Designer's Guide for

RTL8761AUV HCI Series

(RoHS BLE4.2 Serial Bluetooth Dongle)

RTL8761AUV HCI Dongle

RoHS Compliant

Date: 04/17/2019

Doc#RRD2Z50-20190417001-A01-C3

Table of Contents

Introduction

Thank you for choosing RTL8761AUV HCI HCI Dongle. We are committed to providing you quality service and technical support. The RTL8761AUV HCI dongles are designed to meet OEM's needs of embedding low power, wireless data connectivity to their products. The RTL8761AUV HCI family offers a quick and simple solution for wireless Bluetooth communications.

RTL8761AUV HCI dongle is designed to meet the emerging market for Bluetooth 4.2 applications. These embedded Bluetooth 4.2 dongles integrate entire profiles, applications, and Bluetooth protocol stack,

The RTL8761AUV HCI can be factory configured for other Bluetooth cost-effective and power-efficient wireless consumer products such as computer, medical device, TV remote controls and notebook. **Contact** for help to add the BLE Data Protocol functionality to your 4.2 Bluetooth device or for help in determining which Bluetooth Dongle is the best fit for your particular Bluetooth application.

The RTL8761AUV HCI family dongles can be powered with standard USB 5V low power. In lowest mode it consumes only 1.1 nA level power and will wake up in few hundred microseconds. The RTL8761AUV HCI family provides superior performance in the presence of interference from 802.11 (WiFi) wireless devices and other 2.4GHz radios.

The RTL8761AUV HCI dongles support quick connections and data transfers allowing an application to establish a Bluetooth connection within a few milliseconds for short communication bursts before quickly disconnecting the Bluetooth connection to save power. It takes much less time to make a connection than conventional Bluetooth wireless technology and consumes approximately only 1/20th of the power of Bluetooth Basic Rate.

The RTL8761AUV HCI is available in USB dongle designs.

RTL8761AUV HCI DONGLE and BLE Functionality

provides RTL8761AUV HCI DONGLE as a quick platform for testing and evaluating the RTL8761AUV HCI Bluetooth dongles. The RTL8761AUV HCI dongle have a USB interface that allows the user to immediately connect to any standard the Bluetooth devices.

Features

- Support the Bluetooth 4.2 core specification
- Frequency Range 2.402 – 2.480 GHz
- Integrate MCU to execute Bluetooth protocol stack
- Ultra low power consumption with intelligent PMU
- Supports Master and Slave modes
- Support fully multiple Low Energy states
- Support LE L2CAP Connection Oriented Channel Support
- Support LE low duty directed advertising
- Support LE data length extension feature
- Integrated Bluetooth low energy stack including ATT, GATT, SMP, L2CAP, GAP
- Generic Applications for GAP Central, Peripheral, Observer and Broadcaster Roles
- Firmware upgradeable through serial port
- Low power 5V operation
- TX Power: 4.0 dBm Max ~ RX Sensitivity: -97dBm Min
- Range: Up to 20 meters (line of sight)
- Support AES128/192/256 encrypt/decrypt engine
- 0°C to +70°C temperature operating

Approvals

Pending

FCC Certification

- 47 CFR FCC Part 15.247 & ANSI C63.10 2013 KDB 558074 D01 v03r05
- FCC 1.1310

CE Certification

- EN 300 328 V2.1.1
- ETSI EN 301 489-17 V2.2.1 / ETSI EN 301 489-1 V1.9.2
- EN 61000-3-2: 2014 / EN 61000-3-3: 2013
- EN 55032: 2015 / EN 55024: 2010+A1: 2015
- ETSI EN 301 489-17 V2.2.1
- ETSI EN 301 489-1 V1.9.2
- EN 61000-3-2: 2014
- EN 61000-3-3: 2013
- EN 55032: 2015
- EN 55024: 2010+A1: 2015

IC Certified

RoHS Compliant

Electronic Characteristics

	Minimum	Typical	Maximum	Unit
Operation voltage	4.8	5	5.2	V
Output Power			4.0	dBm
Sensitivity	-92.5			dBm
Current Consumption *				
Pairing mode		4.4		mA
RX active		6.9		mA

※The Current Consumption is code dependent. Bluetooth functions and characteristics will vary depending on the application firmware that is loaded into the RTL8761AUV HCI dongle. The standard code is for BLE TransData. Using any RTL8761AUV HCI I/O (output) will draw more current and change the overall current consumption.

