

GW-USB-03

FW v2.01

IQRF USB Gateway

User's Guide



Simple way to smarter wireless solutions

Description

GW-USB-03 is an IQRF gateway with USB connectivity. It is intended as an interface between IQRF network and PC.

The user can realize specific functionality by software for internal TR module.



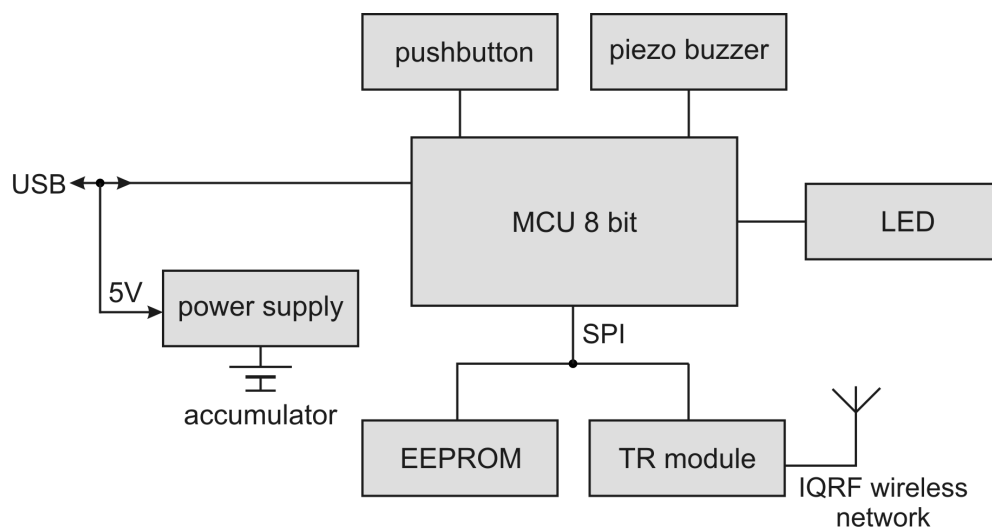
Applications

- IQRF – PC interface
- Home automation
- Diagnostic tool
- IQRF gateway

Key features

- PC connectivity via USB interface (2 classes)
- TR module and internal antenna
- TR module programming via USB and IQRF IDE
- Bidirectional RF communication
- High performance
- 8b microcontroller, bootloader for firmware upgrade
- 1 pushbutton, 1 LED
- EEPROM memory
- Piezo buzzer
- Backup accumulator
- Very low power consumption in Sleep mode

Block schematics



Electrical specifications*(typical values unless otherwise stated)*

Power supply	5.0 ± 0.35 V DC
Accumulator	Li-Pol 3.7V, 400mAh
USB	V2.0 Compliant SIE
Supply current	
operational	17 mA ¹
standby	10 µA ²
accumulator charging	85 mA
Temperature range	0 °C to +70 °C
TR module	TR-52B
Antenna	PCB on GW board
Frequency band	868 MHz / 916 MHz, SW selectable
RF output power	according to TR module, programmable
EEPROM memory	64 kb, SPI, 1 000 000 erase/write cycles (typ.)
Dimensions	93 mm x 42 mm x 14 mm
Weight	39 g ³

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

Note 2: All peripherals shut down.

Note 3: Including accumulator and TR module.

Absolute maximum ratings

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

Hardware

The user can realize specific functionality by software for the TR module. Application for TR module inside can also be developed using the CK-USB-04 development kit. For detailed information refer to CK-USB-04 User's guide.

Power supply

GW-USB-03 is intended to be supplied via micro USB connector, either from PC or from the adapter. The accumulator serves just as a backup for external power source and should be charged from it.

Sleep mode

While supplied from the accumulator for more than 2 s, the GW is turned to power saving mode with all functions and peripherals switched off. Wake-up (normal operation) is reestablished just after reconnecting supply to USB connector. GW power is never completely switched off, the Sleep mode is used instead of this.

Reset

Reset can be invoked by command in CDC mode. Actual reset is executed ~5 s after the command is issued. This delay allows to disconnect USB communication on PC side in time. Reset indication see chapter Beeper.

USB

The device supports two USB modes: Custom Device and CDC. The last one selected is restored after start-up or reset. Switching between the modes see chapter Pushbutton. Current mode indication see chapter Beeper.

