



Lighting Connectivity Module (LCM) Modular Certification - User Manual / OEM Integrator Instructions

Publication Number: LIFX03N12

Ver. 1.0

February 23, 2015

DRAFT

Confidential and Proprietary – LIFI LABS INC. (LIFX)

Not to be used, copied, reproduced in whole or in part, nor its contents revealed in any manner to others without the express written permission of LIFI LABS INC.

LIFX is registered trademark of LIFI LABS INC.

Any other registered and unregistered trademarks are the property of LIFI LABS INC. or their respective owners and used with permission.

Registered marks owned by LIFI LABS INC. are registered in the United States of America and may be registered in other countries.

This technical data may be subject to U.S. and international export, re-export, or transfer (“export”) laws. Diversion contrary to U.S. and international law is strictly prohibited.

LIFI LABS INC.
524 Union St #309
San Francisco, CA, 94133
United States of America

Copyright © 2015 LIFI LABS INC.
All rights reserved.

Revision History

Revision	Date	Description
Ver. 1.0	Feb. 23, 2015	Initial release

NOTE: The Lighting Connectivity Module (LCM) (the “Module”) is designed for use only in specific countries in which LIFI LABS INC. has obtained certificates of compliance with local laws and regulations. Therefore, the Module may not be sold, operated or incorporated into products for use in countries for which it has not been certified.

See Section 3 herein.

In addition, any deviation from the settings, methods, conditions and restrictions for integration of the Module into a host system, as detailed in this document, could be a violation of applicable national law and may be punishable as such, and in such event, the products into which the Module is incorporated may not be lawfully distributed or sold in such countries. LIFI LABS INC. assumes no responsibility for any liability or loss related to installation, integration or operation of the Module.

Contents

Revision History

Contents

1. Introduction

2. Applicable Module

3. Available Global Modular Approvals from LIFI LABS INC.

4. Additional Regulatory Conformance Testing and/or Submissions Required by the Integrator

5. Compliant/Allowable Tx Power Settings Programmed into EEPROM

6. Allowable Antennas to Use with the Radio Module

7. Antenna Placement inside the Host System and RF Safety

8. Mandatory Host Platform RF Exposure Review

9. Module May Not Be Installed by End Users

10. Required Labeling on the Outside of the Host

10.1 FCC

10.2. European Community R&TTE

10.3. Taiwan NCC

10.4. Korea KCC

10.5. Japan MIC

10.6. China SRRC

10.7. Australia RCM

11. Required Regulatory Wording for User Manual/Installation Manual

11.1. FCC compliance information

11.2. Industry Canada notice

11.3. European Community (R&TTE) user manual wording and declaration

11.4. European Community (R&TTE) Declaration of Conformity for System

11.5. Taiwan user manual wording

11.6. Korea user manual wording

11. OEM Configuration

12. OEM Integrator Checklist

1. Introduction

This document describes the steps that the OEM integrator must follow when designing and manufacturing a system utilizing a Lighting Connectivity Module (LCM) (the “Module”).

Failure to follow the instructions in this document may invalidate the FCC certification and authorization of the Module for use in the U.S. and in other countries.

The LIFI LABS INC. modular certifications described in this document apply only to radio conformance for the Module. The OEM integrator is responsible for all system-level EMI/EMC and Product Safety testing and certification that apply to the host system in the U.S. and other countries where the system will be marketed or sold.

2. Applicable Module

Part Number: LCM1V4T
FCC ID: 2AA53-LIFX03
IC ID: 11475A-LIFX03

3. Available Global Modular Approvals from LIFI LABS INC.

Module certification is limited to those countries for which LIFI LABS INC. has obtained radio modular approvals. Integrators can access the current list of certified countries at the following link:

<http://lifx.com/lcm/certification>

OEM integrators must receive their own radio certification for any country in which the system will be sold if a modular certification for that country is not available from LIFI LABS INC.

4. Additional Regulatory Conformance Testing and/or Submissions Required by the Integrator

The global modular certifications apply to radio conformance for the Module only.

The OEM integrator is responsible for additional system-level EMI/EMC and Product Safety testing and certification that applies in the U.S. and other countries to the host system containing the Module. This includes, but is not limited to, Federal Communications Commission (“FCC”) Part 15 Class B Digital Emissions, China CCC, Taiwan BSMI, Korea KC, ETSI EN 301 489-17 and others. These system-level EMC tests are to be done with the Module installed and included in the scope of the submission.

Some of the countries for which modular certifications are provided require additional submissions, authorizations or import permission by the system-vendor or importer. The integrator is responsible for these additional actions.

