

ALL-IN-ONE "SPECTRUM ANALYZER + ISOTROPIC TRIAXIAL ANTENNA"

SELECTIVE EMF MEASURING EQUIPMENT FREQUENCY RANGE 100 KHz - 3.6 GHz



THE SMALLEST SELECTIVE EMF MEASURING EQUIPMENT IN THE WORLD



SEP (Selective Electric Isotropic Triaxial Antenna for measuring the electrical component of the electromagnetic field) is an innovative all-in-one solution: Spectrum analyzer + 3-axis antenna with an integrated RF switch.

ALDENA (official worldwide distributor) and MPB (R&D and manufacture) will work together to propose a unique solution in terms of technological innovation and precision in the EMF measurement technique with unique characteristics of antenna isotropy and repeatability of the measurement.



Broadcasting, telecommunication systems and industrial sites



SEP is designed to measure radiation compliance with various national standards for personal safety set by governmental regulatory authorities. Many countries have mandated EMF safety testing, perform building inspections and field surveys to monitor radiation exposure intensities in areas situated near transmission antennas. This antenna allows covering different applications, such as broadcasting, telecommunication and industrial sectors.

The SEP selectively monitors the electric field, allowing automatic accurate measurements, in real time and with minimum effort for the operator, thanks to its small size and weight.



Drone application





FEATURES

ISSUES	TRADITIONAL SYSTEMS	SEP 💙	
USE OF THE COAXIAL FERRITE CABLE	The electrical connection between the antenna and the spectrum analyzer interferes in the frequency response of the antenna. Errors are not properly measurable. The problem cannot be totally solved but can only be reduced through the use of ferrites	There is no coaxial ferrite, because both the antenna and the spectrum analyzer are inside the same sphere	
ISOTROPY ERROR	Between the three dipoles and the "N" connector there is more than one cable (RF cable and switching cable/power cable). This worsens the antenna isotropy	The three dipoles are directly connected to the receiver. This choice was intended to minimize the isotropy error	
POWER SUPPLY	Very short battery life of the spectrum analyzer. In several cases the batteries cannot be replaceable by the operator. Their substitution implies a system shutdown	Batteries rechargeable and replaceable by the operator without having to turn off the system	
CALIBRATION	Three elements to be calibrated: antenna, ferrite cable and analyzer	Only the SEP to be calibrated	
DATA RECORD	It is possible to save data or screenshots	It is possible to save data or screenshots. It is also possible to record the measure- ment sessions and to post process the stored signals	
LIGHTNESS	Weight and dimensions not negligible: antenna, ferrite cable and analyzer	SEP is 370g only.	





SYSTEM DESCRIPTION



The SEP is a spherical system that allows to selectively measure the electric field in a frequency range from 100 kHz to 3.6 GHz.

Its all-in-one setting (spectrum analyzer + isotropic antenna) enables faster and easy to handle measurements.

The signal is analyzed and stored directly in the PC throgh a safe fiber optic or wireless connection.

The operating mode of the SEP is described in a simplified block diagram

Triaxial antennas system

Double superheterodyne receiver





to PC

The signal, received from the three dipoles (X, Y and Z), is selected by a switch that directs it to the input of the receiver; the first stage of the superheterodyne receiver converts the signal to the frequency of the first IF, where it is filtered and amplified, before being re-converted to the frequency of the second IF. The latter makes it downloadable from the analog to the digital converter. The digital signal, as a result of complex processing, is made available to the optical interface, that transfers all the data to the PC.



As well as attention to electronics, same importance was given to the mechanics of the SEP. This instrument provides the possibility to replace the batteries directly on the field, without having to turn off the system.

www.aldena.it

CHECK, CALIBRATION AND ASSISTANCE

In order to guarantee a quality and efficient product, several tests have been carried out for the SEP.

Our technical staff has developed, through the years, an important know-how in the field and works every day to improve products and skills.



ALDENA engineers and technicians offer worldwide assistance and hold training courses to illustrate the functioning of the products.

SEP SOFTWARE

The SEP software allows measurements in real time, offers the possibility to apply filters like the channel power, to display the signal on each axis, to set markers, to adapt the multiple graphic settings for each measurement requirement, to save the chosen configuration.

All the functionalities can be applied also on previously stored tracks, in order to perform a signal post processing.

Standard UMTS measurement on X, Y, Z and isotropic

UMTS Channel Power RMS measurement on X, Y, Z and isotropic

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MPB laboratories are also equipped with an anechoic chamber, a TEM cell and two G-TEM cells, in order to test the products under optimal conditions and to provide them with the calibration certificate.











SOFTWARE SPECIFICATIONS

Linear or semi-logarithmic
X, Y, Z selectable
Marker with value (V/m; W/m²; mW/cm²; mV/m)
Detects the peaks over the selectable limit. Sortable in frequency/amplitude
Root mean square value
Selects the max value of the isotropic trace
With selectable time (from 1 minute to 1 hour)
With selectable time (from 1 minute to 1 hour)
Settable from 1 MHz to 20 MHz
Multiple simultaneous channel powers with value acquisition
Easy screenshots of measures with possibility to take notes
Programmable, customizable. Saved setup can be stored and post processed
Windows 7, Windows 8, Windows 8.1, Windows 10
Minimun 2 GB
Minimun 800 x 600

