

Coin Battery Board for Environment Sensing Board RIOT-002A/B/C

NO.EEV-629-221011

1. Overview

The RIOT-C02 is an optional board that can be connected to the Environment Sensing Board RIOT-002A/B/C. It consists of one board of RIOT2 CoinBattery Board with a holder for a CR2032 coin battery mounted (*1).

By connecting the RIOT-002A/B to the RIOT-C02 using a 30-pin connector and the RIOT-002C to the RIOT-C02 using two 2-pin connectors, a secondary battery can be charged by the coin battery (*2).

The power from the coin battery is extracted by the RP605, an ultra-low consumption back-boost DC/DC switching regulator, to provide a constant voltage charge to the secondary battery.

RP605 Series:

<https://www.nisshinbo-microdevices.co.jp/en/products/dc-dc-switching-regulator/spec/?product=rp605>

It takes approximately 30 minutes for the RIOT-002A and 2 hours for the RIOT-002B and the RIOT-002C to become ready for operation after starting to charge a discharged secondary battery from the RIOT-C02 (*3).

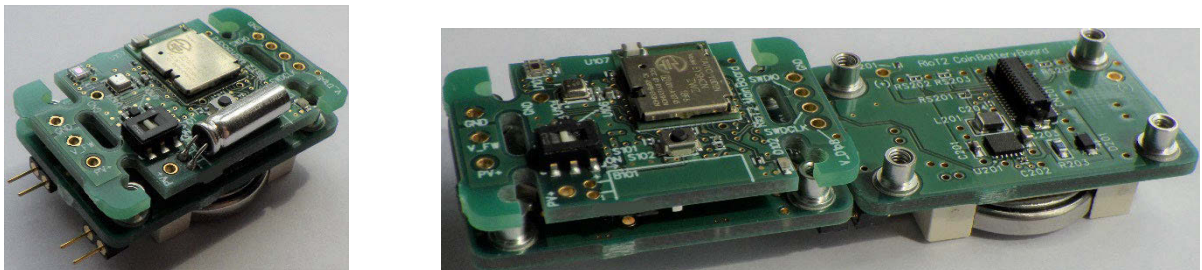


Figure 1. Connection of the RIOT-C02 to the RIOT-002A/B/C (RIOT-002A/B (left) and RIOT-002C (right))

(*1) Coin battery not included.

(*2) Please handle these 2-pin connectors with care, as it may be broken or deformed if it is dropped or otherwise subjected to strong force.

(*3) This is not the time to fully charge the secondary battery.

