

R&S®CMWcards for C-IoT

Ever wondered how you can test your C-IoT device for

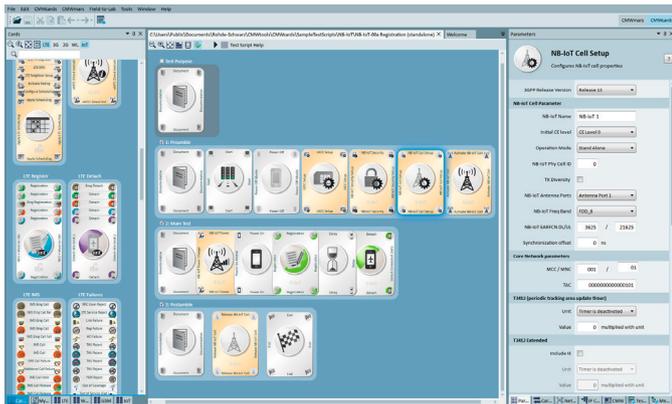
- ▮ Application testing use cases
- ▮ Protocol signaling use cases
- ▮ Reproducing field issues

or a combination of all this in a cost efficient way?

Rohde&Schwarz offers a variety of products to fit your testing needs. Here, we present our solution for testing the above-mentioned use cases.

In C-IoT, the dominant technologies are LTE Cat 1, eMTC and NB-IoT. All these technologies aim to reduce the complexity on the device side, to reduce the cost and to increase the coverage to reach often hard-to-reach regions. Since these technologies reduce the cost to manufacture the device, the natural question is how to also drastically reduce the cost to test the functionality of these devices.

Rohde&Schwarz offers a cost-effective variant of hardware and software products that take this into account and also promise exceptional quality.



Hardware platform

Rohde&Schwarz offers the R&S®CMW500 radio communication tester and the R&S®CMW290 functional radio communication tester to meet different testing needs.

The R&S®CMW500 radio communication tester is an all-in-one test platform that can be highly customized and that caters to several use cases, including those mentioned above. This is not cost-effective from a hardware perspective, but it would be the right investment choice if the goal is to scale the product configuration in the future.

The R&S®CMW290 functional radio communication tester is a compact version of the R&S®CMW500. It has a reduced feature set, which lowers the hardware cost and makes it ideal for C-IoT/M2M customers since it provides the needed functionality for C-IoT testing use case.

R&S®CMW500	R&S®CMW290
LTE Cat-1, eMTC, NB-IoT	LTE Cat-1, eMTC, NB-IoT
4 TRX outputs	2 TRX outputs
2 Signaling units with data application unit	1 Signaling unit with data application unit
Multi R&S®CMW connection possible (R&S®CMWFlexx)	Standalone mode only
Fading possible	Fading not possible
Positioning supported	Positioning not supported

R&S®CMWcards

Play while you work

R&S®CMWcards is a software application based on a card game that can be used to create test scripts for C-IoT. Cells are created by simply placing cards next to each other, and each cell can be parameterized in a graphical way. R&S®CMWcards helps the user by indicating the possible errors that could have crept in while parameterizing the cells, keeping the test script consistent and error free.

The R&S®CMWcards application is available on both the R&S®CMW500 and R&S®CMW290 testing platforms. The same application installs on a laptop and can be used to create test scripts locally on the laptop. The created scripts run on the R&S®CMW platform remotely.

Cellular internet of things (C-IoT) protocol and application testing with R&S®CMWcards

Objective

- Create functional protocol and application test cases as well as regression campaigns for cellular C-IoT devices that support LTE Cat 1, Cat M1 (eMTC), Cat NB1 (NB-IoT) and Cat NB2
- Verify that the device can correctly perform network attach, establish a data connection (SMS, IP and non-IP data) and perform mobility procedures
- Investigate devices' interoperability capabilities for different C-IoT deployment modes, especially for NB-IoT standalone, in-band and guard band mode.
- Create typical negative testing failure scenarios that are hard to reproduce in real-world networks, e.g. attach reject, mobility failures, repeated rejections of the device under test
- Rel-14 NB-IoT LBS location verification using NPRS (OTDOA)

Testing scope

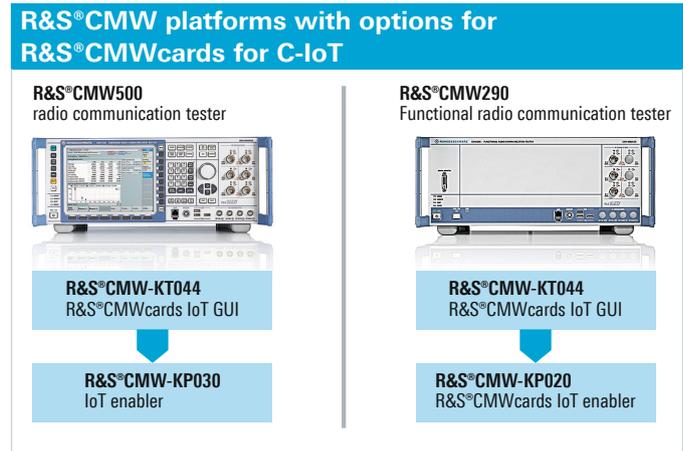
- Network simulation of LTE cells as well as 3GPP Rel-13 eMTC and NB-IoT enhancements
- Support of UE categories Cat 1, Cat M1, Cat NB1 and Cat NB2
- eMTC, NB-IoT CE mode A and B (coverage enhancement)
- Flexible configuration of NB-IoT deployment modes (standalone, in-band and guard band)
- Crucial timer settings (e.g. T3412 or T3324) for sleep modes such as discontinuous reception (eDRX) and power saving mode (PSM)
- Cell selection and reselection scenarios
- Definition of reject causes for network reject scenarios (EMM attach reject) or mobility failures
- Test positioning for C-IoT devices
- Data end-to-end tests for IP and non-IP applications as well as SMS
- Maximum IP throughput tests

Licensing

Uncomplicated and fair

R&S®CMWcards application can be unlocked on any platform (laptop, R&S®CMW500, R&S®CMW290) with the R&S®CMW-KT044 license. This one license covers all C-IoT technologies and releases, with the latest protocol, usability and GUI features. To execute the tests on the R&S®CMW500, an R&S®CMWcards framework license is needed to unleash the full potential of the hardware and software of the R&S®CMW500 to simulate all C-IoT technologies. The framework license is R&S®CMW-KP030.

A similar license is needed for test execution on the R&S®CMW290, except that it has an even lower price. The framework license is R&S®CMW-KP020.



See also

If you would like to know more about R&S®CMWcards, please contact us for a quote or demo under <https://www.rohde-schwarz.com/CMWcards>

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