STM32WBxM wireless modules

Bluetooth® Low Energy 5.4, Zigbee 3.0, and Thread
Five product categories

- Wireless MCU: Short- and long-range connectivity
- Ultra-low-power MCU: 32-bit general-purpose microcontrollers: from 75 to 3,224 CoreMark score
- Mainstream MCU
- High-performance MCU
- Embedded MPU: 32- and 64-bit microprocessors

Enabling edge AI solutions
Scalable security
Choose the STM32WB series
7 keys points that make a difference

- Open 2.4 GHz radio Multi-protocol
- 256KB Flash
- Massive integration Cost saving
- Dual-core / Full control Ultra-low-power
- IoT Protection ready
- 1MB Flash
- 129-pin
- 3.6 V
- 48-pin
- 1.7 V
- 256KB Flash
- A large offer
- Advanced RF tool, Energy control with C code generation
- No matter what!
STM32WB MCU provides a large offering

Bluetooth® Low Energy 5.4, OpenThread, Zigbee 3.0 and proprietary protocol capable
STM32WBxM module portfolio

Easy deliver BLE applications

STM32WB1MMC
- Flash memory / RAM size: 320K / 48K
- Pin count: 77-pin LGA, 6.5 x 10 mm, 0.45 mm pitch
- Temperature range: from -40°C to +85°C
- Voltage range: from 1.7 V to 3.6 V

STM32WB5MMG
- Flash memory / RAM size: 1M / 256K
- Pin count: 86-pin LGA, 7.3 x 11 mm, 0.435 mm pitch
- Temperature range: from -40°C to +85°C
- Voltage range: from 1.7 V to 3.6 V

Latest product generation
Available as a module to reduce your time to market
STM32WB5MMG module

Easy to integrate - smooth certification process for developers

Key advantages

• WLCSP100 package integrated
• Maximum of features exposed
• Low-cost PCB for the mother board
• No RF expertise

Watch the video
STM32WB5MMG multi-protocol module

Small form factor
7.3 x 11 mm
Full reference design up to antenna, crystals

Multi-protocols
- Bluetooth®
- Zigbee
- Matter
- + Concurrent modes & Proprietary 2.4GHz

Rich feature set
- Dual core* based
- 1 Mbyte flash memory
- 256 KBytes of RAM
- LCD, USB FS, ADC, COMP
- Security
- OTA (application, radio)

Reduce the cost
- Down to 2 PCB layers
- Everything inside (single cap outside)
- Free of charge radio stack
- Certified FCC, CE, NCC, JRF, KC, SRRC, ISED, GOST

Discovery kit

STM32 ecosystem

RPN : STM32WB5MMGH6TR

*Dual Core: One core dedicated to Radio and protocols stack and One core dedicated for application
Prototyping made as easy as 1,2,3

Hardware discovery kit

STM32WB5MM-DK

STM32WB

STM32CubeMX/STM32CubeWB/
STM32CubeProg & STM32CubeMonRF
Code generation
Power calculation

STM32CubeMonitor
STM32CubeProgrammer
STM32CubeMX
STM32WB5MM-DK

Sensors:
ToF, Temp/humidity, 3-axis motion, Mic

Module
STM32WB5MMGH6TR

Touch Sense

OLED screen
(SPI connection)

User USB

2 user buttons

STLink

multicolor LED

Reset button

IR LED

EXT Flash
(quad-SPI)

STMOD+

Top view

Bottom view
(ARDUINO connectors)

