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RC1682-SIG-DK Demonstration Kit Quick Start

Introduction

The SIGFOX Ready™ Demonstration Kit from Radiocrafts is designed to make it easy for the user to evaluate the module, develop an application and build prototypes. Bundled with the Demonstration Kit is the RCTools-SIG PC software, to be used together with the Demo Boards.

How to get started

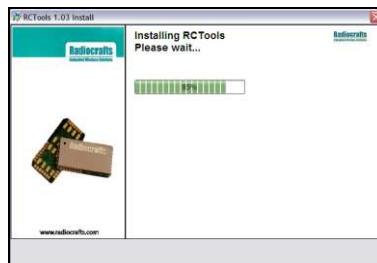
Please follow this guideline to ensure that the USB driver is properly installed on your computer **before** you connect the Demo Board to the PC.

Step 1. Download the latest version of RCTools-SIG from www.radiocrafts.com



Step 2. Install the RCTools as described in the RCTools Installation Guide.

- The USB Driver is automatically installed together with RCTools.



Step 3. Connect the Demo Boards to the PC after installing the RCTools-SIG PC software.

- Connect the antenna or connect to your test equipment.



Step 4. You are now ready to use the Demo Board.

- Radiocrafts offer a powerful RCTools-SIG PC suite, but any terminal program using COM ports can also be used. Visit www.radiocrafts.com to download relevant documents.

How to register the device in the SIGFOX back-end system

Each Demonstration Kit is delivered with Platinum level SIGFOX subscription, which allows up to 140 uplink messages, and up to 4 downlink messages per day, for 1 year after the activation date. Roaming is also included so that the Radiocrafts Demonstration Kits can be used in every place in Europe where a SIGFOX network is available.

To be able to register the Demonstration Kit in the back-end system of SIGFOX, the ID and PAC number have to be available. Each Demonstration Kit has the ID and PAC stored in configuration memory; and this information is also available on the label on each Demonstration Board.

Procedure to register and use the SIGFOX Platinum subscription:

Step 1. Read ID and PAC numbers.

- Read it from the label of the Demonstration Board:
 - The format is the following:
 - ID: [ID1_LSB, ID2, ID3, ID4_MSB]
 - PAC: [PAC8_MSB, PAC7, ..., PAC1_LSB]

Example	
ID:	01020304
PAC:	0F0E0D0C0B0A0908

- Or read the configuration memory:
 - Go to configuration mode.
 - Use command '9' to read the ID and PAC codes:
 - Enter configuration mode. Verify the prompt sent by the module.
 - Send 0x39 (ASCII '9' character).
 - The reply of 13 bytes (4 bytes ID, 8 bytes PAC, 1 byte Prompt) will have the following format:
[ID1_LSB, ID2, ID3, ID4_MSB, PAC8_MSB, PAC7, ..., PAC1_LSB, '>']
 - The last '>' prompt confirms that the module is ready to receive the next command.

Example	
Request:	39
Reply:	01 02 03 04 0F 0E 0D 0C 0B 0A 09 08 '>'

Step 2. Request an account in the SIGFOX backend system.

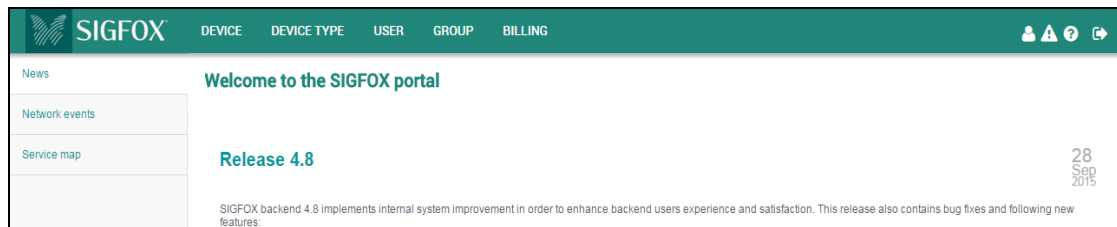
- Contact SIGFOX for activation of subscription via subscribe@sigfox.com with
 - Name of the company,
 - Contact person's name and email address to create the account onto SIGFOX back-end,
 - ID and PAC numbers of the Demonstration Kit to be activated with the format of:
 - ID: [ID4_MSB, ID3, ID2, ID1_LSB]
 - PAC: [PAC8_MSB, PAC7, ..., PAC1_LSB]
 - NOTE: The ID is sent with MSB first.

