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DIGITAL Semiconductor AlphaPC164SX/164LX/164 Motherboards

Firmware Update Procedures

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Preface

This document describes how to update firmware on the following DIGITAL Semiconductor motherboards.

- AlphaPC 164SX and AlphaPC 164LX using the Loadable Firmware Update utility
- AlphaPC 164 using the standalone firmware update utility

It is intended for users administering these motherboard systems.

Conventions

The following conventions are used in this document.

Convention	Description
`>>>`	Three angle brackets indicate the Alpha SRM console prompt.
`boldface type`	Boldface type indicates user input or a menu selection.
`{braces, commas}`	Braces containing items separated by commas indicate mutually exclusive items.
Italic type	Italic type emphasizes important information and indicates complete titles of manuals.
Note:	Notes provide additional information about a topic.
`Monospaced type`	Monospaced type indicates text that the system displays.
Warning	Warnings indicate potential damage to equipment or loss of data.

Associated Documentation

This document does not describe how to use Alpha SRM console firmware commands nor does it list motherboard error codes. You can find information about these subjects in the DIGITAL Semiconductor documentation listed in the following table.

Document Title	Order Number
Alpha SRM Console for Alpha Microprocessor Motherboards User's Guide	EC–QK8DF–TE
AlphaPC 164SX Motherboard DIGITAL UNIX User's Manual	EC–R8P7A–TE
AlphaPC 164LX Motherboard DIGITAL UNIX User's Manual	EC–R2ZPA–TE
AlphaPC 164 Motherboard DIGITAL UNIX User's Manual	EC–QZT5B–TE

1

Updating Firmware in a Flash ROM

The Loadable Firmware Update utility is used to update the firmware in a flash ROM on the AlphaPC 164SX and AlphaPC 164LX. The standalone firmware update utility is used to update the firmware in a flash ROM on the AlphaPC 164.

To update the flash ROM, the update enable/disable jumper must be in the enable position, which is the default. See the motherboard's user's manual for more information about jumper positions.

System	If your system is running...	Then see this section...
AlphaPC 164SX AlphaPC 164LX	Alpha SRM console firmware	Updating the Flash ROM from the Loadable Firmware Update Utility
AlphaPC 164	Alpha SRM console firmware	Updating the Flash ROM from the Standalone Firmware Update Utility

Updating the Flash ROM from the Loadable Firmware Update Utility

This section describes how to update the flash ROM from the Loadable Firmware Update (LFU) utility on the AlphaPC 164SX and the AlphaPC 164LX.

The AlphaPC 164SX and AlphaPC 164LX contain a flash ROM for the Alpha SRM console and AlphaBIOS firmware. The Alpha SRM console is for the DIGITAL UNIX operating system; AlphaBIOS is for the Windows NT operating system, which is not described in this document.

Updating Firmware on a DIGITAL UNIX System

Updating firmware is easy using the Alpha Firmware CD–ROM. The Alpha Firmware CD–ROM determines what kind of AlphaPC system you have and displays the recommended bootfile to use.

To update the firmware from the Alpha SRM console, perform the following steps:

1. Insert the Alpha Firmware CD–ROM into the CD–ROM drive.
2. Enter the following command to determine the unit number of the drive for your CD–ROM device:

   ```
   >>>show device
   ```

   A display appears showing information about the devices on your system. In the following example, DKA400 is the CD–ROM device:

   ```
   dka0.0.0.9.0          DKA0               RZ26L 440C
   dka400.4.0.9.0        DKA400             RRD43 1084
   dva0.0.0.0.1          DVA0
   ewa0.0.0.7.0          EWA0       08-00-2B-E2-B1-08
   pka0.7.0.9.0          PKA0          SCSI Bus ID 7
   ```

   - The letters DK refer to a SCSI CD–ROM.
   - The letter A refers to the SCSI bus designation. Refer to the hardware owner's guide for more details.
   - The number 4 refers to the drive number.
3. Using the following syntax, enter the boot command to boot from the CD–ROM:

   boot *device-number*

   For example, to boot the system from CD–ROM drive number 4, enter:

   ```
   >>>boot dka400
   ```
4. At the `Bootfile:` prompt, press the Enter key to get the firmware file and run the LFU.
5. The LFU menu is displayed followed by the `UPD>` prompt. Enter **`update`** to update the firmware.