For example, the OEM integrator must take additional action for radio certification in these countries:

Country	Additional Action
Malaysia	Each importer/distributor needs to file for import permission
Singapore	Recommend use of importer's own local radio dealer number
Israel	Additional approval certificate required for importer
Indonesia	Certificate B is required for each importer
China	Modular approval not accepted. Requires system approval
Brazil	Tablets require system level SAR evaluation and submission to Anatel.
Philippines	Modular approval not accepted. Requires system approval
Vietnam	Modular approval not accepted. Requires system approval

Modular radio certification is not possible in some countries. For such countries, OEM integrators must ensure radio certification for the end system is obtained, before placing the product on the market.

A current list of applicable countries can be provided by LIFI LABS INC. at the following link:

<http://lifx.com/lcm/certification>

Please contact LIFI LABS INC. at hello@lifx.co if you have questions about the additional regulatory conformance testing and/or related submissions.

5. Compliant/Allowable Tx Power Settings Programmed into EEPROM

The following link lists the allowable transmit power settings that are to be programmed into the Module during original manufacturing:

<http://lifix.com/lcm/certification>

NOTE: Programming in higher values than provided for in this link will invalidate all radio certifications for this Module.

6. Allowable Antennas to Use with the Radio Module

The declared max antenna gain for the Module is:
1 dBi

There is no restriction for antenna types for this product, when host platform is designed with greater than 20 cm separation distance between antenna and user.

When antenna to user separation distance is from 1.3cm-20cm, only PIFA antenna may be used in host platform design.

Note: Using transmit power settings in host products that have antennas with declared gain exceeding 1 dBi. stated above will invalidate all radio certificates for this module.

Contact LIFI LABS INC. at hello@lifix.co for additional guidance if you decide to use higher gain antennas in the end system.

In addition, regulatory agencies in Japan, Korea, and Taiwan require submission of antenna specification sheets for all antenna models used with the LCM module. This notification process must be followed by the integrator before the original product is launched and whenever new host systems (with new antenna models) are launched.

Please submit antenna specifications to: hello@lifix.co

7. Antenna Placement inside the Host System and RF Safety

The FCC and other national regulatory bodies impose strict conditions and limitations on the RF exposure levels of end products.

Acceptable RF exposure levels for this Module depend on transmit power, the location of the transmitting antenna(s) inside the host system, the expected separation of the transmitting antennas to the end user, as well as if there is/are collocated RF transmitter(s) in the same host system.

OEM integrators must ensure each host system complies with the applicable RF exposure requirements.

8. Mandatory Host Platform RF Exposure Review

The FCC imposes conditions and limitations when additional radio(s) are co-located in the same host system as the Module with capability to transmit simultaneously.

The detailed rules from the FCC are described in various Knowledge Database publications that may be found using the instructions below. Co-locating other radios such as an integrated or plug in Wireless WAN/cellular radio with the Module requires additional evaluation and possibly submission for authorization from the FCC.

Because the rules are highly dependent on the characteristics of the particular radios that are co-located and simultaneously transmitting, the OEM integrator should seek guidance from a knowledgeable test lab or consultant to determine if additional testing and FCC certification is required.

In this case, failure to evaluate and follow the required FCC procedures will invalidate the FCC certification of the Module and end system.

To download the FCC rules for collocated radios:

1. <https://apps.fcc.gov/oetcf/kdb/index.cfm>
2. Enter 996369 in the 'publication number' search box
3. Download latest applicable version of 996369 document.

For expert advice regarding collocation rules, we recommend you contact an FCC-approved Telecommunication Certification Body ("TCB")::

1. <https://apps.fcc.gov/oetcf/kdb/index.cfm>
2. Choose your country and or state from the pull-down list.
3. Scroll through the search results and choose a TCB contact from which to seek advice.

To ensure total compliance of RF exposure requirements, LIFI LABS INC. requires that all its OEM customers submit their host platforms integrated with LCM for Host Platform RF Exposure Assessment under a LIFI LABS INC. established program.

All host platform must be submitted to a LIFI LABS INC. designated third party lab for professional assessment to determine if the host system is in compliance of RF exposure requirements or if it will need to undergo further SAR test and class II permissive change approvals before it can be placed onto the US and Canada market.

For training on the Host Platform RF Exposure Assessment Program, please contact:

hello@lifix.co

For host platform assessment, make host platform submission to: hello@lifix.co

9. Module May Not Be Installed by End Users

FCC rules require this Module to be installed in host systems at the factory by the OEM integrator. Thus, end users of the system may not install the Module. Therefore, the host product user instructions must not advise the end user on how to access or remove the Module. Additional FCC authorization/filing is needed to allow end user installation of radio modules.

10. Required Labeling on the Outside of the Host

NOTE: Explanatory text in red font must not be included in the final label.

