narda Safety Test Solutions
an L3 Communications Company

NARDA BROADBAND FIELD METER

NBM-550

Measuring electric and magnetic fields

ranging from high frequency to microwaves

Narda Broadband Field Meter NBM-550

- **Non-directional measurement using isotropic probes for applications in the frequency range 100 kHz to 60 GHz**
- **Large, graphic display for easy-to-read results**
- **Intelligent probe interface with automatic detection of probe parameters for simple operation**
- **Memory for up to 5000 measurement results**

OPTIONAL

- **Automatic storage of position data with GPS interface and plug-in GPS receiver**
- **Voice recording for comments**

DESCRIPTION

The Narda Broadband Field Meter NBM-550 is part of the NBM-500 device family. It makes extremely accurate measurements of non-ionizing radiation. Equipped with probes for measuring electric and magnetic field strengths, it covers all frequencies from long wave up to microwave radiation. Flat frequency response probes (“flat probes”) as well as so-called shaped probes that evaluate the field strength on the basis of a human safety standard are available. These probes are calibrated separately from the field meter, and include a non-volatile memory that contains the probe parameters and calibration data. They can therefore be used with any device in the NBM-500 family without losing any of the calibration accuracy.

Robust yet light and easy to carry, designed for simple, one-hand operation

APPLICATIONS

The NBM-550 is used to make precision measurements to establish human safety, particularly in workplace environments where high electric or magnetic field strengths are likely to occur. Some examples are:

- **Measuring field strengths to comply with general safety regulations**
- **Establishing safe zones**
- **Measuring and monitoring field strengths around broadcasting and radar equipment**
- **Measuring field strengths of cell phone transmitters and satellite communications systems to demonstrate compliance with human safety standard limit values**
- **Measuring field strengths in the industrial environment, such as plastics welding equipment, RF heating, tempering, and drying equipment**
- **Measurements for protecting users of diathermy equipment and other medical devices that generate high-frequency radiation**
- **Measuring field strength in TEM cells and absorber chambers to demonstrate electromagnetic compatibility (EMC)**

Changing the probe is quick and easy, with no need to reconfigure the device

FEATURES

The Narda Broadband Meter NBM-500 is designed for on-site use. The combined features listed below ensure that it delivers precise results quickly and simply, even under difficult operating conditions.

Display and operation

- Graphical user interface with selectable language.
- Backlit monochrome LCD with selectable illumination time; easy to read, even in bright daylight.

Result display and evaluation

- 5 types of result can be displayed in easy-to-read form: Momentary value (Actual), minimum value (Min), maximum value (Max Hold), average value (Average), maximum average value (Max Avg).
- History Mode memory operates continuously in the background. This allows you to graphically evaluate and save the results for the previous 8 hours of operation (see upper picture opposite).
- Selectable units: V/m, A/m, mW/cm^2, W/m^2 when using non-weighted (flat) probes, % of limit value when using weighted (shaped) probes.
- Stored limit values for common human safety standards allow direct display of results for flat probes in % of limit value at a known frequency of the field under test (see lower picture opposite).

Automatic adjustment, application of calibration data

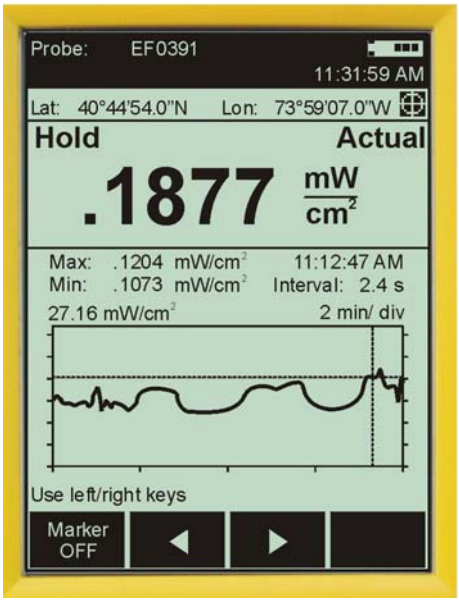
- Intelligent probe interface detects the NBM probe type and automatically recalls and applies the correction values that were recorded during calibration.
- Fully automatic zero point adjustment at programmable time intervals.
- Reminder function lets you know when calibration is due.

