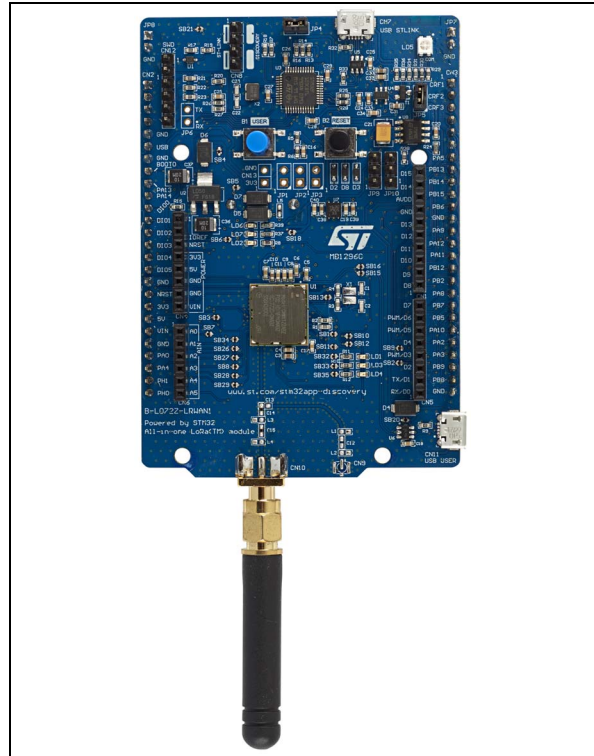


## Discovery kit for LoRaWAN™, Sigfox™, and LPWAN protocols with STM32L0

Data brief

### Features

- CMWX1ZZABZ-091 LoRa®/Sigfox™ module (Murata)
  - Embedded ultra-low-power STM32L072CZ Series MCUs, based on Arm® Cortex® -M0+ core, with 192 Kbytes of Flash memory, 20 Kbytes of RAM, 20 Kbytes of EEPROM
  - Frequency range: 860 MHz - 930 MHz
  - USB 2.0 FS
  - 4-channel, 12-bit ADC, 2xDAC
  - 6-bit timers, LP-UART, I<sup>2</sup>C and SPI
  - Embedded SX1276 transceiver
  - LoRa®, FSK, GFSK, MSK, GMSK and OOK modulations (+ Sigfox™ compatibility)
  - +14 dBm or +20 dBm selectable output power
  - 157 dB maximum link budget
  - Programmable bit rate up to 300 kbit/s
  - High sensitivity: down to -137 dBm
  - Bullet-proof front end: IIP3 = -12.5 dBm
  - 89 dB blocking immunity
  - Low Rx current of 10 mA, 200 nA register retention
  - Fully integrated synthesizer with a resolution of 61 Hz
  - Built-in bit synchronizer for clock recovery
  - Sync word recognition
  - Preamble detection
  - 127 dB+ dynamic range RSSI
- SMA and U.FL RF interface connectors
- Including 50 ohm SMA RF antenna
- On-board ST-LINK/V2-1 supporting USB re-enumeration capability
- USB ST-LINK functions:
  - Virtual COM port
  - Mass storage
  - Debug port



Picture is not contractual.

- Board power supply:
  - Through USB bus or external  $V_{IN}/3.3\text{ V}$  supply voltage or batteries
- 3xAAA-type-battery holder for standalone operation
- 7 LEDs:
  - 4 general-purpose LEDs
  - A 5 V-power LED
  - An ST-LINK-communication LED
  - A fault-power LED
- 2 push-buttons (user and reset)
- Arduino™ Uno V3 connectors
- Arm® Mbed™ (see <http://mbed.org>)



## Description

The B-L072Z-LRWAN1 LoRa<sup>®</sup>/Sigfox<sup>™</sup> Discovery kit is a development tool to learn and develop solutions based on LoRa<sup>®</sup>, Sigfox<sup>™</sup>, and FSK/OOK technologies. This Discovery kit features an all-in-one open module CMWX1ZZABZ-091 (by Murata). The module is powered by an STM32L072CZ and an SX1276 transceiver. The transceiver features the LoRa<sup>®</sup> long-range modem, providing ultra-long-range spread spectrum communication and high interference immunity, minimizing current consumption. Since CMWX1ZZABZ-091 is an open module, user has access to all STM32L072 peripherals such as ADC, 16-bit timer, LP-UART, I<sup>2</sup>C, SPI and USB 2.0 FS (supporting BCD and LPM).

The B-L072Z-LRWAN1 Discovery kit includes an ST-LINK/V2-1 embedded debug tool interface, LEDs, push-buttons, antenna, Arduino<sup>™</sup> Uno V3 connectors and USB OTG connector in Micro-B format.

The LoRaWAN<sup>™</sup> stack is certified class A and C compliant. It is available in the I-CUBE-LRWAN firmware package. Several examples, including an AT-command stack, are available to help users setting up a complete LoRaWAN<sup>™</sup> node.

The Sigfox<sup>™</sup> stack is RCZ1, RCZ2, and RCZ4 certified. It is available in the X-CUBE-SFOX Expansion package. Several examples, including an AT-command modem, are also available to help users setting up a complete Sigfox<sup>™</sup> node.

## System requirements

- Windows<sup>®</sup> OS (7, 8, 10), Linux<sup>®</sup> or macOS<sup>®(a)</sup>
- USB Type-A to Micro-B cable

## Development toolchains

- Keil<sup>®</sup> MDK-ARM<sup>(b)</sup>
- IAR<sup>™</sup> EWARM<sup>(b)</sup>
- GCC-based IDEs including free SW4STM32 from AC6
- Arm<sup>®</sup> Mbed<sup>™(c)</sup> online

---

a. macOS<sup>®</sup> is a trademark of Apple Inc., registered in the U.S. and other countries.

b. On Windows<sup>®</sup> only.

c. Arm and Mbed are registered trademarks or trademarks of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

## Demonstration software

The demonstration software is preloaded in the STM32 Flash memory. The latest versions of the demonstration source code and associated documentation can be downloaded from the [www.st.com/i-cube-lrwan](http://www.st.com/i-cube-lrwan) webpage.

## Ordering information

To order the B-L072Z-LRWAN1 Discovery kit refer to [Table 1](#).

**Table 1. Ordering information**

Order code	Target STM32
B-L072Z-LRWAN1	STM32L072CZ

## Revision history

**Table 2. Document revision history**

Date	Revision	Changes
30-Jan-2017	1	Initial release.
31-Jan-2018	2	Extended the document scope to Sigfox™: updated <a href="#">Features</a> , <a href="#">Description</a> , and <a href="#">System requirements</a> .
28-Jun-2018	3	Updated <a href="#">Features</a> with frequency range.

**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. 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.

© 2018 STMicroelectronics – All rights reserved