

Release Note

Topic	u-connectXpress software v1.0.0 for NINA-W15 UBX-19028638
Author	Erik Carlberg
Date	2 July 2019

Copying, reproduction, modification or disclosure to third parties of this document or any part thereof is only permitted with the express written permission of u-blox. The information contained herein is provided "as is" and u-blox assumes no liability for its use. No warranty, either express or implied, is given, including but not limited to, with respect to the accuracy, correctness, reliability and fitness for a particular purpose of the information. This document may be revised by u-blox at any time. For most recent documents, visit www.u-blox.com.
Copyright© u-blox AG.

Contents

1	Software	1
1.1	General Information	1
1.1.1	Scope	1
1.1.2	Related documentation	1
1.1.3	Released software image	2
1.1.4	Released software tools	2
1.2	Features and improvements	2
1.2.2	Wi-Fi	3
1.2.3	Retrieve beacon information	3
1.2.4	Bluetooth	4
1.3	Known limitations	4

1 Software

1.1 General Information

1.1.1 Scope

This release note describes the u-connectXpress software v1.0.0 for NINA-W15.

1.1.2 Related documentation

Document	UBX number	Audience	Updates
AT Commands manual	UBX-14044127	Public	Updated with NINA-W15 v1.0.0
NINA-W15 Data Sheet	UBX-18006649	Public	Updated with data from product verification
NINA-W15 Product Summary	UBX-18052290	Public	Updated with data from product verification

1.1.3 Released software image

The NINA-W15 software image is available on the product resources page of the NINA-W15 series at u-blox.com. The table below lists the binary and configuration files included in the package.

File	Description
NINA-W15X-SW-1.0.0-126.bin	Software binary
NINA-W15X-CF-1.0.json	Manifest that defines the memory addresses for the binary

1.1.4 Released software tools

1.1.4.1 s-center

s-center version 4.8.0 is available and can be used with NINA-W15. It is required to use s-center version 4.7.0 or later to flash the u-connectXpress v1.0.0 for NINA-W15.

1.2 Features and improvements

1.2.1.1 General

1.2.1.2 UART host interface

For communication with the host system, a UART interface is implemented. Baud rate up to 3 Mbit/s is supported.

1.2.1.3 RMII interface

Support for Ethernet over the RMII interface is included in this software version.

1.2.1.4 GPIO control

GPIO pins available on the NINA-W15 module can be configured, written to, and read from using an AT command from the host over the UART interface. By using the configuration over air functionality, the NINA-W15 GPIO pins can be controlled also from a remote device using Bluetooth low energy.

1.2.1.5 Secure boot

The NINA-W15 modules implement a secure boot procedure assuring that the modules boot up only in the presence of a software authorized by u-blox. This ensures that the malicious software cannot be injected in the module. As a result, the NINA-W15 series cannot be used by customers developing their own software to run on the module MCU; use the NINA-W10 series with open CPU in this scenario.

1.2.1.6 Extended Data Mode

If you set the module to data mode, it is possible to configure multiple connections. The Extended Data Mode (EDM) allows individual control of each individual connection. Thus, it is possible to transmit data to one specific remote device and to know from which remote device the data is received.

1.2.1.7 Bridge

Bridge is a way to connect different network interfaces to each other. The user can bridge between Wi-Fi Station, Wi-Fi Access Point, Bluetooth low energy, Bluetooth BR/EDR and Ethernet.

1.2.1.8 Configuration over air

With configuration over air enabled, the module accepts the AT commands sent from a remote device connected via Bluetooth.

1.2.2 Wi-Fi

1.2.2.1 Wi-Fi station and access point modes

NINA-W15 can be setup as a Wi-Fi station and connect to an Access Point. Both DHCP client and static IP configuration are supported. Access Point functionality with up to ten connected Stations is supported.

1.2.2.2 WPA/WPA2

Data encryption with WPA and WPA2 is supported as specified in 802.11i.

1.2.2.3 Wi-Fi Enterprise security

Support for client authentication using PEAP and EAP-TLS methods is included. This feature covers both Station and Access Point modes. To further strengthen the authentication procedure, there is a validation procedure of the remote server certificate before sending any credentials over the link.

1.2.2.4 End-to-end security

Connections using Transport Layer Security (TLS) enabling encrypted end-to-end communication over TCP is supported. The TLS versions 1.0, 1.1, and 1.2 are supported.

1.2.2.5 Point-to-Point Protocol (PPP)

PPP is a protocol for IP communication from the host, over Wi-Fi, through a gateway to an internet server. The host will send Ethernet frames over the UART or RMIII interface.

1.2.2.6 MQTT and MQTT-SN protocol

NINA-W15 can be set up as an MQTT client allowing the host to transmit and receive MQTT data directly over the UART.

The support for MQTT-SN (SN=Sensor Network) allows NINA-W15 to act as a gateway for devices without TCP support to communicate with an MQTT broker.

This feature has been tested against IBM IoT Platforms, AWS IoT Core, Azure IoT Hub and Eclipse Mosquitto.

1.2.3 Retrieve beacon information

Wi-Fi Access Points can transmit beacons with vendor specific information elements. The possibility to retrieve the data contained in the beacon has also been added.

1.2.4 Bluetooth

1.2.4.1 Serial Port Profile (SPP)

The Serial Port Profile that allows to setup a serial data connection between two devices using Bluetooth BR/EDR is supported.

1.2.4.2 GATT server and client

NINA-W15 supports the Generic Attribute Profile (GATT) in the Bluetooth low energy specification. It can act as both GATT server and GATT client simultaneously.

1.2.4.3 Peripheral and central roles

NINA-W15 can have both peripheral and central roles. A module can be peripheral and central simultaneously.

1.2.4.4 Serial Port Service

Serial Port Service (SPS) is implemented according to u-blox low energy Serial Port Service. SPS is implemented on top of GATT and provides a serial data connection over Bluetooth low energy similar to the Serial Port Profile (SPP) in Bluetooth BR/EDR. u-blox provides example code for implementation of the SPS protocol in Android and iOS devices.

1.2.4.5 Pairing

NINA-W15 supports pairing using the Secure Simple Pairing model with either Just Works or Passkey Entry methods. When connecting with devices supporting Bluetooth 2.0 or earlier, Legacy Pairing method is available.

1.3 Known limitations

Area	Description	Reference
Wi-Fi	AT+UWSCANIE does not report vendor specific Microsoft OUI (00:50:F2) IEs.	UCS_DEV-57
Wi-Fi	When scanning for a specific SSID with AT+UWSCANIE, the report may include other networks as well.	UCS_DEV-69
Wi-Fi	Wi-Fi scanning while sending data can cause Wi-Fi driver to hang and should be avoided. Workaround: World mode is enabled by default to avoid regular background scanning. Not recommended to use ETSI mode and channels 12 and 13.	UCS_DEV-374
Bluetooth	When running data pumps over SPS with connection interval 6 (7.5 ms), data errors could occur.	UCS_DEV-288
Bluetooth	Master-Slave role switch request from the remote device may in some cases be ignored by NINA-W15.	UCS_DEV-68
Bluetooth	SPP limited to 6 peer connections.	UCS_DEV-53
Application	Incorrect configuration of Ethernet will return ERROR. The next attempt will then result in a reset of the module.	UCS_DEV-380
Application	Binding TLS/TCP and SPP not supported.	UCS_DEV-434
Bluetooth	If the host is too slow to handle Bluetooth low energy scan results, the module can be reset.	UCS_DEV-518
Application	Wi-Fi Access Point and Bluetooth cannot operate simultaneously.	