I-CUBE-LRWAN

STM32 LoRa® software expansion for STM32Cube

Data brief

Features

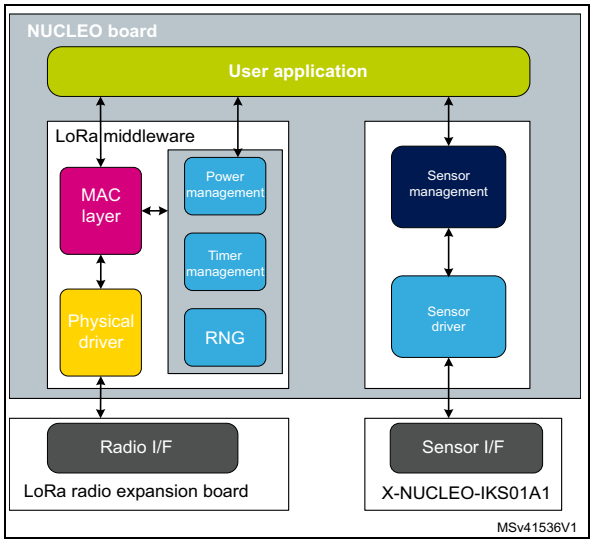
- Compliant with the LoRa Alliance™ specification protocol, named LoRaWAN™ version V1.0.2 July 2016
- Bidirectional end-devices with class A and class C protocol support
- EU 868 MHz ISM band ETSI (European telecommunications standards institute) compliant
- EU 433 MHz ISM band ETSI compliant
- US 915 MHz ISM band FCC (federal communications commission) compliant
- End-device activation either through OTAA (over-the-air activation) or ABP (activation-by-personalization)
- Adaptive data rate support
- LoRaWAN™ test application for certification tests included
- Low-power optimized
- Full STM32 portfolio compatibility
- Compliant with the CMWX1ZZABZ-091 LoRa® module from Murata
- Compliant with the WM-SG-SM-42 LoRa® module from USI

Description

LoRa® is a long range wireless area network allowing low-power sensors to report over ranges of up to a dozen kilometers.

The I-CUBE-LRWAN software expansion package consists of a set of libraries and application examples for STM32L0, STM32L1 and STM32L4 Series microcontrollers acting as end-devices.

This package supports the SX1276MB1MAS, SX1276MB1LAS and SX1272MB2DAS LoRa® radio expansion boards provided by SEMTECH.



This package includes an application running on NUCLEO-L053R8, NUCLEO-L152RE, NUCLEO-L476RG and B-L072Z-LRWAN1 Discovery kits embedding the CMWX1ZZABZ-091 LoRa® module from Murata. It also supports a USI® LoRaWAN™ technology module through the I-NUCLEO-LRWAN1 expansion board. The application reads sensor data from the X-NUCLEO-IKS01A1 expansion board and sends the sensor data to the LoRa® network in class A. For further details about the components of the LoRa middleware library, refer to the "*STM32 LoRa® software expansion for STM32Cube*" User manual (UM2073).

Package naming convention

Table 1 shows the I-CUBE-LRWAN package naming convention.

Table 1. I-CUBE-LRWAN package naming convention

Package	1st digit	2nd digit	3rd digit
I-CUBE-LRWAN package x.y.z	Major feature support: x = 1: LoRa application only	Supported version of the LoRa stack: – y=0:LoRa stack v1.0.1 – y=1:LoRa stack v1.0.2 – y=2:LoRa stack v1.1	z: FW/SW changes based on a defined package (z = 0,....,9).

Ordering information

I-CUBE-LRWAN is available for free download from the *www.st.com* website.

License

The software components provided in this package come with different license schemes as shown in *Table 2*.

For further details about licenses, refer to the license agreement of each component.

Table 2. Software component license agreements

Software component	Owner	License
Cortex®-M CMSIS	ARM®	Open source BSD
HAL STM32 L0/L1/L4	ST	Open source BSD
LoRaWAN™ stack	SEMTECH	Open source BSD
Project examples	ST	Ultimate Liberty (source release)

Revision history

Table 3. Document revision history

Date	Revision	Changes
28-Jun-2016	1	Initial release.
29-Aug-2016	2	Updated *Features*: – Updated compliance of LoRaWAN version from V1.0 January 2015 to V1.0.1 February 2016 – Specified “V1.0” for class A certification.
10-Nov-2016	3	Updated *Features*.
22-Dec-2016	4	Updated *Features* and reference to the CMWX1ZZABZ-xxx LoRa module from Murata
7-Feb-2017	5	Updated *Features* and reference to the CMWX1ZZABZ-091 LoRa module from Murata
16-Mar-2017	6	Updated *Features* and *Description* to introduce support of the USI LoRaWAN technology module.