ORICO RHINO2 Rhino Transmitter and Receiver Units User Guide

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ORICO RHINO2 Rhino Transmitter and Receiver Units

Change log

May 24 2022	Initial Version
May 24 2022	Updated with FCC/IC Caution Statements
Jun 14 2022	Update to reflect review comment about antennae and professional installation.
Jun 23 2022	Update to address review comment – "*The user guide shows a pwoer level of 14 (dBm?) on page V02. Thus indicagting that the 12 dBm max power stated in the rf expo sure exhibit can be exceeded by the user. Please justify how the 12 dBm maximum in t he rf exposure exhibit cannot be set to the 14 dBm shown in the user manual. PLeaase make all documentation consistent in this regard.*"
Jun 30 2022	Update to address review comment – "*Upon reviewing the test reports setup photos an d operational description it was seen that the transmitter has a cable from which DC is provided. The photos indicate that a battery was used. However, it is not clear if the po wer cable can also be connected to an AC battery elimiator or other DC supply obtainin g power from an AC line source. If this is possible, please have AC line conducted testin g performed and submit the missing data. If it is not possible to connect the DC cable of the transmitter to a battery eliminator or other AC derived DC* *power, please provide an attestation so declaring and provide information as to how onl y a battery can be used with the device.*"
Jul 20 2022	Update to address review comment – "Please add the required statement per FCC 15.2 1, "Per FCC 15.21, The user manual or instruction manual for an intentional or unintention al radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment." Please revise the section regarding the antennas to follow the requirements in RSS-GE N 6.8: https://**www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08449.html#s6.8**"

This user guide focuses on configuration of Rhino transmitter and receiver units. Installation and mechanical setup of these units is not described in this document and is out of scope. Typically, Rhino system is preconfigured in factory.

FCC Caution Statement

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.

FCC Part 15.21 Caution Statement

Any changes or modifications to this equipment not expressly approved by the party responsible for compliance could void users' authority to operate the equipment.

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

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

FCC RF EXPOSURE STATEMENT
This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

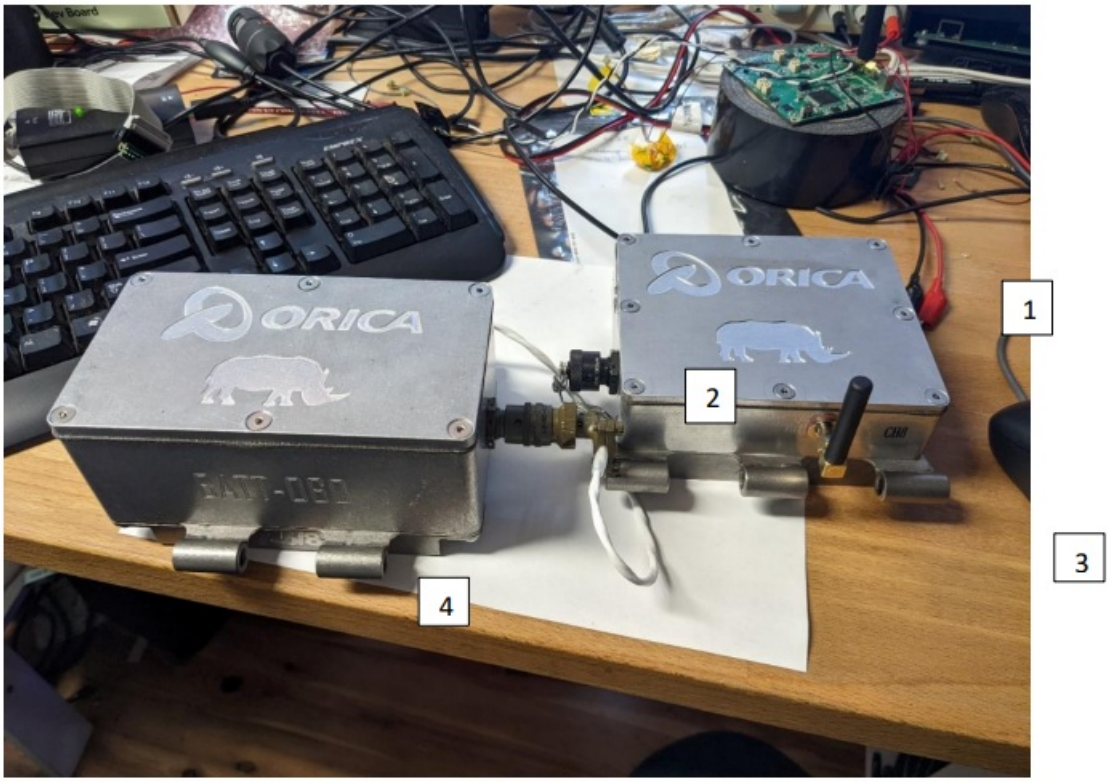
IC RADIATION EXPOSURE STATEMENT
Important Note: Radiation Exposure Statement This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.
Note: Importante: Déclaration d'exposition aux radiations.

