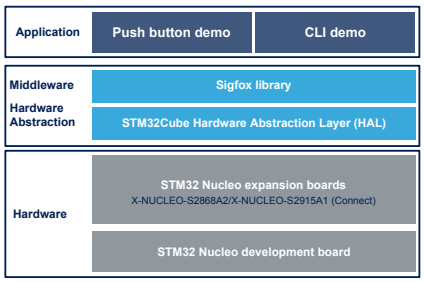
X-CUBE-SFXS2LP1

Data brief

Sigfox™ software expansion for STM32Cube based on S2-LP



Features

- Complete software to build applications using Sigfox™ long range wireless area network running on the S2-LP high performance ultra-low power RF transceiver
- S2-LP Sigfox™ library with a complete set of APIs to develop embedded applications
- S2-LP Sigfox library support for Monarch feature
- Compatible with the STSW-S2LP-SFX-DK graphical user interface (GUI) to register end-device to Sigfox™ network and get ID (Unique Device ID)/PAC (Port Authorization code) /Key from the pool assigned to ST devices
- Sigfox proprietary protocol with Monarch feature
- GUI PC application available as interactive interface to transmit messages to the Sigfox™ network
- Sample implementation available on the X-NUCLEO-S2868A2 and X-NUCLEO-S2915A1 expansion boards connected to a NUCLEO-L073RZ, NUCLEO-L152RE or NUCLEO-L476RG development board
- ID/PAC/Key stored in internal MCU flash or external EEPROM
- Easy portability across different MCU families, thanks to STM32Cube
- Compatible with STM32CubeMX
- Free, user-friendly license terms

Product summary	
Sigfox™ software expansion for STM32Cube based on S2-LP	X-CUBE-SFXS2LP1
Sub-1 GHz 868 MHz RF expansion board based on S2-LP radio for STM32 Nucleo	X-NUCLEO-S2868A2
Sub-1 GHz 915 MHz RF expansion board based on S2-LP radio for STM32 Nucleo	X-NUCLEO-S2915A1
Ultra-low power, high performance, sub-1 GHz transceiver	S2-LP
Applications	Wireless connectivity

Description

The X-CUBE-SFXS2LP1 expansion software package for STM32Cube runs on the STM32 and includes the drivers for S2-LP and the library for the Sigfox™ proprietary protocol.

This software together with the suggested combination of STM32 and S2-LP device can be used, for example, to develop applications for smart home/building and smart cities, agriculture, parking, lighting, etc.

The expansion is built on STM32Cube software technology to ease portability across different STM32 microcontrollers.

The software comes with a sample implementation of the drivers running on the X-NUCLEO-S2868A2 and X-NUCLEO-S2915A1 expansion boards connected to a NUCLEO-L073RZ, NUCLEO-L152RE or NUCLEO-L476RG development board.

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 a Board Support Package (BSP) for the S2-LP and middleware components for Sigfox.

The drivers abstract low-level details of the hardware and allow the middleware components and applications to access Sigfox packet data in a hardware independent fashion.

The Sigfox package includes the Push button demo and Command line interface (CLI) demo sample applications.

In the Push button demo, the Sigfox message can be transmitted just by pressing the user button on the STM32 Nucleo board. The message can be seen in the Sigfox website.

The CLI demo is used for serial communication with the Sigfox GUI and provides VCOM port connectivity with a PC. It allows a new node registration. The node gets its ID/PAC (written in the NVM) after registration.

The message to be transmitted can be typed using the keyboard in the uplink tab and transmitted from the GUI by clicking on the “Tx” button. The data logging with ID can be seen in the Sigfox website.

Revision history

Table 1. Document revision history

Date	Version	Changes
11-Sep-2018	1	Initial release.
05-May-2020	2	Updated cover page image, product summary table and Section 1.1 What is STM32Cube? Added X-NUCLEO-S2868A2, X-NUCLEO-S2915A1 and NUCLEO-L073RZ compatibility information.
13-Oct-2020	3	Updated cover page features.