

NARDA BROADBAND FIELD METER SRM-3006

Technical Note 01

Features of Safety Evaluation mode



The SRM-3006 has a whole host of new and useful features compared to its predecessor the SRM-3000. These will be described in a series of Technical Notes, starting with *Safety Evaluation* mode – the operating mode that was developed specifically for examining safety in electromagnetic fields as easily as possible.

▲ More information

You can now set up to six Result Types – including several at the same time:

- **Act** (Actual): Actual instantaneous measured value
- **Max** (Maximum): Largest value measured
- **MxA** (Maximum Average): Largest of all averaged values
- **Avg** (Average): Average taken over a specific number of measurements or over a specified time period
- **MnA** (Minimum Average): Smallest of all averaged values
- **Min** (Minimum): Smallest value measured

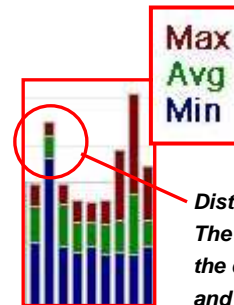
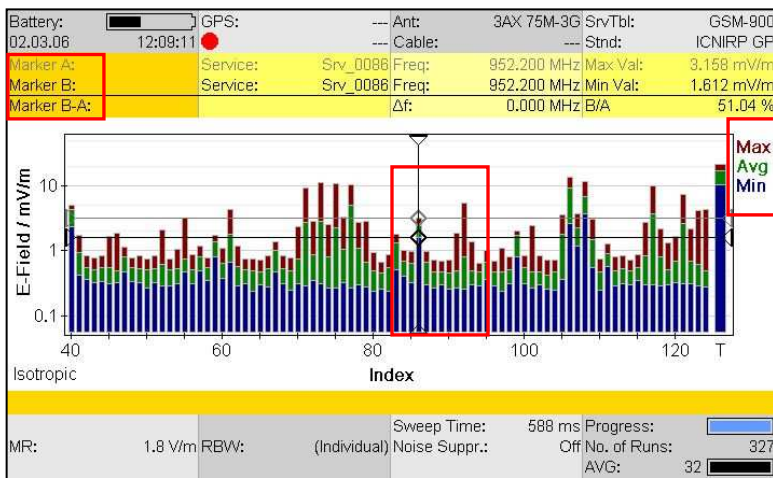
The Selective Radiation Meter SRM-3006 from Narda Safety Test Solutions has been specially developed for environmental and safety measurements in electromagnetic fields. Using isotropic measuring antennas, the instrument covers the entire frequency range from 9 kHz to 6 GHz. It can therefore be used equally well to investigate safety in the near field region of long wave transmitters, make measurements on radio and TV broadcast transmitters, and determine exposure levels caused by the latest generation of mobile telecommunications services.

6 Result Types at the same time

Battery: 02.03.06	Ext. Power: 12:02:31	GPS: ●	Ant: 3AX 75M-3G	SrvTbl: Full Band EU
			Cable: ---	Strnd: ICNIRP_GP
Table View ▲				
Index	Service	Max	Avg	Min
5	BandIII	25.74 mV/m	22.18 mV/m	19.16 mV/m
6	Trains	1.930 mV/m	1.289 mV/m	0.710 mV/m
7	BandIV	46.23 mV/m	41.50 mV/m	25.17 mV/m
8	BandV	11.93 mV/m	10.72 mV/m	8.99 mV/m
9	GSM-R	243.6 mV/m	86.6 mV/m	63.7 mV/m
10	L-Band	7.315 mV/m	6.907 mV/m	6.267 mV/m
11	DECT	10.15 mV/m	5.231 mV/m	4.609 mV/m
12	UMTS-TDD	131.6 mV/m	24.95 mV/m	21.03 mV/m
13	W-LAN	20.28 mV/m	19.35 mV/m	18.13 mV/m
14	ISM	9.930 mV/m	8.967 mV/m	7.929 mV/m
Total		255.3 mV/m	115.8 mV/m	98.2 mV/m
Isotropic				
MR:	1.8 V/m	REW:	(Individual)	Sweep Time: 3.755 s
				Progress: 
			Noise Suppr.:	Off No. of Runs: 408
			AVG:	32 

Figure 1: A comprehensive Safety Evaluation. It covers 14 different services, ranging from TV band III through to WLAN and ISM frequencies. SRM-3006 measures the maximum, average and minimum values simultaneously and shows them in three columns in this example.

A much clearer overview is therefore produced in conjunction with the new bar graph display. For example, if you set the display to show maximum, average, and minimum values, you can immediately distinguish GSM traffic channels (TCH) from control channels (BCCH).



Distinguishing feature:
 The BCCH is "static", i.e. the difference between Max and Min is much smaller than in a TCH.