Rhino Transmitter

Rhino Transmitter is an IoT device designed to collect and transmit vibration data. Transmitter will transmit data at a rate of 2KHz and is designed to continuously transmit data if vibration is detected. If no vibration is detected for a configurated amount of time, device goes to sleep and wakes up when vibration is detected again.

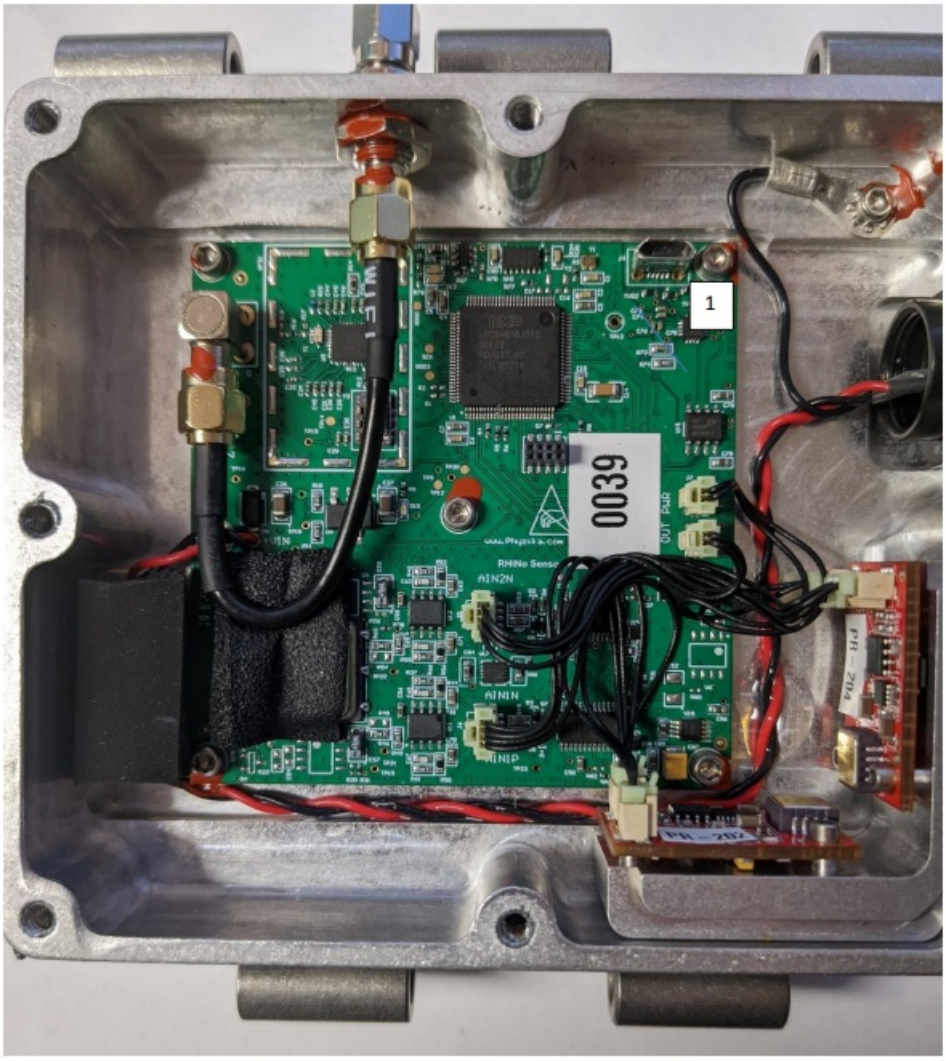
External Interfaces

Rhino Transmitter has two physical external interfaces – a power connector and an antennae connector.



