

# **DK-EVAL-04A**

**IQRF development kit**

## **User's Guide**



Smarter Wireless. Simply.

## Description

DK-EVAL-04A is a universal development kit for wireless applications with IQRF transceivers. Very small size, LiPol accumulator and low cost make this kit ideal for use in networks.

A user-specific functionality is given by application software in internal TR transceiver.



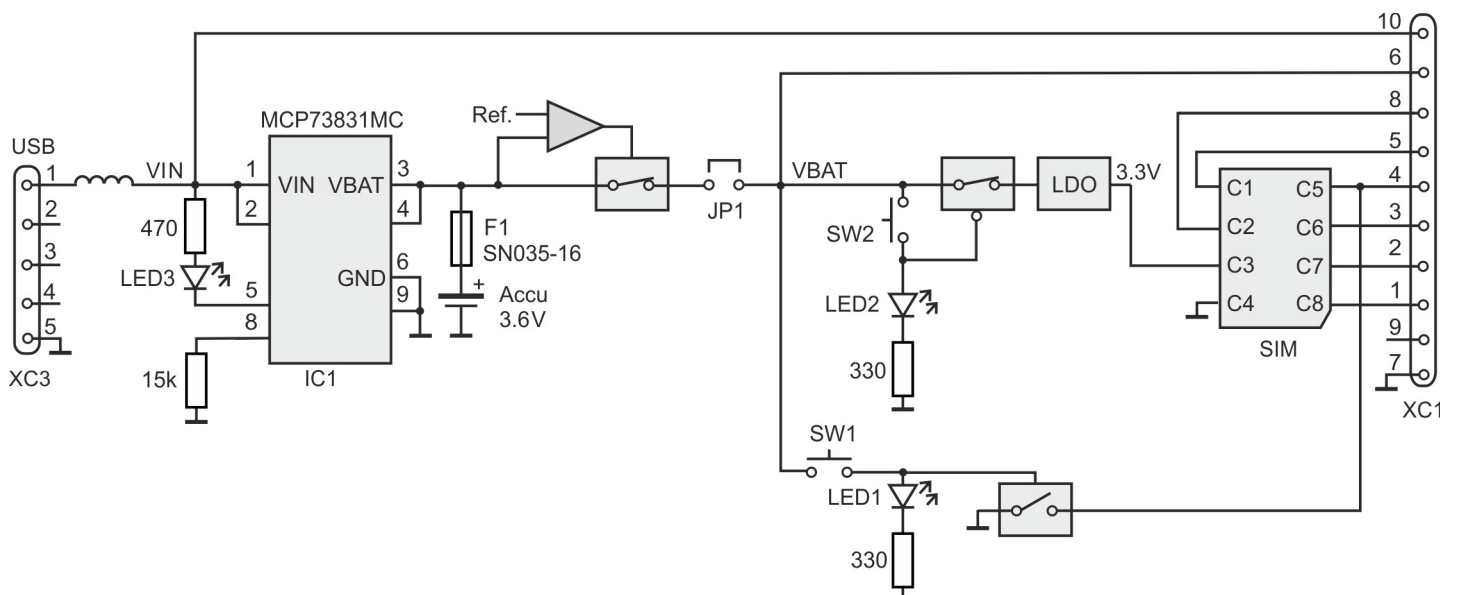
## Applications

- Development of wireless applications
- Host for IQRF TR transceiver
- Debug and testing of huge IQMESH networks
- Battery powered and portable wireless systems

## Key features

- SIM connector with plastic holder for TR transceiver
- 2 pushbuttons, wake-up on button press capability
- 3 indication LEDs
- 6 I/Os
- LiPol accumulator and internal charger. Charged via micro USB connector
- Accumulator over-current and over-discharge protection
- Voltage output to supply low power peripherals, sensors etc.
- Optional DK-PWR-01 power supply board to support operation and charging up to 5 kits available
- Compatible with IQRF DDC kits (Development Daisy Chain)
- Space saving