Subject to change without notice

TECHNICAL SPECIFICATIONS

Frequency range		
Bandi	100 KHz 9.999 MHz	
Band2 Baselution	10 MHZ 3.6 GHZ	
Reference Frequency	1 × 10 5	
Aying year Temporature drift (0°C + 30°C)	5 x 10-6	
	3 × 10-0	
Papago	100 kHz to full enan	
Step number	MIN 50: MAX 12000 (Each Axis)	
Desolution bandwidth		
Range (-3 dB bandwidth)	3 KHz to 1 MHz 1/3 sequence	
Tolerance	5%	
Spectral purity		
SSB phase noise	@ 1 GHz	
@ 3 KHz (carriers)	<-85 dBc/Hz	
@ 30 KHz (carriers)	<-90 dBc/Hz	
@ 300 KHz (carriers)	<-102 dBc/Hz	
Measurement range		
Max level	200 V/m @ 10 MHz 3.6 GHz	
	1 V/m @ 3 KHZ RBW; HW Detector Average	
	0.02 V/m @ 3 KHz RBW: Hw Detector Average	
	0.02 V/m @ 3 KHz BBW: Hw Detector Average	
@ 3 3 6 GHz	0.1 V/m @ 3 KHz BBW: Hw Detector Average	
Damage level	350 V/m @ 10 MHz 3 6 GHz	
	750 V/m < 2 MHz	
Dynamic range @ 200 MHz @ 3 KHz RBW; Hw Detector Average	> 80 dB; 85 dB (Typ)	
Linearity error @ 200 MHz	< +/-0.5 dB @ 0.1 30 V/m (+/- 0.25 dB Typ)	
	< +/-1 dB @ 0.03 100 V/m	
Flatness		
@ 0.5 MHz10 MHz	< +/- 1 dB @ 50V/m	
@ 10 MHz2 GHz	< +/- 1 dB @ 6V/m	
@ 2 GHz3 GHz	< +/- 1.2 dB @ 6V/m	
@ 3 GHz3.6 GHz	< +/- 1.5 dB @ 6V/m	
Isotropy @ 6 V/m; 3 KHz RBW; Hw Detector Average		
500 MHz	< +/-0.5 dB ; < +/-0.3 dB (Typ)	
1000 MHZ	< +/-0.6 dB (Typ)	
2000 MHz	$< \pm /-1.3 \text{ dB} (Typ)$	
Max	0.001 V/m	
Min	0.1 V/m	
Spurious response	$\leq -60 dBc (Typ)$	
Input related	0.1 V/m @ 30 MHz 1.5 GHz	
Residual @ HW Detector Average	0.2 V/m @ 10 MHz 3 GHz	
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Selectable standards	Pre-defined	
Correction factor	Stored in EEPBOM	
Detectors HW	Peak AVG and BMS	
Antonno	Three evid X X and 7 (Identified by a lod)	
Antenna	Positioned with an axis in vertical or all the axes inclined at 54.7 degrees	
1/O Interface		
Ontice ("Connector-Jess" type)	Plastic fiber cable (length may 20 m)	
	Micro LISB connector	
Bluetooth	Fiber/Bluetooth Adapter (distance max 20 m in open air)	
WiFi	WiFi radio link Adapter (distance max 300 m in open air)	
Operating Temperature	0 °C to 50 °C	
Power supply		
Rechargeable and replaceable battery	Li-lon 3.7 V	
Operation time	4 h	
Battery charger	4 slots battery 110240V	
Dimensions	140x140x140 mm	
Weight	370 g	
Recommended calibration interval	24 months	
	Zimonalo	

STANDARD CONFIGURATION

SEP + Plexiglass support Calibration certificate Bag Fiber optic (10 m) USB with PC utility software Operating manual USB cable USB optical converter Cap remover 4 rechargeable batteries Chargers

AVAILABLE OPTIONS

WiFi link connection (Up to 300 m) Bluetooth link connection (Up to 20 m) Fiber optic connection (50 m) Non-magnetic and non-reflective tripod Universal adapter of 1/4" Positioner for H/V polarization Shoulder Bag for the NMR-01 tripod

Mod SEP-WHD Mod SEP-WLD Mod FO-50 Mod NMR-01 Mod NRM-UNI Mod NMR-ARJ Mod NMR-BAG



Mod FO-50

Mod NMR-01

DRONE APPLICATION



Thanks to its light weight and the possibility of using a wireless connection, the SEP can also be used for high altitude measurements with a drone.

This application is enabled through:

- Bluetooth connection with mod. SEP-WLD up to 20m

- WiFi connection with mod. SEP-WHD up to 300m



NMR01

NON-MAGNETIC AND NON-REFLECTIVE TRIPOD FIBERGLASS lighter but stronger than wood and not affected by humidity

The "non-magnetic and non-reflective" tripod NMR-01 allows to place antennas and measuring instruments in every environment with no problem of interference, reflection, magnetic attraction or humidity. The tripod is built with non-metallic material, in order to be usable in anechoic chambers and MRI. The NMR-01 is solid. suitable for all environments, extendable up to 2 m, lightweight and easy to carry. All these features make it a greatly innovative tripod for EMI-EMC, RF and EMF measurement. Compliant with the IEC 61 786 directive, where it is required to perform EMF low frequency measurements not affected by humidity.



NMR-01 is used to place antennas

(log periodic, biconical, horn, rod) and measuring instruments (electromagnetic field meter, low frequency sensor, shielding effectiveness meter) in environments where metal is not allowed.

MRIs, anechoic chambers, industrial sites and outdoor









and it is distributed by:

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