Example	
ID:	04030201
PAC:	0F0E0D0C0B0A0908

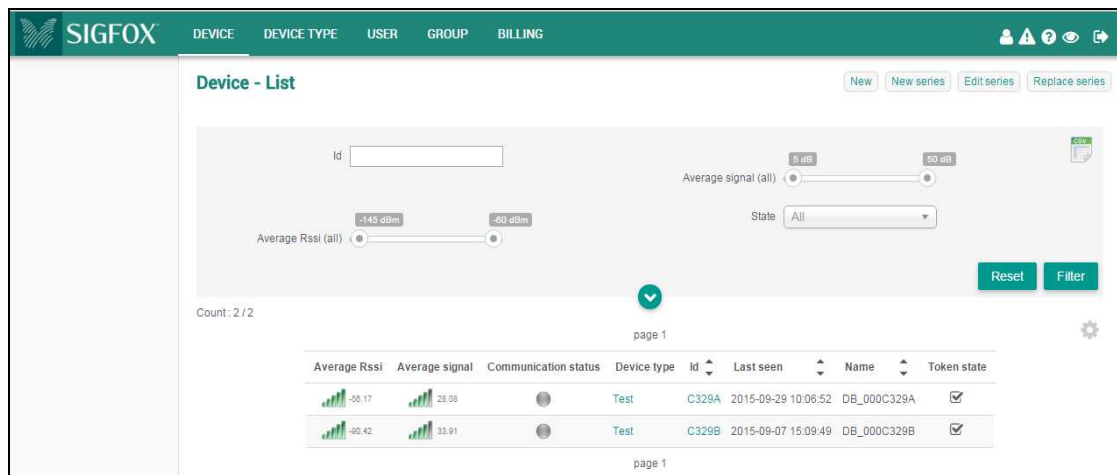
- The SIGFOX sales team will acknowledge receipt of the activation request and will explain what the next step is.
 - SIGFOX will set up your account within 48 hours following the subscription request.

Step 3. Register the device in the backend system.

- Go to the SIGFOX back-end system: <http://backend.sigfox.com>.
- Sign in with your account.



Step 4. Select DEVICE page in the menu bar.



Step 5. Click on 'New' button in the top-right corner.

- Select your group.

Step 6. Edit the given fields.

- Name, Identifier, PAC and Product Certificate fields are mandatory.
 - The Name can be selected by the customer to identify the device.
 - The Identifier is unique and delivered with the Demonstration Kit.
 - Format: [ID4_MSB, ID3, ID2, ID1_LSB]
 - *NOTE: The bytes are in opposite order than they are stored in the memory/displayed on the label.*

Example

Identifier: 04030201

- PAC is unique and delivered with the Demonstration Kit.
 - Format: [PAC8_MSB, PAC7, ... , PAC1_LSB]
 - *NOTE: The bytes are in the same order as they are stored in the memory/displayed on the label.*

Example

PAC: 0F0E0D0C0B0A0908

- The Product Certificate belongs to the revision of product:

Product Name	Rev.	Product Description	Freq.	Product Certificate	Date of certification
RC1682-SIG	1.00	Radio module.	ETSI	M_0013_B3F9_01	2015-08-24
RC1682-SIG-DK	1.00	Demonstration kit based on RC1682-SIG module.	ETSI	P_002D_8803_01	2015-10-19

- Click OK. The device is now added to your account.

The screenshot shows the SIGFOX web interface for creating a new device. The top navigation bar includes the SIGFOX logo and menu items: DEVICE, DEVICE TYPE, USER, GROUP, and BILLING. On the right side of the navigation bar, there are icons for user profile, notifications, help, and refresh. The main content area is titled 'Device - New' and contains a form with the following fields:

- Identifier (hex):
- Name:
- PAC:
- Product certificate:
- Type:
- Lat (-90° to +90°):
- Lng (-180° to +180°):
- Map: [Locate on map](#)
- Prevent token renewal?:

At the bottom of the form are 'Ok' and 'Cancel' buttons.

How to receive packets in the SIGFOX back-end system

Step 1. Go to the SIGFOX back-end web interface.

- Go to the SIGFOX back-end system: <http://backend.sigfox.com>.
- Sign in with your account.

Step 2. Select 'DEVICE' page. All the registered devices will be listed here.

Average Rssi	Average signal	Communication status	Device type	Id	Last seen	Name	Token state
-58.17	28.08	●	Test	C329A	2015-09-29 10:06:52	DB_000C329A	✓
-60.42	33.91	●	Test	C329B	2015-09-07 15:09:49	DB_000C329B	✓

Step 3. Select the device of interest

- Click on the 'ID' of the device of interest. A new menu will open.
- Disengage sequence number by pressing the button in the top-right corner.

