Radiocrafts
Embedded Wireless Solutions

RCxxxx-USB

USB-stick with RF Module and Embedded Antenna

Product Description

The RC11xx / RC2400HP / RC2500HP family of USB sticks contains an RF transceiver module from the wide selection of Radiocrafts modules, together with USB level shifter, an USB type A connector, and an antenna. All fits inside a transparent plastic enclosure for visibility of embedded LEDs.

Applications

- Home- and building automation
- Smart Metering / AMR / AMI
  - Electricity, gas, water and heat meters, installation and monitoring/control
  - Energy Service Portal (ESP) / Load Control
- Wireless sensor networks



The photo is illustration only, showing a white variant.
The standard variant is transparent.

Features

- Embedded protocols for KNX RF, Wireless M-Bus, ZigBee (supporting profiles like Smart Energy), TinyMesh and RC232
- 100mW / 20 dBm output power for 2.4 GHz modules
- Integrated antenna option / U.FL connector option
- Conforms with EN 300 220 and EN 300 328 (Europe), FCC CFR 47 part 15 (US), ARIB STD-T66 (Japan) and G.S.R. 542(E)/45(E) (both for India)

Embedded protocols and supported frequencies

The USB-stick contains a certified module with a selection of RF protocols running on a hardware platform at either: 433 MHz, 865 MHz, 868 MHz, 915 MHz or 2.4 GHz.

For a full overview over each module, and to download the available literature for the embedded module itself, visit www.radiocrafts.com:

- User Manual (KNX, MBUS, RC232, ZNM (ZigBee))
- Data sheet (RC11xx-MBUS, -KNX, -RC232, TinyMesh or ZNM) and RC2500HP-RC232 or -TM (TinyMesh)

The documentation is available at the Radiocrafts webpage after selecting the protocol and then product article number.

In general, the information about the RF module hardware inside the USB stick is found in the data sheet while the protocol description is found in the User Manual:

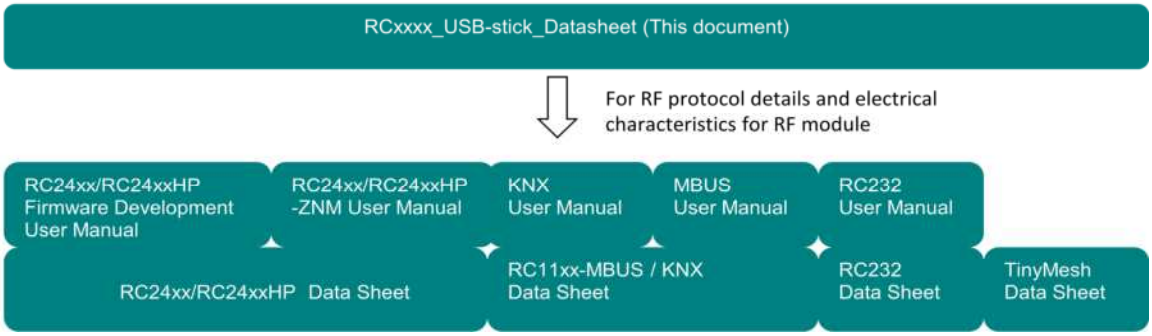
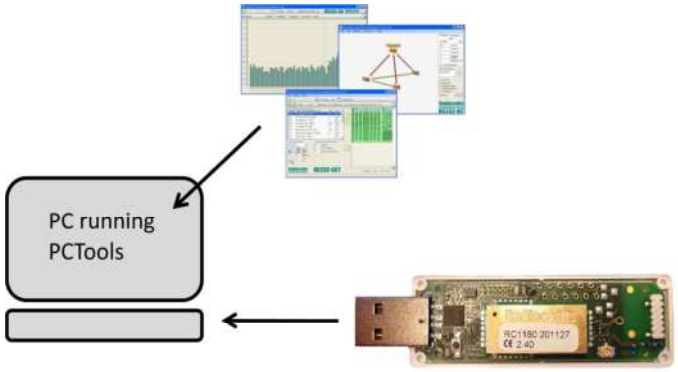


Figure 1: Document structure

For RC2400(HP) the following document structure applies:

- RC24xx/RC24xxHP Firmware Development User Manual for using the module as a hardware platform only
- RC24xx/RC24xxHP-ZNM User Manual for details on how to use the ZNM module with preloaded ZigBee Pro stack and API through a serial interface.

Getting started and principle of operation



Do not connect the USB stick until you have followed the steps below.

