MELOPEE – ADOC 1001

Active Dipole Optically Coupled for EMC tests

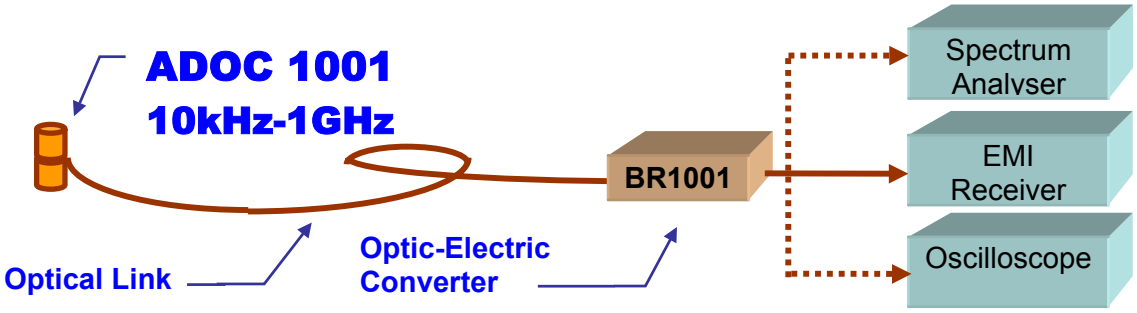
Specially adapted for EMC tests, the ADOC 1001 electric field sensor is a stand-alone and user-friendly active dipole optically coupled. It is designed for free space measurement of sinusoidal or transient electric field in the 10 kHz – 1 GHz bandwidth (range of frequency of GAM-EG-13 and MIL-STD-461 standards).

The full emission spectrum is measured with only one ADOC sensor. Thus the active dipole can replace the 2 or 3 antennas needed before. Moreover the ADOC is much smaller than an antenna (the whole system fits into a suitcase!). Easy to install and to use, it improves the repeatability of tests and reduces the number of manipulation. Thus it makes save money and time and minimizes the maintenance.

The galvanic isolation and the low volume of the sensor minimize distortion of the measured field and allow measurements in limited spaces, inaccessible to conventional antennas.

The system shows a nearly constant frequency response over the all bandwidth which avoids antenna factor corrective calculations. This feature prevents induced errors and ensures faithful restoration of pulse-type signals.

The system includes the active dipole ADOC 1001 (with A NiMH batteries and a charger), a 25 m fiber optic cable, a BR1001 receiver and a transportation suitcase. The ADOC 1001 converts the electric field to a proportional voltage. Then the optical signal is transmitted to the BR1001 optic-electric converter by a single-mode fiber optic. The BR1001 can be linked to a spectrum analyzer, an EMI receiver or an oscilloscope.



Configuration of tests with the ADOC 1001

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Applications

- EMC measurement (radiated emission and immunity levels)
- Emission spectrum caracterisation and control
- Complex antennas diagram measurement
- Field cartography and uniformity measurements
- Radiated interferences analysis
- Shielding effectiveness measurements

Main characteristics (typical data)

Bandwidth	10 kHz - 1 GHz
Flatness within bandwidth	± 3 dB
1 dB compression point	350 mV/m_{RMS}
Sensitivity within 100 KHz	20 $dB\mu V/m_{RMS}$
Antenna factor	AF = 3 dB (m^{-1})
Instantaneous dynamic	> 140 dB within 1 Hz
Optical cable	25 meters (standard)
Output of receiver	50 ohms, 200 mV_{PEAK}
Operating time	> 10 hours
Power supply	4 x AA batteries (LR6)
Size	H 150 mm x Ø 56 mm

The ADOC 1001 compared to classical antennas

	Classical antennas	ADOC 1001
Dimensions	Large (>> λ/2)	Small (≈λ/2 at 1 GHz)
Transmission	Coaxial cable	Optic fiber link
Losses	HF losses in cable	AGC on optical signal
Field distortion	Yes: metallic cables	No: dielectric medium
Spurious signal	Yes: ground loops	No: optical isolation
Complexity	2 or 3 antennas	One sensor only
Antenna factor	Variable	Nearly constant
Sensitivity	Limited by reveiver	20 dBµV/m noise floor
Instantaneous dynamic	Limited by reveiver	80 dB
Operating Time	n.a. (passive)	> 10 hours
Test installation	Tedious and time-consuming	Simple and fast
Maintenance	High cost (2 or 3 antennas)	Low cost (only one small sensor)

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