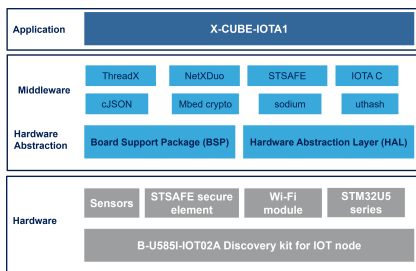# IOTA Distributed Ledger Technology software expansion for STM32Cube

Features

- Complete firmware to build IOTA DLT applications for STM32-based boards
- Middleware libraries featuring:
  – STSAFE secure element for a secure hardware root of trust
  – Wi-Fi management
  – encryption, hashing, message authentication, and digital signing (sodium/mbedCrypto)
  – Azure RTOS ThreadX and NetXDuo
  – IOTA Client API to interact with the Tangle
- Complete driver to build applications accessing motion and environmental sensors
- Examples to help understand how to develop an IOTA DLT Client application
- Example to help understand how to build and send to the Tangle an encrypted, authenticated message stream based on L2Sec, a Layer 2 lightweight security protocol designed for embedded IoT devices
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

The X-CUBE-IOTA1 expansion software package for STM32Cube runs on the STM32 and includes middleware to enable the IOTA Distributed Ledger Technology (DLT) functions.

The IOTA DLT is a transaction settlement and data transfer layer for the Internet of Things (IoT). IOTA allows people and machines to transfer money and/or data without any transaction fees in a trustless, permissionless and decentralized environment. This technology even makes micro-payments possible without the need of a trusted intermediary of any kind.

The expansion is built on STM32Cube software technology to ease portability across different STM32microcontrollers.

The current version of the software runs on the B-U585I-IOT02A discovery kit for IoT node and connects to the Internet through the attached WiFi® interface.

The software is also available on GitHub, where the users can signal bugs and propose new ideas through [**Issues**] and [**Pull requests**] tabs.

Product summary

Product summary	
IOTA distributed ledger technology software expansion for STM32Cube	X-CUBE-IOTA1
Discovery kit for IoT node with STM32U5 series	B-U585I-IOT02A
Applications	Embedded Security
	Goods Guarantee
	IoT for Smart Industry

DB3959 - Rev 5 - November 2022
For further information contact your local STMicroelectronics sales office.

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1 Detailed description

1.1 What is STM32Cube?

STM32Cube is a combination of a full set of PC software tools and embedded software blocks running on STM32 microcontrollers and microprocessors:

- STM32CubeMX configuration tool for any STM32 device; it generates initialization C code for Cortex-M cores and the Linux device tree source for Cortex-A cores
- STM32CubeIDE integrated development environment based on open-source solutions like Eclipse or the GNU C/C++ toolchain, including compilation reporting features and advanced debug features
- STM32CubeProgrammer programming tool that provides an easy-to-use and efficient environment for reading, writing and verifying devices and external memories via a wide variety of available communication media (JTAG, SWD, UART, USB DFU, I2C, SPI, CAN, etc.)
- STM32CubeMonitor family of tools (STM32CubeMonRF, STM32CubeMonUCPD, STM32CubeMonPwr) to help developers customize their applications in real-time
- STM32Cube MCU and MPU packages specific to each STM32 series with drivers (HAL, low-layer, etc.), middleware, and lots of example code used in a wide variety of real-world use cases
- STM32Cube expansion packages for application-oriented solutions.

1.2 How does this software complement STM32Cube?

The proposed software is based on the STM32CubeHAL, the hardware abstraction layer for the STM32 microcontroller.

The package extends STM32Cube by providing some middleware components to enable the IOTA Distributed Ledger Technology, building a cryptographically secured distributed database that records transactions on an STM32 microcontroller.

The package includes test and examples showing how to create an IOTA Client, running on an STM32 microcontroller, for use cases especially related to data transactions among machines.

Revision history

Table 1. Document revision history

Date	Version	Changes
10-Jun-2019	1	Initial release.
03-May-2021	2	Updated all content to reflect software release v2.0.0.
15-Nov-2021	3	Updated all content to reflect software release v2.1.0.
14-Jan-2022	4	Added link to GitHub in the description.
29-Nov-2022	5	Updated to B-U585I-IOT02A

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