2. Board Specifications

2-1. Block Diagram

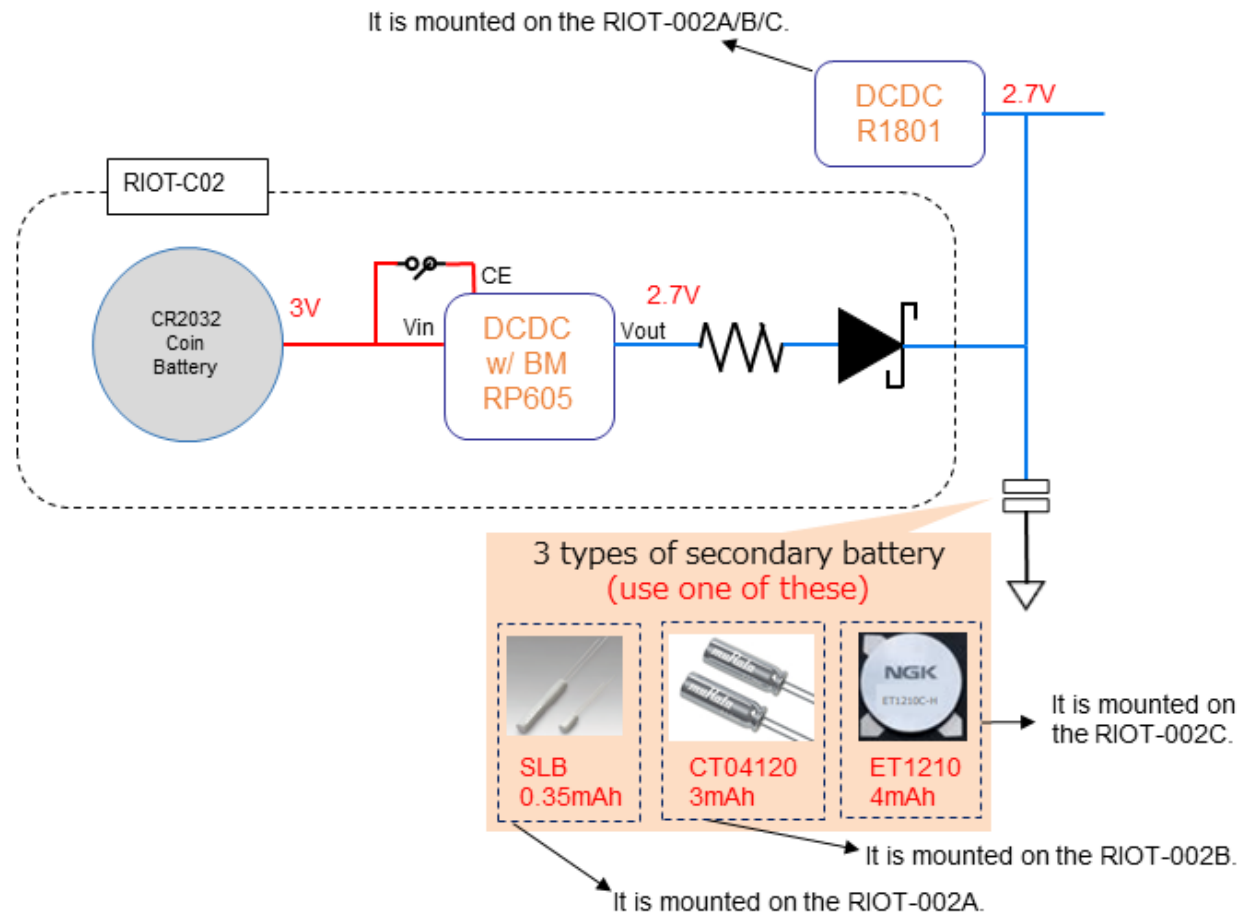


Figure 2. Block Diagram of RIOT-C02

2-2. Ratings

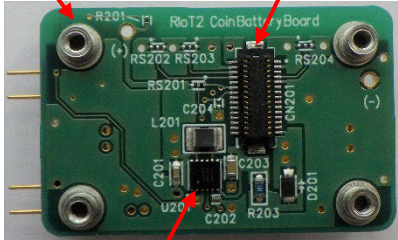
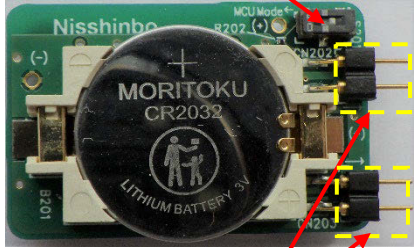
Coin battery: CR2032

Input voltage (coin battery voltage): 3.0 [V] (typ.)

Output voltage (charge voltage of secondary battery: 2.7 [V] (typ.)

2-3. Appearance

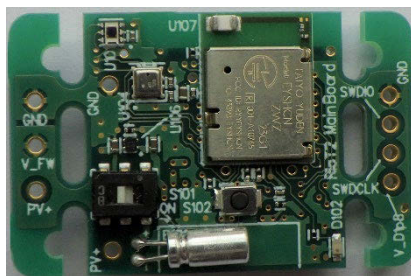
Table 1. RIOT-C02 Appearance

Top View	Bottom View
 <p>Spacers for Screwing to RIOT-002A/B (4 Locations)</p> <p>Connector for Connection to RIOT-002A/B</p> <p>Buck-boost DC/DC Switching Regulator, RP605 (For Conversion of Charge Voltage)</p>	 <p>Switch for Charge</p> <p>Connectors for Connection to RIOT-C02</p>

2-4. How to Connect RIOT-C02 to RIOT-002A/B/C

There are two connection methods depending on the type of the environment sensing board used.

