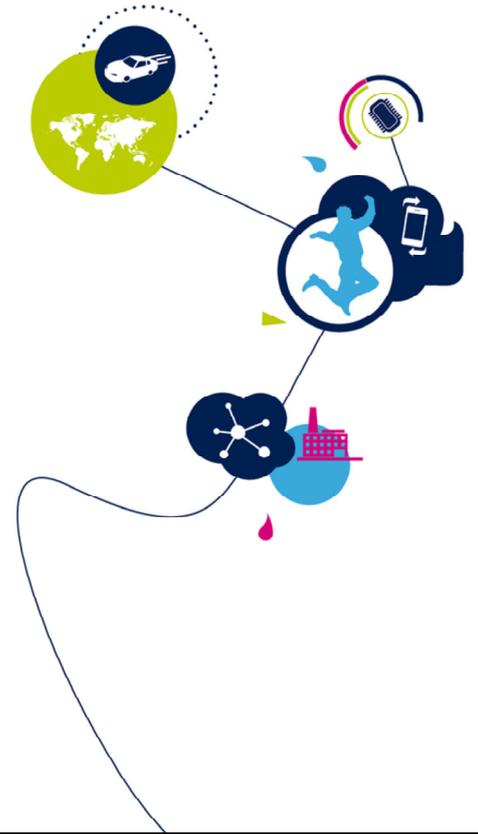


# STM32WB - Welcome

Welcome session

Revision 1.0



Hello, and welcome to the STM32WB training session.

# Training session organization

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- Introduction
- System
- Memory
- Security & Safety
- Analog
- Communication & Peripherals
- Watchdogs & Timers
- Ecosystem
- Next steps



This session is organized to provide you with the most important information to ensure that you can develop your application as easily as possible. You will find a technical description of all the STM32WB modules including peripherals and development tools organized into specific sections: system, memory, security, analog, peripherals, watchdog and timers and ecosystem.

You can browse each section separately and learn about each module in the order of your choice and at your convenience.

This session also allows you to search directly for a keyword and you will have a direct access to the sections covering this information.

The graphic features a blue wavy line across the top. Below it, a cluster of blue circles contains a silhouette of a person jumping. To the right, a yellow cube is enclosed in a circular frame with a pink arc. Further right, a small pink dotted circle is connected by a thin line. Below these elements is a purple circle containing a white butterfly icon and the text "STM32" with a Wi-Fi symbol above "WB".

**STM32WB MCU series**  
Excellence in **connectivity**



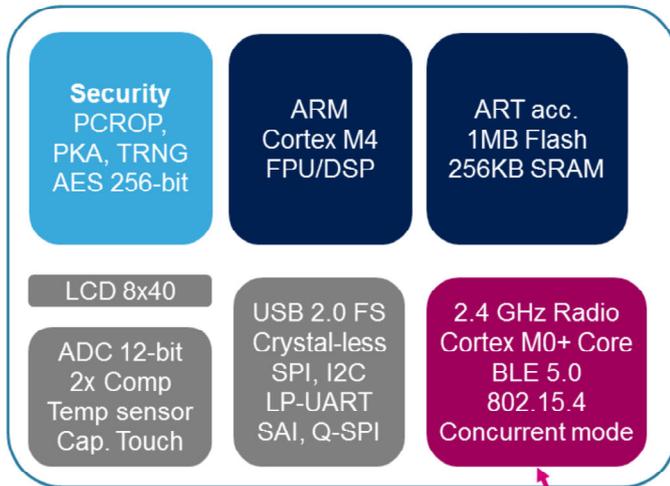
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Now, let's take a closer look at the STM32WB new series of wireless microcontrollers.



# About the STM32WB

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## KEY FEATURES

- 2 independent cores for real time execution
- Ultra-low-power consumption
  - 50  $\mu$ A/MHz Active mode (at 3.0V)
  - 1.8  $\mu$ A Stop mode (Radio in standby + 256KB RAM)
  - < 50 nA Shutdown mode
- Peripherals
  - 2xI<sup>2</sup>C, 1xUSART, 1xLP-UART, 2xSPI, 1x USB 2.0 FS device supporting Battery Charging Detection, 1xSAI, Q-SPI (XIP), 6x 16-bit timer (including LPWM and low-power one)
- 1.71 to 3.6V voltage range (DC/DC, LDO)
- -40°C to +105°C temperature range

Independent  
Sub-system RF  
2.4GHz



The STM32WB microcontroller is a new series of wireless MCUs with built-in BLE 5.0 and IEEE 802.15.4 RF modules. It is an evolution of the well-known market-leading STM32L4 ultra-low-power series of MCUs extended with new peripherals to support the widest range of use cases and enriched with additional low-power functions to improve the overall power efficiency.

The STM32WB embeds a dual-core architecture with a Cortex-M4 core used as an application processor CPU1, and a Cortex-M0+ core used as connectivity processor CPU2. The advantage of this dual-core architecture is that the connectivity processor handles all real-time aspects of the wireless protocols, and the application processor can freely be dedicated to the application with no real time constraints. The Radio sub-system is the third sub-system that can work autonomously and independently from the two CPUs.



