Press release

For immediate publication

[Short version]

Unrivaled precision to perfection – more applications for the popular SRM-3006 from Narda STS with the LTE-TDD option

Pfullingen, August 23, 2017 – Narda Safety Test Solutions has added the LTE-TDD option to the latest generation of its highly specialized SRM-3006 Selective Radiation Meter. This puts the finishing touch to this frequency-selective handheld field strength measuring system, which has long been the benchmark device for rapid, reliable, standard-compliant safety assessments. The code-selective measurement process used in the SRM-3006 makes it possible to automatically and precisely extrapolate for the values of electromagnetic fields (EMF) that occur at maximum traffic load. This is a recognized procedure according to international standards such as ITU-T K.100, IEC 62232 and EN 50492. Now, in addition to UMTS and LTE-FDD, users will also be able to capture and determine LTE-TDD field strengths in the frequency range between 9 kHz and 6 GHz reliably and selectively.

In all cases, legally airtight RF immission measurements must take the worst case scenario for human radiation exposure level into account. This means making the measurements at the point where immissions are highest at the time when the equipment is operating at maximum load. The ICNIRP (International Commission on Non-Ionizing Radiation Protection) recommends determination of the field strength of signals that vary in power level as RMS values averaged over a 6 minute interval. No value may exceed the limit value during the entire measurement period. Alternatively, the measured values may be extrapolated to the maximum value using a suitable method. The SRM-3006 therefore eliminates the complex post-processing on a PC that would be absolutely necessary if there was no code-selective measurement available. Users have complete flexibility in making the measurement, as it does not depend on the time of day or the level of data traffic through the equipment. This saves time and money.

Because frequency resources are limited, LTE-TDD uses the same frequency bands for the uplink and downlink of data traffic between the base station and receiver. With its new option, the SRM-3006 is capable of using the information present in the signal to automatically extrapolate for the maximum overall exposure level and selectively identify signal sources, even for network operators using this particular configuration. The device supplies authorities, mobile service providers and measurement service providers with guaranteed standard compliance and the security that immission protection limit values can be reliably monitored and adhered to. A wide range of pre-configured operating modes simplifies

complex measurement routines and helps to prevent errors. This battery powered handheld device is ideal for field use, thanks to its robust casing and the two three-axis measuring antennas designed specially for mobile communications (E field, 27 MHz - 3 GHz and 420 MHz - 6 GHz), with which it forms a compact unit.

[Long version]

Unrivaled precision to perfection – more applications for the popular SRM-3006 from Narda STS with the LTE-TDD option

Following UMTS and LTE-FDD, the SRM-3006 can now drill down into LTE-TDD signals and clearly identify the source

Pfullingen, August 23, 2017 – Narda Safety Test Solutions has added the LTE-TDD option to the latest generation of its highly specialized SRM-3006 Selective Radiation Meter. This makes the frequency-selective handheld field strength measuring system, which has long been the benchmark device for rapid, reliable, standard-compliant safety assessments, even more useful than before. The special code-selective measurement process used in the SRM-3006 makes it possible to automatically and precisely extrapolate for the values of electromagnetic fields (EMF) that occur at maximum traffic load when making RF exposure level measurements. This is an effective and reliable method that is recognized by international standards such as ITU-T K.100, IEC 62232 and EN 50492. Now, in addition to UMTS and LTE-FDD, users will also be able to capture and determine LTE-TDD field strengths in the frequency range between 9 kHz and 6 GHz reliably and selectively.

The basis: the worst case scenario

Legally compliant immission measurements that are made in order to demonstrate conformance with limit values in the high frequency range must take the worst case scenario into account in addition to being made with care and precision. Human safety demands that the least favorable conditions to which persons could be exposed are accurately recorded. The relevant regulation in Germany (26. BImSchV) requires that the immission measurement be maximized for both the particular location and time, rather than using the instantaneous immission measured at any location. In this regard, the particular location can be measured effectively using the so-called pendulum method, which uses a hand-held measuring antenna to cover an entire volume rather than just a fixed measurement point.

Code-selective measurement

The ICNIRP (International Commission on Non-Ionizing Radiation Protection) recommends determination of the field strength of signals that vary in power level as RMS values averaged over a 6 minute interval. No value may exceed the applicable limit value during the entire measurement period. In every other case, where a maximum cannot be directly

determined for either a location or a time, the recorded values must be reliably extrapolated mathematically. The only way that such an alternative, rapid, reliable and precise evaluation can be made is by means of a code selective measurement of the information contained in the reference signal (RS), which is broadcast at a constant level, followed by decoding and extrapolation to the maximum exposure level. Using the SRM-3006 eliminates the need for complex post processing of the results on a PC that would be required if these automatic functions were not available. This also means that users have complete flexibility in making measurements, as they do not depend on the time of day or the level of data traffic through the equipment. This saves time and money.

