



FMC internal peripheral



# FMC internal peripheral

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## 1 Article purpose

The purpose of this article is to

- briefly introduce the FMC peripheral and its main features
- indicate the level of security supported by this hardware block
- explain how each instance can be allocated to the three runtime contexts and linked to the corresponding software components
- explain, when needed, how to configure the FMC peripheral.

## 2 Peripheral overview

The **FMC** peripheral is used to interface an STM32 MPU with SLC 8-bit or 16-bit NAND Flash memory devices.

The **FMC** NAND controller supports:

- Programmable error correction capability (ECC) using BCH8 code, BCH4 code or Hamming code
- Programmable page size of 2048, 4096 and 8192 bytes
- Programmable memory timings
- Multiple dice per package.



## 2.1 Features

Refer to [STM32MP15 reference manuals](#) for the complete list of features, and to the software components, introduced below, to know which features are really implemented.

## 2.2 Security support

The FMC is a **non-secure** peripheral.

# 3 Peripheral usage and associated software

## 3.1 Boot time

FMC instance is boot device that support serial boot for Flash programming with [STM32CubeProgrammer](#).

## 3.2 Runtime

### 3.2.1 Overview

The FMC instance can be allocated to the Arm<sup>®</sup> Cortex<sup>®</sup>-A7 non-secure core to be controlled in Linux<sup>®</sup> by the MTD framework

Chapter #Peripheral assignment describes which instance can be assigned to which context.

### 3.2.2 Software frameworks

Do	Peri	Software frameworks			Comment
main Cortex -A7 non-secure (OPTEE)	Cortex-A7 non-secure (Linux)	Cortex-M4 (STM32Cube)			
Mass	F				

Do	Peri	Software frameworks			Comment
ma	ph		Linux MTD Framework		
in	er				
st	a				
a	l				
n					
c					
e					
M					

### 3.2.3 Peripheral configuration

The configuration is applied by the firmware running in the context to which the peripheral is assigned. The configuration can be done alone via the **STM32CubeMX** tool for all internal peripherals, and then manually completed (particularly for external peripherals), according to the information given in the corresponding software framework article.

For Linux kernel configuration, please refer to [FMC device tree configuration](#)

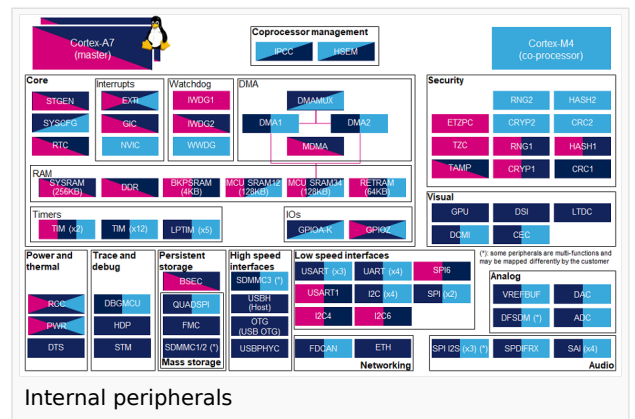
### 3.2.4 Peripheral assignment

**Check boxes** illustrate the possible peripheral allocations supported by **STM32 MPU Embedded Software**:

- means that the peripheral can be assigned ( ) to the given runtime context.
- is used for system peripherals that cannot be unchecked because they are statically connected in the device.

Refer to [How to assign an internal peripheral to a runtime context](#) for more information on how to assign peripherals manually or via **STM32CubeMX**.

The present chapter describes STMicroelectronics recommendations or choice of implementation. Additional possibilities might be described in **STM32MP15** reference manuals.



Do	Peri	Runtime allocation			Comme
ma	ph				nt
in	er				
st	a				
a	l				
n					
c					
e					
M					



Do ma in s st or a g e	Per iph era l	Runtime allocation				Comme nt
		FMC				

## 4 How to go further

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## 5 References

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Microprocessor Unit

Single-Level Cell is a kind of NAND flash

Flash memories combine high density and cost effectiveness of EPROMs with the electrical erasability of EEPROMs. For this reason, the Flash memory market is one of the most exciting areas of the semiconductor industry today and new applications requiring in system reprogramming, such as cellular telephones, automotive engine management systems, hard disk drives, PC BIOS software for Plug & Play, digital TV, set top boxes, fax and other modems, PC cards and multimedia CD-ROMs, offer the prospect of very high volume demand.

Elliptic curve cryptography

Error Correction Capability

Open Portable Trusted Execution Environment