Installation Guide

1. Purpose

The purpose of this document is to provide information on how to integrate the Wireless Power Transmitter (Model: 81909005) and Receiver (Model: 81909004) with

FCC ID: 2AOR81909004

into a final application.

Incorrect integration or use may infringe compliance rules meaning recertification may be required.

2. Module Description

The Wireless Power modules (Tx= power transmitter, Rx = power receiver) are designed to provide a high efficiency power transmission of up to 13.5W to an USB Type-C device. This power transmission is using a pair of tightly coupled power coils. An additional pair of inductive coupled coils is used to transfer control information from the power receiver back to the transmitter to provide a safe operation at the optimum working frequency.

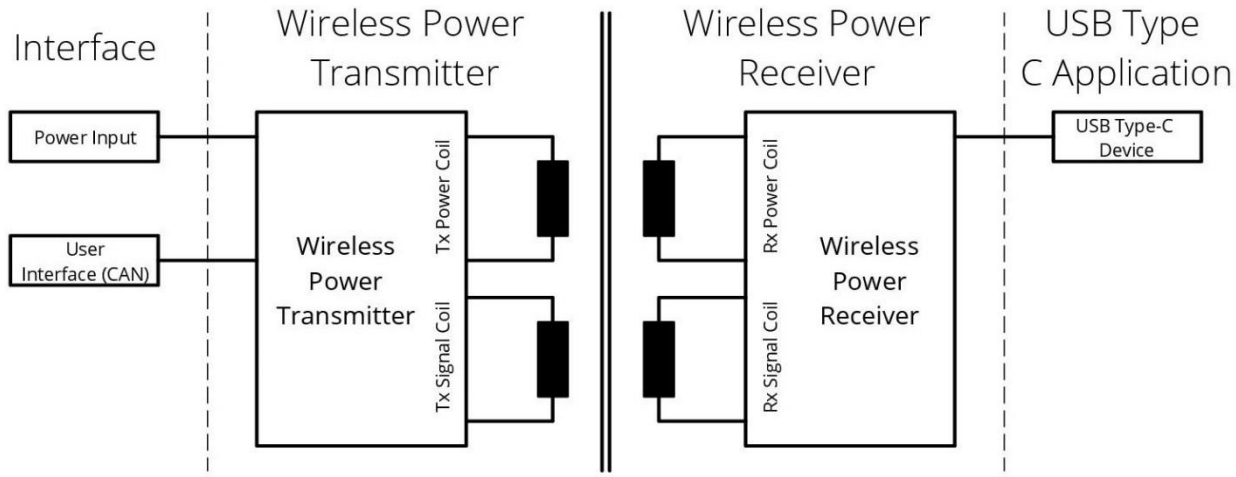
The power transmission module input voltage is 24V DC.

To maximize the system efficiency, the power transmission between Wireless Transmitter and Receiver is realized using resonant circuits. These resonant circuits additionally provide the ability to vary the transmitted power by changing the switching frequency. By increasing the switching frequency, the available power on the receiver side de-creases.

For an accurate output voltage regulation, a control loop is necessary. The output conditions like output current, voltage and power are measured on the receiver side and sent to the power transmitter. If corrections are necessary, the transmitter will change the switching frequency to the desired value.

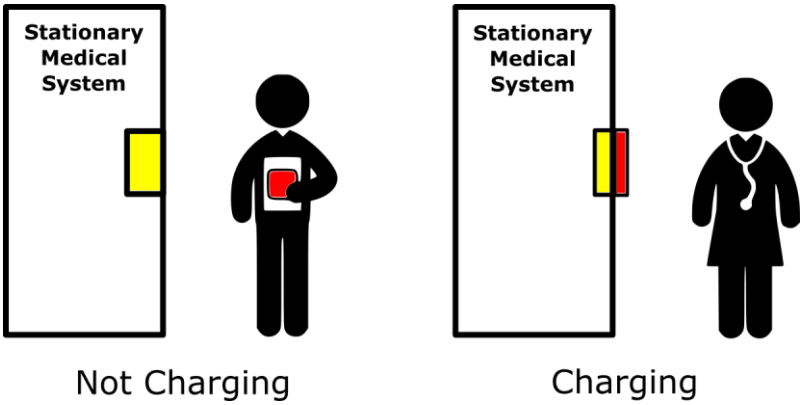
An appropriate control loop needs a fast signal transmission with little delay. This transmission is accomplished using a second pair of coupled coils. Like the power transmission coils, the signal coils form a near field coupling system thus the intended use of radio waves isn't necessary.

