

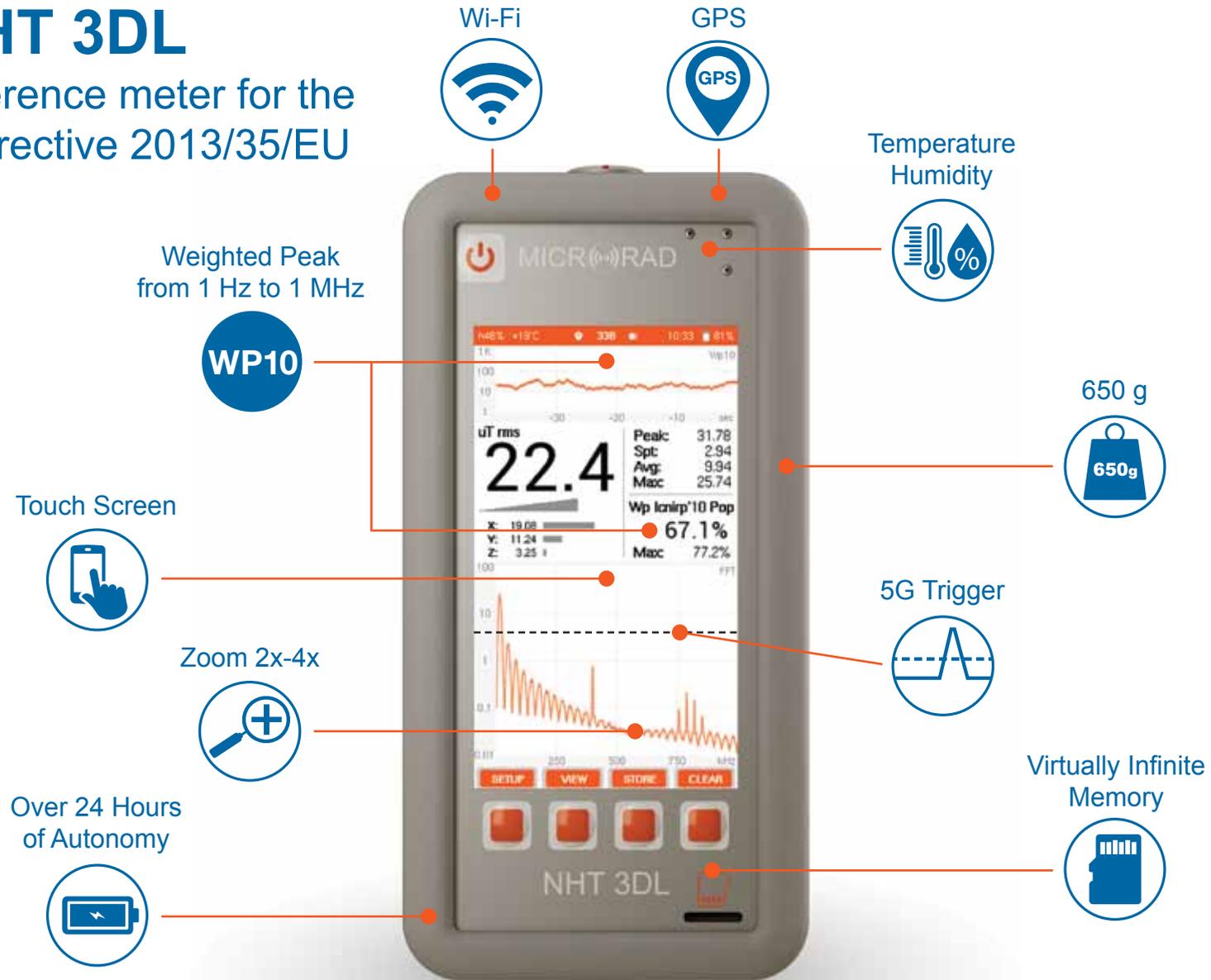
# MICRO RAD

Percipere Aestimare et Inquirere

## ELECTROMAGNETIC SAFETY INSTRUMENTS

### NHT 3DL

The new reference meter for the European Directive 2013/35/EU



# Eight innovations that make NHT 3DL the most advanced instrument on the market

01



## Remote Wi-Fi Connection

In addition to the optical fiber, Microrad offers Wi-Fi remote connection, so there are no cables between the instrument and the operator interface.

