



# Open-Q 845 uSOM Module Certification Technical Note OEM Integrator Guide

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## Contacts

### **Lantronix, Inc.**

7535 Irvine Center Drive, Suite 100  
Irvine, CA 92618, USA  
Toll Free: 800-526-8766  
Phone: 949-453-3990  
Fax: 949-453-3995

### **IES Customer Support Portal**

<https://helpdesk.intrinsyc.com>

### **Lantronix Technical Support**

<http://www.lantronix.com/support>

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## Revision History

| Date       | Rev. | Comments                                                                                                           |
|------------|------|--------------------------------------------------------------------------------------------------------------------|
| April 2021 | 0.0  | Initial Draft                                                                                                      |
| May 2021   | 0.1  | Changed minimum distance of usage from antenna to user to 21 cm for FCC and 24 cm for ISED. Pages 10,16,17,18 &19. |
|            |      |                                                                                                                    |

For the latest revision of this product document, please go to: <http://tech.intrinsyc.com>.

Note: The Lantronix Open-Q 845 uSOM radio module (the “Module”) is certified for compliance for use in the USA and Canada only. For use in other countries, certificates of compliance must be obtained for that country or region before the module can be sold, operated or incorporated into products. In addition, any deviation from the settings, methods, conditions and restrictions for integration of the Module into a host system, as defined 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. Lantronix assumes no responsibility for any such liability or loss related to installation or operation of the Module.

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# 1 Introduction

This document describes the steps that the OEM integrator must follow when designing and manufacturing a system utilizing the Open-Q 845 uSOM Transmitter Module.

Failing to follow the instructions in this document may invalidate the FCC and IC (Industry Canada) certifications and authorizations of the Module for use in the U.S. and Canada.

The Module 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 certifications that apply to the host system in the U.S. and other countries where the system will be marketed or sold.

## 2 Applicable Module

| Model           | USA/FCC    | CANADA/IC     |
|-----------------|------------|---------------|
| Open-Q 845 uSOM | R68OQ845US | 3867A-OQ845US |

## 3 Additional Regulatory Conformance Testing and/or Submissions Required by the Integrator

- The modular certifications apply to the 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. 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.
- 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.

## 4 Compliant/Allowable Tx Power Settings

Any adjustments made to increase transmit power settings will invalidate all radio certifications for this module.

## 5 Allowable Antennas to use with the Radio Module

The module is certified for use with certain antennas as described in this section.

Allowed Antenna Types:

1. Dipole antenna

**Table 1 Allowed Maximum Gain (dBi) Dipole, Including Cable Loss**

|            |      |
|------------|------|
| 2.4~2.5GHz | 3.32 |
| 4.9~5.8GHz | 6.11 |

The required antenna impedance is 50 ohms.

Use of other antenna types or the same type of antenna but with higher gain than listed above is not allowed without additional testing and appropriate FCC or IC approval.

## 6 Antenna Placement and RF Safety

The FCC and other countries' 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 and the expected separation of the transmitting antennas to the end user. OEM integrators must take great care to ensure each host system complies with the applicable RF exposure requirements.

The antenna-to-user (bystander) separation distance must be a minimum of 21 cm for FCC and a minimum of 24 cm for ISED.

Failure to adhere to these separation/spacing rules will invalidate the FCC and IC certifications for the Module.

- This separation is measured between the closest point of each transmitting antenna inside the host device to the point of contact by the user or nearby person outside the host device.
- The transmitting antenna cables shall be positioned away from the antenna elements to conform to the configuration tested for compliance.
- When transmitting antennas are installed in the display section of a device, the display section shall not have metallic components and material that can influence or change the operating and RF exposure characteristics of the antennas.
- The separation between the main and aux antennas must be at least 3 cm.
- The transmitter module may not be co-located with any other transmitter or antenna.
- SAR evaluation is required if a separation distance of less than or equal to 20cm between the user or bystanders and the device antenna cannot always be maintained. For ISED, bystander SAR evaluation is always required for antenna installation in laptop screens per RSS-102 (SPR)-001.

Where one or more of the conditions above cannot be met for a particular host system, additional testing is required to secure the necessary certifications for the system.

Note: These restrictions do not apply to receive-only antenna.

## 7 Simultaneous Transmission with other Integrated or Plug-in Radios

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

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

## 8 Module May Not Be Installed by End Users

FCC and IC 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 the radio modules.

If modules are provided to the end users for installation in the host, a two-way authentication protocol is required to limit the module to operate only with the authorized host system.

## 9 Required Labeling on the Outside of the Host

### 9.1 FCC Labeling Requirements on the Outside of the Host

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

|                                                      |
|------------------------------------------------------|
| Contains:<br>FCC ID: R68OQ845US<br>IC: 3867A-OQ845US |
|------------------------------------------------------|

The FCC requires a logo signifying emission compliance on the outside of the host system. The OEM integrator is responsible to perform FCC Part 15 Class B digital emissions testing on the end system with the radio Module installed. The FCC logo below should not be affixed unless the OEM integrator has obtained the necessary Part 15 approval, e.g., self-declaration of conformity.