1. Install the PCTool matching the protocol inside the embedded module.
   This will also install the driver for the USB level-shifter
2. Connect the USB stick to one of the computers USB ports and monitor which COM port it gets allocated to
3. Start the relevant Radiocrafts PCTool and connect to the same COM-port at the speed described in the data sheet for the RF module

USB-stick overview

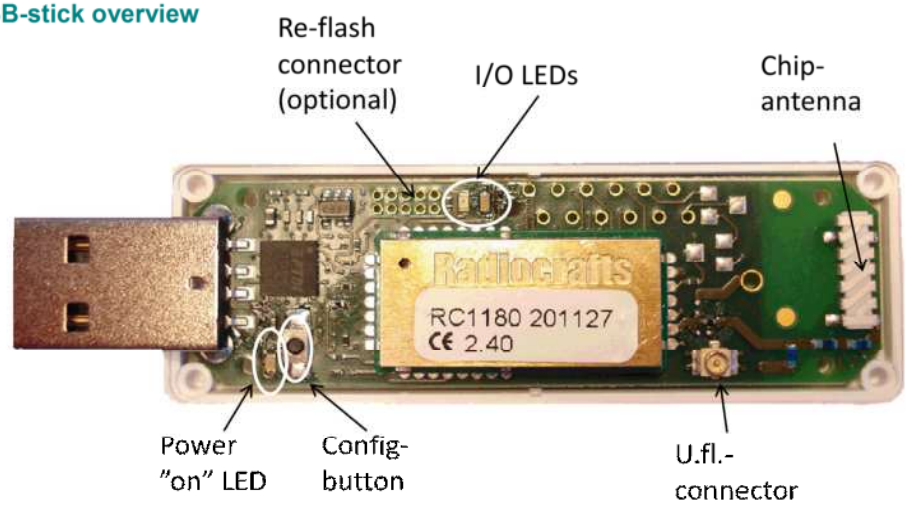
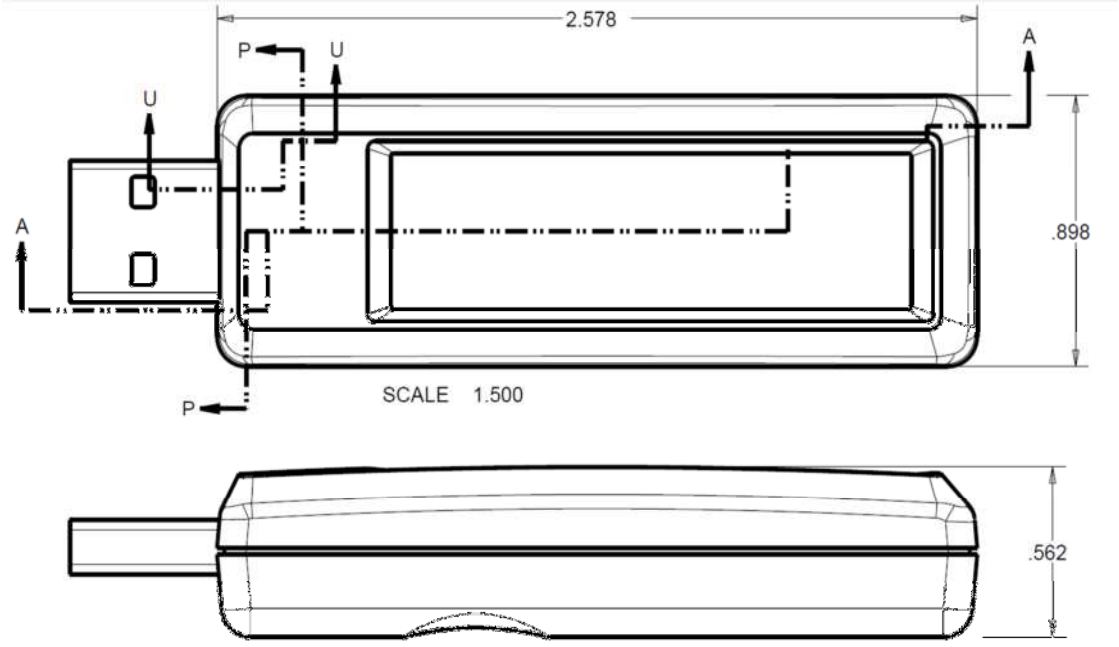


Figure 2: USB Stick top view

- The re-flashing connector is used for RC2400(HP) program development when connected to a CC debugger, or for firmware upgrade of any other embedded module
- Power-on LED will lit when connected to a USB port providing power to the port
- I/O-LEDs: Supported by some protocols like TinyMesh
- U.fl-connector: Optional

Mechanical Dimensions

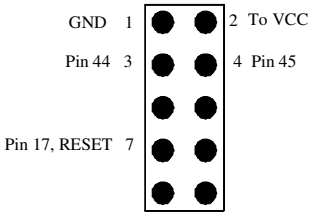


Total length including USB A connector: 78 mm

Figure 3: Mechanical measures (inches)

Programming and debugging Interface

For downloading firmware to the module (IEEE 802.15.4/ZigBee code based on own compiled firmware, or firmware upgrade of any other embedded protocol) a 2x5 pins programming connector is available on the PCB securing access to the modules programming pins. The connector is a 1.27 mm pitch pin-row (same pitch in both directions) through-hole version, with the following connections:



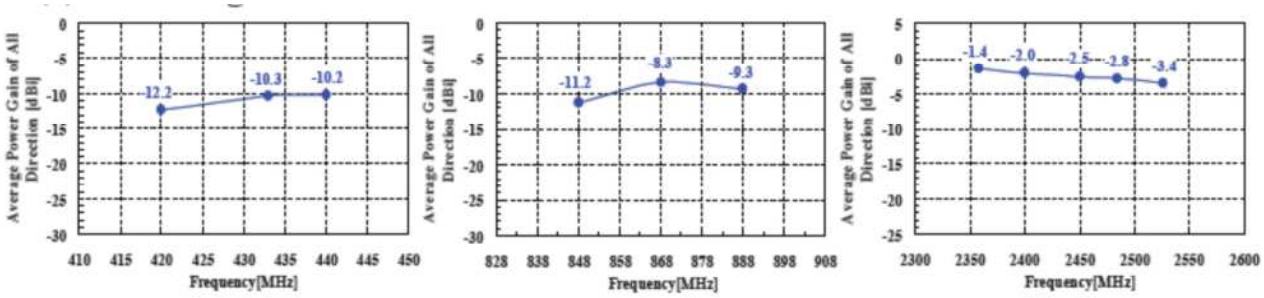
Regulatory Compliance Information

The use of RF frequencies and maximum allowed transmitted RF power is limited by national regulations. The RC2400HP has been designed to comply with worldwide regulations (R&TTE directive 1999/5/EC in Europe, G.S.R. 542(E)/45(E) for India and FCC and ARIB). The RC2400 (non-HP) complies with all directives and regulations at any power lever setting. In order to comply with the different standards, the output power for RC2400HP should be configured as commented in the data sheet for each respective module.

Antenna and Range Considerations

The module includes a compact antenna solution for 433 MHz, 868 MHz and 2.4 GHz. Due to the compressed size, the peak radiated power is reduced compared to a full quarter-wave whip-antenna as for instance delivered with the Radiocrafts Demo Kits.

The following antenna peak gains versus operating frequency apply:



Ordering part numbers

Ordering Part Number	RC1140-KNX2-USB RC1140-MBUS3-USB RC1140-RC232-USB RC1140-TM-USB	RC1170-MBUS3-USB RC1170-RC232-USB RC1170-TM-USB	RC1180-KNX2-USB RC1180-MBUS3-USB RC1180-RC232-USB RC1180-TM-USB	RC1190-RC232-USB RC1190-TM-USB	RC2400HP-ZNM-USB	RC2500HP-RC232-USB RC2500HP-TM-USB
High power amplifier (20 dBm)					•	•
Chip antenna	•	•	•	•	•	•
U.FL connector (optional)					•	

The standard variant comes in transparent plastic casing. The transparent plastic provides visibility of the LED, and access to configuration button. For other colour variant, please contact Radiocrafts.

Document Revision History

Document Revision	Changes
0.1	First draft
0.2	Added variant matrix, renamed to RCxxxx-USB
1.0	First release
1.1	Added information about plastic casing colour variants

Product Status and Definitions

Current Status	Data Sheet Identification	Product Status	Definition
	Advance Information	Planned or under development	This data sheet contains the design specifications for product development. Specifications may change in any manner without notice.
	Preliminary	**Engineering Samples and First Production**	**This data sheet contains preliminary data, and supplementary data will be published at a later date. Radiocrafts reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.**
X	No Identification Noted	Full Production	This data sheet contains final specifications. Radiocrafts reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
	Not recommended for new designs	Last time buy available	Product close to end of lifetime
	Obsolete	Not in Production Optionally accepting order with Minimum Order Quantity	This data sheet contains specifications on a product that has been discontinued by Radiocrafts. The data sheet is printed for reference information only.

Disclaimer

Radiocrafts AS believes the information contained herein is correct and accurate at the time of this printing. However, Radiocrafts AS reserves the right to make changes to this product without notice. Radiocrafts AS does not assume any responsibility for the use of the described product; neither does it convey any license under its patent rights, or the rights of others. The latest updates are available at the Radiocrafts website or by contacting Radiocrafts directly.

As far as possible, major changes of product specifications and functionality, will be stated in product specific Errata Notes published at the Radiocrafts website. Customers are encouraged to check regularly for the most recent updates on products and support tools.

Trademarks

ZigBee®™ is a registered trademark of the ZigBee Alliance.
TinyMesh™ is a trademark of Tiny Mesh AS. The TinyMesh™ Embedded RF Protocol is used in a range of products from Radiocrafts. The protocol handles host communication, data buffering, error check, addressing and broadcasting. It supports transparent and packet-addressed mesh topologies.

All other trademarks, registered trademarks and product names are the sole property of their respective owners.

Life Support Policy

This Radiocrafts product is not designed for use in life support appliances, devices, or other systems where malfunction can reasonably be expected to result in significant personal injury to the user, or as a critical component in any life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness. Radiocrafts AS customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Radiocrafts AS for any damages resulting from any improper use or sale.

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