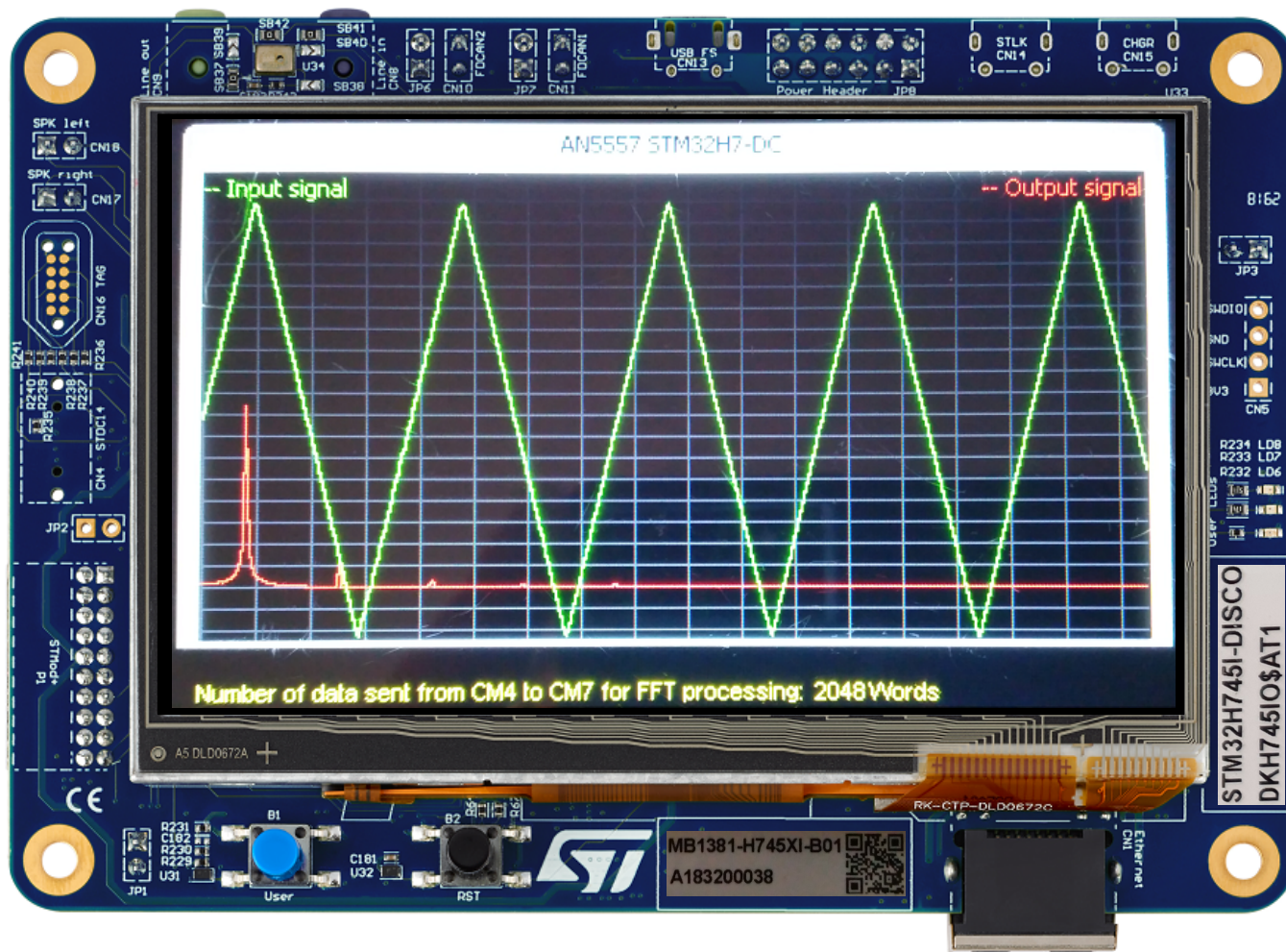


STM32H74xxx and STM32H75xxx dual-core OpenAMP application software expansion for STM32Cube



Picture is not contractual.

