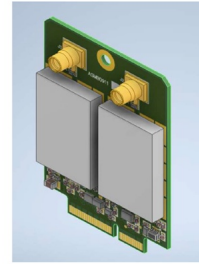




Wabtec
ASMB0911
Mini Dual RF
UHF Module
Silabs



Wabtec ASMB0911 Mini Dual RF UHF Module Silabs Instruction Manual

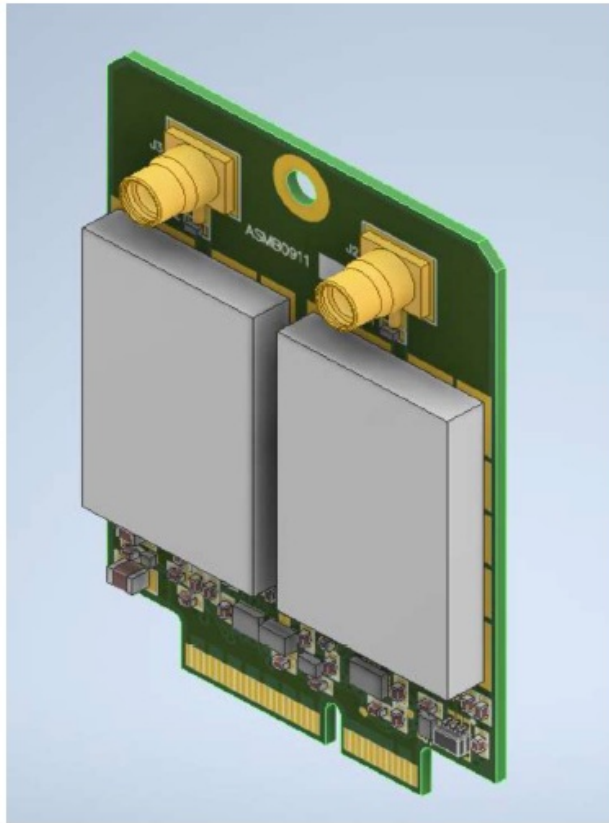
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Wabtec ASMB0911 Mini Dual RF UHF Module Silabs



Specifications

- Product Name: Digital Mining Technology ASMB0911 MINI DUAL RF UHF MODULE SILABS
- Hardware Integration Manual

Product Information

General Business

The Digital Mining Technology ASMB0911 MINI DUAL RF UHF MODULE SILABS is designed for use in digital mining operations.

Overview

The module features advanced dual RF technology for improved connectivity and communication in challenging mining environments.

General Information

Integration

Follow the hardware integration manual provided to seamlessly integrate the module into your existing system.

Maintenance

Regular maintenance is essential to ensure optimal performance of the module. Refer to the manual for maintenance guidelines.

Decommission and Disposal

When decommissioning the module, follow proper disposal guidelines to minimize environmental impact.

Product Usage Instructions

Installation

1. Identify a suitable location for installing the module with adequate ventilation.
2. Power off the system before proceeding with the installation.
3. Connect the module as per the pin configuration outlined in the manual.
4. Power on the system and ensure the module is recognized.

Configuration

1. Access the configuration settings through the provided software interface.
2. Configure the module settings as required for your specific mining operation.
3. Save the configurations and ensure they are applied successfully.

Troubleshooting

If you encounter any issues with the module, refer to the troubleshooting section of the manual for guidance.

MANUFACTURER INFORMATION

INTRODUCTION

- The product or product family described under scope of this document will be henceforth referred to as DEVICE.
- This manual provides the information on the DEVICE, its variants, specifications, operation, maintenance, decommission and disposal.

SAFETY INFORMATION

The safety section includes safety precautions which must be observed when working on items that appear throughout the manual. Examples of safety precautions and labels are outlined below:



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



Indicates a potential for equipment damage.

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These specifications are subject to change without notice.

COMPANY DETAILS

Manufacturer: 1 – General Business

- Industrea Mining Technology Pty Ltd (trading as Digital Mining Technology) 3 Co-Wyn Close
- Fountaindale, New South Wales, 2258

Australia

- **Telephone** +61 2 8863 4730
- dm.fulfilment@wabtec.com
- www.wabteccorp.com

Industrea Mining Technology Pty Ltd is a registered business subsidiary of Wabtec Corporation

OVERVIEW

GENERAL FEATURES

The ASMB0911 is a digitally controlled radio module implemented on an industry standard M2.xx style circuit board. This module can use used in a host controller board to provide a short range, power limited UHF radio link for a variety of applications.