Figure 2: Bar graph display of GSM channels showing maximum, average and minimum values simultaneously.

It's just as easy to use the bar graph display to see the actual occupancy of UMTS frequency channels. This means that users can see immediately which channels need to be demodulated and which do not. That saves measuring where there is nothing to measure.

Faster measurements

All the characteristics of the SRM-3006 are tuned to give the best possible resolution and measurement speed. The resolution bandwidth (RBW) has a major role in determining the measurement speed: The finer the resolution, the longer the measurement takes to perform. The SRM-3006 gives users a wide range of choices here.

- **RBW automatic:** The SRM-3006 sets the resolution bandwidth so that the narrowest defined service is resolved finely enough. This is the simplest solution.
- **RBW manual** for the entire table: Users can set the resolution bandwidth according to their requirements.
- **RBW individual:** Users can set the resolution specified by the standard or which is best suited to the measurement task individually for each service using the *SRM-3006 Tools* PC software. The measurement speed can be further optimized in this way. More information on this is found in the on line help for *SRM-3006 Tools*.

RBW – automatic, manual or individual



In the bar graph display of Safety Evaluation mode, you can use all the marker and delta marker functions for evaluation – just as you would with a spectrum analysis.

In *Safety Evaluation* mode, the SRM-3006 also registers the field exposure levels in the frequency ranges between the defined services and shows the total level as *Others*. A further increase in measurement speed can be achieved if this function is disabled. This does mean though that unknown field sources remain unknown, since these would otherwise easily be recognized by a high value for *Others*.

Table View				
Index	Service	Max	Avg	Min
1	E-GSM	89.23 mV/m	72.99 mV/m	52.69 mV/m
2	GSM	90.76 mV/m	79.58 mV/m	64.94 mV/m
3	UMTS	28.90 mV/m	21.67 mV/m	16.99 mV/m
Total		125.9 mV/m	110.1 mV/m	10

Isotropic

MR: 1.8 V/m RBW: 2 MHz (Auto) Sweep Time: 918 ms Noise Suppr.: Off

Figure 3: Lightning fast Safety Evaluation across three mobile phone services: E-GSM, GSM and UMTS by disabling measurement of the intermediate frequency bands.

Distribution			
Index	Service	Max	Distribution
1	E-GSM	86.27 mV/m	47.07 %
2	GSM	78.86 mV/m	39.33 %
3	UMTS	22.91 mV/m	3.319 %
Others		55.03 mV/m	19.15 %
Total		125.7 mV/m	100.0 %

Isotropic



MR: 1.8 V/m RBW: 2 MHz (Auto) Sweep Time: 911 ms Progress:  Off No. of Runs: 9 Noise Suppr.: Off AVG: 32 

Figure 4: The same measurement including the intermediate frequency bands: Others account for some 19 percent of the total exposure level, shown directly in the Distribution column.

Direct view of distribution

The new evaluation function called *Distribution* shows the contribution of each individual service in relation to the total result of a *Safety Evaluation* (Total = 100%, not to be confused with 100% of the limit value!). In this way, providers using shared sites can immediately see which service is contributing too much to the overall exposure level. For example, the same function can be used in the home to straightaway see which proportion of the field exposure is due to mobile phones and which proportion is emanating from the DECT phone in the house itself.

Distribution

Technical Notes from Narda Safety Test Solutions

These notes report, in no particular order, on the possible applications of Narda measuring equipment. Typical applications for the Selective Radiation Meter SRM-3006 are safety measurements on

- **Radio and TV transmitters (AM, FM, DAB, DVB-T)**
- **Mobile phone stations (GSM-900, GSM-1800, UMTS, CDMA, W-CDMA, LTE)**
- **Wireless communications networks (WiFi, WLAN, WiMAX, DECT, ZigBee, Bluetooth)**
- **Radio controls using ISM frequencies**

The Technical Notes are found on www.narda-sts.de under Literature ► High Frequency

Narda Safety Test Solutions GmbH
Sandwiesenstrasse 7
72793 Pfullingen, Germany
Phone: +49 (0) 7121-97 32-777
Fax: +49 (0) 7121-97 32-790
E-Mail: support@narda-sts.de
www.narda-sts.de

Narda Safety Test Solutions
435 Moreland Road
Hauppauge, NY 11788, USA
Phone: +1 631 231-1700
Fax: +1 631 231-1711
E-Mail: NardaSTS@L-3COM.com
www.narda-sts.us

Narda Safety Test Solutions Srl
Via Leonardo da Vinci, 21/23
20090 Segrate (Milano), Italy
Phone: +39 02 269987 1
Fax: +39 02 269987 00
E-mail: support@narda-sts.it
www.narda-sts.it