10.1 FCC

The FCC requires a label on the outside of the host system visible to the end user. Example wording is:

Contains:

FCC ID:2AA53-LIFX03

The OEM manual must provide clear instructions explaining to the OEM the labelling requirements, options and OEM user manual instructions that are required

For a host using a this FCC certified modular with a standard fixed label, if (1) the module's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the module so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed module:

“Contains Transmitter Module FCC ID: **2AA53-LIFX03** or “Contains FCC ID: **2AA53-LIFX03**” must be used. The host OEM user manual must also contain clear instructions on how end users can find and/or access the module and the FCC ID.

Host product is required to comply with all applicable FCC equipment authorizations regulations, requirements and equipment functions not associated with the transmitter module portion. compliance must be demonstrated to regulations for other transmitter components within the host product; to requirements for unintentional radiators (Part 15B). To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. If a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with

the host, we suggest the host device to recertify part 15B to ensure complete compliance with FCC requirement: Part 2 Subpart J Equipment Authorization Procedures , KDB784748 D01 v07, and KDB 997198 about importation of radio frequency devices into the United States.

10.2. European Community R&TTE

The European Community R&TTE Directive requires the CE Marking shown below on the outside of the host AND on the outside of the shipping container/packaging:

For 2.4GHz



For 5 GHz or 2.4GHz = 5GHz dual bands



The European Community R&TTE Directive also requires the following note to consumers on the outside of the shipping container/packaging:

Important Notice: This product is a Radio LAN device operating in 2.4 & 5 GHz bands (or 2.4GHz band) for Home and Office use in the E.E.A. .			
AT	BE	CH	CY
CZ	DE	DK	ES
FI	FR	GB	GR
EE	HU	IT	IE
IS	LI	LT	LU
LV	MT	NL	NO
PL	PT	SE	SI
SK			

NOTE: The Integrator is expected to translate the text in this Section into the appropriate local languages for the European countries in which the product will be marketed or sold.

10.3. Taiwan NCC

Taiwan NCC requires a label on the outside of the host system visible to the end user. The required wording is:

(Replace X's with actual IDs found in section 2).

本產品內含射頻模組: XXXXXXXXXXXX

10.4. Korea KCC

10.5. Japan MIC

11. Required Regulatory Wording for User Manual/Installation Manual

The integrator must include text in the user manual meeting the regulators' requirements. The text below or similar wording should be used.

NOTE: Text in red font must be replaced.

11.1. FCC compliance information

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.

This product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals, including authority to operate this device.

FCC Part 15 Digital Emissions Compliance

We [System Manufacturer Name, Address, Telephone], declare under our sole responsibility that the product [System Name] 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.

WARNING: 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 radiates 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No.004-000-00345-4.

(RF exposure statement)

Radiation Exposure Statement:

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

11.2. Industry Canada notice

This device complies with Canadian RSS-210.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

(Notice for 5GHz and/or when co-locate with 5GHz transmitters, following statements should be provided for user information)

Caution:

- (i) the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
- (ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and
- (iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.
- (iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

- (i) les dispositifs fonctionnant dans la bande 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;
- (iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.
- (iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

11.3. European Community (R&TTE) user manual wording and declaration

NOTE: Text in red font must be replaced with name of company responsible for placing the system on the European Community Market.

Europe – EU Declaration of Conformity



Marking by the above symbol indicates compliance with the Essential Requirements of the R&TTE Directive of the European Union (1999/5/EC). This equipment meets the following conformance standards: EN300 328, EN 301 893, EN 301 489-17, EN60950, EN 62311

cs Česky [Czech]	[COMPANY NAME] tímto prohlašuje, že tento Radiolan je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede [COMPANY NAME] erklærer herved, at følgende udstyr Radiolan overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erkläre [COMPANY NAME] dass sich das Gerät Radiolan in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab [COMPANY NAME] seadme Radiolan vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, [COMPANY NAME] , declares that this Radiolan is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente [COMPANY NAME] declara que el Radiolan cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [COMPANY NAME] ΔΗΛΩΝΕΙ ΟΤΙ Radiolan ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français [French]	Par la présente [COMPANY NAME] déclare que l'appareil Radiolan est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Íslenska [Icelandic]	Hér með lýsir [COMPANY NAME] yfir því að Radiolan er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
it Italiano [Italian]	Con la presente [COMPANY NAME] dichiara che questo Radiolan è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
lv Latviski [Latvian]	Ar šo [COMPANY NAME] deklarē, ka Radiolan atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
lt Lietuvių [Lithuanian]	Šiuo [COMPANY NAME] deklaruoja, kad šis Radiolan atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
mt Malti [Maltese]	Hawnhekk, [COMPANY NAME] , jiddikjara li dan Radiolan jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, [COMPANY NAME] nyilatkozom, hogy a Radiolan megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
nl Nederlands [Dutch]	Hierbij verklaart [COMPANY NAME] dat het toestel Radiolan in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
no Norsk [Norwegian]	[COMPANY NAME] erklærer herved at utstyret Radiolan er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.
pl Polski [Polish]	Niniejszym [COMPANY NAME] oświadcza, że Radiolan jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	[COMPANY NAME] declara que este Radiolan está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	[COMPANY NAME] izjavlja, da je ta Radiolan v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
sk Slovensky [Slovak]	[COMPANY NAME] týmto vyhlasuje, že Radiolan spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	[COMPANY NAME] vakuuttaa täten että Radiolan tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