Connection Method 1: In Case of the RIOT-002A or the RIOT-002B



RIOT-002A with SLB03070LR35



RIOT-002B with CT04120

Figure 3. RIOT-002A and RIOT-002B

After confirming the position of the 30-pin connector, ensure that the outline of the RIOT-C02 and the RIOT-002A/B are aligned as shown in the figure below, and gently press the area of the 30-pin connector from the top and the bottom to fit it in. If necessary, fix the boards with M2x4mm screws at 4 positions (*4).

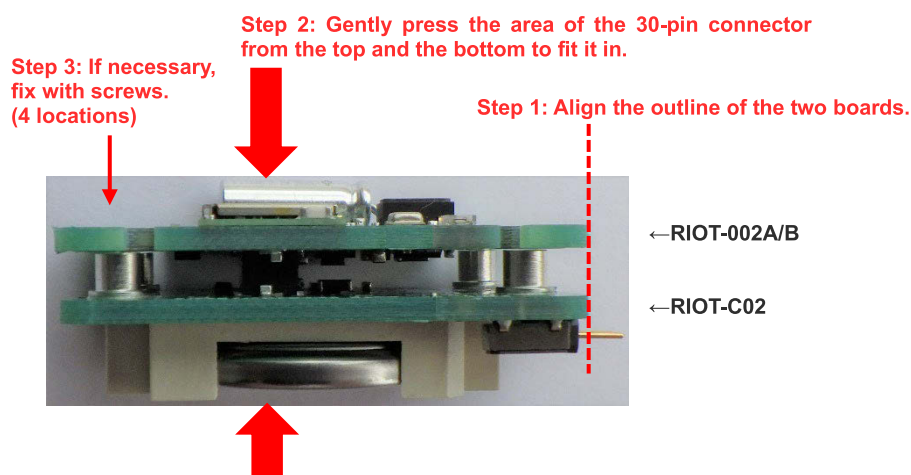


Figure 4. Connection of RIOT-C02 to RIOT-002A/B (Side View)

(*4) Screws not included.

Connection Method 2: In Case of the RIOT-002C

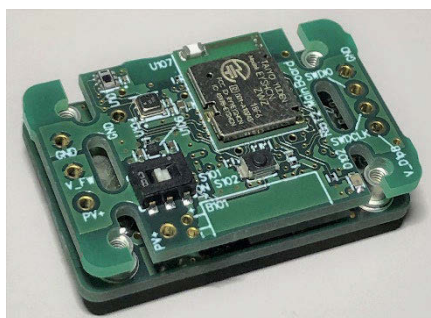


Figure 5. RIOT-002C with ET1210C-H

After confirming the position of the two 2-pin connectors, ensure that the 2-pin connectors of the RIOT-C02 and the RIoT2 EnerCera® Board ("EnerCera® Board") of the RIOT-002C are aligned as shown in the figure below (*5), and gently press both boards from the left and right to fit them together. At this time, be very careful to align the pins with the pin holes, as misalignment may cause the pins to break or bend.

Step 1: Align the position of 2-pin connectors (2 locations) on the two boards.

