

# **GW-USB-03A**

**FW v1.02**

**IQRF USB Gateway**

**User's Guide**



Smarter wireless. Simply.

## Description

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

It is a revised version of GW-USB-03 with completely redesigned hardware and the same functionality.

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



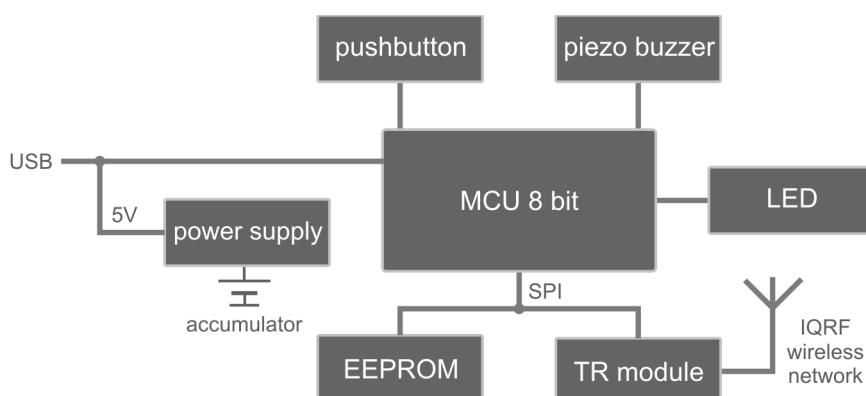
## Applications

- 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 RGB
- EEPROM memory
- Piezo buzzer
- Backup accumulator
- Very low power consumption in Sleep mode

## Block diagram



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

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Power supply	5.0 ± 0.35 V DC
Accumulator	Li-Pol 3.7V, 400mAh
USB	V2.0 Compliant SIE
Supply current	
standby	10 µA <sup>1</sup>
operational <sup>2</sup>	
TR module in Sleep mode	14 mA
TR module active	Additional current depended on mode of TR module. See datasheet of respective TR module.
accumulator charging	85 mA max.
Temperature range	0 °C to +70 °C
TR module	TR-52D
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 <sup>3</sup>

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**Note 1:** All peripherals shut down.**Note 2:** This current is increased due to charging in case of external supply (depended on the accumulator state).**Note 3:** Including accumulator and TR module.

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**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(A) development kit. For detailed information refer to CK-USB-04(A) User's guide.

### Power supply

GW-USB-03A 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 the *Reset USB Device* 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.

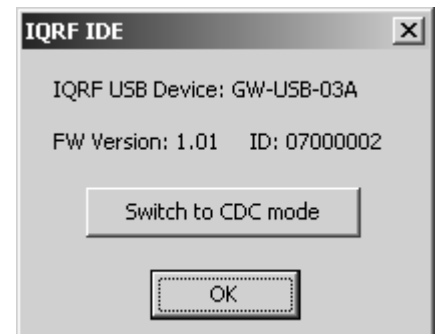
## USB

The device supports two USB modes:

- Custom Device 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*.

Switching between the modes can be done by Pushbutton (see chapter Pushbutton) or by commands:

- From Custom Device to CDC:  
Using IQRF IDE v2.08 or higher:  
Help → Show IQRF USB Device Info → Switch to CDC mode.
- From CDC to Custom Device:  
Using the *Switch to USB Custom Class* command in CDC protocol.



Current mode indication see chapter Beeper. The last selected mode is restored after start-up or reset.

### 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

Red 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-52D 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.

**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.

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**Software**

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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 IDE 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(A).

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**Product information**

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**Pack list**

- GW-USB-03A, in Sleep mode
- TR-52D, 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-03A            Gateway GW-USB-03A, 868 MHz as well as 916 MHz

**Document history**

- 140331                  TR-52D inside
- 110616                  First release

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# Sales and Service

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## Corporate office

MICRORISC s.r.o., Prumyslova 1275, 506 01 Jicin, Czech Republic, EU  
Tel: +420 493 538 125, Fax: +420 493 538 126, [www.microrisc.com](http://www.microrisc.com)

## Partners and distribution

Please visit [www.iqrf.org/partners](http://www.iqrf.org/partners)

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## Quality management

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*Complies with Directive 2002/95/EC (RoHS)*



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