The following example is similar to the output that will be displayed on your terminal or graphics display unit:

```
eb.....ea.e9.e8.e7
Checking dka400.4.0.1.0
firmware files...
Copying DFEAA130 from dka400.4.0.1.0...
Copying DFEAB310 from dka400.4.0.1.0...
Copying DFXAA310 from dka400.4.0.1.0...
Copying KZPSAA10 from dka400.4.0.1.0...

          ***** Loadable Firmware Update Utility *****
--------------------------------------------------------------------
Function       Description
--------------------------------------------------------------------
Display        Displays the system's configuration table.
Exit           Done exit LFU (reset).
List           Lists the device, revision, firmware name and
               update revision.
Update         Replaces current firmware with
               loadable data image.
Verify         Compares loadable and hardware images.
? or Help      Scrolls this function table.
--------------------------------------------------------------------
UPD>update
...
UPD>
```

6. As shown in the previous example, when the firmware finishes loading into ROM, the `UPD>` prompt is displayed. Enter **`exit`** to leave the LFU and to reset the system and use the updated firmware.

Updating Option Adapter Firmware from the Alpha Firmware CD-ROM

The LFU supports updating firmware on the following option adapters:

- DEPFA–PCI to FDDI interface (uses DFXAA_FW)
- KZPSA–PCI to SCSI interface

Perform the following steps to update option adapter firmware.

Warning: When updating option adapter firmware, it is important that you perform the steps as shown. Failure to perform the update procedure correctly may render your option adapter inoperable.

7. Insert the Alpha Firmware CD–ROM into the CD–ROM drive.

8. Enter the following command to determine the unit number of the drive for your CD–ROM device:

```
>>>show device
```

A display appears showing information about the devices on your system. In the following example, DKA400 is the CD–ROM device:

```
dka0.0.0.9.0          DKA0               RZ26L 440C
dka400.4.0.9.0        DKA400             RRD43 1084
dva0.0.0.0.1          DVA0
ewa0.0.0.7.0          EWA0      08-00-2B-E2-B1-08
pka0.7.0.9.0          PKA0         SCSI Bus ID 7
```

- The letters DK refer to a SCSI CD–ROM.
- The letter A refers to the SCSI bus designation. Refer to the hardware owner's guide for more details.
- The number 4 refers to the drive number.

1. Using the following syntax, enter the boot command to boot from the CD–ROM:

   boot *device-number*

   For example, to boot the system from CD–ROM drive number 4, enter:

   ```
   >>>boot dka400
   ```

2. Press the Enter key at the `Bootfile:` prompt to run the LFU.
3. The LFU menu is displayed followed by the `UPD>` prompt. Enter **`list`** to get a list of the options available for the system.

   The LFU **`list`** command shows a list of memory-loaded images and currently supported flash ROMs. In the following example, only three devices can have their firmware updated:

   ```
   UPD>list
   Device   Current Revision  Filename    Update Revision
   fsb      3.1               fsb_fw      3.1
   fw       5.4               srm_fw      5.4
   fwb0     3.10              dfxaa_fw    3.10
                              dfeaa_fw    1.3
                              dfeab_fw    3.10
                              kzpsa_fw    A10
   ```

4. Enter **`update`** ***`option-name`*** at the `UPD>` prompt to update one option at a time

   or

   enter **`update`** to update all options.