Freedom of movement, the instrument can be easily moved around to map the electromagnetic field in three dimensions, or simply fixed to a tripod.

03

WP10

## WP10

Extension of the frequency band of the WP10 weighted peak from the current limit of 400 kHz to 1 MHz with simultaneous display of the electric and magnetic fields directly on the instrument. Frequency domain with 2x/4x zoom function.

05



## Trigger

The introduction of the Trigger function allows you to capture and identify complex signals in the time domain from 0 Hz to 40 GHz. This function is particularly useful in the analysis and identification of 5G signals and Radar signals up to 500 ns.

07



## Zoom

2x/4x zoom function in both time and frequency domains.

02



## Touch Screen

Touch Screen operator interface on the instrument and remotely on Windows pc OS and Android smartphone OS.

Color display, easy navigation of settings, and measurement functions. Call-up of the measurements in graphic and numerical formats.

04



## Virtually Infinite Memory

Memory is no longer limited and it is removable. With the Memory Card it is possible to record large quantities of data with virtually no limits.

06



## Over 24 Hours of Autonomy

Extraordinary energy capacity, NHT 3DL exceeds 24 hours of measurement autonomy with all probes, except for the ER Radar series.

08



## Simultaneous Double View

Simultaneously view the electric and magnetic fields up to 1 MHz directly on the meter display.

# Wireless





## Paradigm and dynamic characteristics of the 5G electromagnetic field

The new 5G paradigm utilizes mobile directional beams (Full Dimensional 3D) with the possibility of directing the radiated lobe of the antenna in a targeted way towards the individual user, even in motion.

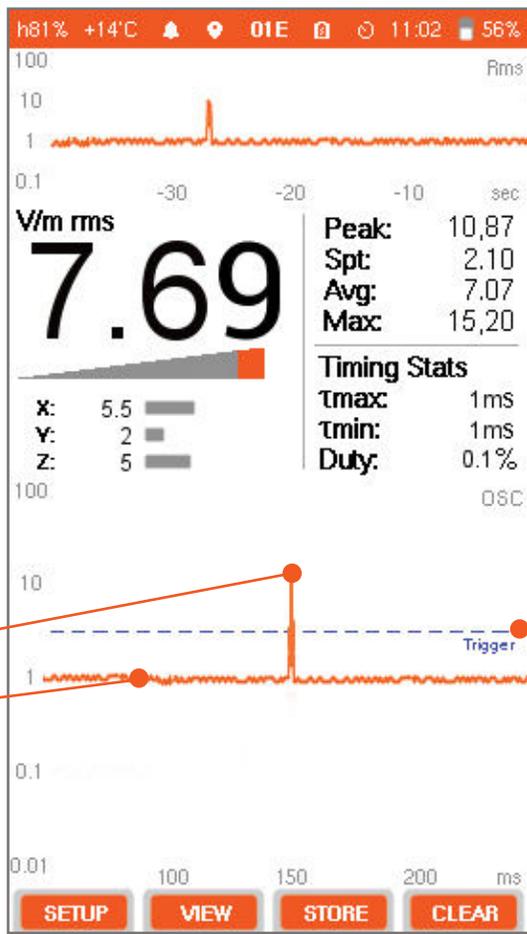
The mobile directional beams, in horizontal plane (azimuth) as well as in vertical plane (elevation), will be emitted from macro-cellular, micro-cellular and pico-cellular sites that use Massive MIMO (Multiple Input Multiple Output) antennas up to 8x8 elements.

The most notable difference, compared to the fourth generation technology, is in the passage from the time-invariant characteristic 4G to the dynamic time-variant 5G radiation diagram.