The following picture shows a block diagram of the complete system including Transmitter and Receiver.



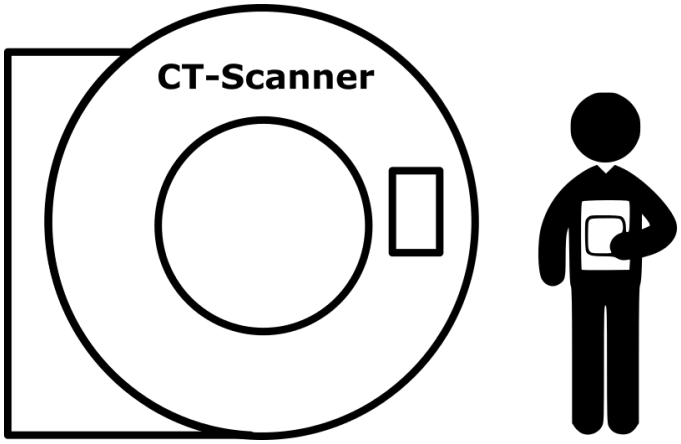
3. Application Examples

The system is designed to be used as a Wireless Charger for USB Type-C powered devices in medical environments (e.g. tablets). The Wireless Power Transmitter must be mounted on and powered by a base station. The Wireless Power Receiver can be connected with the USB Type-C device either using an USB type C compliant cable. The USB type-C device together with the Wireless Power Receiver can be used in mobile applications, the base station including the Wireless Power Transmitter is stationary and not intended for mobile usage. In order to start the charging process, the Power Receiver must be placed close to the Power Transmitter. Charging will only take place during non-mobile stationary usage. The power transmitter is stationary and the power receiver will be installed inside a non-stationary device. The power receiver and the device which will be charged are to be mounted in the same enclosure, so it's not possible for hum

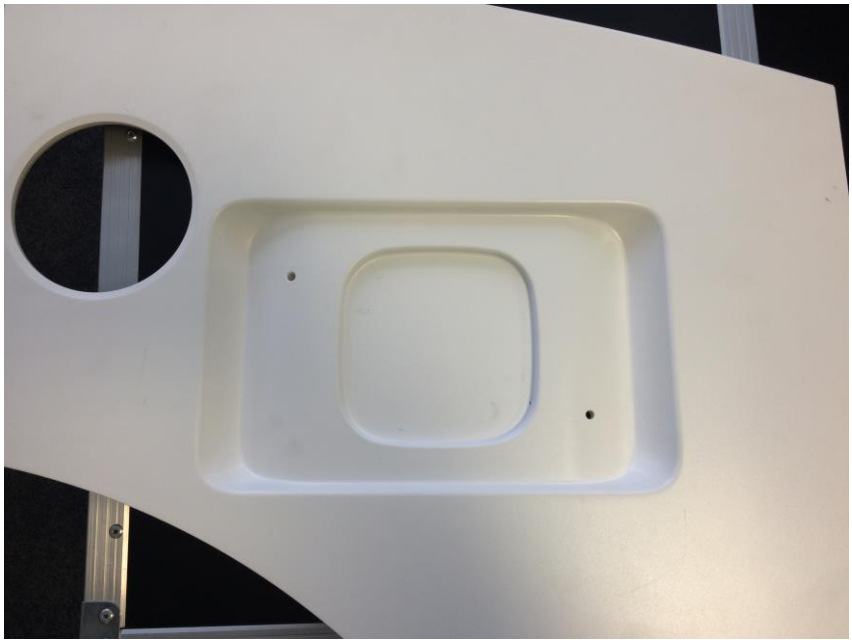


The picture shows the use cases "Not Charging" and "Charging". The Power Transmitter is depicted yellow, the Power Receiver red.

