as MM/DD/YYYY
  
```

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 storage devices.

LPC Card devices: Allows for the configuration of the serial and parallel ports on an LPC Card.

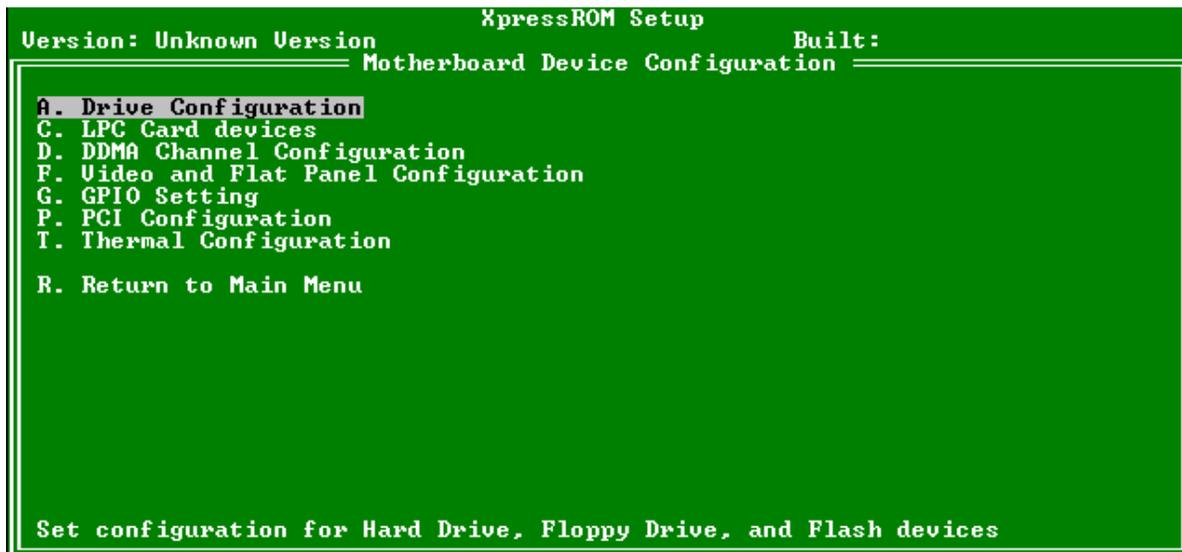
DDMA Channel Configuration: Allows for the configuration of the ISA DMA channels.

Video and Flat Panel Configuration: Allows for the configuration of flat panels and video memory.

GPIO Setting: Allows for the configuration of GPIO pins.

PCI Configuration: Allows for the configuration of PCI Interrupt Steering and SMBus setting.

Thermal Configuration: Reads the LM82 temperature.



D. Memory and Cache Optimizations

The Memory and Cache Optimizations screen should not be left in a shipping system. Misconfiguring 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 to be either Write-Back or Write-Through

L2 Cache Enable: Allows L2 Cache of the system to be either Enabled or Disabled

Cache Allocate: Allows Cache Allocate to be either Enabled or Disabled

DIMM 0 or 1:

Memory Optimization DIMM 0 or 1: Allows the memory to be configured by Automatically or Manually. If Auto is selected, DIMM Page Size, DIMM Size, Number of Devices, 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

Number of Devices: Allows selections of 0, 2, 4, 8, 16, 32

DIMM 0 or 1 Module Banks: Allows for the configuration of the number of module banks. Options are 1 or 2

DIMM 0 or 1 Component Banks: Allows for the configuration of the component banks Options 2 or 4

CAS Latency: Allows the configuration Column Address Select latency. The options are Auto, 1.5CLK, 2CLK, 2.5CLK, 3CLK, and 3.5CLK

Refresh rate: Allows the setting of the memory refresh rate. Options include: Auto, 15us, 3us, 7us, 31us, 62us and 125us

Interleave selection: Allows the setting of the interleaving to either LOI (Low Order Interleaving) or HOI (High Order Interleaving)

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

XOR Bit Select: Allows the XOR bit to be selected. Options are 18, 19, 20, and 21.

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 SDRAM 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.

ACT2ACTREF: tRC = tRP + tRAS. May be set from 0 to 15.

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