# All in one MCU - Full flexibility control

- Robust RF link **-100dBm** sensitivity with IEEE 802.15.4 and **+6 dBm** output power
- Upgrade legacy 802.15.4 device to **BLE 5**
- Update** securely Radio and stack firmware with built-in RSS
- BLE 5 and 802.15.4 protocols **Mesh capable** to extend network range



Lighting



Fleet maintenance

- Retrofit legacy product to **BLE 5** and concurrency mode
- Remotely upgrade device with **OTA capability**
- Brand protection** with Authenticated **FW upgrade** system

- Up to **105°C** radio capable
- Down to **600 nA mode** with RTC and 32KB of RAM
- Only **5µs wakeup** time over 16 wakeup lines
- PCROP, ECC, IRNG, PKA, for best design robustness
- Reduce BOM cost with **built-in LCD booster**



Industrial devices



Fitness/Healthcare

- Multipoint** BLE 5 connections
- Small form factor design with **CSP100 pins**
- Battery life time care with **< 50 nA** Shutdown mode
- Dynamic Efficient **50 µA/MHz**
- Extend memory storage with **Quad-SPI**
- Handle advanced algorithm with **1 Mbyte** of Flash
- Cost optimized product with **USB 2.0 crystal-less** device

- Beacon** profile available among a huge list
- Embedded balun** to minimize design cost
- Only **5.5mA Radio TX** current to extend beacon life time
- Up to **+6 dBm** output power to get best beacon range
- < 1.8 µA** Stop mode with full RAM for **battery life** optimization
- Down to 1.71 full feature capable



Beaconing



Home security and Audio

- 100 dBm** sensitivity to increase area coverage
- Customer Key Storage (CKS)** for trustable Application update
- Manage full duplex **audio** with embedded SAI
- USB FS 2.0 with **Battery Charging Detection** for remote device



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Thanks to its rich set of features, the STM32WB can support a wide range of use cases from lighting to healthcare, from home monitoring to industrial control and any other IOT devices.



# Make the Choice of STM32WB Series

6

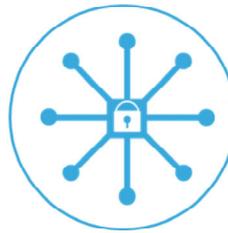
*The 7 keys points to make the difference*



Open 2.4 GHz radio  
Multi-protocol



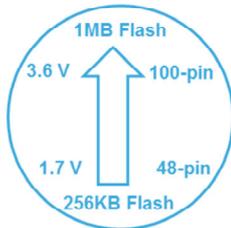
Dual-core / Full control  
Ultra-low-power



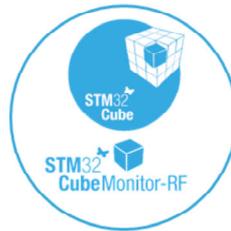
IoT Protection ready



Massive integration  
Cost saving



A large offer



Advanced RF tool, Energy control  
with C code generation



No matter what!



This slide summarizes the 7 key points that make a difference for the selection of the STM32WB microcontroller for a new project.

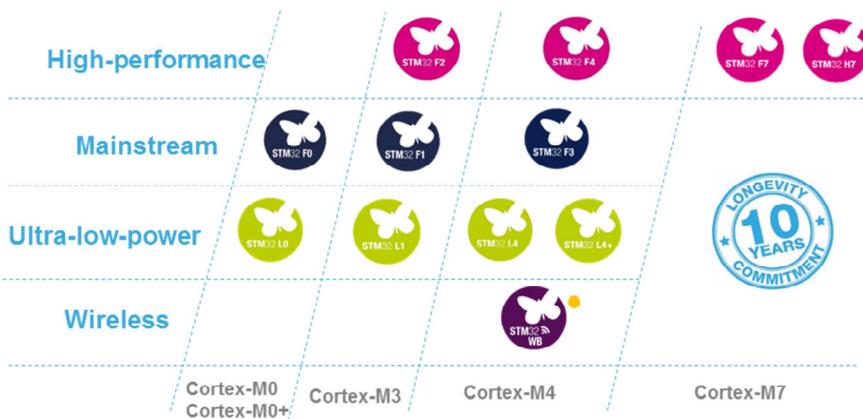
With two totally independent cores, this innovative architecture is optimized for real-time execution (radio-related software processing), resource use flexibility, power management, and BOM cost, to bring a better user experience.



# Great investment

7

12 product series / More than 50 product lines



More than  
40,000 customers



Legend: Cortex-M0+ Radio Co-processor



The STM32WB series benefits from ST's long experience in developing STM32 microcontrollers as well as a rich ecosystem based on its hardware and software tools already used throughout the STM32 MCU family.

Enjoy!

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[www.st.com/stm32wb](http://www.st.com/stm32wb)



Now let's get started with the training. Do not hesitate to follow the events and news about this product on our website at [www.st.com/stm32wb](http://www.st.com/stm32wb).  
Enjoy!