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## SIGFOX Frequently Asked Questions

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### Frequently asked questions (FAQ)

#### What is SIGFOX?

Launched in 2012, SIGFOX is the world's leading provider of connectivity for the Internet of Things.

The SIGFOX company **is deploying a global network** that provides two-way, out-of-the-box, energy-efficient and cost-effective connectivity to Internet of Thing devices.

Currently (as of October 2015) deployed in the U.S. and 10 European countries and registering over 5 million devices, SIGFOX's network is the only IoT-dedicated connectivity solution commercially available that guarantees a high level of service and reliability on an international scale.

#### What is the SIGFOX communication protocol?

The SIGFOX communication protocol is used to read data from sensors through a fixed network of base stations. It works like a low cost "SMS" service.

#### Why should I use SIGFOX instead of other communicational protocols?

As an end-user, you only need to buy a subscription to connect to the data network operated by SIGFOX. Thus the end-user can focus on its product and all the rest is taken care of by SIGFOX. SIGFOX has the advantage of covering larger areas than other fixed local systems. The end product with similar functionality will have a lower cost and lower current consumption, and thus longer battery lifetime than other GSM based systems.

#### How much does it cost to use SIGFOX?

SIGFOX provides a subscription-based pricing, which depends on two parameters: the volume of messages exchanged by the devices, and the volume of devices.

The typical yearly fee can be from 14€ to less than 1€ / device.

#### Is SIGFOX working in my country?

As of June 2016, SIGFOX has coverage and is operating and available in many countries across the world:

Nationwide coverage:

- Ireland
- Portugal
- Luxembourg
- France
- Spain
- The Netherlands
- U.K.

On-going nationwide rollouts:

Belgium, Czech Republic, Brazil, Australia, New Zealand, Brazil, Finland, Germany, Italy, Mauritius, Oman, USA.

SIGFOX will roll out its two-way network in 10 major U.S. cities by 2016: San Francisco, New York, Boston, Los Angeles, Chicago, Austin, Houston, Atlanta, Dallas and San Jose.

While SIGFOX has the ambition to reach a global coverage (60 countries within the next 5 years), new countries are added regularly.

More details about deployment plans are available on SIGFOX's website.

### **How good is the coverage, and where can I find a coverage map?**

Deployment information can be found on SIGFOX's website. In addition, SIGFOX provides a coverage map tool to see the coverage level for any location. The SIGFOX support team can also provide coverage information on request.

### **What if SIGFOX does not have a base station in my area?**

For integrators/developers, SIGFOX offers a USB dongle called SIGFOX Network Emulator Kit (SNEK) for free of charge. It comes with a software tool (both Windows and Linux are supported) and simulates the backend cloud system (with limited features). For more details, please see:

*<http://www.sigfox.com/sites/default/files/2016-06/SIFOX%20network%20emulator%20User%20Guide.pdf>*

Alternatively you can contact SIGFOX to get a base station under a loan agreement. This is handled on a per request basis.

For substantial volume business projects, please contact SIGFOX Network Operator in your country to study custom offer feasibility for spot coverage in areas where the devices will be deployed.

### **What radio modules are available?**

Radiocrafts offers two series of SIGFOX compliant radio modules:

- RC1682-SIG is for European use and CE marked.
- RC1692HP-SIG is FCC and AU/NZ certified.

For simplicity, we refer to these modules as RC16xxxx-SIG module family. For further details, please visit our website at [www.radiocrafts.com](http://www.radiocrafts.com).

### **How can I test SIGFOX in my application?**

Radiocrafts provides a RC16xxxx-SIG-DK Demonstration Kit. This kit includes two Demo Boards configured as SIGFOX transmitter nodes. They can be connected to a PC via USB. The unit can be used to test radio coverage, and it can be used as a prototype for many applications where you interface the module over UART.

### **Can I have a trial subscription to test my application?**

Yes, Radiocrafts offers a trial subscription together with the RC16xxxx-SIG Demonstration Kit.

It includes:

One year platinum level subscription (platinum subscription comprises of 140 uplink and 4 downlink messages / day during 1 year starting from the activation date).

Otherwise, for application prototyping, you have to contact your local SIGFOX Network Operator (SNO) who will make you a subscription offer. For example, French SNO is offering

a developer package of 20 platinum level subscriptions at 250€ to support development purposes.

### **How often can I transmit a SIGFOX message?**

Limitations in the European telecommunication regulations (transmission duty cycle) allow up to 6 SIGFOX message transmissions in one hour, that is, 144 messages/day/device.

### **How many bytes can I transmit in one message from my device?**

You can send up to 12 bytes per message from the device (uplink).

### **How shall the data in the message be formatted?**

You can send any string of data to the RC16xxxx-SIG module, starting with a length byte. There is no specific format required for the application data. The module will then generate and transmit a valid SIGFOX message including this data string (encrypted).

### **Can I also send data to a SIGFOX end-point to control my device?**

Yes, SIGFOX is a two-way system. You can send a short data message to your device.