- Custom Device mode
Full communication with the IQRF IDE is enabled in this mode. The GW uses identical USB driver like e.g. CK-USB-04. It is possible to upload the application into internal TR module, display data received from SPI interface of the TR in IQRF IDE Terminal etc. The user can easily create his own PC program using the mpushapi.dll library. See USB Custom Device Example on IQRF website.
- CDC mode
After connecting to PC a virtual serial port is created in this mode. The user can create his own PC program and communicate via this port using the protocol described in document *CDC implementation in IQRF platform*.

Pushbutton

- USB mode switching
To switch between the USB modes, press and hold the pushbutton during wake-up from sleep for more than 1 s. Sound indication: Custom Device – 1x beep, CDC – 3x beep.
- Factory setup
Press and hold the pushbutton for more than 1 s after reset. Sound indication: 1x beep 2 s.
- C5 pin control
Pin C5 of the TR module is held low and LED is on while the pushbutton is pressed and SPI communication is just not in progress. Similar to CK-USB-04 (S1, LED1).

LED

LED is on while the pushbutton is pressed.

Beeper

- Entering the Sleep mode
1x deep beep
- Wake-up from Sleep
Custom Device – 1x beep, CDC – 3x beep
- Acoustic indication
3x beep (can be invoked by clicking the IQRF logo in IQRF IDE in Custom Device mode or by command in CDC mode.)
- Reset
1x beep 1 s
- Factory setup
1x beep 2 s

EEPROM memory

Capacity 64 kb, serial interface SPI, shared with the TR module. Reserved for internal GW purpose.

TR module

The TR-52B wireless IQRF transceiver module, 868 MHz as well as 916 MHz, in SIM card format. Higher versions also supported.

Antenna

PCB antenna on GW board, soldered.

Case

The plastic case is limited to a very few number of open/close cycles only. User program can be uploaded into the TR module without opening the case.

Software

Firmware for the MCU inside the GW is fixed but can be upgraded by the user using the code provided by IQRF manufacturer. Refer to IQRF Application note *AN008 – Firmware upgrade* for details.

TR module functionality is fully user programmable. Factory default is E03-TR (one of basic IQRF examples). Programming and uploading the code is similar to CK-USB-04.

Pack list

- GW-USB-03, in Sleep mode
- TR-52B, with E03-TR example programmed, inserted in SIM connector and connected to the antenna
- Accumulator (soldered)
- Micro USB cable

Recommended options

- MI-TY-A6-microUSB Switching power supply

Ordering code

- GW-USB-03 Gateway GW-USB-03, 868 MHz as well as 916 MHz

Document history

- 110225 Page 6 corrected.
- 110131 Update for FW v2.01. CDC mode added.
- 100113 User programming allowed for TR module only.
Firmware upgradable by the user using a code provided by IQRF manufacturer.
Product names slightly simplified.
- 090626 GW-USB-03 as generic module.
- 090514 First release for FW v2.00.

Sales and Service

Corporate office

MICRORISC s.r.o., Delnicka 222, 506 01 Jicin, Czech Republic, EU
Tel: +420 493 538 125, Fax: +420 493 538 126, www.microrisc.com

Partners and distribution

Please visit www.iqrf.org/partners

Quality management

ISO 9001 : 2000 certified

*Complies with ETSI directives EN 30279 V.1.2.1:99, ETS 30683:97, ETSI EN 301489-1:00,
ETSI EN 300220-1:00, ETSI EN 300390-2V.1.1.1:00*

Complies with FCC directives FCC CFR, Title 47, Part 15, Section 15.209, FCC CFR, Title 47, Part 15, Section 15.249

Complies with Directive 2002/95/EC (RoHS)



Trademarks

*The IQRF name and logo are registered trademarks of MICRORISC s.r.o.
PIC, SPI, Microchip, RFM and all other trademarks mentioned herein are property of their respective owners.*

Legal

All information contained in this publication is intended through suggestion only and may be superseded by updates without prior notice. No representation or warranty is given and no liability is assumed by MICRORISC s.r.o. with respect to the accuracy or use of such information.

Without written permission it is not allowed to copy or reproduce this information, even partially.

No licenses are conveyed, implicitly or otherwise, under any intellectual property rights.

The IQRF products utilize several patents (CZ, EU, US)

On-line support: <http://iq-esupport.com>



Simple way to smarter wireless solutions