

# STM32WB Wireless Series With BLE 5.0 & IEEE 802.15.4



Deliver best-in class IoT solutions with built-in key storage, OTA firmware updates and protocol concurrency control

#### **A WIRELESS DUAL-CORE BRAIN**

The STM32WB series is a dualcore, multi-protocol and ultra-low-power 2.4 GHz MCU system-on-chip. It supports BLE 5.0 as well as IEEE 802.15.4 communication protocols (in Single and Concurrent modes) covering a wide spectrum of IoT application needs.

Based on ST's best-in-class, ultra-low-power STM32L4 MCU, the STM32WB series reduces development time and BOM cost, extends application battery life and inspires innovation thanks to its rich and flexible peripheral set.

The STM32WB series is designed to fit industrial, healthcare and consumer applications.

#### BLUETOOTH 5.0 & IEEE 802.15.4

The STM32WB SoC offers multi-protocol stacks including BLE 5.0 and OpenThread as well as standardized or proprietary IEEE 802.15.4 protocols in Concurrent mode for best-in-class RF performance and an optimized BOM.

#### **IP PROTECTION**

STM32WB devices offer a number of device integrity and industrial IP protection features to meet manufacturers' increasing demand for brand protection.

Features	Benefits
Dual-core solution in a single die	Dual-core solution with independent clock trees ensures real-time RF execution and optimized PCB and BOM
TX: 5.5 mA, RX: 3.8 mA BLE: –96 dBm, 802.15.4: –100 dBm	Extended battery life time. Perfect fit for coin cell battery Comfortable and robust operating distance of connection
Integrated balun	Reduces BOM cost and PCB footprint
OTA firmware updates	Easy fleet maintenance
Crystal-less USB 2.0 FS interface	Optimized BOM cost. Battery charging detection
LCD driver, integrated booster	Only a simple low-cost glass display is needed
Quad-SPI XIP	Simple way to upgrade active memory on existing designs.
Customer key storage Secure bootloader	Offers brand protection, IP protection and device integrity

#### STM32WB55 BLOCK DIAGRAM

Control		Memory
Power supply 1.71 to 3.6 V w/ DC/DC + LDO PDR/PDR/PVD/BOR	Arm <sup>®</sup> Cortex <sup>®</sup> -M4 FPU/DPS 64 MHz	Up to 1-Mbyte Flash memory
		Up to 256-Kbyte SRAM
	Nested vector	Boot ROM
Xtal oscillators 32 MHz (RF) 32.769 kHz (LSE)	interrupt controller (NVIC)	Secure boot loader
	Memory protected unit (MPU)	Connectivity
Internal RC oscillators	JTAG/SW debug	2 x SPI, 2 x I <sup>2</sup> C
32 kHz+ 4 ~ 48 MHz + 16 MHz (HSI) + 48 MHz ± 1% acc. over V and T(°C)	ADT Accolorator <sup>TM</sup>	1 x USART, LIN, Smartcard, IrDA Modem control
	AHB Bus matrix	1 x ULP UART
	2 x DMA 7 channels	USB 2.0 FS - Xtal less
SysTick timer	Multi protocol DE otock	Quad-SPI (XIP)
2 watchdogs	BLE 5.0	SAI (full duplex)
(WWDG/IWĎG)	IEEE 802 15.4	Timoro
Up to 72 GPIOs	AES	4 x 16-bit 32-bit timers
Cyclic redundancy check		2 x ULP 16-bit timers
Voltage scaling (2 modes)	Arm <sup>®</sup> Cortex <sup>®</sup> -M0+	Sensing 16-key capacitive touch
	MPU 32 MHz	Encryption
Analog	Nested vector	256-bit AES/PKA
2 x ULP comparators	interrupt controller (NVIC)	TRNG/PCROP
1 x 12-bit ADC SAR 4.25 Msps	Memory Protection Unit (MPU)	Display
Temperature sensor		8 x 40 LCD driver

## STANDARD PROTOCOL **Bluetooth** 5

THREAD

#### **STM32WB PORTFOLIO**

#### Flash memory / RAM size (bytes) 1 M / 256 K STM32WB55CG STM32WB55RG STM32WB55VG STM32WB55CE STM32WB55RE STM32WB55VE 512 K / 256 K 256 K / 128 K STM32WB55CC STM32WB55RC STM32WB55VC Pin count 48-pin UQFN 68-pin VQFN 100-pin WLCSP (0.5 mm pitch) (0.4 mm pitch) (0.4 mm pitch) Legend: Samples available © STMicroelectronics - February 2018 - All rights reserved



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#### For more information on ST products and solutions, visit www.st.com/stm32wb

#### **HARDWARE TOOLS**

This STM32 Nucleo pack is the most cost-effective way to quickly get started developing STM32WB-based prototypes.



Order code: P-NUCLEO-WB55 Samples available

### EMBEDDED SOFTWARE

The STM32CubeWB package includes the STM32Cube HAL and low-layer (LL) APIs peripheral drivers, a consistent set of middleware components (RTOS, USB, FatFS and STM32 touch sensing), as well as BLE and Thread connectivity stacks. All embedded software utilities come with a full set of examples running on STMicroelectronics boards.

## **SOFTWARE TOOLS**

STM32CubeMX enables faster development thanks to its MCU pinout and clock configurator, power consumption calculator and code generation tools. An Eclipse plug-in (STSW-STM32095) is also available.

STM32CubeMonRF, a development tool dedicated to wireless connectivity, is also available for radio testing and beaconing to fasten time to market.



