



DBGMCU internal peripheral



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Stable: 26.09.2019 - 13:46 / Revision: 26.09.2019 - 13:46

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1 Article purpose

The purpose of this article is to:

- briefly introduce the DBGMCU 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 necessary, how to configure the DBGMCU peripheral.

2 Peripheral overview

The **DBGMCU** peripheral is used to configure internal peripherals behavior when one of the cores (Cortex[®]-A7 or Cortex[®]-M4) enters in debug mode.

For instance, it allows to freeze a watchdog (IWDG) to avoid getting a watchdog reset when the Cortex[®]-A7 enters in debug mode (via a breakpoint or JTAG break).

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 implemented.



2.2 Security support

The DBGMCU is a non secure peripheral.

3 Peripheral usage and associated software

3.1 Boot time

DBGMCU is partly initialized by the FSBL at boot time in order to freeze IWDG2 when the Cortex[®]-A7 enters in debug mode.

3.2 Runtime

3.2.1 Overview

There is no real runtime support for DBGMCU. Instead, users who need to freeze some peripherals for a debug session should complete the minimal initialization done in the FSBL with their needs.

3.2.2 Software frameworks

| Domain | Peripheral | Software frameworks | | | Comment |
|---------------------------|------------------------------|-----------------------|--|--|---------|
| Cortex-A7 secure (OP-TEE) | Cortex-A7 non-secure (Linux) | Cortex-M4 (STM32Cube) | | | |
| Trace & Debug | DBGMCU | | | | |

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



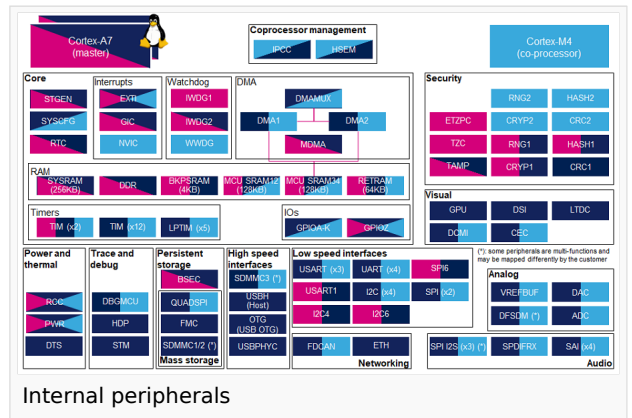
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Check boxes illustrate the possible peripheral allocations supported by STM32 MPU Embedded Software:

- **â** means that the peripheral can be assigned (**â**) to the given runtime context.
- **â** 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.



| Dom | Perip | Runtime allocation | | | Comment |
|-----|-------|--------------------|-------------|--|---------------|
| ain | Co | | | | |
| Ins | rt | | | | |
| tan | x- | | | | |
| ce | A7 | | | | |
| | se | Cortex-A7 | Cortex-M4 | | |
| | cur | non-secure | (STM32Cube) | | |
| | e | (Linux) | | | |
| | (O | | | | |
| | P- | | | | |
| | TE | | | | |
| | E) | | | | |
| Tr | D | | | | |
| ac | B | | | | |
| & | G | | | | |
| De | M | | | | |
| bu | C | | | | |
| g | U | DBGMCU | | | No assignment |

debug and test protocol, named from the Joint Test Action Group that developed it
Open Portable Trusted Execution Environment