StarBot 4300

Microwave Vision Group

Similar to the StarBot 4200, the StarBot 4300 is a portable test system designed for antenna testing of aircrafts or vehicles in-situ. Improving upon its predecessor, in addition to the high measurement flexibility for radar testing in the nose of an aircraft, its full robotic system and 6 positioning axes enable it to measure antennas anywhere on an aircraft (or vehicle): top, bottom, nose, tail, wings, etc. The StarBot 4300 is designed to characterize antennas without displacing the device under test and without enclosure in an anechoic chamber. It is the ideal spherical near-field antenna test system for extra large devices.

- **High measurement flexibility**
- **In-situ measurements of extra large devices**

SOLUTION FOR

- **Aircraft/ Vehicle Antenna Characterization**

Main features

Technology

- Near-field / Spherical

Measurement capabilities

- On-board antenna testing in its operational environment
- Multi-beam, multi-port, multi-frequency dual polarized complex measurements
- CW or pulsed measurements for radar testing
- Indoor/Outdoor measurements
- Gain
- Directivity
- Beamwidth
- Cross polar discrimination
- Sidelobe levels
- 3D radiation pattern in any polarization (linear or circular)
- Antenna efficiency
- Beam pointing properties

Frequency bands

- 500 MHz - 18 GHz

Probe array diameter

- 6 m

Typical dynamic range

- 0.5 - 6.0 GHz: 50 dB
- 0.6 - 18 GHz: 45 dB

Available movements

- Robotized trolley and 6 positioning axes

System configurations

Software

Measurement control, data acquisition and post processing

- ■ SatEnv
- □ MiDAS**
- □ 959 Spectrum (North America only)

Near-field/far-field transform

- ■ SatMap

Advanced post processing

- □ SatSIM
- □ Insight

Equipment

- ■ Amplification unit
- ■ Mixer unit
- ■ N-PAC
- ■ Primary synthesizer
- ■ Auxiliary synthesizer
- ■ Transfer switching unit
- ■ Power and control unit
- ■ Probe array power supply
- ■ Heavy DUT positioner
- ■ Elevation positioner for gantry arm
- ■ Positioner controller
- ■ E-Stop unit
- ■ Local control unit
- ■ Real time controller
- ■ Control Interface Unit
- ■ Uninterruptible power supply
- ■ Instrumentation rack
- ■ Ethernet switch
- □ AUT port switch

Add-ons

- ■ Removable mechanical interface supporting laser pointer and laser telemeter
- ■ Hardware limit, limit switches and contact detectors for security
- ■ Flashing light and siren
- □ Shielded anechoic chamber*
- □ Reference antennas (horns, sleeve dipoles, loops)