Practical example: LTE

For LTE base stations, the P-SS (Primary Synchronization Signals) and S-SS (Secondary Synchronization Signals) that contain the Cell ID which is needed for unique identification of the source, and the RS (Reference Signals) are each coded according to their cells. Code selective measurement is based on this, as it means that a unique code is used for each base station and each base station sector or cell. When the measured signal is decoded by the SRM-3006, the individual immissions can be separated and automatically assigned to their particular cells.

If several cells and base stations from the same provider are present that are operating synchronously, they will all be transmitting on the same frequency. A simple spectrum analyzer cannot distinguish the individual cells from each other, but can only display the total power level of all the base stations transmitting on this frequency. If the user wants to know the identity of the base station from which the measured field strength is emanating, the signal must be examined in more depth. The part of the signal that contains the coded unique source identification information must be read out.

FDD and TDD briefly explained

The difference between the FDD and TDD wireless communications methods is basically that the first uses separate carrier frequencies for the uplink (UL) and downlink (DL), while TDD uses just one frequency for both directions. FDD is short for frequency division duplex and TDD stands for time division duplex. In essence this means that the more flexible FDD technology allows signals to be transmitted and received simultaneously, whereas TDD can only perform these functions one after the other, which means that it makes much more economical use of valuable radio frequency resources.

The environmental measurement specialists

The SRM-3006 supplies authorities, mobile service providers and measurement service providers with guaranteed standard compliance and the security that immission protection limit values can be reliably monitored and adhered to. The device is highly specialized, having been developed and tailored by our engineers in Pfullingen together with clients and users from authorities and higher education to match the individual requirements for

environmental measurements. Particularly for such applications, Narda STS possesses enormous expertise, which results in many benefits to users, not least of which is ease of use. This is really helpful, as this field of measurement is particularly challenging and demands a high degree of experience from all concerned.

The result is preconfigured operating modes that simplify complex measurement routines and help to avoid errors. For example, “Safety Evaluation” makes it possible to preset different channels and thus easily and quickly determine the field strength that is present from which service in which frequency band. “Scope” mode is used for short term analysis of pulsed signals and long term recording of variable exposure levels. With “UMTS P-CPICH Demodulation” mode, automatic, rapid extrapolation to maximum field strengths is possible, just as with LTE. The basic unit takes care of the evaluation directly, with the results such as field strength and power density shown as individual values in tables, or collected together as a total value, and/or as an instantly recognizable percentage of the permitted limit value. This means that users do not have to be recognized experts in spectrum analysis in order to use the SRM properly. The whole process, from device configuration to evaluation and documentation and even management of the measurement data is extremely convenient thanks to the SRM-3006 TS PC software, which also allows device setups to be linked together into measurement routines and uploaded to the SRM.

This battery powered handheld device is ideal for field use, thanks to its robust casing and the two three-axis measuring antennas designed specially for mobile communications (E field, 27 MHz - 3 GHz and 420 MHz - 6 GHz), with which it forms a compact unit. The device has built in GPS and a Voice Recorder for recording comments in difficult operating environments. The casing is radiation proof to electric field strengths of up to 200 V/m, which means that the device can measure field strengths in ranges where other instruments have given up.

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Image captions

Figure 1: The new LTE-TDD option now means that the SRM-3006 can be used by the operators of such systems to automatically and reliably extrapolate to the maximum overall exposure level and selectively identify sources when making RF immission measurements.

Figure 2: The requirement for determining the localized maximum value in RF exposure measurements can be met effectively using the pendulum method. This method uses a hand-held measuring antenna to cover an entire volume rather than just a fixed measurement point.

Narda is a leading supplier of measuring equipment in the RF safety, EMC and RF testing sectors. The RF safety product spectrum includes wideband and frequency-selective measuring devices, and monitors for wide area coverage or which can be worn on the body for personal safety. Under the PMM brand, Narda offers instruments for determining the electromagnetic compatibility (EMC) of devices. The RF testing sector covers analyzers and instruments for measuring and identifying radio sources. The range of services includes servicing, calibration, and training programs. The company operates a management system complying with ISO 9001/2008 and ISO/IEC 17025.

Narda has development and production facilities at three locations: Hauppauge, Long Island / USA, Pfullingen / Germany and Cisano / Italy and has its own representative in Beijing / China. A worldwide network of representatives guarantees closeness to customers.

Narda is part of **L-3 Technologies**, New York.

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