1. Rhino Transmitter Unit
2. Power port
3. Antennae Port
4. Battery Pack

Transmitter device is powered by battery pack. Device is always powered by the provided battery pack and does not have any capability of operating using a battery eliminator or AC-DC adapter.

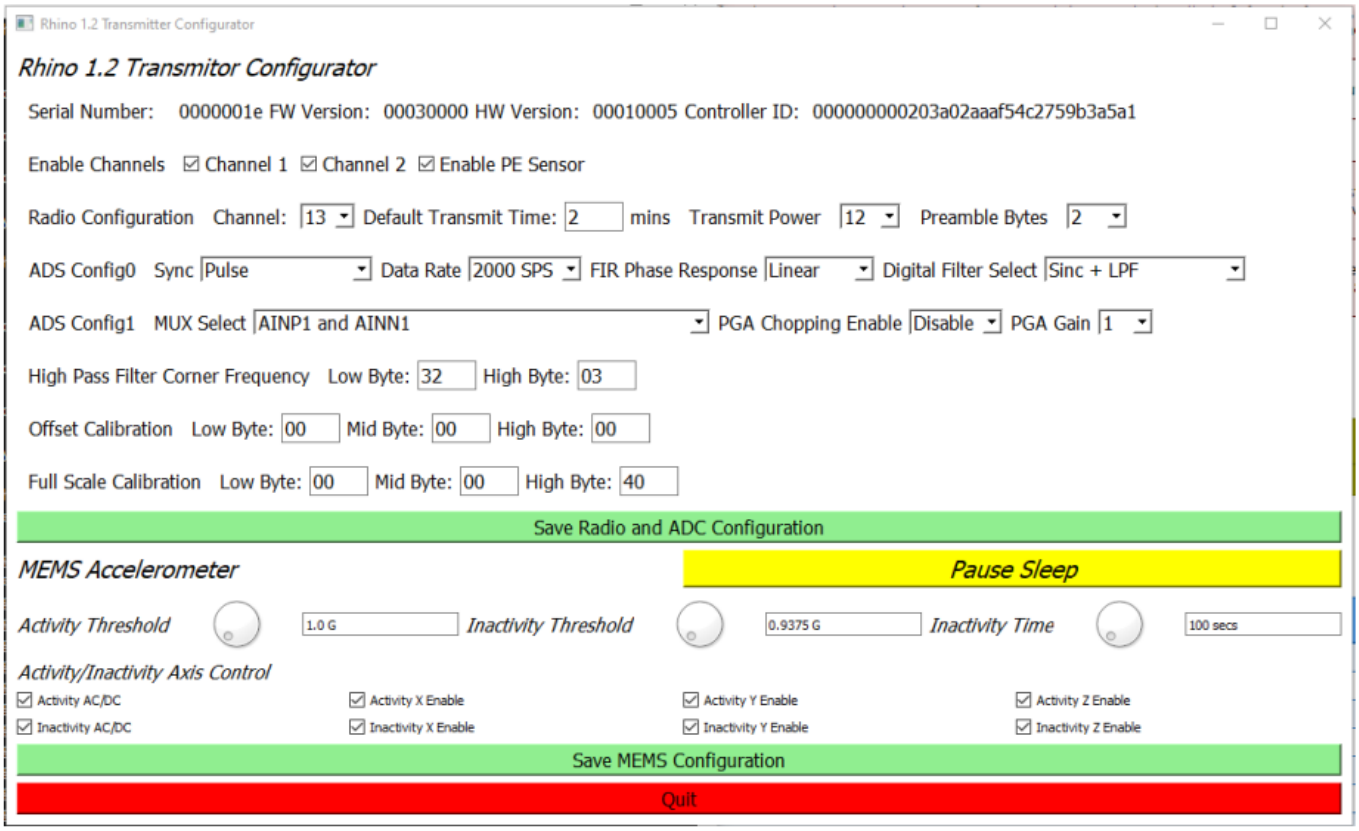


1. Serial USB interface

Configuration

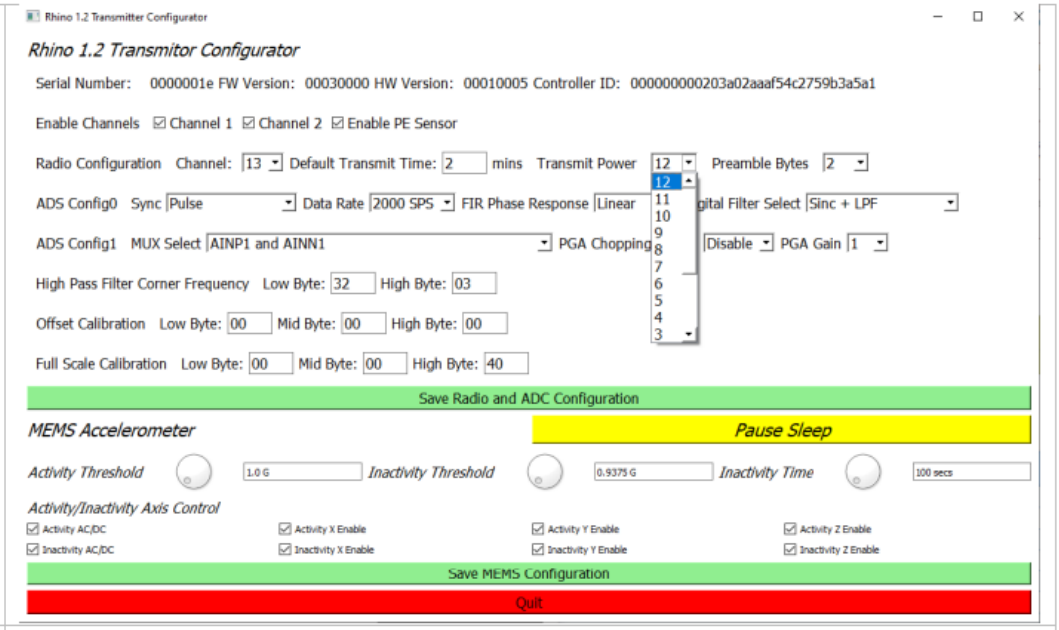
Rhino Transmitter is configured via serial USB interface. A proprietary application is used to perform configuration.

Configuration application supports configuration of radio, ADC and MEMS accelerometer. This guide focuses on radio configuration. Rhino devices are typically preconfigured at the factory and rarely reconfigured in the field. If at all reconfigured, only parameters that require reconfiguration are radio parameters. These are described below.



Configuration Parameters

Channel	Parameter selects channel on which unit will transmit. Channels are spaced 2 MHz apart and ranges from 902MHz to 928MHz.
Transmit Time	Transmit time specified in minutes -Device will transmit for configured amount of time before monitoring for activity.
Transmit Power	Configures transmit power at the radio transceiver. This is not a measure of transmit power at the antennae port. Transmit power is selected in the UI using a dropdown. Transmit power selection is limited to 12 or lower thereby eliminating installers' ability to select any value higher.

	
Preamble Bytes	The radio transceiver as part of its packet transmission protocol generates a set of preamble bytes to synchronize transmitter and receiver units. The actual data packet is transmitted after the preamble bytes. This parameter configured the number preamble bytes transmitted.

Rhino Receiver

Rhino Receivers are paired with Rhino Transmitters and are configured to receive data from a particular transmitter.

