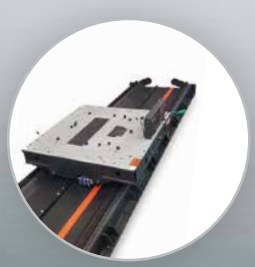
POSITIONERS & CONTROLLERS

OVERVIEW



Microwave Vision Group

TABLE OF CONTENTS

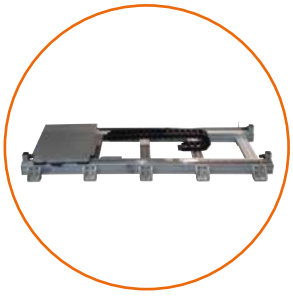
+ Introduction

This document encompasses a short, practical overview of MVG's positioning system product line. Inside you will find guidelines, configuration examples, brief descriptions of each product group, and a matrix of models for you to quickly locate what you may be looking for to complete or update your current antenna measurement system.

Conscious of our part in protecting the planet, we have chosen to provide datasheets for each product, with specifications and details, uniquely on line. Easy access to these online datasheets has been provided via the QR codes in the quickguides of this Overview.
We encourage you to contact our Sales team to discuss further how to determine the best match that meets your specific requirements. Our mission: to offer you the broadest choice of EMC testing and antenna measurement solutions.

FROM ORBIT/FR TO MVG

With over 35 years in the design and manufacture of advanced antenna positioning subsystems, MVG-Orbit/FR now contributes its expertise to the Microwave Vision Group (MVG), extending its know-how and participating in a full range of antenna test and measurement solutions. Today, as part of MVG, it continues to develop and innovate to meet the testing demands of an increasingly wireless and electronic-driven world. From the legacy of the original positioning systems to our new low-profile, compact series, MVG-Orbit/FR continues to present quality engineered products with the most advanced technology to ensure high-grade, accurate mechanical motion, rotation, and velocity control. This broad portfolio provides customers with turn-key solutions for a variety of applications in the aerospace and defense, telecommunications, and automotive industries, as well as in antenna R&D.



GLOSSARY

RF	Radio Frequency
AZ	Azimuth
EL	Elevation
QZ	Quiet Zone
AUT	Antenna Under Test
DUT	Device Under Test
INC	Incremental encoder
ABS	Absolute encoder
Tx	Transmission mode
Rx	Reception mode
PCU	Power Control Unit
LCU	Local Control Unit
LAN	Local Area Network
GPIB	General Purpose Interface Bus
CAN	Controller Area Network
FF	Far-field
NF	Near-field
PNF	Planar Near Field

Which positioning subsystem for which configuration?

Positioners, an integral part of the system

From the device to be tested to the real-estate available, several factors are to be considered when selecting equipment for a test facility configuration. The choice of the positioning subsystem to install is dependent upon these as a result. Antenna test systems are designed to perform direct measurements in far-field, direct far-field in compact range, or measurements in spherical, cylindrical, or planar near-field, possibly in combination. The directivity of the antenna to be tested determines the geometry of the measurement. Based on these geometries several configurations are feasible, however the characteristics of the DUT, the available real-estate, and measurement requirements are non-negligible determinants. Consequently, the selection of the appropriate positioning subsystem is dependent upon all of the above.

① Define your requirements → ② Conceptualize your configuration → ③ Select the subsystems

① Define your requirements

Device under test (DUT) mechanical characteristics

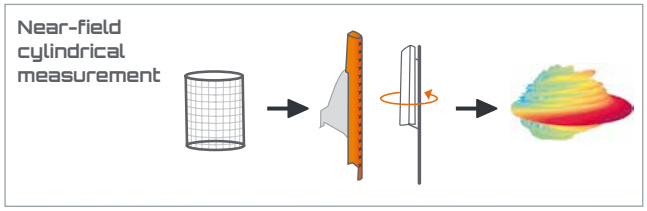
- Dimensions
- Weight
- Center of Gravity (CG)-including fixture
- Can the DUT be moved? Can it be inclined? Is the DUT self-sustaining?

