Established 1981

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RF Safety Test Solutions

50 Years of Excellence

Electric and Magnetic Field Measurement

Model 8715 Survey Meter

- **Precise Spatially-Averaged Measurements**
- **Six Minute Time Average**
- **Extremely Easy To Operate**
- **Powerful, Microprocessor Design**
- **Single, 30 dB Dynamic Range**
- **Large-Character Liquid Crystal Display (LCD)**
- **Displays Fields in mW/cm^2, W/m^2, V/m, A/m, and Percent of International Standards**
- **Small Size, Ergonomic Design**
- **Lightweight**
- **Variable Alarm**

Description

The Model 8715 Survey Meter combines an unprecedented ease of operation with powerful measurement capabilities. It is fully compatible with all 8700 Series probes. This cost-effective, small, lightweight meter is ideal for most applications that do not require data logging or some of the advanced features incorporated in the Model 8718 Survey Meter.

A key feature of the Model 8715 is its ability to easily make precise spatially-averaged measurements. By simply moving the probe vertically in front of the body at a constant rate of speed, the 8715 provides a precise spatial average. Taking a typical ten second average will result in a spatial average that is based on about 400 readings since the 8715 averages at the rate of 40 readings per second.

The importance of spatial averaging is now widely appreciated with the expansion of the wireless industry. Spatially-averaged measurements can be critical for the typical co-linear dipole arrays used for many wireless services. Single point measurements can vary by as much as 3:1 over a vertical distance equal to half a wavelength. At 900 MHz, for example, this distance would be only 16.7 cm or about 6.5 inches.

Operation

The 8715 was designed with the new or occasional user in mind so that the most common measurement mistakes cannot happen.

NO RANGE CHANGES – the meter automatically displays a numeric value over the probe's entire measurement range. The user simply pushes the **Probe** button until the arrow points to the full scale measurement range of the probe. The probe ranges are even color coded on the meter to match the color band of the probe.

NO CONFUSING SCALES – once you select the probe's full scale measurement range you simply read the digital display, including the units of measure.

NO DIFFICULT ZEROING – just touch the Auto Zero key.

NO UNIT CALCULATIONS – simply select the unit of measure that you want. Only units appropriate to the probe you are using can be selected.

NO FORGETTING THAT YOU ARE IN THE MAXIMUM HOLD MODE – the meter clearly displays the word "MAX" when you are in the maximum hold mode. The digital display shows the maximum value while the bar graph continues to indicate the instantaneous value.

LESS CHANCE OF DAMAGING THE PROBE DUE TO AN OVERLOAD CONDITION – the meter gives both audio and visual warnings of an over range condition, which greatly reduces the chance that a probe will be damaged.

SIMPLE SPATIALLY-AVERAGED MEASUREMENTS – One key is used to start and stop the averaging and a second key clears the display.

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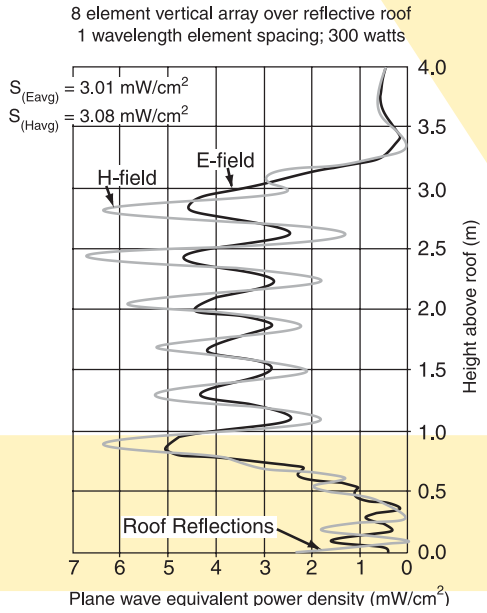
Understanding Spatial Averaging

The major standards concerned with human exposure to radio frequency radiation specify maximum exposure levels averaged over the whole body. The co-linear dipole antenna arrays that are very common in modern wireless communications systems, for example, have multiple lobes close to the antenna. The field strength typically varies by 6-7 dB along the length of an array. Therefore, the measured value is highly dependent on not only the distance from the antenna but the height above the ground.

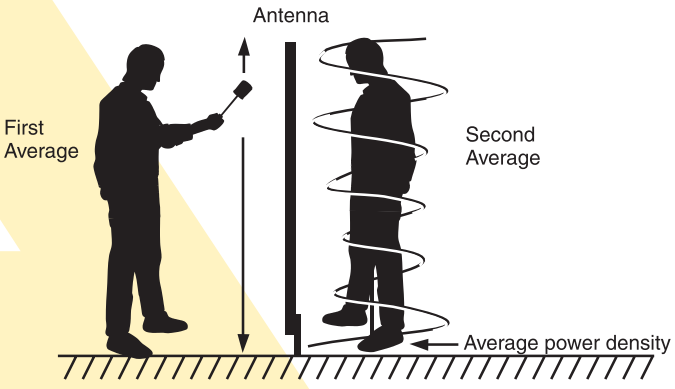
The traditional method of making spatially-averaged measurements is to use a “storypole”. A storypole is a non-conductive pole , often wooden, equal in height to an average adult with distance marks equally spaced along its length. Measurements are made alongside the storypole at each height and then mathematically averaged. The height and spacing of each measurement varies from standard to standard. For example, the IEEE C95.1-1999 standard specifies measurements from 20 centimeters (about 8 inches) to 200 centimeters in 20 centimeter increments. Some exposure standards, such as Canada’s Safety Code 6, require that measurements be averaged across two dimensions – vertically and horizontally. Modern wireless communications sites make this manual technique more difficult than ever since field levels at many sites, particularly multi-user sites, are constantly varying. For example, paging systems go on and off and the number of cellular channels in use is constantly changing. Thus, a series of measurements made at varying heights can vary more as a function of time than location.

