



# STM32WL5X/EX LINES

The world's first SoC enabling  
LoRaWAN®, (G)FSK, (G)MSK, BPSK



**STM32WL5x/Ex lines: the STM32 pioneer in Sub-GHz wireless connectivity.  
Easy-to-use, reliable and tailored for a wide range of RF applications.**

The STM32WL5x/Ex lines supports multi-modulation and delivers outstanding ultra-low-power performance.

This makes it an ideal choice for LPWAN and IoT developments.

Embedding an Arm® Cortex®-M4 core, an optional Cortex®-M0+ and a Sub-GHz transceiver in one single chip, the STM32WL series ensures wireless application flexibility with LoRaWAN® and is compatible with Sigfox, W-MBUS or many other proprietary protocols, in a fully open way.

## WIRELESS CONNECTIVITY

Designed for Sub-GHz LPWANs, the STM32WL5x/Ex lines comes with a LoRaWAN® stack and Sigfox stack, available free of charge on [st.com](http://st.com) in STM32CubeWL.

Thanks to a deep integration, the innovative and open architecture is optimized for flexible resource use, power management and helps lower BOM cost while offering a better user experience.

Developed using the same technology as the one implemented in our ultra-low-power STM32L4 microcontrollers, the STM32WL series, with its integrated Sub-GHz transceiver, provides similar digital and analog peripherals for basic or complex

application use cases requiring an extended battery life and a long RF range.

## SYSTEM PERIPHERALS

- Modulations: LoRaWAN®, (G)FSK, (G)MSK, BPSK
- Linear frequency range: 150 to 960 MHz
- Dual-power outputs: up to 22 dBm and up to 15 dBm (Embedded PAs)
- Up to 43 GPIOs
- Embedded SMPS and LDO
- Multiple low-power modes to maximize battery life

## Security & ID

In addition to its wireless and ultra-low-power features, the dual-core line STM32WL5x/Ex also provides advanced security features, including embedded security hardware functions such as 128- / 256-bit AES hardware encryption, PCROP read / write protection, and public-key cryptography with an elliptic curve encryption engine.

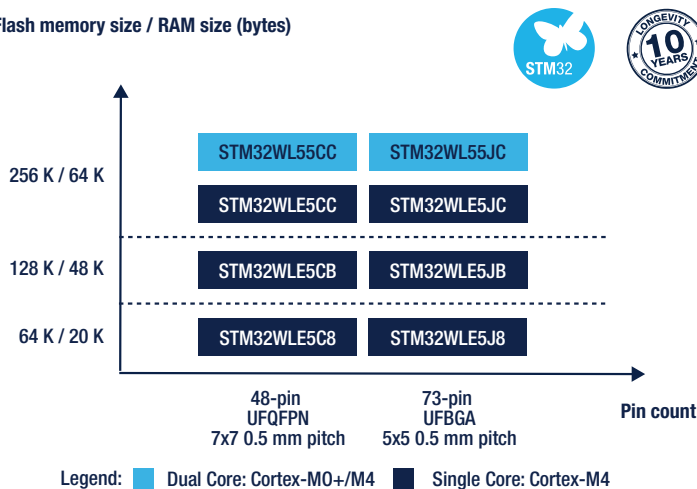
## Standard protocols



Legend:   Available from STM32CubeWL   Available from stackforce

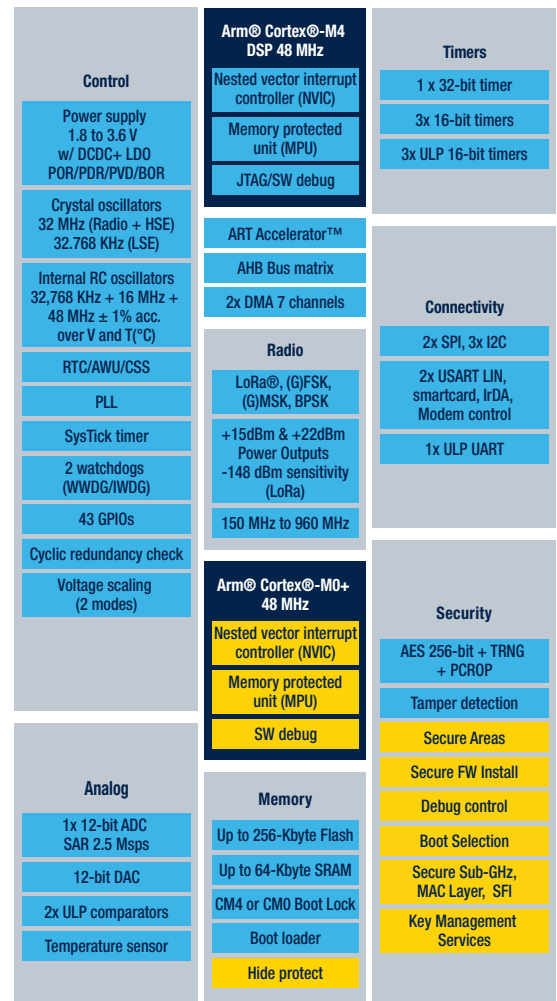
## STM32WL5x/Ex portfolio

Flash memory size / RAM size (bytes)



Companion chip  
STMicroelectronics' integrated matching RF components are tailored for STM32WL BGA, QFN, CSP packages:  
RF IPDs products STM32WL companion chip: BALFxBL-WL-xxxx

## Block diagram



Legend:   Features available only in the STM32WL5x dual-core line

## START DEVELOPING NOW!

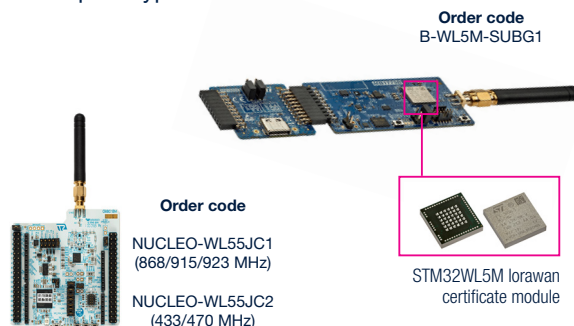
More than **1 million developers** have chosen STM32Cube, making it the reference in the industry.

STM32CubeWL  
firmware package

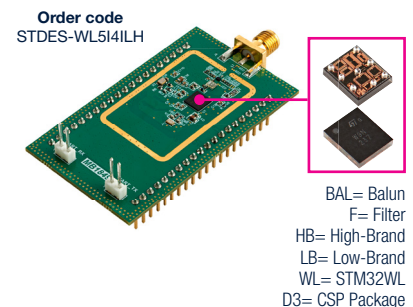


## Hardware tools

This STM32 Nucleo pack is the most cost-effective way to quickly get started developing STM32WL-based prototypes.



## Reference designs and IPD (balun)



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