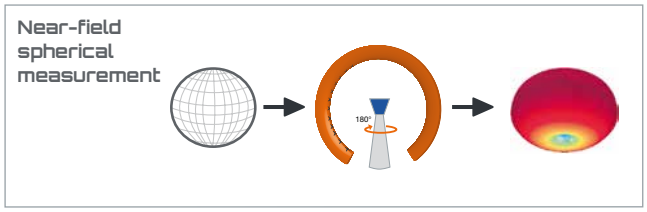
Type of measurement to be made

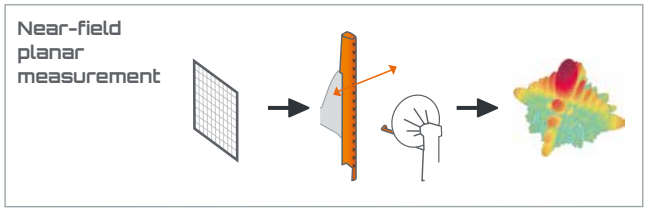
- Radiation pattern : omni, toroid, narrow beam, multi-beam
- Active or passive
- Frequency range
- 2D or 3D patterns, or principle cuts
- Required antenna parameter measurement accuracy: antenna pattern, beam peak, side lobe levels, gain, directivity, efficiency

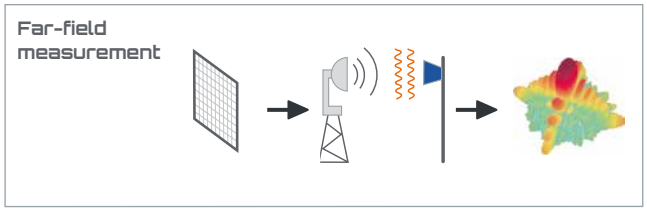
Antenna test technique to be applied

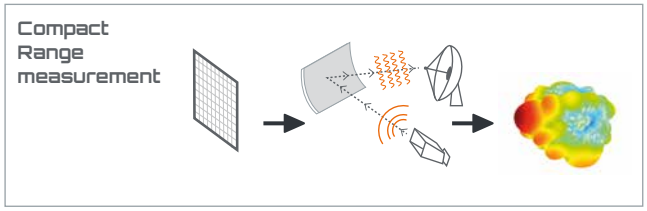
- Planar Near-Field
- Spherical Near-Field
- Cylindrical Near-Field
- Hybrid (combined)
- Compact Range
- Indoor/Outdoor Far-Field
- RCS
- Radome Measurements

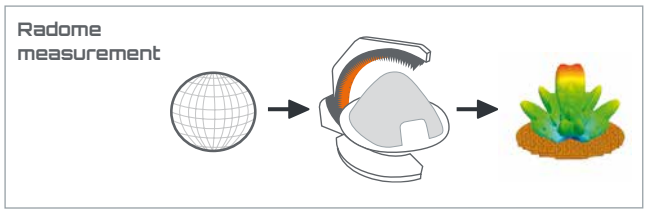












Pre-conditions/pre-requisites

Available real-estate, available budget, schedule, available hardware (PNA, positioners), building requirements.

Computing

Control room computer hardware & software - acquisition & analysis, post-processing requirements.

Positioning subsystem hardware selection

a) Compact Range hardware: Reflector dimensions
b) Positioning system hardware: AZ, AZ/EL, EL/AZ, AZ/EL/AZ, roll, polarization, model tower, combined rotary & linear positioning system
c) XY scanner hardware: scanner dimensions

To suitably support the DUT and enable measurements at all required angles with accurate characterization, the positioner selection should take into account:

- Vertical load
- Applied torque (delivered torque)
- Withstand torque
- Required angular/linear accuracy
- Indoor or outdoor application
- Required travel of each axis
- Measurement speed
- Positioning system position feedback type: absolute/incremental/synchro

Additional requirements in positioning systems: DUT alignment (PNF), feed positioners (compact range), transmit tower (FF), initialization axes, alignment positioning system.

Motion control selection

Motion controller selection considerations: One axis at a time / simultaneous, multi-axis motion, number of axes to be controlled, required power to drive the positioner, position feedback type (incremental, absolute, or synchro encoder).

RF antenna subsystem

Frequency range functionality: Tx, Rx, DUT ports, antenna calibration, probes, feed carousel, system power levels, RF cables, adapters, etc.

Chamber

Dimensions, required parts: doors, power, attenuvents, fire protection, mounting devices, absorbing materials.

Accessories

Remote control units, alignment lasers, infra-red cameras, DUT installation lifts, maintenance program.

