



MIRION
TECHNOLOGIES

Mirion Technologies Ultra-Wideband OEM Module User Manual

Version 4 - September 2020

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Version History

Version 1 – August 2020: Initial Release

Version 2 – September 2020: Including additional required information

Version 3 – September 2020: Including additional required information

Version 4 – September 2020: Including additional required information

Overview

The OEM module is a part of the Mirion Technologies Orion RTLS system. The module utilizes ultra-wideband (UWB) pulses to communicate data and timestamp information to other UWB devices in the system. This information is used to calculate the position and movement of the OEM module.

Product Specifications

Main System Components

Microcontroller:	Nordic nRF52840 MCU BLE Transceiver
RF Transceiver:	Decawave DW1000 Ultra-Wideband (UWB) IEEE802.15.4-2011
Sensors:	Accelerometer
Indicators:	LED
Operating Voltage:	3.0 - 3.6V (3.3V nom.)
Operating Temperature:	-20°C to 65°C
Storage Temperature:	-40°C to 65°C

Mechanical

Length: 40 mm
 Width: 20 mm
 Height: 7.8 mm
 Weight: 3.4 g

RF Characteristics

UWB IEEE802.15.4-2011

Channel: 5, PRF 16 MHz

Bandwidth (Values in MHz):

fM	The highest emission peak	6544.5
Bandwidth	10 dB Bandwidth	613.3

Data Rate: 6.81 Mbps

Channel: 5, PRF 64 MHz

Bandwidth (Values in GHz):

fM	The highest emission peak	6644.4
Bandwidth	10 dB Bandwidth	520.5

Data Rate: 6.81 Mbps

Antenna

Manufacturer	Model	Type	Peak Gain (dBi)
Mirion Technologies	N/A [Embedded]	Planar PCB	1.4

United States (FCC) Regulatory Information

FCC ID: 2AWTM-RTLS-OEM001

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.

NOTE: 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.

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

The OEM integrator is responsible for compliance testing to Part 15 Subpart B with the module installed and for compliance to any other FCC rules that apply to the host not covered by the module grant of certification.

To fulfill FCC Certification requirements, an OEM manufacturer must comply with the following regulations: 1. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:

IMPORTANT: Contains FCC ID: 2AWTM-RTLS-OEM001. This equipment 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 (FCC 15.19).

Applicable rules: FCC 15.250

Canada (ISED) Regulatory Information

IC: 21847-RTLSEOM001

CAN ICES-3 (B)/NMB-3(B)

This device complies with Industry Canada's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- 1) l'appareil ne doit pas produire de brouillage;
- 2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

This Module is labelled with its own IC ID. If the IC ID Certification Number is not visible while installed inside another device, then the device should display the label on it referring to the enclosed module. In that case, the final end product must be labelled in a visible area with the following:

"Contains Transmitter Module IC: 21847-RTLSEOM001"

OR

"Contains IC: 21847-RTLSEOM001"

Ce module est étiqueté avec son propre ID IC. Si le numéro de certification IC ID n'est pas visible lorsqu'il est installé à l'intérieur d'un autre appareil, l'appareil doit afficher l'étiquette sur le module de référence ci-joint.

Dans ce cas, le produit final doit être étiqueté dans un endroit visible par le texte suivant:

"Contains Transmitter Module IC: 21847-RTLSEOM001"

OR

"Contains IC: 21847-RTLSEOM001"

This radio transmitter (IC:21847-RTLSE0EM001) has been approved by ISED Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC:21847-RTLSE0EM001) a été approuvé par ISED Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Manufacturer Model Type Peak Gain (dBi)
Mirion Technologies Embedded PCB Trace Omnidirectional 1.4

Radiation Exposure Statement:

The device has been found to be compliant to the requirements set forth in CFR 47 Sections 2.1091 and ISED Canada RSS-102 for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Déclaration d'exposition aux radiations:

Le dispositif a été jugé conforme aux exigences énoncées dans les articles 47 CFR 2.1091 et ISED Canada RSS-102 pour un environnement non contrôlé. L'antenne(s) utilisée pour ce transmetteur doit être installée pour fournir une distance de séparation d'au moins 12 mm de toutes les personnes et ne doit pas être co-localisée ou fonctionner en conjonction avec une autre antenne ou transmetteur.

This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. As long as the condition above is 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:
Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne. Tant que les 1 condition 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 can not 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 can not 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.

Applicable rules: RSS-210