Watch the video
STM32WB1M module

Flash memory / RAM size (bytes)
320K / 48K

STM32WB1MMC
Pin count
77-pin LGA
from 1.7 V to 3.6 V
from -40°C to +85°C

Bluetooth LE Module Solution

Dual Core
RF Filter
Antenna
XTAL + passive

Control
- Power supply: 1.71V to 3.6V w/ DC/DC
- Nested Vector Interrupt Controller (NVIC)
- Memory Protection Unit (MPU)
- JTAG / SW debug
- ARM Cortex-M4 FPU/DSP 64MHz
- Nested Vector Interrupt Controller (NVIC)
- Memory Protected Unit (MPU)
- JTAG / SW debug
- ART Accelerator™
- AHB Bus Matrix
- 1x DMA 7 channels
- Multi-Protocol Radio
- Bluetooth™ LE 5.3
- AES 256-bit
- ARM Cortex-M0+ MPU 32MHz
- Nested Vector Interrupt Controller (NVIC)
- SW debug
- Control
- Memory
- 32Kb Flash
- 4Kb SRAM
- Boot ROM
- Secure boot loader
- Connectivity
- 1x SPI, 1x PC
- 1x USART
- ISO7816, smartcard, I/O, Modem control
- 1x ULP UART
- Security
- AES 256-bit/PKA/TRNG
- PCROP / FUS
- 32KHz XTAL
- 32MHz XTAL
- 27 GPIOs
- Option for external antenna

STM32

77-pin LGA
from 1.7 V to 3.6 V
from -40°C to +85°C
STM32WB1M module

**Small form factor**
- 6.5 x 10 mm
- Everything inside (antenna, crystals…)
- Option: internal or external antenna

**Extended Battery life**
- DCDC configuration
- Standby ultra-low-power mode while radio activities

**Reduce costs**
- Down to 2 PCB layers
- Everything inside (single cap outside)
- Free radio stack
- Certifications FCC, CE, NCC, JRF, KC, SRRC, ISED

**Bluetooth® Low Energy protocol**
- Proprietary 2.4GHz

**Rich feature set**
- Dual core* based
- 320 Kbytes flash
- 48 Kbytes RAM
- ADC, COMP, TSC
- Security
- OTA (application, radio)

**Connectivity expansion board**
- STM32W1MMCH6
- RPN: B-WB1M-WPAN1
- SMA connector not assembled by default

**STM32 ecosystem**

RPN: STM32WB1MMCH6

*Dual Core: One core dedicated to Radio and protocols stack and One core dedicated for application
Prototyping made as easy as 1,2,3

STM32WB

B-WB1M-WPAN1*

Hardware connectivity expansion board

*Available in Q4/2023

STM32CubeMX/STM32CubeWB/STM32CubeProg & STM32CubeMonitor
Code generation
Power calculation

Life augmented
B-WB1M-WPAN1 expansion board

**Power supply options:**
- From Host through STMOD+ (slave mode)
- From USB type C through STMOD+ adapter (master mode)
- From Battery LiPo type directly connected (master mode)

Boot mode through micro switch

1x User button
1x Reset button
1x LED Blue

**Sensors:**
- Temperature sensor
- Accelerometer

**Connectors:**
- STMOD+
- STDC14 receiver
- SMA connector for external antenna connexion option (not assembled by default)

**Additional features:**
Adapter board female-female STMOD+ (B_STMOD_FEM), provided with CEB
Power consumption measurement capability through jumper
Software tools for STM32WBxM modules

A complete design journey, from configuration to application monitoring

**STM32CubeMX**
- Graphical tool for easy configuration
  - Configure and generate code
  - Peripherals and middleware configuration

**IDEs**
- Simple, powerful solutions
  - Partners IDE (Arm® Keil®) FREE
  - IDE based on Eclipse
  - RTOS aware debug

**STM32 programming & monitoring tools**
- Device and memory configuration
- Program the application
- Monitor variables at runtime

STM32CubeProg
STM32CubeMonitor
Releasing your creativity

/STM32
@ST_World
community.st.com
www.st.com/STM32WB
wiki.st.com/stm32mcu
github.com/STMicroelectronics
STM32WB online training
STM32WB blog article
MOOC – STM32WB workshop
Our technology starts with You

Find out more at [www.st.com/STM32WB](http://www.st.com/STM32WB)