

Hartvik Engineering AB

HE1074-915

2-way digital radio module

FCC ID: 2ASTV-1074-915

Reference manual

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Revision history

Revision	Date	Description	Changes
1	190702	Initial release	-

Warranty

1 year from purchase.

Disclaimer

This document may change without any notice. Hartvik Engineering AB provides this dokument "as is" and may make improvements/changes in this manual or in the product at any time.

Customer support

support@hartvik.se

General specifications

Specification	HE1074-915
Operating temperature	-40° to 85°C
Antenna connection	Dual male U.FL connectors for up to two external antennas
Dimensions	59,20 x 41,91 x 5,00mm
RoHS	Compliant
Module connector	Samtec TMM-110-01-L-D-SM-A
Mounting holes diameter	3,2mm

Power requirements

Specification	HE1074-915
Supply voltage	3,3V $\pm$ 5%
Max allowed ripple	$\pm$ 20mV
Operating current - transmit	111mA
Operating current - receive	22mA
Operating current - average	6 – 70mA depending on received/transmitted data size

Radio specifications

Specification	HE1074-915
Frequency	902 - 928MHz
Transmit power output	+19,0dBm $\pm$ 0,6dBm conducted
RF data rate	22kbit/s
Sensitivity	-113dBm @1% PER
Frequenzy band	902-928Mhz
Modulation	2GFSK
Channels	FHSS 53 channels
First channel	902,200MHz
Last channel	925,002MHz
Channel spacing	438,5kHz

Serial communication specifications

UART 115200bit/s, no parity, 8 data bits, 1 stop bit.

TTL levels.

Host requirements

Only Hartvik Engineering AB determines what host that can use this module trough testing to ensure the host comply to the supply voltage requirements and the host/module combination will be tested to correspond to all the regulations noted in the module grant including RF exposure evaluation.

The host manufacturer is responsible for compliance to any other FCC-rules that apply to the host, this module only complies to the rules stated in the module grant.

Together with the host manufacturer a number of testmodes can be setup to further evaluate the hosts ability to comply to all applicable FCC rules and the module approval is sustained.

Testing must be done according to FCC Modular transmitter integration guide KDB 996369 D04.

A "Class II Permissive Change" must be filed to the FCC when a new host is approved.

Regulatory conformity summary

No modifications to the module HE1074-915 made by other than Hartvik Engineering AB are allowed to ensure that the products approval of FCC and IC regulation is sustained.

Modules were tested and found to comply to the regulations using Linx ANT-916-CW-HW-SMA halfwave center-fed dipol antennas, only equal or similar antennas must be used and gain can not exceed 2dBi.

Only antennas and other peripheral approved by Hartvik Engineering AB must be used.

FCC and Industrial Canada (IC) notices

Testing for unintentional radiators of end product with the HE1074-915 built in must be done to verify that it achieve approval of FCC rules Part 15 (eg 15.107 and 15.109) respectively IC-003 for Canadian regulations.

Labeling

The FCC ID of this radio module must be included clearly visible on the final products outside label to comply with part 15 of FCC regulations.

Part 15.19(a):

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.

Part 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 15.21:

NOTE: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Part 15.247:

NOTE: This equipment will meet the requirements of FCC part 15.247, the same must applies to the host.

Regulatory Module Integration Instructions

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC / IC (Industry Canada) certification if they meet the following conditions. Otherwise, additional FCC / IC approvals must be obtained.

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The users manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- To comply with FCC / IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 2dBi.
- A label must be affixed to the outside of the host product with the following statements:

This device contains FCCID: 2ASTV-1074-915.

The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

If the final host / module combination is intended for use as a portable device (see classifications below) the host manufacturer is responsible for separate approvals for the SAR requirements from FCC Part 2.1093 and RSS-102.

Device Classifications

Since host devices vary widely with design features and configurations module integrators shall follow the guidelines below regarding device classification and simultaneous transmission, and seek guidance from their preferred regulatory test lab to determine how regulatory guidelines will impact the device compliance. Proactive management of the regulatory process will minimize unexpected schedule delays and costs due to unplanned testing activities.

The module integrator must determine the minimum distance required between their host device and the user's body. The FCC provides device classification definitions to assist in making the correct determination. Note that these classifications are guidelines only; strict adherence to a device classification may not satisfy the regulatory requirement as near-body device design details may vary widely. Your preferred test lab will be able to assist in determining the appropriate device category for your host product and if a KDB or PBA must be submitted to the FCC.

Note, the module you are using has been granted modular approval for mobile applications. Portable applications may require further RF exposure (SAR) evaluations. It is also likely that the host / module combination will need to undergo testing for FCC Part 15 regardless of the device classification. Your preferred test lab will be able to assist in determining the exact tests which are required on the host / module combination.

FCC Definitions

Portable: (§2.1093) — A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is / are within 20 centimeters of the body of the user.

