

US130Q User's Manual

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Preface

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Document Revision History

Revision	Date	Product Application
V1.0	July 07 2016	First edition of the US130Q User Manual

About this Document

Purpose and Scope

This user manual is intended for engineers who use the US130Q to run various qualification tests in Verizon environment.

Who Should Read this User Manual

This document is intended for engineers who want to operate the evaluation kit based on the US130Q module, for IOT and certification tests purposes.

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1 US130Q Product Description

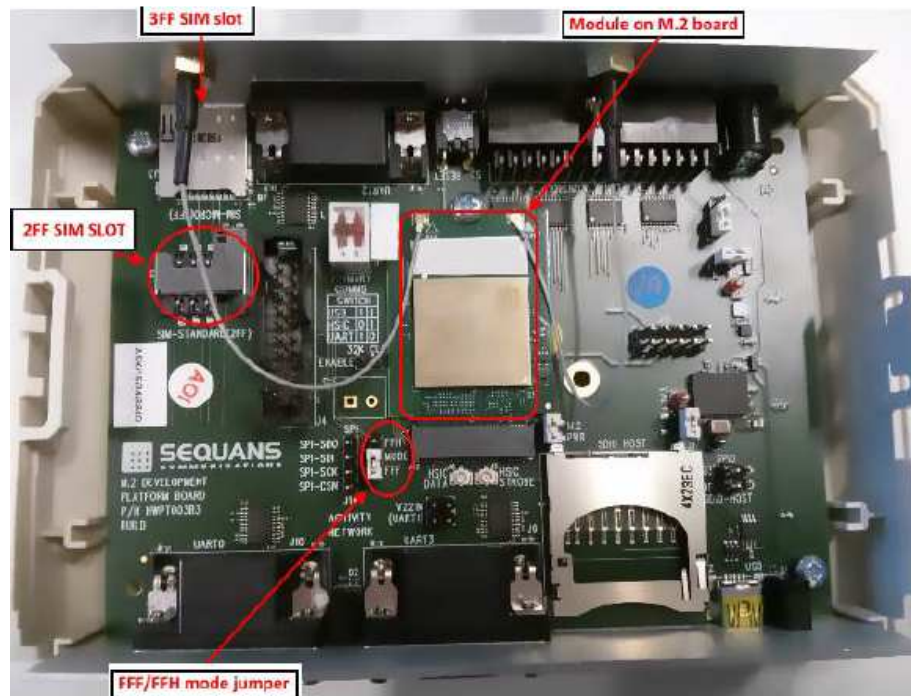
1.1 Product Features

The US130Q is a complete Verizon Wireless certified LGA LTE module including base-band, RF and memory, for the design of connected consumer electronics devices, tablet and laptop computers, machine-to-machine devices, and other devices with embedded LTE connectivity. For the sake of convenience during conformance and certifications tests, the US130Q module is typically used on a test platform. The US130Q LGA module is sold, as is, for usage on OEM platforms.

Indeed, the US130Q (on an M.2 adaptation board) can be fitted into an M.2 host connector. The US130Q comes with a shielding as illustrated below.



The US130Q can be used on the M.2 adaptation board plugged into an evaluation kit that provides standard easily accessible interfaces, e.g. USB and UART (debug) connectivity, SIM access, or antenna connection... as depicted below. That's the test board which is used below in section 2.



1.2 Software Description

The US130Q is a hostless device. All the required software is present in the device's Flash memory:

- LTE stack software
- Hardware configuration parameters
- Application software, including Linux openWrt kernel

This manual also presents the procedure to upgrade the firmware.

2 Installation Procedures

2.1 Prerequisites

2.1.1 Hardware

Sequans' US130Q LGA module (soldered on an M.2 adaptation board) requires a Windows® PC, running Windows 8, Windows XP or Windows 7 with either a M.2 host connector or an USB 2.0 port. It can also be used with a computer running Linux.

2.1.3 Sequans Software Delivery

- Verizon_x.y.z-abcd.exe

This installs the host software providing access to the system with WebUI interface. You will connect the US130Q on its evaluation board to the PC when this installation completes. It is only required on Windows.

2.2 First Installation

2.2.1 Install the Host Software

Without plugging in the device, launch the Windows installer. It automatically installs the Sequans' US130Q drivers on the PC.

Follow the procedure:

1. Launch the installer and confirm its execution. Click **Yes** button to start the installation process.
2. Click the **Next>** button.
3. Select the installation directory. The default directory can be changed by clicking the **Browse . . .** button. Click **Next** when the appropriate directory is selected.
4. Verify the installation directory and click **Install** if no change is required. You can update the installation directory by clicking the **Back** button at this stage.
5. Check the box to trust Sequans software and proceed with the installation process.
6. Click **Finish** to complete the installation process.

2.3 US130Q Board Connection

After the installation of the Host Software is completed, you can plug the device bearing the US130Q module in an USB port. Three drivers should be installed:

- One composite driver,
- One serial over USB driver (SqnAcm) to control the device using AT commands
- One Ethernet over USB driver (SqnUsb) to transport the data traffic between the device and the PC

1. Plug the test board on an USB port of your PC.
2. Wait for the automatic driver installation. It takes some time (a few dozens of seconds) before the evaluation kit is properly identified on the USB interface.
3. When the process is completed, the PC indicates that the device is ready to use.

