NINA-B1 series

Standard | **Professional** | Automotive

Stand-alone Bluetooth® low energy modules with NFC

The most advanced Bluetooth low energy modules

- Bluetooth 5
- Advanced Serial Port Service
- GATT server and client
- Open CPU with Arm® Mbed™ and Nordic SDK
- Internal or external antenna
- Global certification

NINA-B111
10.0 x 10.6 x 2.2 mm

NINA-B112
10.0 x 14.0 x 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-blox connectivity software that provides support for u-blox Bluetooth low energy Serial Port Service, GATT client and server, beacons, NFC™, 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 Connectivity 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.

Product selector

Model	Software application	Bluetooth qualification	Bluetooth profiles	NFC for "Touch to Pair"	Maximum radiated output power (EIRP) [dBm]	Maximum range [m]	Antenna type	UART	SPI and I²C	GPIO pins	AD converters (ADC)	Power supply: 1.7- 3.6 VDC	Current consumption, sleep [µA]	Current consumption, idle [µA]	Current consumption, Tx @ 0 dBm [mA]	u-blox Low Energy Serial Port Service	GATT server and GATT client	Throughput [Mbps]	AT command support	IPv6	Mesh networking	Max simultaneous connections	Over-the-air firmware update	Standard	Professional	Automotive
NINA-B111	uCS[1]	v4.2	G	•	7	350	P	•				•	0.3	2	5	•	•	0.7	•			8				
	Open CPU[2]	v5.0	G	•	7	350	P	•	•	19	8	•	0.3	2	5		•	1.4		•	•	20	•			
NINA-B112	uCS[1]	v4.2	G	•	6	300	I	•				•	0.3	2	5	•	•	0.7	•			8				
	Open CPU[2]	v5.0	G	•	6	300	I	•	•	19	8	•	0.3	2	5		•	1.4		•	•	20	•			

1 = u-blox connectivity software
2 = open CPU for embedded customer developed applications using Nordic SDK, Arm® Mbed™ or Wirepas SDK
P = antenna pin
I = internal antenna
G = GATT

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-blox connectivity software

This section describes the NINA-B1 features when used with the embedded u-blox connectivity software. All NINA-B1 modules are delivered with this software and the module is configured using AT commands. 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
HW interfaces	UART
Configuration	AT Commands
Support tools	s-center
Simultaneous connections	8
Security	Secure Simple Pairing 128-bit AES encryption
Throughput	700 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 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 connectivity software (for large scale mesh networking)	
HW interfaces*	NFC tag for pairing	UART
	3 x SPI	2 x I²C
	19 x GPIO pins	I²S
	8 x ADC channels	PDM
	12 x PWM	QDEC
Security	Secure Simple Pairing 128-bit AES encryption LE secure connections	

* Not all simultaneously

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

Electrical data

Power supply	1.7 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)

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); Australia (ACMA); New Zealand; Brazil (Anatel); Canada (IC RSS); Japan (MIC - formerly TELEC); South Africa (ICASA); South Korea (KCC); Taiwan (NCC)
Health and safety	EN 62479, EN 60950-1, IEC 60950-1
Medical Electrical Equipment	IEC 60601-1-2
Bluetooth Qualification	v5.0 (Bluetooth low energy)

Bluetooth®

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-blox connectivity 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

Product variants

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

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

Further information

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

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