Spatial Averaging with the 8715

The Model 8715 can be used to make precise, spatially averaged measurements. Pressing the **Start**/**Stop** key begins the averaging interval. Pressing the same key again ends the averaging. The meter averages 40 measurements per second during the averaging interval. Effective measurement technique requires you to simply move the probe slowly from about 8 inches to 2 meters while the timer is running. This technique is referenced by the US FCC, as the preferable method of spatially averaging. It is technically very sound and much more accurate than averaging a series of measurements. It is anticipated that future updates of the major standards will reflect this automatic technique now that the survey equipment makes it practical. The **Clear** key is used to clear the display and to return to real-time measurements.



Output of Typical Co-linear Dipole Array



Spatial-Averaging of Fields

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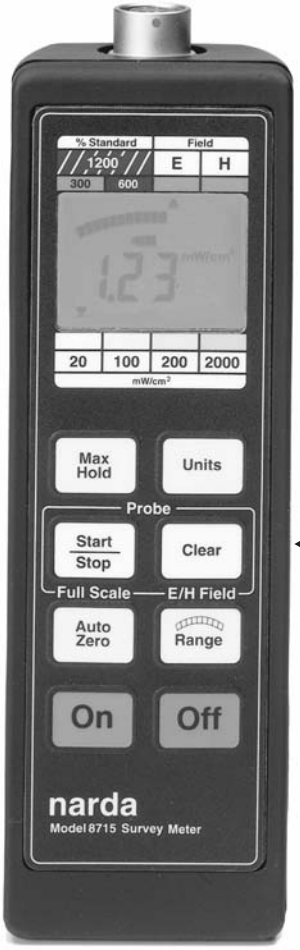
Electric and Magnetic Field Measurement

CABLE INPUT

- Compatible with all 8700 Series D Type probes*

AUDIO ALARM

- Alarm sounds if input exceeds probe's measurement range
- Set variable alarm using "hidden" keys to sound alarm from 1% to 100% of the full scale measurement range of the probe



DISPLAY

- Large, bright seven-segment numeric display
- Analog bar graph
- Custom legends indicate unit of measure, battery status, maximum hold mode, etc.
- Arrows indicate probe's full scale measurement range and field type – electric or magnetic

SHAPE

- Easy to hold and well balanced
- No sharp corners

SPATIAL AND TIME AVERAGING

- Spatial averaging immediately available at any time
- Start/Stop key begins and ends averaging interval
- Averageing ends automatically after six minutes
- Clear key clears average value and returns meter to real time measurement mode

KEYPAD

- Positive, tactile feel keys

BATTERY

- Operates about 50 hours from a standard 9V battery

HOUSING

- Rugged, cast aluminum housing
- Fully shielded against strong electromagnetic fields

*Does not display direct results for 8760D and 8725D probes.

Electric and Magnetic Field Measurement

Specifications

Model	8715
Display Type Digital Output Bar Graph Units	 Custom Liquid Crystal Display (LCD) 3 1/2 Digits, .44 inch (11mm) Character Height 18 Segments Custom Legends
Controls	8 Key Membrane Keypad
Inputs	Probe Cable Input
Zeroing	One Touch Auto-Zero
Measurement Range	Single, 30 dB Dynamic Range Bar Graph Auto Ranges or Select One of Three 10 dB Ranges Compatible with all Narda 8700 probes[a]
Units	mW/cm^2, W/m^2, V/m, A/m, and Percent of International Standards
Audible Alarm	Probe Overload Warning Variable Alarm from 1% to 100% of full scale
Spatial Averaging and Time Averaging	Averages 40 samples per second. Timer shuts off automatically after six minutes

Battery Type Life (approx)	 9V alkaline 50 Hrs.
Size (LxWxD)	7.8" x 2.5" x 1.8" (19.8 cm x 6.4 cm x 4.6 cm)
Weight (approx)	1.4 lbs (0.64 kg)
Temperature Operating Non-Operating	 -20°C to +50°C -20°C to +70°C
Humidity	0% to 90%, Non-Condensing
Accessories Supplied	Shielded Storage Case[b] that holds Meter and One or Two Probes, Battery, Manual, Model 8713B Electric Field Attenuator, Insulated Handle / Tripod, Probe Extension Cable Model 8744-04
Optional Accessories	Upgrade to larger case that holds four probes (P/N 32542707)

[a] Not all units of measure can be displayed when used with certain model probes, for example, 8725D (1000 mW/cm^2 full scale) and 8760D (100 $\mu W/cm^2$ full scale).

[b] The heavy duty storage case supplied with the Model 8715 Meter is foam-lined and shielded to protect the meter and probes in storage and in transit. The meter, manual, and up to two probes can be stored in the case. It is approximately 21" x 13" x 6.3" (53 cm x 33 cm x 16 cm).

Accessories (supplied)

Model 8713B Electric Field Attenuator

- Provides "Zero" Density for Electric Field Probes
- Portable and Lightweight

Insulated Handle / Tripod

- Mounts directly to Model 8715
- Improves isolation between the operator and the meter when making low frequency (<10 MHz) measurements
- Can be used as a benchtop tripod

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