## Simplified circuit diagram



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

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Power supply	
Accumulator	LIP552240, 400 mAh, nominal voltage 3.7 V
External source	
Via micro USB connector (with charging)	4.75 V to 5.25 V DC
Via XC1 connector, pin 6	3.5 V to 6.0 V DC (Jumper JP1 must be disconnected)
Accumulator charging current	70 mA
Supply current	(When powered from accumulator)
Standby	1.5 $\mu$ A (Jumper JP1 disconnected)
Additional operation current	(Jumper JP1 connected)
LED2 or LED3 on	2 mA per LED (rough value for brief guidance only)
TR transceiver plugged	Depends on the application in TR. See datasheet of TR.
Temperature	
Operating	
Accumulator not charged	-20°C to +60°C
Accumulator charged	0 °C to +45 °C
Storage	-20°C to +20°C (1 year), +10°C to +25°C recommended
Supported TR modules	TR-72D, TR-75D, TR-76D, TR-77D, TR-52D, TR-55D, TR-56D, TR-52B and similar types, in SIM card format
Dimensions	48 mm x 27 mm x 11 mm
Weight	17 g

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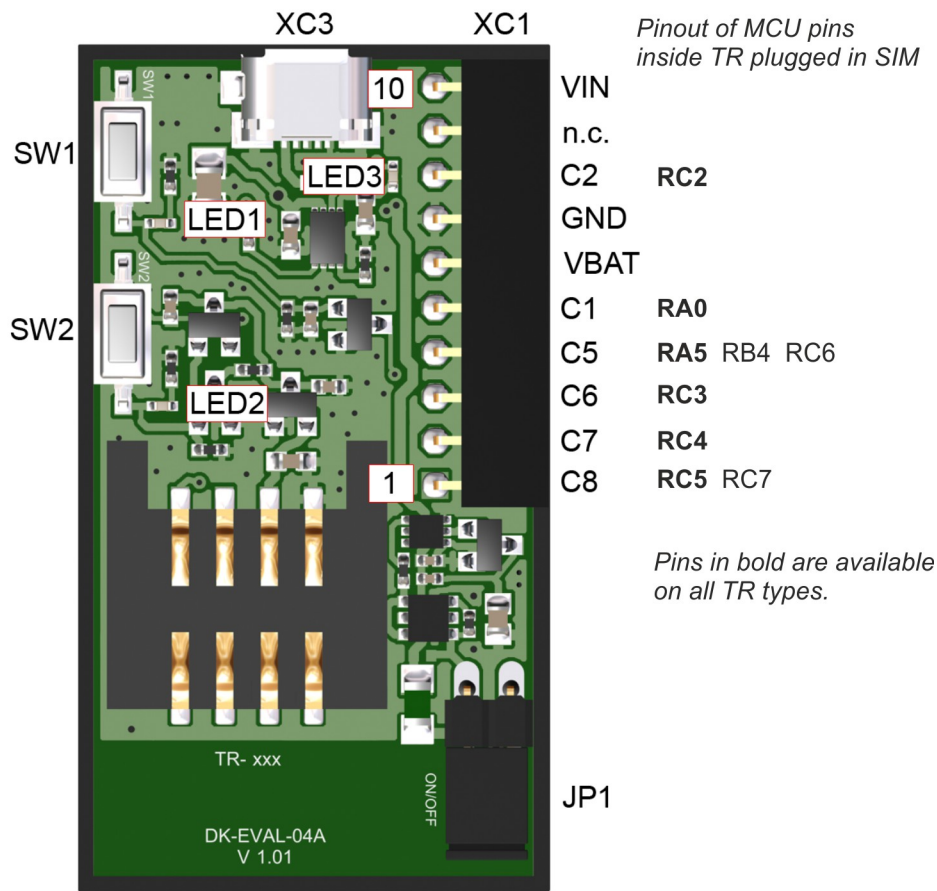
**Absolute maximum ratings**

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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.

Power supply (from external source)	6.0 V
Ambient temperature	-20 °C to +60 °C
Storage temperature	-20°C to +60°C (1 month)

## Hardware



### Power supply

DK-EVAL-04A is supplied from the internal accumulator or from external power source via micro USB connector XC3 which also serves as a charger. The TR transceiver is supplied when jumper JP1 is set. Charging is indicated by LED3. The accumulator is protected against over-current (by resettable fuse SN035-16) and against over-discharging.