Accessories

- ■ PC
- ■ Instrumentation rack

Services

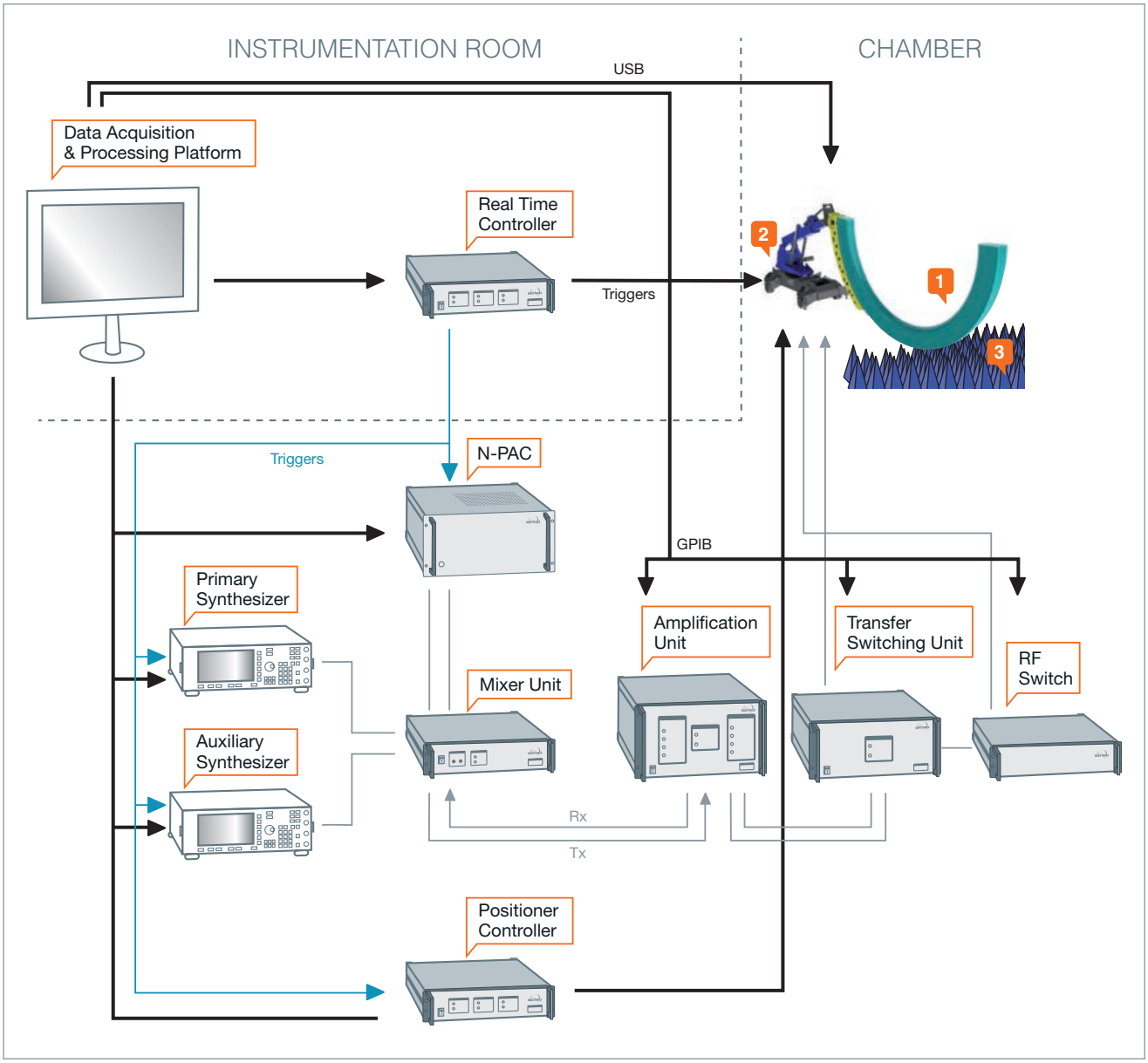
- ■ Installation and calibration
- ■ Training
- ■ Project management
- ■ Warranty
- □ Post warranty service plans

* See MVG-EMC System catalogs for more information

** See ORBIT/FR's catalogs for more information

■ Included □ Optional ○ Required

System overview



StarBot 4300 is composed of a mechanical scanner paired with our patented MV-Scan™ probe array of 126 dual polarized probes. The probes are distributed over half an arch of 6m in diameter. The 6 axes enable flexible positioning so as to access antennas placed anywhere on an aircraft. The system is driven by a full remote control robotic system to facilitate displacements and positioning.

One spherical dimension is measured by an electronic scanning of the probes at a very high speed. The other dimension is obtained by a simple rotation of the arch around the first to last probe axis. The goniometric axis allows for oversampling. The aircraft itself is the only limitation to completing the 360°. Measurements can be performed in CW or pulsed mode thanks to a network analyser.

Standard system components

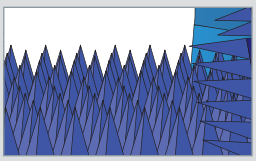
1 Arch

- Different arch sizes available
- A choice of probes available according to the frequency range

2 Positioner

- An innovative 6 axis portable robot offering versatile positioning of a probe array

ORBIT/FR positioning equipment catalog



3 Absorbers and anechoic chambers

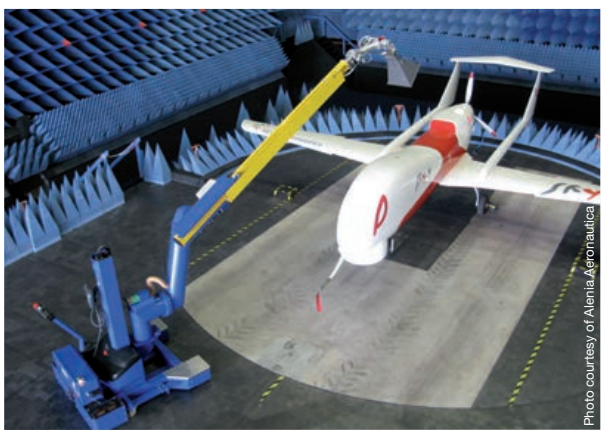
- A selection of standard, adapted and specialty absorbers
- Anechoic chambers or outdoor radomes with integrated design, production, installation and testing services

AEMI absorber catalog

Antennas

- A choice of reference antennas (horns, dipoles and loops) and a single probe positioner.