Special evaluations

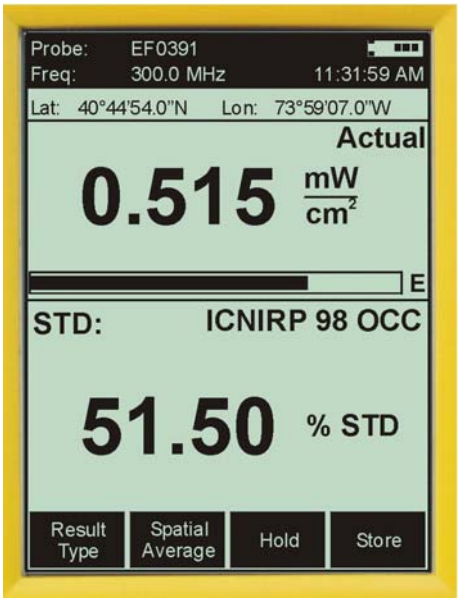
- Time averaging, period settings of up to 30 minutes.
- Spatial averaging, discrete or continuous.
- Multi-position spatial averaging for up to 24 locations.

Warning functions

- Audible warning with programmable alarm threshold.
- Hot spot search function with audible warning.



History Mode shows the variation of field strength versus time as a graph. Numerical values can be read out using the marker.



Apply Standard: You can also display the field strength as a percentage of the limit value of a standard even when using flat probes. Simply select the standard on the NBM-550 (ICNIRP in the example shown) and set the frequency. The evaluation is useful if the main component of the field strength is due to a single source of known frequency.

Operation

- User-defined setups make it easy to recall device settings
- Battery saving user-selectable timed auto-off function
- Hold button “freezes” measurement result for easy readout
- Keypad lock prevents inadvertent operation of control keys

Remote control

- NBM-TS PC software enables remote controlled measurements
- PC connection via USB or optical interface
- Additional freedom of movement for probes provided by using an extension and optical cable. The NBM-550 controller function enables data communication with the smaller NBM-520 for use as a “probe extension handle”. This makes it possible to locate the probe remotely from the NBM-550 control unit without the adverse effects on the measurement that would be caused by metallic connecting cables.

Left:
Probe extension using an optical cable. The NBM-550 acts as controller and displays the results. The smaller NBM-520 acts as the optical probe interface. Both devices can also be used separately as measuring devices when fitted with probes.

Result storage and evaluation

- Data memory for up to 5000 results
- External trigger input for data storage (e.g. for connecting to an odometer)
- Timer Logging for timer controlled data storage (e.g. for long-term monitoring)
- Screenshot download as bitmap for simple documentation
- “NBM-TS” PC software for convenient data management, documentation and subsequent evaluations

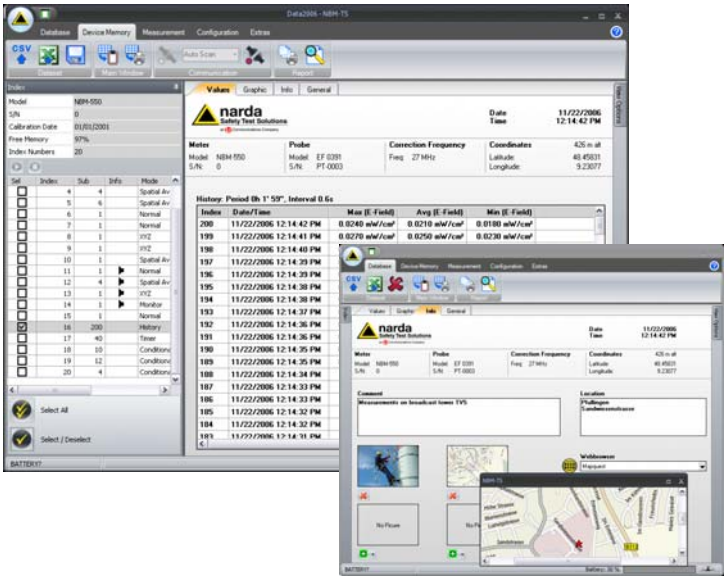
OPTIONS

- GPS interface and plug-in GPS receiver for automatic storage of position data
- Conditional Logging: Stores measurement data when a threshold value is exceeded
- Audio recorder for voice comments, with built in microphone, and earphone output; transfer to PC

Above: The battery compartment is opened easily using a coin. Four replaceable NiMH rechargeable batteries (AA size) are used to power the device.

Below:
Open the protective rubber cover to access the connectors: Charger socket, optical interface, headphone connector and the multi purpose GPS / USB/ external trigger connector.