 Svenska [Swedish]	Härmed intygar [COMPANY NAME] att denna Radiolan står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
---	--

Table 1. Restrictions for use of 2.4 GHz frequencies in European Community countries. The restriction described below follows ERC/REC 70-03 (Edition of September 2011). It is recommended to check latest edition for updated restrictions.

France:	The outdoor use is limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz.
Italia:	For private use, a general authorisation is required if WAS/RLAN's are used outside own premises. For public use, a general authorisation is required.

11.4. European Community (R&TTE) Declaration of Conformity for System

In addition to including the radio conformity wording described in the previous section in the user manual, the end integrator must also create and sign a European Declaration of Conformity (DoC) for all European Directives applicable to the end product. At a minimum, this will be a DoC per the R&TTE Directive covering Radio, EMC, product Safety and RF Exposure essential requirements. The DoC must reference harmonized standards used for all radios present in the system.

Full details of R&TTE DoC requirements can be found at:

http://www.ec.europa.eu/enterprise/sectors/rtte/index_en.htm

NOTE: An image of the DoC signed by the OEM integrator may be included in the user manual or a link to the DoC on the integrator's company web site should be provided in the user documentation.

11.5. Taiwan user manual wording

台灣: 國家通訊傳播委員會

低功率電波輻射性電機管理辦法

第十二條經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

在 5.25-5.35 赫茲(GHz)頻帶內操作之無線資訊傳輸設備，限於室內使用。(For 5GHz only)

11.6. Korea user manual wording

Korea KCC

해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

11. OEM Configuration

The LCM supports customization by OEMs. The majority of these fields are exposed via the AllJoyn API allowing applications to query the LCM and discover its features.

A subset of the fields available for customisation:

- Product manufacturer (such as “LIFX”)
- Product name (such as “LIFX White 800”)
- Product description (such as “Wi-Fi LED Smart Bulb”)
- Manufacture date (such as “2015-02-14”)
- Manufacturer logo (e.g. a PNG or JPG, maximum size of 16KB)
- Bulb input voltage range, socket type, color temperature.

There are also a number of internal parameters that can be configured, such as:

- PWM configuration, such as:
 - Minimum frequency (in Hz)
 - Maximum frequency (in Hz)
 - Minimum on-time (in microseconds)
- Power configuration, such as:
 - Minimum time delay between power on and boot (in milliseconds)
 - Quiescent power draw (including LCM idle power)
 - Maximum LED power draw

Please contact hello@lifx.co for instructions to program the OEM page, as well as all of the fields available.

NOTE: If a single output frequency is required, set the minimum and maximum frequency to the same value. To set a particular minimum duty cycle, use the minimum frequency and minimum on-time as appropriate (eg, 1% duty cycle at 1 kHz = 10 us minimum on-time).

AllJoyn LSF allows clients to request the bulb instantaneous power consumption. The LCM calculates this as:

$$\text{Power}_{\text{instantaneous}} = \text{Power}_{\text{quiescent}} + (\text{Power}_{\text{LED}} \times \text{duty-cycle})$$

12. OEM Integrator Checklist

The party below will implement the Module in host systems in accordance with the instructions specified in this document and the documents referenced herein.

- The OEM integrator will ensure the Module is integrated in a host systems using only the approved antenna for the Module
- The OEM integrator will ensure the antenna placement inside the host system will maintain the required spacing to end user for RF Exposure compliance, as specified in this document.
- If other radios are integrated inside the host with the Module, the OEM integrator will contact its test lab, LIFI LABS INC. to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.
- The OEM integrator will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself are labeled as specified in this document.
- The OEM integrator will ensure the Module is programmed in the factory with compliant transmit power not exceeding the levels specified in this document.

LIFI LABS INC. requests that the OEM integrator acknowledge its receipt of this document and the above instructions. You may contact LIFI LABS INC. with any questions concerning this document or the responsibilities of the OEM integrator.

Company Name _____

Company Address _____

Signature _____

Name _____

Title _____

Email _____

Phone _____ Date _____

NOTE: Please email a signed and completed copy of this acknowledgment to hello@lifix.co