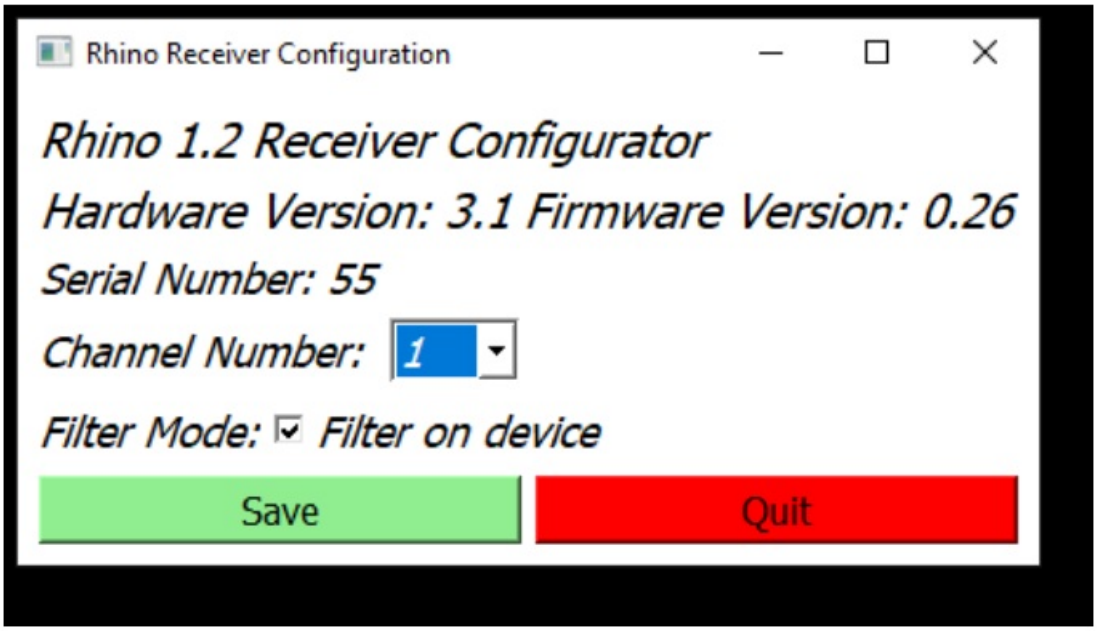
External Interfaces

External interfaces supported by the Rhino Receiver are the following:

1. Power Port – a wall adapter is used to power Rhino receiver.
2. USB Serial Port – Rhino Receiver connects to a data logger via a USB serial port. This interface is also used for configuration.
3. RJ45 Ethernet – Rhino device has a RJ45 Ethernet port – however this port is not connected electrically.

Configuration

Only configuration supported by the receiver is selection of radio channels. Similar to transmitter a proprietary application needs to be used to configure the transmitter.



Installation

Rhino system is designed to operate in rugged industrial environments. These devices will be subjected to extreme conditions such as extreme weather, dust and vibration shock etc. Rhino devices are installed in environments where industrial safety is paramount. Rhino transmitters are installed on drilling shafts and improper installation could result in industrial safety incidents. Rhino devices should be installed only by personnel trained in both installation as well as safety procedures mandated at a specific install location. Procedures for installation is described in the installation manual and detailed installation videos. Following proper installation procedures by trained personnel will ensure safe and secure operation of the devices.

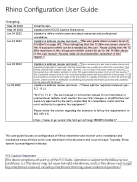
Antennae

Rhino devices should be operated only with provided antennae.

Transmitter	PulseLarsen W1900	Peak Gain 1dBi, Notional Impedance 50 Ohms
Receiver	Proxycast ANT-127-002 with SMA to RP-N Cable	Peak Gain 10dBi, Notional Impedance 50 Ohms

This radio transmitter 28722-RHINO2 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.No other antennae should be used with Rhino systems.

Documents / Resources

	**ORICO RHINO2 Rhino Transmitter and Receiver Units** [pdf] User Guide RHINO2, 2A7SR-RHINO2, 2A7SRRHINO2, Rhino Transmitter and Receiver Units, RHINO2 Rhino Transmitter and Receiver Units

References

- **RSS-Gen â€" General Requirements for Compliance of Radio Apparatus - Spectrum management and telecommunications**