GPS receiver connected to the NBM-550



PC SOFTWARE

The comprehensive, easy to use “NBM-TS” PC software (included) provides the following functions:

- Result transfer to a PC
- Result database management
- Result evaluations
- Device configuration management
- Firmware update control
- Remote controlled measurements

PROBES

Frequency range	100 kHz – 3 GHz	3 MHz -18 GHz	300 MHz – 50 GHz	27 MHz – 60 GHz	300 kHz – 30 MHz	27 MHz – 1 GHz	300 kHz – 50 GHz
Field type	E	E	E	E	H	H	E Shaped
Probe designation	**EF0391**	**EF1891**	**EF5091**	**EF6091**	**HF3061**	**HF0191**	**Ex5091**
Mobile radio / telecommunications	●	●			●	●	●
Radio / TV broadcasting	●	●			●	●	●
Satellite communications			●	●			○
Radar		●	●	●			○
Industry: Heating and tempering	●				●		
Industry: Plastics welding	●				●		
Industry: Semiconductor production	●				○		
Medicine: Diathermy, hyperthermy	●						○
Leak detection			●				○
Human safety (general public safety)	●	●	○	●	●	○	○
Health and safety at work (occupational safety)	●	●	●	●	●	●	●

● very suitable ○ moderately suitable

SPECIFICATIONS [a]

NBM-550	
DISPLAY	
Display type	Transflective LCD, monochrome
Display size	10 cm (4“), 240 x 320 dots
Backlight	White LEDs, selectable illumination time (OFF, 5s, 10s, 30s, 60s, PERMANENT)
Refresh rate	200 ms for bar graph and graphics, 400 ms for numerical results
MEASUREMENT FUNCTIONS	
Result units	mW/cm^2, W/m^2, V/m, A/m, % (of standard)
Display range	.0001 to 9999, 4 digits, variable or fixed triads can be selected Variable triads: 0.01 V/m to 100 kV/m; 0.027 mA/m to 265.3 A/m; 0.265 µW/m^2 to 26.53 MW/m^2; 0.027 nW/cm^2 to 2.653 kW/cm^2; 0.0001 % to 9999 % Fixed triads: 0.01 to 9999 V/m; 0.0001 to 265.3 A/m; 0.0001 to 9999 W/m^2; 0.0001 to 9999 mW/cm^2; 0.0001 to 9999 %
Result types (isotropic, RSS)	Actual, Maximum, Minimum, Average, Average Maximum
Result types (X-Y-Z mode)	Actual X, Actual Y, Actual Z (requires a probe with separate axes)
Time averaging	Selectable averaging time, 4 s to 30 min (2 s steps)
Spatial averaging	Discrete or continuous
Multi-position spatial averaging	Averages up to 24 spatially averaged results, each position and total is stored
History Mode	Graphical display of Actual results versus time (span of 2 minutes to 8 hours)
Correction frequency	1 kHz to 100 GHz or OFF (direct frequency entry, interpolation between calibration points)
Hot Spot Search	Audible indication of increasing and decreasing field strength (result type Act or Max)
Alarm function	2 kHz audible signal (4 Hz repetition), adjustable threshold
Timer Logging	Start time pre-selection: up to 24 h or immediate start Logging duration: up to 100 h Logging interval: 1s to 6 min (in 11 steps)
RESULT MEMORY	
Physical memory	12 MB non-volatile flash memory for measurement results and voice comments
Storage capacity	Up to 5000 results (including instrument settings, time stamp and GPS data when available)
INTERFACES	
Remote control	Via USB or optical RS-232 interface (selectable)
- USB	Serial, full duplex, 460800 baud (virtual COM port), multi-pin connector
- Optical interface	Serial, full duplex, 115200 baud, no parity, 1 start and 1 stop bit
Earphone	3.5 mm TRS, ≥ 16 ohms (mono), for voice recorder option only
External trigger (for result storage)	Uses the multi-pin connector. Interface cable with BNC connector available as accessory Triggers when contacts short-circuited
External GPS receiver	Uses the multi-pin connector; GPS receiver with interface cable available as an option
Probe interface	Plug-and-play auto detection, compatible with all NBM series probes

