



CC9U Flash Replacement

Migration Guide

1 Document History

Date	Version	Change Description
05/29/2009	V1.0	Initial entry/outline

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3 Introduction

Current CC9U (UNC90) modules populate a 16MiB NOR Flash chip S29GL128M90TFIR1 by SPANSION.

SPANSION announced that this Flash chip is End Of Life (EOL) and no longer being manufactured.

Digi has selected two compatible NOR Flash models to substitute the current one on new CC9U modules:

- NUMONYX M29W128GH
- SPANSION S29GL128P

NUMONYX is a semiconductor company founded in 2008 by Intel and STMicroelectronics.

<p>DIGI STRONGLY RECOMMENDS YOU TO CAREFULLY READ THE PRESENT MIGRATION GUIDE TO PROPERLY SUPPORT THE NEW FLASH CHIP OF CC9U MODULES IN OLD AND NEW DEVELOPMENTS.</p>
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4 Hardware compatibility

From the hardware perspective, the new Flash chip is fully compatible and no hardware modifications are required.

5 Software compatibility

The main difference between the new Flash and the old one is that the new part has 128K erase-block size, while the old part has 64K erase-block size. The new Flash and its different erase-block size requires some software modifications to be done on U-Boot boot loader and also on LxNETES-3.2.

The software can be downloaded from

ftp://ftp1.digi.com/support/documentation/80010022_A.zip

6 Software installation

6.1 ZIP file contents

Uncompress the ZIP file into a temporary folder, for example:



```
$ cd /tmp
$ unzip 80010022_A.zip
```

The ZIP file contains the following:

- *cc9u_fr_uboot.zip*: U-Boot software patches.
- *cc9c_fr_lxnetes.zip*: LxNETES-3.2 software patches.
- *cc9u_fr_images.zip*: Precompiled images for U-Boot, Linux kernel, and the default root file system.
- *cc9u_fr_appnote.pdf*: This Application Note.

The following topics contain details about the installation of the patches, the creation of LxNETES projects for the new modules, the migration of existing LxNETES projects, and the support for old modules.

6.2 U-Boot patches

If you are developing a customized U-Boot boot loader image for CC9U modules, you will need to install these patches to the U-Boot source code, to generate a customized U-Boot which supports the new flash.

You can skip this topic if not developing a customized U-Boot boot loader.

Before applying the patches, you must have the U-Boot source code and toolchain installed (installation instructions for U-Boot are given in a README file in the LxNETES-3.2 CD-ROM).

To install the patches, go into the U-Boot installation directory and uncompress the ZIP (it is assumed that the zip file has been placed in the /tmp folder):



```
$ cd /home/myusername/LxNETES-3.2/U-Boot
$ unzip -B /tmp/cc9u_fr_uboot.zip
```

Once the patches are installed you can recompile U-Boot normally. The resulting image will be valid for both old modules and new modules.

The *unzip* command with *-B* option will create a backup of the files being updated. If you did modifications to any of these files, you will need to merge such changes in the new files.



IMPORTANT NOTE: It is needed that the Flash partitions are aligned to 128K sectors (0x20000).

The default addresses for erasing and flashing U-Boot, rootfs, and kernel, are already aligned, but if you have modified them, please check that start addresses and sizes of U-Boot scripts *cfu, cfk, cfr, wfu, wfk, and wfr* are a multiple of 128K.

6.2.1 List of modified files in U-Boot

This is the list of files that will be installed:

```
board/unc90/flash.c
include/flash.h
include/configs/unc90.h
```

6.3 LxNETES patches

To install the patches, go into the LxNETES installation directory and uncompress the ZIP (it is assumed that the zip file has been placed in the /tmp folder):



```
$ cd /home/myusername/LxNETES-3.2
$ unzip -B /tmp/cc9u_fr_lxnetes.zip
```

The *unzip* command with *-B* option will create a backup of the files being updated. If you did modifications to any of these files, you will need to merge such changes in the new files.

Then execute *autoconf* to generate a new *configure* script:



```
$ autoconf
```

With these patches, any **newly created** LxNETES project will support the flash of the new CC9U modules. Migration of existing projects is explained later in this document.



IMPORTANT NOTE: It is needed that the Flash partitions are aligned to 128K sectors (0x20000).