Key features include:

- Silabs Si4463 digitally controlled radio Qty: 2 Nos.
- Power supply regulation/conditioning
- Serial interface
- Dual RF antennae connectors

ABBREVIATIONS

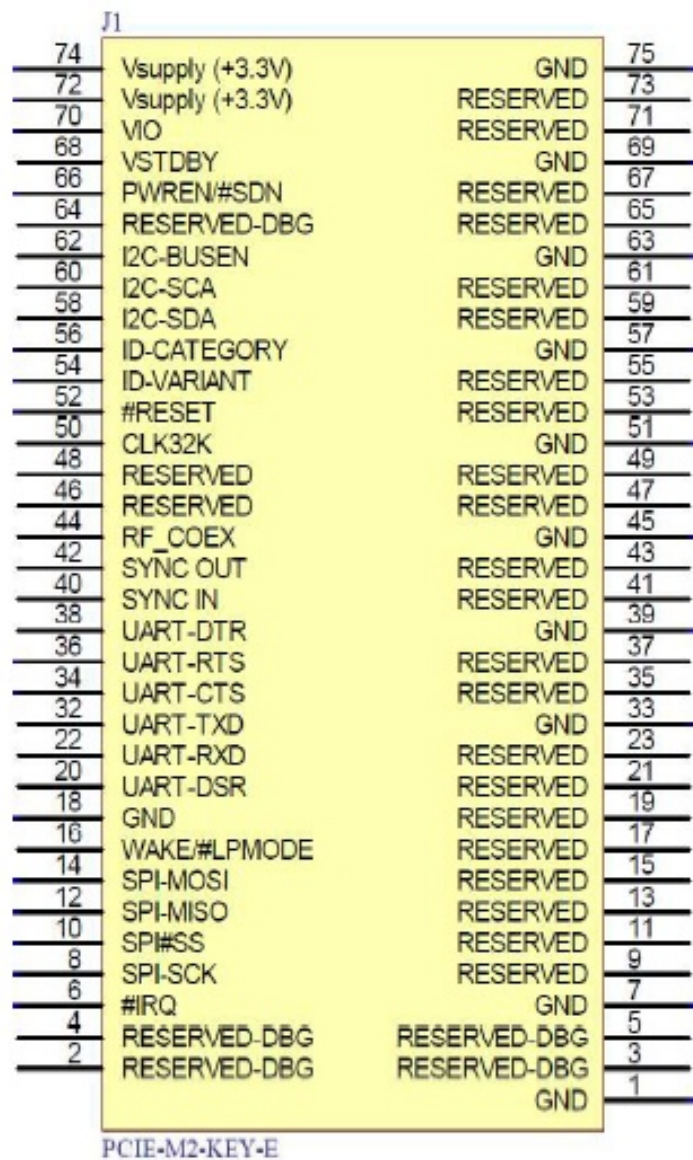
ABBREVIATION	DESCRIPTION
V2V	Vehicle to Vehicle
N/C	Not Connected

SCOPE & SPECIFICATION

This user manual covers Mini Dual RF UHF Module Silabs Radio Module, Model No.: ASMB0911.

FEATURE	DETAIL
Operating Frequency Band	869.40 – 869.650 MHz 902 928 MHz
Nominal Transmit Power	20 dBm at MMCX Pins
Chipset	SiLabs Si4463 2 Nos.
Chipset Frequency Range	142 1050 MHz
Modulation	4GFSK
Antenna Type	Two MMCX antenna connectors
Antenna Gain	902-928 MHz: Peak Gain +8 dBi max 869.40 – 869.650 MHz: Peak Gain +2.9 dBi max
Additional Mitigation Techniques	Listen Before Talk
Rated Voltage	3.3 Vdc
Operating Temperature	-40°C to +85°C
Module Dimensions	45 mm x 32 mm

PIN CONFIGURATION AND FUNCTION



PIN	SIGNAL	TYPE
74	Vsupply (+3.3V)	PWR
72	Vsupply (+3.3V)	PWR
70	VIO	PWR
68	VSTDBY	PWR
66	PWREN/#SDN	CMOS
64	RESERVED-DBG	N/C
62	I2C-BUSEN	CMOS
60	I2C-SCA	CMOS-OD
58	I2C-SDA	CMOS-OD
56	ID-CATEGORY	Passive
54	ID-VARIANT	Passive
52	#RESET	CMOS-OD