Device C329A - Information

Name: DB_000C329A
Protocol: V1
Sequence number: 9 (2015-09-29 10:06:52)
Trash sequence number: N/A (N/A)
Last seen: 2015-09-29 10:06:52
Last purge: 2015-09-29 10:03:05
PAC: 1DC3E06A84B0D646
Product certificate:
Latitude: 59.942 (degrees)
Longitude: 10.770 (degrees)
Device type: Test
Average SNR: 28.08 dB
Average RSSI: -58.17 dBm
Communication status: ●
Contract: Radiocrafts test contract

Step 4. Open the messages window.

- Click on 'MESSAGES' option. A new window will open.
- Press the 'Purge all messages' button in the top-right corner if you want to clear the window.

Time	Delay (s)	Header	Data / Decoding	Location	Base station	RSSI (dBm)	SNR (dB)	Freq (MHz)	Rep	Callbacks
2015-09-29 10:06:52	1.4	0000	010203 ASCII...		0510	-54.00	29.59	868.1690	3	

Step 5. Send a packet through UART to the Demonstration Board.

- Open a terminal window with the default 19200 bps, 8N1 settings.
- Send a packet to the module through UART. It must start with a length byte and can be followed by up to 12 bytes of payload.

Step 6. Receive a packet.

- The received packets will appear with a couple of second delay in the 'MESSAGES' window in the back-end system.

Time	Delay (s)	Header	Data / Decoding	Location	Base station	RSSI (dBm)	SNR (dB)	Freq (MHz)	Rep	Callbacks
2015-09-29 10:06:52	1.4	0000	010203 ASCII...		0510	-54.00	29.59	868.1690	3	

How to configure two way communication

Step 1. Configure your module to use Uplink & Downlink mode.

- Step into configuration mode
 - Use F command to configure the mode in volatile memory
 - Send ['F', 0x01] to enable Uplink & Downlink mode.
 - Send ['F', 0x00] to enable Only uplink mode.
 - Use the M command to change the mode in non-volatile memory.
 - Send ['M', 0x3B, 0x01, 0xFF] to enable Uplink & Downlink mode.
 - Send ['M', 0x3B, 0x00, 0xFF] to enable Only uplink mode.

Step 2. Configure the downlink message content.

- Go to device type window

The screenshot shows the 'Device type - List' page in the SIGFOX management interface. It includes a search bar for Name, a dropdown for Group (set to 'Select a group'), and a dropdown for Display type (set to 'All'). There are 'Reset' and 'Filter' buttons. Below the filters, a table displays one device type entry:

Description	Display type	Group	Keep alive	Name
This is a test unit.	Test	RADIOCRAFTS	N/A	Test

Step 3. Click on the Name of the selected device type.

- Last column in the example called 'Test'.

The screenshot shows the 'Device type 'Test' - Information' page. It displays the following details:

- Id: 551d46799336852c00be2959
- Name: Test
- Description: This is a test unit.
- Keep alive: N/A
- Long polling: false
- Group: RADIOCRAFTS
- Type: Test
- Contract: Radiocrafts test contract
- Alert Email:
- Downlink data hexa: deadbeedcafebabab
- Creation date: 2015-04-02 15:39:05
- Created by: N/A
- Last edition date: N/A
- Last edited by: N/A

Step 4. Click on the Edit button in the top-right corner.

The screenshot shows the 'Device type Test - Edition' configuration page in the SIGFOX web interface. The page has a green header with the SIGFOX logo and navigation tabs for DEVICE, DEVICE TYPE, USER, GROUP, and BILLING. On the left, there is a sidebar menu with options like Information, Location, Associated devices, etc. The main content area is titled 'Device type Test - Edition' and contains several sections: 'Device type information' with fields for Name (Test), Description (This is a test unit.), Keep-alive (0 minutes), and Alert email; 'Downlink data' with a dropdown for Downlink mode (DIRECT) and a text input for Downlink data in hexa (deadbeedc:afebabe); and 'Display type' with a dropdown for Type (Test). At the bottom, there are 'Ok' and 'Cancel' buttons.

Step 5. Edit the Downlink data in hexadecimal entry as the payload of reply.

Step 6. Send any packet in Uplink & Downlink mode from the module.

- The network will automatically recognise the mode and will reply to the packet with the predefined reply.
- The payload of reply will be sent on UART after reception.

Related Documents on www.radiocrafts.com

On the Radiocrafts website you will find more documentation on the product:

- Module Data Sheet / User Manual (Module RF and embedded firmware description)
- RCxxxxDK-USB User Manual (Description of your Demonstration Board hardware)
- RCTools installation guide (Install/uninstall description)
- RCTools User Manuals (Description of the RCTools PC applications for your module)

Please visit the product page for the selected module to download all relevant documents.

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