You can launch a web browser and connect.

2.4 Firmware Upgrade

2.4.1 Upgrade Prerequisites

The firmware upgrade process requires:

- An operational board bearing the module connected to a PC with USB

- A web browser launched and connected to the said board at `http://192.128.15.1`.
- An upgrade package such as *.sfp.

2.4.2 Upgrade Execution

Execute the following steps of the upgrade procedure.

1. Click on **System** tab.
2. Click on **Backup / Flash Firmware** item.
3. In the **Flash new firmware image** frame, click the **Browse** button and navigate to select the sfp file that contains the upgrade.
4. Click the **Flash image...** button when you have selected the appropriate file.
5. Confirm the operation when the firmware checksum is verified, by clicking the **Proceed** button.
6. Do not disconnect or power the device off while the following screen is displayed.
7. The login screen is displayed when the automatic reboot operation has completed.

2.5 Software Uninstallation

Use Windows' uninstaller service.

3

FCC Regulatory Notices to the OEM and End product Users

FCC-ID: 2AAGMUS130Q (limited modular approval)

This above identified LTE radio module is not intended to be provided to end-users but is for installation by OEM integrators only.

Installation/Integration

OEM integrators must follow Sequans installation instructions to provide for and benefit from FCC compliant module integrations and must abide especially by the following:

The maximum antenna gain values (accounting for cable attenuation) to comply with the FCC maximum ERP/EIRP limits and with RF Exposure rules:

LTE band 13 (700MHz): 8.9 dBi

LTE band 4 (1700MHz): 5.0 dBi

The Sequans PCB design guidelines provided with this filing must be closely followed.

Compliance of host integrations of the module is limited to hosts adaption designs which are identical to the documented reference design as documented in this filing (M.2 adaptation PCB). Design guidance for host integration are provided under NDA.

Host integrations with adaption designs deviating from the documented reference design require either class 2 permissive change to this modular approval or a separate host approval with different FCC-ID;

Host integrations with co-located (simultaneously operating) radio transmitters must be evaluated in

accordance with FCC multi-transmitter rules and may require either class 2 permissive change to this modular approval or a separate host approval with different FCC-ID, dependent on the result of the evaluation; Inquiry at FCC or a TCB is urgently recommended.

Integrations of the module into host products which are intended for *portable* use, i.e. less than 20cm distance between its radiating structures (antenna) and the body of nearby persons, or which otherwise put additional technical requirements like Hearing Aid compatibility require either class 2 permissive change to this modular approval or a separate host approval with different FCC-ID;

Compliance with Unwanted Emission Limits for Digital Device

If the OEM host integration fully complies with the above described reference design and can completely inherit and rest on compliance of the existing modular approval the OEM remains still responsible to show compliance of the overall end-product with the FCC limits for unwanted conducted and radiated emissions from the digital device (unintentional radio) portion of such end-product (commonly addressed as part 15B compliance or similar).

End-product Labelling

FCC ID

The module's FCC-ID must either be visible from the exterior of the host product (e.g. per window) or per electronic display, or shall be displayed on an additional exterior label per the following or similar string: *contains FCC ID: 2AAGMUS130Q*

Digital Device - Unwanted Emissions Notice

If the end-product falls under part 15 of the FCC rules (it shall display the following user notice on its exterior acc. to part 15.19 (the notice may be printed in the manual in case the host is too small):

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and***
- (2) This device must accept any interference received, including interference that may cause undesired operation.***

Further Labelling Requirements

may apply dependent on the FCC rule parts relevant to the host product.

End-product User Instructions / Notices in the Manual

At a minimum, end-product users must be provided with the following notices at a prominent location of the product literature furnished with the product:

Product Modifications

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Compliance

This equipment complies with FCC radio frequency radiation exposure rules and limits set forth for an uncontrolled environment, when installed and operated with minimum distance of 20cm between its radiating structures (antenna) and the body of nearby persons and when not operated simultaneously with other nearby radio-transmitters.

Maximum Antenna Gain

The user instructions of end-products equipped with standard external antenna connectors for the modular radio transmitter subject to this filing i.e. providing the option to connect other antennae than those which may or may not be bundled with the end-product must list the maximum allowed antenna gain values as derived from those given above, accounting for the cable attenuations of the actual installation.

Digital Device - Unwanted Emissions Notice

If the end-product is or contains a digital device (unintentional radio portions) and is not exempted by its use case (like vehicular use) the following part 15.105 (b) user notice shall be provided at prominent location of the product literature:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- o Reorient or relocate the receiving antenna.*
- o Increase the separation between the equipment and receiver.*

- o Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- o Consult the dealer or an experienced radio/TV technician for help.*

Further User Notices

May be required dependent on the FCC rule parts relevant to the host product.

Non-allowed User Instructions

The end-product user guidance may NOT include instructions about how to install or de-install the module.

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Operational conditions

The US130Q module is built to support operational conditions in temperature of -30° up to 60°C
Its voltage operation range is 3.135-4.4V.