Mobile: (§2.1091) (b) — A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Per §2.1091d(d)(4) In some cases (for example, modular or desktop transmitters), the potential conditions of use of a device may not allow easy classification of that device as either Mobile or Portable. In these cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength, or power density, whichever is most appropriate.

Simultaneous Transmission Evaluation

This module has **not** been evaluated or approved for simultaneous transmission as it is impossible to determine the exact multi-transmission scenario that a host manufacturer may choose. Any simultaneous transmission condition established through module integration into a host product **must** be evaluated per the requirements in KDB447498D01(8) and KDB616217D01,D03 (for laptop, notebook, netbook, and tablet applications).

These requirements include, but are not limited to:

- Transmitters and modules certified for mobile or portable exposure conditions can be incorporated in mobile host devices without further testing or certification when:

Or

- Antenna separation distance and MPE compliance requirements for **ALL** simultaneous transmitting antennas have been specified in the application filing of at least one of the certified transmitters within the host device. In addition, when transmitters certified for portable use are incorporated in a mobile host device, the antenna(s) must be ≥ 5 cm from all other simultaneous transmitting antennas.
- All antennas in the final product must be at least 20 cm from users and nearby persons.

OEM Instruction Manual Content

Operating Requirements and Conditions:

The design of *HE1074-915* complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for *portable* devices.

FCC ID:

This product contains FCCID: 2ASTV-1074-915

Note: In the case where the Host / Module combination has been re-certified the FCCID shall appear in the product manual as follows:

FCCID: 2ASTV-1074-915

Portable Device RF Exposure Statement:

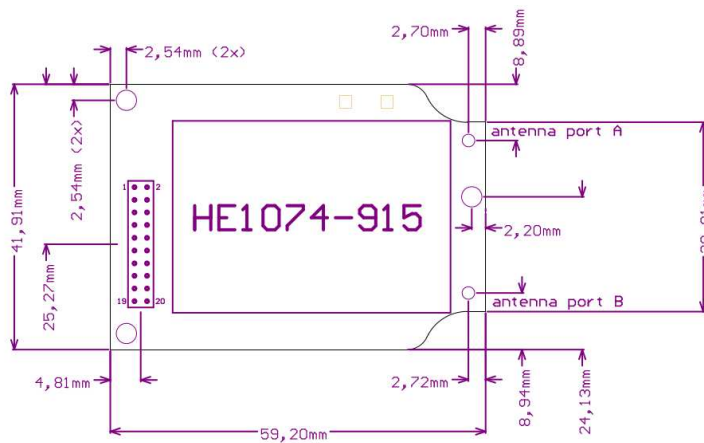
RF Exposure - This device has been tested for compliance with FCC RF exposure limits in a portable configuration. At least 0,5 cm of separation distance between the *HE1074-915* device and the user's body must be maintained at all times. This device must not be used with any other antenna or transmitter that has not been approved to operate in conjunction with this device.

Caution Statement for Modifications:

CAUTION: Any changes or modifications not expressly approved by *Hartvik Engineering AB* could void the user's authority to operate the equipment.

Mechanical drawing and pinout

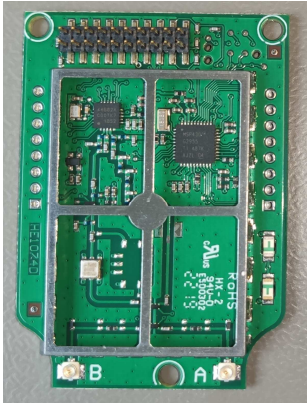
Top view.



Pin number	Description	Input/output
1	NC	
2	TxD	Output
3	RxD	Input
4	Extern I/O	Input
5	GND	
6	Frequency hop pulse	Output
7	Internally connected to pin 8	
8	Internally connected to pin 7	
9	NC	
10	VCC	
11	NC	
12	NC	
13	NC	
14	NC	
15	NC	
16	GND	
17	CMD Data	Input
18	NC	
19	NC	
20	In range	Output

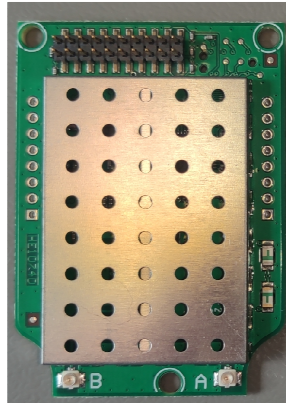
Pictures

Top view



Side view

Top side with shield lid on

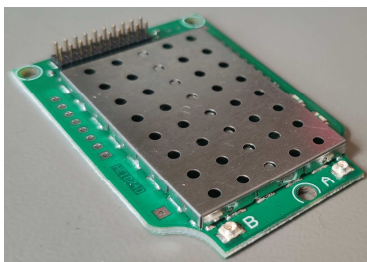


Bottom view



Antenna used in testing:
Linx Technologies Inc

Top view



ANT-916-CW-HW-SMA