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**Grant Notes for Compliance as a Final Product in Model  
RangeLINK**

Federal Communications Commission  
Authorization and Evaluation Division  
1435 Oakland Mills Road  
Columbia, MD 21046

FCC Application for FCC ID: 2ADS3-TS1RLNK101

The model RangeLINK, carrying FCC ID: 2ADS3-TS1RLNK101 contains the following FCC certified Bluetooth module and either one of the following FCC certified WIFI modules. This attestation is to attest that the FCC Grant Notes are satisfied in the final product.

FCC ID: 2ADHKSAMB11

Manufacturer: Atmel Corporation

Model: SAMB11 MODULE

Grant Note: Must not be co-located or operation in conjunction with any other antenna or transmitter.

FCC ID: 2ADUIESP-12

Manufacturer: Shenzhen Anxinke Technology Co., LTD

Model: ESP-12

Grant Note: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures. This OEM module is approved for use in products operating as mobile or fixed transmitting device. The antennas approved for use with this module are those documented in the filing, and must be installed in the manner specified therein. Grantee shall provide installation

and operating instructions for satisfying RF exposure requirements to OEM integrators and installers. This grant is valid only when the device is sold to OEM integrators and the OEM integrators are instructed to ensure that the end user has no manual instructions to remove or install the device.

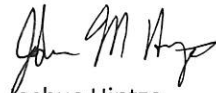
FCC ID: 2ADUIESP-12-F

Manufacturer: Shenzhen Anxinke Technology Co., LTD

Model: ESP-12-F

Grant Note: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures

Testing was completed with 2ADUIESP-12. With the attached document, RangeLINK Module Grant Note Considerations, and the submitted MPE Analysis, TAGSMYTH confirms and attests that either WIFI module with the Bluetooth module and the RangeLINK is compliant with all FCC regulations. No additional filing is required for the RangeLINK, the Bluetooth module, or either of the WIFI modules.



Joshua Hintze  
*Vice President*

18 November 2016

# RangeLINK

## Module Grant Note Considerations

### Summary

The RangeLINK includes a 915 MHz long-range transmitter, a bluetooth module (Modular ID: 2ADHKSAMB11), and a WIFI module (either Modular ID 2ADUIESP-12 or Modular ID 2ADUIESP-12-F)

The bluetooth module's grant note states:

"The antenna(s) used with this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter."

The grant note for WIFI Module 2ADUIESP-12 states:

"Output Power listed is peak conducted. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures. This OEM module is approved for use in products operating as mobile or fixed transmitting device. The antennas approved for use with this module are those documented in the filing, and must be installed in the manner specified therein. Grantee shall provide installation and operating instructions for satisfying RF exposure requirements to OEM integrators and installers. This grant is valid only when the device is sold to OEM integrators and the OEM integrators are instructed to ensure that the end user has no manual instructions to remove or install the device."

The grant notes for WIFI module 2ADUIESP-12-F states:

"Single Modular Approval. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures."

The purpose of this document is to show that even with the three transmitters simultaneously transmitting, the RangeLINK is in compliance with all FCC regulations regarding RF exposure and EMC, thus not requiring additional testing or FCC application filings to be completed.

# Introduction

To understand what considerations we must make for FCC compliance, we will first look at KDB 996369 D01 Clause VII (Multiple Transmitter Modules Used in a Host) which explains:

Combining multiple modular approved transmitters within a host is permitted for modules which have been evaluated and granted authorization to cover such configurations; and all required and submitted test data must include compliance information for any simultaneous transmission configurations. Each module must have a unique FCC ID. A transmitter module capable of transmitting simultaneously with another transmitter can be granted as an original grant, or a Class II permissive change, by following the applicable simultaneous transmission test procedures.<sup>9</sup> Additional tests for RF exposure and EMC are necessary for modules which have not been evaluated for such operation to demonstrate compliance with all the rules. This will require modification of simultaneous transmission restrictions through permissive changes for the modules in the host, unless it is determined that such evaluations are exempted. Applicability of such a policy must be explained within a filing when a justification for no testing is submitted. The OEM integrator or the host manufacturer is responsible for the overall compliance of the host products, and as discussed below, may work with the module grantees to ensure that proper test data for multiple transmitter operations are included in the application filings for the modules.

Footnote 9 give a little clarification:

For examples and discussions, see Questions 12 and 13 in KDB Publication 996369 D02. Also, KDB Publications 447498 and 662911 provide guidance for evaluation of multiple transmitters. EMC see requirements under § 15.31(k) for simultaneous transmission.