5G is a system that optimizes the electromagnetic coverage both in spatial and energetic terms, able to modify the dimensional characteristics of the radiation beam both in Beam Sweeping and in Beam Tracking phases.



# 5G



5G  
Timing: 1ms

4G level

5G Trigger



5G signal detection in less than 1 ms

# NHT 3DL is the solution for measuring the electromagnetic field generated by 5G technology

Fifth generation telephony imposes a new paradigm in the world of isotropic measurements of the electromagnetic field.

The transition from static irradiation to dynamic irradiation requires that the electromagnetic field be measured with extremely rapid response times.

The variability of the field at the measurement point depends on the direction of maximum radiation of the beams, and on the degree of alignment with the isotropic sensor.

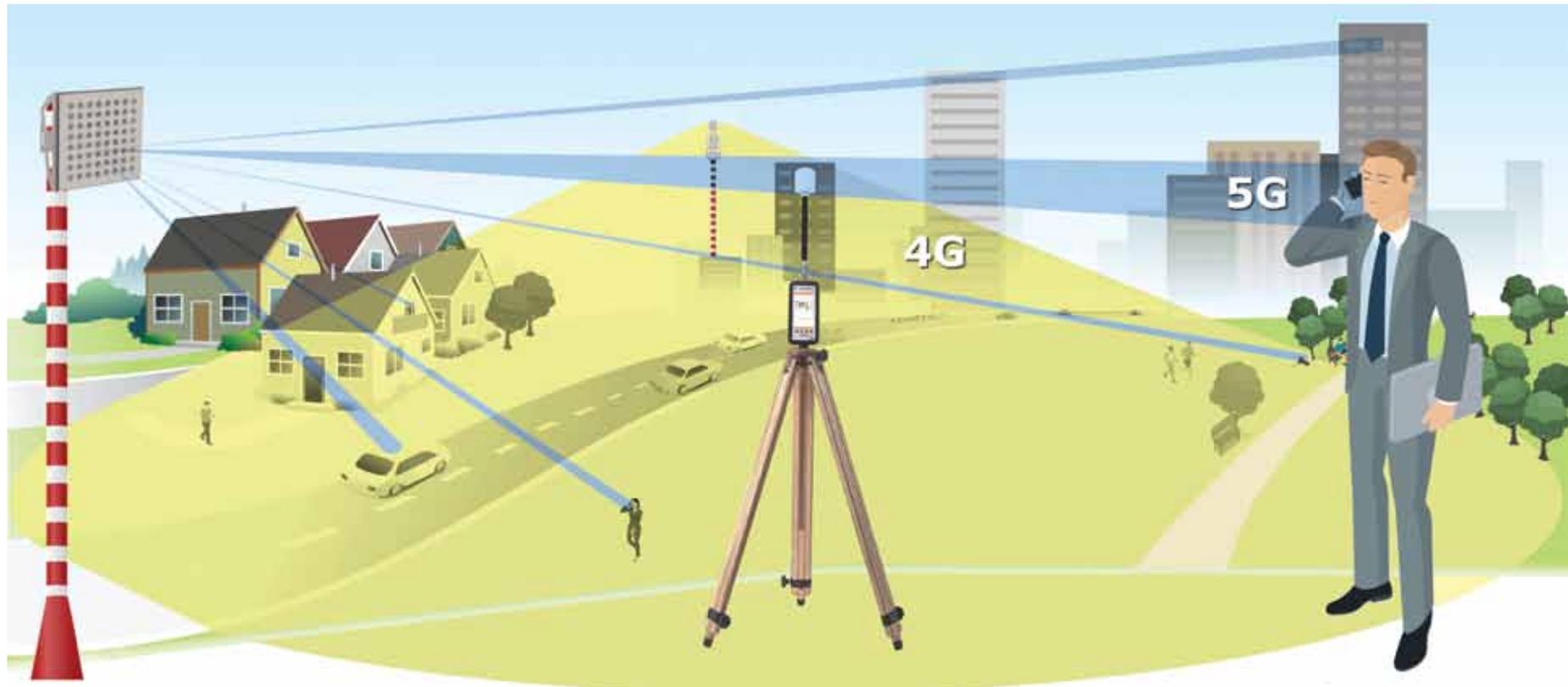
In this scenario the isotropic sensor can be repeatedly illuminated by the Beam Sweeping, whose azimuthal and zenithal angles change rapidly. If the response time of the sensor and meter chain are not adequate these conditions inevitably involve the underestimation of the measurement.

