

BeagleBoard.org Foundation

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Federal Communication Commission
Equipment Authorization Division, Application Processing Branch
7435 Oakland Mills Road
Columbia, MD 21046

2019-07-19

Attn: Office of Engineering and Technology
Subject: Attestation Letter regarding UNII devices

FCC ID: 2ATUT-BBONE-AI

Software security questions and answers per KDB 594280 D01:

Software Security description – General Description		
1	Describe how any software/firmware updates for elements that can affect the device's RF parameters will be obtained, downloaded, validated and installed. For software that is accessed through manufacturer's website or device's management system, describe the different levels of security as appropriate.	We do not release the firmware on our website for downloading. Our direct host manufacturer (OEM) can request the firmware from us and it will be made available via a secure server.
2	Describe the RF parameters that are modified by any software/firmware without any hardware changes. Are these parameters in some way limited such that any other software/firmware changes will not allow the device to exceed the authorized RF characteristics?	Radio frequency parameters are limited by US regulatory domain and country code to limit frequency and transmit power levels. These limits are stored in non-volatile memory by the module manufacturer at the time of production. They will not exceed the authorized values.
3	Describe in detail the authentication protocols that are in place to ensure that the source of the RF-related software/firmware is valid. Describe in detail how the RF-related software is protected against modification.	The firmware is installed on each single module during manufacturing process. The correct firmware is verified and installed by the module manufacturer. In addition, the firmware binary is encrypted using

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		openSSL encryption and the firmware updates can only be stored in non-volatile memory when the firmware is authenticated. The encryption key is known by the module manufacturer only.
4	Describe in detail any encryption methods used to support the use of legitimate RF-related software/firmware.	The firmware binary is encrypted. The process to flash a new firmware is using a secret key to decrypt the firmware, only correct decrypted firmware is stored in non-volatile memory (see #3).
5	For a device that can be configured as a master and client (with active or passive scanning), explain how the device ensures compliance for each mode? In particular if the device acts as master in some band of operation and client in another; how is compliance ensured in each band of operation?	The device ensures the compliance by checking the configured parameter and operation values according to the regulatory domain and country code in each band.
Software Security description – Third-Party Access Control		
1	Explain if any third parties have the capability to operate a U.S.-sold device on any other regulatory domain, frequencies, or in any manner that may allow the device to operate in violation of the device's authorization if activated in the U.S.	No, third parties don't have the capability to access and change radio parameters. US sold modules are factory configured to US.
2	Describe, if the device permits third-party software or firmware installation, what mechanisms are provided by the manufacturer to permit integration of such functions while ensuring that the RF parameters of the device cannot be operated outside its authorization for operation in the U.S. In the description include what controls and/or agreements are in place with providers of third-party functionality to ensure the devices' underlying RF parameters are	Unauthorized firmware is not accepted by the firmware update process. See General Description #5, #3

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	unchanged and how the manufacturer verifies the functionality.	
3	For Certified Transmitter modular devices, describe how the module grantee ensures that host manufacturers fully comply with these software security requirements for U-NII devices. If the module is controlled through driver software loaded in the host, describe how the drivers are controlled and managed such that the modular transmitter RF parameters are not modified outside the grant of authorization.	The module is not available for sale or installation outside of company licensing agreements. Modules are always installed in host systems in a factory by end integrators (OEM) responsible for loading authorized software.
SOFTWARE CONFIGURATION DESCRIPTION– USER CONFIGURATION GUID		
1	Describe the user configurations permitted through the UI. If different levels of access are permitted for professional installers, system integrators or end-users, describe the differences.	The UI is accessible to anyone using the device.
	a. What parameters are viewable and configurable by different parties?	Various device status information is made available like log information, connection status, operation mode, operation frequency, etc. Radio parameters are described in c.i
	b. What parameters are accessible or modifiable by the professional installer or system integrators? i. Are the parameters in some way limited, so that the installers will not enter parameters that exceed those authorized? ii. What controls exist that the user cannot operate the device outside its authorization in the U.S.?	This device is not subject to professional installation
	c. What parameters are accessible or modifiable by the end-user?	The end user is able to configure the operation frequency, modulation, reduce the output power levels etc. The end user cannot

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	i. Are the parameters in some way limited, so that the user or installers will not enter parameters that exceed those authorized? ii. What controls exist so that the user cannot operate the device outside its authorization in the U.S.?	change the antenna gain and country code, those settings are programmed at factory production time. Yes, the parameters can only be changed within the limits of country code US. The country code and regulatory domain control do limit all the parameters set by UI
	d. Is the country code factory set? Can it be changed in the UI? i. If it can be changed, what controls exist to ensure that the device can only operate within its authorization in the U.S.?	The country code is factory set and is never changed by UI. The country code is factory set and is never changed by UI
	e. What are the default parameters when the device is restarted?	At each boot up the country code and the antenna gain are read from the non-volatile memory, those values are configured during module production.
2	Can the radio be configured in bridge or mesh mode? If yes, an attestation may be required. Further information is available in KDB Publication 905462 D02	Not supported
3	For a device that can be configured as a master and client (with active or passive scanning), if this is user configurable, describe what controls exist, within the UI, to ensure compliance for each mode. If the device acts as a master in some bands and client in others, how is this configured to ensure compliance?	No end user controls or user interface operation to change master/client operation.
4	For a device that can be configured as different types of access points, such as point-to-point or	The device does not support these

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	point-to-multipoint, and use different types of antennas, describe what controls exist to ensure compliance with applicable limits and the proper antenna is used for each mode of operation. (See Section 15.407(a))	modes/features.
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Dated 07-19-2019**this** _____**Agency agreement
expiration date:****07-18-2020**
_____**By****:****Signature****Jason Kridner****Printed****Titl President of the Board****e:** _____**On behalf of : BeagleBoard.org
Foundation**
_____**Telephone 586-764-1992**