The default partition table is already aligned, but if you have modified it, please check that all partitions start addresses and sizes are a multiple of 128K.

6.3.1 List of modified files in LxNETES

This is the list of files that will be installed:

```
Makefile.in
configure.ac
linux/drivers/mtd/chips/cfi_probe.c
linux/drivers/mtd/chips/cfi_util.c
linux/include/linux/mtd/cfi.h
```

6.4 Precompiled images

The file *cc9u_fr_images.zip* contains the following binary images:

- ***u-boot-unc90dev.bin***: *U-Boot 1.1.3 FS1b* boot loader

This new U-Boot version does not have any additional feature. It only adds support to the flash of new CC9U modules.

U-Boot version *U-Boot 1.1.3 FS1b* comes already flashed in new modules which populate the new flash chip. Old modules can keep the old version *U-Boot 1.1.3 FS1a*.

- ***uImage-unc90dev***: Linux kernel image

This is the factory default kernel image prepared to work in the flash of the new CC9U modules.

- ***rootfs-unc90dev-128.jffs2***: JFFS2 root file system image with 128K erase-block size.

This is the factory default root file system image prepared to work in the flash of the new CC9U modules (with 128K erase-block size). This image is not suitable for old modules.

- ***rootfs-unc90dev-64.jffs2***: JFFS2 root file system image with 64K erase-block size.

This is the factory default root file system image prepared to work in the flash of the old CC9U modules (with 64K erase-block size). This image is not suitable for new modules.

7 Software development

7.1 New LxNETES projects

Once the LxNETES patches are installed, a new project can be created in the standard way:



```
$ cd /home/myusername/myprojects
$ mkdir newProject
$ cd newProject
$ ~/LxNETES-3.2/configure --enable-platform=unc90dev
```

After compilation, two root file system images will be created:

- **rootfs-unc90dev-128.jffs2**: JFFS2 root file system image with 128K erase-block size.

This image is prepared to work **only in new** CC9U modules.

- **rootfs-unc90dev-64.jffs2**: JFFS2 root file system image with 64K erase-block size.

This image is prepared to work **only in old** CC9U modules.

7.2 Migration of existing LxNETES projects

To add support for the new flash on existing LxNETES projects, you need to reconfigure the project with the same options you created it in the past:



```
$ cd /home/myusername/myprojects/oldProject
$ ~/LxNETES-3.2/configure --enable-platform=unc90dev [other-options]
```



*To see the options the project was created with, see the file **config.log** before reconfiguring your project.*

After compilation and installation of the project, two root file system images will be created in your TFTPBOOT directory:

- **rootfs-unc90dev-128.jffs2**: JFFS2 root file system image with 128K erase-block size.

This image is prepared to work **only in new** CC9U modules.

- **rootfs-unc90dev-64.jffs2**: JFFS2 root file system image with 64K erase-block size.

This image is prepared to work **only in old** CC9U modules.

The kernel that will be created (uImage-unc90dev) will contain the support for the new flash and is also suitable for old modules, as long as the partitions are aligned to 128K.

8 Firmware update

8.1 New CC9U modules

New CC9U modules must be flashed with the kernel image (uImage-unc90dev) and the rootfs image *rootfs-unc90dev-128.jffs2* of either a new or a migrated LxNETES project.

8.2 Old CC9U modules

Old CC9U modules can keep old versions of U-Boot, kernel, and root file system.

If an update is needed, old modules can use the new U-Boot, the kernel of a new or a migrated LxNETES project, and the rootfs image *rootfs-unc90dev-64.jffs2*, which is prepared for 64K erase-block size flash.

8.3 Update of rootfs from U-Boot

U-Boot expects the root file system image to be a file called *rootfs-unc90dev.jffs2*, so you must create a symlink in your TFTPBOOT folder with this name that points to the proper file, depending on the module that you want to update.

If it is a **new** module:



```
$ cd /tftpboot
$ ln -s rootfs-unc90dev-128.jffs2 rootfs-unc90dev.jffs2
```

If it is an **old** module:



```
$ cd /tftpboot
$ ln -s rootfs-unc90dev-64.jffs2 rootfs-unc90dev.jffs2
```

Once done, you can update the rootfs normally with:



```
# run update_rootfs_tftp
```