

+ Measurement Services  
IN-HOUSE FACILITIES AND EXPERTISE





+ **Be on time:**  
benefit from our  
fast measurement  
services!

**MVG** offers pre-compliance and certification measurement services for wireless devices, stand-alone antennas, and integrated antennas in four measurement facilities in the USA, France and Italy. In addition to advanced post-processing services, our measurement facilities offer the following measurement capabilities:

#### **ANTENNA**

Gain directivity, beamwidth, cross polar discrimination, sidelobe levels, 3D radiation pattern, radiation pattern, globalstar registration and certification measurements in any polarization (linear or circular), antenna efficiency, either in transmit or receive mode, advanced post-processing.

#### **SAR**

Specific Absorption Rate, local peak and average SAR (10 g and 1 g) in W/Kg, E-Field (V/m) measurement, body simulating tissue dielectric evaluation (permittivity, conductivity)

#### **OTA**

Total Radiated Power (TRP), Total Isotropic Sensitivity (TIS), Effective Isotropic Radiated Power (EIRP), Effective Isotropic Sensitivity (EIS), GPS sensitivity (TIS, UHIS, PIGS, ICD).

#### **HAC**

M ratings (microphone mode) and T ratings (telecoil mode) with Hearing Aid Compatibility devices



**For antenna measurements, all of our systems are able to perform measurements in record speed, using our patented multi-probe technology (MV-Scan™). Faster measurements enable not only increased throughput, but real-time performance feedback and design tuning. It is not unusual for customers to measure over 30 antennas per day for full 3D, volumetric pattern measurements!**

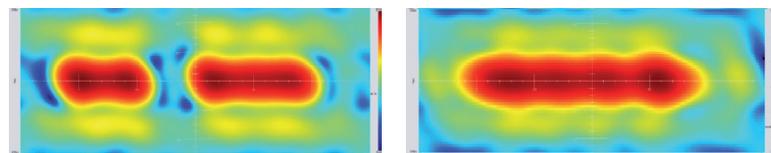
## + **Benefit from full on-site support**

**We offer more than traditional “black box” measurement services**

- If required, our clients are welcome to support the measurement session in order to perform on-site troubleshooting and fine tuning of the antenna.
- Whether present on site or not, our test engineer can help with diagnostic performance evaluation and further post-processing possibilities.
- We measure antennas from all over the world. Our on-site administrative manager will be happy to assist you with a shipment and travel plan.

## + **Get more from the results**

Profit from our expertise in antenna, wireless device measurements and in the measurement systems we develop. Our test engineer will let you know immediately if any particular measurement configuration or post processing would be appropriate. Please consult the section: "Select the results you need" for additional information on our post-processing capabilities.



Example of back propagation post processing with SatMap to quickly identify the source of a defect

# + Choose the right equipment

The choice of the appropriate measurement system is according to measurement specifications and the size of the device that needs to be measured. See the chart below presenting the capabilities of each system at our different locations. Further information on the equipment used in each of these facilities can be found on each product's dedicated page on our website.

	EQUIPMENT	SERVICE OFFICE	APPROXIMATE MAX. DUT SIZE <sup>1</sup>	FREQUENCY RANGE	MEASUREMENT CAPABILITY	ACCREDITATIONS	
						ISO 17025	ISO 9001
<b>Passive, Active or Over The Air (OTA) Measurement</b>	SG 64	- Atlanta, USA	179 cm / 70.47 in	0.4 to 6 GHz	- Gain - Directivity - Beamwidth - Cross polar discrimination - Sidelobe levels - Front to back ratio	✓	✓
	SG 64	- Paris, France	179 cm / 70.47 in	0.4 to 18 GHz		✓	
	SG 24	- Brest, France	134 cm / 52.75 in	0.4 to 6 GHz		✓	
	StarLab	- Atlanta, USA - Paris, France	45 cm / 17.71 in	0.65 to 50 GHz	- 1D, 2D and 3D radiation patterns - Radiation pattern in any polarization (linear or circular) - Antenna efficiency - TRP, TIS, EIRP and EIS - AAS		✓
		- Rome, Italy - Paris, France	45 cm / 17.71 in	0.65 to 18 GHz			✓
<b>Linear or BTS antennas</b>	StarLab BTS	- Paris, France	400 cm / 157.48 in <sup>2</sup>	0.65 to 18 GHz			
		- Rome, Italy	270 cm / 106 in <sup>2</sup>	0.65 to 50 GHz			✓
<b>SAR</b> IEC/IEEE 62209/1528 FCC KDB 865664 D01	ComoSAR	- Brest, France	100 cm / 39.37 in	600 MHz to 6 GHz		- Probe calibrations - SAR dipole & waveguide calibrations - Liquid measurement probe	✓
<b>HAC</b> ANSI C63-19	ComoHAC	- Brest, France	40 cm / 15.75 in	Audio: 300 Hz to 3 kHz RF: 600 MHz to 6 GHz	- Enhanced HAC testing - E-Field probe calibrations - Tcoil probe calibrations - HAC dipole calibration - Telephone magnetic field simulator calibration	✓	✓

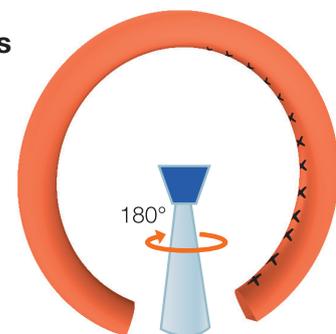
✓ Facility/ Measurements are certified

(1) Max. DUT size depends on design and frequency range. Please consult us for more details.  
 (2) Maximum DUT length (maximum DUT width: 45 cm)



## Antenna measurement: the advantages of our SG and StarLab systems

Our systems can perform cylindrical or spherical measurements, based on our probe array technology. For passive (cable-fed) measurements, post-processing options include back projection and holography, allowing the determination of the field values at the aperture or on a particular plane or radius. As opposed to traditional single-probe mechanical scanning, our technology is based on electronic scanning of an array of probes. This technology is faster, reduces mechanical movements, simplifies mounting, reduces setup time, and improves accuracy and repeatability.



