The STM32WBx0 is a dual-core wireless MCU based on an Arm® Cortex®-M4 core running at 64 MHz and an Arm® Cortex®-M0+ core at 32 MHz.

A wireless dual-core brain
The STM32WBx0 Value Line is an entry-level solution, extending our portfolio to allow developers to define the right level of features for cost-efficient design to meet the requirement of a broad range of industrial and consumer IoT applications. Thanks to its low-power stop and standby modes and best-in-class RF performance, the STM32WBx0 Value Line provides application connectivity with an extended battery life, making it ideal for point to point or meshed applications such as innovative location-based services in retail marketing, asset tracking, beaconing...

Bluetooth® LE 5.2 & IEEE 802.15.4*
Value Line of wireless microcontrollers addresses Bluetooth® LE 5.2-certified stack, with Mesh 1.0 and multiple profiles. It also supports several IEEE 802.15.4 meshed protocols with Zigbee® PRO and its wide set of Zigbee 3.0 Clusters, as well as OpenThread.

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

<table>
<thead>
<tr>
<th>Features*</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-core solution in a single die</td>
<td>Dual-core solution with independent clock trees ensures real-time RF execution and optimized PCB and BOM</td>
</tr>
<tr>
<td>+4dBm max output power</td>
<td>Comfortable and robust operating distance of connection</td>
</tr>
<tr>
<td>BLE: −96 dBm (all value line references)</td>
<td>Reduces BOM cost and 2 layers PCB footprint</td>
</tr>
<tr>
<td>802.15.4: −100 dBm (STM32WB30 &amp; STM32WB50)</td>
<td>A 2 in 1 effective centric solution for wireless platforms</td>
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<tr>
<td>Integrated balun</td>
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<tr>
<td>Easy package integration</td>
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<tr>
<td>Up to 1MB flash, 30 GPIOs, RTC, high resolution ADC and multi communication interfaces</td>
<td></td>
</tr>
</tbody>
</table>

Note: * Features availability or characteristics depend on STM32WB reference
STM32WB50 BLOCK DIAGRAM

**Control**
- Power supply 2.0V to 3.6V (LDO)
- POR/PDR/PVD/BOR
- Crystal oscillators 32 MHz (Radio)
- 32.769 KHz (LSE)
- Internal RC oscillators 32 KHz (LSI)
- 32 MHz (Radio)
- 32.769 KHz (LSE)
- 32 KHz (LSI)
- 16 MHz (HSI)
- RTC/AWU/CSS
- PLL/PLL
- SysTick timer
- 2 watchdogs (WWDOG/WSDG)
- 30 GPIOs
- 48 pins QFN
- Cyclic redundancy check

**Memory**
- Arm® Cortex®-M4 FPU/DSP 64 MHz
- Nested Vector Interrupt Controller (NVIC)
- Memory Protected Unit (MPU)
- JTAG/SW debug
- Single 1-Mybyte Flash memory
- 128-Kbyte SRAM
- Boot ROM
- Secure boot loader

**Connectivity**
- 1 x SPI, 1 x PC
- 1 x UART
- ART Accelerator™
- AHB bus matrix
- 1 x DMA 7 channels
- Multi-protocol RF stack
- Bluetooth® LE
- IEEE 802.15.4
- Arm® Cortex®-M0+
- 32 MHz
- Nested Vector Interrupt Controller (NVIC)

**Timers**
- 3 x 16-bit 32-bit timers
- 2 x 16-bit timers

**Security**
- TRNG/PCROP

**Analog**
- 1 x 12-bit ADC
- SAR 4.1 MSPS
- Temperature sensor

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

**Stick code**: P-NUCLEO-WB55

**Order codes**: NUCLEO-WB55RG
NUCLEO-WB15CC

**EMBEDDED SOFTWARE**
The STM32CubeWB package includes the STM32Cube hardware abstraction layer (HAL) and low-layer (LL) APIs peripheral drivers, a consistent set of middleware components (RTOS, FatFS), as well as Bluetooth® LE 5.2, OpenThread and Zigbee 3.0 connectivity stacks. All embedded software components 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.

**STM32CubeIDE**
Is an Eclipse-based IDE which integrates the features of the STM32CubeMX configuration tool.

**STM32CubeMonitor**
Is a development tool dedicated to wireless connectivity (STM32CubeMonRF) which helps reduce time-to-market by enabling radio testing and beaconing.

**STM32CubeProg**
Is an all-in-one software tool for programming STM32 devices which can be easily used to interact with the memory of the STM32WB, including secure programming of the RF stacks.

**STM32WB ONLINE TRAINING**
www.st.com/stm32wb-online-training

**Pin count**
48-pin UQFN
(0.5 mm pitch)

**STM32WBx0 PORTFOLIO**

<table>
<thead>
<tr>
<th>Flash memory / RAM size (bytes)</th>
<th>STM32WB50CG</th>
<th>STM32WB30CE</th>
<th>STM32WB10CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 M / 128 K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>512 K / 96 K</td>
<td></td>
<td></td>
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<tr>
<td>320 K / 48 K</td>
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</table>

**Legend**
- STM32WB50 super set
- STM32WB30 featured
- STM32WB10 optimized

**Companion chip**
STMicroelectronics’ integrated matching RF components are tailored for STM32WB packages : MLPF-WB-01E3.