Based on this, we must show two things:

1. RF exposure with the long-range transmitter, bluetooth, and WIFI transmitting complies with FCC regulations.
2. EMC compliance is met with the bluetooth and WIFI module installed and operational in the RangeLINK.

## EMC Considerations

Since the bluetooth and WIFI modules are not removable, all EMC testing done on the RangeLINK was with the bluetooth and WIFI modules installed and active. Therefore EMC compliance is shown through the results of the RangeLINK testing reports.

# RF Exposure Considerations

With some further discussion, we will determine that further testing and filings for RF exposure compliance will not be necessary.

Question 12 in KDB 996369 D02 reads as follows:

Question 12: Aside from RF exposure evaluation considerations (which are covered in, e.g., Question 13), is there guidance for multiple certified modules when integrated in a host and transmitting simultaneously in the same or different bands?

Answer 12: Over the years, the numbers and types of modules used in end products has evolved, in particular products with MIMO capabilities and a large number of multi-transmitter products. KDB Publication 662911 specifies additional procedures for host products with combinations of certified modular transmitters and/or built-in transmitters.

For EMC/radio-parameter compliance purposes, when an evaluation is done by the grantee or host provider (see Clause IX in KDB Publication 996369 D01) and there are no additional emissions generated due to simultaneous-transmission operations compared to single transmitter operations testing (i.e., not transmitting simultaneously), it is not necessary to file the additional simultaneous transmission test data. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

We will look at Clause IX in KDB 996369 D01 and determine if the RangeLINK is exempt from further testing.

KDB 996369 D01 Clause IX (Guidance for host manufacturers using modules) states:

A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end-use operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application (as discussed in Clause VIII above).

When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers.

Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters<sup>11</sup> not previously granted together.

The RangeLINK falls under option (C) simultaneous transmission for independent collocated transmitters not previously granted together. Based on this, additional testing and/or FCC application filings may be required for the RangeLINK. Footnote 11 states:

Independent of whether the grant notes explicitly state collocation restrictions or not, compliance for simultaneously-transmitting transmitters contained in an end product not previously tested together must be addressed, as described in this document.

This footnote explains that even though the bluetooth and WIFI module grant notes state collocation restrictions, compliance for the simultaneously-transmitting transmitters in the RangeLINK must be addressed.

Clause IX section C of KDB 996369 D01 explains:

To date, very few modules have been tested together and granted for operation in simultaneously-transmitting (collocated) end product configurations. Evaluating compliance for a host using certified modules and/or a standalone end product requires addressing EMI requirements under § 15.31(k) for simultaneous transmission and for RF exposure (§ 2.1091 mobile devices and § 2.1093 portable devices). In either case, the filing requires demonstrating that all transmitters designed to operate simultaneously have been evaluated under simultaneous transmission conditions.

When a host product supports simultaneous-transmission operations, and the associated transmitters have not been evaluated for the specific combination, the host manufacturer can first determine if there are additional RF exposure filing requirements due to the simultaneous transmissions (see Clause VI above, and KDB Publication 447498). If additional filing is required, either have the grantee file a Class II permissive change, or the host manufacturer may file a Change in ID application or new FCC ID (see Question 1 in KDB Publication 996369 D02).

We must determine if there are additional RF exposure filing requirements due to the simultaneous transmissions, so we will look at Clause VI in KDB 996369 D01, which states:

KDB Publication 447498 provides detailed guidance to determine RF exposure evaluation requirements for modular transmitters for use in mobile and portable devices.

KDB Publication 447498 D01 (RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices) Sections 4.3.1 and 4.3.2 contain General SAR test exclusion considerations, and Simultaneous transmission SAR test exclusion considerations, respectively.

In the RangeLINK MPE Analysis document, the RangeLINK is shown to be under the the SAR test exclusion thresholds for both standalone, and simultaneous transmission configurations. To summarize:

SAR test exclusion for simultaneous transmission is defined in KDB 447498 Chapter 4.3.2. To wit,

“Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.”

With bluetooth, WIFI, and the long-range radio enabled, worst-case Total SAR 1.2W/kg, which is under the SAR limit of 1.6W/kg, as specified in §1.1310(c). This shows that the SAR test exclusion applies to the simultaneous transmission configuration in the RangeLINK, and therefore the RangeLINK complies with FCC RF exposure regulations.

## Conclusion

With the RangeLINK excluded from SAR testing, and EMC tested compliant, no additional test information is required to be submitted for the simultaneously-transmitting transmitters in the RangeLINK. As such, a permissive change is also not required for the bluetooth or WIFI modules per Answer 12 in KDB 996369 D02. It is the responsibility of the host provider to ensure compliance with the applicable FCC rules, which has been done.