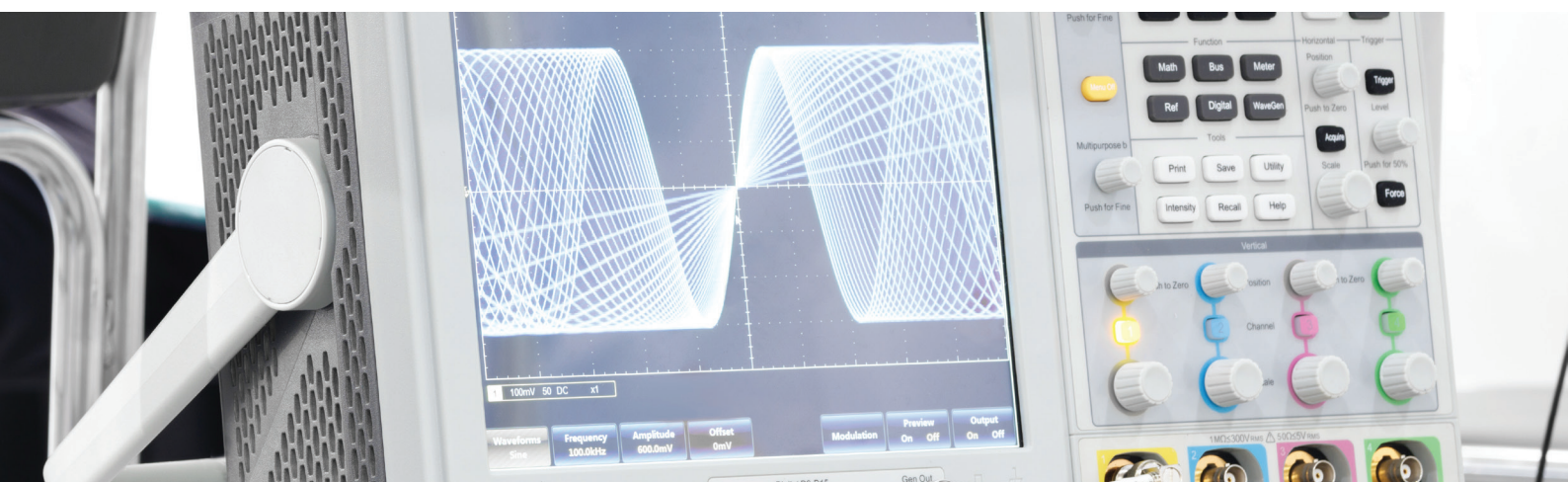# IoT interference and coexistence test

Evaluate the impact of interference on the user experience

IoT devices must have internet connectivity. Many also need to be easy and cheap to install and be easy to relocate and possibly even mobile. Therefore, many choose wireless communication for the data connectivity to the device. In particular, many choose technologies like LoRaWAN, Sigfox, Wireless-MBUS, Z-wave and RFID - all operating in the unlicensed frequency band at 868 MHz. When creating a system or a product it is essential to know how the users will experience the functionality of the system and therefore, it is essential to test the performance in a real life wireless spectrum.

The test
FORCE has collected information about the number of wireless devices utilizing the wireless 868 MHz spectrum and compared it to the findings in the literature, where also universities have reported substantial amounts of wireless interference. Based on this information we have constructed various scenarios that reflect real life wireless interference spectrum such that the environment can be controlled, and the test become repeatable. By subjecting your wireless communication channel to the interference, it is possible to evaluate the impact on the user experience in the case of interference.

Why you should perform this test
Before building a large system and business case related to it, it is important to know the expected service level of the system. Currently, the link budget is the primary component in this evaluation to determine the range or coverage from a base station. But if this base station encounters interference, the range will be reduced, leading to a lower customer expe-

rience. Therefore, the test is also slowly becoming regulatory requirements, where for instance FDA in the USA requires that if you develop medical devices, you have to perform wireless co-existence test - for example by the standard C63.27. An often-overlooked risk is associated with CRC16, where a residual error of 0.001 % is present. This means that if this is the only error check you perform, 1 out of 1 million bits will be the wrong value. If this is an error flag missing, it might have catastrophic results. This can be tested with the interference test.

Preparation and requirements
The test is purpose build for 868 MHz wireless interference testing, but can be modified to other frequencies. For the test you should bring a transmitter and receiver. You must be able to evaluate the functionality of the device, when the communication is failing. In addition, many clients find it advantageous to be able to monitor the bit error rate, or the packet error rate to evaluate exactly what is going on, when the devices are subjected to interference. You can either perform the test as a conducted test through the antenna connectors, or wirelessly where we supply the antenna couplers.