Motion Detector

User and Integration Manual

Revision A

Revision History

Revision	Date	Changes Made	Responsible Engineer
A	2019-09-12	Initial version	Andrea Krmac Lore Eargle (editor)

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1.　Introduction

The motion detector is a combined BLE RF device that can be installed as an RF module on a host device. It is comprised of a BLUETOOTH® Low Energy transceiver plus an accelerometer. This document describes how the device should be connected when used on a host device.

2.　Power Interface

2.1.　Overview

The module is designed to operate on a DC power supply within 2.7 – 3.6 V. The host must provide safe and continuous power to the module.

2.2.　Power Signals

Connect the module according to Table 1 and the pin-out diagrams in Figure 1 and Figure 2.

Table 1: Power Signals

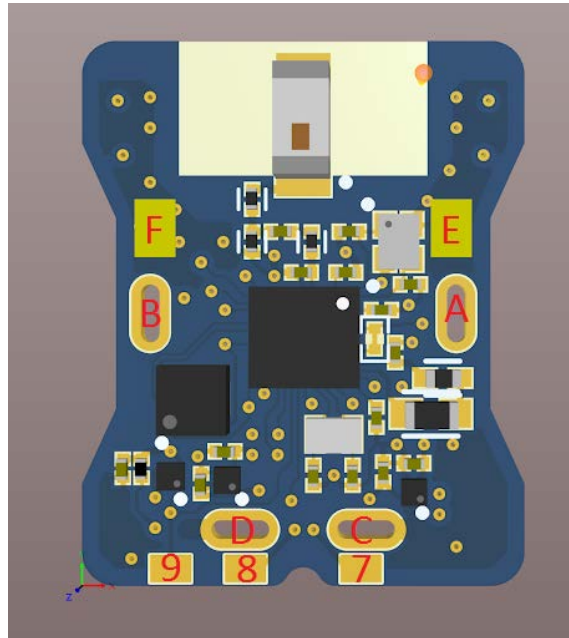| Pin Number	Pin Name	Description
1, 10	VDD_BAT	3.3 VDC power supply
A	VBAT_A	First Li battery positive terminal
B	VBAT_B	Second Li battery positive terminal
4, 13	GND	Ground. power supply return.

Figure 1: Top View of Circuit Board for Motion Detector
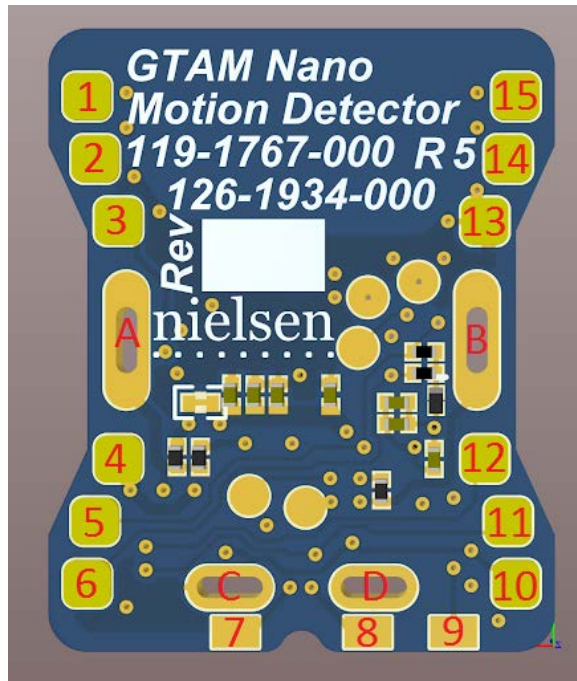
Figure 2: Bottom View of Circuit Board for Motion Detector

2.3. Motion Detector Installed on Host Device

When the unit is installed on a host device, rather than used as a standalone unit, use the power connections in Table 2

Table 2: Pin Numbers for Installation on Host Device

Pin Number	Pin Name	Description
10	VDD_BAT	3.3V DC power supply
4	GND	Ground. power supply return

2.4. Ratings

Table 3: Ratings

Parameter	Typical	Units
Supply current	10	uA

3. Communication Ports

3.1. Two-Wire Interface Module

The module contains a compatible, two-wire interface that may be used as an interface between the host board and the module.

Listed here are the main features for the two-wire interface module:

- • I2C compatible
- • 100 kbps, 250 kbps, or 400 kbps
- • Support for clock stretching
- • EasyDMA

Table 4 shows connections to the I2C interface with associated pin numbers.

Table 4: Pin Numbers for I2C Interface Module

Pin Number	Pin Name	Function
5, 14	I2C0_SCL	SCL
6, 15	I2C0_SDA	SDA

3.2. UART Port

The module also contains a UART port to interface with host board. The UART implements support for the following features:

- • Full-duplex operation
- • Automatic flow control
- • Parity checking and generation for the 9th data bit

Table 5 shows connections to the UART interface with associated pin numbers.

Table 5: Pin Numbers for UART Port

Pin Number	Pin Name	Function
7	UART0_RX	RX
8	UART0_TX	TX

4. Other Signals

4.1. GPIO

Table 6 shows the numbers for the two, digital/analog GPIO pins in the module.

Table 6: Pin Numbers for GPIO

Pin Number	Pin Name	Function	Voltage
2, 11	ADC_DEV_ID	Digital I/O or analog Input	0 – 3.3V
3, 12	ADC_PHOTO	Digital I/O or analog Input	0 – 3.3V

4.2. Reset Signal

Table 7: Pin Numbers for Reset Signal

Pin Number	Pin Name	Function
9	ACC_PWR_RESET	Reset input

5. Antenna

This section describes the type of antenna used on the module.

5.1. Antenna Type

The module incorporates a board-mounted, ceramic chip antenna (Johanson Technology 2450AT18B100) and associated matching circuit. The host board does not need any antenna-related circuitry.

5.2. Antenna Characteristics

Table 8 lists the characteristics of the antenna mounted on the module.

Table 8: Antenna Characteristics

Impedance	50 Ω
Frequency Range	2400 - 2500 MHz
Peak Gain	0.5 dBi typ. (XZ-V)
Average Gain	-0.5 dBi typ. (XZ-V)
Return Loss	9.5 dB min.

6. Regulatory Information: FCC Rules

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.

The Federal Communications Commission (FCC) warns the users that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

6.1. FCC Notes for a Host Subject to Certification

For a host device assembled with the certified module and subject to 47 CFR Part 15 certification of class B digital devices, the following statements have to be included in the user manual and the host device has to be labeled as noted below.

If the host device is subject to other authorization procedures or parts, the appropriate requirements of these authorization procedures or parts apply.

The end device must be labeled with the following statement:

Contains FCC ID: 2ASUZ003 (enter FCC ID on the Label)

6.2. Additional Testing

The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

6.3. Instruction Manual

Regarding modification of equipment, the instruction manual of the host shall include the following statement:

Changes or modifications made to this equipment not expressly approved by the party responsible for compliance may void the FCC authorization to operate this equipment.

The instruction manual of the host shall include the following statement:

For class B device:

FCC §15.105 (b):

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 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.