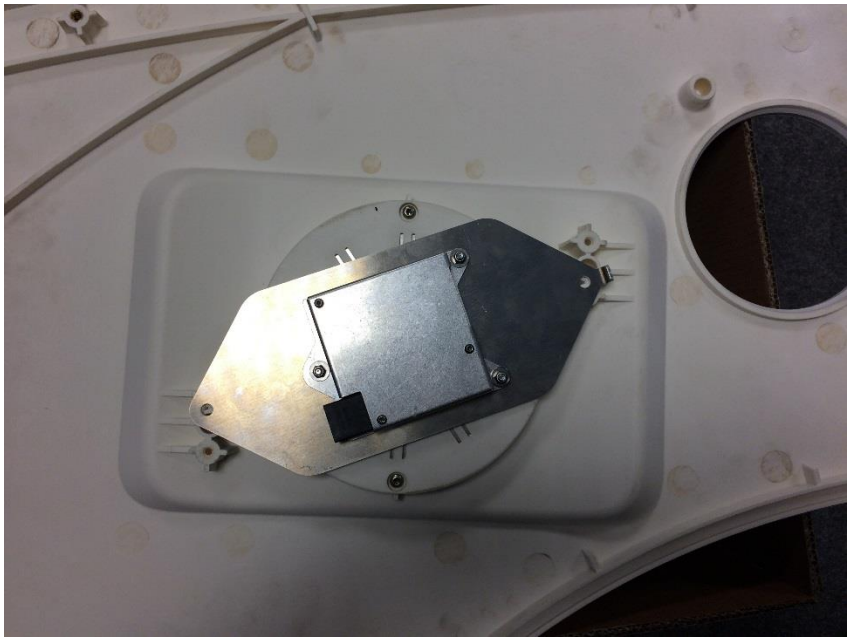
The following pictures shows an example application where the Wireless Power Transmitter is wall mounted on a computer-tomography scan unit and the Receiver is connected to a tablet which is used for supervision. In this situation the tablet isn't charging.



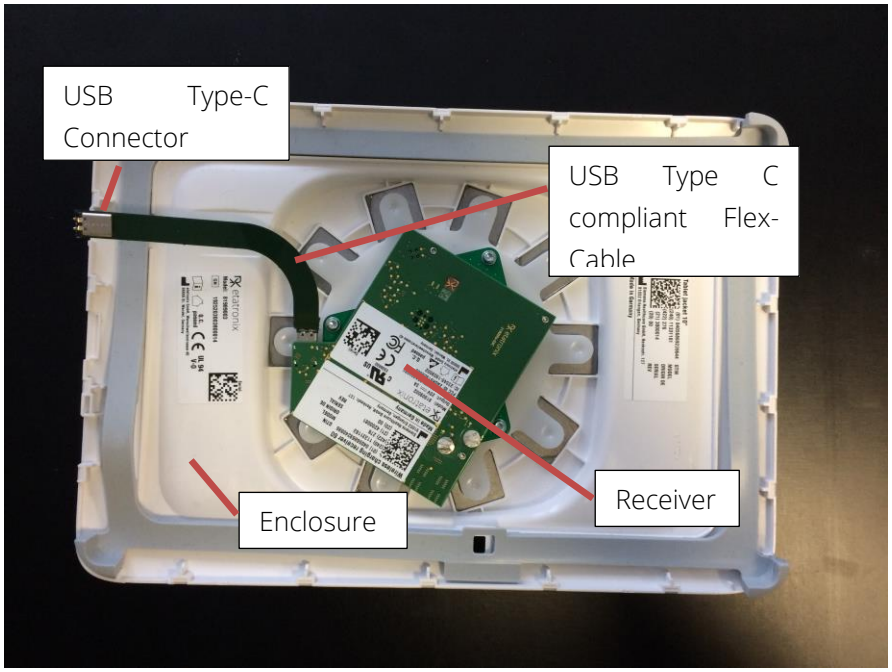
The following pictures shows part of the front of a medical stationary device. The Transmitter is mounted behind the front and not accessible on back and side:



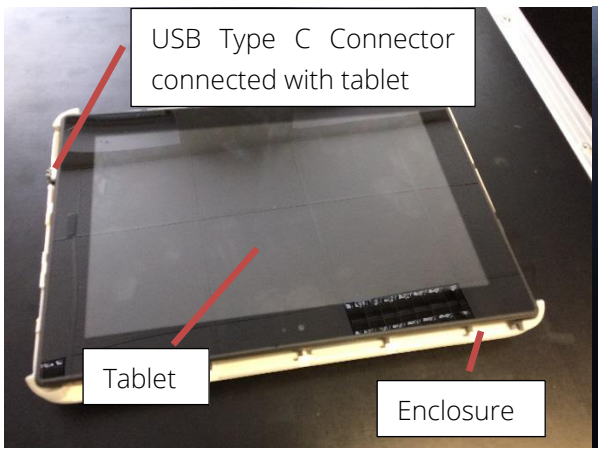
The following pictures shows the backside of the front of the stationary medical device where the Transmitter is mounted:

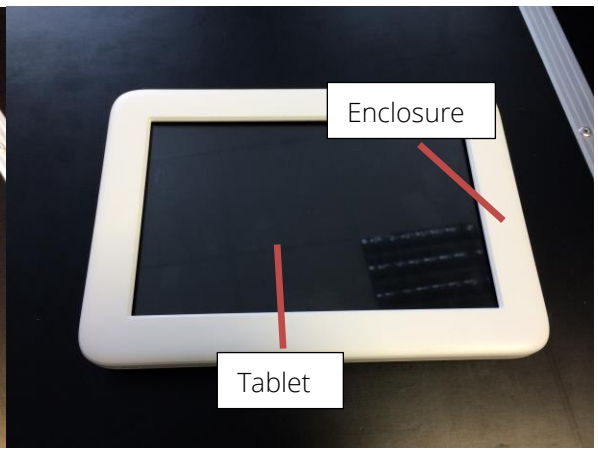


The following pictures shows the enclosure for both Wireless Receiver and tablet with Receiver mounted and tablet not mounted.



The following pictures shows the enclosure for both Wireless Receiver and tablet with Receiver and tablet mounted. The tablet is connected with the Receiver using an USB-cable (see picture above and section “Integration into products”.



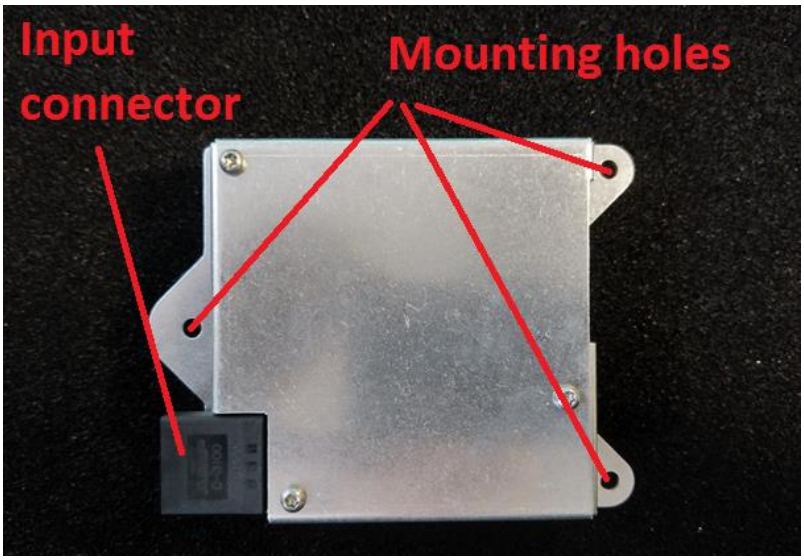


The following pictures shows the enclosure with tablet and Wireless Receiver put on top of the stationary medical device. This is the typical setup for the charging tablet:

4. Integration into Products

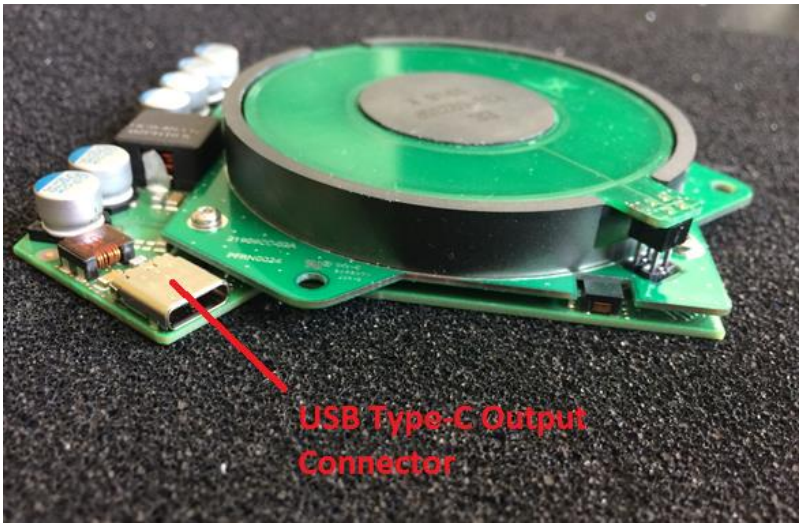
Transmitter

The input connector of the Wireless Power Transmitter is a TE Connectivity 1-178293-3. The Wireless Power Transmitter shall be mounted using the mounting holes provided by the manufacturer. M4 screws and hex nuts are recommended.



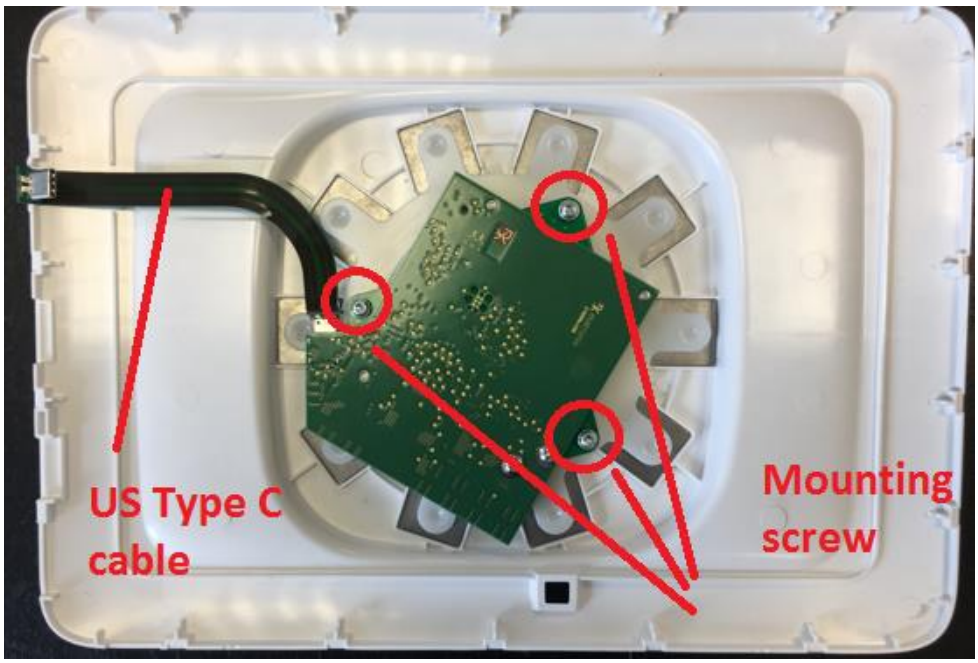
Receiver

The Wireless Power Receiver supplies a USB Type-C compliant power to the host application. The following picture shows the USB type C output connector:



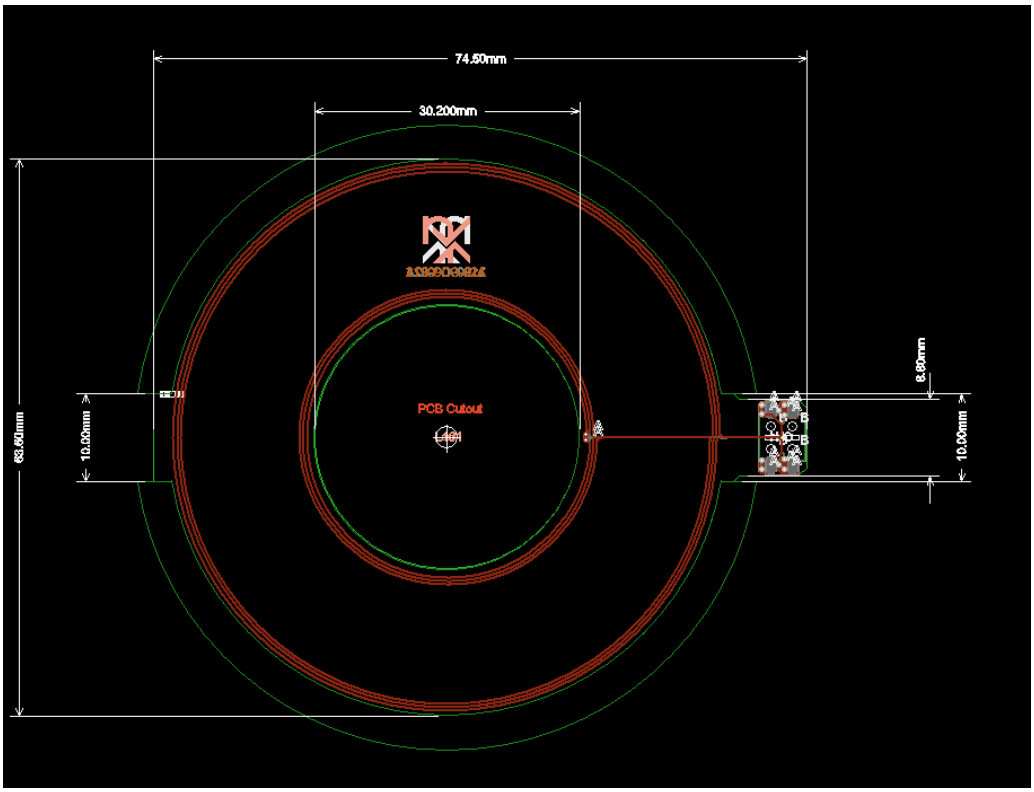
The Wireless Power Receiver shall be mounted using the mounting holes provided by the manufacturer. M3 screws are suitable, e.g. Screwerk STP 3803000803 or comparable. The cable to supply the load shall be USB Type-C compliant.

The following picture shows the system mounted in a final example application without the tablet.



5. Antenna design

The following picture shows the antenna design. The antenna is carried out on a 1mm PCB using traces of 200u width, the distance between the windings is 200u.



As shown in various EMC tests, no intended radiation is used to transmit data. All information is transmitted using the principle of near field coupled coils utilizing a carrier frequency of 2MHz. The coil area used is 440 mm².

6. Regulatory Information

FCC

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

1) This device may not cause harmful interference, and

2) This device must accept any interference received including

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

This device and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC's multi-transmitter procedures.

IMPORTANT NOTE:

FCC Radiation Exposure Statement; Co-location of this module with other transmitter that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device must be installed to insure a separation distance of at least 20cm from all persons (mobile application).

7. Integration Information for the OEM

It is the responsibility of the OEM / Host product manufacturer to ensure continued compliance to FCC certification requirements once the module is integrated in to the Host product. Please refer to FCC KDB 996369 D04 for additional information.

The module is subject to the following FCC rule parts: 15.205, 15.207, 15.209 and 15.215

AC conducted emissions at the host's AC power input need to be verified with Wireless Power Transfer (WPT) PT / communications active to ensure continued compliance with 15.207 and 15.107

8. Host Product

User Guide Text/FCC Compliance

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

1) This device may not cause harmful interference, and

2) (This device must accept any interference received including

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

This device and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC's multi-transmitter procedures.

IMPORTANT NOTE:

FCC Radiation Exposure Statement; Co-location of this module with other transmitter that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

The following text is placed in the host product, user guide:

> *This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device contains an integral antenna hence, the device must be installed to so that a separation distance of at least 20cm from all persons.*

9. Host Product Label

The host product must be labelled with the following information:

"Contains FCC ID: 2AOR81909004"

"This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received including interference that cause undesired operation."

Important Notice to OEMs: The FCC Part 15 text must go on the Host product unless the product is too small to support a label with the text on it. It is not acceptable just to place the text in the user guide.

E-Labelling

It is possible for the Host product to use e-labelling providing the Host product supports the requirements of FCC KDB 784748 D02 e labelling.

E-labelling would be applicable for the FCC ID certification number and the FCC Part 15 text.

Changes in Usage Conditions of the Module

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures.

In accordance with FCC KDB 996369 D03, section 2.9, test mode configuration information is available from the Module manufacturer for the Host (OEM) product manufacturer.