

# NINA-B30 series



## Stand-alone Bluetooth 5 low energy modules



Standard



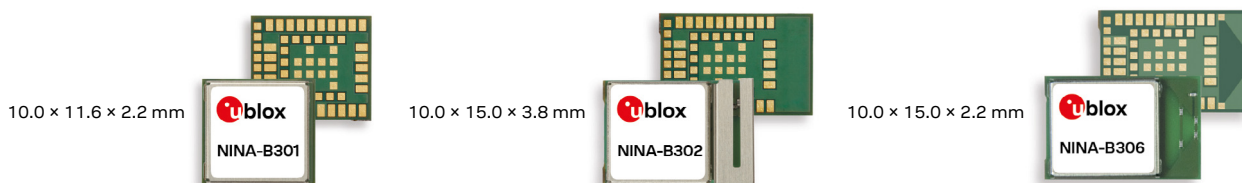
Professional



Automotive

### Full Bluetooth 5 with powerful MCU and worldwide certifications

- Full Bluetooth 5, Bluetooth mesh, 802.15.4 Thread, and Zigbee
- Powerful open CPU for advanced customer applications
- Hardware optimized for performance and low power consumption
- Pin compatible with other NINA modules
- Superior security functionality
- Multiple antenna options



### Product description

The NINA-B30 series are small, stand-alone Bluetooth low energy microcontroller unit (MCU) modules. NINA-B30 features full Bluetooth 5, a powerful Arm® Cortex®-M4 with FPU, and state-of-the-art power performance. The embedded low power crystal in NINA-B30 improves the power consumption by enabling optimal power save modes.

Both variants are open CPU modules that enable customer applications to run on the built-in Arm Cortex-M4 with FPU. With 1 MB flash and 256 kB RAM, they offer the best-in-class capacity for customer applications on top of the Bluetooth low energy stack. Applications can include Bluetooth low energy services such as GATT, beacons, and mesh. Additionally, the modules support NFC™, 802.15.4 with Thread and ZigBee. The modules have a range of wired interfaces, including UART, SPI, I2C, I2S, USB, QDEC, PDM, PWM, and ADC.

NINA-B30 caters to applications in smart buildings, smart cities, and the Industry 4.0, including smart lighting systems, industrial sensor networks, asset tracking solutions, and building automation systems.

NINA-B302 comes with an internal PIFA antenna, NINA-B306 comes with an internal PCB antenna, while NINA-B301 has a pin for use with an external antenna. The internal PIFA antenna is specifically designed for the small NINA form factor and provides an extensive range, independent of ground plane and component placement. The internal PCB antenna provides a robust low profile solution with high performance.

The NINA-B30 series is globally certified for use with the internal antenna or a range of external antennas. This greatly reduces time, cost, and effort for customers integrating NINA-B30 in their designs.

|                                             | NINA-B301 | NINA-B302 | NINA-B306 |
|---------------------------------------------|-----------|-----------|-----------|
| <b>Grade</b>                                |           |           |           |
| Automotive                                  |           |           |           |
| Professional                                | •         | •         | •         |
| Standard                                    |           |           |           |
| <b>Radio</b>                                |           |           |           |
| Chip inside                                 | nRF52840  |           |           |
| Bluetooth qualification                     | v5.0      | v5.0      | v5.0      |
| Bluetooth low energy                        | •         | •         | •         |
| Thread / Zigbee                             | •         | •         | •         |
| Bluetooth output power EIRP [dBm]           | 10        | 10        | 10        |
| Max range [meters]                          | 1400      | 1400      | 1400      |
| NFC                                         | •         | •         | •         |
| Antenna type (see footnotes)                | pin       | metal     | pcb       |
| <b>Application software</b>                 |           |           |           |
| Open CPU for embedded customer applications | •         | •         | •         |
| <b>Interfaces</b>                           |           |           |           |
| UART                                        | ♦         | ♦         | ♦         |
| SPI                                         | ♦         | ♦         | ♦         |
| I2C                                         | ♦         | ♦         | ♦         |
| I2S                                         | ♦         | ♦         | ♦         |
| USB                                         | ♦         | ♦         | ♦         |
| PDM and PWM                                 | ♦         | ♦         | ♦         |
| GPIO pins                                   | 38        | 38        | 38        |
| AD converters [number of bits]              | 12        | 12        | 12        |
| <b>Features</b>                             |           |           |           |
| MCU (see footnotes)                         | M4F       | M4F       | M4F       |
| RAM [kB]                                    | 256       | 256       | 256       |
| Flash [kB]                                  | 1024      | 1024      | 1024      |
| Simultaneous GATT server and client         | ♦         | ♦         | ♦         |
| Throughput [Mbit/s]                         | 1.4       | 1.4       | 1.4       |
| Maximum Bluetooth connections               | 20        | 20        | 20        |
| Secure boot                                 | ♦         | ♦         | ♦         |
| Bluetooth mesh                              | ♦         | ♦         | ♦         |
| FOTA                                        | ♦         | ♦         | ♦         |