If the host system is approved to FCC Class B digital emissions limits under a grant of certification issued by a TCB, the FCC ID number shown on the grant should be used on the label instead of the FCC logo below.



Also see <https://www.fcc.gov/logos>.

A certified modular has the option to use a permanently affixed label, or an electronic label (Refer to FCC KDB 784748 D02 e labeling for e-labelling guidance). All modules without an integrated display on the module must be labelled with a module's FCC ID - Section 2.926.

### 9.2 Industry Canada Labeling Requirements on the Outside of the Host

#### End Product Labeling

The final end product must be labeled in a visible area with the following for the Open-Q 845 uSOM: **Contains IC: 3867A-OQ845US.**

#### Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:  
Open-Q 845 uSOM: **Contient des IC: 3867A-OQ845US.**

## 10 Required Labeling on the Module

### 10.1 FCC and Industry Canada Labeling on the Module

The OEM integrator must ensure that the FCC ID and IC number is affixed on the Module or in a User/Installation Manual along with other country certification numbers and logos as described herein.

Note: the original Module manufacturer may affix regulatory labeling at time of Module manufacturing. However, the OEM integrator must ensure that Module labeling is complete, correct, and applicable for all the countries to which the host system is to be imported, marketed, or sold.

## 11 Required Regulatory Wording for End User Manual / Installation Manual

### 11.1 FCC Requirements for End User Manual / Installation Manual

The OEM integrator must provide instructions in the end user manual how to retrieve the module FCC ID for host devices using electronic labeling (for example an integrated display) in lieu of a physical label or nameplate to meet the labelling requirements of Industry Canada (Refer to FCC KDB 784748 D02 e labeling document for guidance).

The OEM integrator must include text in the end user manual meeting the regulators' requirements. When the module is installed inside another device, the user manual of that device must contain the statements and warnings below:

#### **FEDERAL COMMUNICATIONS INTERFERENCE STATEMENT**

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 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, uses 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 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 that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

**Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 21 cm between the radiator & your body.

**This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:**

**KDB 996369 D03 OEM Manual v01 rule sections:**

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15.247 and 15.407.

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 21 cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 21 cm can be maintained between the antenna and users.

|                    |                         |
|--------------------|-------------------------|
| Antenna Type:      | Flexible Dipole Antenna |
| Antenna connector: | U.FL                    |

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: R68OQ845US". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

#### 2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

#### Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

#### OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment

## 11.2 Industry Canada Requirements for End User Manual / Installation Manual

### Industry Canada Statements

This device complies with ISED's licence-exempt RSSs. 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.

Le présent appareil est conforme aux RSSs' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée 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.

#### Radiation Exposure Statement:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 24 cm between the radiator & your body.

**Déclaration d'exposition aux radiations:**

Cet équipement est conforme aux limites d'exposition aux rayonnements ISSED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimale de 24 cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed and operated with a minimum distance of 24 cm between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée et utilisée avec une distance minimale de 24 cm entre l'antenne et les utilisateurs, et
- 2) Le module émetteur ne peut pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

**IMPORTANT NOTE:**

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

**NOTE IMPORTANTE:**

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

## End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed and operated with minimum distance of 24 cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 3867A-OQ845US".

## Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée avec une distance minimale de 24 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans une zone visible avec ce qui suit: "Contient IC: 3867A-OQ845US".

## Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in this manual.

## Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

### 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) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

(iii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate;

(iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

**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 5150-5250 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) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5 250 à 5 350 MHz et de 5 470 à 5 725 MHz doit être conforme à la limite de la p.i.r.e.;
- (iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5 725 à 5 850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée, selon le cas;
- (iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués.

## 12 OEM Integrator Checklist

The OEM Integrator will integrate the Module in the host systems in accordance with the instruction specified in this document and the documents referenced herein.

- ☐ The OEM Integrator will ensure the Module is integrated in a host system using only antennas that are of the same type and having equal or less antenna gain as described in this document.
- ☐ The OEM Integrator will ensure the antenna placement inside the host system will maintain the required spacing to the 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 a test lab or TCB 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 is labeled as specified in this document.
- ☐ The OEM Integrator will ensure that nothing is done that will change the transmit power level of the module.
- ☐ The OEM Integrator will ensure end user documentation will contain clear instructions on how to access the FCC ID and IC Number of the module should an electronic display (e-labeling) be used to meet the FCC and IC labeling requirements (Refer to FCC KDB 784748 D02 e labeling document and IC Notice 2014-DRS1003 for guidance).
- ☐ The OEM Integrator will ensure end user documentation will contain clear instructions on how to access the FCC ID and IC Number of the module should an electronic display (e-labeling) be used to meet the FCC and IC labeling requirements (Refer to FCC KDB 784748 D02 e labeling document and IC Notice 2014-DRS1003 for guidance).
- ☐ The Open-Q 845 uSOM is a pre-certified Wi-Fi/BT module that requires a specific binary Board Data File (BDF) and WLAN configuration file to maintain compliance. The correct BDF and WLAN configuration files are included with Android software releases from Lantronix (as indicated in software release notes). Customers programming the SOM with other OS images must contact Lantronix to ensure they have incorporated the correct files to maintain compliance.