Model Naming System

Product Series: **RTL8761AUV HCI dongle**

C: BT 4.2

Model and Ordering Information

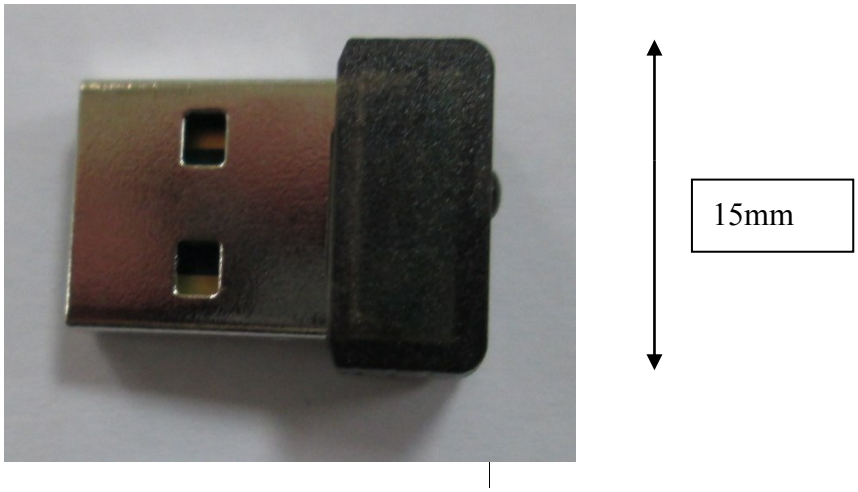
Model Numbers	Description
RTL8761AUV HCI 	RTL8761AUV HCI Bluetooth dongle with on-board antenna.

RTL8761AUV HCI Dongle Mechanical Dimensions & Pin Definitions

Size:

Unit: mm[inch]

dongle= 19.4x15x8.5 mm



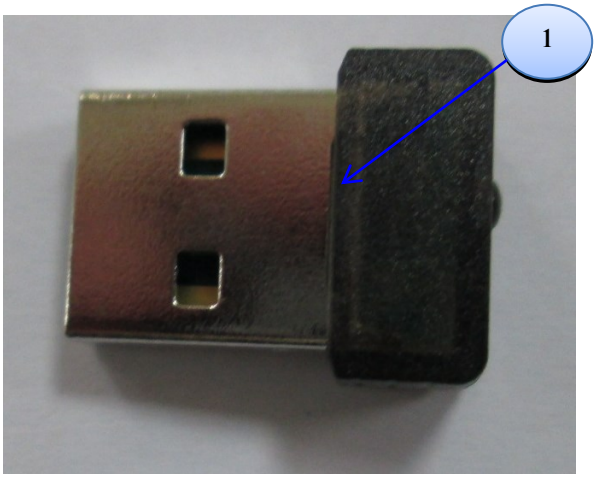
Layout Design Suggestions

General Layout Rules:

All Printed Circuit Boards must comply with UL94V0 standard for flammability. Always use RoHS compliant Parts and materials.

RTL8761AUV HCIDONGLE Development Board Figure and Functions

The RTL8761AUV HCI DONGLE Development Board has white silkscreen legend located by the switches and connectors described below.



1. USB connector

Operating RTL8761AUV HCI

Introduction:

h RTL8761AUV HCI DONGLE has an USB connector interface.

If you use **USB** interface to transmit your data, please plug to USB connector to your computer.

FCC & IC Label and Model Identification

Pending

The RTL8761AUV HCI dongle family is FCC Part 15 and IC (Industry Canada) certified. The RTL8761AUV HCI is also CE marked. The dongles are labeled with the RTL8761AUV HCI dongle model number and FCC Part 15 ID, IC registration number and CE mark. The label can be found on top of the metal shielding on the RTL8761AUV HCI Dongle.

Note: Models RTL8761AUV HCI-HM will have an additional Product ID label containing the HM model number.

Important Regulatory Compliance and User Information

The final product with the dongles installed needs to be tested for FCC Part 15, IC (Industry Canada) CE, EMI/RFI compliance. certification documentation will help streamline the final product approval process. Contact for more information. To maintain compliance in the finished product, carefully follow guidelines in this section. This device is intended only for OEM integrators under the following condition:

The transmitter dongle may not be co-located with any other transmitter or antenna. As long as this condition is met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with the dongle installed (for example, digital device emissions, PC peripheral requirements, etc).

IMPORTANT NOTE: In the event that this condition cannot be met then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Host (End Product) Labeling Requirements

To maintain compliance, the end product hosting the dongle must be properly labeled to identify that this dongle is installed. The final end product must have a label located in a visible area with the following information:

Contains Transmitter Dongle

Model: XXXXXXX

FCC ID: K7TRTL8761AUV HCI

IC: 2377ARTL8761AUV HCI

XXXXXXX is for the model of the dongle used in the end equipment. The XXXXXXX will be RTL8761AUV HCI, RTL8761AUV HCI-HM. The label shall be securely affixed to a permanently attached part of the device, in a location where it is visible or easily accessible to the user, and shall not be readily detachable. The label shall be sufficiently durable to remain fully legible and intact on the device in all normal conditions of use throughout the device's expected lifetime. These requirements may be met either by a separate label or nameplate permanently attached to the device or by permanently imprinting or impressing the label directly onto the device. The label text shall be legible without the aid of magnification, but is not required to be larger than 8-point font size.