MVG antenna catalog



A single probe positioner

System specifications

Measurement time for 20 frequencies*	< 5 min
Typical dynamic range	45 - 50 dB

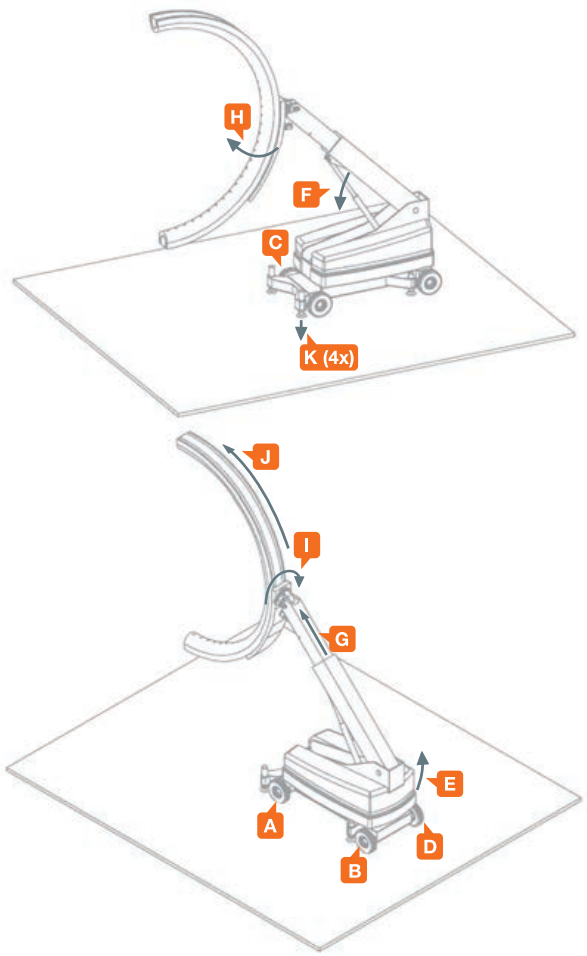
	10 dBi AUT	20 dBi AUT	30 dBi AUT
PEAK GAIN ACCURACY (dB)			
0.07 - 0.3 GHz	-	-	-
0.3 - 0.4 GHz	-	-	-
0.5 - 0.8 GHz	± 1.2 dB	± 1.0 dB	± 0.7 dB
0.8 - 1.0 GHz	± 0.8 dB	± 0.7 dB	± 0.7 dB
1.0 - 6.0 GHz	± 0.8 dB	± 0.7 dB	± 0.7 dB
6.0 - 18.0 GHz	± 1.1 dB	± 0.9 dB	± 0.8 dB
PEAK GAIN REPEATABILITY (dB)			
-10 dB sidelobes accuracy (dB)			
0.5 - 0.8 GHz	± 1.5 dB	± 0.9 dB	± 0.6 dB
0.8 - 1.0 GHz	± 1.3 dB	± 0.8 dB	± 0.6 dB
1.0 - 6.0 GHz	± 1.2 dB	± 0.8 dB	± 0.6 dB
6.0 - 16.0 GHz	± 1.5 dB	± 1.1 dB	± 0.9 dB
16.0 - 18.0 GHz	± 1.5 dB	± 1.1 dB	± 0.9 dB
-20 dB sidelobes accuracy (dB)			
0.5 - 0.8 GHz	-	± 1.5 dB	± 0.8 dB
0.8 - 1.0 GHz	-	± 1.3 dB	± 0.8 dB
1.0 - 6.0 GHz	-	± 1.2 dB	± 0.8 dB
6.0 - 16.0 GHz	-	± 2.2 dB	± 1.8 dB
16.0 - 18.0 GHz	-	± 2.2 dB	± 1.8 dB

* • Hemispherical measurement surface (over 180° in Azimuth - typical for antenna measurement around an aircraft)
• No oversampling
• CW mode: acquisition is asynchronous of RF signal. For pulsed mode with acquisition synchronous of RF pulse signal, the measurement time will be linked to the duty cycle of RF pulse signal

Mechanical characteristics & RF equipment characteristics

Angular coverage	182.95°
Probe array diameter	6 m
Frequency range	500 MHz - 18 GHz
Measurement capability	CW, pulsed mode
Available movement	6 axis portable robot (see figure on next page).
ANGLE BETWEEN PROBES	
500 MHz - 6 GHz	2.95°
6 GHz - 18 GHz	2.95°
NUMBER OF PROBES	
500 MHz - 6 GHz	63 + 1 ref. channel
6 GHz - 18 GHz	63 + 1 ref. channel

