Product summary

NINA-B31 series

Stand-alone Bluetooth 5 low energy modules

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Standard

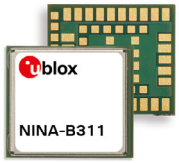
Professional

Automotive

Full Bluetooth 5 made easy and with worldwide certifications

- Full Bluetooth 5 with long range
- u-connectXpress software for accelerated time to market
- Hardware optimized for performance and low power consumption
- Pin compatible with other NINA modules
- Superior security functionality with built-in secure boot
- Multiple antenna options

10.0 × 11.6 × 2.2 mm



10.0 × 15.0 × 3.8 mm

10.0 × 15.0 × 2.2 mm

Product description

The NINA-B31 series are small, stand-alone Bluetooth low energy wireless microcontroller unit (MCU) modules. NINA-B31 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-B31 improves the power consumption by enabling optimal power save modes. The NINA-B31 modules are delivered with u-connectXpress software, providing support for u-blox Bluetooth low energy Serial Port Service, GATT client and server, beacons, NFC™, and simultaneous peripheral and central roles. u-connectXpress provides support for a host to easily configure connectivity using AT commands.

The NINA-B31 modules provide top grade security, thanks to secure boot, which ensures the module only boots up with original u-blox u-connectXpress software. NINA-B31 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-B312 comes with an internal PIFA antenna, NINA-B316 comes with an internal PCB antenna, while NINA-B311 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-B31 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-B31 in their designs.

	NINA-B311	NINA-B312	NINA-B316
Grade			
Automotive			
Professional	•	•	•
Standard			
Radio			
Chip inside		nRF52840	
Bluetooth qualification	v5.0	v5.0	v5.0
Bluetooth low energy	•	•	•
Bluetooth output power EIRP [dBm]	10	10	10
Max range [meters]	1400	1400	1400
NFC	•	•	•
Antenna type (see footnotes)	pin	metal	pcb
Application software			
u-connectXpress	•	•	•
Interfaces			
UART	2	2	2
GPIO pins	28	28	28
Features			
AT command interface	•	•	•
Simultaneous GATT server and client	•	•	•
Low Energy Serial Port Service	•	•	•
Throughput [Mbit/s]	0.8	0.8	0.8
Maximum Bluetooth connections	8	8	8
Secure boot	•	•	•
Bluetooth mesh	•	•	•

pin = Antenna pin
pcb = Internal PCB antenna
metal = Internal metal PIFA antenna

NINA-B31 series

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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) –100 dBm (125 Kbit/s)

u-connectXpress software

This section describes the NINA-B31 u-connectXpress software features. More features will be available via software updates.

Software features	u-blox Low Energy Serial Port Service (SPS); GATT server and client via AT commands; Configuration over air; Extended Data Mode (EDM) protocol for simultaneous AT commands and data, and multiple simultaneous data streams; beacons; NFC tag for pairing and data; 2 Mbit/s modulation; 125 and 500 Kbit/s modulation for long range functionality; Advertisement extensions
HW interfaces	2 x UART, GPIO
Configuration	AT Commands
Support tools	s-center
Operating modes	Central role (7 simultaneous links) Peripheral role (6 simultaneous links) Simultaneous central and peripheral roles (8 in total, where max 4 as peripheral and max 7 as central) LE 1M PHY LE 2M PHY LE CODED PHY Advertising extensions LE data length extension
Security	Secure boot Secure simple pairing 128-bit AES encryption LE secure connections
Throughput over UART	780 Kbit/s

Package

Dimensions	NINA-B311: 10.0 x 11.6 x 2.2 mm NINA-B312: 10.0 x 15.0 x 3.8 mm NINA-B316: 10.0 x 15.0 x 2.2 mm
Weight	< 1.0 g
Mounting	Machine mountable 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

Electrical data

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

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-B311	Evaluation kit for NINA-B311 module with u-connectXpress software and antenna pin
EVK-NINA-B312	Evaluation kit for NINA-B312 module with u-connectXpress software and internal PIFA antenna
EVK-NINA-B316	Evaluation kit for NINA-B316 module with u-connectXpress software and internal PCB antenna

Product variants

The NINA-B31 variants come with pre-flashed u-connectXpress software.

NINA-B311	With antenna pin and u-connectXpress software
NINA-B312	With internal PIFA antenna and u-connectXpress software
NINA-B316	With internal PCB antenna and u-connectXpress software

Further information

For contact information, see www.u-blox.com/contact-us.

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