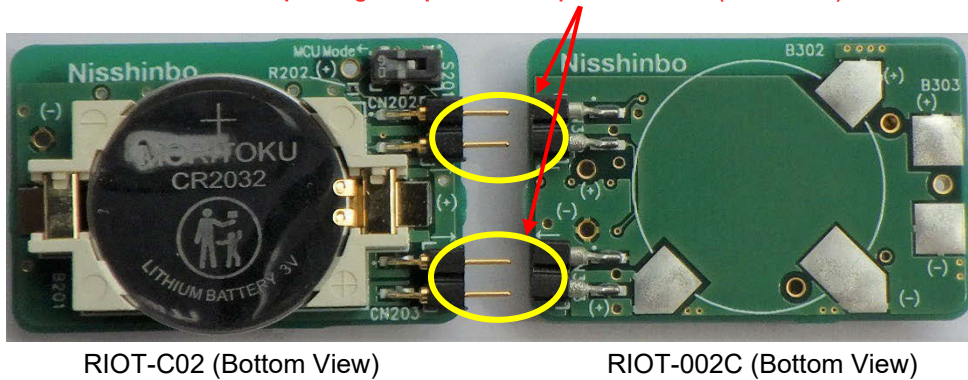


Figure 6. Connection of RIOT-C02 to EnerCera® board of RIOT-002C (1)

Step 2: Gently press both boards from the left and the right to fit them together.

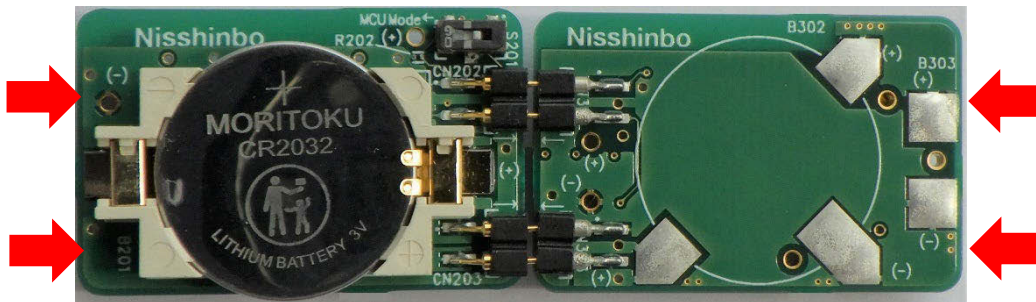


Figure 7. Connection of RIOT-C02 to EnerCera® board of RIOT-002C (2)

(*5) The RIoT2 Main Board of the RIOT-002C is not shown in the figure. Note that charging from the RIOT-C02 is possible even if RIoT2 Main Board and EnerCera® Board are connected.

2-5. How to Insert a Coin Battery

- (1) Check the position of the terminals of the coin battery holder (if the RIOT-C02 and the RIOT-002A/B/C are connected, disconnect them).

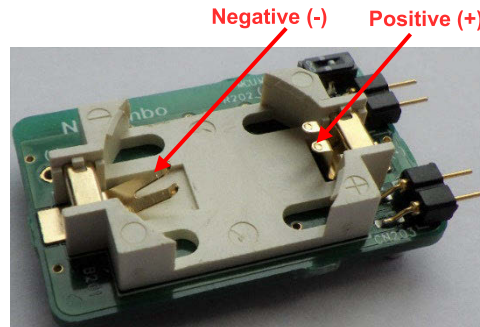


Figure 8. How to Insert a Coin Battery (1)

- (2) Insert a coin battery in the coin battery holder at an angle so that the negative (-) side of the coin battery contacts the negative (-) terminal of the coin battery holder, and the positive (+) side of the coin battery contacts the positive (+) terminal of the coin battery holder.

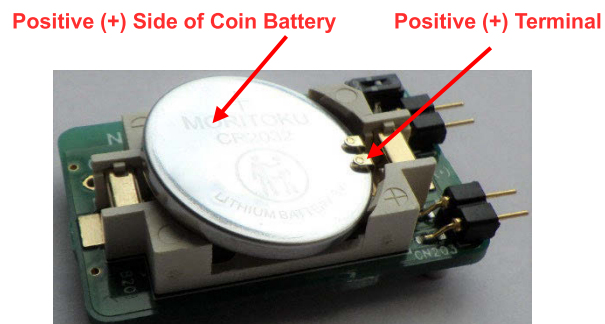


Figure 9. How to Insert a Coin Battery (2)

- (3) Align and push a coin battery.