```

XpressROM Setup
Version: Unknown Version                               Built:
----- Memory and Cache Setup -----
Cache Enable: Enabled                                Cache Mode: Write-Through
L2 Cache Enable: Enabled                             Cache Allocate: Enabled

DIMM 0                                                DIMM 1
Memory Optimization DIMM0: Auto                      Memory Optimization DIMM 1: Auto
DIMM 0 Page Size: Not Installed                       DIMM 1 Page Size: 1 KB
DIMM 0 Size: 8 MB                                    DIMM 1 Size: 8 MB
Number of Devices: 2 devices                          Number of Devices: 2 devices
DIMM 0 Module Banks: 1 bank                          DIMM 1 Module Banks: 1 bank
DIMM 0 Component Banks: 2 banks                      DIMM 1 Component Banks: 2 banks

CAS Latency: Auto                                    Memory Latencies: Auto
Refresh Rate: Auto                                  ACT2PRE: 00
Interleave Select: LOI                              PRE2ACT: 0
XOR BA0: Disabled                                  ACT2CMD: 0
XOR BA1: Disabled                                  ACT2ACT: 00
XOR MB0: Enabled                                   ACT2ACTREF: 00
XOR Bit Select: 18                                 REF2ACT: 00
  
```

E. System Clock/PLL 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 PLL Settings

CPU Multiplier: Options from 1 to 33

GeodeLink Multiplier: Options from 1 to 33

The formulae for the CPU Multiplier and GeodeLink Multiplier are as follows

$33.3 \text{ Mhz} * \text{CPU Multiplier} = \text{CPU speed}$

$33.3 \text{ Mhz} * \text{GeodeLink Multiplier} = \text{GeodeLink}^{\text{TM}} \text{ speed.}$

```

XpressROM Setup
Version: Unknown Version          Built:
System Clock/PLL Configuration

Clock Mode
Clock Determined By: Manual Settings

Manual PLL Settings
CPU Multiplier: 01
GeodeLink Multiplier: 01
  
```

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 Clocks: Allows the configuration of the clocks to either run or not during S1. The options are On or Off.

CPU Clock Gating: Allows the configuration of the processor clocks during power management. The options are Enabled or Disabled.

Chipset Clock Gating: Allows the configuration of the chipset clocks. The options are Enabled or Disabled.

```

XpressROM Setup
Version: Unknown Version          Built:
Power Management

BIOS PM at Boot: Disabled

APM Available:    Yes
ACPI Available:  No
S1 Clocks:       On

CPU Clock Gating:    Enabled
Chipset Clock Gating: Enabled

BIOS will turn on Legacy PM before booting the OS.
  
```

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 Enabled or Disabled.

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

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 Enabled or Disabled.

Summary 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

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

PC Speaker Configuration

AC Beeper: Allows the PC speaker to beep. The options are Enabled or Disabled.

```

===== Miscellaneous Configuration =====
Splash Screen Configuration
Splash Screen:      Enabled
Clear Splash Screen: Enabled
Splash Screen Timeout: 000000

Summary Screen Configuration
Summary Screen:      Enabled
Summary Screen Timeout: 000000

Power Button Configuration
Power Button:      Instant Off

PC Speaker Configuration
AC Beeper:      Enabled

Enable/Disable display of splash screen
  
```

I. ISA I/O and Memory Configuration

The ISA I/O and Memory Configuration screen allows the configuration of the I/O ranges mapped to ISA and the memory ranges mapped to ISA.

I/O Mapped to ISA

I/O Range-0 though I/O Range-5: Allows the I/O range to be Enabled or Disabled.

Size: Selects the I/O range size. It may be set to 1, 2, 4, 8, 16, 32, 64, or 128.

Base Addr (A15-A8) / (A7-A0): Sets the base address for the I/O range.

Memory Mapped to ISA

Mem Range-0 though Mem Range-3: Allows the memory range to be Enabled or Disabled.

Size: Selects the memory range size. It may be set to 16K, 32K, 64K, 128K, 256K, 512K, 1M, or 2M Bytes.

Base Addr (A23-A16) / (A15-A8): Sets the base address for the memory range.

