kontron

» User Guide «

CP3002 / CP3002-RC / CP3002-RA

uEFI BIOS

Doc. ID: 1042-8946, Rev. 4.0
April 19, 2016

If it’s embedded, it’s Kontron.

Revision History

Publication Title:	CP3002/-RC/-RA uEFI BIOS User Guide	
Doc. ID:	1042-8946	
Rev.	Brief Description of Changes	Date of Issue
1.0	Initial issue based on the uEFI BIOS version R10	8-Oct-2010
2.0	Added description for the CP3002 uEFI BIOS, update based on the uEFI BIOS version R13	8-Apr-2011
3.0	General update based on the uEFI BIOS version R13	28-Apr-2011
4.0	General update, changed information about TPM	19-Apr-2016

Imprint

Kontron Europe GmbH may be contacted via the following:

MAILING ADDRESS

Kontron Europe GmbH
Lise-Meitner-Straße 3-5
86156 Augsburg Germany

TELEPHONE AND E-MAIL

+49 (0) 800-SALESKONTRON
sales@kontron.com

For further information about other Kontron products, please visit our Internet web site: www.kontron.com.

Disclaimer

Copyright © 2016 Kontron AG. All rights reserved. All data is for information purposes only and not guaranteed for legal purposes. Information has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Kontron and the Kontron logo and all other trademarks or registered trademarks are the property of their respective owners and are recognized. Specifications are subject to change without notice.

Table of Contents

Chapter 1

Starting uEFI BIOS Setup

This page has been intentionally left blank.

1. Starting uEFI BIOS Setup

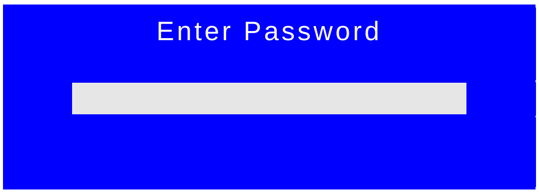
The CP3002/CP3002-RC/CP3002-RA is provided with a Kontron-customized, pre-installed and configured version of Aptio® (referred to as uEFI BIOS in this manual), AMI's next generation BIOS firmware based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI. This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the CP3002/CP3002-RC/CP3002-RA. This user guide reflects the uEFI BIOS version R13.

To take advantage of these functions, the uEFI BIOS comes with a Setup program which provides quick and easy access to the individual function settings for control or modification of the uEFI BIOS configuration.

The Setup program allows the accessing of various menus which 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 <F2> key.
4. If the uEFI BIOS is password-protected, a window such as the one below will appear:



   Enter either the User password or the Administrator password (refer to Chapter 4, Security Setup, for further information), press <RETURN>, and proceed with step 2.

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.

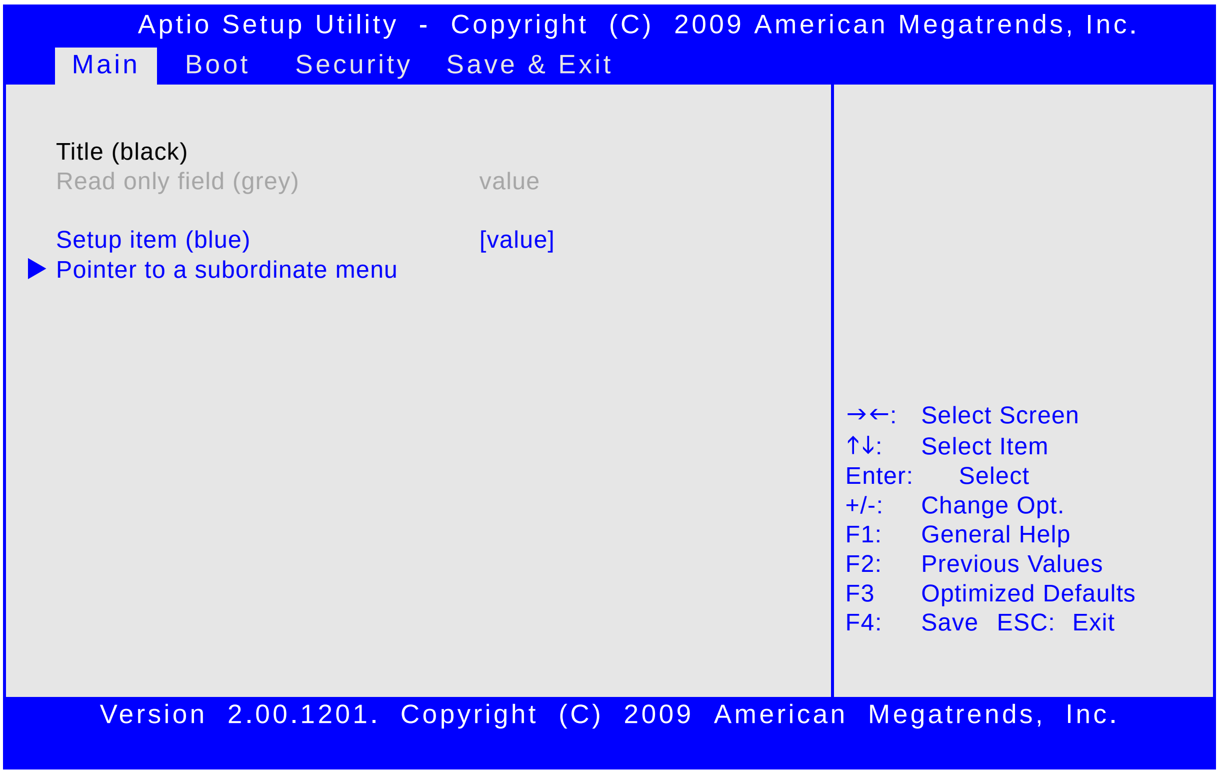
1.1 Main Setup Menu

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)  2009 American Megatrends, Inc.
    Main    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

      Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

1.2 Navigation

The CP3002/CP3002-RC/CP3002-RA 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 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, Advanced Screen, Chipset 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.

This page has been intentionally left blank.

