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DISCO-L072CZ-LRWAN1 | Mbed

The B-L072Z-LRWAN1 LoRa®Discovery kit is a development tool to learn and develop solutions based on LoRa®and FSK/OOK technologies.

Overview¶

The B-L072Z-LRWAN1 LoRa®Discovery kit is a development tool to learn and develop solutions based on LoRa®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®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, I2C, 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™Uno V3 connectors and USB OTG connector in Micro-B format.

Microcontroller features¶

- CMWX1ZZABZ-091 LoRa® module with STM32L072CZ

- ARM® 32-bit Cortex®-M0+ CPU

- 32 MHz max CPU frequency

- VDD from 1.65 V to 3.6 V

- 192 KB Flash

- 20 KB SRAM

- GPIO (40) with external interrupt capability

- General-purpose Timer (4)

- Basic Timer (2)

- Low Power Timer

- SPI (6)

- I2S

- I2C (3)

- USART (4)

- Low-power UART

- USB 2.0 full-speed

- 12-bit ADC with 13 channels

- 12-bit DAC (2) with 1 channel each

- Comparators (2)

- RTC

- Capacitive sensing channels (19)

- Random Generator (TRNG for HW entropy)

Board features¶

- Two types of extension resources

  - Arduino Uno Revision 3 connectivity

  - STMicroelectronics extension pin headers for full access to all STM32 I/Os

- On-board ST-LINK/V2-1 debugger/programmer with SWD connector

  - Selection-mode switch to use the kit as a standalone ST-LINK/V2-1

- Flexible board power supply

  - USB VBUS or external source (3.3 V, 5 V, 7 - 12 V)

  - Power management access point

- User LED (LD1, LD2, LD3, LD4)

- Two push buttons: USER and RESET

- USB re-enumeration capability: three different interfaces supported on USB

- Virtual Com port

- Mass storage (USB Disk drive) for drag'n'drop programming

- Debug port

Board pinout¶

Pins Legend¶

Labels usable in code

PX_Y   MCU pin without conflict

PX_Y   MCU pin connected to other components
        See **PeripheralPins.c** (link below) for more information

XXX   Arduino connector names (A0, D1, ...)

XXX   LEDs and Buttons (LED_1, USER_BUTTON, ...)

Labels not usable in code (for information only)

XXX   Serial pins (USART/UART)

XXX   SPI pins

XXX   I2C pins

XXX   PWMOut pins (TIMER n/c[N])
       n = Timer number c = Channel
       N = Inverted channel

XXX   AnalogIn (ADC) and AnalogOut pins (DAC)

XXX   CAN pins

XXX   Power and control pins (3V3, GND, RESET, ...)

You can find more details on the available pins and labels in the **PeripheralPins.c** and **PinNames.h** files.

These files can be found in:

- ARMmbed/mbed-os repository on GitHub (**up-to-date** version, used with **mbed CLI commands**)

https://github.com/ARMmbed/mbed-os/blob/master/targets/TARGET_STM/TARGET_STM32L0/TARGET_STM32L072xZ/TARGET_DISCO_L072CZ_LRWAN1/

- mbed-dev library in developer.mbed.org (source files of the mbed library used on **mbed compiler IDE**)

https://developer.mbed.org/users/mbed_official/code/mbed-dev/file/default/targets

/TARGET_STM/TARGET_STM32L0/TARGET_STM32L072xZ
/TARGET_DISCO_L072CZ_LRWAN1/

DISCO-L072CZ-LRWAN1

ARDUINO HEADER
(top right side)