The LFU **update** command updates option adapter firmware, as shown in the following example:

```
UPD>update fwb0
Confirm update on:
fwb0
[Y/(N)]y

WARNING: Updates may take several minutes to complete for
         each device.

                     DO NOT ABORT!

fwb0     Updating to 3.10...  Verifying 3.10...  PASSED.

UPD>
```

5. As shown in the previous example, when the firmware finishes loading into ROM, the UPD> prompt is displayed. Enter **exit** to leave the LFU and to reset the system and use the updated firmware.

AlphaPC LFU Commands

This section describes the following AlphaPC LFU commands:

- save_nvram
- restore_nvram

save_nvram

Save NVRAM data in EEROM/TOY to diskette.

Note: The `save_nvram` command is available only under the LFU.

Syntax

`save_nvram` `{all, arc, srm, toy}`

Arguments

`all`
All of the EEROM and 50 bytes of TOY NVRAM are saved in the file `allnvram.sav`. If no argument is specified, this is the default.

`arc`
AlphaBIOS data in first 8KB of the EEROM is saved in file `arcnvram.sav`.

`srm`
SRM console data in last 2KB of the EEROM is saved in file `srmnvram.sav`.

`toy`
TOY console data in last 50 bytes of TOY NVRAM is saved in file `toynvram.sav`.

Options

None

Description

Save the system NVRAM data from the EEROM and last 50 TOY NVRAM bytes onto a write-unlocked, FAT-formatted diskette. By default, if no script argument is specified, all NVRAM is saved to file `allnvram.sav`. If the file already exists, then a copy of the original file is made to `*.bak`. If that file exists, it is overwritten.

Note: Attempts to write to a write-locked diskette fail without any errors being flagged.

Examples

To save all the system NVRAM to an image on diskette, do:

```
>>>save_nvram
Save all NVRAM data to file
fat:allnvram.sav/dva0.0.0.1000.0
If file already exists, first copy original to
a .bak file.
Please insert a write-UN-locked, FAT formatted floppy...
...and enter “y” to continue:
y
Checking for a FAT formatted floppy...
...Found it.
Checking for existing fat:allnvram.sav/dva0.0.0.1000.0...
...Found one.
Copying fat:allnvram.sav/dva0.0.0.1000.0 to .bak file...
...Succeeded.
Copying all NVRAM to fat:allnvram.sav/dva0.0.0.1000.0...
...Succeeded.
>>>
```

Source File

save_nvram

restore_nvram

Restore NVRAM data to EEROM/TOY from diskette.

Note: The `restore_nvram` command is available only under the LFU.

Syntax

`restore_nvram` {`all, arc, srm, toy`}

Arguments

`all`
All of the EEROM and 50 bytes of TOY NVRAM are restored from file `allnvram.sav`. If no argument is specified, this is the default.

`arc`
AlphaBIOS data in first 8KB of the EEROM is restored from file `arcnvram.sav`.

`srm`
SRM console data in last 2KB of the EEROM is restored from file `srmnvram.sav`.

`toy`
TOY data in last 50 bytes of 64 bytes in TOY NVRAM is restored from file `toynvram.sav`.

Options

None

Description

Restore the system NVRAM data to the EEROM and last 50 TOY NVRAM bytes from a diskette containing the NVRAM save files. By default, if no script argument is specified, all NVRAM is restored from file `allnvram.sav`.

Examples

To restore a previously saved AlphaBIOS NVRAM image, do:

```
>>>restore_nvram arc
Restore arc NVRAM data from the file
fat:arcnvram.sav/dva0.0.0.1000.0
Please insert the floppy containing this file...
...and enter “y” to continue:
y
Looking for file fat:arcnvram.sav/dva0.0.0.1000.0...
...Found it.
Restoring system NVRAM data...
...Succeeded.
>>>
```

Source File

`restore_nvram`

Updating the Flash ROM from the Standalone Firmware Update Utility

This section describes how to update the AlphaPC 164 using the standalone firmware update utility.