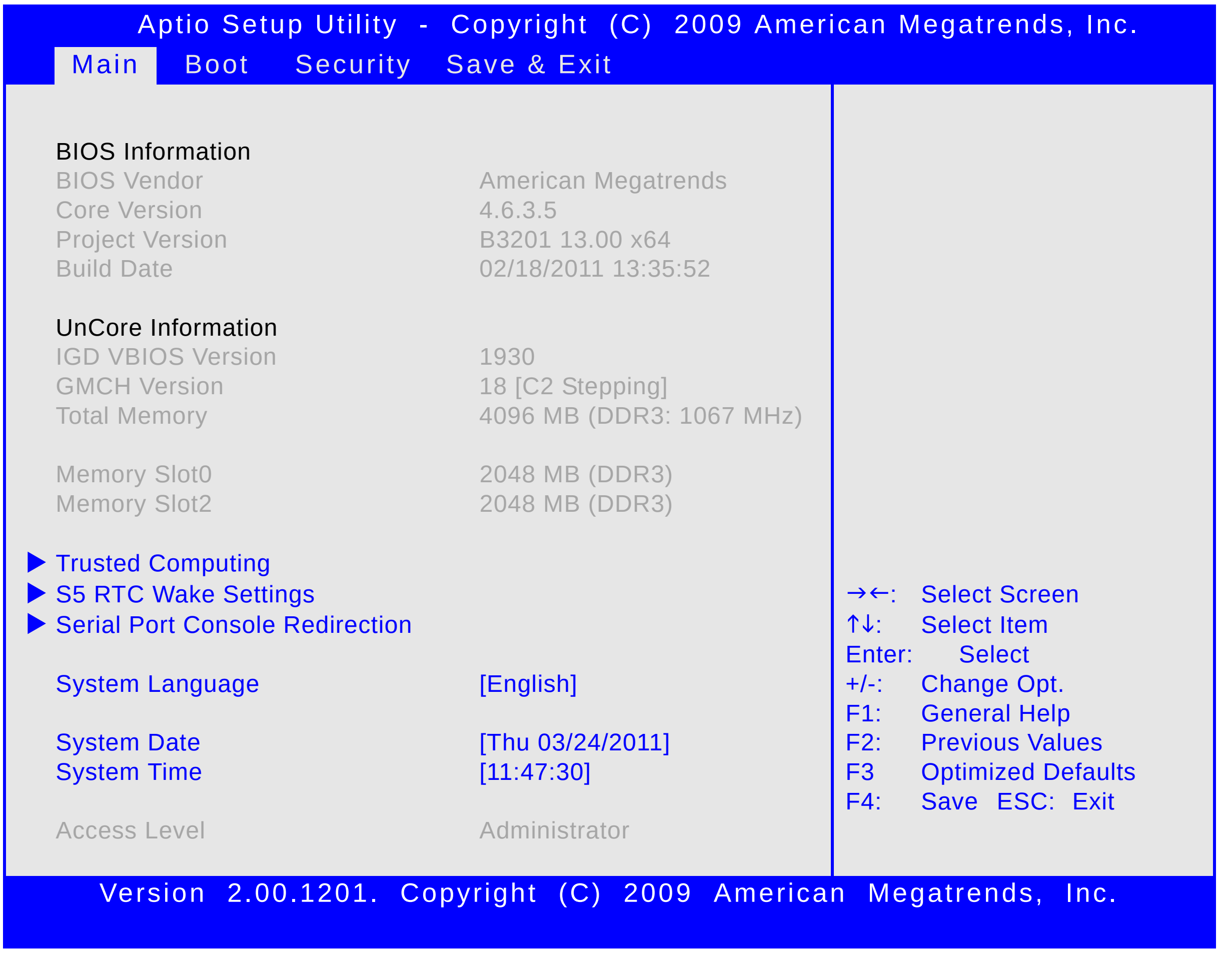
Chapter 2

Main Setup

This page has been intentionally left blank.

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)  2009 American Megatrends, Inc.
   Main    Boot    Security   Save & Exit

   BIOS Information
   BIOS Vendor                    American Megatrends
   Core Version                   4.6.3.5
   Project Version                B3201 13.00 x64
   Build Date                     02/18/2011 13:35:52

   UnCore Information
   IGD VBIOS Version              1930
   GMCH Version                   18 [C2 Stepping]
   Total Memory                   4096 MB (DDR3: 1067 MHz)

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

 ▶ Trusted Computing
 ▶ S5 RTC Wake Settings                                       →←:   Select Screen
 ▶ Serial Port Console Redirection                            ↑↓:   Select Item
                                                              Enter:    Select
   System Language                [English]                   +/-:  Change Opt.
                                                              F1:   General Help
   System Date                    [Thu 03/24/2011]            F2:   Previous Values
   System Time                    [11:47:30]                  F3    Optimized Defaults
                                                              F4:   Save  ESC:  Exit
   Access Level                   Administrator

     Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

2.1 BIOS Information

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

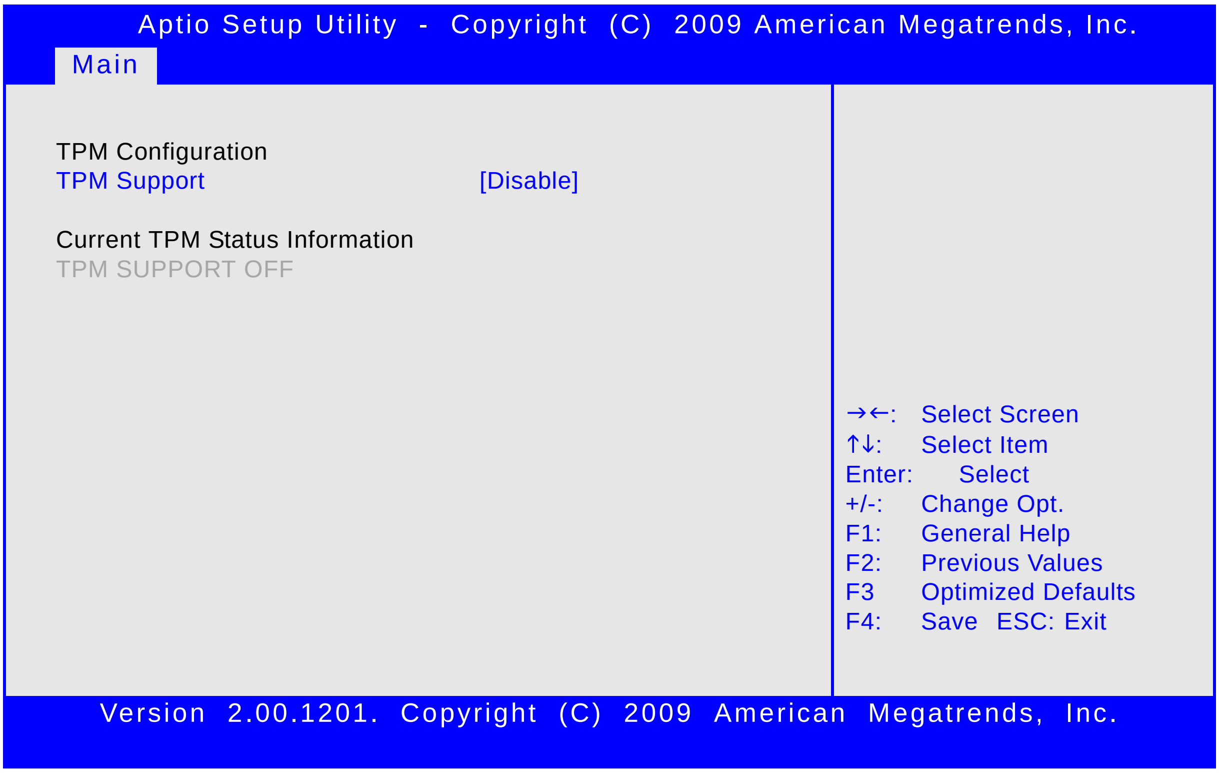
Information about the running uEFI BIOS version is reflected in the display-only function Project Version (parameter “13.00” indicates Rev. 13).

2.2 UnCore Information

This function provides display-only information concerning the NorthBridge (GMCH die of the Intel® Core™ i7 processor) features 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)  2009 American Megatrends, Inc.
   Main

   TPM Configuration
   TPM Support                        [Disable]

   Current TPM Status Information
   TPM SUPPORT OFF

                                                          →←:    Select Screen
                                                          ↑↓:    Select Item
                                                          Enter:    Select
                                                          +/-:   Change Opt.
                                                          F1:    General Help
                                                          F2:    Previous Values
                                                          F3     Optimized Defaults
                                                          F4:    Save  ESC: Exit
        Version  2.00.1201.  Copyright  (C)  2009  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.