```

XpressROM Setup
Version: Unknown Version          Built:
ISA I/O and Memory Configuration

I/O Mapped to ISA
I/O Range-0: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00
I/O Range-1: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00
I/O Range-2: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00
I/O Range-3: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00
I/O Range-4: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00
I/O Range-5: Disabled Size: 1    Base Addr <A15-A8>: 0x00 <A7-A0>: 0x00

Memory Mapped to ISA
Mem Range-0: Disabled Size: 16K  Base Addr <A23-A16>: 0x00 <A15-A8>: 0x00
Mem Range-1: Disabled Size: 16K  Base Addr <A23-A16>: 0x00 <A15-A8>: 0x00
Mem Range-2: Disabled Size: 16K  Base Addr <A23-A16>: 0x00 <A15-A8>: 0x00
Mem Range-3: Disabled Size: 16K  Base Addr <A23-A16>: 0x00 <A15-A8>: 0x00

Enable/Disable mapping selected I/O addresses to ISA
  
```

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 Hard Drive/Flash Drive, USB CD-ROM Drive.

```

Boot Order
Boot Order Configuration
1. Floppy Disk
2. Hard Drive
3. CD-ROM Drive
4. USB Floppy Disk
5. USB Hard Drive/Flash Drive
6. USB CD-ROM Drive
  
```

Motherboard Device Configuration

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 Enabled or Disabled.

80-Conductor Cable Sense: Selects the GPIO that is connected to the IDE –PDIAG sense. The options are None (Disabled), Force 40 Conductor Cable, Force 80 Conductor Cable, and GPIO 05.

DMA/UDMA BIOS Support: This enables DMA/UDMA timings. The options are Enabled and Disabled.

Force mode for Drive 1 or 2: This enables the transfer mode. The options are Auto, PIO 0-4, MDMA 0-2, and UDMA 0-5.

Floppy Configuration

Floppy BIOS Support: Allows the Floppy to be either Enabled or Disabled.

CD-ROM Boot Configuration

CD-ROM Boot BIOS Support: Allows the CD-ROM to be either Enabled or Disabled.

Flash Configuration: Allows the use of a flash device over the IDE.

Flash Interface: The flash device may be either Enabled or Disabled.

Chip Select 0- 3

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

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

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

```

XpressROM Setup
Version: Unknown Version                               Built:
----- Drive Configuration -----
Hard Drive Configuration
  IDE BIOS Support: Enabled
  80-Conductor Cable Sense: Force 80 Conductor Cable
  DMA/UDMA BIOS support: Disabled
  Force mode for Drive 1: UDMA 0
  Force mode for Drive 2: Auto

Floppy Configuration
  Floppy BIOS Support: Disabled

CD-ROM Boot Configuration
  CD-ROM Boot BIOS Support: Disabled

Flash Configuration
  Chip Select 0 - Size: 256MB/256B
  Chip Select 1 - Size: Disabled
  Chip Select 2 - Size: Disabled
  Chip Select 3 - Size: Disabled
Flash Interface: Disabled
  Base: PCI default   Type: NAND I/O
  Base: PCI default   Type: NOR Mem
  Base: PCI default   Type: NOR Mem
  Base: PCI default   Type: NOR Mem

Type of Flash device.
  
```

C-C LPC Card devices

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

Serial Port 1-2: Allows the selection of the serial port address and IRQ. The choices are Disabled, 0x3f8 IRQ 4, 0x2f8 IRQ 3, 0x3e8 IRQ 4, and 0x2e8 IRQ 3.

Mode: Allows changing the serial port mode. The options are RS232 and RS485.

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 1.9, and ECP.

IRQ: Allows the configuration of the IRQ for the parallel port. The options are Disabled, IRQ5, IRQ7, IRQ9, IRQ10, and IRQ11

DMA: Allows the configuration of the DMA for the parallel port. The options are None, Channel 3, and Channel 1.

