Product summary

NINA-B1 series

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Stand-alone Bluetooth 5 low energy modules with NFC

Standard

Professional

Automotive

Feature rich Bluetooth 5 low energy with most worldwide certifications

- Bluetooth 5 and Bluetooth mesh
- u-connect software for accelerated time to market
- Open CPU for customer applications
- Hardware optimized for performance and low power consumption
- Pin compatible with other NINA modules
- Multiple antenna options

10.0 × 10.6 × 2.2 mm

10.0 × 14.0 × 3.8 mm

Product description

The NINA-B1 series modules are small, stand-alone Bluetooth low energy modules featuring Bluetooth 5, a powerful Arm® Cortex®-M4 with FPU, and state-of-the-art power performance. The embedded low power crystal in NINA-B1 minimizes power consumption, thus extending the battery life.

The NINA-B1 is delivered with u-connectXpress software that provides support for u-blox Bluetooth low energy Serial Port Service, GATT client and server, beacons, NFC™, Bluetooth mesh, and simultaneous peripheral and central roles – all configurable from a host by using AT commands.

NINA-B1 offers full flexibility for customers who prefer their application to run on the built-in Arm Cortex-M4 with FPU. With 512 kB flash and 64 kB RAM, it offers the best-in-class capacity for customer applications running on top of the Bluetooth low energy stack using SDK from Nordic Semiconductor or Arm Mbed. Additionally, NFC and interfaces such as SPI, I²C, and I²S are available, and features like Bluetooth mesh, AirFuel, and Apple HomeKit are also supported. In combination with Wirepas Mesh stack, NINA-B1 can form large scale industrial mesh networks for several applications, such as lighting, asset tracking, and metering.

NINA-B112 comes with an internal antenna and NINA-B111 has a pin for use with an external antenna. The internal PIFA antenna is specifically designed for the small NINA-B1 form factor and provides an extensive range of more than 300 m, independent of ground plane and component placement.

The NINA-B1 series is globally certified for use with the internal antenna or a range of external antennas. This reduces time and effort for customers integrating NINA-B1 in their designs.

	NINA-B111		NINA-B112	
Grade				
Automotive				
Professional	•		•	
Standard				
Radio				
Chip inside	nRF52832			
Bluetooth qualification	v5.0		v5.0	
Bluetooth low energy	•		•	
Bluetooth output power EIRP [dBm]	7		6	
Max range [meters]	350		300	
NFC	•		•	
Antenna type (see footnotes)	pin		metal	
Application software				
u-connectXpress	•		•	
Open CPU for embedded applications		•		•
Interfaces				
UART	1	♦	1	♦
SPI		♦		♦
I2C		♦		♦
I2S		♦		♦
PDM and PWM		♦		♦
GPIO pins	7	19	7	19
AD converters [number of bits]		12		12
Features				
AT command interface	•		•	
MCU (see footnotes)		M4F		M4F
RAM [kB]		64		64
Flash [kB]		512		512
Simultaneous GATT server and client	•	♦	•	♦
Low Energy Serial Port Service	•		•	
Throughput [Mbit/s]	0.8	1.4	0.8	1.4
Maximum Bluetooth connections	7	20	7	20
Bluetooth mesh	•	♦	•	♦
FOTA		♦		♦

pin = Antenna pin
metal = Internal metal PIFA antenna

♦ = Feature enabled by HW. The actual support depends on the open CPU application SW.
M4F = 64 MHz Arm® Cortex-M4 with FPU

NINA-B1 series

S

Features

Bluetooth	v5.0 (Bluetooth low energy)
NFC	NFC-A tag support
Range	NINA-B111: 350 m, antenna pin reference design with 1/2 wave antenna NINA-B112: 300 m, internal antenna
Max. conducted output power	4 dBm
Max. radiated output power (EIRP)	7 dBm with approved antennas
Receiver sensitivity	NINA-B111: –95 dBm Conducted (–98 dBm with approved antennas) NINA-B112: –97 dBm

u-connectXpress software

This section describes features of NINA-B1 when used with the embedded u-connectXpress software. All NINA-B1 modules are delivered with this software and are configured using AT commands.

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; Bluetooth mesh
HW interfaces	UART, 7 x GPIO pins
Configuration	AT Commands
Support tools	s-center
Operating modes	Central role (7 simultaneous links) Peripheral role (6 simultanous links) Simultaneous central / peripheral roles (7 in total, max 4 as peripheral and max 6 as central) LE 1M PHY LE 2M PHY Advertising Extensions LE Data Length Extension
Security	Secure Simple Pairing 128-bit AES encryption LE secure connections
Throughput	780 kbps

Open CPU for customer application

Customers can develop and embed their own application on top of the Bluetooth stack and software inside the NINA-B1 module (open CPU concept). This section describes features specific to using NINA-B1 with an open CPU. Many software features are already available via the Arm Mbed or Nordic SDK environment, and more are added continously.

Development environment	Nordic SDK (including Bluetooth Mesh HomeKit, AirFuel, IoT); Arm Mbed 5; Wirepas Mesh (for large scale mesh networking)	
HW interfaces*	NFC tag for pairing 3 x SPI 19 x GPIO pins 8 x ADC channels 12 x PWM	UART 2 x I2C I2S PDM QDEC
Security	Secure Simple Pairing 128-bit AES encryption LE secure connections	

* Not all simultaneously

Further information

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

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

Package

Dimensions	NINA-B111: 10.0 x 10.6 x 2.2 mm NINA-B112: 10.0 x 14.0 x 3.8 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 V to 3.6 VDC
Power consumption	Active TX @ 0 dBm: 5.3 mA Standby: 2.2 µA Sleep: 300 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); Australia (ACMA); New Zealand; Brazil (Anatel); Canada (IC RSS); Japan (MIC - formerly TELEC); South Africa (ICASA); South Korea (KCC); Taiwan (NCC); China (SRRC)
Health and safety	EN 62479, EN 62368-1
Medical Electrical Equipment	EN 60601-1-2
Bluetooth qualification	v5.0 (Bluetooth low energy)

Support products

The evaluation kits include a NINA-B1 module on an evaluation board with built-in debugging capabilities. To be used with Nordic SDK or Arm Mbed as a development kit or with s-center to evaluate the u-connectXpress software. A blueprint is available on request, which includes a NINA-B1 module, a sensor, LEDs, buttons, and the source code for NINA-B1 and smart phones.

EVK-NINA-B111*	Evaluation kit for NINA-B111 module with antenna pin and external antenna
EVK-NINA-B112	Evaluation kit for NINA-B112 module with internal antenna

*End of life - EVK-NINA-B112 recommended for use

Product variants

NINA-B111	With antenna pin
NINA-B112	With internal antenna

Modules are shipped with the u-connectXpress software and can be re-flashed with customer application (open CPU).

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