pin = Antenna pin  
 metal = Internal metal PIFA antenna  
 pcb = Internal PCB antenna  
 M4F = 64 MHz Arm® Cortex-M4 with FPU

♦ = Feature enabled by hardware.  
 Support depends on the open CPU application software.

# NINA-B30 series



## Features

|                             |                                             |
|-----------------------------|---------------------------------------------|
| Bluetooth                   | v5.0 (Bluetooth low energy)                 |
| NFC                         | NFC-A tag support                           |
| Range                       | 1400 m                                      |
| Max. conducted output power | 8 dBm                                       |
| Conducted sensitivity       | -94 dBm (1 Mbit/s)<br>-100 dBm (125 Kbit/s) |

## Open CPU for customer application

Customers develop and embed their own application on top of the Bluetooth stack in the NINA-B30x modules (open CPU concept). This section describes the possible features enabled by the NINA-B30 hardware. Use Nordic Semiconductor's SDK environment to develop the connectivity and application software.

|                         |                                                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Development environment | Nordic SDK (including Bluetooth Mesh, HomeKit, AirFuel, IoT)                                                                  |
| HW interfaces *         | 2 x UART<br>3 x SPI<br>38 x GPIO pins<br>8 x ADC channels<br>12 x PWM<br>1 x USB<br>2 x I2C<br>1 x I2S<br>1 x PDM<br>1 x QDEC |
| Security                | Secure boot<br>Secure Simple Pairing<br>128-bit AES encryption<br>BLE secure connections                                      |

\* Not all simultaneously

## Electrical data

|                                        |                                                                                                |
|----------------------------------------|------------------------------------------------------------------------------------------------|
| Power supply                           | 1.7 VDC to 3.6 VDC                                                                             |
| Power consumption in Bluetooth LE mode | Active TX @ 0 dBm: 4.9 mA<br>Standby: 1.3 µA<br>Sleep: 400 nA (with wake-up on external event) |

## Package

|            |                                                                                                       |
|------------|-------------------------------------------------------------------------------------------------------|
| Dimensions | NINA-B301: 10.0 x 11.6 x 2.2 mm<br>NINA-B302: 10.0 x 15.0 x 3.8 mm<br>NINA-B306: 10.0 x 15.0 x 2.2 mm |
| Weight     | < 1.0 g                                                                                               |
| Mounting   | Machine mountable<br>Solder pins                                                                      |

## Environmental data, quality & reliability

|                       |                           |
|-----------------------|---------------------------|
| Operating temperature | -40 °C to +85 °C          |
| Storage temperature   | -40 °C to +85 °C          |
| Humidity              | RH 5 – 90% non-condensing |

## Certifications and approvals

|                         |                                                                                                                                                                                                   |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type approvals          | Europe (ETSI RED); US (FCC/CFR 47 part 15 unlicensed modular transmitter approval); Canada (IC RSS); Japan (MIC); Taiwan (NCC); Australia (ACMA); New Zealand; Brazil (Anatel); South Korea (KCC) |
| Health and safety       | EN 62479, EN 60950-1, IEC 60950-1                                                                                                                                                                 |
| Bluetooth qualification | v5.0 (Bluetooth Low Energy)                                                                                                                                                                       |

## Support products

|               |                                                                             |
|---------------|-----------------------------------------------------------------------------|
| EVK-NINA-B301 | Evaluation kit for NINA-B301 module with open CPU and antenna pin           |
| EVK-NINA-B302 | Evaluation kit for NINA-B302 module with open CPU and internal PIFA antenna |
| EVK-NINA-B306 | Evaluation kit for NINA-B306 with open CPU and internal PCB antenna         |

## Product variants

|           |                                         |
|-----------|-----------------------------------------|
| NINA-B301 | With open CPU and antenna pin           |
| NINA-B302 | With open CPU and internal PIFA antenna |
| NINA-B306 | With open CPU and internal PCB antenna  |

## Further information

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).

For more product details and ordering information, see the product data sheet.

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