

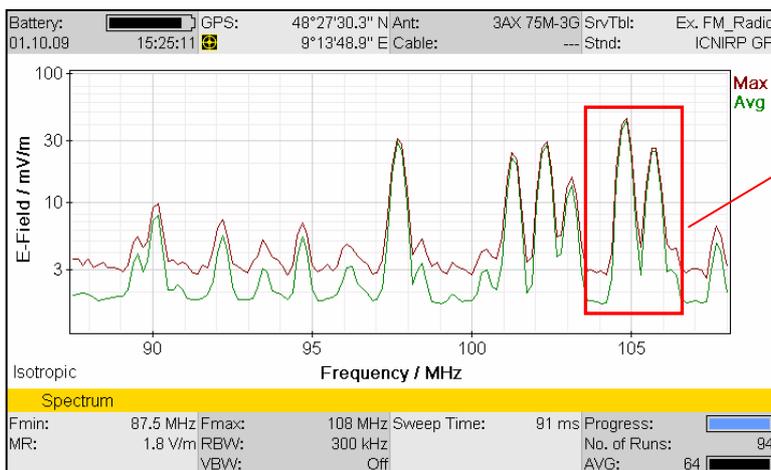
# Features of Spectrum Analysis mode



The Selective Radiation Meter SRM-3006 is equipped with *Safety Evaluation* mode, specifically designed for its special role in making environmental and safety measurements (Technical Note 01). Nevertheless, it can also be used generally just like a spectrum analyzer for making safety assessments as well. *Spectrum Analysis* mode provides various display and evaluation features for this purpose:

- ▲ **Graphical spectrum: A picture is worth more than a thousand words ...**
- ▲ **Smoothing the spectrum: The video bandwidth**
- ▲ **Evaluating the spectrum: The Peak Marker**
- ▲ **Comparing spectral values: The Delta Marker**
- ▲ **The spectrum as a table: The Peak Table**

*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.*



**Figure 1: Result of a spectrum analysis in the VHF range. The small difference between the maximum and average values is typical for FM radio broadcasts.**

### ▲ Graphical spectrum: A picture is worth more than a thousand words ...

... Well, measurement values actually. You can see at a glance the highest peaks in the spectrum and their relationships to one another. The display of *several Result Types* as in *Safety Evaluation* is new. This gives you additional information about the individual sources. For example, you can easily distinguish the constant level carrier frequencies or pilot channels from the variable traffic channels by the difference between maximum and average values.

### ▲ Smoothing the spectrum: The video bandwidth

You can set a video bandwidth (VBW) on the SRM-3006 too, just like any standard spectrum analyzer, to smooth the measurement values if the signals are very noisy or they have high crest factors (UMTS, LTE, EDGE). Some measurement regulations require the use of a video bandwidth setting and this requirement can be met formally using the SRM-3006.

### ▲ Evaluating the spectrum: The Peak Marker

As usual, you can move a marker through the spectrum and read off the corresponding numerical values of frequency and field strength. A special feature: If you use the Peak Marker, e.g. using the softkey for *Highest Peak* or *Next Lower Peak* etc., the marker jumps precisely to the apex of the spectral line.

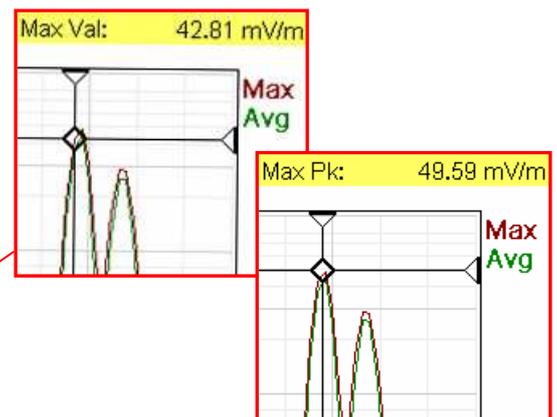
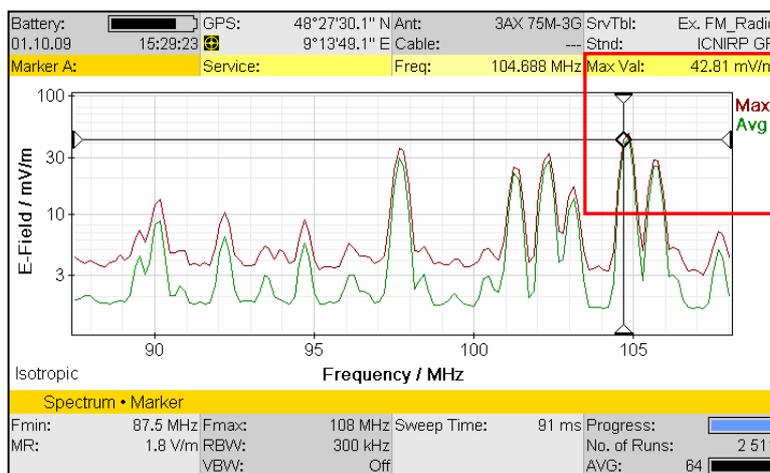


Figure 2: Reading off any value using the marker ... (Max Val).

When you press the *Highest Peak* softkey, the marker jumps precisely to the apex of the line and the associated numerical value (Max Pk) is displayed.

### ▲ Comparing spectral values: The Delta Marker

The SRM-3006 has two markers that can be used separately or to determine a difference in values. For example, you can set both markers to the same frequency but read out the values for two different Result Types. You can see the ratio of the two values by using the delta function. You can also set the markers to show the same Result Type but set them to different frequencies so that you can compare two peaks with one another.

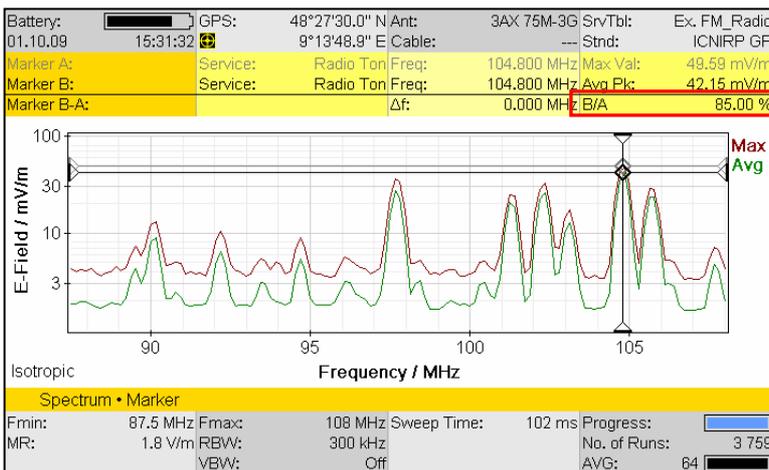


Figure 3: Both markers are on the same frequency but show the values of different Result Types (Max and Avg). The ratio of the average to maximum values in percent is shown instead of the difference.

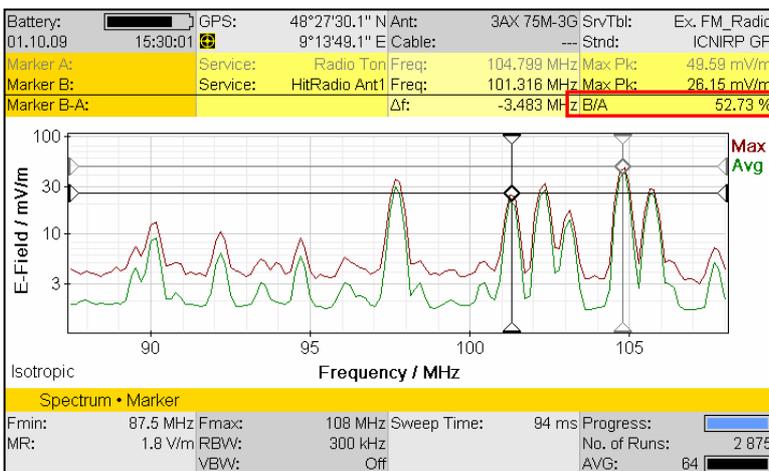


Figure 4: The markers are on different frequencies but show the values for the same Result Type (Max). The ratio of the two peaks in percent is shown instead of the difference.

**▲ Even simpler:  
The spectrum as a table – the Peak Table**

You can specify that the results for any particular Result Type are shown in the first column. The other columns can be used to show the values for other Result Types, either as absolute values or relative to the results in the first column. In this way, you can straightaway see how much greater the maximum value is than the average value, for example.

Battery: 01.10.09		GPS: 15:28:08		48°27'29.8" N Ant: 9°13'49.2" E Cable:		3AX 75M-3G SrvTbt: --- Stnd:		Ex. FM_Radio ICNIRP GP	
Peak Table									
Index	Frequency	Service	Avg	Max					
1	104.801 MHz	Radio Ton	45.50 mV/m	49.59 mV/m					
2	97.699 MHz	Das Ding RT	30.80 mV/m	37.57 mV/m					
3	102.299 MHz	AFN	28.75 mV/m	33.05 mV/m					
4	105.700 MHz	SWR 2 BW	27.82 mV/m	30.92 mV/m					
5	101.301 MHz	HitRadio Ant1	23.01 mV/m	26.09 mV/m					
6	103.100 MHz	HitRadio Ant1	13.93 mV/m	17.26 mV/m					
7	90.099 MHz	SWR 4 BW	9.466 mV/m	13.49 mV/m					
8	92.189 MHz	SWR 3	6.245 mV/m	10.42 mV/m					
9	94.696 MHz	SWR 1	5.678 mV/m	8.858 mV/m					
10	107.699 MHz		5.097 mV/m	7.269 mV/m					
Isotropic									
Spectrum • Peak Table									
Fmin:	87.5 MHz	Fmax:	108 MHz	Sweep Time:	92 ms	Progress:			
MR:	1.8 V/m	RBW:	300 kHz	No. of Runs:	1 792	AVG:	64 		
		VBW:	Off						

**Figure 5: Peak Table with numerical display of the ten largest spectral values as average (Avg) and peak (Max) values in mV/m.**

Avg	Max
45.31 mV/m	109.4 %
30.98 mV/m	121.3 %
28.73 mV/m	115.0 %
27.56 mV/m	112.2 %
22.93 mV/m	113.7 %
13.74 mV/m	125.7 %
9.443 mV/m	142.9 %
6.282 mV/m	165.9 %
5.606 mV/m	158.2 %
5.049 mV/m	143.9 %

*If you display the maximum values as relative values, you can directly see by how much they exceed the average values in percent.*

## 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](http://www.narda-sts.de) under Literature ► High Frequency

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