Product status link

[X-CUBE-H7DC-APP](#)



Features

- STM32H74xxx and STM32H75xxx dual-core communication demonstrator
- Code execution and data storage in different memory locations
- Arm® Cortex®-M7 and Arm® Cortex®-M4 communication channel
- OpenAMP middleware
- Digital oscilloscope
- FFT display

Description

The X-CUBE-H7DC-APP Expansion Package shows how to use OpenAMP middleware to create a communication channel (called rmsg channel) between the two CPUs of dual-core STM32H74xxx and STM32H75xxx microcontrollers, and send the data from the Cortex®-M4 to the Cortex®-M7 to create an application such as a digital oscilloscope. This application is working in bare metal mode for both CPUs.

The Expansion Package is provided with two project configurations for the [STM32H745I-DISCO](#) Discovery kit. In the STM32H7_CM4_Oscilloscope_OpenAMP first project, the Cortex®-M4 generates an analog signal via the DAC and timer peripheral; The generated signal is looped back via an external cable to analog inputs; The ADC converts the signal and sends the data to the Cortex®-M7 via OpenAMP middleware. In the second project called STM32H7_CM7_Oscilloscope_OpenAMP, the Cortex®-M7 core receives the converted data from the Cortex®-M4 via OpenAMP middleware and displays the input signal and its FFT32 (provided by the CMSIS library) on the LCD. This package supports several toolchains: IAR Systems® IAR Embedded Workbench®, Keil® MDK-ARM, and STMicroelectronics System Workbench for STM32 ([SW4STM32](#)). It can be ported easily to any other toolchain and any STM32H7 Series dual-core device.

1 General information

The X-CUBE-H7DC-APP Expansion Package runs on STM32 microcontrollers based on Arm® cores.

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.



1.1 Ordering information

X-CUBE-H7DC-APP is available for free download from the www.st.com website.

1.2 What is STM32Cube?

STM32Cube is an STMicroelectronics original initiative to significantly improve designer's productivity by reducing development effort, time, and cost. STM32Cube covers the whole STM32 portfolio.

STM32Cube includes:

- A set of user-friendly software development tools to cover project development from conception to realization, among which are:
 - STM32CubeMX, a graphical software configuration tool that allows the automatic generation of C initialization code using graphical wizards
 - STM32CubeIDE, an all-in-one development tool with peripheral configuration, code generation, code compilation, and debug features
 - STM32CubeProgrammer (STM32CubeProg), a programming tool available in graphical and command-line versions
 - STM32CubeMonitor (STM32CubeMonitor, STM32CubeMonPwr, STM32CubeMonRF, STM32CubeMonUCPD) powerful monitoring tools to fine-tune the behavior and performance of STM32 applications in real-time
- STM32Cube MCU and MPU Packages, comprehensive embedded-software platforms specific to each microcontroller and microprocessor series (such as STM32CubeH7 for the STM32H7 Series), which include:
 - STM32Cube hardware abstraction layer (HAL), ensuring maximized portability across the STM32 portfolio
 - STM32Cube low-layer APIs, ensuring the best performance and footprints with a high degree of user control over hardware
 - A consistent set of middleware components such as USB, TCP/IP, FAT file system, RTOS, and graphics
 - All embedded software utilities with full sets of peripheral and applicative examples
- STM32Cube Expansion Packages, which contain embedded software components that complement the functionalities of the STM32Cube MCU and MPU Packages with:
 - Middleware extensions and applicative layers
 - Examples running on some specific STMicroelectronics development boards

2 License

X-CUBE-H7DC-APP is delivered under the *Mix Ultimate Liberty+OSS+3rd-party V1* software license agreement (SLA0048).

The software components provided in this package come with different license schemes as shown in [Table 1](#).

Table 1. Software component license agreements

Software component	Copyright	License
Cortex [®] -M CMSIS	Arm Limited	Apache License 2.0
STM32H7 CMSIS	STMicroelectronics	BSD-3-Clause
STM32H7 HAL	STMicroelectronics	BSD-3-Clause
Board support package (BSP)	STMicroelectronics	BSD-3-Clause
Project example	STMicroelectronics	Proprietary

Revision history

Table 2. Document revision history

Date	Revision	Changes
30-Mar-2021	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2021 STMicroelectronics – All rights reserved