Product summary
NINA-W15 series

Stand-alone multiradio modules

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Secure industrial multiradio made easy

- Simultaneous Wi-Fi 802.11b/g/n and Bluetooth dual-mode
- u-connect software for accelerated time to market
- Built-in security with secure boot
- Small footprint and multiple antenna options
- Pin compatible with other NINA modules
- Global certification

10.0 × 10.6 × 2.2 mm   NINA-W151

10.0 × 14.0 × 3.8 mm   NINA-W152

10.0 × 14.0 × 2.2 mm   NINA-W156

Product description

The NINA-W15 series stand-alone multiradio modules integrate Wi-Fi, Bluetooth BR/EDR and Bluetooth low energy in a compact form factor. The NINA-W15 modules support simultaneous operation on Wi-Fi and Bluetooth dual-mode and can thus serve as a gateway between Bluetooth and Wi-Fi or Ethernet. They can act as both Wi-Fi station and micro access point and connect to a host system using either a UART or a high speed RMII interface. Intended applications include telematics, industrial automation, connected buildings, wireless sensors, point-of-sales, and medical devices.

The modules have many security features embedded, including secure boot, which ensures that only authenticated software is run on the module.

The NINA-W15 modules are used with u-connectXpress software, which is pre-flashed at delivery. This significantly simplifies integration in the host system and speeds up the time to market. The software provides a number of features that can be configured from the host using AT commands.

The u-connectXpress software for NINA-W15 enables communication with cloud services. The software features end-to-end security with TLS and built-in MQTT protocol for lightweight communication with cloud-based applications. NINA-W15 can also act as an MQTT-SN gateway allowing devices without a TCP/IP stack to make use of the MQTT protocol. This allows, for example, networks of Bluetooth low energy sensors to easily communicate with the cloud.

Device design is simplified, as developers can choose to either use an external antenna (NINA-W151) or take advantage of the internal antenna (NINA-W152 and NINA-W156). Additionally, the NINA-W15 modules are pin-compatible with other NINA modules, thus offering maximum flexibility for development of similar devices offering different radio technologies.

NINA-W15 modules are certified and approved for usage globally. The modules support operation in an extended temperature range of −40 °C to +85 °C.

	NINA-W151	NINA-W152	NINA-W156
Grade			
Automotive			
Professional	•	•	•
Standard			
Radio			
Chip inside	ESP32	ESP32	ESP32
Bluetooth qualification	v4.2	v4.2	v4.2
Bluetooth low energy	•	•	•
Bluetooth BR/EDR	•	•	•
Bluetooth output power EIRP [dBm]	8	8	8
Antenna type (see footnotes)	pin	metal	pcb
Wi-Fi 2.4 / 5 [GHz]	2.4	2.4	2.4
Wi-Fi IEEE 802.11 standards	b/g/n	b/g/n	b/g/n
Wi-Fi output power EIRP [dBm]	18	18	18
Max Wi-Fi range [meters]	500	400	400
Application software			
u-connectXpress	•	•	•
Interfaces			
UART	1	1	1
RMII	1	1	1
GPIO pins	21	21	23
Features			
AT command interface	•	•	•
Point-to-Point Protocol	•	•	•
Low Energy Serial Port Service	•	•	•
MCU (see footnotes)	LX6	LX6	LX6
RAM [kB]	520	520	520
Flash [kB]	2048	2048	2048
Wi-Fi throughput [Mbit/s] *	13	13	13
Maximum Bluetooth connections	7	7	7
Micro Access Point [max stations]	10	10	10
Wi-Fi enterprise security	•	•	•
End-to-end security (TLS)	•	•	•
Secure boot	•	•	•
WPA/WPA2	•	•	•

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

LX6 = 240 MHz dual-core Xtensa LX6
  * = User data throughput over RMII

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NINA-W15 series

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Features

Wi-Fi standards	802.11b/g/n 802.11d/e/i/h
Wi-Fi channels	2.4 GHz channels 1-13
Wi-Fi maximum transfer rates	802.11b: 11 Mbit/s 802.11g: 54 Mbit/s 802.11n: 72 Mbit/s
Wi-Fi output power	18 dBm EIRP
Wi-Fi Sensitivity (conducted)	–96 dBm conducted
Bluetooth output power	8 dBm EIRP (Bluetooth BR/EDR) 8 dBm EIRP (Bluetooth low energy)
Bluetooth sensitivity	-88 dBm conducted (Bluetooth BR/EDR 1 Mbit/s) -88 dBm conducted (Bluetooth low energy)
Antenna	Internal antenna or antenna pin for connecting to the external antenna

u-connectXpress software

This section describes the NINA-W15 features integrated in the u-connectXpress software. All NINA-W15 modules are delivered with this software and the module is configured using AT commands.

Wi-Fi features	Wi-Fi station Wi-Fi micro access point
Bluetooth features	SPP profile u-blox Low Energy Serial Port Service (SPS) GATT server and client Simultaneous central and peripheral roles Up to 5 peripheral connections
Security features	WPA/WPA2 Enterprise security (EAP-TLS, PEAP) End-to-end security with TLS Secure boot Secure simple pairing
Extended Data Mode™	For individually controlled multipoint data channels
Point-to-Point Protocol	For UART-based IP connectivity between host and module, enables individually controlled data channels and AT commands in parallel
Configuration over air	Wireless transmission of AT commands to control the module
HW interfaces	UART, RMII, GPIO
Throughput (user data)	Bluetooth low energy: 350 kbit/s Bluetooth BR/EDR: 1 Mbit/s Wi-Fi: 13 Mbit/s
Support tools	s-center

Interfaces

All variants	UART, RMII, GPIO

Package

Dimensions	NINA-W151: 10.0 x 10.6 x 2.2 mm NINA-W152: 10.0 x 14.0 x 3.8 mm NINA-W156: 10.0 x 14.0 x 2.2 mm
Weight	< 1 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	3.3 V
Power consumption	Wi-Fi 15 dBm: 117 mA Blutooth BR/EDR: 166 mA Bluetooth low energy: 67 mA Idle mode: 33 mA

Certifications and approvals [1]

Type approvals	Europe (ETSI RED), US (FCC/CFR 47 part 15 unlicensed modular transmitter approval), Canada (IC RSS), Japan (MIC), Taiwan (NCC), South Korea (KCC), Brazil (Anatel), Australia (ACMA), New Zealand; South Africa (ICASA)
Health and safety	EN 62479, EN 60950-1, IEC 60950-1
Medical Electrical Equipment	IEC 60601-1-2
Bluetooth qualification	v4.2 (Bluetooth BR/EDR and Bluetooth low energy)

1 = NINA-W156 variant pending approvals

Support products

EVK-NINA-W151	Evaluation kit for NINA-W151 module with antenna pin and external antenna
EVK-NINA-W152	Evaluation kit for NINA-W152 module with internal PIFA antenna
EVK-NINA-W156	Evaluation kit for NINA-W156 module with internal PCB trace antenna

Product variants

NINA-W151	With u-connectXpress software and antenna pin
NINA-W152	With u-connectXpress software and internal PIFA antenna
NINA-W156	With u-connectXpress software and internal PCB trace antenna

Further information

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

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