50	CLK32K	CMOS
48	RESERVED	N/C
46	RESERVED	N/C
44	RF_COEX	CMOS-OD
42	SYNC OUT	CMOS
40	SYNC IN	CMOS
38	UART-DTR	CMOS
36	UART-RTS	CMOS
34	UART-CTS	CMOS
32	UART-TXD	CMOS
30	MECH E KEY	
28	MECH E KEY	
26	MECH E KEY	
24	MECH E KEY	
22	UART-RXD	CMOS
20	UART-DSR	CMOS
18	GND	PWR
16	WAKE/#LPMODE	CMOS
14	SPI-MOSI	CMOS
12	SPI-MISO	CMOS(HiZ)
10	SPI#SS	CMOS
8	SPI-SCK	CMOS
6	#IRQ	CMOS-OD
4	RESERVED	N/C
2	RESERVED	N/C

PIN	SIGNAL	TYPE
75	GND	PWR
73	RESERVED	N/C
71	RESERVED	N/C
69	GND	PWR
67	RESERVED	N/C
65	RESERVED	N/C

63	GND	PWR
61	RESERVED	N/C
59	RESERVED	N/C
57	GND	PWR
55	RESERVED	N/C
53	RESERVED	N/C
51	GND	PWR
49	RESERVED	N/C
47	RESERVED	N/C
45	GND	PWR
43	RESERVED	N/C
41	RESERVED	N/C
39	GND	PWR
37	RESERVED	N/C
35	RESERVED	N/C
33	GND	PWR
31	MECH E KEY	
29	MECH E KEY	
27	MECH E KEY	
25	MECH E KEY	
23	RESERVED	N/C
21	RESERVED	N/C
19	RESERVED	N/C
17	RESERVED	N/C
15	RESERVED	N/C
13	RESERVED	N/C
11	RESERVED	N/C
9	RESERVED	N/C
7	GND	PWR
5	RESERVED	N/C
3	RESERVED	N/C
1	GND	PWR

APPROVED ACCESSORIES LIST

The below table outlines the accessories that are approved for operation with this Module:

For V2V Radio operation, this module has been tested and approved for use with the antenna listed below. The module may be integrated with other antennas of the same type and antenna gains of less than or equal than the approved.

For 902-928 MHz frequency band:

ANTENNA PART NO.	FREQUENCY	ANTENNA TYPE	PEAK GAIN
PROD1196	865-930MHz	Omni-directional	+2.9 dBi Max
MISC1626	915 MHz	Monopole Type	+2 dBi Max
MISC0607	865-930MHz	Omni-directional	-2.4 dBi Max
EA2-0287-N01SP-050	860-930 MHz	Omni-directional	+8 dBi Max

For 869.400-869.650 MHz frequency band:

ANTENNA PART NO.	FREQUENCY	ANTENNA TYPE	PEAK GAIN
PROD1196	865-930MHz	Omni-directional	+2.9 dBi Max
MISC1625	824-2170 MHz	Monopole Type	+1.9 dBi Max
MISC0607	865-930MHz	Omni-directional	-2.4 dBi Max

WARNINGS

- **CAUTION** Keep this Integration Manual for later reference.
- **CAUTION** Do not leave this Module in an uncontrolled environment where the storage temperature is below- 40°C (-40°F) or above 85°C (176°F). This may damage the DEVICE.
- **CAUTION** Do not operate this Module outside specified temperature range. Refer to specification table for further information.

GENERAL INFORMATION

INTEGRATION

Module Integration should be in accordance with the procedures defined by Digital Mining Technology and only performed by the manufacturer or authorized representative. Host equipment must be configured to the modulation schemes to comply with the modular approval listed in Sec. 2.3 and adhere to all local regulations appropriate for automotive Installations in the end-user geographic region.

MAINTENANCE

- This equipment is not intended to be maintained by the end user. Opening the enclosure should not be attempted, will void any warranty and could compromise the safe operation of the unit.
- No user-serviceable parts.
- Contact your local authorized representative for service arrangements.

DECOMMISSION AND DISPOSAL

Disposal of electronics should be done in accordance with local regulations.

Power should be disconnected before decommissioning.

The unit must not be treated as general waste. By ensuring that this product is disposed of correctly, you will be helping to prevent potentially negative consequences for the environment and human health which could otherwise be caused by incorrect handling of this product.