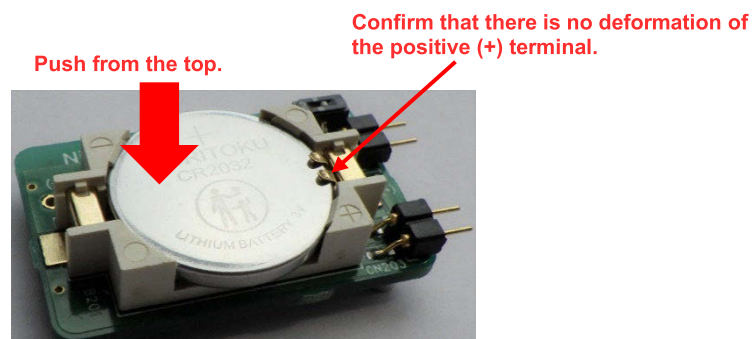


Figure 10. How to Insert a Coin Battery (3)

2-6. How to Remove a Coin Battery

- (1) Push the coin battery into the positive (+) side.

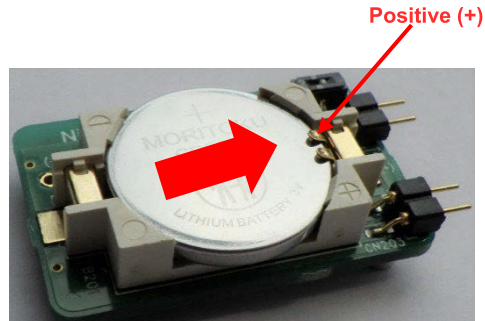


Figure 11. How to Remove a Coin Battery (1)

- (2) While pushing the coin battery toward the positive (+) side, lift the coin battery from the negative (-) side of the coin battery holder, being careful not to break claws on the four corners of the coin battery holder.

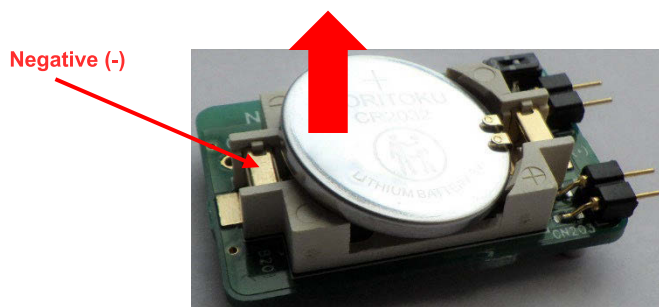


Figure 12. How to Remove a Coin Battery (2)

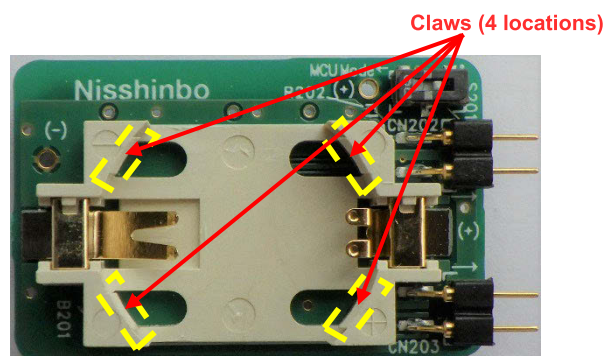


Figure 13. Coin Battery Holder Claws

2-7. How to Charge

When the switch is aligned with the white line on the switch holder, charging is stopped (off); when the switch is not aligned with the white line, charging is activated (on).

After connecting the RIOT-C02 to the RIOT-002A/B/C, turn the switch on to charge the battery, and after charging, turn the switch off and disconnect the RIOT-002A/B/C from the RIOT-C02.

