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SYSCFG internal peripheral

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1 Article purpose

The purpose of this article is to:

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

2 Peripheral overview

The SYSCFG peripheral is used to configure various system aspects like IOs compensation, Ethernet clocking path, ...

2.1 Features

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

2.2 Security support

The SYSCFG is a **non secure** peripheral.

3 Peripheral usage and associated software

3.1 Boot time

The SYSCFG peripheral is configured by [TF-A](#) and [U-Boot](#) at boot time.

3.2 Runtime

3.2.1 Overview

[Linux](#) and [STM32Cube](#) can directly change the SYSCFG at runtime from various drivers.

For instance, I2C fast mode plus (FM+) can be enabled for each instance in the SYSCFG so:

- [Linux I2C driver](#) uses [syscon](#) ^[1] to enable this mode in the SYSCFG for the instances allocated to itself
- [STM32Cube I2C HAL driver](#) uses its [SYSCFG HAL driver](#) to do the same on the instances allocated to itself

3.2.2 Software frameworks

Domain	Peripheral	Software frameworks		Comment
Cortex-A7 secure (OP-TEE)	Cortex-A7 non-secure (Linux)	Cortex-M4 (STM32Cube)		
Core	SYSCFG		Linux syscon framework ^[1]	STM32Cube SYSCFG driver

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.

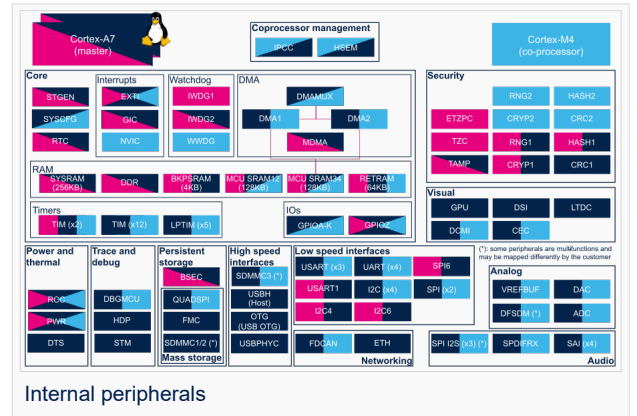
3.2.4 Peripheral assignment

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](#).



Domain	Peripheral	Runtime allocation		Comment		
Instance	Cortex-A7 secure (OP-TEE)	Cortex-A7 non-secure (Linux)	Cortex-M4 (STM32Cube)			
Core	SYSCFG	SYSCFG		✓	✓	

4 References

- [↑ 1.01.1 Documentation/devicetree/bindings/mfd/syscon.txt](#)

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