- **Waste Disposal Method:** Recycling is encouraged. Dispose of in accordance with local, state and federal laws and regulations.
- **USA:** Dispose of in accordance with local, state and federal laws and regulations.
- **Canada:** Dispose of in accordance with local, state and federal laws and regulations.
- **EC:** Dispose of in accordance with relevant EC Directives.

AUTHORIZED REPRESENTATIVES

Australia



- Industree Mining Technology Pty Ltd, Trading as Digital Mining Technology 3 Co-Wyn Close
- Fountaindale, NSW, 2258
- Australia
- Telephone
- +61 (2) 8863 4730
- GETProductionIMT@wabtec.com
- www.wabteccorp.com

Brazil



- Industree Mining Technology Pty Ltd, Trading as Digital Mining Technology 3 Co-Wyn Close
- Fountaindale, NSW, 2258
- Australia
- Telephone +61 (2) 8863 4730
- GETProductionIMT@wabtec.com
- www.wabteccorp.com

Canada



- Wabtec Transportation Canada Inc 84 Terracon Pl.
- Winnipeg Manitoba, R2J 4G7 Canada
- Telephone +1 [204-951-4320](tel:204-951-4320)
- www.wabteccorp.com

India



- Wabtec Transportation Canada Inc 84 Terracon Pl.
- Winnipeg Manitoba, R2J 4G7 Canada
- **Telephone** +1 [204-951-4320](tel:204-951-4320)
- www.wabteccorp.com

Indonesia



- PT Intecs Teknikatama Industri
- Jl. Ciputat Raya No. 18D
- Kebayoran Lama Selatan, Jakarta, 12240 Indonesia
- **Telephone** +62 (21) 729 3351
- **Fax** +62 (21) 729 3352
- www.intecs.co.id

Mexico



- Comercializadora Minera Norte, S.A. DE C.V.
- Ave. H. Colegio Militar No. 2000-B
- Col. Las Fuentes Piedras Negras, Coahuila México. C.P. 26010
- Telephone + 52 (878) 783 8215, + 1 (830) 352 5519
- Fax +52 [878-783-8218](tel:878-783-8218)
- www.cominsa.com.mx

North America



- Digital Mining
- 2901 East Lake Road Erie, Pennsylvania, 16531 USA
- Telephone +1 (480) 264 2063
- Fax +1 (480) 264 6402
- www.wabteccorp.com

Sub Saharan Africa



- Probe Integrated Mining Technologies (PTY) Ltd
- 245 Albert Amon Road
- Meadowdale, Germiston, 1614 South Africa
- Telephone +27 (11) 453 0924
- Fax +27 (11) 453 2141
- www.probebattery.co.za

PRODUCT APPROVALS AND REGULATORY INFORMATION

ASMB0911 module have modular approval and comply with FCC Part 15 and Canada Innovation, Science and Economic Development Canada (ISED) RSS-247 and RSS-Gen.

FCC ID:	YIY-ASMB0911
IC:	8903A-ASMB0911

CAUTION Modifications to this product without written consent from the manufacturer or its designated authorized representatives could void the user's authority to operate the equipment.

DECLARATION OF CONFORMITY 47 CFR § 2.1077 COMPLIANCE INFORMATION

We, Industree Mining Technology Pty Ltd, T/A Digital Mining Technology, at 3 Co-Wyn Close, Fountaindale, NSW, 2258, Australia declare under our sole responsibility the products:

Trade Name:	Digital Mining Technology
Model Number:	ASMB0911
Product Name	Mini Dual RF UHF Module Silabs
FCC ID:	YIY-ASMB0911
Responsible Party:	Digital Mining 2901 East Lake Road Erie, PA, 16531 814-875-2234

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.

MODULE STATEMENT, LABELLING & USER INSTRUCTIONS

The ASMB0911 has single module approval and comply with FCC Part 15 and Canada Innovation, Science and Economic Development Canada(ISED) RSS-247 and RSS-Gen. Single-modular transmitter approval is defined as a complete RF transmission sub-assembly, designed to be incorporated into another device, that must demonstrate compliance with FCC/IC rules and policies independent of any host. A transmitter with a modular grant can be installed in different end-use products (referred to as a host, host product, or host device) by the grantee or other equipment manufacturer, then the host product may not require additional testing or equipment authorization for the transmitter function provided by that module.