```

XpressROM Setup
Version: Unknown Version                               Built:
----- LPC CARD I/O Device Configuration -----
Serial Port 1: Disabled
Mode: RS232

Serial Port 2: Disabled
Mode: RS232

Parallel Port: 0x378
MODE: Compatible
IRQ: IRQ 7
DMA: None

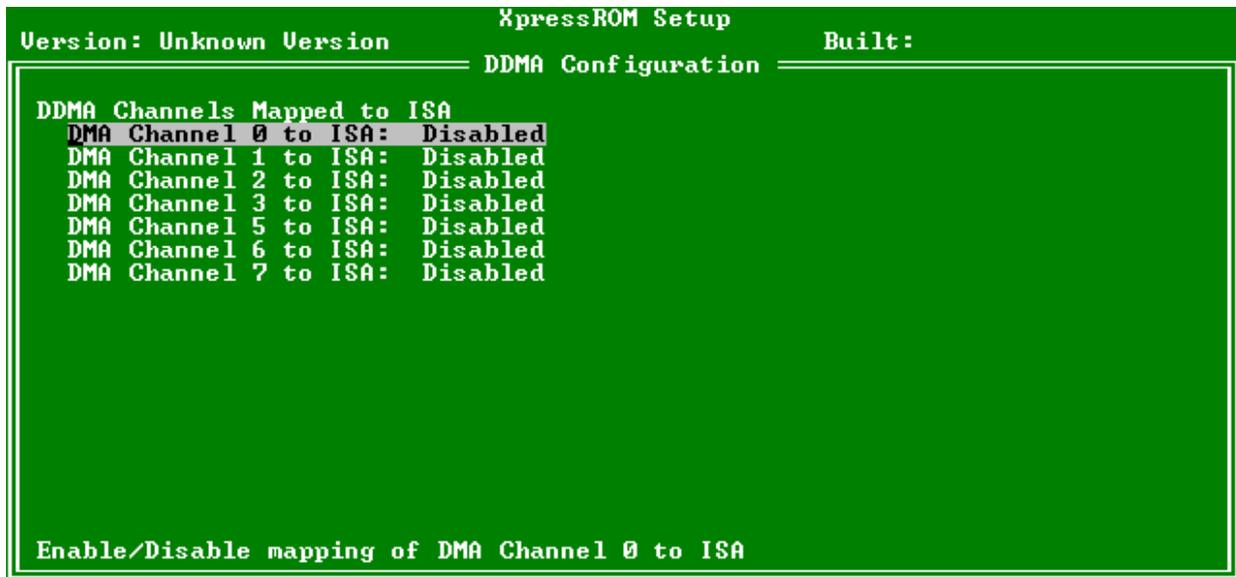
* Floppy Configuration on Drive Configuration Menu

Configure the 1st LPC UART
  
```

C-D. DDMA Channel Configuration

The DDMA Configuration screen allows the configuration of the DMA channels mapped to ISA.

DMA Channel 0-7 to ISA: Allows the DMA channel to be Enabled or Disabled.



C-F. Video and Flat Panel Configuration

The following menu allows you to configure graphics 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.

Internal Adapter Mode: Allows you to select the mode for the internal controller when an external video device is present. The options are Disabled, Primary Controller, and Secondary Controller.

Graphics Memory: Allows you to select the amount of video memory to reserve on the system. It may be set from 2 to 254 MB.

Driver controls init: Allows you to select whether the Operating System driver initializes the graphics or not. It may be Enabled or Disabled.

Output display: Allows the selection of the display type. The choices include Auto, CRT, Flat Panel, TV output, and Panel and CRT. Various menu selections are allowed or grayed out depending on this selection.

DOTPLL Bypass: Allows DOTREF pin to be used as the dot clock frequency. It may be Enabled or Disabled.

HSDIP Support: Allows the High Speed Data Input Port to be Enabled or Disabled. The HSDIP Memory Size menu selection is grayed out when HSDIP Support is Disabled.

HSDIP Memory Size: Allows the memory size of the High Speed Data Input Port to be selected. It may be set from 2 to 254 MB.

Flat Panel Configuration

Type: This enables the selection of the type of flat panel. The choices are Auto, TFT, and LVDS. Typically, Auto is recommended. (If Auto is selected, then Resolution, Data Bus Type, Refresh Rate, HSYNC Polarity, and VSYNC Polarity will be grayed out.)

Resolution: Allows the setting of the resolution of the panel. The choices are 320x240, 640x480, 800x600, 1024x768, 1152x864, 1280x1024, and 1600x1200.

Data Bus Type: Allows the selection of the data bus width and data type for the panel. The options are 9-24 bits, 1 ppc and 18,24 bits, 2 ppc.

Refresh Rate: Allows the selection of the refresh rate. The options are 60, 70, 72, 75, 85, 90, and 100 Hz

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

Software Backlight Control

Backlight Enable: Selects if the software controlled flat panel backlighting is Enabled or Disabled.

Initial Brightness: Selects the initial backlight value for the panel. The options are Last Value, 0% (Off), 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% (Full On)

TV Output Configuration This will be grayed out unless the Output display menu choice is set to TV output.

TV Encoder: This enables the TV encoder that is attached to the system to be specified. The choices are AUTO, ADV7171, SAA7127, ADV7301, and FS454. (If Auto is selected, then TV Standard and TV Resolution will be grayed out. TV Resolution may only be set for the FS454.)

TV Standard: Allows the TV display standard to be selected. The choices are NTSC, PAL, and HDTV.

TV Resolution: Allows the setting of the television resolution. The choices are Low, Medium, and High.

```

XpressROM Setup
Version: Unknown Version                               Built:
----- Graphics Configuration -----
Internal Adaptor Mode: Disabled
Graphics Memory: 008                                Driver controls init: Disabled
Output display: Flat Panel                           DOTPLL Bypass: Disabled
HSDIP Support: Enabled
HSDIP Memory Size: 002

Flat Panel Configuration
Type: AUTO                                           HSYNC Polarity: Active high
Resolution: 320x240                                  VSYNC Polarity: Active high
Data Bus Type: 9-24 bits, 1 ppc                     LP Active Period: Free running
Refresh Rate: 60 Hz                                 SHFCLK Active Period: Free running

Software Backlight Control
Backlight Enable: Disabled                           Initial Brightness: 0% <Off>

TV Output Configuration
TV Encoder: AUTO
TV Standard: NTSC
TV Resolution: Low

Mode for internal controller when an external video device is present.

```

C-G GPIO Setting

The following menu system allows for configuration of some GPIO pins.

GPIO pins setting

GPIO6: This pin can be set to Available or used as the MFGPT0_RS pin.

GPIO25: This pin can be set to Available or used as the LOW_BAT# pin.

```

Version: Unknown Version           XpressROM Setup           Built:
                                GPIO Setting
GPIO pins setting
GPIO6: Available
GPIO25: Available

Select GPIO6 pin usage
  
```

C-P PCI Configuration

The following menu system allows the configuration of the PCI interrupts and SMBus setting.

PCI Interrupt Steering

PCI INT A# - INT D#: Use <enter> to cycle through the selections. The selections are Disabled, IRQ 1, IRQ 3, IRQ 4, IRQ 5, IRQ 6, IRQ 7, IRQ 9, IRQ 10, IRQ 11, IRQ 12, IRQ 14, and IRQ 15.

SMBus Setting

SMBus: The PCI header of the SMBus may be Enabled or Disabled.

```

Version: Unknown Version           XpressROM Setup           Built:
                                PCI Configuration
PCI Interrupt Steering
PCI INTA#: Disabled
PCI INTB#: Disabled
PCI INTC#: Disabled
PCI INTD#: Disabled

SMBus setting
SMBus: Disabled

Enable/Disable INTA# to IRQ steering
  
```

C-T Thermal Configuration

The Thermal Configuration screen reads the current state of the CPU temperature from the LM82. The value is in Celsius.

```
Version: Unknown Version          XpressROM Setup          Built:
                               Thermal Configuration
Reading Current Temperature...
Current CPU Temperature:      000

Reading back the current temperature <Celsius> from LM82.
```

Conclusion

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