End User Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF Exposure compliance. The end user should NOT be provided any instructions on how to remove or install the device. The user's manual for end users must include the following information in a prominent location.

FCC RF Radiation Exposure Statement

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, this device must not be co-located or operating in conjunction with any antenna or transmitter. This device contains a low power transmitter. When this device is operational, use only with the supplied, or recommended antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations. Changes or modifications not expressly approved by the manufacturer or party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) This device may not cause harmful interference

(2) This device must accept any interference received, including interference that may cause undesired operation.

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 and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. 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 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 assistance.

IC (Industry Canada) Statement:

"This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device"

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de license. L'exploitation est autorisee aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit acceptor tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

CE Declaration of Conformity

For the following equipment:

Research, Inc. Bluetooth Dongle

Model(s): RTL8761AUV HCI, RTL8761AUV HCI-HM

are herewith confirmed to comply with the requirements set out in the Council (European parliament) Directive on the Approximation of the Laws of the
Member States relating to Electromagnetic Compatibility of Radio and Telecom device (2014/53/EU). For the evaluation regarding this Directive, the following
standards were applied:

EN 61000-4-2:2010, EN 300 328 V2.1.1:2016, EN 62311: 2008,
EN 61000-4-3:2010, EN 301 489-17 V2.1.1: 2009-05, EN301 489-1 V1.92,
EN 60950-1:2006+A11:2009+A1: 2010+A12:2011,

This equipment is marked with CE and can be used throughout the European community.

France – 2.4GHz for Metropolitan France:
In all Metropolitan departments, wireless LAN frequencies can be used under the following conditions, either for public or private use:

- Indoor use: maximum power (EIRP*) of 100 mW for the entire 2400-2483.5 MHz frequency band
- Outdoor use: maximum power (EIRP*) of 100 mW for the 2400-2454 MHz band and with maximum power (EIRP*) of 10 mW for the 2454-2483 MHz band

Europe – R&TTE Compliance Statement:

Hereby, Research Inc. declares that this equipment complies with the essential requirements and other relevant provisions of LVD 2014/53/EU and EMC 2014/30/EU OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of April 14, 2014 on Radio Equipment Directive (RED) 2014/53/EU and the mutual recognition of their conformity.

Limited Warranty

Warranty Coverage and Duration

Research, Inc. ("RRI") warrants to the original purchaser its RRI-manufactured products ("Product") against defects in material and workmanship under normal use and service for a period of one year from the date of delivery. During the applicable warranty period, at no charge, RRI will, at its option, either repair, replace or refund the purchase price of this Product, provided it is returned in accordance with the terms of this warranty to RRI. Repair, at the option of RRI, may include the replacement of parts, boards or other components with functionally equivalent reconditioned or new parts, boards or other components. Replaced parts, boards or other components are warranted for the balance of the original applicable warranty period. All replaced items shall become the property of RRI.

RRI MAKES NO GUARANTEE OR WARRANTY THAT THE PRODUCT WILL PREVENT OCCURRENCES, OR THE CONSEQUENCES THEREOF, WHICH THE PRODUCT IS DESIGNED TO DEFECT.

This expressed limited warranty is extended by RRI to the original end-user purchaser only, and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by RRI, and RRI assumes no obligation or liability for additions or modifications to this warranty. In no case does RRI warrant the installation, maintenance or service of the Product. RRI is not responsible in any way for any ancillary equipment not furnished by RRI that is attached to or used in connection with the Product, or for operation of the Product with any ancillary equipment and all such equipment is expressly excluded from this warranty. Because of wide variations in topographical and atmospheric conditions, which may require availability of repeater stations or of particular radio frequencies, RRI assumes no liability for range, coverage or suitability of the Product for any particular application. Buyer acknowledges that RRI does not know a particular purpose for which buyer wants the Product, and that buyer is not relying on RRI's skill and judgment to select or furnish suitable goods.

What this Warranty does NOT Cover:

1. Defects or damage resulting from use of the Product in other than its normal and customary manner.
2. Defects or damage from misuse, accident or neglect.
3. Defects of damage from improper testing, operation, maintenance, installation, alteration, modification or adjustment.
4. Disassembly or repair of the Product in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.
5. Any Product that has had its serial number or date code removed or made illegible.

How to Receive Warranty Service:

To obtain warranty service, contact RRI by phone (408) 383 9006 for RMA Department and RMA (Return Merchandise Authorization) number. Deliver or send the Product, transportation and insurance prepaid to RRI, with the RMA number clearly marked on the outside of the package.

General Provision

This warranty sets forth the full extent of RRI's responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at RRI's option, is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESSED WARRANTIES. ANY APPLICABLE IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTY OF MERCHANTABILITY, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. TO THE FULLEST EXTENT PERMITTED BY LAW, RRI DISCLAIMS ANY LIABILITY FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVING OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE OR FAILURE OF SUCH PRODUCT.