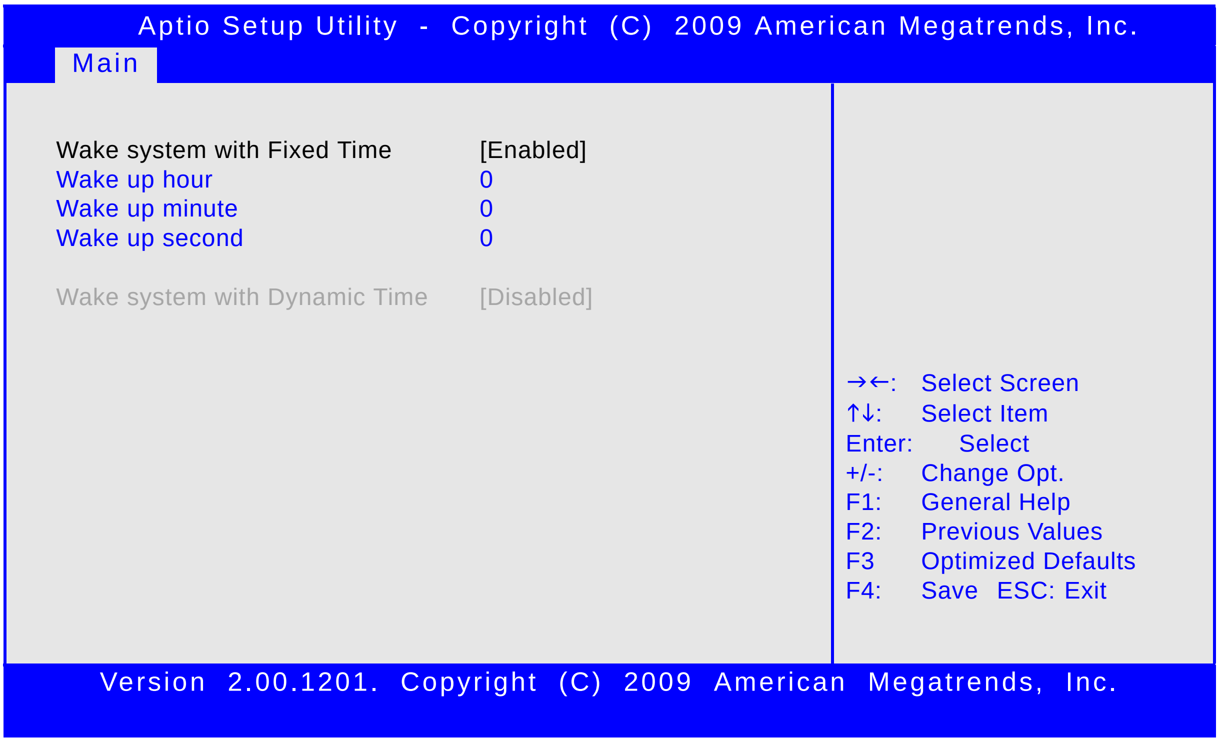
Note: On the CP3002, Trusted Platform Module support is available on request.

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: Disable

2.4 S5 RTC Wake Settings

This screen provides functions for specifying the S5 RTC Wake Settings.



```
        Aptio Setup Utility  -  Copyright  (C)  2009 American Megatrends, Inc.
   Main

 Wake system with Fixed Time       [Enabled]
 Wake up hour                      0
 Wake up minute                    0
 Wake up second                    0

 Wake system with Dynamic Time     [Disabled]

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

      Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

2.4.1 S5 RTC Wake Settings

This function defines the RTC wake-up settings to allow the system to wake up from the S5 (soft off) state.

2.4.2 Wake System with Fixed Time

This function allows the system to wake up from S5 state at a specified time.

SETTING	DESCRIPTION
Disabled	Use this setting to disable Wake System with Fixed Time.
Enabled	Use this setting to enable Wake System with Fixed Time.

Default setting: Disabled

2.4.2.1 Wake-Up Hour, Wake-Up Minute, Wake-Up Second

This function is used to specify the hour (0-23), the minute (0-59) and the second (0-59) when the system is to wake up from S5 state.

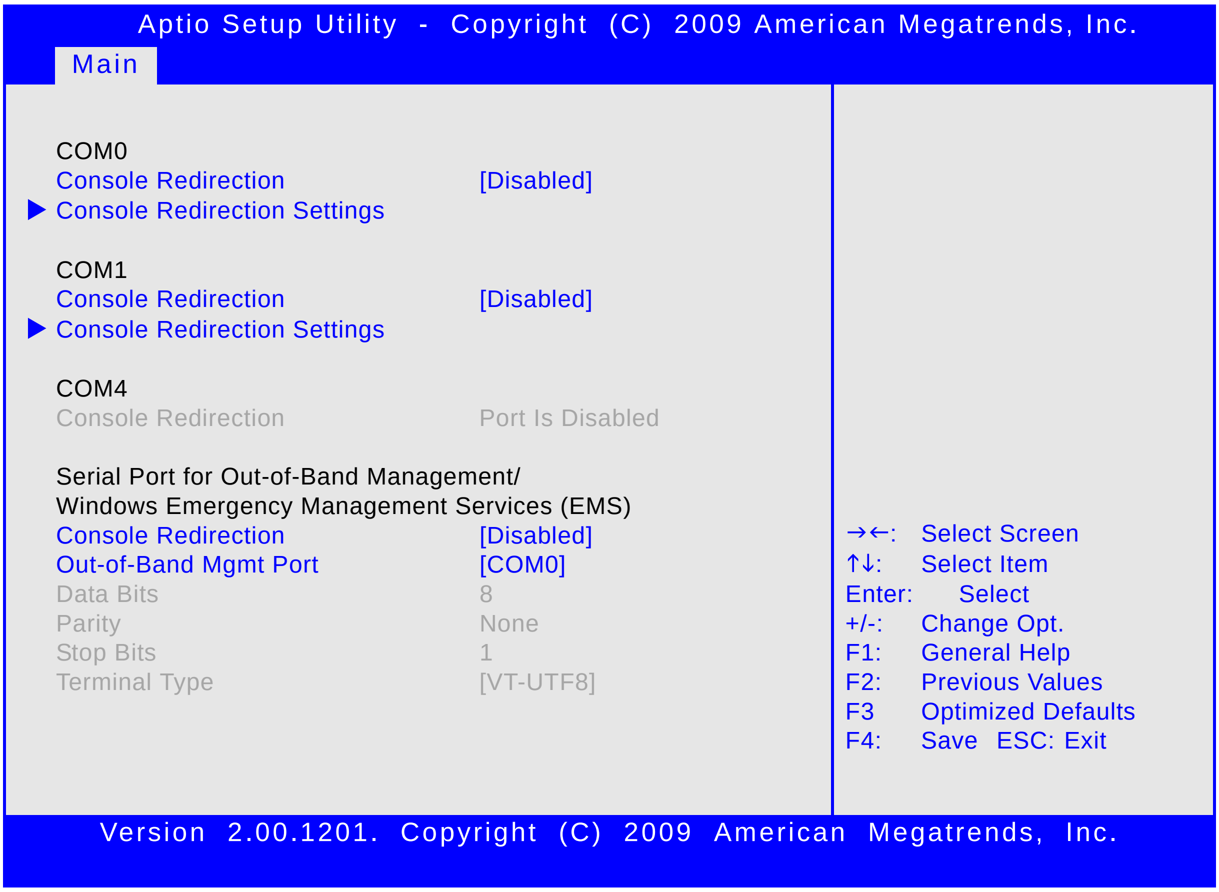
Note: This function is available only when the function “Wake System with Fixed Time” is set to Enabled.

2.4.3 Wake System with Dynamic Time

This function is intended for debugging purposes only and is therefore locked.

2.5 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)  2009 American Megatrends, Inc.
  Main

  COM0
  Console Redirection                  [Disabled]
▶ Console Redirection Settings

  COM1
  Console Redirection                  [Disabled]
▶ Console Redirection Settings

  COM4
  Console Redirection                  Port Is Disabled

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)
  Console Redirection                  [Disabled]         →←:    Select Screen
  Out-of-Band Mgmt Port                [COM0]             ↑↓:    Select Item
  Data Bits                            8                  Enter:    Select
  Parity                               None               +/-:   Change Opt.
  Stop Bits                            1                  F1:    General Help
  Terminal Type                        [VT-UTF8]          F2:    Previous Values
                                                          F3     Optimized Defaults
                                                          F4:    Save  ESC: Exit

     Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

2.5.1 COM0

On the CP3002 the COM0 port corresponds to the COMA port (RS-232) and is available either on the 8HP extension module or on the rear I/O.

On the CP3002-RA/-RC the COM0 port corresponds to the COMA port (RS-232) and is available only on the rear I/O.

2.5.1.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for COM A (RS-232).
Enabled	Use this setting to enable console redirection for COM A (RS-232).

Default setting: Disabled

2.5.1.2 Console Redirection Settings

For information about this function, refer to Chapter 2.5.5 in this manual.

2.5.2 COM1

The COM1 port corresponds to the COMB port (RS-422/RS-232) and is available on the rear I/O.

2.5.2.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for COM B (RS-422/RS-232).
Enabled	Use this setting to enable console redirection for COM B (RS-422/RS-232).

Default setting: Disabled

2.5.2.2 Console Redirection Settings

For information about this function, refer to Chapter 2.5.5 in this manual.

2.5.3 COM4

On the CP3002/CP3002-RC/CP3002-RA, the COM4 port is not available and is therefore disabled.

2.5.4 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.

2.5.4.1 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

2.5.4.2 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.
COM4	Use this setting to specify that a PCIe serial port is to be used with Out-of-Band Management.

Default setting: COM0

2.5.4.3 Data Bits

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

2.5.4.4 Parity

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

2.5.4.5 Stop Bits

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

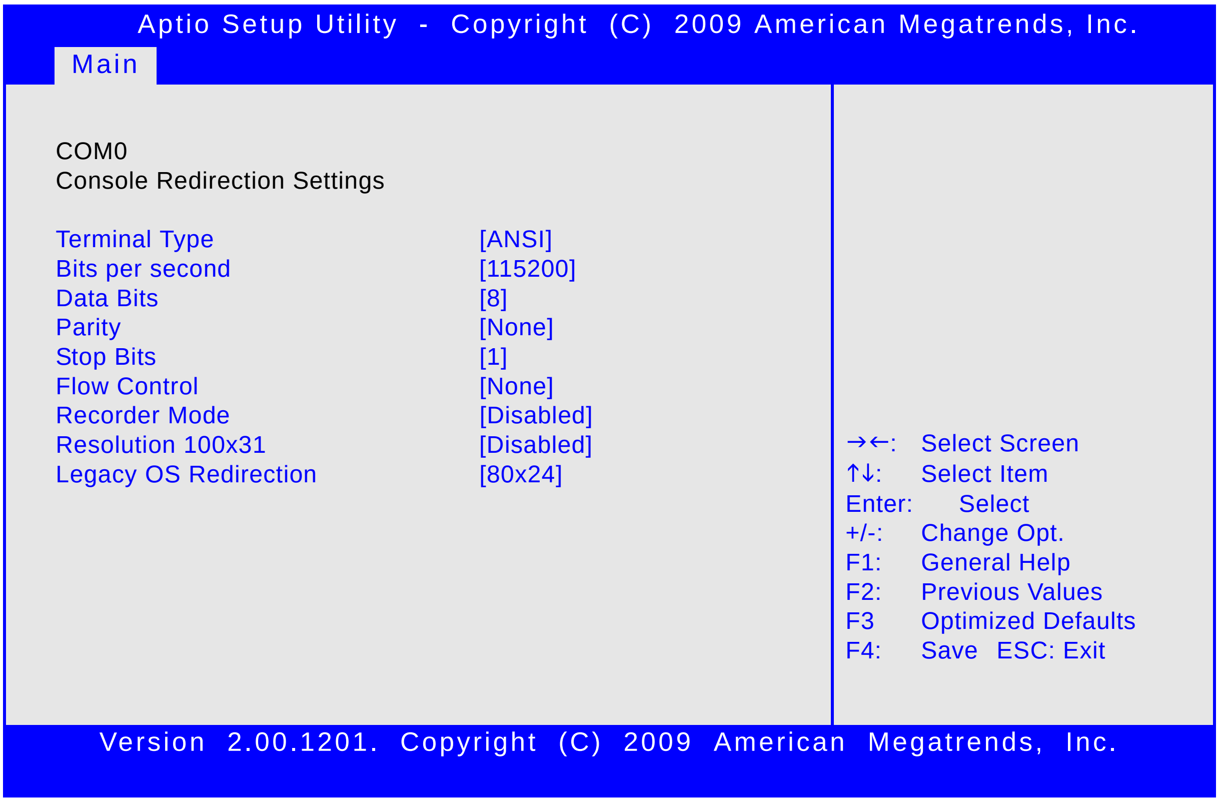
2.5.4.6 Terminal Type

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

2.5.5 Console Redirection Settings

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



```
        Aptio Setup Utility  -  Copyright  (C)  2009 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]      →←:    Select Screen
   Legacy OS Redirection           [80x24]         ↑↓:    Select Item
                                                   Enter:   Select
                                                   +/-:   Change Opt.
                                                   F1:    General Help
                                                   F2:    Previous Values
                                                   F3     Optimized Defaults
                                                   F4:    Save  ESC: Exit

     Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

2.5.5.1 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

2.5.5.2 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

2.5.5.3 Data Bits

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

Default setting: 8

2.5.5.4 Parity

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

Default setting: None

2.5.5.5 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

2.5.5.6 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

2.5.5.7 Recorder Mode

SETTING	DESCRIPTION
Disabled	Use this setting the disable Recorder Mode.
Enabled	Use this setting to enable Recorder Mode. When this setting is used, all control escape sequences are suppressed from the serial redirection output. This may lead to a misformatted screen output but makes automatic storage of the serial console output easier.

Default setting: Disabled

2.5.5.8 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

2.5.5.9 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

2.6 System Language

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

2.7 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 or press +/- to increment/decrement values. Use “Tab” to switch between date elements.

2.8 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 or press +/- to increment/decrement values. 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.

2.9 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.

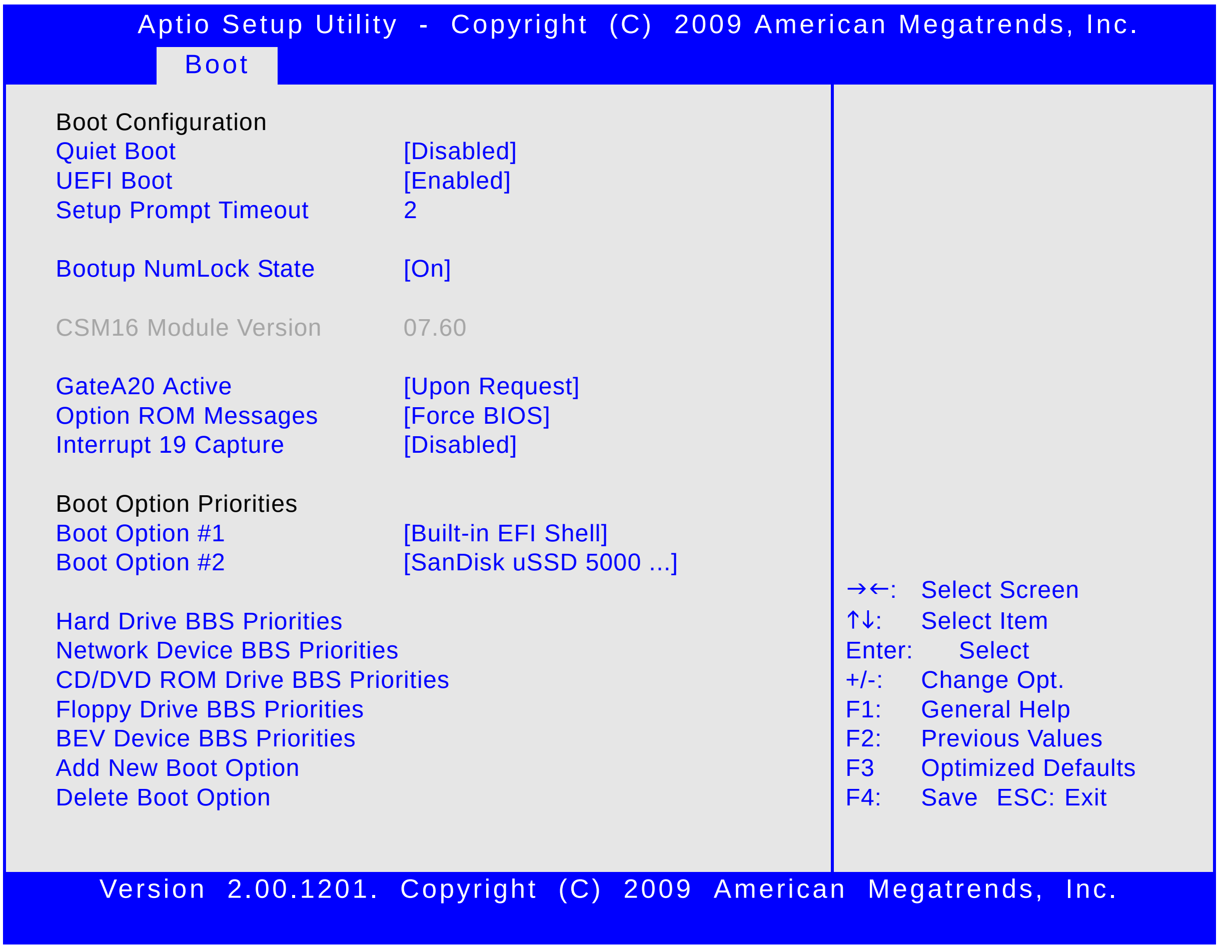
Chapter 3

Boot Setup

This page has been intentionally left blank.

3. 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)  2009 American Megatrends, Inc.
            Boot

  Boot Configuration
  Quiet Boot                   [Disabled]
  UEFI Boot                    [Enabled]
  Setup Prompt Timeout         2

  Bootup NumLock State         [On]

  CSM16 Module Version         07.60

  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
  Hard Drive BBS Priorities                               ↑↓:    Select Item
  Network Device BBS Priorities                           Enter:    Select
  CD/DVD ROM Drive BBS Priorities                         +/-:   Change Opt.
  Floppy Drive BBS Priorities                             F1:    General Help
  BEV Device BBS Priorities                               F2:    Previous Values
  Add New Boot Option                                     F3     Optimized Defaults
  Delete Boot Option                                      F4:    Save   ESC: Exit

      Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

3.1 Boot Configuration

3.1.1 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

3.1.2 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-aware operating systems from disks.
Enabled	Use this setting to enable booting of native uEFI-aware operating systems from disks, if present, and in boot order.

Default setting: Enabled

3.1.3 Setup Prompt Timeout

This integer function is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

SETTING	DESCRIPTION
1 : 65535	Use one of these settings to specify the setup prompt timeout.

Default setting: 2

3.1.4 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: On

3.1.5 CSM16 Module Version

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

3.1.6 GateA20 Active

This function is used to enable or disable GateA20.

SETTING	DESCRIPTION
Upon Request	Use this setting to disable GateA20 in the uEFI BIOS.
Always	Use this setting to prevent the system from disabling GateA20.

Default setting: Upon Request

3.1.7 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 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

3.1.8 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

3.2 Boot Option Priorities

3.2.1 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.

3.2.2 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 visible only if at least one device for this class is present. These functions are dynamically generated.

3.2.3 Add New Boot Option

This function is used to create a native uEFI boot option and is visible only if at least one appropriate native boot device is present. Please refer to the documentation for the respective native uEFI-aware operating system for further information about creating a boot option.

3.2.4 Delete Boot Option

This function is used to delete a native uEFI boot option. Refer to the user manual for the respective native uEFI-aware operating system further information about deleting a 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.

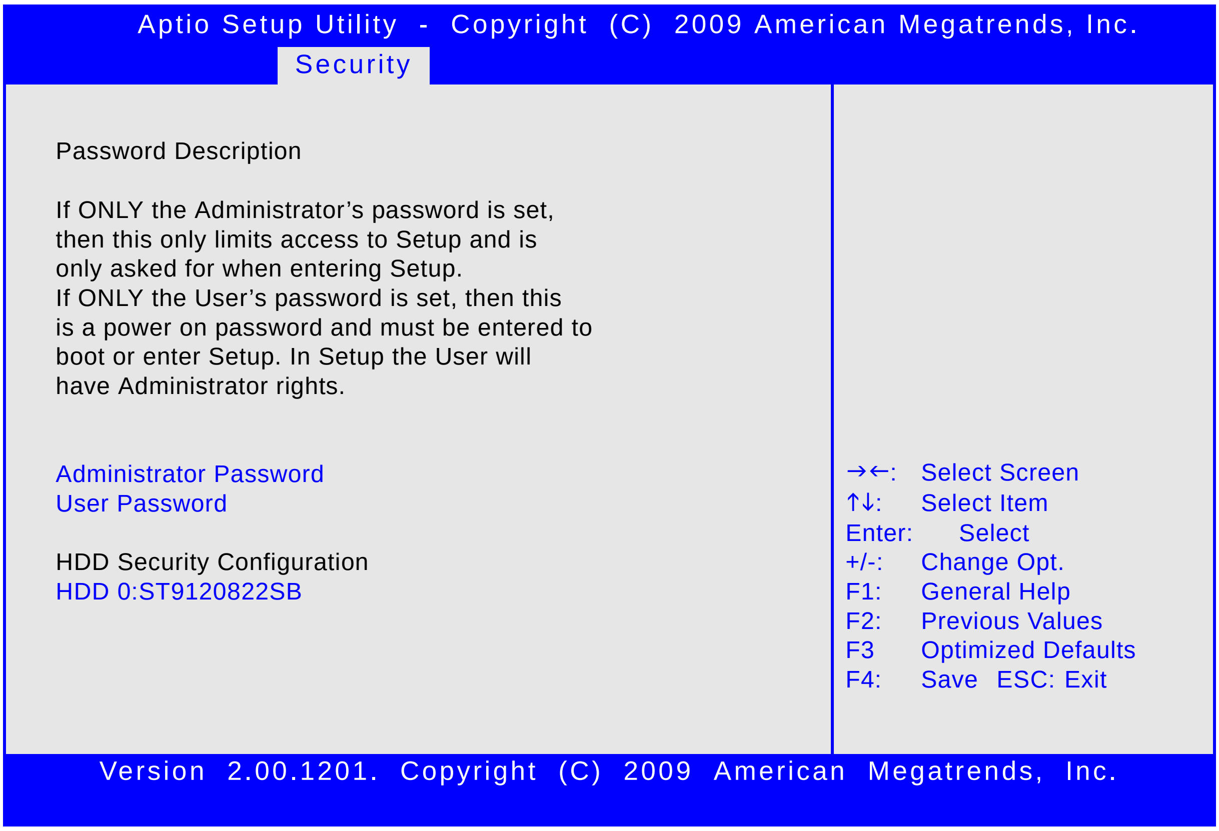
Chapter 4

Security Setup

This page has been intentionally left blank.

4. 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) 2009 American Megatrends, Inc.
                    Security

   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.


   Administrator Password                          →←:   Select Screen
   User Password                                   ↑↓:   Select Item
                                                   Enter:   Select
   HDD Security Configuration                      +/-:  Change Opt.
   HDD 0:ST9120822SB                               F1:   General Help
                                                   F2:   Previous Values
                                                   F3    Optimized Defaults
                                                   F4:   Save  ESC: Exit

      Version 2.00.1201. Copyright (C) 2009 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. If no valid Administrator password is entered, only limited access to Setup is provided.
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 is unsecured. For entering the Setup, a password is required. If the User password is entered here, limited access to the Setup is granted. Entering the Administrator password provides full access to all Setup entries.

Note: The CP3002/CP3002-RC/CP3002-RA provides no factory-set passwords.

4.1 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.

4.2 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.

4.3 HDD Security Configuration

This function is not fully supported on the CP3002/CP3002-RC/CP3002-RA.

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

4.4 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. Booting may not be possible, and in worst case the uEFI BIOS Setup program will also not be accessible.

If the system cannot be booted because neither the User password nor the Administrator password are known, refer to the respective section providing information about clearing the uEFI BIOS settings (CP3002 User Guide, Chapter 4.1, DIP Switch Configuration and CP3002-RC/ CP3002-RA User Guide, Chapter 4.1.2, uEFI BIOS Configuration Jumper Settings (JP3 and JP4) or contact Kontron for further assistance.

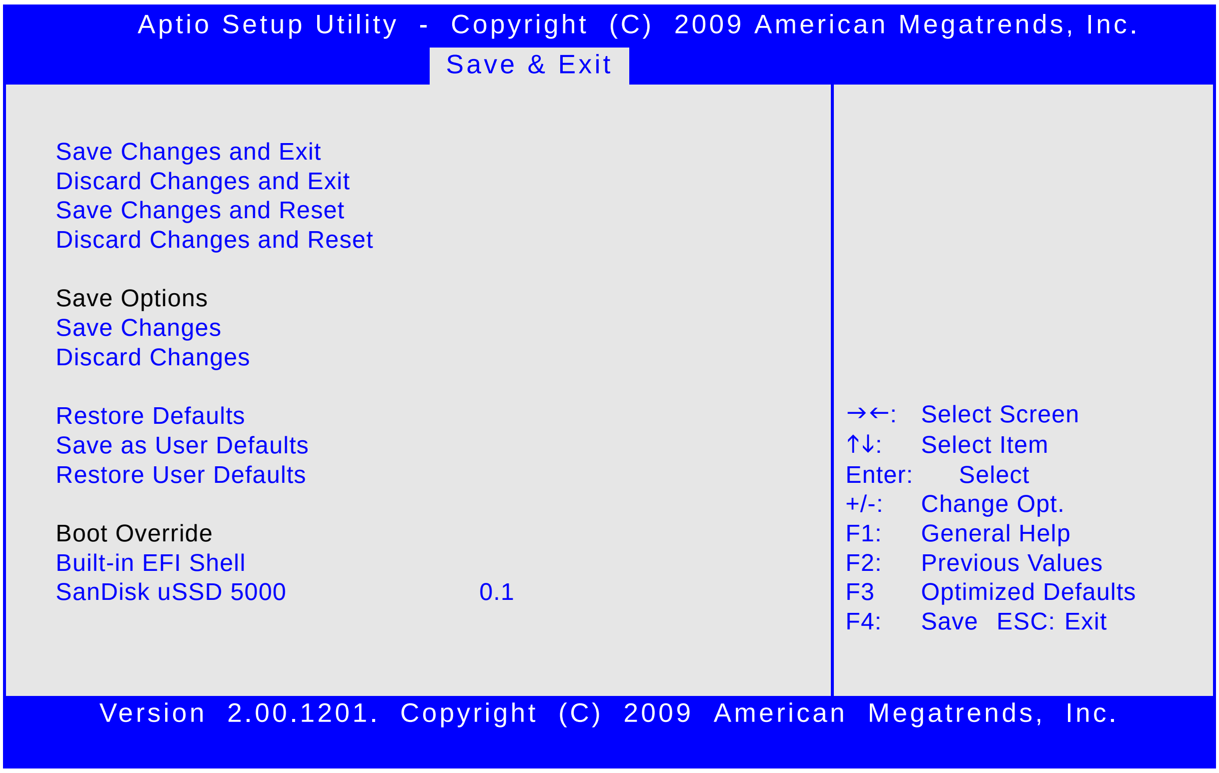
Chapter 5

Save & Exit

This page has been intentionally left blank.

5. 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) 2009 American Megatrends, Inc.
                               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 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.
```

5.1 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.

5.2 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.

5.3 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.

5.4 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.

5.5 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.

5.6 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.

5.7 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.

5.8 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.

5.9 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.

5.10 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 6

The uEFI Shell

This page has been intentionally left blank.

6. 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 homepage (https://efi-shell.tianocore.org) under the “Documents and Files” section.

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

6.1 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.

6.1.1 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>
```

6.2 Kontron Shell Commands

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

- **kboardconfig**
- **kboardinfo**
- **kboot**
- **kbootnsh**
- **kclearnvram**
- **kclsp**
- **kflash**
- **kmkramdisk**
- **kpassword**
- **kwdt**

The following tables provide information concerning these Kontron-specific commands. Where “RESPONSE” information is provided in “USAGE”, the value indicated in brackets is the currently selected setting. Where “SETTINGS” information is provided, the value indicated in brackets is the default setting. The uEFI Shell commands are case-sensitive.

6.2.1 kboardconfig uEFI Shell Command

kboardconfig

FUNCTION: Configure 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 is used to configure non-volatile board settings.

USAGE: Show all possible configurations

COMMAND / RESPONSE:

```
Shell> kboardconfig
Control nonvolatile board settings
Example: kboardconfig
pxe: Select PXE boot network adapter ([disabled] all eth_a eth_b
eth_c eth_d)
StorageOrom: Launch Storage PCI OpROM (disabled [enabled])
HyperThreading: Enable Hyper Threading technology (disabled
[enabled])
CpuTurbo: Enable CPU turbo mode technology (disabled [enabled]
CpuC: Enable C states when the CPU is not 100% utilized (disabled
[enabled])
PrimaryDisplay: Select primary display device ([auto] igd peg pci)
SataMode: Determines how SATA controller(s) operate ([ide] ahci
raid)
com_a: Com A port configuration ([rear] extension)
com_b: Com B port configuration (rs232 [rs422])
gbe_a: GbE A port configuration ([front] rear)
gbe_b: GbE B port configuration ([front] rear)
vga: VGA port configuration (auto [front] rear disabled)
wr_prot_eeprom: System EEprom write protection ([disabled]
enabled)
wr_prot_sata: Onboard Sata flash write protection ([disabled]
enabled)
wr_prot_spi: EFI spi flash write protection ([disabled] enabled)
```

Note: not all options are available on all variants.

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

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

kboardconfig (continued)

SETTINGS:	`pxe:` Select PXE boot network adapter `disabled:` No PXE boot available `[all]:` Try all Ethernet devices round robin for PXE boot `eth_a:` Try only Ethernet port A for PXE boot `eth_b:` Try only Ethernet port B for PXE boot `eth_c:` Try only Ethernet port C for PXE boot (CP3002-RC/-RA only) `eth_d:` Try only Ethernet port D for PXE boot (CP3002-RC/-RA only) Note: On the CP3002, both `eth_a` and `eth_b` ports are available either on the front or the rear I/O. On the CP3002-RC/-RA, all Ethernet ports are available only on the rear I/O.
	`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
	`CpuTurbo:` Enable/Disable CPU Turbo Boost Technology
	`CpuC:` Enable/Disable C states when the CPU is not 100% utilized
	`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 bus first
	`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
	`com_a:` COM A port configuration `[rear]:` `com_a` port signal is routed to the rear I/O `extension:` `com_a` port signal is routed to the 8HP extension module Note: This option has no effect if no rear I/O is attached to the CP3002. On the CP3002-RA/-RC this option is not present as the `com_a` port signal is fixed to rear I/O.

kboardconfig (continued)

	com_b: COM B port configuration **rs232: com_b** port signal level follows the RS-232 standard **[rs422]: com_b** port signal level follows the RS-422 standard Note: The serial port COM B is available only on the rear I/O. This option is present only on the CP3002-RC/-RA as the **com_b** port signal is fixed to RS-232 on the CP3002.
	gbe_a: GbE A port configuration **[front]: gbe_a** port signal is routed to the front connector **rear: gbe_a** port signal is routed to the rear I/O Note: This option is not present on the CP3002-RC/CP3002-RA.
	gbe_b: GbE B port configuration **[front]: gbe_b** port signal is routed to the front connector **rear: gbe_b** port signal is routed to the rear I/O Note: This option is not present on the CP3002-RC/CP3002-RA.
	vga: VGA port configuration **auto: vga** port signals are routed either to the front connector or to the rear I/O **[front]: vga** port signals are routed to the front connector **rear: vga** port signals are routed to the rear I/O **disabled: vga** port disabled (**vga** port signals not routed) Note: “Auto” operation may fail if the monitor cable in use does not correctly follow the VESA standard. For further information, refer to the CP3002 User Guide, Chapter “VGA Analog Interface and Connector J6”. Note: This option is not present on the CP3002-RC/CP3002-RA as the **vga** port signals are fixed to rear I/O.
	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_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. OS needs to be prepared to work with write-protected flash. For further information, refer to the operating system’s documentation.
	wr_prot_spi: uEFI SPI flash write protection **[disabled]:** Do not write protect the uEFI SPI flash **enabled:** The uEFI SPI flash is write-protected after POST

6.2.2 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.
USAGE:	Show board identification data COMMAND / RESPONSE:

```
Shell> kboardinfo
KOMaOEMF rev.:       3
Board ID:            0xB320
Hardware rev.:       0x0
Logic rev.:          0x1
Boot flash:          Boot flash 0
In system slot:      Yes
Geographic address:  8
Material number:
Hardware index:
Serial number:
EFI article name:    SK-EFI-B3201
EFI material number: 1039-2704
EFI index:           13, standard
EFI build time:      13:35:52
EFI build date:      02/18/2011
NorthBridge rev.:    0x18
SouthBridge rev.:    0x6
Microcode:           0x2
CPU ID:              0x20655
CPU Branding:        Intel(R) Core(TM) i7 CPU
                     L 620 @ 2.0GHz
RIO Module:          001
```

kboardinfo (continued)

USAGE:	KOMaOEMF rev.:	Revision of KOMaOEMF protocol
	Board ID:	Kontron board identification value (should be 0xB320 for the CP3002 and 0xB330 for the CP3002-RC/CP3002-RA)
	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:	Indicates that the board is installed in the system slot
	Geographic Address:	Geographic address of the 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:	Type of attached RIO module

6.2.3 kboot uEFI Shell Command

kboot

<table>
<tr><td><b>FUNCTION:</b></td><td>Boot a legacy OS
Not to be used for uEFI BootLoaders!</td></tr>
<tr><td><b>SYNTAX:</b></td><td><code>kboot [-?|-d|-p|-p &lt;path&gt;|-n &lt;name&gt;|-t &lt;type&gt;]</code>
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</td></tr>
<tr><td><b>DESCRIPTION:</b></td><td>The <b>kboot</b> 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 <b>kboot</b> command cannot boot native uEFI-aware 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.</td></tr>
</table>

kboot (continued)

USAGE:

Show all connected devices:

COMMAND / RESPONSE:

```
fs0:\> kboot
____BBS_TABLE____
00002 network “IBA GE Slot 0100 v1300”
00003 network “IBA GE Slot 0101 v1300”
00004 network “IBA GE Slot 0200 v1300”
00005 network “IBA GE Slot 0201 v1300”
00002 usb-harddrive “SanDisk uSSD 5000 0.1”
Device path: Acpi(PNP0A03,0)/Pci(1A|7)/Usb(1,0)
0001 usb-harddrive “KingstonDataTraveler 2.04.10”
Device path: Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1,0)
```

Boot from device containing the string “Kingston”:

```
fs0:\> kboot -n Kingston
```

Boot from the first device found that is of type floppy:

```
fs0:\> kboot -t floppy
```

6.2.4 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 executes a **kboot -d** command to 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 COMMAND / RESPONSE: `Shell> kbootnsh -g boot.nsh`
	Store file named boot.nsh to flash: COMMAND / RESPONSE: `Shell> kbootnsh -p boot.nsh`
	Delete startup script: COMMAND / RESPONSE: `Shell> kbootnsh -d`

6.2.5 kclearnvram uEFI Shell Command

kclearnvram

FUNCTION:	Clear the NVRAM to restore the system’s default settings
SYNTAX:	**`kclearnvram`** No parameters required. For safety reasons this command must be confirmed by pressing “c”.
DESCRIPTION:	The **kclearnvram** command allows to clear the system NVRAM. Since all EFI settings are stored inside the NVRAM, the default settings are loaded afterwards.

6.2.6 kclsp uEFI Shell Command

kclsp

FUNCTION:	Configure clock spreading
SYNTAX:	**`kclsp [-?│-d│-e]`** where: -? show help -d disable clock spreading -e enable clock spreading
DESCRIPTION:	The **kclsp** command enables or disables clock spreading on the onboard core clock generator. Clock spreading can be used to reduce system EMI.

USAGE:	Get help:
	COMMAND / RESPONSE:
	`Shell> kclsp -?`
	
	`Kontron Clock Spreading Configuration for ICS9LPRS365`
	`-d disable clock spreading`
	`-e enable clock spreading`
	Default setting: disable

6.2.7 kflash uEFI Shell Command

kflash

<table>
<tr><th>FUNCTION:</th><td>Manage uEFI BIOS update</td></tr>
<tr><th>SYNTAX:</th><td><code>kflash [-p|-i|-v|-s|-c|-h|-?] [-f] [-r] [file]</code>
Operation mode:
-p Program flash
-i Show information string and check CRC
-v Verify flashed image
-s Save current ROM image to file
-c Clone flash content to second flash
-h Show this help
-? Show online help
file uEFI BIOS binary file
Options:
-f Force write
Expert options: Not recommended for standard use
-r Raw image mode (.bin, .rom)</td></tr>
<tr><th>DESCRIPTION:</th><td>The <b>kflash</b> command is used to program and verify the flash banks holding the uEFI BIOS code. uEFI BIOS binary files must be available from connected mass storage devices, such as USB flash drive or harddisk.</td></tr>
<tr><th rowspan="4">USAGE:</th><td>Get help:
COMMAND / RESPONSE:
<code>Shell> kflash -?</code></td></tr>
<tr><td>Get help:
COMMAND / RESPONSE:
<code>Shell> kflash -h</code></td></tr>
<tr><td>Program uEFI BIOS into primary flash bank:
COMMAND / RESPONSE:
<code>Shell> kflash -p BIOS_file.kfl</code></td></tr>
<tr><td>Copy uEFI BIOS into secondary flash bank:
COMMAND / RESPONSE:
<code>Shell> kflash -c</code></td></tr>
</table>

6.2.8 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)
```

6.2.9 kpassword uEFI Shell Command

kpassword

FUNCTION:	Control EFI setup and shell passwords
SYNTAX:	`kpassword [-u|-s]` Call without parameters to get current password status Parameters: -u Install or change user password -s Install or change superuser password Note: Old passwords must be verified if set. Entering an empty password disables the password.
DESCRIPTION:	The **kpassword** command is used to get and set the EFI shell and setup passwords. Both user and superuser (Administrator) passwords can be controlled.

USAGE:	Control EFI setup and shell passwords
	COMMAND / RESPONSE:
	`kpassword [-u|-s]`
	`No password is installed!`
	`Enter new USER password`
	`-->`
	`Retype password`
	`-->`
	`Done.`

6.2.10 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 Call kwdt -h to obtain a list of time index values and related times

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
```

kwdt (continued)

USAGE:	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.

	Display Watchdog configuration:
	COMMAND / RESPONSE:
	`Shell> kwdt`
	`Kontron Board Watchdog Configuration:`
	`Watchdog Configuration Register (0x28C):    0x00`

6.3 uEFI Shell Scripting

6.3.1 Startup Scripting

If the ESC key is not pressed and the timeout is run out, the uEFI Shell tries to execute some startup scripts automatically. It searches for scripts and executes them 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.`**
3. If none of the startup scripts is present or the startup script terminates, the default boot order is continued.

6.3.2 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 shell script, simply save the script on any FAT-formatted drive attached to the system under the file name **`\efi\boot\startup.nsh.`** To copy the startup script to the flash use the **kbootnsh** uEFI Shell command.

In case there is no mass storage device attached, the startup script can be generated in a RAM disk and stored in the flash bank.

6.3.3 Examples of Startup Scripts

6.3.3.1 Automatic Booting from USB Flash Drive

Automatic booting is made from a USB flash drive, if present, otherwise the boot is made from the harddrive.

```
kboot -t usb-harddrive

kboot -t harddrive
```

If neither a USB flash drive nor a harddrive is present, the boot order is continued.

6.3.3.2 Switch On Clock Spreading Prior to Booting from Harddrive

```
kclsp -e

kboot -t harddrive
```

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

6.3.3.3 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`**).

```
fs0:

bootme.nsh
```

6.3.3.4 Enable Watchdog and Control PXE Boot

The uEFI Shell provides environment variables used to control the execution flow.

The following sample start-up script shows two uEFI Shell environment variables, **`wdt_enable`** and **`pxe_first`**, used to control the boot process and the Watchdog.

```
echo -off
echo “Executing sample startup.nsh...”
if %wdt_enable% == “on” then
   kwdt -t 15
   echo “Watchdog enabled”
endif
if %pxe_first% == “on” then
   echo “forced booting from network”
   kboot -t network
endif
```

To create uEFI Shell environment variables, use the **set** uEFI Shell command as shown below:

```
Shell> set wdt_enable on
Shell> set pxe_first on
Shell> set
   pxe_first : on
   wdt_enable : on
Shell> reset
```

6.3.3.5 Handling the Startup Script in the Flash Bank

In case there is no mass storage device attached, the startup script can be generated in a RAM disk and stored in the flash bank using the following instructions:

4. Press <ESC> during power-up to log into the uEFI Shell.
5. Create a RAM disk and set the proper working directory as shown below:

```
Shell> kmkramdisk -s 3 myramdisk
Shell> myramdisk:
```

6. Enter the sample start-up script mentioned above in this section using the **edit** uEFI Shell command.

```
myramdisk:\> edit boot.nsh
```

7. Save the start-up script to the uEFI flash bank using the **kbootnsh** uEFI Shell command.

```
myramdisk:\> kbootnsh -p boot.nsh
```

8. Reset the board to execute the newly installed script using the **reset** uEFI Shell command.

```
myramdisk:\> reset
```

9. If a script is already installed, it can be edited using the following **kbootnsh** uEFI Shell commands.

```
myramdisk:\> kbootnsh -g boot.nsh
myramdisk:\> edit boot.nsh
```

This page has been intentionally left blank.

Chapter 7

Updating the uEFI BIOS

This page has been intentionally left blank.

7. 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.

7.1 BIOS Redundancy Strategy

The CP3002/CP3002-RC/CP3002-RA has two sets of uEFI flash banks to form a redundancy strategy. The basic idea behind that is to always have at least one working uEFI flash bank available regardless if there have been any flashing errors or not.

7.2 Updating Strategy

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

1. Switch to the second flash bank.
   Since the update CD always changes the flash bank 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 bank.
   This flash is now selected as active boot flash.

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

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

7.3 uEFI BIOS Recovery

In case of one flash being corrupted and therefore the board not starting up, the second flash can be selected via the onboard jumper JP4 on the CP3002-RC/-RA and via DIP Switch SW1, switch 2 on the CP3002.

For further information, refer to Chapter 4.1, DIP Switch Configuration in the CP3002 User Guide, and Chapter 4.1.2 in the CP3002-RC/CP3002-RA User Guide, or contact Kontron for further assistance.

7.4 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 Chapter 6.2.2, kboardinfo uEFI Shell Command.

This page has been intentionally left blank.