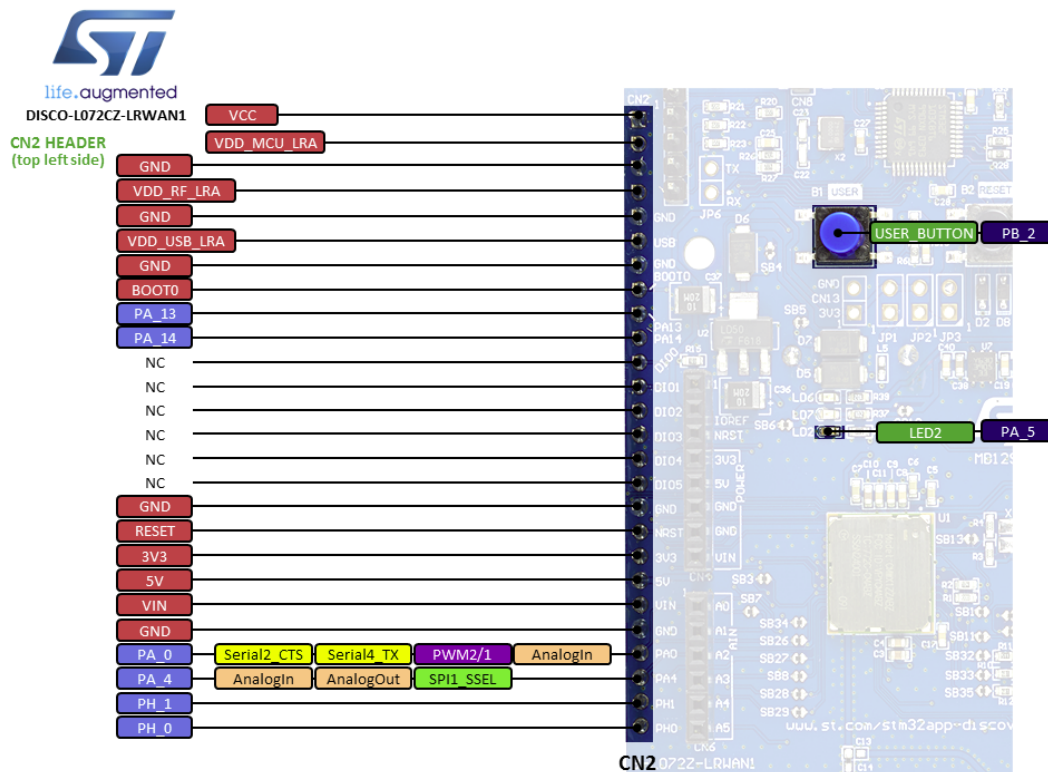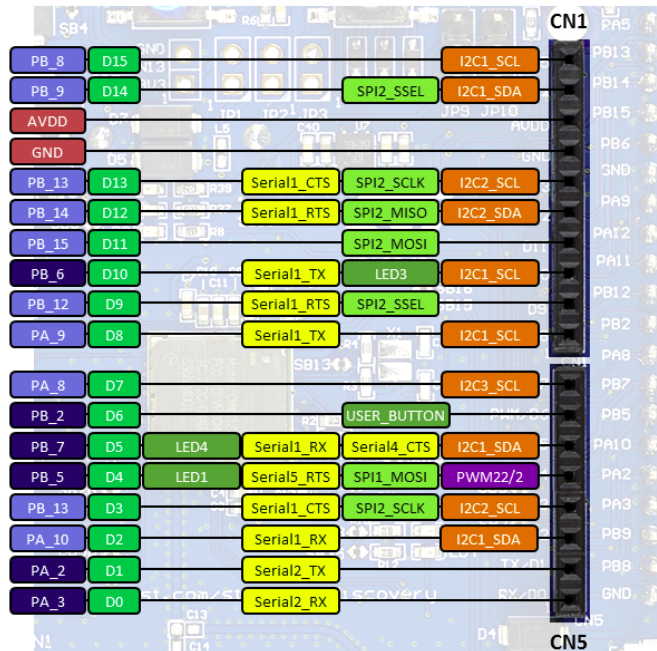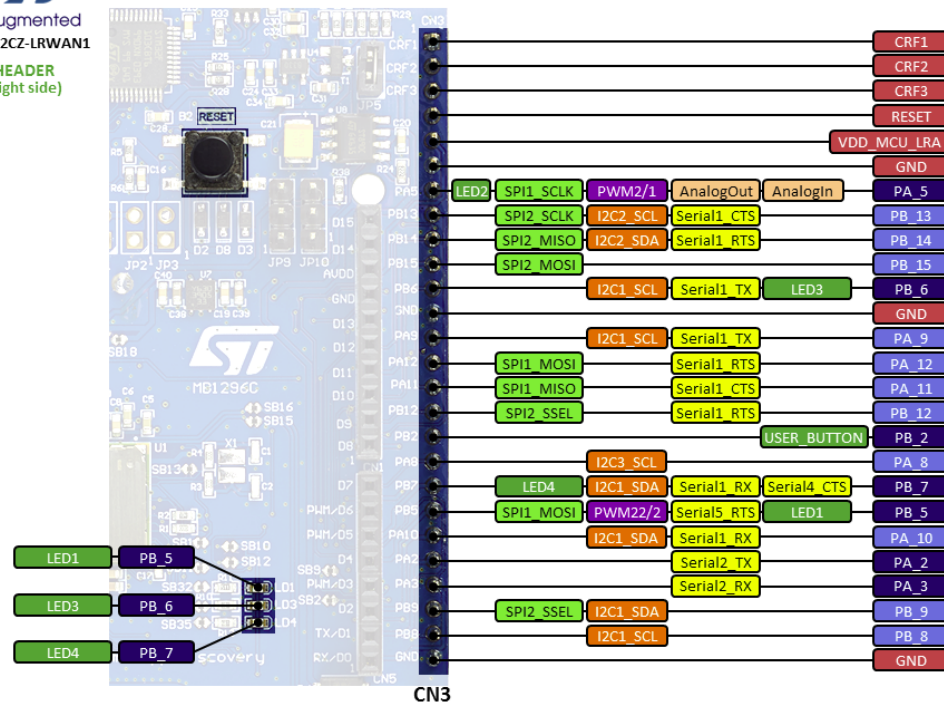| Pin	Arduino			
PB_8	D15			I2C1_SCL
PB_9	D14		SPI2_SSEL	I2C1_SDA
AVDD				
GND				
PB_13	D13	Serial1_CTS	SPI2_SCLK	I2C2_SCL
PB_14	D12	Serial1_RTS	SPI2_MISO	I2C2_SDA
PB_15	D11		SPI2_MOSI	
PB_6	D10	Serial1_TX	LED3	I2C1_SCL
PB_12	D9	Serial1_RTS	SPI2_SSEL	
PA_9	D8	Serial1_TX		I2C1_SCL
PA_8	D7			I2C3_SCL
PB_2	D6		USER_BUTTON	
PB_7	D5	LED4	Serial1_RX	Serial4_CTS	I2C1_SDA
PB_5	D4	LED1	Serial5_RTS	SPI1_MOSI	PWM22/2
PB_13	D3		Serial1_CTS	SPI2_SCLK	I2C2_SCL
PA_10	D2		Serial1_RX		I2C1_SDA
PA_2	D1		Serial2_TX		
PA_3	D0		Serial2_RX		