Standalone Firmware Update Utility Conventions

To select and choose different options in the menus, use the following keys:

Key	Description
Arrow	The Arrow keys are used to select different options.
Enter	The Enter key is used to choose the highlighted option.
Esc	The Escape key is used to close a menu or cancel an operation.

Starting the Standalone Firmware Update Utility

To invoke the standalone firmware update utility, follow this procedure.

1. Insert the Alpha Firmware CD–ROM into the CD–ROM drive.
2. Enter the following command to determine the unit number of the drive for your CD–ROM device:

   ```
   >>>show dev
   ```

   Information about the devices on your system is displayed. In the following example, DKA400 is the CD–ROM device:

   ```
   dka0.0.0.9.0          DKA0                RZ26L 440C
   dka400.4.0.9.0        DKA400              RRD43 1084
   dva0.0.0.0.1          DVA0
   ewa0.0.0.7.0          EWA0          08-00-2B-E2-B1-08
   pka0.7.0.9.0          PKA0             SCSI Bus ID 7
   ```

   - The letters DK refer to a SCSI CD–ROM.
   - The letter A refers to the SCSI bus designation. Refer to the hardware owner's guide for more details.
   - The number 4 refers to the drive number.

1. Using the following syntax, enter the boot command to boot from the CD–ROM:

   boot *device-number*

   For example, to boot the system from CD–ROM drive number 4, enter:

   ```
   >>>boot dka400
   ```

2. Press the Enter key at the `Bootfile:` prompt to run the standalone firmware update utility.

1. From the Firmware Update menu, choose whichever selection appears:
   - **Update SRM Console Firmware**
   - **Update Firmware**
2. When you are prompted to continue the update, choose **Yes**.

   If the console selection does not match the firmware you flashed, you will be prompted to update the console selection. If you are prompted to update the console selection, choose **Yes**.
3. Restart the motherboard system.

   You should observe the Alpha SRM console prompt (>>>) on the terminal attached to the COM1 serial port and on the graphics display unit. If you do *not* receive the Alpha SRM console prompt (>>>), press the Enter key on the terminal attached to COM1 or on the console keyboard.

   To change the default console device, use the following Alpha SRM console commands.

To use the...	Enter these commands...
Terminal attached to the COM1 serial port	>>>**set console serial** >>>**init**
Graphics display unit	>>>**set console graphics** >>>**init**

See the *Alpha SRM Console for Alpha Microprocessor Motherboards User's Guide* for more information about Alpha SRM console commands and environment variables.

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Release Notes

EIDE PCI Interrupt Vector Allocation Error (AlphaPC 164LX Only)

On the AlphaPC 164LX motherboard systems, the following error message is displayed in the console's error log and may be displayed on the console terminal device during power-up:

```
Vector allocation failed for hose 0, bus 0, slot 11, pin 1
Vector 0095 already allocated
```

The EIDE interrupts on the AlphaPC 164LX motherboard are routed through the ISA interrupt control logic on ISA IRQ 14 and 15. Because the EIDE interrupts do not make use of the PCI interrupt control logic, this error message can be ignored.

Updating to SRM Console from AlphaBIOS on AlphaPC 164LX/SX

The following describes how to create a floppy for updating an AlphaPC 164LX/SX system to the SRM Console firmware from AlphaBIOS. This procedure overwrites the existing AlphaBIOS firmware in the system with the SRM Console firmware.

1. Mount the Alpha Firmware CD on a PC and copy the appropriate file, as shown in the table below, onto a blank, FAT-formatted diskette.

System	Firmware CD Directory	File Name
AlphaPC 164LX	ALPHAPC164LX	LX164SRM.ROM
AlphaPC 164SX	ALPHAPC164SX	SX164SRM.ROM

IMPORTANT: The file must not be renamed to something other than the file name shown in the table above, and the file must be placed in the top-most (root) directory on the floppy diskette, or the file will not be found by the AlphaBIOS firmware update utility.

2. Place the floppy in the target system, and from the AlphaBIOS setup menu, select "AlphaBIOS Update".