The accumulator should be kept charged.

For external power source also connector XC1 (pins 6 and 7) can be used.

Jumper JP1 must be disconnected in this case otherwise the accumulator may be damaged.

### Pushbuttons

- User pushbutton SW1 is connected to pin C5 of the TR module, active low. Therefore, the TR module should have the C5 pin configured as an input with internal pull-up. It is arranged by OS by default. Wake-up on change or interrupt on change on this pin can also be configured by user software.
- Reset pushbutton SW2 TR module is disconnected from the power supply when the SW2 pushbutton is pressed.

### LEDs

- LED1 and LED2 are on when the appropriate pushbutton is pressed.
- LED3: charging indication. LED3 is on during charging and switched off when fully charged.

### SIM connector

**Caution:** The TR module can be plugged / unplugged into / from the SIM connector while powered off only.

**Tip:** Use the SW2 pushbutton for this. The TR module is disconnected from power while the SW2 pushbutton is held.

## Supported TR module types

TR	Supported
TR-52D	Yes
TR-53D	–
TR-54D v1.01	–
TR-54D v1.02	Yes *
TR-55D	Yes *
TR-56D	Yes *
TR-58DA	–

TR	Supported
TR-52B	Yes
TR-53B	–
TR-72D	Yes
TR-75D	Yes *
TR-76D	Yes *
TR-77D	Yes *
TR-78D	–

\* These TRs can not use the SW1 pushbutton for bonding initiation (unless the default pin is changed in Custom DPA handler), wake-up from sleep and interrupt on pin change.

**Caution:** The unsupported TR modules must not be plugged into DK-EVAL-04A SIM connector.

## Interface connector

Interface connector XC1 makes SIM I/O pins, power supply and ground accessible externally. It is compatible with IQRF DDC development kits.

## Range test

**Caution:** DK-EVAL-04A PCB layout is optimized for space savings during the development of network applications with a lot of nodes on a table. Thus, this kit is not intended for range tests using TR modules with internal PCB antenna (e.g. TR-72DA, the range would be shortened in this case). For range test, use either e.g. TR-72DA with range extender RNG-EXT-01 or TR-72D with an external antenna.

## Software

For application software refer to examples in IQRF Startup package.

For power consumption measurements, no TR pins must be left as digital inputs without defined input log. level values. See example E14-CONSUMPTION.

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**Product information**

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**Pack list**

- DK-EVAL-04A kit (without a TR-transceiver)
- Accumulator (soldered) inside
- 1 jumper (power on switch, switched off)

**Recommended options**

- TY-A6A Power supply with USB A connector
- CAB-USBABMICRO-100 Cable for TY-A6A power supply
- DK-PWR-01 Power supply expansion board (to supply and charge up to 5 DK-EVAL-04A kits)

**Ordering code**

- DK-EVAL-04A IQRF universal development kit

**Document history**

- 210712 Chapters *Quality management* and *Trademarks* revised.
- 191010 LED serial resistor values added to *Simplified circuit diagram*. Slightly more precise specifications regarding power supply and supported TR types.
- 171109 Updated for TR-75D transceivers.
- 170823 Updated for TR-78D transceivers.
- 170810 Chapter *Sales and service* updated.
- 170428 Chapter *Range test* extended. Chapter *Software* added. Updated for TR-77D. Some other slight improvements.
- 150805 Extended for TR-72D and TR-76D transceivers. Temperature range revised.
- 150119 Pinout of MCU pins added in chapter *Control and indication*.
- 140801 Chapter *Supported TR module types* added.
- 140124 First release.

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## Sales and Service

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### Corporate office

IQRF Tech s.r.o., Prumyslova 1275, 506 01 Jicin, Czech Republic, EU  
Tel: +420 493 538 125, Fax: +420 493 538 126, [www.iqrf.tech](http://www.iqrf.tech)  
E-mail (commercial matters): [sales@iqrf.org](mailto:sales@iqrf.org)

### Technology and development

[www.iqrf.org](http://www.iqrf.org)  
E-mail (technical matters): [support@iqrf.org](mailto:support@iqrf.org)

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### Quality management

ISO 9001 : 2016 certified



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