StarBot 4300: a robot scanner offering high measurement flexibility



A B C D Motorized wheels - direction and rotation

E Azimuth Rotation

F Arm Elevation

G Arm Extension

H Angular correction of vertical axis

I Spherical rotation of the arch

J Goniometric axis rotation

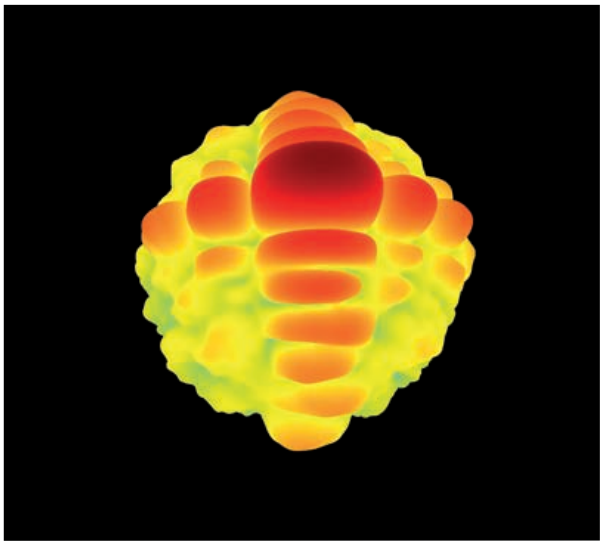
K Stabilization

The overall system is composed of:

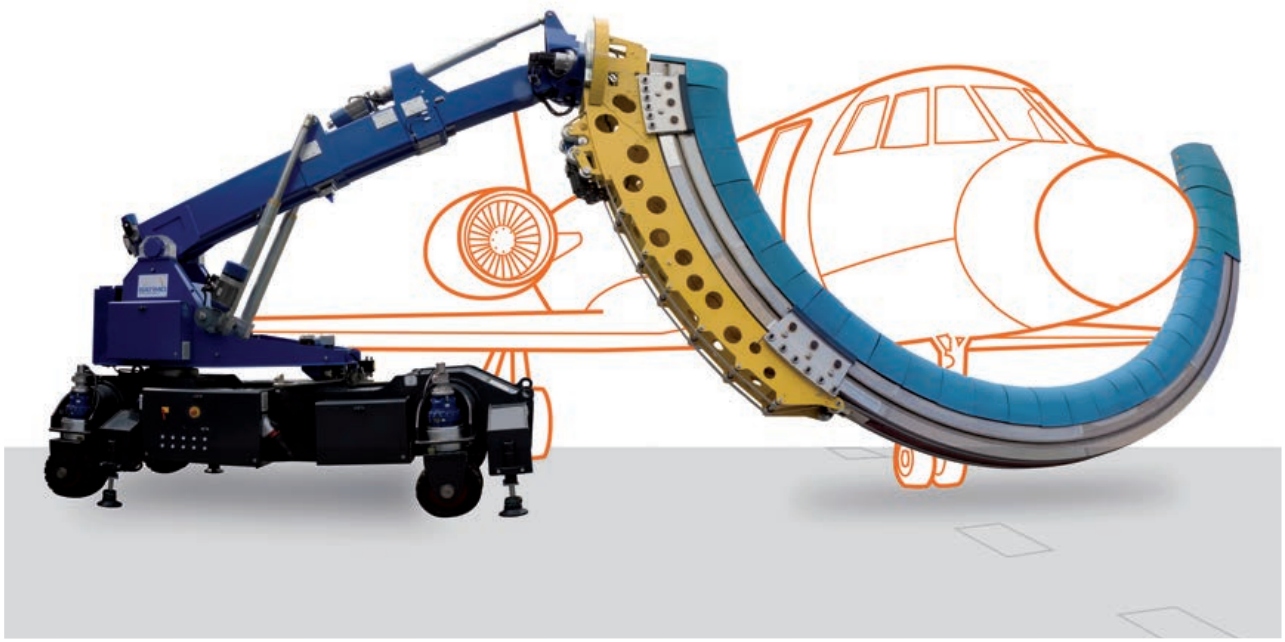
The base trolley
The base trolley moves the scanner to the measurement area. It is mounted on four independent, directional wheels (A, B, C, D). Once in position, four jacks (K) lock the trolley to the ground.

The telescopic arm
The telescopic arm holds the spherical probe array and provides four independent movements. An azimuth table (E) ensures the rotation of the upper part of the trolley. An arm (G) lifts the probe array which can be elevated with an electrical actuator. Finally, a tilt axis positions the probe array in place.

The measurement scanner
The measurement scanner is composed of a sturdy arch mounted on a sliding structure (J) that allows the positioning of the probe array. A rotation axis (I) rotates the array 720° so that a partial sphere surrounding the antenna under test can be measured.



3D radiation pattern of a radar



StarBot 4300 with the arch in vertical position

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