CN1
CN5

DISCO-L072CZ-LRWAN1

CN2 HEADER
(top left side)

Pin				
VCC				
VDD_MCU_LRA				
GND				
VDD_RF_LRA				
GND				
VDD_USB_LRA				
GND				
BOOT0				
PA_13				
PA_14				
NC				
NC				
NC				
NC				
NC				
NC				
GND				
RESET				
3V3				
5V				
VIN				
GND				
PA_0	Serial2_CTS	Serial4_TX	PWM2/1	AnalogIn
PA_4	AnalogIn	AnalogOut	SPI1_SSEL	
PH_1				
PH_0				

USER_BUTTON — PB_2

LED2 — PA_5

CN2

CN3

Supported shields¶

ST X-NUCLEO boards¶

See Matrix of tested boards.

Other Non-ST boards¶

See here.

Technical references¶

For more information, please refer to:

- STM32L072CZ microcontroller

- B-L072Z-LRWAN1 board

Known limitations¶

The following section describes known limitations of the platform. Note that general issues are tracked into the [mbed repository](#) available on GitHub.

- There is no AnalogIn on Arduino A1, A3, A4, A5 pins.

- There is no PWM on Arduino D3, D5, D6, D9 pins.

- In order to use Serial (TX and RX) on Arduino D0 and D1 pins, you have to remove SB28 and SB29 solder bridges. In this case you will lose the ST-Link connection.

- The C24 capacitor must be removed if the MCO clock configuration is selected (SB36 closed and USE_PLL_HSE_EXTC config enabled in targets.json file).

Tips and Tricks¶

Find more information in [ST WIKI pages](#).

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