In order to respond to the new measurement paradigm, Microrad has developed the NHT 3DL electromagnetic field analyzer, which is capable of quickly capturing field variations in the time domain.

To facilitate the analysis and measurement of the field, Microrad has introduced the 5G Trigger function capable of capturing events up to 100 microseconds.

Microrad NHT 3DL analyzer is designed to operate also as an area monitor. The operating time is over 24 hours with a minimum acquisition interval of 1 ms. Data are available on removable memory.

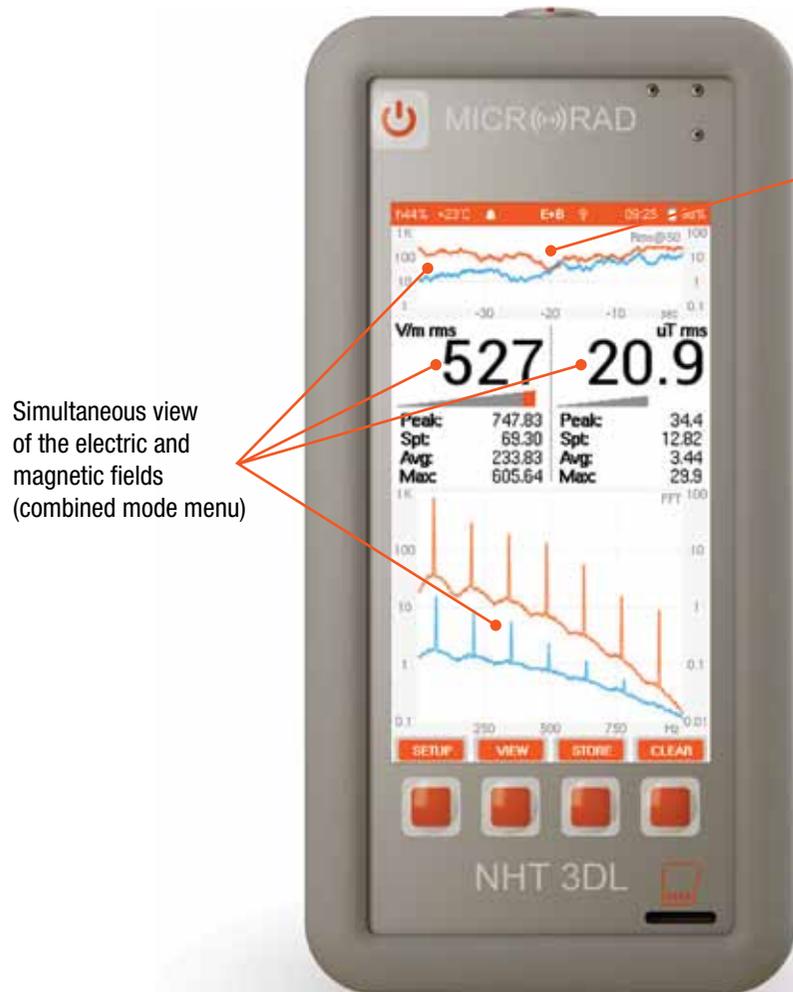
With the IP67 enclosure, outdoor monitoring in all weather conditions can be carried out.



# Spectrum Analyzer, Oscilloscope and Radar Pulse Detector

**Series 33 with electric and magnetic fields selective probe**

**Series 10 with magnetic field probe**



Simultaneous view of the electric and magnetic fields (combined mode menu)

FFT component tracing of electric and magnetic fields (example: frequency 50 Hz)



Instantaneous R.M.S. value

Axial components

Graphic data logger of the WP10 index

Peak, average, maximum values

WP10 weighted index

1 MHz FFT in 4 bands  
1/10/100/1,000 kHz  
1,000 points per band

$$WP_{10} = \left| \sum_{i=1\text{Hz}}^{1\text{MHz}} \frac{A_i}{EL_i} \cos(2\pi f_i t + \theta_i + \varphi_i) \right| \leq 1$$

**Series Ø with RF electric field probe**



Graphic data logger of the instant R.M.S. value

Time statistics

Oscilloscope mode (time domain)

**Series ER with Radar probe**



Graphic data logger with instant peak value

Time statistics

Oscilloscope mode (time domain)

**Fiber optic Option**



**Wi-Fi Option**



**GPS Option**



# Key Features

FREQUENCIES	
Frequency range	Selective mode: DC – 1 MHz Wide Band mode: 100 kHz – 40GHz
OPERATOR INTERFACE	
Graphic display	4.3" TFT, 272 x 480 pixel, 262K color
Backlight	LED, automatic or manual intensity adjustment, readable in sunlight
Input devices	Touch Screen and keypad
MEASUREMENT FUNCTIONS	
Measurement units	V/m, kV/m, A/m, W/m <sup>2</sup> , mW/cm <sup>2</sup> , uW/cm <sup>2</sup> , uT, mT, Gauss, % (depending on the probe)
Display measurement range	From 0,00001 to 999'999 (depending on the probe and on the selected unit)
Refresh period	4 times per second
Result types	r.m.s. instantaneous and peak, isotropic and individual Cartesian components
Time average	r.m.s. value on a moving window selectable from 1 second to 24 hours
Space average	Single acquisitions average value
Max Hold	Display of the r.m.s. instantaneous value and of the maximum weighted index value
Weighted indexes	Weighted peak calculated according to the limit levels set by the guidelines Icnirp'98 for the population, Icnirp'10 for the working environments, and by the directive 2013/35/EU for the lower, upper, localized levels; main international standards
Combined mode	Simultaneous display of electric and magnetic field values (Series 33 probes)
Time measurement	Minimum (up to 500 ns) and maximum pulse width measurement, PRF and duty cycle calculation
GRAPHIC FUNCTIONS	
Data logger	Time diagram of the measured values, selectable among: r.m.s. instantaneous or peak, time average, weighted index, value of a component of the FFT at a certain selectable frequency. The window length can be set from 1 minute to 48 hours
FFT (selective mode)	FFT with 1000 graphic points in the selected span (1/10/100/1000 kHz)
Oscilloscope	High resolution diagram of the signal in the time domain
Marker	Graphic markers with indication of the selected value
Trigger	Programmable threshold for exceeding the instantaneous peak r.m.s. value or the weighted peak index

ACQUISITIONS	
Single/continuous acquisitions	Saving of all the data presented by the instrument, with a settable interval, between one memorization and the next, from 0.25 to 60 seconds
Acquisition memory	Removable memory card; with the provided memory over 1 million measurements in acquisition mode or over 200 seconds in high resolution mode are stored
GENERAL SPECIFICATIONS	
Operation time	> 24 hours (backlight and external accessories off)
Charging time	3.5 hours
Integrated sensors	Humidity (accuracy ±2%) and temperature (accuracy ±0.2°C)
Interface	USB
Operating temperature	-10°C to +50°C
Storage temperature	-20 to +70°C
Humidity	5% to 95%, non-condensing
Size (h x w x d)	170 x 85 x 31 mm (without probe)
Weight	650 g (including battery, without probe)
Country of origin	Italy
ACCESSORIES	
Included accessories	Power charger, protective silicone shell, USB cable, application software and user manual in electronic format, ISO 9001÷2015 Standard IEEE 1309-2013 calibration certificate
Optional accessories	Rigid case, GPS sensor, Wi-Fi module, Fiber optic module, Power Bank module, ISO 17025 accredited calibration certificate

Technical information may be subject to change without notice

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