Only azimuth rotation required for a full 3D measurement

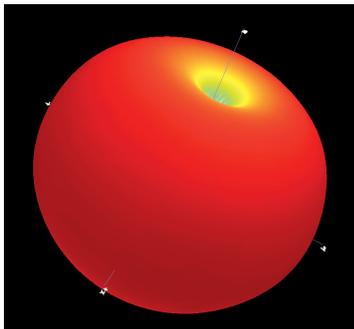
## Faster measurement means faster service and higher throughput

TYPICAL MEASUREMENT TIME		
<b>Mobile phone/OTA</b>	TIS Measurement*	Less than 5 min
<b>179 cm diameter antenna</b>	3D pattern at 6 GHz**	Less than 3 min
<b>18 cm diameter antenna</b>	3D pattern at 18 GHz**	± 1 min
<b>Mobile phone/SAR</b>	1 position/ 1 frequency/ 1 channel	± 1 min 30 s

\* Typical TIS based on Rx level, 1 channel, 30° sampling, 1 time each probe with a SG 64. Measurement time depends on protocol. CTIA comparable measurements.  
 \*\* For 11 frequencies, no oversampling, no averaging with a SG 64

## + Select the results you need

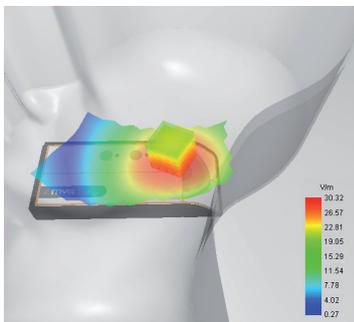
The exported data is available in both ASCII (CSV form) and freeware 3D viewer formats, by default. An automated HTML report containing summary plots allows for a quick overview of the measurement results via a web browser. Specific report content or formats are available when required (such as CTIA certification report) or upon request.



3D view of omnidirectional positioning antenna



ComoSAR measurement system



3D view of SAR measurement for a handset

ANTENNA MEASUREMENT		
STANDARD DATA	ASCII data	Plots
Antenna efficiency [dB or %] versus frequency	✓	✓
Antenna gain and antenna peak gain [dBi] versus frequency and as a function of 3D pattern angle	✓	✓
Principal plane far-field radiation patterns for multiple frequencies as a function of angle	✓	✓
1D, 2D and 3D radiation patterns	✓	✓
Additional special cuts	✓	✓
ADVANCED POST-PROCESSING	ASCII data	Plots
Linear, slant or circular polarizations	✓	✓
Cross-pol discrimination	✓	✓
Beamwidth	✓	✓
Front to back ratio	✓	✓
Sidelobe levels	✓	✓
Active CW measurement	✓	✓
Diversity measurement	✓	✓
Diversity correlation	✓	✓
Beamforming	✓	✓
Cylindrical back propagation/ Holography	✓	✓
Phase center identification	✓	✓
S11	✓	✓
OTA MEASUREMENT for 2G to 5G, Wi-Fi, Bluetooth or NB-IoT protocols*		
STANDARD DATA	ASCII data	Plots
Effective isotropic radiated power	✓	✓
Effective isotropic radiated sensitivity	✓	✓
Upper hemisphere partial radiated power	✓	✓
Upper hemisphere partial isotropic sensitivity	✓	✓
Near-horizon partial radiated power	✓	✓
Near-horizon partial isotropic sensitivity	✓	✓
Intermediate channel	✓	✓
SAR MEASUREMENT		
STANDARD DATA	ASCII data	3D View
SAR mapping	✓	✓
ADVANCED POST-PROCESSING	ASCII data	3D View
Local SAR value [W/kg]	✓	✓
Average SAR value over 1 g and 10 g	✓	✓
HAC MEASUREMENT		
STANDARD DATA	ASCII data	2D Plots
Magnetic signal strength axial and radial calculation	✓	✓
Signal quality calculation	✓	✓
Frequency response curved data	✓	✓
Max. electric and magnetic values	✓	✓

\* The list of compatible protocols is evolving on an on-going basis. Please contact us for updated information.

## + 4 steps to keep it short

- 1 Fill out the short form on our website by indicating your interest in "Services" <http://www.mvg-world.com/contact-us> or contact one of our offices listed below.
- 2 You will be contacted for details and arrangements, then you will receive a financial proposal stipulating the measurement duration, the closest possible date, time and location.
- 3 An email notification will be sent to confirm reception of the equipment and delivery time of the results.
- 4 A shipping notification is sent as soon as the equipment is shipped back along with a digital record of the measurement results.



### YOUR DEVICE AND INFORMATION ARE SECURE WITH US!

Items are stored in a dedicated, secured area, and classified by customer and company name.

Certification 2246.02 for dipole calibration and electrical: The scope of accreditation is location-dependent and does not include the entire scope of MVG activities. The actual scope of accreditation is available on A2LA's website.



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For more information:

<https://mvg.link/service>

Contact us:

[www.mvg-world.com/en/contact](http://www.mvg-world.com/en/contact)

