

# **RC-03**

## **IQRF Programmable remote controller**

### **User's Guide**

- RC-03-868
- RC-03-916



Simple way to smarter wireless solutions

## Description

RC-03 is a universal user programmable IQRF remote controller with bidirectional communication and accumulator.

It is a generic equipment, i.e. the hardware is fixed and the user can realize specific functionality by software for internal TR module only.

User program can be uploaded into the TR module via RF.

Network applications can be developed using the DK-RC-03 development kit.



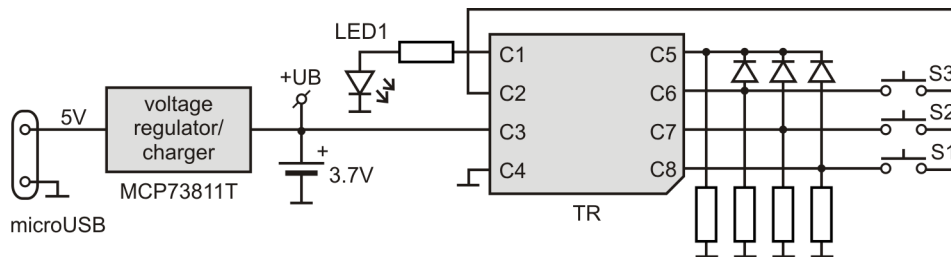
## Applications

- Portable controller
- Automation
- Voting systems
- Wide usage facilities

## Key features

- IQRF transceiver module programmable via RF
- On-board PCB antenna
- 3 pushbuttons, 1 LED
- Bidirectional communication – high security in comparison to unidirectional systems
- High performance
- Sleep mode with ultra low power consumption
- Accumulator and internal charger
- Charged via microUSB connector
- Low cost

## Simplified schematics



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**Electrical specifications***(typical values unless otherwise stated)*

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Accumulator	Li-Pol 3.7 V, 400 mAh
External power supply/charging	5.0 ± 0.35 V DC via microUSB connector
Supply current:	Exact values see datasheet of corresponding TR module. Contribution of other RC-03 circuitry is negligible.
operational:	1 mA <sup>1</sup>
standby:	2.5 µA <sup>2</sup>
accumulator charging:	85 mA
Temperature range:	0 °C to +70 °C
Frequency band:	868 MHz or 916 MHz
RF output power:	According to the TR module, SW programmable
Supported TR modules:	TR-31B-868 or TR-31B-916 and higher
Antenna:	PCB shortened ¼ wave whip
Dimensions:	93 mm x 42 mm x 14 mm
Weight:	38 g <sup>3</sup>

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**Note 1:** This current is increased due to charging in case of external supply (depended on the accumulator state).

**Note 2:** With TR-31BA, all peripherals shut down.

**Note 3:** Including accumulator and TR module.

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**Absolute maximum ratings**

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Stresses above those values may cause permanent damage to the device. Exposure to maximum rating conditions for extended periods may affect device reliability.

Supply voltage (VCC):	5.5 V
Storage temperature:	-40 °C to +85 °C

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**Hardware**

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RC-03 is a generic equipment, i.e. the hardware is fixed and the user can realize specific functionality by software for internal TR module only.

**Power supply**

RC-03 is supplied from the accumulator and charged via microUSB connector, either from PC or from mains adapter.

**Sleep mode**

It is possible to switch off all functions and peripherals to minimize current. For Sleep mode control refer to demo software included. The power can not be switched off at all, the Sleep mode is used instead of this. To wake-up, any of the pushbuttons can be used.

**Pushbuttons and LED**

Functionality of all three pushbuttons and LEDs is fully under user software control.

**TR module**

Wireless IQRF transceiver module TR-31B or higher, in SIM card format.

**Antenna**

Built-in PCB antenna on the RC-03 board.

**Case**

The plastic case is limited to a very few number of open/close cycles only. Opening the case is not required for RF programming.

## Software

### Relay control demo application

This demo illustrates unidirectional non-networking communication between the RC-03 controller and the DK-31BA relay kit, both equipped with TR-31B modules. The `RC03_simple.c` program is intended for the controller and the `DK31BA_simple.c` for the relay kit. Both are available on IQRF CD and IQRF website. Use IQRF IDE development environment and CK-USB-02 or other IQRF programmer to upload the code (`RC03_simple.hex` and `DK31BA_simple.hex`) to the TR modules. The TR module inside the RC-03 should be programmed via RF – see IQRF Application note AN007 – Programming via RF.



### RC-03

In idle state the controller stays in Sleep mode allowing wake-up by any pushbutton. After wake-up the accumulator voltage is checked and LED flashing indicates pressing the button and accumulator condition. Then respective command is sent to DK-31BA and the controller gets to sleep again.

#### Commands

- button S1                    toggle relay RE1
- button S2                    toggle relay RE2
- button S3                    switch off both RE1 and RE2 relays

#### LED indication

- LED on the case
  - button S1, S2 or S3    1 x flash (accumulator O.K.), 3 x flash (accumulator exhausted)
  - microcontroller reset   3 x flash
- LED on TR module        red LED 1 x flash – accumulator checking

### DK-31BA

This kit switches the relays according commands received via RF packet. Successful receiving is indicated by LED.

#### LED indication

- main board
  - relay 1 on                    green LED on
  - relay 2 on                    red LED on
- TR module
  - RF packet received        red LED 1 x flash
  - microcontroller reset     red LED 3 x flash

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**Pack list**

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- RC-03, in Sleep mode
- TR module in requested frequency band, with demo example programmed, inserted in SIM connector inside
- Accumulator (soldered)
- MI-TY-A6-microUSB power supply adapter

**Recommended options**

- CAB-USBABMICRO-200 micro USB cable (for charging from PC)
- DK-31-BA development kit
- DK-RC-03 development kit – useful in case of network applications

**Ordering codes**

- RC-03-868                      RC-03 with TR-31B, 868 MHz
- RC-03-916                      RC-03 with TR-31B, 916 MHz
- DK-RC-03-868                Developemnt kit for RC-03-868
- DK-RC-03-916                Developemnt kit for RC-03-916

**Document history**

- 100117                          First release

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# Sales and Service

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