### **How many bytes can I transmit in one message to my device?**

You can send up to 8 bytes per message to the device (downlink).

### **Is my data secure and protected?**

Yes, the data is secured by an authentication code based on AES-128 encryption. The encryption key is secret and cannot be read from the device. This avoids man-in-the middle and anti-replay mechanisms. On top of this, each customer can choose if and how they want to encrypt the payload.

### **What is the battery lifetime of a SIGFOX device?**

The battery lifetime of course depend on how often the unit transmits, and the size of the battery. The RC16xxxx-SIG module provides a very low sleep current, so if the number of transmissions are limited, the battery lifetime can be very long. If the unit is used to transmit very seldom alarms, and only a daily keep-alive message is transmitted and receiving one command message per day, the battery lifetime can be more than 10 years using a 3.6V lithium AA-cell battery. Another example, the lifetime is 6 years using a 3.6V lithium AA-cell battery transmitting 10 times per day. This is a conservative figure as the battery capacity is de-rated to 60% due to the pulsed current consumption.

### **What can Radiocrafts offer me?**

Radiocrafts can offer a complete RF module containing all HW and FW necessary to make a SIGFOX compliant device. The RF module is certified by SIGFOX with best class performance. The RC16xxxx-SIG module has a UART interface for control and communication, and is very easy to use. Radiocrafts can also make customizations adapting the module to a specific application. Please contact Radiocrafts for any request.

### **What are the technical specifications of the RC16xxxx-SIG module?**

See RC16xxxx-SIG User Manual and the RC1682-SIG/RC1692HP-SIG Data Sheets for details. The User Manual is available on [www.radiocrafts.com](http://www.radiocrafts.com), at the log-in area.

### **What is the advantage of using the Radiocrafts RC16xxxx-SIG module?**

SIGFOX require a high performance narrowband radio. It is not straight forward to build a radio system that complies with radio regulations and SIGFOX requirements. RC16xxxx-SIG is certified as compliant to the SIGFOX protocol, and it also meeting all regulatory requirements for such radio transmitters and receivers. The RC1682-SIG is CE marked, while the RC1692HP-SIG is FCC certified and AU/NZ compliant.

### **What is the competitive advantage of Radiocrafts vs other module providers?**

The Radiocrafts module has achieved the best performance class at the SIGFOX certification. It is capable of two-way communication, which means it can also be used to control devices in the field, in addition to collect data from them. Radiocrafts also provide a wide range of other modules and communication technologies that can be combined with SIGFOX, making even more flexible solutions. For special features, Radiocrafts can provide support to integrate custom specific functionalities into the RC16xxxx-SIG module in order to minimize cost and development time.

### **Can Radiocrafts design a SIGFOX unit for us?**

Radiocrafts provide the RC16xxxx-SIG module, which contains the SIGFOX communication stack and a serial port application. Radiocrafts can also modify the stack and add application specific features if required. Radiocrafts normally do not design the complete end product.

### **How can Radiocrafts help us designing a SIGFOX unit?**

Radiocrafts gives technical support during the in-design free of charge. We have extensive experience in RF design, power management in battery operated systems, and the design of very compact antennas. Contact us at [support@radiocrafts.com](mailto:support@radiocrafts.com)

### **Can I build a SIGFOX receiver or base station myself?**

No, the base station receiving SIGFOX messages must be provided by SIGFOX.

### **How do I manage the unique ID and Key?**

Every module is programmed with a unique ID and an encryption key. Also a PAC code is stored in the module. You can read out the ID and the PAC, and use these to register the device in the SIGFOX network. The Key is securely stored in the device and cannot be read.

### **What does public ID and Key means?**

The SIGFOX Network Emulator Kit can only receive packets encrypted with the public key. The RC1692HP-SIG module provides the opportunity to switch between the uniwue ID+Key and the public ID+Key. This is a useful feature during product development.

### **Do I need to certify my product?**

Yes, the product must be P2 certified for use in the SIGFOX network. But using the RC16xxxx-SIG modules which is already P1 certified, the product certification is very easy.

### **What does P1 and P2 certification means?**

SIGFOX performs qualification tests in order to ensure compliancy towards their general requirements.

Each transceiver module has to go through the P1 level qualification. This ensures that the radio module meets all the RF and protocol specific requirements.

In case end products are built on such a transceiver, it only need to be P2 qualified. If not, the entire process has to be done (P1 and P2).

### What is a SIGFOX zone?

The global SIGFOX network is split into zones where different channel/frequency definitions apply. These zones are named as RCZx where x is an index. The following zones are available:

SIGFOX Zones	
Zone	Region
RCZ1	Europe
RCZ2	US
RCZ3	TBD
RCZ4	Australia/New Zealand

### Document Revision History

Document Revision	Changes
1.0	First release
1.1	Update on countries covered by SIGFOX network
1.2	Changed Product ID.
1.3	Minor updates and additions
2.0	Update on SIGFOX network coverage
2.1	Added information about the RC1692HP-SIG module and updated the text accordingly. Added zones and certification procedures.

### Contact Information

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