The user must comply with all of the instructions provided by the Grantee, which indicate installation and/or operating conditions necessary for compliance.

The host product itself is required to comply with all other applicable FCC/IC equipment authorizations regulations, requirements and equipment functions that are not associated with the transmitter module portion. For example, compliance must be demonstrated: to regulations for other transmitter components within a host product; to requirements for unintentional radiators(Part 15 Subpart B, ICES-003), such as digital devices, computer peripherals, radio receivers, etc.; and to additional authorization requirements for the non-transmitter functions on the transmitter module (i.e., Suppliers Declaration of Conformity (SDoC) or certification) as appropriate.

LABELING AND USER INFORMATION REQUIREMENTS:

The ASMB0911 module has been labeled with its own FCC/IC ID number, and if the FCC/IC ID number is not visible when the module is installed inside another device, then the outside of the finished product into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wordings as follows:

- Contains Transmitter Module FCC ID: YIY-ASMB0911 or Contains FCC ID: YIY-ASMB0911
- Contains Transmitter Module IC: 8903A-ASMB0911 or Contains IC: 8903A-ASMB0911

FCC INTERFERENCE STATEMENT FOR CLASS B DEVICES

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

A shielded type Ethernet cord is required to meet FCC Class B emission limits and prevent interference to the nearby radio and television reception.

This device and its antenna(s) must not be co-located or operate in conjunction with any other antenna or transmitter.

The antenna is considered an integral system component. Use of any antenna other than those specified in the installation manual or supplied with the product may void the product's compliance.

FCC RADIATION EXPOSURE STATEMENT

CAUTION To comply with FCC RF exposure limits for general population / uncontrolled exposure, the antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION To comply with FCC RF exposure limits for general population / uncontrolled exposure, the antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

INDUSTRY CANADA COMPLIANT

This Class B digital apparatus complies with Canadian ICES-003. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

CONCERNING RADIO TRANSMITTERS

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotopically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

INDUSTRY CANADA – RADIATION EXPOSURE STATEMENT

CAUTION To comply with Industry Canada RF exposure limits for general population / uncontrolled exposure, the antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

AUSTRALIAN RADIO COMMUNICATIONS EQUIPMENT RADIATION EXPOSURE STATEMENT

The equipment complies with the Radiocommunications Equipment(general) Rules 2021 + Amendment Rules 2023 (No. 1), Electromagnetic Radiation Human Exposure Standard RPS-1 for General Public Exposure, Non-Aware User, for a Compliance Level 2 Radiocommunications Equipment, when the minimum safety distance is adhered to, and shall bear the RCM.

DOCUMENT REVISION

DOCUMENT NO	REVISION
ASMB0911-HARWARE INTEGRATION MAN UAL-A	Original document
ASMB0911-HARWARE INTEGRATION MAN UAL-B	Included Module statement, labelling & User Instruction in Sec. 4.2
ASMB0911-HARWARE INTEGRATION MAN UAL-C	Included MISC0607 Antenna & extended operating temp to +8 5°C

DOCUMENT SIGN OFF

DOCUMENT REVISION NO.	
POSITION	Certification Engineer
DATE	 By P C Shivalingam at 7:22 pm, Nov 28, 2024
POSITION	Design Engineering
DATE	 By Stephen Coates at 11:40 am, Nov 29, 2024
POSITION	Engineering Manager
DATE	 By Peter O'Donnell at 1:11 pm, Nov 29, 2024

FAQs

- **Q: Is the module compatible with all mining equipment?**
 - A: The module is designed for general compatibility, but specific integration may vary. Refer to the manual for detailed compatibility information.
- **Q: How can I ensure optimal RF connectivity?**
 - A: Proper installation and placement of the module, along with regular maintenance, can help ensure optimal RF connectivity.

Documents / Resources



[Wabtec ASMB0911 Mini Dual RF UHF Module Silabs](#) [pdf] Instruction Manual
ASMB0911, YIY-ASMB0911, YIYASMB0911, ASMB0911 Mini Dual RF UHF Module Silabs, AS
MB0911, Mini Dual RF UHF Module Silabs, RF UHF Module Silabs, Module Silabs

References

- [🌐 INTECS Teknikatama Industri | INTECS Teknikatama Industri](#)
- [» One moment, please...](#)
- [🏠 Homepage | Wabtec Corporation](#)
- [User Manual](#)

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