OPTIONS	
Conditional Logging	
Logging conditions	Selectable: - On upper threshold: Results stored when measurements exceed the adjustable threshold - Out of gap: Results stored when measurements are above the upper threshold or below the lower threshold
Logging range	Selectable: - Store all (as long as the condition is true), sampling rate 5 Hz - Store first and last event (when the condition was true)
Voice Recorder	
Microphone	Built in microphone located at the top of the instrument near the Narda logo
Recording level	Fixed level, VU meter for level monitoring displayed when recording
Recording length	30 s max. length per voice comment, 1 voice comment stored with relevant result
Recording format	8-bit PCM mono, stored as WAV file (approx. 240 kbyte per 30 s)
Output	External earphone (adjustable output level) or via NBM-TS PC software
GPS Position Logging	
Receiver type	12-channel satellite tracking, DGPS capability, WAAS/ EGNOS compatible
Displayed position data	Latitude (Lat) and longitude (Long), selectable units: DMS (degrees, minutes, seconds)/ MinDec (decimal minutes)/ DegDec (decimal degrees)
Geodetic system	WGS84/ NAD83
Position accuracy	< 3 m (DGPS, WAAS), <15 m (SPS), high precision mode indicated on the NBM-550
Update rate	1 s
Receiver size/ weight	61 mm diameter x 19.5 mm high / 62 g (approx. 100 g with mounting plate)
Receiver mounting	Uses the tripod thread on underside of device, mounting plate included
GENERAL SPECIFICATIONS	
Recommended calibration interval	24 months
Battery	NiMH rechargeable batteries, 4 x AA size (Mignon), 2500 mAh, included
Operation time	20 hours (backlight off, no GPS) 12 hours (permanent backlight, no GPS) 10 hours (GPS receiver connected, no backlight)
Charging time	2 hours
Battery level display	100%, 80%, 60%, 40%, 20%, 10%, low level (< 5%)
Temperature range Operating Non-operating (transport)	 -10 °C to +50 °C -30 °C to +70°C
Humidity	5 to 95%, non condensing ≤29 g/m³ absolute humidity (IEC 60721-3-2 class 7K2)
Size (h x w x d)	45 x 98 x 280 mm (without probe and GPS receiver)
Weight	550 g (without probe and GPS receiver).
Accessories (included)	Hard case, power supply, rechargeable batteries, shoulder strap, tripod (bench top), NBM-TS software, operating manual, certificate of calibration, USB cable interface

ORDERING INFORMATION

NBM-550	Part Number (P/N)
NBM-500 Set 1, Narda Broadband Field Meter Includes: - NBM-550 Basic Unit (2401/01) - Hard case, holds field meter and up to 4 probes (2400/90.06) - Power supply, 9VDC, 100V-240VAC, for all AC line connectors (2259/92.06) - Shoulder strap, 1 m (2244/90.49) - Tripod, bench top, 0.16m, non-conductive (2244/90.32) - Cable, USB interface for NBM-550, 2 m (2400/90.05) - Software, NBM-TS, PC transfer (2400/93.01) - Operating manual NBM-550 - Certificate of calibration *Probes are not included*	**2400/101**
Option set for NBM-550: GPS, Voice Recorder, Conditional Logging Includes: GPS receiver, GPS mounting set, earphone, option key	**2401/40**
PROBES	
Probe EF0391, E-field for NBM, 100 kHz – 3 GHz, isotropic	**2402/01**
Probe EF1891, E-field for NBM, 3 MHz – 18 GHz, isotropic	**2402/02**
Probe EF5091, E-field for NBM, thermocouple, 300 MHz – 50 GHz, isotropic	**2402/03**
Probe EF6091, E-field for NBM, 27 MHz – 60 GHz, isotropic	**2402/04**
Probe HF3061, H-field for NBM, 300 kHz - 30 MHz, isotropic	**2402/05**
Probe HF0191, H-field for NBM, 27 MHz – 1 GHz, isotropic	**2402/06**
Probe EA5091, Shaped E-field, FCC for NBM, 300 kHz - 50 GHz, isotropic	**2402/07**
Probe EB5091, Shaped E-field, IEEE for NBM, 300 kHz - 50 GHz, isotropic	**2402/08**
Probe EC5091, Shaped E-field, SC6 Canada for NBM, 300 kHz - 50 GHz, isotropic	**2402/09**
Probe ED5091, Shaped E-field, ICNIRP for NBM, 300 kHz - 50 GHz, isotropic	**2402/10**
Probe EF5092, E-field for NBM, thermocouple, 300 MHz – 50 GHz, high power, isotropic	**2402/11**
ACCESSORIES	
Test generator, 27 MHz, hand-held	**2244/90.38**
Tripod, non-conductive, 1.65 m with carrying bag	**2244/90.31**
Tripod extension, 0.50 m, non-conductive (for 2244/90.31)	**2244/90.45**
Handle, non-conductive extension, 0.42 m	**2250/92.02**
Cable, coaxial, multi-pin / BNC for NBM-550, external trigger, 2 m	**2400/90.04**
Cable, fiber optic, duplex (1000 µm), RP-02, 2 m	**2260/91.02**
Cable, fiber optic, duplex (1000 µm) ,RP-02, 20 m	**2260/91.03**
Cable, fiber optic, duplex, F-SMA to RP-02, 0.3 m	**2260/91.01**
O/E converter, RS232, RP-02 / DB9	**2260/90.06**
Cable, adapter, USB 2.0 - RS232, 0.8 m	**2260/90.53**

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