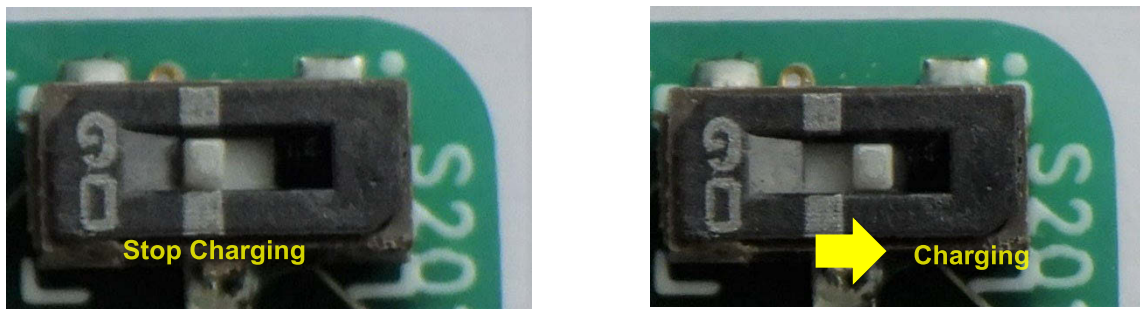


Figure 14. Position of Switch



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Please note that our warranty does not cover free samples and products purchased via another channels.
13. This product is a sample board for customers to understand our power management ICs. Safety, reliability, compatibility, etc., which are commonly required by final products for consumers or industries, are not considered in design, nor in sales, nor in manufacturing.
Please note that we do not take any responsibility or liability for any damage or loss using the product for any final products for consumer or industry.
14. Customers shall be strictly prohibited to use the products in equipment or systems that require extreme level of quality and reliability, and of which malfunction or failure may cause loss of human life and/or bodily injury, e.g., equipment used in aerospace industry, nuclear reactor control systems, traffic control systems, automotive and transportation equipment, combustion equipment, safety devices, life support systems.
15. Customer shall not use the products under any of the conditions mentioned below. This may cause malfunction or defect.
 - in water
 - in high humidity
 - under oily environment
 - in corrosive atmosphere
 - under environment with corrosive gas or inflammable gas
 - under an extremely high or low temperature environment
 - under conditions of violent vibration
 - in the place that generates electrostatic charges and electrifies
 - in a place that exposed to direct sunlight
 - in a dusty placeAnti-radiation design is not implemented in the products described in this document.
16. Improper or unintended use or misuse may lead to loss of human life and bodily injury, firing and smoking, failure of the products and connected components, and damage to property or loss of social profits.
17. Sharp edge of components such as short plug may unavoidably appear. Customer shall handle the products with the utmost care and attention to avoid injury from the sharp edge.
18. To avoid electrostatic discharge failure, Customer shall not touch the metal portion of the connector with bare hands or fingers.
Also, Customer shall remove static electricity of the human body before handling the products through touching something made of metal such as door handles. Customer shall turn off immediately when firing, smoking or abnormal heating occur during operation.
19. When connecting the products to other products, Customer shall not give excessive stress on the products. Customer shall not warp boards nor push forcefully the mounted components.
20. Customer shall not apply the supply voltage to the product if the surface of the board is wet or the product touches any metals.
21. The X-ray exposure can influence functions and characteristics of the products.
22. Do not turn on this product at the place where using wireless devices is prohibited, such as in airplanes, hospitals, near an implantable cardiac pacemaker or medical electrical equipment, etc.
The radio wave generated from this product may interfere with those devices' operation.
23. This product may be affected by radio waves emitted from devices or equipment such as wireless LAN, BLE devices, digital cordless phones, microwave ovens, etc.
24. This product must not be incorporated nor used in a metallic cabinet. Also, do not use cabinets whose coating materials contain metal composition.
25. Our company warrants the products with exceptions as indicated below, to the original purchaser to be free of defects for a period of three months from the date of arrival. Within the warranty period, we will replace a defective product with a substitute. We assumes no liability for indirect, special or incidental damage or loss including loss of profits and consequential damage regardless of possibility of anticipation.



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