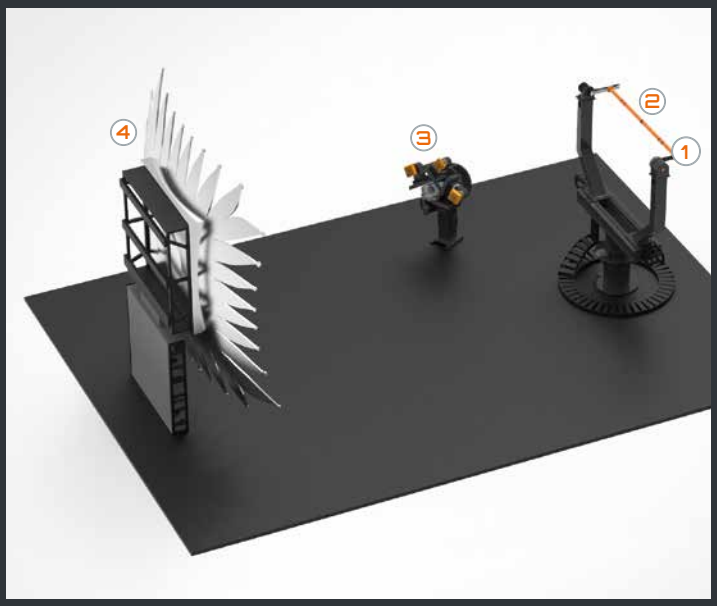
System characterization criteria

Subsystem level test plan and required results.

② Conceptualize a configuration

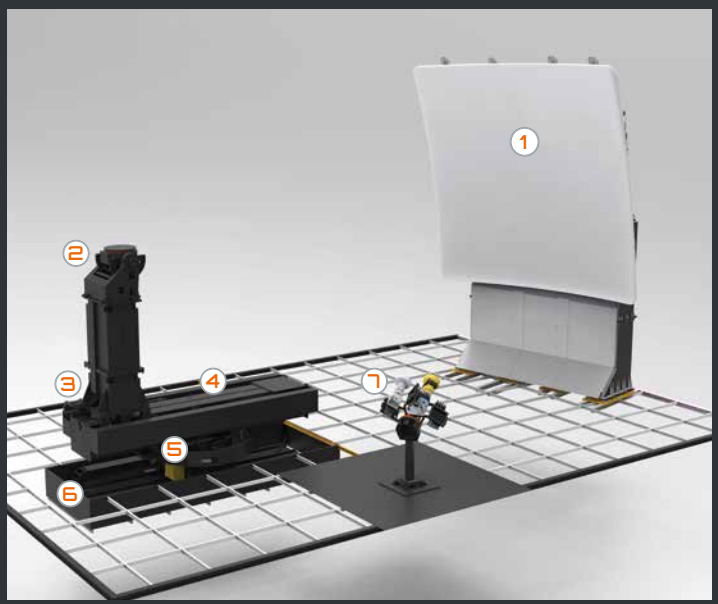
Once requirements have been defined, the next step is conceptualization. Below are examples of a variety of possible positioner subsystems in different test configurations. This list is non-exhaustive. MVG provides quality, standard positioning subsystems, yet is also expert in customized solutions to meet your specific test requirements.

EXAMPLE OF COMPACT RANGE MEASUREMENT CONFIGURATION - 1



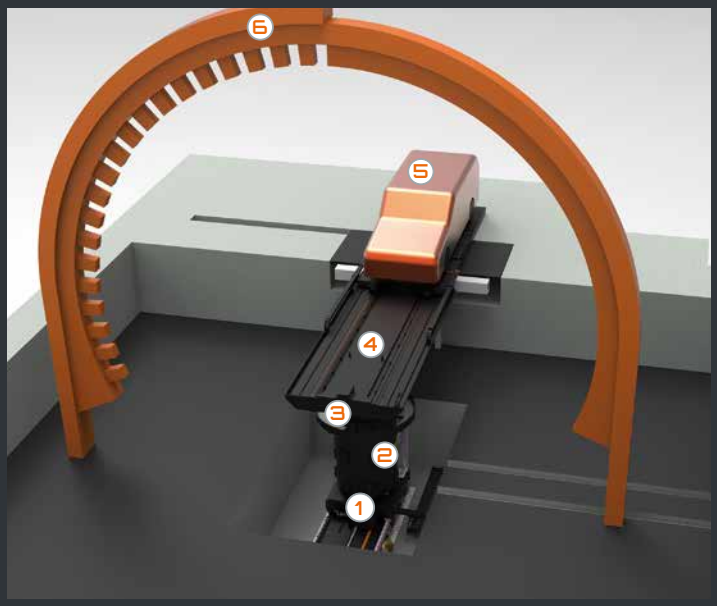
1. Model tower - 2 Pol positioners, 1 AZ positioner
2. DUT
3. Feed source
4. Serrated-edge reflector

EXAMPLE OF COMPACT RANGE MEASUREMENT CONFIGURATION - 2



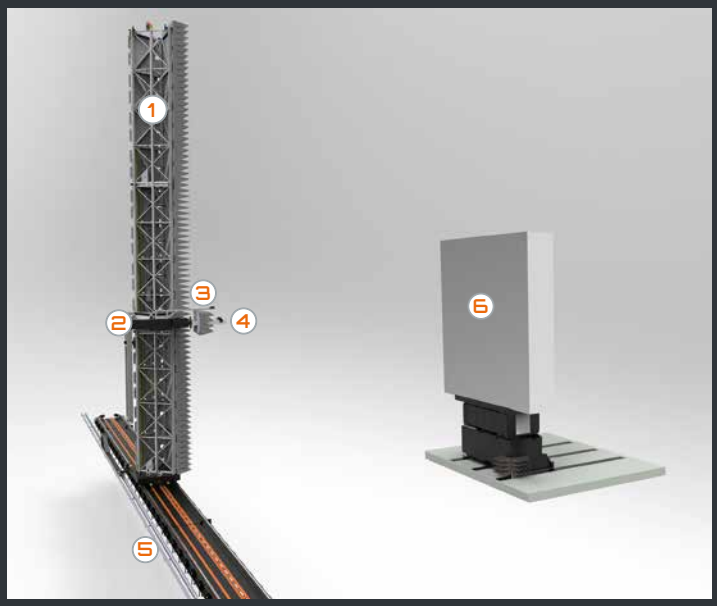
1. Rolled edge reflector
2. AZ/EL medium duty positioner
3. AZ/EL Heavy duty positioner
4. Heavy duty upper slide
5. Azimuth heavy duty positioner
6. Heavy duty floor slide
7. Source feed

EXAMPLE OF NEAR-FIELD MEASUREMENT CONFIGURATION - 1



1. Heavy duty floor slide
2. Base riser
3. AZ heavy-duty positioner
4. Heavy duty upper slide
5. DUT
6. Multi-probe scanner

EXAMPLE OF NEAR-FIELD MEASUREMENT CONFIGURATION - 2

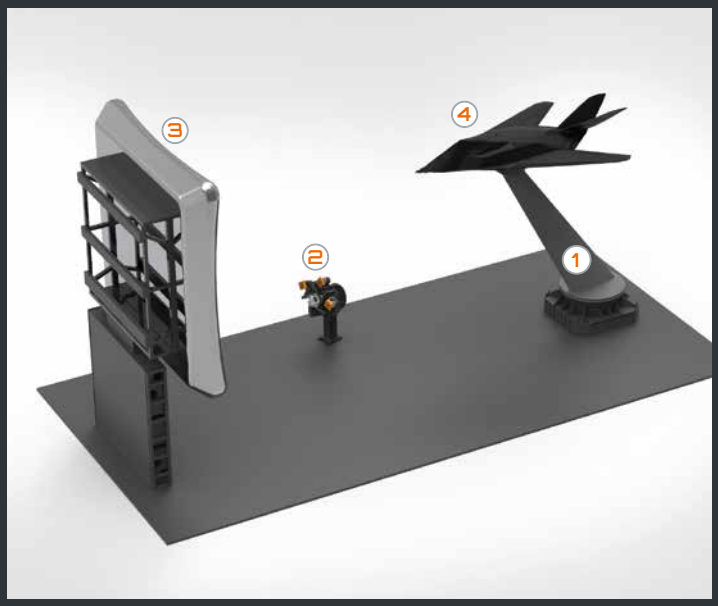


1. Y-axis positioner (scanner)
2. Z-axis positioner
3. Roll unit
4. Measurement probe
5. X-axis positioner (floor slide)
6. DUT with alignment system

EXAMPLE OF RADOME MEASUREMENT CONFIGURATION

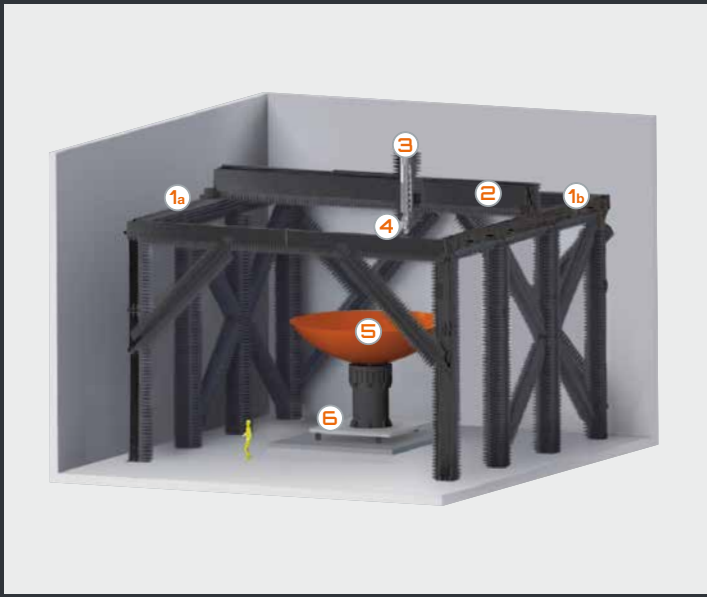
1. 2 polarization positioners
2. Base riser
3. AZ heavy duty positioner
4. DUT (Radome)

EXAMPLE OF RCS MEASUREMENT CONFIGURATION



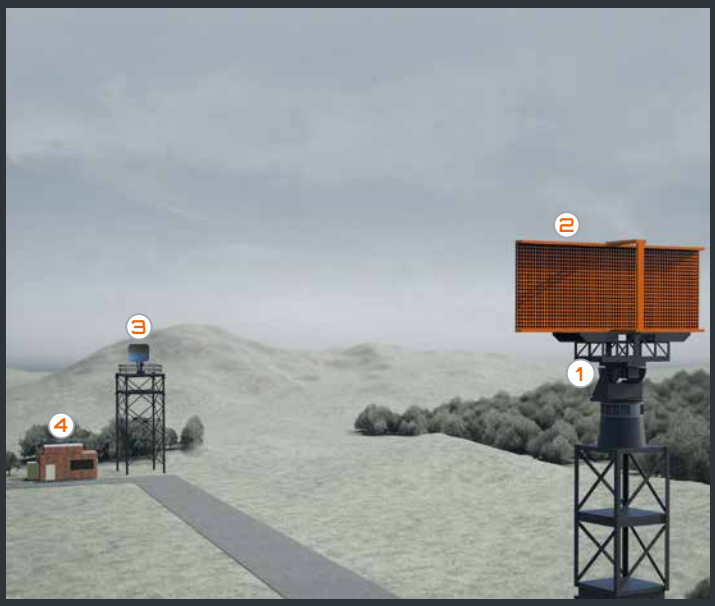
1. Pylon + head
2. Measurement feed
3. Rolled-edge reflector
4. DUT

EXAMPLE OF NEAR-FIELD MEASUREMENT CONFIGURATION - 3



- 1a 1b X-axis positioner (scanner)
- 2 Y-axis positioner (scanner)
- 3 Z-roll unit
- 4 Measurement probe
- 5 DUT
- 6 Multi-axis DUT positioner

EXAMPLE OF FAR-FIELD MEASUREMENT CONFIGURATION

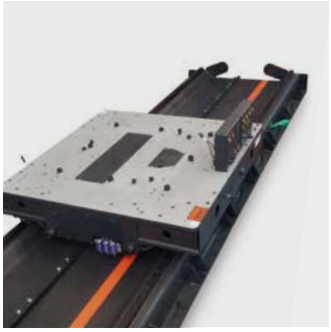


- 1 AZ/EL/AZ positioner
- 2 DUT
- 3 Measurement probe
- 4 Control room

③ Select a positioning subsystem

- Rotary Positioners
- Linear Floor Slides
- Model Towers
- Controllers

Once requirements are defined, and you have a conceptualized configuration, the next step is the selection of subsystems and components to be used. In the following pages, you'll find an overview of MVG positioning subsystems to guide you in your configuration & project planning.



MVG advanced positioning systems

MVG positioning systems provide the highest accuracy in motion and controllable velocity for the positioning of devices under test (DUT). Their robust and straight-forward design ensures maximum safety and reliability in operation. Fitted with DC motors, gear reducers, and high precision encoders or synchros, the systems continuously yield outstanding size and weight/performance ratios.

MVG's advanced electromechanical technology brings additional precision to our positioning systems. Controllers with on-the-fly real-time discrete table triggering capabilities, and real time on-the-fly position correction, work with various types of feedback. Correction table service, provided by MV-Cor™, MVG patented technology, can increase accuracy by integrating geometrical error correction techniques into the systems.

Countless positioner and slide combinations are configurable for your specific test requirements.

THE POSITIONER'S ROLE IN ANTENNA MEASUREMENT

As an example, considering a spherical measurement configuration, a practical way to obtain the radiation pattern is to record the signal received by the AUT through its motion in spherical coordinates (Θ,φ) while keeping the probe antenna stationary. Two orthogonal rotational axes are required in order to provide the relative motion of the AUT with respect to the source antenna. Figure1 illustrates these axes, OA (Θ rotational axis), and OZ (φ rotational axis). The AUT is located at the origin, while the source antenna is located at point S, with OS being the line of sight between them. Note that both OS and OZ are always perpendicular to OA. Moreover, to minimize radiation pattern measurement errors, the phase center of the antenna should coincide with the axes-crossing point of the positioner.

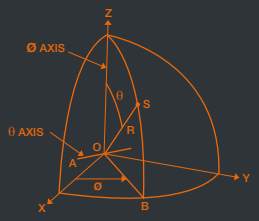


Figure 1: The two orthogonal rotation axes required for a spherical-coordinate positioning system

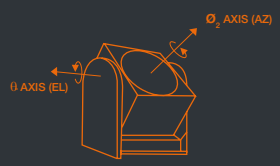


Figure 2.1: The three basic spherical-coordinate positioners (a) Azimuth-over-elevation positioner

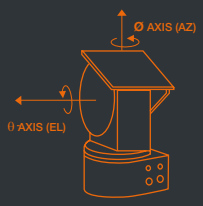


Figure 2.2: (b) Elevation-over-azimuth positioner

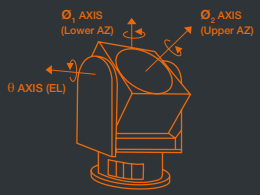


Figure 2.3: (c) Azimuth-over-elevation-over-azimuth positioner

There are various positioners that provide the Θ and φ rotations. Figure 2 shows the most common types of positioners and their coordinate systems: (a) azimuth-over-elevation (AZ/EL), (b) Elevation-over-azimuth (EL/AZ) and (c) azimuth-over-elevation-over-azimuth (AZ/EL/AZ). In the AZ/EL positioner, the azimuth positioner provides 360° motion around the φ axis, while the elevation positioner provides a limited motion around the Θ axis. In the EL/AZ positioner, the elevation positioner provides the motion around the Θ axis, while the azimuth positioner provides motion around the φ axis. The AZ/EL/AZ positioner is similar to the AZ/EL positioner, but has an extra φ axis for the purpose of alignment with the source antenna. The axes-crossing point of these positioners is lower than the phase center of the AUT, therefore measurement errors may be introduced. On the AZ/EL positioner, the AUT phase center is relatively closer to the axes-crossing point compared to the EL/AZ positioner, but its alignment with the source (without affecting the accuracy of the measured radiation patterns) is limited. The AZ/EL/AZ combines the advantage of both AZ/EL and EL/AZ positioners and can also be used as a polarization positioner. Depending on the antenna and the measurement probe, a polarization positioner may need to be included in the configuration. This positioner allows the probe to pivot and measure the components of the field. Polarization measurements can be performed if the source antenna (linear polarization) is assembled on a special positioner and rotated at high speed.

Rotary positioners

A wide selection

ORBIT/FR offers a wide selection of rotary-based positioning products and various options to support the demanding needs of test ranges. Our rotary positioner solutions include industry standard single-axis and multi-axis platforms. Note that our azimuth positioners can be used as test chamber turntables such as for automotive antenna testing.*

ORBIT/FR has extensive experience in designing rotary stage positioners and high-grade positioning subsystems for a variety of applications and organizations. These designs range from heavy duty, full-size aircraft positioners to light duty specialty positioners. With the accumulated experience in specialized positioning subsystems, we also have the capacity to customize to meet your specific application needs.

Performance and legacy

For over three decades, ORBIT/FR engineers have been developing new models as market demands and customer requirements evolve. As a result, the Legacy line for which we are recognized has strengthened its base.

The Performance Series represents the latest generation of multi-axis rotary positioning subsystems, offering enhanced capabilities and improved performance relative to size. We've recently added more low-profile configurations and state-of-the art electronics while ensuring the high accuracy and precision our positioners are well-known for.

Rotary positioners - quick guide

	AZ[1]			AZ/EL		
Duty	LIGHT	MEDIUM	HEAVY	LIGHT	MEDIUM	HEAVY
Applications	• General purpose positioning subsystems • Far-field & near-field antenna measurements • Indoor & outdoor use			• General purpose positioning subsystems • Far-field & near-field antenna measurements • