» User Guide «

CP6002 uEFI BIOS

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Chapter 1

Starting uEFI BIOS Setup

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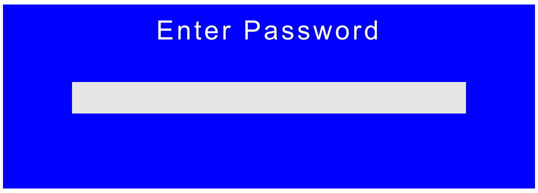
1. Starting uEFI BIOS Setup

The CP6002 is provided with a Kontron-customized, pre-installed and configured version of Aptio® (referred to as uEFI BIOS in this manual), AMI's next generation BIOS firmware based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI.

This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the CP6002. To take advantage of these functions, the uEFI BIOS comes with an uEFI Shell, which provides quick and easy access to the individual function settings for control or modification of the uEFI BIOS configuration, and a Setup program, which allows the accessing of various menus that provide functions or access to sub-menus with more specific functions of their own. The individual menus and the configurable functions are described in this guide.

To start the uEFI BIOS Setup program, follow the steps below:

1. Power on the board.
2. Wait until the first characters appear on the screen (POST messages or splash screen).
3. Press the <DEL> or <F2> key.
4. If the uEFI BIOS is password-protected, a window such as the one below will appear:



Enter Password

Enter either the User password or the Administrator password (refer to Chapter 5, Security Setup, for further information), press <RETURN>, and proceed with step 5.

5. A Setup menu with the following token attributes will appear. The currently active menu and the currently active uEFI BIOS Setup item are highlighted in white.

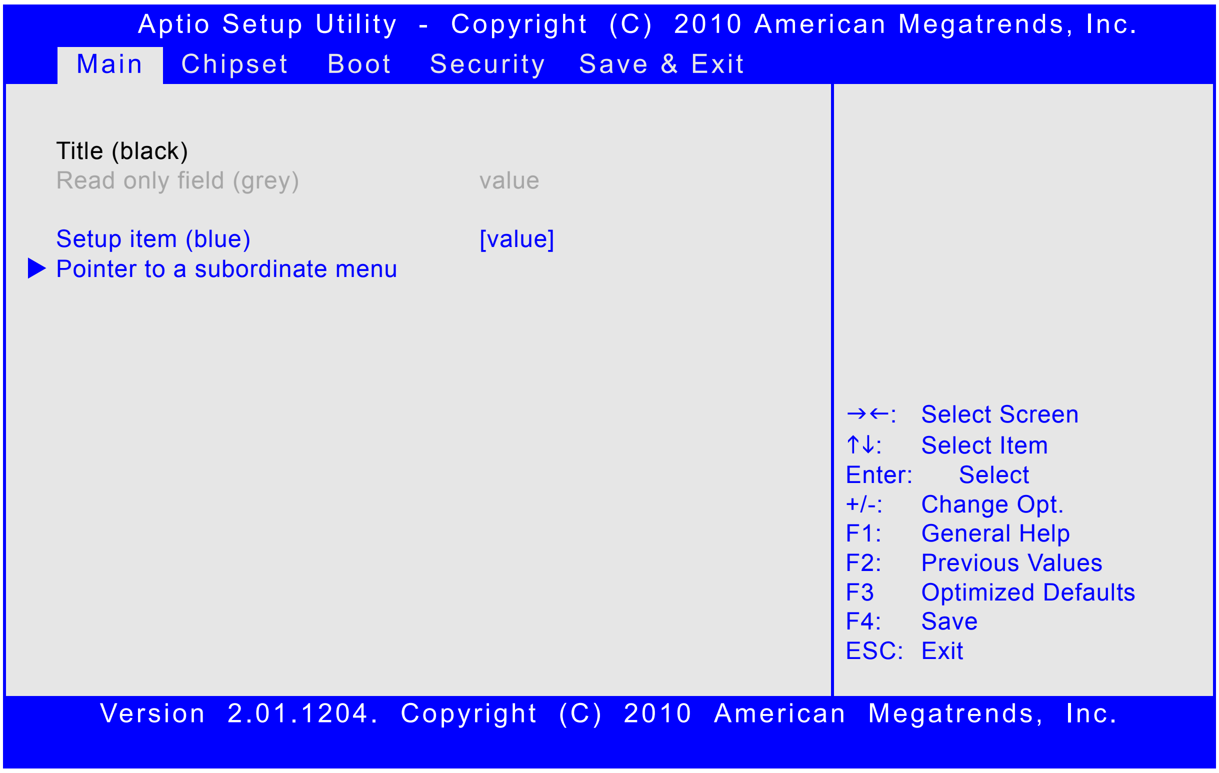
1.1 Main Setup Menu

The Main setup menu is the first screen that appears after starting the Setup program.

At the top of this screen and all of the other major screens, there is a setup menu selection bar, which permits access to all of the other major setup menus. These menus are selected via the left-right arrow keys.

All setup menu screens have two main frames. The left frame displays all the functions that can be configured. They are displayed in blue. Functions displayed in gray provide information about the status or the operational configuration.

The right frame displays the key legend. Above the key legend there is an area reserved for a text message. When a function is selected in the left frame, it is displayed in white. Often a text message will accompany it.



Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Main
Chipset
Boot
Security
Save & Exit

```
  Title (black)
  Read only field (grey)              value

  Setup item (blue)                   [value]
▶ Pointer to a subordinate menu

                                              →←:   Select Screen
                                              ↑↓:   Select Item
                                              Enter:   Select
                                              +/-:  Change Opt.
                                              F1:   General Help
                                              F2:   Previous Values
                                              F3    Optimized Defaults
                                              F4:   Save
                                              ESC:  Exit
```

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1.2 Navigation

The CP6002 uEFI BIOS setup program uses a hot key-based navigation system. A hot key legend is located in the right frame on most setup screens.The following table provides information concerning the usage of these hot keys.

HOT KEY	DESCRIPTION
<F1>	The <F1> key is used to invoke the General Help window.
<F2>	The <F2> key is used to restore the previous values.
<F3>	The <F3> key is used to load the optimized defaults.
<F4>	The <F4> key is used to save the current settings and exit the uEFI BIOS Setup.
← → Left/Right	The *Left and Right* <Arrow> keys are used to select a major Setup screen. For example: Main Screen, Boot Screen, Security Screen, etc.
↑ ↓ Up/Down	The *Up and Down* <Arrow> keys are used to select a Setup function or a sub-screen.
+ - Plus/Minus	The *Plus and Minus* <Arrow> keys are used to change the field value of a particular Setup function, for example, system date and time.
<ESC>	The <ESC> key is used to exit a menu or the uEFI BIOS Setup. Pressing the <ESC> key in a sub-menu causes the next higher menu level to be displayed. When the <ESC> key is pressed in a major Setup menu, the uEFI BIOS Setup is terminated without saving any changes made.
<Enter>	The <Enter> key is used to execute a command or select a menu.

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Chapter 2

Main Setup

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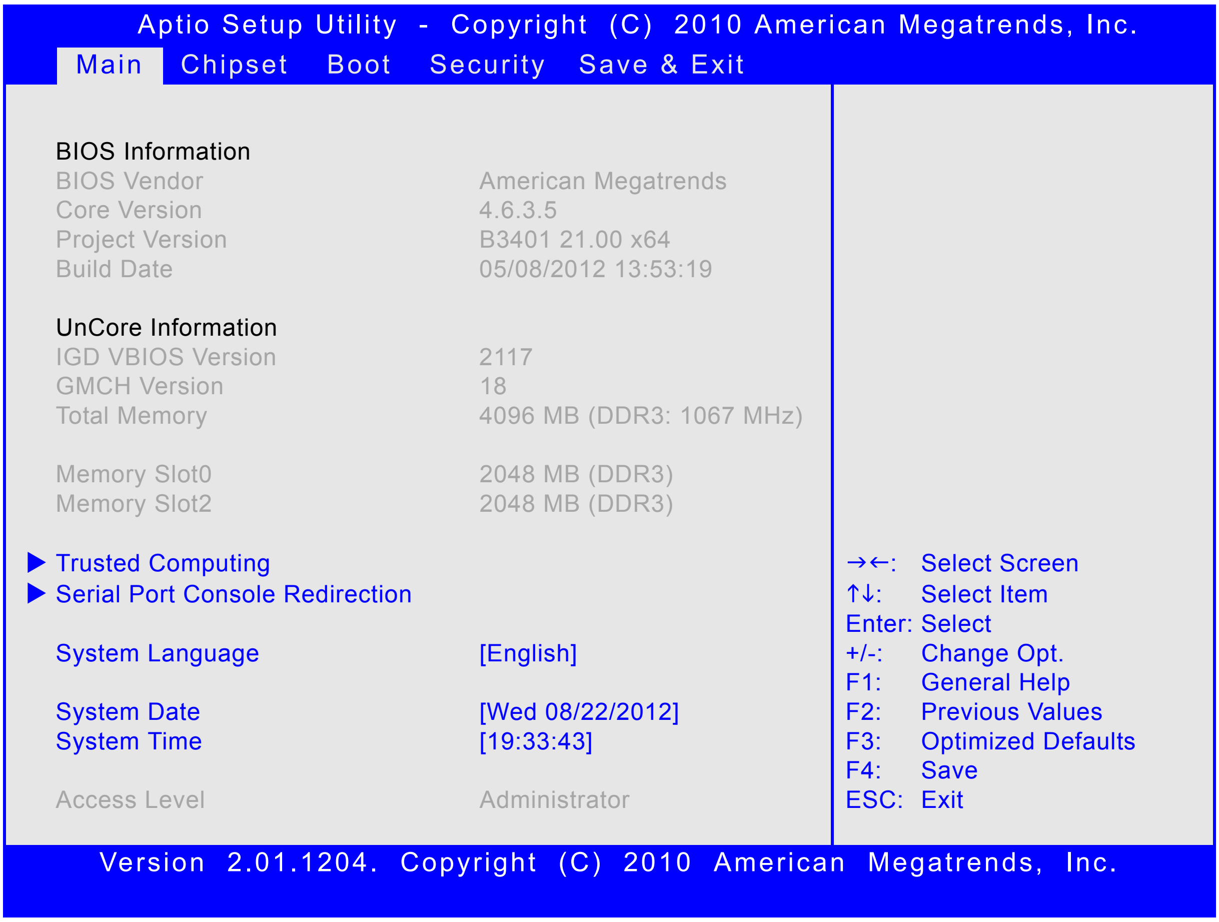
2. Main Setup

Upon entering the uEFI BIOS Setup program, the Main setup screen is displayed. This screen lists the main setup sub-screens and provides very basic system information as well as functions for setting the system time and date. In addition, the remaining major setup menus can be accessed from this screen. This screen can also be selected from any other major setup screen by using the Main tab.



Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Main
Chipset
Boot
Security
Save & Exit

```
BIOS Information
BIOS Vendor                  American Megatrends
Core Version                 4.6.3.5
Project Version              B3401 21.00 x64
Build Date                   05/08/2012 13:53:19

UnCore Information
IGD VBIOS Version            2117
GMCH Version                 18
Total Memory                 4096 MB (DDR3: 1067 MHz)

Memory Slot0                 2048 MB (DDR3)
Memory Slot2                 2048 MB (DDR3)

▶ Trusted Computing                                        →←:    Select Screen
▶ Serial Port Console Redirection                          ↑↓:    Select Item
                                                           Enter: Select
System Language              [English]                     +/-:   Change Opt.
                                                           F1:    General Help
System Date                  [Wed 08/22/2012]              F2:    Previous Values
System Time                  [19:33:43]                    F3:    Optimized Defaults
                                                           F4:    Save
Access Level                 Administrator                 ESC:   Exit
```

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2.1 BIOS Information

This function provides display-only information concerning the uEFI BIOS.

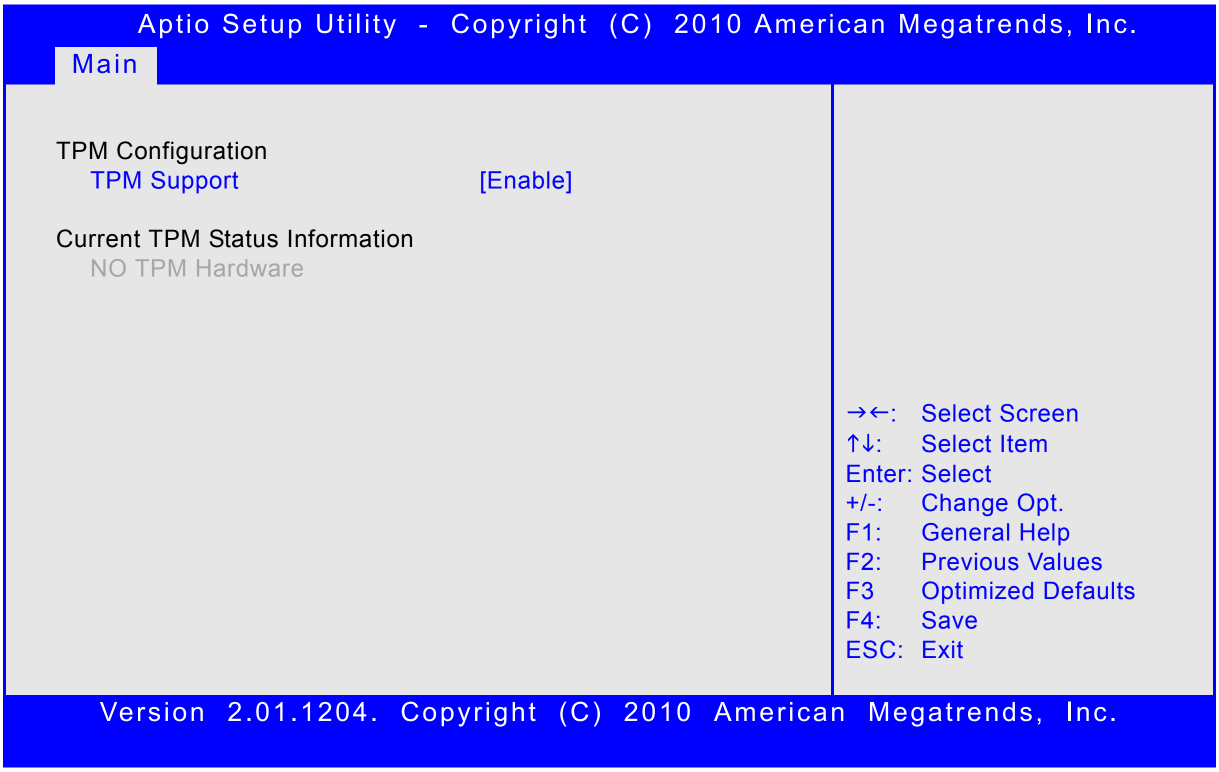
Information about the running uEFI BIOS version is reflected in the display-only function Project Version (parameter “21.00” indicates revision 21).

2.2 UnCore Information

This function provides display-only information concerning the NorthBridge (GMCH die of the Intel® Core™ i7 processor) features, VBIOS revision and the system memory.

2.3 Trusted Computing

This screen provides functions for specifying the TPM configuration settings and TPM displaying status information.



```
      Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
  Main

  TPM Configuration
     TPM Support                    [Enable]

  Current TPM Status Information
     NO TPM Hardware

                                                  →←:    Select Screen
                                                  ↑↓:    Select Item
                                                  Enter: Select
                                                  +/-:   Change Opt.
                                                  F1:    General Help
                                                  F2:    Previous Values
                                                  F3     Optimized Defaults
                                                  F4:    Save
                                                  ESC:   Exit
     Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

2.3.1 TPM Configuration

2.3.1.1 TPM Support

This function is used to provide the Trusted Platform Module (TPM) functionality to the OS.

SETTING	DESCRIPTION
Disable	Use this setting to disable the TPM support. If this setting is used, the TPM is not present for the OS, regardless whether the function TPM State is enabled or not.
Enable	Use this setting to enable the TPM support.

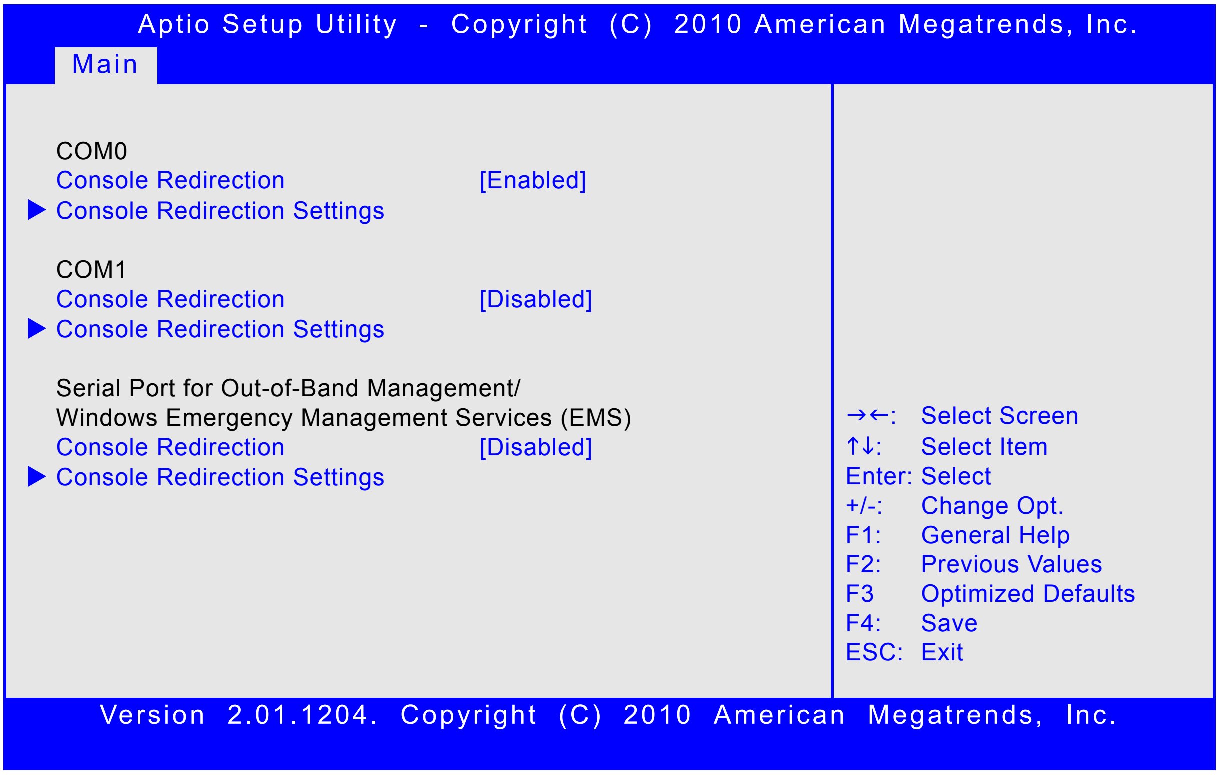
Default setting: Enable

2.3.1.2 Current TPM Status Information

This function provides display-only information concerning the Trusted Platform Module (TPM) operational status.

2.4 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.



```
      Aptio Setup Utility  -  Copyright  (C)  2010 American Megatrends, Inc.
  Main

  COM0
  Console Redirection              [Enabled]
▶ Console Redirection Settings

  COM1
  Console Redirection              [Disabled]
▶ Console Redirection Settings

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)      →←:   Select Screen
  Console Redirection              [Disabled]      ↑↓:   Select Item
▶ Console Redirection Settings                      Enter: Select
                                                    +/-:  Change Opt.
                                                    F1:   General Help
                                                    F2:   Previous Values
                                                    F3    Optimized Defaults
                                                    F4:   Save
                                                    ESC:  Exit

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```

2.4.1 COM0

The COM0 port (serial port 0) corresponds to the serial port on the front panel of the CP6002.

2.4.1.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for the serial port 0.
Enabled	Use this setting to enable console redirection for the serial port 0.

Default setting: Enabled

2.4.1.2 Console Redirection Settings

For information about this function, refer to Chapter 2.4.4 in this manual.

2.4.2 COM1

The COM1 port (serial port 1) corresponds to the RS-422 (hardware designation COM2) serial port on the RIO connector (J3) of the CP6002.

2.4.2.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for the serial port 1.
Enabled	Use this setting to enable console redirection for the serial port 1.

Default setting: Disabled

2.4.2.2 Console Redirection Settings

For information about this function, refer to Chapter 2.4.4 in this manual.

2.4.3 Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The following functions control the presence and content of the ACPI serial port redirection table (SPCR). This table is mainly used by the Windows server variants to provide Windows Emergency Management Services (EMS). This functionality is totally independent from serial redirection of other console output.

OoB Management or EMS makes it possible to control selected components of (Windows) servers, even when a server is not connected to the network or the network is not available. In short: EMS allows for remote management of a Windows Server OS through a serial port

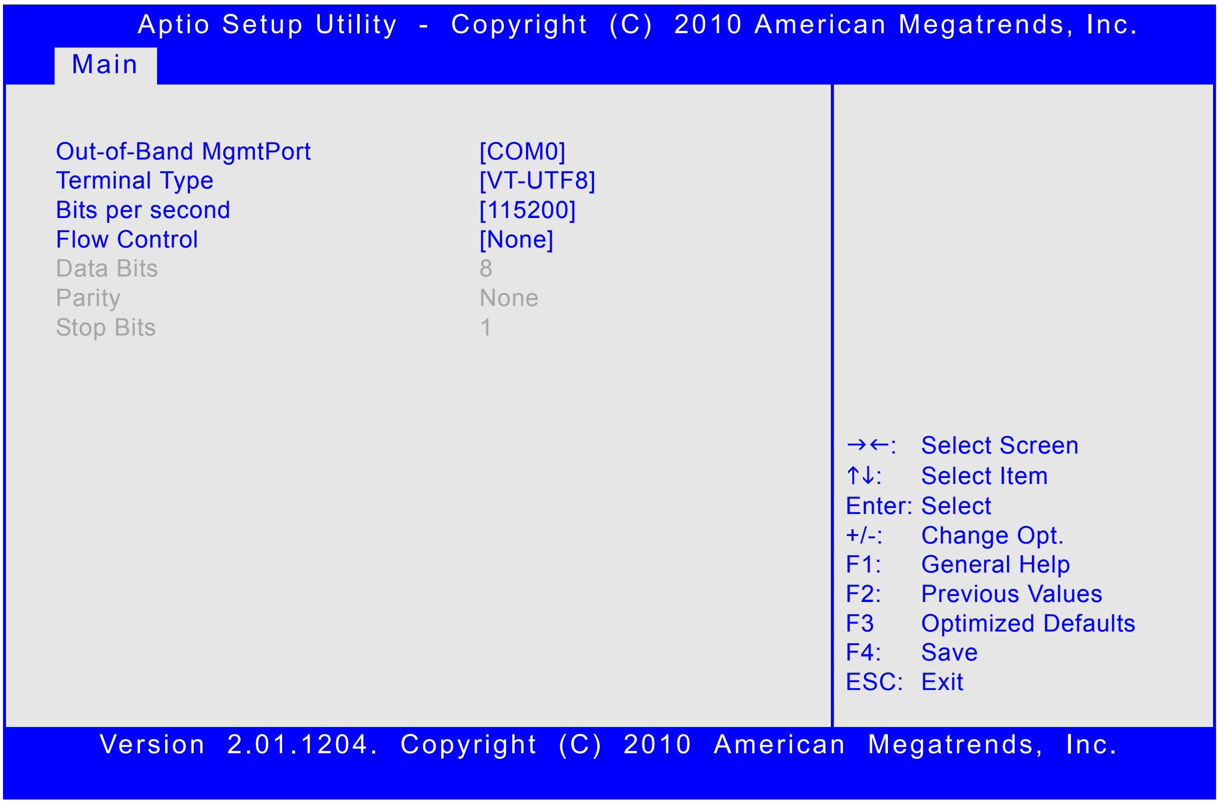
2.4.3.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to prevent the system from adding the SPCR table to the ACPI tables.
Enabled	Use this setting to add the SPCR table to the ACPI tables. The OS can further use the information provided for serial redirection services.

Default setting: Disabled

2.4.3.2 Console Redirection Settings

This screen provides information about functions for specifying the console redirection configuration settings for the Out-of-Band Management / Windows Emergency Management Services (EMS).



```
Aptio Setup Utility  -  Copyright  (C)  2010 American Megatrends, Inc.
  Main

  Out-of-Band MgmtPort              [COM0]
  Terminal Type                     [VT-UTF8]
  Bits per second                   [115200]
  Flow Control                      [None]
  Data Bits                         8
  Parity                            None
  Stop Bits                         1

                                                  →←:    Select Screen
                                                  ↑↓:    Select Item
                                                  Enter: Select
                                                  +/-:   Change Opt.
                                                  F1:    General Help
                                                  F2:    Previous Values
                                                  F3     Optimized Defaults
                                                  F4:    Save
                                                  ESC:   Exit

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```

2.4.3.2.1 Out-of-Band Mgmt Port

This function is used to select the serial port intended for use with Out-of-Band Management. This functionality is independent from serial redirection of other console output.

SETTING	DESCRIPTION
COM0	Use this setting to specify that the serial port 0 is to be used with Out-of-Band Management.
COM1	Use this setting to specify that the serial port 1 is to be used with Out-of-Band Management.

Default setting: COM0

2.4.3.2.2 Terminal Type

SETTING	DESCRIPTION
VT100	Use one of these settings to select the terminal type for out-of-band management.
VT100+	
VT-UTF8	
ANSI	

Default setting: VT-UTF8

2.4.3.2.3 Bits per second

SETTING	DESCRIPTION
9600	Use one of these settings to select the baud rate of the serial port.
19200	
57600	
115200	

Default setting: 115200

2.4.3.2.4 Flow Control

SETTING	DESCRIPTION
None	Use one of these settings to specify the type of flow control to be used for this serial port.
Hardware RTS/CTS	
Software Xon/Xoff	

Default setting: None

2.4.3.2.5 Data Bits

This is a display-only function providing information about the frame width for the Out-of-Band Management.

2.4.3.2.6 Parity

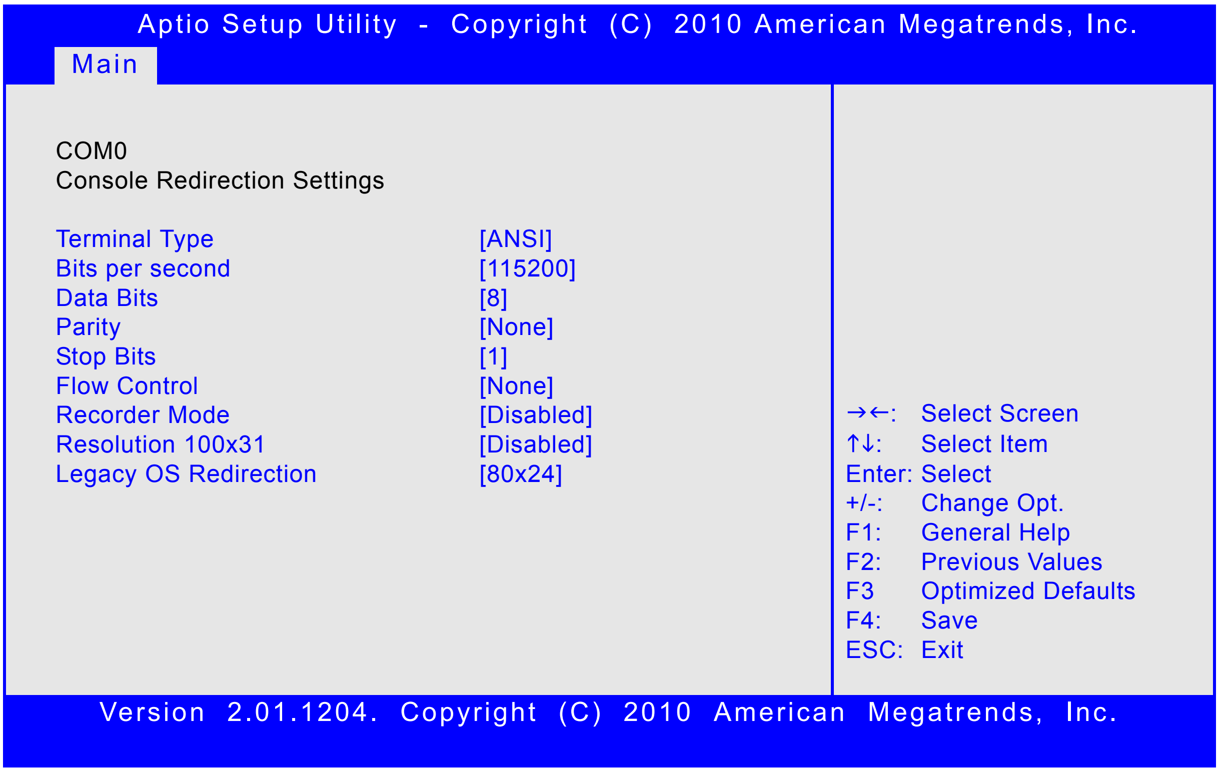
This is a display-only function providing information about the parity for Out-of-Band Management.

2.4.3.2.7 Stop Bits

This is a display-only function providing information about the number of stop bits for Out-of-Band Management.

2.4.4 Console Redirection Settings

This screen provides information about functions for specifying the Console Redirection configuration settings for the serial ports 0 and 1. Each serial port can be independently configured.



Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.

Main

COM0
Console Redirection Settings

```
Terminal Type               [ANSI]
Bits per second             [115200]
Data Bits                   [8]
Parity                      [None]
Stop Bits                   [1]
Flow Control                [None]
Recorder Mode               [Disabled]
Resolution 100x31           [Disabled]
Legacy OS Redirection       [80x24]
```

```
→←:    Select Screen
↑↓:    Select Item
Enter: Select
+/-:   Change Opt.
F1:    General Help
F2:    Previous Values
F3     Optimized Defaults
F4:    Save
ESC:   Exit
```

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2.4.4.1 Terminal Type

SETTING	DESCRIPTION
VT100	Use one of these settings to select the terminal type to be emulated.
VT100+	
VT-UTF8	
ANSI	

Default setting: ANSI

2.4.4.2 Bits per second

SETTING	DESCRIPTION
9600	Use one of these settings to select the baud rate of the serial port.
19200	
57600	
115200	

Default setting: 115200

2.4.4.3 Data Bits

SETTING	DESCRIPTION
7	Use one of these settings to specify the number of data bits per frame.
8	

Default setting: 8

2.4.4.4 Parity

SETTING	DESCRIPTION
None	Use one of these settings to select the parity for the serial port.
Even	
Odd	
Mark	
Space	

Default setting: None

2.4.4.5 Stop Bits

SETTING	DESCRIPTION
1	Use one of these settings to specify the number of stop bits for the serial port.
2	

Default setting: 1

2.4.4.6 Flow Control

SETTING	DESCRIPTION
None	Use one of these settings to specify the type of flow control to be used for this serial port.
Hardware RTS/CTS	

Default setting: None

2.4.4.7 Recorder Mode

Use this setting to specify whether display formatting characters are to be transmitted along with data or if only data is to be transmitted.

SETTING	DESCRIPTION
Disabled	Use this setting to specify normal terminal operation.
Enabled	Use this setting to specify that only text will be sent. Use this to capture terminal data

Default setting: Disabled

2.4.4.8 Resolution 100x31

SETTING	DESCRIPTION
Disabled	Use this setting the disable extended terminal resolution.
Enabled	Use this setting the enable extended terminal resolution.

Default setting: Disabled

2.4.4.9 Legacy OS Redirection

SETTING	DESCRIPTION
80x24	Use one of these settings to select the number of rows and columns for legacy OS redirection.
80x25	

Default setting: 80x24

2.5 System Language

SETTING	DESCRIPTION
English	Use this function to select the system language. Currently, only English is supported.

2.6 System Date

SETTING	DESCRIPTION
<WD MM/DD/YYYY>	Use this function to change the system date. Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Use <TAB> to switch between date elements.

2.7 System Time

SETTING	DESCRIPTION
<HH:MM:SS>	Use this function to change the system time. Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Use <TAB> to switch between time elements.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

2.8 Access Level

This function provides display-only information concerning the uEFI BIOS Setup accessibility for the current Setup session. Depending on the type of password protection used, one of the following settings is displayed:

SETTING	DESCRIPTION
Administrator	This setting indicates that read/write access to all setup options is available.
User	This setting indicates that only a limited subset of all setup options is modifiable.

Note: If no password is set, the access setup is Administrator.

Chapter 3

Chipset Setup

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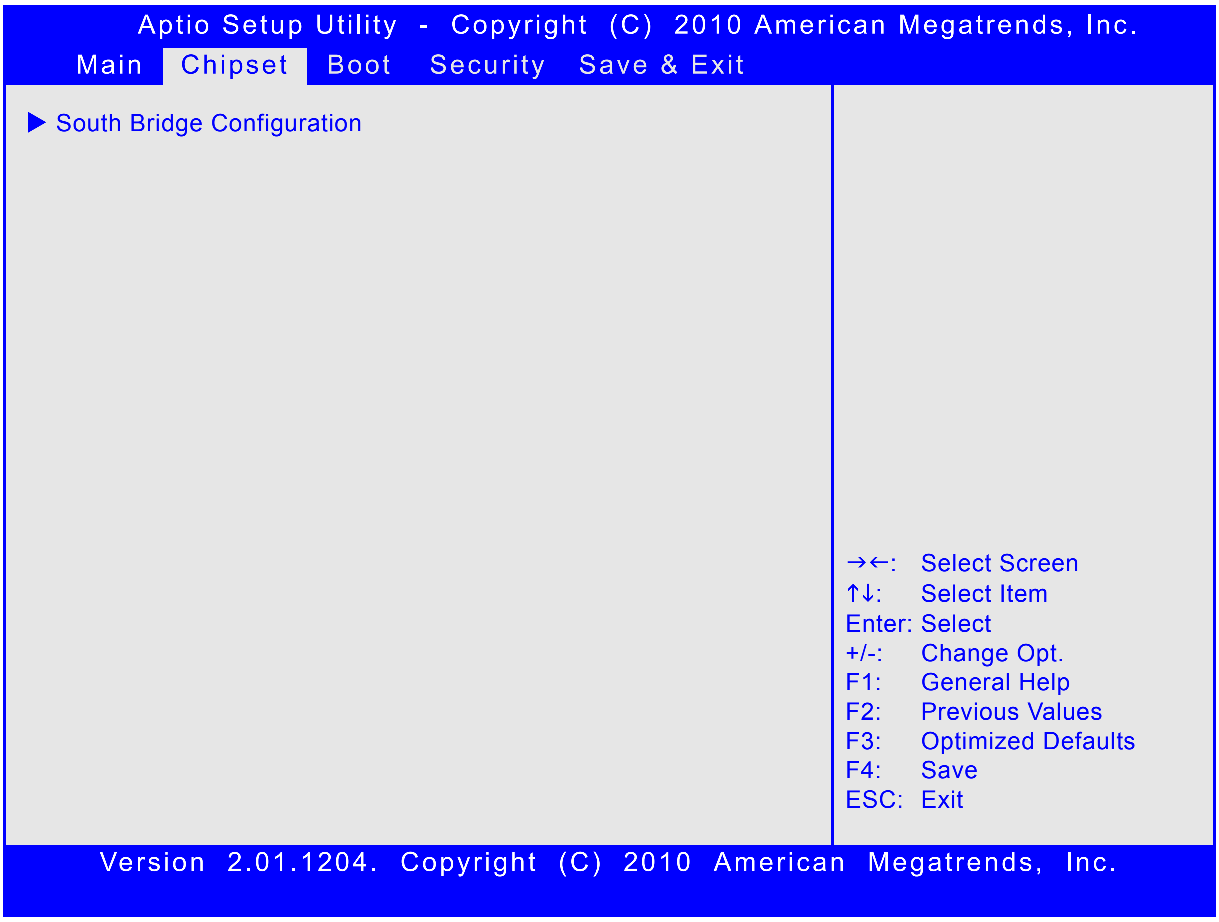
3. Chipset Setup

Select the Chipset tab to enter the Chipset Setup screen. This screen provides access to chipset configuration sub-screens



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Main   Chipset   Boot   Security   Save & Exit

▶ South Bridge Configuration

                                                    →←:    Select Screen
                                                    ↑↓:    Select Item
                                                    Enter: Select
                                                    +/-:   Change Opt.
                                                    F1:    General Help
                                                    F2:    Previous Values
                                                    F3:    Optimized Defaults
                                                    F4:    Save
                                                    ESC:   Exit

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```

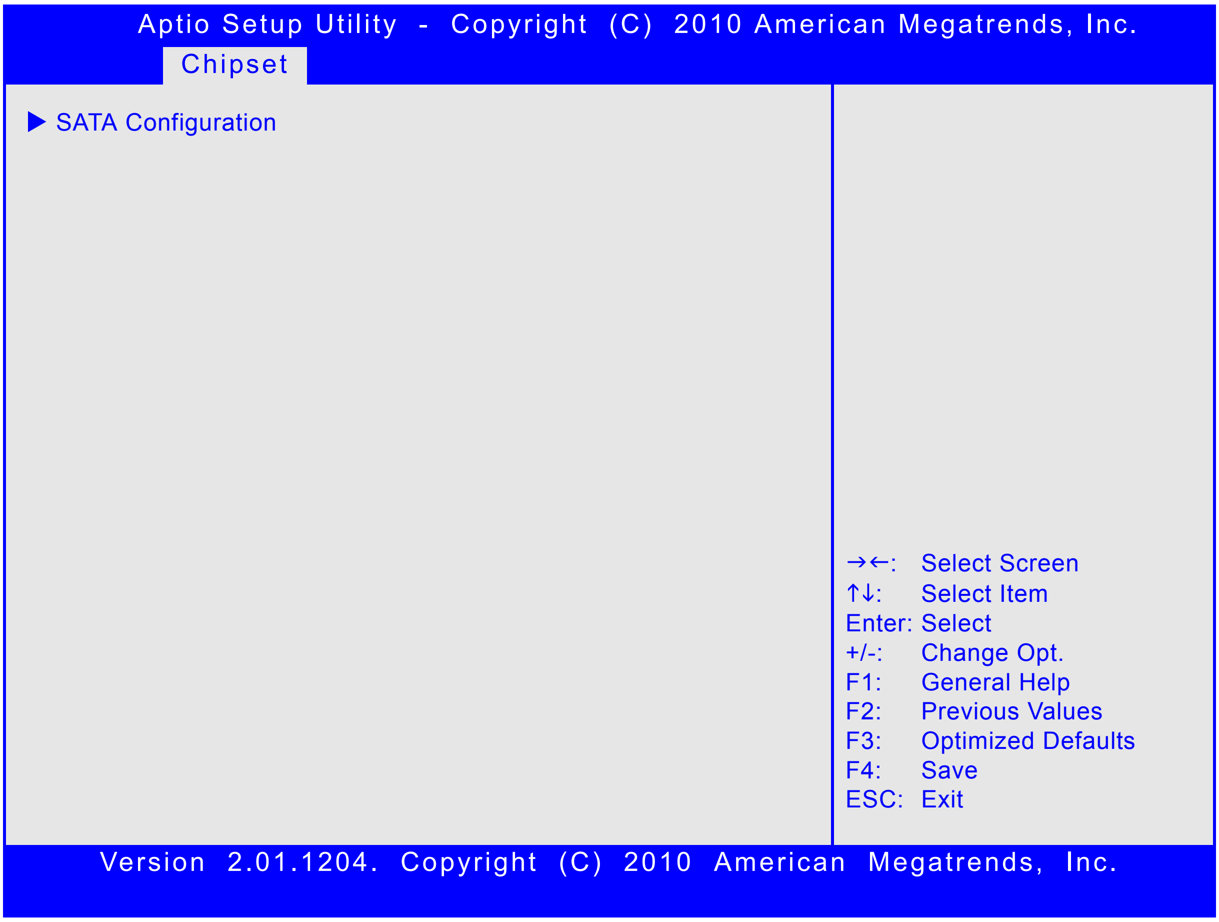
3.1 South Bridge Configuration

This function provides access to the SouthBridge configuration settings.

3.1.1 SATA Configuration

This function provides access to the SATA Configuration settings.

SATA operation depends on whether or not the SATA controller(s) is(are) enabled and, if enabled, which SATA mode is selected: IDE, AHCI or RAID. The following screens provide configuration possiblities depending on the enabling of the SATA controller(s) and the SATA mode selected.



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Chipset

▶ SATA Configuration

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save
ESC: Exit

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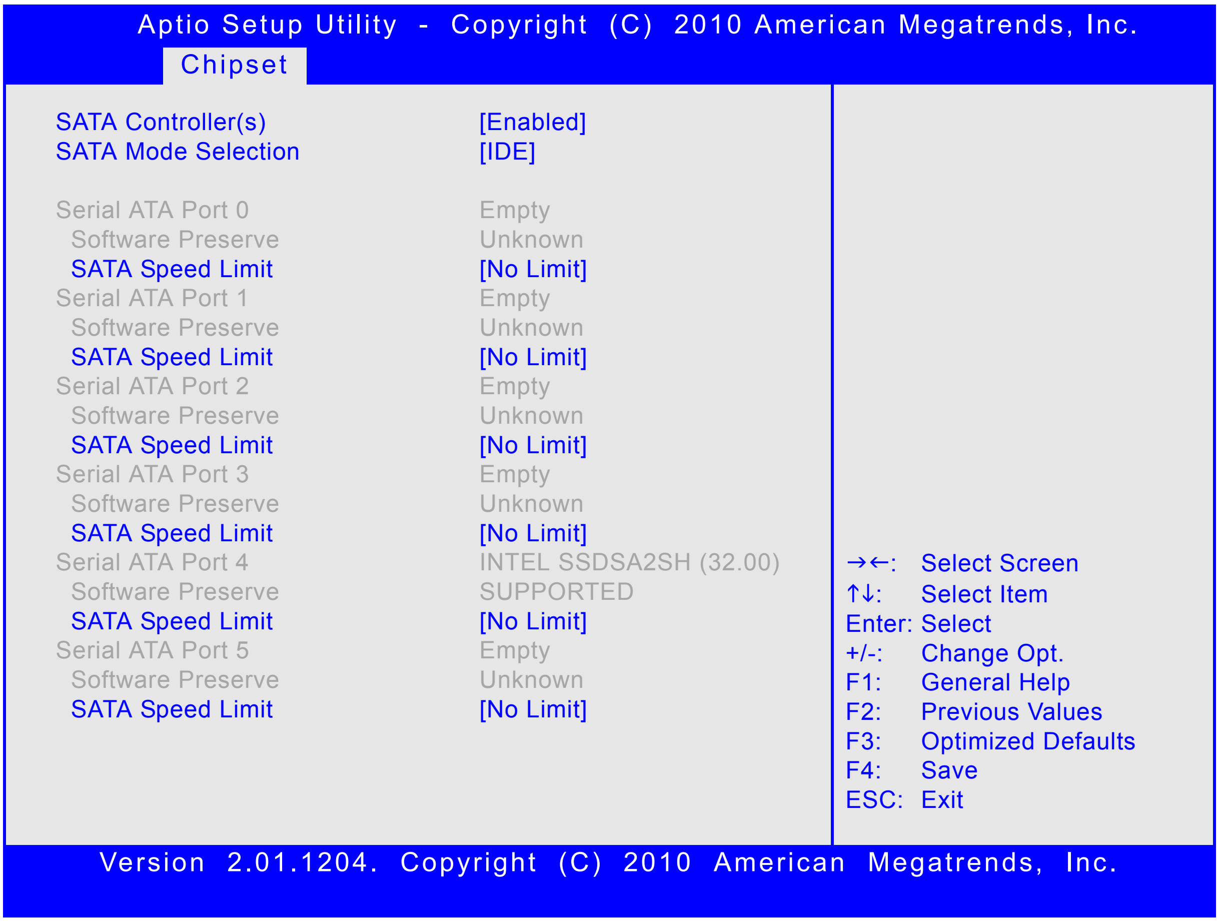
3.1.1.1 SATA Mode Selection: IDE

This screen provides functions for enabling/disabling of the SATA controllers and for selecting the operational mode if enabled.

The following screen indicates the functions available when the SATA controllers are enabled and the IDE mode is selected.



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Chipset

SATA Controller(s)              [Enabled]
SATA Mode Selection             [IDE]

Serial ATA Port 0               Empty
  Software Preserve             Unknown
  SATA Speed Limit              [No Limit]
Serial ATA Port 1               Empty
  Software Preserve             Unknown
  SATA Speed Limit              [No Limit]
Serial ATA Port 2               Empty
  Software Preserve             Unknown
  SATA Speed Limit              [No Limit]
Serial ATA Port 3               Empty
  Software Preserve             Unknown
  SATA Speed Limit              [No Limit]
Serial ATA Port 4               INTEL SSDSA2SH (32.00)     →←:    Select Screen
  Software Preserve             SUPPORTED                  ↑↓:    Select Item
  SATA Speed Limit              [No Limit]                 Enter: Select
Serial ATA Port 5               Empty                      +/-:   Change Opt.
  Software Preserve             Unknown                    F1:    General Help
  SATA Speed Limit              [No Limit]                 F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save
                                                           ESC:   Exit

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```

3.1.1.1.1 SATA Controller(s)

This function is used to enable or disable the onboard SATA controllers.

SETTING	DESCRIPTION
Disabled	Use this setting to disable the SATA controllers.
Enabled	Use this setting to enable the SATA controllers.

Default setting: Enabled

3.1.1.1.2 SATA Mode Selection

This function is used to select the operational mode of the SATA controller(s) when enabled.

SETTING	DESCRIPTION
IDE	Use this setting to select IDE mode operation.
AHCI	Use this setting to select AHCI mode operation.
RAID	Use this setting to select RAID mode operation.

Default setting: IDE

3.1.1.1.3 Serial ATA Ports 0 - 5

Displays an identifier string if a device is connected to the port indicated (0-5).

3.1.1.1.4 Software Preserve Ports 0 - 5

Indicates whether or not a connected device supports Software Setting Preservation (SSP).

3.1.1.1.5 SATA Speed Limit Ports 0 - 5

This function is used to limit the transfer speed of a SATA port. This function is available only when the SATA mode is set to IDE.

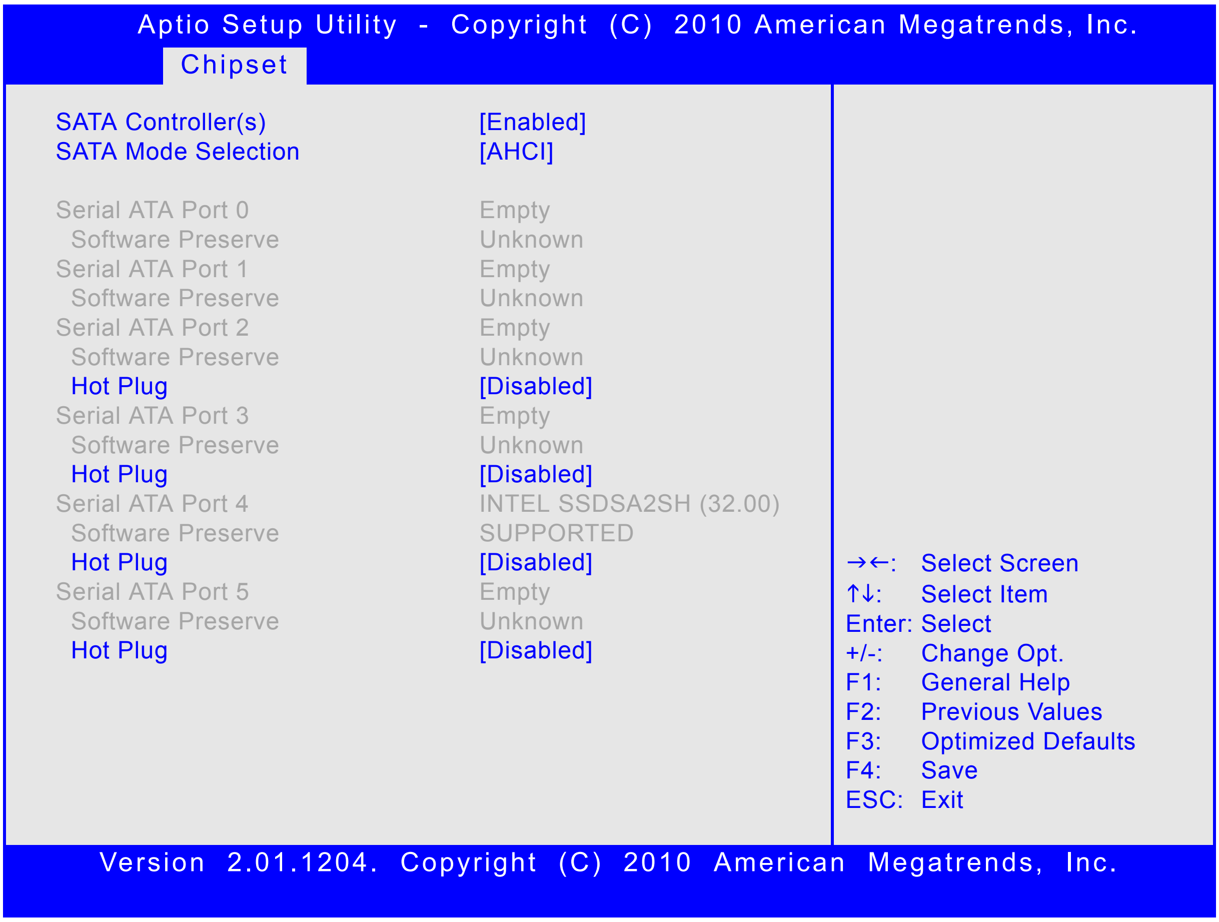
SETTING	DESCRIPTION
No Limit	Use this setting for no transfer speed limit
Gen1	Use this setting to restrict port to Generation 1 communication rate (1.5 Gb/s).

Default setting: No Limit

3.1.1.2 SATA Mode Selection AHCI

This screen provides functions for enabling/disabling of the SATA controller and for selecting the operational mode if enabled.

The following screen indicates the functions available when the SATA controller is enabled and the AHCI mode is selected.



```
        Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
           Chipset

  SATA Controller(s)              [Enabled]
  SATA Mode Selection             [AHCI]

  Serial ATA Port 0               Empty
   Software Preserve              Unknown
  Serial ATA Port 1               Empty
   Software Preserve              Unknown
  Serial ATA Port 2               Empty
   Software Preserve              Unknown
   Hot Plug                       [Disabled]
  Serial ATA Port 3               Empty
   Software Preserve              Unknown
   Hot Plug                       [Disabled]
  Serial ATA Port 4               INTEL SSDSA2SH (32.00)
   Software Preserve              SUPPORTED
   Hot Plug                       [Disabled]           →←:    Select Screen
  Serial ATA Port 5               Empty                ↑↓:    Select Item
   Software Preserve              Unknown              Enter: Select
   Hot Plug                       [Disabled]           +/-:   Change Opt.
                                                       F1:    General Help
                                                       F2:    Previous Values
                                                       F3:    Optimized Defaults
                                                       F4:    Save
                                                       ESC:   Exit

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```

3.1.1.2.1 SATA Controller(s)

This function is used to enable or disable the onboard SATA controller.

SETTING	DESCRIPTION
Disabled	Use this setting to disable the SATA controller.
Enabled	Use this setting to enable the SATA controller.

Default setting: Enabled

3.1.1.2.2 SATA Mode Selection

This function is used to select the operational mode of the SATA controller when it is enabled.

SETTING	DESCRIPTION
IDE	Use this setting to select IDE mode operation.
AHCI	Use this setting to select AHCI mode operation.
RAID	Use this setting to select RAID mode operation.

Default setting: IDE

3.1.1.2.3 Serial ATA Ports 0 - 5

Displays an identifier string if a device is connected to the port indicated (0-5).

3.1.1.2.4 Software Preserve Ports 0 - 5

Indicates whether or not a connected device supports Software Setting Preservation (SSP).

3.1.1.2.5 Hot Plug Ports 2 - 5

This function is used to enable or disable hot plug. This function is available only when SATA mode is set to AHCI or RAID and only for SATA ports 2-5.

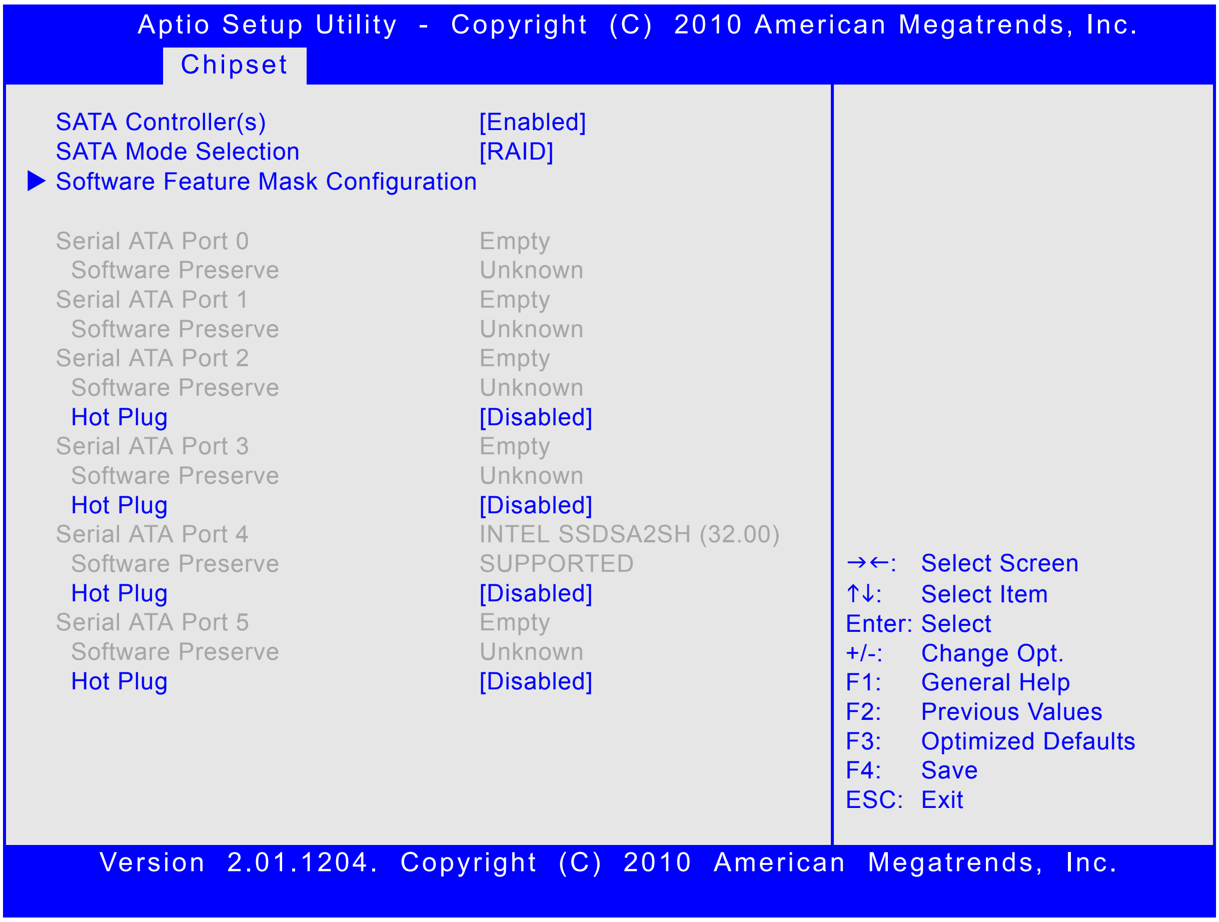
SETTING	DESCRIPTION
Disabled	Use this setting to disable the hot plug feature.
Enabled	Use this setting to enable the hot plug feature.

Default setting: Disabled

3.1.1.3 SATA Mode Selection RAID

This screen provides functions for enabling/disabling of the SATA controllers and for selecting the operational mode if enabled.

The following screen indicates the functions available when the SATA controller is enabled and the RAID mode is selected.



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
     Chipset

  SATA Controller(s)                [Enabled]
  SATA Mode Selection               [RAID]
▶ Software Feature Mask Configuration

  Serial ATA Port 0                 Empty
    Software Preserve               Unknown
  Serial ATA Port 1                 Empty
    Software Preserve               Unknown
  Serial ATA Port 2                 Empty
    Software Preserve               Unknown
    Hot Plug                        [Disabled]
  Serial ATA Port 3                 Empty
    Software Preserve               Unknown
    Hot Plug                        [Disabled]
  Serial ATA Port 4                 INTEL SSDSA2SH (32.00)
    Software Preserve               SUPPORTED        →←:    Select Screen
    Hot Plug                        [Disabled]       ↑↓:    Select Item
  Serial ATA Port 5                 Empty            Enter: Select
    Software Preserve               Unknown          +/-:   Change Opt.
    Hot Plug                        [Disabled]       F1:    General Help
                                                     F2:    Previous Values
                                                     F3:    Optimized Defaults
                                                     F4:    Save
                                                     ESC:   Exit

Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

3.1.1.3.1 SATA Controller(s)

This function is used to enable or disable the onboard SATA controller.

SETTING	DESCRIPTION
Disabled	Use this setting to disable the SATA controller.
Enabled	Use this setting to enable the SATA controller.

Default setting: Enabled

3.1.1.3.2 SATA Mode Selection

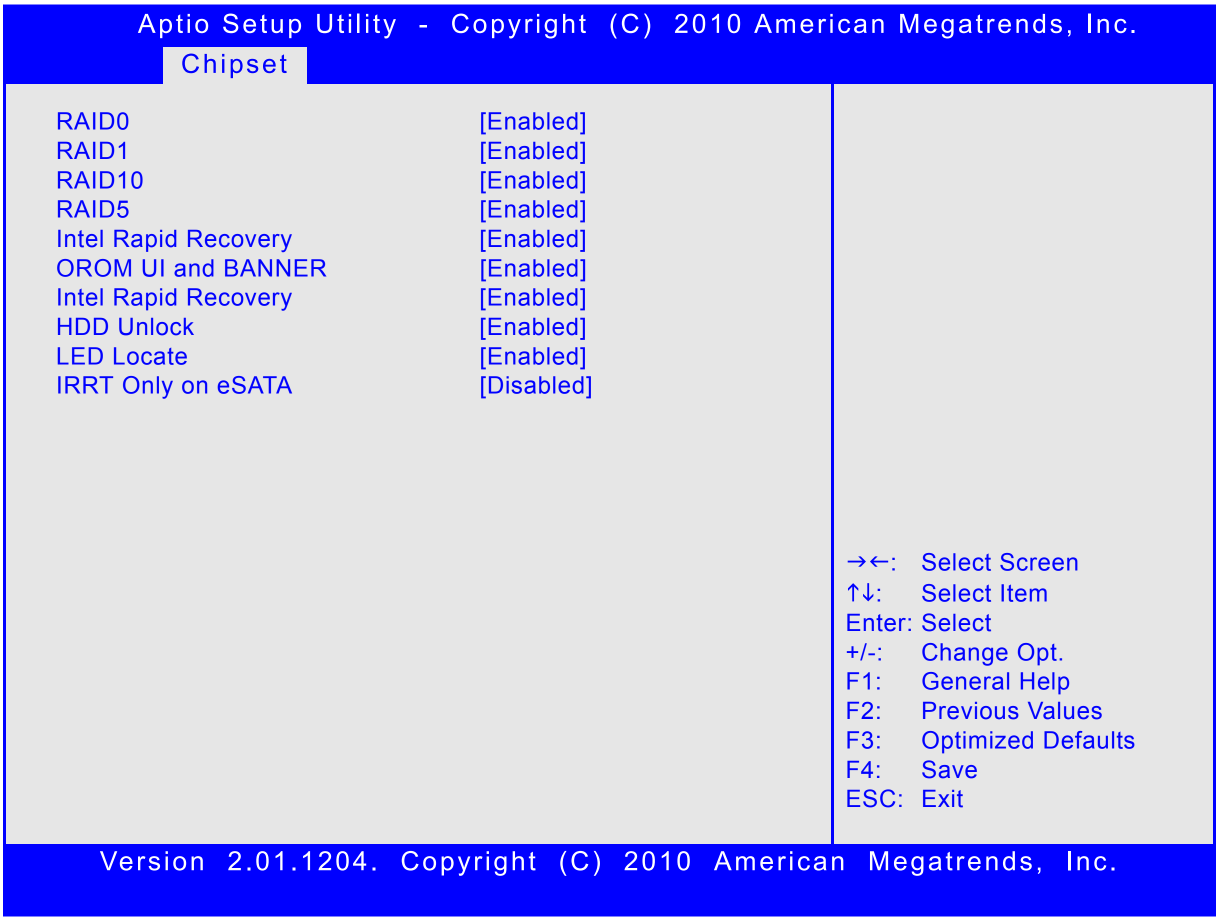
This function is used to select the operational mode of the SATA controller when it is enabled.

SETTING	DESCRIPTION
IDE	Use this setting to select IDE mode operation.
AHCI	Use this setting to select AHCI mode operation.
RAID	Use this setting to select RAID mode operation.

Default setting: IDE

3.1.1.3.3 SATA RAID Software Feature Mask Configuration

This screen provides functions for configuring various RAID parameters.



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
Chipset

RAID0                         [Enabled]
RAID1                         [Enabled]
RAID10                        [Enabled]
RAID5                         [Enabled]
Intel Rapid Recovery          [Enabled]
OROM UI and BANNER            [Enabled]
Intel Rapid Recovery          [Enabled]
HDD Unlock                    [Enabled]
LED Locate                    [Enabled]
IRRT Only on eSATA            [Disabled]

                                          →←:    Select Screen
                                          ↑↓:    Select Item
                                          Enter: Select
                                          +/-:   Change Opt.
                                          F1:    General Help
                                          F2:    Previous Values
                                          F3:    Optimized Defaults
                                          F4:    Save
                                          ESC:   Exit

Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

3.1.1.3.3.1 RAID0

This function is used to enable or disable the RAID0 feature.

SETTING	DESCRIPTION
Disabled	Use this setting to disable RAID0 feature.
Enabled	Use this setting to enable RAID0 feature.

Default setting: Enabled

3.1.1.3.3.2 RAID1

This function is used to enable or disable the RAID1 feature.

SETTING	DESCRIPTION
Disabled	Use this setting to disable RAID1 feature.
Enabled	Use this setting to enable RAID1 feature.

Default setting: Enabled

3.1.1.3.3.3 RAID10

This function is used to enable or disable the RAID10 feature.

SETTING	DESCRIPTION
Disabled	Use this setting to disable RAID10 feature.
Enabled	Use this setting to enable RAID10 feature.

Default setting: Enabled

3.1.1.3.3.4 RAID5

This function is used to enable or disable the RAID5 feature.

SETTING	DESCRIPTION
Disabled	Use this setting to disable RAID5 feature.
Enabled	Use this setting to enable RAID5 feature.

Default setting: Enabled

3.1.1.3.3.5 Intel Rapid Recovery

This function is used to enable or disable Intel Rapid Recovery Technology.

SETTING	DESCRIPTION
Disabled	Use this setting to disable Intel Rapid Recovery Technology.
Enabled	Use this setting to enable Intel Rapid Recovery Technology.

Default setting: Enabled

3.1.1.3.3.6 OROM UI and BANNER

This function is used to display or hide RAID OptionROM graphical UI and information.

SETTING	DESCRIPTION
Disabled	Use this setting to hide RAID UI and information as long as RAID volumes are normal.
Enabled	Use this setting to display RAID UI and information.

Default setting: Enabled

3.1.1.3.3.7 HDD Unlock

This function is used to indicate that the HDD password unlock in the OS is enabled.

SETTING	DESCRIPTION
Disabled	Use this setting to indicate that the HDD password unlock in the OS is disabled.
Enabled	Use this setting to indicate that the HDD password unlock in the OS is enabled.

Default setting: Enabled

3.1.1.3.3.8 LED Locate

This function is used to indicate that the LED/SGPIO hardware is attached and the “ping to locate” feature is enabled on the OS.

SETTING	DESCRIPTION
Disabled	Use this setting to indicate that the LED/SGPIO hardware is attached and the “ping to locate” feature is disabled on the OS.
Enabled	Use this setting to indicate that the LED/SGPIO hardware is attached and the “ping to locate” feature is enabled on the OS.

Default setting: Enabled

3.1.1.3.3.9 IRRT Only on eSATA

This function is used to indicate that only Intel Rapid Recovery Technology (IRRT) volumes or any RAID volume can span internal and external SATA.

SETTING	DESCRIPTION
Disabled	Use this setting to allow that any RAID volume can span internal and external SATA.
Enabled	Use this setting to allow only IRRT volumes to span internal and external SATA.

Default setting: Disabled

3.1.1.3.4 Serial ATA Ports 0 - 5

Displays an identifier string if a device is connected to the port indicated (0-5).

3.1.1.3.5 Software Preserve Ports 0 - 5

Indicates whether or not a connected device supports Software Setting Preservation (SSP).

3.1.1.3.6 Hot Plug Ports 2 - 5

This function is used to enable or disable hot plug. This function is available only when SATA mode is set to AHCI or RAID and only for SATA ports 2-5.

SETTING	DESCRIPTION
Disabled	Use this setting to disable the hot plug feature.
Enabled	Use this setting to enable the hot plug feature.

Default setting: Disabled

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Chapter 4

Boot Setup

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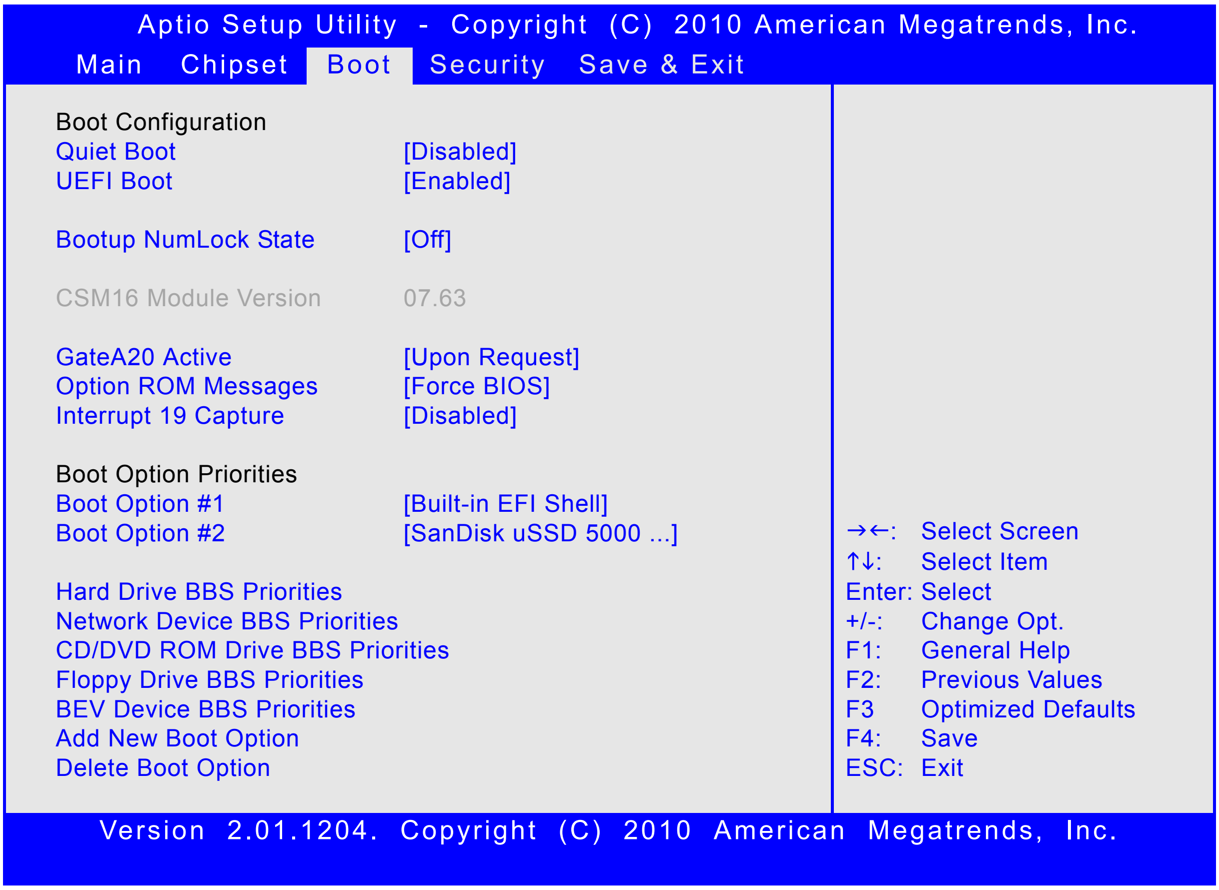
4. Boot Setup

Select the Boot tab to enter the Boot Setup screen. This screen lists the sub-screens for boot configuration and boot device priority.



```
       Aptio Setup Utility  -  Copyright  (C)  2010 American Megatrends, Inc.
    Main   Chipset   Boot   Security   Save & Exit

  Boot Configuration
  Quiet Boot                 [Disabled]
  UEFI Boot                  [Enabled]

  Bootup NumLock State       [Off]

  CSM16 Module Version       07.63

  GateA20 Active             [Upon Request]
  Option ROM Messages        [Force BIOS]
  Interrupt 19 Capture       [Disabled]

  Boot Option Priorities
  Boot Option #1             [Built-in EFI Shell]
  Boot Option #2             [SanDisk uSSD 5000 ...]     →←:    Select Screen
                                                         ↑↓:    Select Item
  Hard Drive BBS Priorities                              Enter: Select
  Network Device BBS Priorities                          +/-:   Change Opt.
  CD/DVD ROM Drive BBS Priorities                        F1:    General Help
  Floppy Drive BBS Priorities                            F2:    Previous Values
  BEV Device BBS Priorities                              F3     Optimized Defaults
  Add New Boot Option                                    F4:    Save
  Delete Boot Option                                     ESC:   Exit

     Version  2.01.1204.  Copyright  (C)  2010  American  Megatrends,  Inc.
```

4.1 Boot Configuration

4.1.1 Quiet Boot

This function is used to display either POST output messages or a splash screen during boot-up.

SETTING	DESCRIPTION
Disabled	Use this setting to display POST output messages during boot-up.
Enabled	Use this setting to display a splash screen during boot-up.

Default setting: Disabled

4.1.2 uEFI Boot

This function is used to enable or disable uEFI boot from disks.

SETTING	DESCRIPTION
Disabled	Use this setting to prevent the system from booting native uEFI operating systems from disks.
Enabled	Use this setting to enable booting of native uEFI operating systems from disks, if present, and in boot order.

Default setting: Enabled

4.1.3 Bootup NumLock State

This function is used to set the state of the keyboard's numlock function after POST.

SETTING	DESCRIPTION
On	Use this setting to switch on the keyboard's numlock function after POST.
Off	Use this setting to switch off the keyboard's numlock function after POST.

Default setting: Off

4.1.4 CSM16 Module Version

This function provides display-only information concerning the CSM Module and is intended for internal use only.

4.1.5 GateA20 Active

This function is used to enable or disable GateA20.

SETTING	DESCRIPTION
Upon Request	Use this setting to disable GA20 in the uEFI BIOS.
Always	Use this setting to prevent the system from disabling GA20.

Default setting: Upon Request

4.1.6 Option ROM Messages

This function is used to control the messages of the loaded PCI option ROMs.

SETTING	DESCRIPTION
Force BIOS	Use this setting to force to a BIOS-compatible output. This will show the option ROM messages.
Keep Current	Use this setting to keep the current video mode. This will suppress option ROM messages. Option ROMs requiring interactive inputs may not work properly in this mode.

Default setting: Force BIOS

4.1.7 Interrupt 19 Capture

This function is used to specify if legacy PCI option ROMs are allowed to capture software interrupt 19h.

SETTING	DESCRIPTION
Disabled	Use this setting to prevent legacy PCI option ROMs from capturing software interrupt 19h.
Enabled	Use this setting to allow legacy PCI option ROMs to capture software interrupt 19h.

Default setting: Disabled

4.2 Boot Option Priorities

4.2.1 Boot Option #1..2

These functions are used to form the boot order and are dynamically generated. They represent either a legacy BBS (BIOS Boot Specification) class of devices or a native EFI boot entry. Press Return on each option to select the BBS class / EFI boot entry desired.

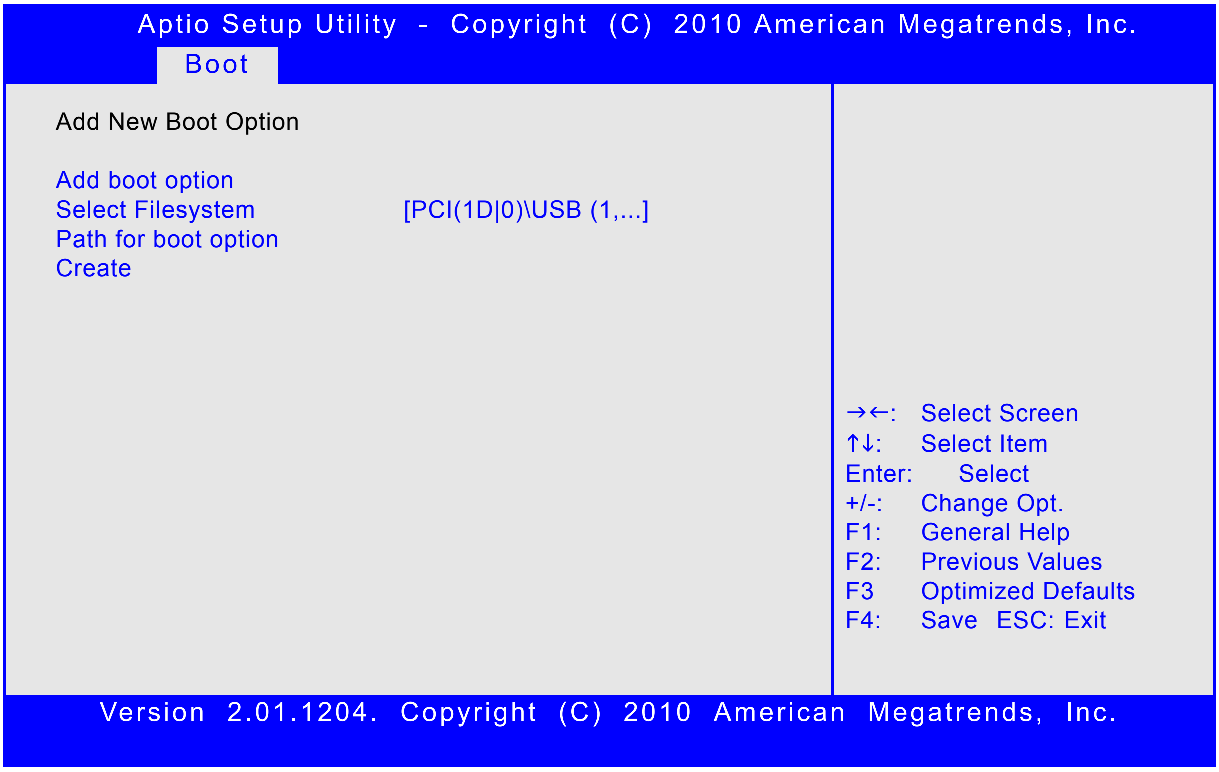
4.2.2 Hard Drive/Network Device/CD/DVD ROM Drive/Floppy Drive/BEV Device BBS Priorities

These functions lead to sub-menus that allow configuring the boot order for a specific device class. These options are only visible if at least one device for this class is present. These functions are dynamically generated.

4.2.3 Add New Boot Option

This function is used to create a native uEFI boot option. When selected a sub-menu appears with functions for creating a new boot option. Select each function as appropriate, then either fillout the pop-up menu by typing in the requested information or select an appropriate item within the pop-up menu. After completing all entries, select “Create” to generate a new boot option.

These options are only visible if at least one USB device is present.



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
         Boot

 Add New Boot Option

 Add boot option
 Select Filesystem            [PCI(1D|0)\USB (1,...]
 Path for boot option
 Create

                                              →←:   Select Screen
                                              ↑↓:   Select Item
                                              Enter:    Select
                                              +/-:  Change Opt.
                                              F1:   General Help
                                              F2:   Previous Values
                                              F3    Optimized Defaults
                                              F4:   Save  ESC: Exit

Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

Add boot option: Enter a descriptive name for the OS for the new boot option (e.g. RedHat Linux)

Select Filesystem: Select the corresponding filesystem of the OS for the new boot option from the list presented

Path for boot option: Enter the path where the OS is located for the new boot option

Create: Select “Create” to generate the new boot option using the information provided above

4.2.4 Delete Boot Option

This function is used to delete a native uEFI boot option.

Note: Do not delete the “Built-in EFI Shell” boot option as this would remove the uEFI Shell from the boot order. In case the uEFI Shell got removed, use “Save & Exit” / “Boot Override” / “Built-in EFI Shell” to recover.

Chapter 5

Security Setup

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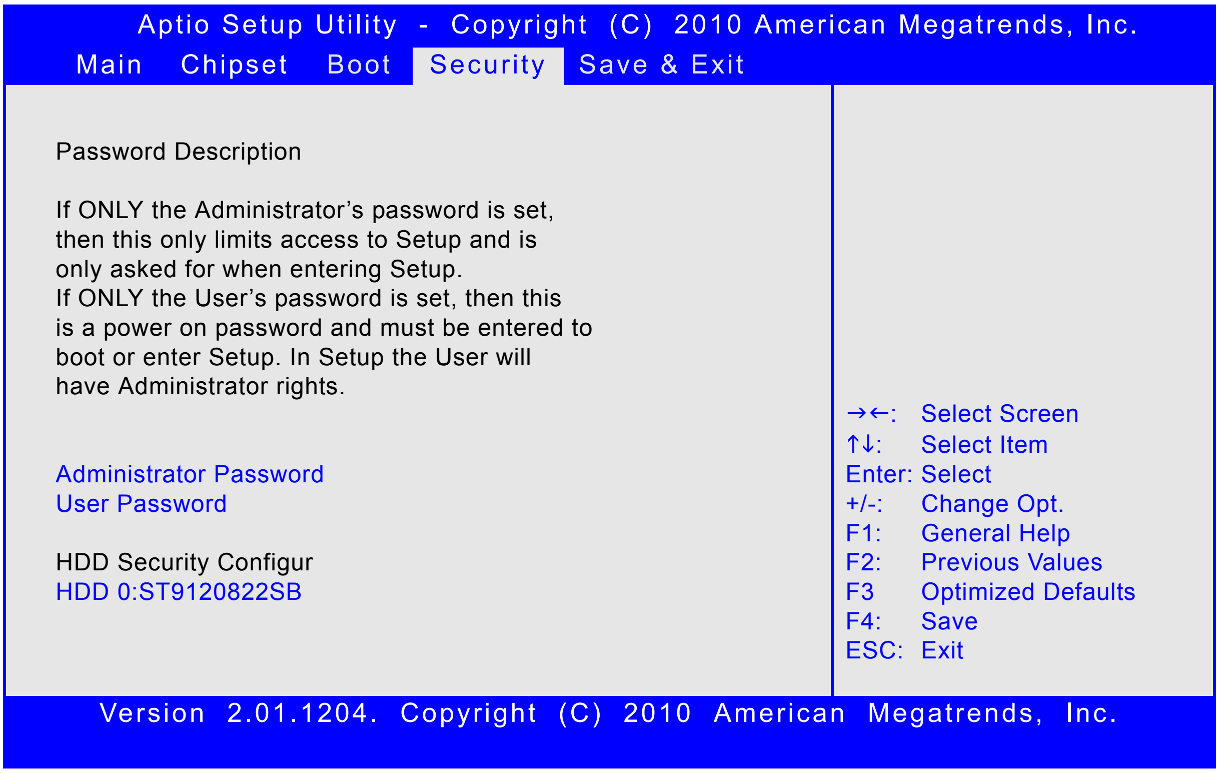
5. Security Setup

Select the Security tab to enter the Security Setup screen. This screen provides information about the passwords and functions for specifying the security settings.



```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main   Chipset   Boot   Security   Save & Exit

Password Description

If ONLY the Administrator’s password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User’s password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
                                                   →←:    Select Screen
                                                   ↑↓:    Select Item
Administrator Password                             Enter: Select
User Password                                      +/-:   Change Opt.
                                                   F1:    General Help
HDD Security Configur                              F2:    Previous Values
HDD 0:ST9120822SB                                  F3     Optimized Defaults
                                                   F4:    Save
                                                   ESC:   Exit

Version 2.01.1204. Copyright (C) 2010 American Megatrends, Inc.
```

The following modes of security are provided:.

SETTING	DESCRIPTION
No password is set	Booting the system as well as entering the Setup is unsecured.
Only Administrator password is set	Booting the system is unsecured. For entering the Setup, the Administrator password is required.
Only User password is set	The password is required for booting the system as well as for entering the Setup menu. On every startup, the user will be asked for the password.
Both User and Administrator passwords are set	Booting the system as well as entering the Setup is secured. For entering the Setup, a password is required. If the User password is entered here, security related Setup entries cannot be modified. Entering the Administrator password provides full access to all Setup entries.

5.1 Administrator Password

This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return.

Note: The password is case sensitive.

5.2 User Password

This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return.

Note: The password is case sensitive.

5.3 HDD Security Configuration

This function is only available if a HDD/SSD is detected which supports this function.

Warning! Before using this function, contact Kontron’s Technical Support for assistance. Failure to comply with the instruction above may result in an irreparable disk lockout.

5.4 Remember the Password

It is highly recommended to keep a record of all passwords in a safe place. Forgotten passwords may lead to being completely locked out of the system.

If the system cannot be booted because neither the User password nor the Administrator password are known, refer to Chapter 4.1 in the CP6002 User Guide for information about clearing the uEFI BIOS settings, or contact Kontron for further assistance.

Note: The harddisk User password cannot be cleared using the above method.

Chapter 6

Save & Exit

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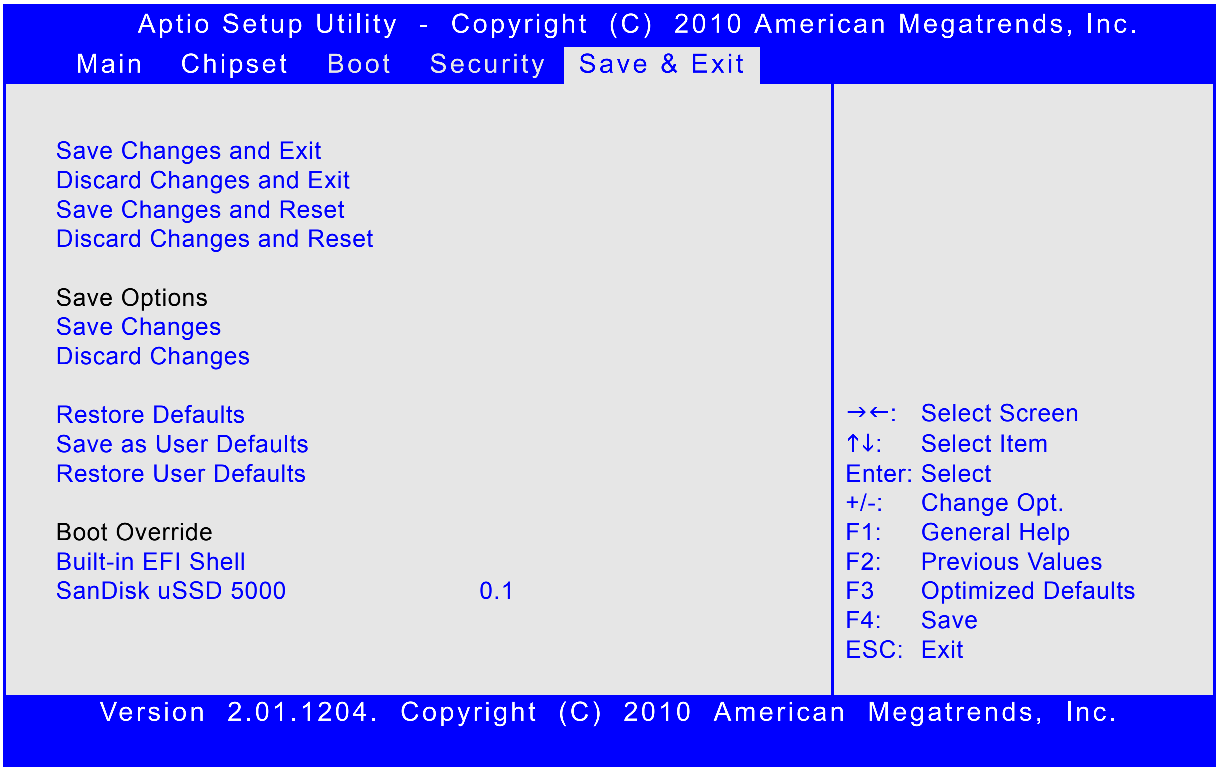
6. Save & Exit

Select the Save & Exit tab to enter the Save & Exit menu screen. This screen provides functions for handling changes made to the uEFI BIOS settings and the exiting of the Setup program.



```
        Aptio Setup Utility  -  Copyright  (C)  2010 American Megatrends, Inc.
     Main    Chipset    Boot    Security    Save & Exit

   Save Changes and Exit
   Discard Changes and Exit
   Save Changes and Reset
   Discard Changes and Reset

   Save Options
   Save Changes
   Discard Changes

   Restore Defaults                                      →←:   Select Screen
   Save as User Defaults                                 ↑↓:   Select Item
   Restore User Defaults                                 Enter: Select
                                                         +/-:  Change Opt.
   Boot Override                                         F1:   General Help
   Built-in EFI Shell                                    F2:   Previous Values
   SanDisk uSSD 5000              0.1                    F3    Optimized Defaults
                                                         F4:   Save
                                                         ESC:  Exit

     Version  2.01.1204.  Copyright  (C)  2010  American  Megatrends,  Inc.
```

6.1 Save Changes and Exit

This function is used to save all changes made within the Setup to flash. This function continues the boot process as long as no option was altered that requires a reboot.

Note: The Setup will ask for confirmation prior to executing this command.

6.2 Discard Changes and Exit

This function is used to discard all changes made within the Setup. This function continues the boot process.

Note: The Setup will ask for confirmation prior to executing this command.

6.3 Save Changes and Reset

This function is used to save all changes made within the Setup to flash. This function performs a reboot afterwards.

Note: The Setup will ask for confirmation prior to executing this command.

6.4 Discard Changes and Reset

This function is used to discard all changes made within the Setup. This function performs a reboot afterwards.

Note: The Setup will ask for confirmation prior to executing this command.

6.5 Save Changes (Save Options)

This function is used to save all changes made within the Setup to flash. This function returns to Setup.

Note: The Setup will ask for confirmation prior to executing this command.

6.6 Discard Changes (Save Options)

This function is used to discard all changes made within the Setup. This function returns to Setup.

Note: The Setup will ask for confirmation prior to executing this command.

6.7 Restore Defaults (Save Options)

This function is used to restore all tokens to factory default.

Note: The Setup will ask for confirmation prior to executing this command.

6.8 Save as User Defaults (Save Options)

This function is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Note: The Setup will ask for confirmation prior to executing this command.

6.9 Restore User Defaults (Save Options)

This function is used to restore all tokens to settings previously stored by Save as User Defaults.

Note: The Setup will ask for confirmation prior to executing this command.

6.10 Boot Override

This group of functions includes a list of tokens, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order. If booting to EFI Shell this way, an exit from the shell returns to Setup.

Chapter 7

The uEFI Shell

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7. The uEFI Shell

The Kontron uEFI BIOS features a built-in and enhanced version of the uEFI Shell. For a detailed description of the available standard shell scripting refer to the EFI Shell User's Guide. For a detailed description of the available standard shell commands, refer to the Shell Command Manual 1.0. Both documents can be downloaded from the EFI and Framework Open Source Community website: http://sourceforge.net/projects/efi-shell/files/documents/.

Please note that not all shell commands described in the Shell Command Manual 1.0 are provided by the Kontron uEFI BIOS.

7.1 Introduction, Basic Operation

The uEFI Shell forms an entry into the uEFI boot order and is the first boot option by default. It is simply started by putting the uEFI Shell first in boot and running the board as usual.

7.1.1 Shell Startup

If the shell is executed, it displays its signon message followed by a list of detected devices. The output produced by the device mapping table can vary depending on the board's configuration.

```
EFI Shell version 2.00 [4.631]
Current running mode 1.1.2
Device mapping table
  fs0      :Removable HardDisk - Alias hd33b0b0b blk0
            Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)/HD(Part1,Sig17731773)
  fs1      :Removable BlockDevice - Alias f33b0c0 blk1
            Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(2, 0)
  blk0     :Removable HardDisk - Alias hd33b0b0b fs0
            Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)/HD(Part1,Sig17731773)
  blk1     :Removable BlockDevice - Alias f33b0c0 fs1
            Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(2, 0)
  blk2     :HardDisk - Alias (null)
            Acpi(PNP0A03,0)/Pci(1F|2)/Ata(Primary,Master)/HD(Part1,SigC811D18D)
  blk3     :BlockDevice - Alias (null)
            Acpi(PNP0A03,0)/Pci(1F|2)/Ata(Primary,Master)
  blk4     :Removable BlockDevice - Alias (null)
            Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)

Press the ESC key within 5 seconds to skip startup.nsh, and any other key to
continue.
```

If the ESC key is pressed before the 5-second timeout has elapsed, the shell prompt is shown:

```
Shell>
```

7.2 Kontron Shell Commands

The Kontron uEFI implementation provides the following additional commands related to the specific HW features of the Kontron system:

- **kBiosRevision**
- **kboardconfig**
- **kboardinfo**
- **kboot**
- **kbootnsh**
- **kclearnvram**
- **kclsp**
- **kipmi**
- **kmkramdisk**
- **kpassword**
- **kresetconfig**
- **kSettings**
- **kwdt**

The following chapters provide information concerning these Kontron-specific commands. The command response values indicated can vary depending on the board’s configuration.

Where applicable, in the following command descriptions, the default settings are indicated in brackets.

7.2.1 kBiosRevision uEFI Shell Command

kBiosRevision

FUNCTION: Get BIOS revision

SYNTAX:

```
kBiosRevision [-?|-lt|-eq|-gt] <number>
```

where:

?	Show online help
-lt	Check if current BIOS revision is less than <number>
-eq	Check if current BIOS revision is equal to <number>
-gt	Check if current BIOS revision is greater than <number>
<number>	revision number to be used

DESCRIPTION: The **kBiosRevision** command can be used to display the current BIOS revision. In scripting environments it can be used to perform checks against a specified BIOS revision number.

Note that the command name “kBiosRevision” is case sensitive.

USAGE: Display current BIOS revision:

COMMAND / RESPONSE:

```
Shell> kBiosRevision
BIOS revision: 21
```

Check if current BIOS revision is equal to R21 (used within EFI shell script):

```
kBiosRevision -eq 21
if not %lasterror% == 0 then
    echo "NOT R21, need to update"
    goto _update
else
    "EFI R21 found"
endif
```

7.2.2 kboardconfig uEFI Shell Command

kboardconfig

FUNCTION: Configure the non-volatile board settings

SYNTAX:

```
kboardconfig

kboardconfig [-?|<device>|<setting>]
```

where:

?	Show online help
<device>	Specify device from list
<setting>	Select configuration type

DESCRIPTION: The **kboardconfig** command enables the PXE feature or sets the front/ rear I/O configuration of the dedicated device.

Note that many command settings are case sensitive.

USAGE: Show all possible configurations

COMMAND / RESPONSE:

```
Shell> kboardconfig
Control nonvolatile board settings
Example: kboardconfig
pxe: Select PXE boot network adapter ([disabled] all front_a
front_b rear_a rear_b)
StorageOrom: Launch Storage PCI OpROM (disabled [enabled])
HyperThreading: Enable Hyper Threading technology (disabled
[enabled])
CpuTurbo: Enable CPU turbo mode technology (disabled [enabled])
PrimaryDisplay: Select primary display device ([auto] igd peg pci)
vga: VGA Port Configuration ( auto  [front]  rear  disabled )
SataMode: Determines how SATA controller(s) operate ([ide] ahci
raid
wr_prot_sata: Onboard Sata flash write protection ([disabled]
enabled)   NOTE: CONTACT KONTRON BEFORE USING THIS FUNCTION
wr_prot_eeprom: System EEprom write protection ([disabled]
enabled)
wr_prot_spi: EFI spi flash write protection ([disabled] enabled)
CStates: Enable CPU C-States ( disabled [enabled] )
C1eState: Enable CPU C1e-State ( disabled [enabled] )
C3State: Enable CPU C3-State ( [disabled] enabled )
C6State: Enable CPU C6-State ( [disabled] enabled )
PciCfgDelay: Set Delay for PCI CFG Cycle ( [disabled] 1s 2s 3s 4s 5s )
VgaInterrupt: Enable VGA interrupt generation ( [disabled] enabled )
```

Show allowed settings e.g. for “PrimaryDisplay”:

```
Shell> kboardconfig PrimaryDisplay
PrimaryDisplay: Select primary display device
PrimaryDisplay == auto
Allowed options: auto, igd, peg, pci
```

kboardconfig

SETTINGS:	**pxe:** Select PXE boot network adapter **disabled:** No PXE boot available **[all]:** Try all Ethernet devices round robin for PXE boot **front_a:** Try only front port a for PXE boot **front_b:** Try only front port b for PXE boot **rear_a:** Try only rear port a for PXE boot **rear_b:** Try only rear port b for PXE boot Note: **front_a** corresponds to GbE A and **front_b** corresponds to GbE B on the front panel of the CP6002.
	StorageOrom: Launch Storage PCI Option ROMs **disabled:** Do not launch storage PCI option ROMs. This includes the onboard RAID option ROM. **[enabled]:** Launch storage option ROMs, if present
	HyperThreading: [Enable]/Disable Hyper-Threading Technology. If this option is changed, a power cycle is required for it to take effect.
	CpuTurbo: [Enable]/Disable CPU Turbo Boost Technology
	PrimaryDisplay: Select primary display device **[auto]:** Automatically detect primary display device **igd:** Use internal graphics, if enabled **peg:** Try to use video on the PCIe graphics port, if present **pci:** Try to use video on the PCI(e) bus first
	vga: VGA Port configuration **auto:** Automatically detect devices. HDMI/DVI on Rear I/O takes precedence over Front VGA if devices are connected to both front and rear **[front]:** Try to use Front-VGA if available. **rear:** Try to use device connected to Rear I/O if available **disabled:** Disable graphic output
	SataMode: Determines how SATA controllers operate **[ide]:** SATA ports operate as two IDE controllers **ahci:** SATA ports operate as one 6-port AHCI controller **raid:** SATA ports operate as one 6-port RAID controller
	wr_prot_sata: Onboard SATA flash write protection **[disabled]:** Do not write protect the onboard SATA flash **enabled:** The onboard SATA flash is write-protected after POST. NOTE: CONTACT KONTRON BEFORE USING THIS FUNCTION

kboardconfig

SETTINGS	`wr_prot_eeprom:` System EEPROM write protection `[disabled]:` Do not write protect the system EEPROM `enabled:` System EEPROM is write-protected after POST
	`wr_prot_spi:` EFI SPI flash write protection `[disabled]:` Do not write protect the EFI SPI flash `enabled:` The EFI SPI flash is write-protected after POST
	`CStates:` Enable/Disable all CPU CStates ([enabled])
	`C1eState:` Enable/Disable CPU C1eState ([enabled])
	`C3State:` Enable/Disable CPU C3State ([disabled])
	`C6State:` Enable/Disable CPU C6State ([disabled])
	`PciCfgDelay:` Set Delay for PCI Configuration Cycle `[disabled]:` No delay for PCI Configuration Cycle `1s, 2s, 3s, 4s or 5s:` 1 to 5 seconds delay possible
	`VgaInterrupt:` Enable/Disable VGA interrupt generation (assertion of IGD interrupt signal) ([disabled])

7.2.3 kboardinfo uEFI Shell Command

kboardinfo

FUNCTION:	Show board identification data
SYNTAX:	`kboardinfo`
DESCRIPTION:	The **kboardinfo** command shows a summary of board-specific identification data. It is especially useful for support queries because it contains this data in a concentrated form.

kboardinfo

USAGE:

Show board identification data

COMMAND / RESPONSE:

```
Shell> kboardinfo
KOMaOEMF rev.:        3
Board ID:             0xB340
Hardware rev.:        0x1
Logic rev.:           0x2
Boot flash:           Boot flash 0
In system slot:       Yes
Geographic address:   3
Material number:      <nnnn-nnnn>
Hardware index:       <nn>
Serial number:        <nnnnnnnnn>
EFI article name:     SK-EFI-B3401
EFI material number: <nnnn-nnnn>
EFI index:            21, standard
NorthBridge rev.:     0x18
SouthBridge rev.:     0x6
Microcode:            0x2
CPU ID:               0x20655
CPU Branding:         Intel(R)Core(TM) i7 CPU
                      E 610 @ 2.53 GHz
RIO Module            0x010
```

REMARKS:

KOMaOEMF rev.:	Revision of KOMaOEMF protocol
Board ID:	Kontron board identification value
Hardware rev.:	Hardware revision of this board
Logic rev.:	Logic revision of this board
Boot flash:	Current boot flash: either “Boot flash 0” or “Boot flash 1”
In system slot:	Yes / no
Geographic Address:	Geographic address of the cPCI backplane slot the board is currently plugged into
Material number:	Kontron hardware reference number
Hardware index:	Kontron hardware index
Serial number:	This board’s unique serial number
EFI article name:	Kontron uEFI reference name
EFI material number:	Kontron uEFI reference number
EFI index:	Version of this uEFI BIOS
NorthBridge rev.:	Chip revision of the NorthBridge (GMCH die of the Intel® Core™ i7 processor)
SouthBridge rev.:	Chip revision of the SouthBridge (Intel ® QM57)
Microcode:	Currently loaded microcode
CPU ID:	CPUID
CPU Branding:	CPU identification string
RIO Module:	RIO identification string

7.2.4 kboot uEFI Shell Command

kboot

FUNCTION:

Boot a legacy OS
Not to be used for uEFI BootLoaders!

SYNTAX:

```
kboot [-?|-d|-p|-p <path>|-n <name>|-t <type>]
```

where:

-?	Show online help
-d	Boot default order
-p <path>	Specify the path to the device to boot from
-n <name>	Specify the device name to boot from
-t <type>	Specify the device type to boot from Available types are: floppy harddrive cdrom network usb-floppy usb-harddrive usb-cdrom

DESCRIPTION:

The **kboot** command boots a legacy OS. Boot device can be selected in a very flexible way. If the requested device is not present, boot returns to shell. The **kboot** command cannot boot native uEFI operating systems. But since these are bootable from shell by calling their bootloader, this is not necessary either. If a requested device is present but not bootable, uEFI continues to boot with the next bootable device in the boot order.

USAGE:

Show all connected devices and select boot devices in various ways:

COMMAND / RESPONSE:

```
Shell> kboot
_____BBS_TABLE_____
00001 usb-harddrive "SanDisk Extreme 0001"
Device path: Acpi(PNP0A03,0)/Pci(1A|0)/Usb(1, 0)/Usb(1, 0)
00002 usb-harddrive "JetFlashTS64GSSD18C3"
Device path: Acpi(PNP0A03,0)/Pci(1D|0)/Usb(1, 0)/Usb(4, 0)
00000 harddrive "P0: HTS541040G9SA00           "
Device path: Acpi(PNP0A03,0)/Pci(1F|2)/?
```

```
Boot from device containing the string "SanDisk":
Shell> kboot -n SanDisk
```

```
Boot from first device found that is of type harddrive:
Shell> kboot -t harddrive
```

```
Boot from device using the path to the device:
Shell> kboot -p "Acpi(PNP0A03,0)/Pci(1D|0)/Usb(1, 0)/
Usb(4, 0)"
```

7.2.5 kbootnsh uEFI Shell Command

kbootnsh

FUNCTION: Manage the startup script stored in the flash

SYNTAX:

```
kbootnsh [-b][-?|-g <filename>|-p <filename>|-d]
```

where:

-b	Display output page by page
-?	Show online help
-g <filename>	Store the current boot script to disk. If there is no physical disk drive present, the **kmkramdisk** command may be used.
-p <filename>	Store the shell script pointed to by filename to flash. Note: The shell script cannot be larger then 400 bytes.
-d	Delete the current startup script from flash.

DESCRIPTION: The **kbootnsh** command manages the flash stored startup script. If the shell is launched by the boot process, it executes a shell script stored in the flash. If the shell script terminates, the shell will continue the boot process. However, the shell script can of course contain any other boot command.

USAGE: Get current startup script to file named boot.nsh

```
kbootnsh -g boot.nsh
```

Store file named boot.nsh to flash:

```
kbootnsh -p boot.nsh
```

Delete startup script:

```
kbootnsh -d
```

7.2.6 kclearnvram uEFI Shell Command

kclearnvram

<table>
<tr><td><b>FUNCTION:</b></td><td>Clear the NVRAM to restore the system’s default settings</td></tr>
<tr><td><b>SYNTAX:</b></td><td><code>kclearnvram [-?|-q]</code>
where:
-? show help
-q silent mode operation
(for use of this command in shell scripts)</td></tr>
<tr><td><b>DESCRIPTION:</b></td><td>Invoking the <b>kclearnvram</b> command clears the system NVRAM. Since all EFI settings are stored inside the NVRAM, the default settings are loaded afterwards.
When invoked without an option, this command must be confirmed by pressing “c”.
If invoked with the “-q” option, no confirmation is requested.</td></tr>
</table>

7.2.7 kclsp uEFI Shell Command

kclsp

<table>
<tr><td><b>FUNCTION:</b></td><td>Configure clock spreading</td></tr>
<tr><td><b>SYNTAX:</b></td><td><code>kclsp [-?|-d|-e]</code>
where:
-? show help
-d disable clock spreading
-e enable clock spreading</td></tr>
<tr><td><b>DESCRIPTION:</b></td><td>The <b>kclsp</b> command enables or disables clock spreading on the onboard core clock generator. Clock spreading can be used to reduce system EMI.</td></tr>
<tr><td><b>USAGE:</b></td><td>Get help:
COMMAND / RESPONSE:
<code>Shell> kclsp -?</code>

<code>Kontron Clock Spreading Configuration for ICS9LRS3187</code>
<code>-d [disable clock spreading]</code>
<code>-e enable clock spreading</code>
This parameter is volatile, and at the next startup it is set to disable.</td></tr>
</table>

7.2.8 kipmi uEFI Shell Command

kipmi

FUNCTION: Read or configure available Board Management Controller parameters

SYNTAX:

```
kipmi [-?] [-b] [<option>[ <parameter>]]
```

where:

-?	show online help (for kipmi or kipmi + option)
-b	display output page by page
	OPTIONS
fru	display FRU data
info	show information about the device and firmware
ipmb	IPMB bus settings
irq	get / set KCS IRQ
mode	set IPMI controller mode
net	display and change SOL network settings
sel	handle system event log
sensor	shows sensor related information
raw	execute raw IPMI command
rawsendmessage	execute rawSendMessage ipmi cmd
	PARAMETERS
	Most of the above options have their own unique set of parameters. Use the online help (“-?”) for more information concerning the available parameters.

DESCRIPTION: The **kipmi** command can read event logs or can set the Board Management Controller IRQ configuration. This shell application can also be used to issue raw IPMI commands to the Board Management Controller.

USAGE: Read or configure available Board Management Controller parameters:

COMMAND / RESPONSE:

```
Shell> kipmi -b fru 0
```

“kipmi fru” alone returns parameter info or status

Clear all sel entries

```
  kipmi sel clear
```

Display sel entry number 3 in hex

```
  kipmi sel raw 0x03
```

Execute raw command. Example: Get selftest results

```
  kipmi raw 0x06 0x00 0x04
```

kipmi

USAGE:	Change IRQ
	`kipmi irq 10`
	Show IRQ configuration
	`kipmi irq`

SETTINGS:	`fru [<FRU Device ID>]:` Displays FRU data Options: `FRU Device ID:` Numeric FRU Device ID. 0 is assumed if FRU Device ID is omitted. 0 is the baseboard's own FRU Device ID.
	`info:` Display IPMI firmware information
	`ipmb:` Displays IPMB bus settings `ipmb dual-ported:` Switch IPMB bus to dual-ported mode `ipmb single-ported:` Switch IPMB bus to single-ported mode
	`irq <number>:` Display/Set the IRQ number of the KCS interface Options: `0:` KCS uses no IRQ `10:` KCS uses IRQ 10 `11:` KCS uses IRQ 11 The board must be reset for the settings to apply.
	`mode <mode>:` Display/Set the IPMI controller operating mode Options: `bmc:` IPMI controller operates in BMC mode `smc:` IPMI controller operates in SMC mode
	`net:` Set Serial-over-LAN parameters
	`sel:` Display system event log
	`sensor list|read:` Show board sensor data Options: `list:` Display an overview of all available board sensors `read:` Display specific sensor data
	`raw [<bytes> <...>]:` Execute raw IPMI command Syntax: `raw [NetFn] [LUN] [COMMAND] ...`
	Execute rawSendMessage command: COMMAND / RESPONSE: `Shell> kipmi rawsendmessage 0x20 0x00 0x06 0x00 0x01` “kipmi rawsendmessage” alone returns error message and help on available parameters

7.2.9 kmkramdisk uEFI Shell Command

kmkramdisk

FUNCTION: Create RAMdisk drives

SYNTAX:

```
kmkramdisk [-?|-s <size> <name>]
```

where:

-? show help

-s <size> <name> create a RAMdisk of given size in Megabytes with the mount point name <name>

DESCRIPTION: Creates a RAMdisk of variable size. Can be very useful to perform file operations when no real filesystem is connected to the system.

Note: The RAMdisk loses its mount point name after all drives are remapped by the **map -r** command. The RAMdisk will then be enumerated as any other connected drive and gain a mount point name like “fs0”. This is not a bug of the **kmkramdisk** command but a normal function of the uEFI framework.

USAGE: Create RAMdisk:

COMMAND / RESPONSE:

```
rd:\> kmkramdisk -s 5 myramdisk
Device mapping table
  myramdisk :BlockDevice - Alias (null)
      VenMsg’(93B5F448-127A-4B29-B306-
          5BE8AAC4826E)
Success - Force file system to mount
rd:\> myramdisk:
myramdisk:\> echo testfile > testfile
myramdisk:\> ls
Directory of: myramdisk:\

 05/24/08 04:39a      22 testfile
    1 File(s)         22 bytes
    0 Dir(s)
```

7.2.10 kpassword uEFI Shell Command

kpassword

FUNCTION:	Control EFI setup and shell passwords

SYNTAX:	`kpassword [[-u [-n <password>] [-o <password>]]│`
	`[-s [-n <password>] [-o <password>]]]`
	where:
	-u Install or change user password
	-s Install or change superuser password
	Additional options for automated scripting
	-n <password> New password to be set
	-o <password> Password to be overwritten if one is already set
	When used without option “-n” the password is cleared

DESCRIPTION:	The **kpassword** command is used to determine the status of both passwords (set or not set) and to set or clear the EFI shell and setup passwords. Both user and superuser (Administrator) passwords can be controlled with this command. Call without options to get current password status If a password has been previously entered, it must be re-entered to validate the command (-o <*old-password*>). Entering an empty password clears the password. Note: Before invoking this command, users must be aware of the consequences of the usage of passwords. Refer to chapter 5 for further information **before** implementing passwords.

USAGE:	Set User password for EFI setup and shell
	COMMAND / RESPONSE:
	`kpassword -u`
	`No password is installed!`
	`Enter new USER password`
	`-->`
	`Retype password`
	`-->`
	`Done.`

	Set new superuser password via script COMMAND / RESPONSE: `kpassword -s -n <password>`
	Change user password via script COMMAND / RESPONSE: `kpassword -u -o <password> -n <password>`

7.2.11 kresetconfig uEFI Shell Command

kresetconfig

FUNCTION:	Control the board reset behavior
SYNTAX:	`kresetconfig [-?|<parameter>]` where: -? Show help <parameter> pcislave [on|off] Controls if the board shall react on a PCI backplane reset if it is used as slave board in a peripheral slot. It has no effect if the board is located within a PCI master slot. Note: This parameter is volatile, and at the next startup it is set to off.
DESCRIPTION:	The **kresetconfig** command controls the board's reset behavior.

USAGE:	Enable PCI backplane reset:
	COMMAND / RESPONSE:
	`Shell> kresetconfig pcislave on`
	`Reset from system master is enabled`

	Disable PCI backplane reset:
	COMMAND / RESPONSE:
	`Shell> kresetconfig pcislave off`
	`Reset from system master is disabled`

7.2.12 kSettings uEFI Shell Command

kSettings

FUNCTION: Verify the validity of the setup settings

SYNTAX:

```
kSettings [-?|-s|-c] [<file>]
```

where:

-?	show help
-s	Save current setup settings to “file”
-c	Compare current setup settings to “file”
<file>	“file” to be used for saving or comparison

DESCRIPTION: The **kSettings** command is used to create a binary file of the current setup settings. This file can later be used to check whether the settings have changed or not.

To use this command a device with a FAT file system is required to be connected.

Note that the command name “kSettings” is case sensitive.

USAGE: Save current setup settings

(assumes that FAT file system is mapped to fs0:)

COMMAND / RESPONSE

```
fs0:\> kSettings -s companyDefaults.bin
Reading flash content... done
Saving setup settings to file... done
```

Check whether current setup settings differ from “file”

COMMAND / RESPONSE

```
fs0:\> kSettings -c companyDefaults.bin
Reading flash content... done
Setup settings and file match
```

7.2.13 kwdt uEFI Shell Command

kwdt

FUNCTION: Configure the Kontron onboard Watchdog

SYNTAX:

```
kwdt [-?|-t <timeindex>]
```

where:

-?	Show help
-t <timeindex>	Configure the Watchdog with the time related to <timeindex> and activate it with reset routing

DESCRIPTION: The **kwdt** command allows to enable the Kontron onboard Watchdog with reset target before OS boot. This can be used to detect if the OS fails to boot and react by reset. The OS Watchdog driver is required for this functionality to operate.

USAGE: Get help:

COMMAND / RESPONSE:

```
Shell> kwdt -?
-t [time]     - set Timer
value 0    =  125ms
value 1    =  250ms
value 2    =  500ms
value 3    =  1s
value 4    =  2s
value 5    =  4s
value 6    =  8s
value 7    =  16s
value 8    =  32s
value 9    =  64s
value 10   =  128s
value 11   =  256s
value 12   =  512s
value 13   =  1024s
value 14   =  2048s
value 15   =  4096s
```

Set Watchdog to 16 seconds and activate it

COMMAND / RESPONSE (none):

```
Shell> kwdt -t 7
```

Note: Because there is no application which triggers the Watchdog, the system will be reset after 16 seconds in this case. This command should be invoked from a script, followed by an operating system boot, and the OS then has to start triggering the Watchdog.

7.3 uEFI Shell Scripting

7.3.1 Startup Scripting

If the ESC key is not pressed and the timeout is run out, either the Kontron flash-stored startup is executed, if present, or the uEFI specified `startup.nsh` script located under `\efi\boot\` on any of the attached drives is executed. If none of the startup scripts is present, or the startup script terminates, the default boot order is continued.

If the shell is started with no interaction, it tries to execute some startup scripts automatically. It searches for scripts in the following order:

1. Kontron flash-stored startup script

2. If there is no Kontron flash-stored startup script present, the uEFI specified `startup.nsh` script is used. This script must be located on any of the attached FAT formatted disk drives under `\efi\boot\startup.nsh.`

If both startup scripts are absent, the shell terminates and the default boot order is continued.

7.3.2 Create a Startup Script

Startup scripts can be created using the uEFI Shell built-in editor **edit** or under any OS with a plain text editor of your choice. To create a `startup.nsh` type shell script, simply save the script on any FAT-formatted drive attached to the system under `\efi\boot\startup.nsh.` To create a Kontron flash-stored startup script, the script is to be saved anywhere on a FAT-formatted drive attached to the system and stored to flash using the built-in uEFI Shell command **kbootnsh**.

7.3.3 Examples of Startup Scripts

7.3.3.1 Automatic Booting from USB Memory Stick

Automatic booting is made from a USB memory stick, if present, otherwise the boot is made from the harddrive.

```
kboot -t usb-harddrive

kboot -t harddrive
```

If neither a USB memory stick nor a harddrive is present, the boot order is continued.

7.3.3.2 Switch On Clock Spreading Prior to Booting from Harddrive

```
kclsp -e

kboot -t harddrive
```

If no harddrive is present, the default order is continued.

7.3.3.3 Execute Shell Script on Other Harddrive

This example executes the shell script named `bootme.nsh` located in the root of the first detected disc drive (`fs0`).

```
shell> fs0:

fs0:\> bootme.nsh
```

Chapter 8

Updating the uEFI BIOS

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8. Updating the uEFI BIOS

BIOS updates are typically delivered as an update CD ISO image. This ISO image needs just to be burned to a CD and booted. Follow the menu for updating the uEFI BIOS. For further information refer to the update CD documentation.

8.1 BIOS Redundancy Strategy

The CP6002 has two sets of EFI flash chips to form an EFI redundancy strategy. Basic idea behind that is to always have at least one working EFI available regardless if there have been any flashing errors or not.

8.2 Updating Strategy

To always maintain at least one EFI flash correct, the update CD uses the following update procedure:

1. Switch to the second flash.
   Since the update CD always changes the flash chip prior to doing any updates, the uEFI BIOS that was used to actually boot the board and is therefore known to be good is preserved for backup.
2. Update the second flash.
   This flash is now selected as active boot flash.

The update CD will not allow to flash both chips at a time. Flashing both chips would destroy the backup version and therefore break the redundancy.

If you want to have the same BIOS version on both flash chips, then simply run the update CD twice.

8.3 Fallback Mechanism

In case of one EFI being corrupted and therefore the board not starting up, the IPMI controller automatically switches to the other flash and resets the board. The board should now come up successfully from the other not corrupted image. The flashing procedure can now be restarted to restore the broken image.

8.4 Flash Selection by IPMI Command

Usually the active flash is selected by the IPMI controller. The flash bank can be switched via an IPMI OEM command. This command is used by the update CD. See the IPMI manual for further information.

8.5 Flash Selection by DIP Switch

On some cases it may be necessary to force the board to boot from the other flash without using the appropriate IPMI command to switch the flash chips. In this case, the onboard DIP switch SW1, switch 2, is used to toggle the active flash. Note that this switch does not “select” one flash chip. It toggles the currently active flash. Therefore, the IPMI controller will still switch the flashes by command or in case of the active flash is defective. Note that using this DIP switch does not change the way the update CD handles the update procedure. Refer to the CP6002 user guide for further information.

8.6 Determining the Active Flash

Sometimes it may be necessary to check which flash is active. On the AMI Aptio-based uEFI BIOS, the information is available using the EFI shell command “kboardinfo”. For further information, refer to the “kboardinfo” section in the uEFI Shell chapter of this document.