

ARGON

ARG411M01

User Manual

June 2019

Rev: 1.0.0

FCC ID: 2ATN7-ARG411M01

IC: 25152-ARG411M01

16 Ribocon Way, Progress Park, Luton, United Kingdom LU4 9UR • P: +44 1582 491 616 • www.argonelectronics.com

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Introduction

The ARG411M01 is a modular device that relies on ultra-wideband (UWB) pulses and time-stamp information to capture real-time location and movement data. The ARG411M01 also includes a 2.4GHz radio transceiver for long-range communication and communication with other devices. The UWB and 2.5GHz transceivers are not to be actively transmitting simultaneously.

Product Specifications

Main System Components

Microcontroller / 2.4GHz Transceiver: Laird BL654 Module (FCC ID: SQGBL654, IC: 3147A-BL654) based on Nordic Semiconductor nRF52840

RF Transceiver: Decawave DW1000 Ultra-Wideband (UWB) IEEE802.15.4-2011

Operating Voltage: 3.3V

Temperature Range: -40 - 85C

Mechanical

Length: 1.93" (49.0mm)

Width: 1.00" (25.5mm)

Height: 0.12" (3.0mm)

Weight: 0.14 oz (4 grams)

RF Characteristics

UWB IEEE802.15.4-2011

Bandwidth (Values in GHz):

Antenna: Taoglas FXUWB01.07.0100C

Channel: 5, PRF: 16 MHz

fM	The highest emission peak	6.38156
fL	10 dB below the highest peak	6.21464
fH	10 dB above the highest peak	6.73438
fC	Calculated (fH - fL)/2	6.47451
Bandwidth	Calculated: (fH - fL)	0.51974

Channel: 5, PRF: 64 MHz

fM	The highest emission peak	6.38356
fL	10 dB below the highest peak	6.21664
fH	10 dB above the highest peak	6.74388
fC	Calculated (fH - fL)/2	6.48026
Bandwidth	Calculated: (fH - fL)	0.52724

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Antenna: Argon Electronics MAN

Channel: 5, PRF: 16 MHz

fM	The highest emission peak	6.38806
fL	10 dB below the highest peak	6.21414
fH	10 dB above the highest peak	6.74838
fC	Calculated (fH - fL)/2	6.48126
Bandwidth	Calculated: (fH - fL)	0.53423

Channel: 5, PRF: 64 MHz

fM	The highest emission peak	6.39905
fL	10 dB below the highest peak	6.17816
fH	10 dB above the highest peak	6.80735
fC	Calculated (fH - fL)/2	6.49276
Bandwidth	Calculated: (fH - fL)	0.62919

Antenna: Argon Electronics MDO-ANT-C5UWB30 (Directional)

Channel: 5, PRF: 16 MHz

fM	The highest emission peak	6.48951
fL	10 dB below the highest peak	6.09220
fH	10 dB above the highest peak	6.85382
fC	Calculated (fH - fL)/2	6.47301
Bandwidth	Calculated: (fH - fL)	0.76162

Channel: 5, PRF: 64 MHz

fM	The highest emission peak	6.53098
fL	10 dB below the highest peak	6.12169
fH	10 dB above the highest peak	6.82434
fC	Calculated (fH - fL)/2	6.47302
Bandwidth	Calculated: (fH - fL)	0.70265

Antennas

Manufacturer	Model	Type	Peak Gain (dBi)
Taoglas	FXUWB01.07.0100C	Omnidirectional	3.5
Argon Electronics	MAN	Omnidirectional	3.6
Argon Electronics	MDO-ANT-C5UWB30	Directional	13.0

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United States (FCC) Regulatory Information

FCC ID: 2ATN7-ARG411M01

This device complies with Part 15 of the FCC Rules:

Operation is subject to the following 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

Changes and Modifications not expressly approved by Argon Electronics (UK) Ltd. can void your authority to operate this equipment under Federal Communications Commissions rules.

To fulfill FCC Certification requirements, an OEM manufacturer must comply with the following regulations:

1. The ARG411M01 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: 2ATN7-ARG411M01. 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).

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Canada (ISED) Regulatory Information IC: 25152-ARG411M01

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development (ISED) Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS(s) exemptés de licence d'Innovation, Sciences et Développement économique (ISED) Canada. L'opération est soumise aux deux conditions suivantes:

1. Cet appareil ne doit pas causer d'interférences
2. Cet appareil doit accepter toute interférence, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil.

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 the enclosed module. In that case, the final end product must be labelled in a visible area with the following:

"Contains Transmitter Module IC: 25152-ARG411M01"

OR

"Contains IC: 25152-ARG411M01"

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: 25152-ARG411M01"

OR

"Contains IC: 25152-ARG411M01 "

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This radio transmitter (IC: 25152-ARG411M01) 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: 25152-ARG411M01) 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)
Taoglas	FXUWB01.07.0100C	Omnidirectional	3.5
Argon Electronics	MAN	Omnidirectional	3.6
Argon Electronics	MDO-ANT-C5UWB30	Directional	13.0

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 be installed to provide a separation distance of at least 12 mm from all persons and 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.

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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 changé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

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IC: 3147A-BL654

This device contains licence-exempt transmitter(s)/receiver(s) that comply with ISED Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS(s) exemptés de licence d'ISED Canada. L'opération est soumise aux deux conditions suivantes:

1. Cet appareil ne doit pas causer d'interférences
2. Cet appareil doit accepter toute interférence, y compris les interférences pouvant provoquer un fonctionnement indésirable de l'appareil.

This radio transmitter (IC: 3147A-BL654) 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: 3147A-BL654) 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) 2400 - 2500 MHz	Peak Gain (dBi) 2400 - 2480 MHz
Laird	NanoBlue	PCB Dipole	2	-
Laird	FlexPIFI	PCB Dipole	-	2
Laird	FlexNotch	PCB Dipole	-	2
Mag.Layers	EDA-8709-2G4C1-B27-CY	Dipole	2	-
Laird	mFlexPIFA	PIFA	-	2
Laird	Laird NFC	NFC	-	-
Laird	BL654-SA PCB printed antenna	Printed PCB	0	
Walsin	EDA-8709-2G4C1-B27-CY	Dipole	2	-

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 be installed to provide a separation distance of at least 12 mm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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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.

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.

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European Union (ETSI) Regulatory Information:

The ARG411M01 Module has been certified for use in European Union countries. If these modules are incorporated into a product, the manufacturer must ensure compliance of the final product to be European harmonized EMC and low voltage/safety standards. A declaration of Conformity must be issued for each of these standards and kept on file as described in Annex II of the R&TTE Directive. Furthermore, the manufacturer must maintain a copy of the modules' documentation and ensure the final product does not exceed the specified power ratings, antenna specifications, and/or installation requirements as specified in the user manual. If any of these specifications are exceeded in the final product, a submission must be made to a notified body for compliance testing to all required standards.

IMPORTANT: The "CE" marking must be affixed to a visible location on the OEM product. The CE mark shall consist of the initials "CE" taking the following form:

The CE marking must have a height of at least 5mm except where this is not possible on account of the nature of the apparatus. The CE marking must be affixed visibly, legibly, and indelibly.

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