

# **CDC**

## **Implementation in IQRF USB devices**

### **User's guide**



## CDC class

Unlike the Custom class, the CDC class provides a simpler serial bus via USB interface. A device equipped with the firmware supporting CDC creates a virtual serial port enabling to communicate with PC or another equipment (supporting USB) via the USB interface like through a standard COM port.

After the first connection the USB driver *iqrfcdc* is requested. It is available to download from [www.iqrf.org/cdc](http://www.iqrf.org/cdc). It is also installed within the IQRF IDE 4 development environment installation. This driver (by Microchip) uses VID / PID by MICRORISC when used with IQRF devices.

IQRF kits working with IQRF IDE 4 use the Custom class but can be switched to/from the CDC class by the IQRF IDE 4 (if the kit is equipped with the CDC option).

### **TIP**

For testing a communication in CDC mode various SW terminals operating with PC serial ports are available. Select a terminal enabling to issue direct byte commands and data. Recommended terminal: Docklight, [www.docklight.de](http://www.docklight.de). There is a project containing all supported commands for this terminal available at [www.iqrf.org/218](http://www.iqrf.org/218). It is necessary just to select the COM port used.

Unsuitable terminals: Windows Hyperterminal, Tera Term, ...

This document describes CDC implementation in IQRF USB devices.

## Communication

Communication is based on commands sent from PC and USB device responds with answers. Additionally, USB device can send asynchronous messages as well.

### Format

Every command begins with the ">" character. Every answer and asynchronous message begins with the "<" character. It allows easy orientation in directions if PC terminal is used. Every packet is terminated with the CR character (CR LF is also accepted).

#### *Command:*

> [body] [CR]

#### *Answer:*

< [body] [CR]

#### *Message:*

< [body] [CR]

[body] – body of the command

[CR] – Carriage Return (value 0x0D)

## General error

In case of syntax error or not supported command general error message is issued.

#### *Answer:*

<ERR [CR]

## Communication test

#### *Command:*

> [CR]

#### *Answer:*

<OK [CR]

## Commands

### Reset USB Device

5 s after receiving of this command USB device is reset. This delay allows to disconnect USB communication on PC side in time.

*Command:*

```
>R[CR]
```

*Answer:*

```
<R:OK[CR]
```

### Reset TR Module

TR module inside the USB device is reset.

*Command:*

```
>RT[CR]
```

*Answer:*

```
<RT:OK[CR]
```

### Get USB Device Info

Returns USB device identification.

*Command:*

```
>I[CR]
```

*Answer:*

```
<I:[type]#[version]#[id][CR]
    [type]    - device type (in text format)
    [version] - firmware version (in text format)
    [id]      - serial number (in text format)
```

*Example:*

```
>I[CR]
<I:GW-USB-03#02.01#03010000[CR]
    [type]    - GW-USB-03
    [version] - 2.01
    [id]      - 0x03010000
```

### Get TR Module Info

Returns identification of TR module inside the USB device.

*Command:*

```
>IT[CR]
```

*Answer:*

```
<IT:[module_info][CR]
    [module_info] - description see IQRF OS User's guide (chapter Identification → Module Data)
```

## Connectivity Indication

USB device issues an acoustical or optical indication.

### Command:

```
>B[CR]
```

### Answer:

```
<B:OK[CR]
```

## Get Status

Returns information about current status.

### Command:

```
>S[CR]
```

### Answer:

```
<S:[spi_status][CR]
```

[spi\_status] - value according to the table in IQRF SPI User's guide (chapter SPI status)

## Send Data

Sends data to TR module inside the USB device.

### Command:

```
>DS[dlen]:[data][CR]
```

[dlen] – data length (number of bytes in the [data] field), in hexadecimal

– range 1 to 41

– range 1 to 64 (GW-USB-05)

[data] – actual data for TR module

– number of bytes must correspond to [dlen]

### Answers:

```
<DS:OK[CR]
```

– data successfully sent to TR module

```
<DS:ERR[CR]
```

– communication failure (checksum error)

– [dlen] out of range

– data length mismatch (number of bytes in [data] does not correspond to [dlen])

```
<DS:BUSY[CR]
```

– SPI bus is busy, communication is just running

– TR module is not in communication mode

### Example:

```
>DS[0x05]:Hello[CR]
```

```
<DS:OK[CR]
```

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## Received Data

Asynchronous message sent by the USB device after data receipt from TR module.

### Messages:

```
<DR[dlen]:[data][CR]
  [dlen] - data length (number of bytes in the [data] field), in hexadecimal
    - range 1 to 41
    - range 1 to 64 (GW-USB-05)
  [data] - actual data from TR module
<DR:ERR[CR]
  - communication failure (checksum error)
```

### Example:

```
<DR[0x05]:Hello[CR]
```

## Switch to USB Custom Class

USB class is switched to Custom and the device is reset 5 s after this command is issued. This delay allows to cancel USB communication on PC side. Refer to user's manual of given USB device how to return to CDC.

### Command:

```
>U[CR]
```

### Answer:

```
<U:OK[CR]
```

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## Supported devices

- GW-USB-03 with FW v2.01 or higher. The *Switch to USB Custom Class* command is supported from FW v2.03.
- GW-USB-04 with FW v1.20 or higher
- GW-USB-03A with FW v1.00 or higher
- GW-USB-05 with FW v1.03 or higher
- CK-USB-04A with FW v1.01 or higher

## Document history

- 140129 CK-USB-04A support added.  
Document file renamed from MNCDC\_130121 to User\_Guide\_CDC\_140129.
- 130121 GW-USB-05 support added.
- 121008 First chapter extended. Bugs in *Switch to USB Custom Class* and *Reset USB Device* fixed.
- 110526 *Switch to USB Custom Class* command added.
- 110318 First release.

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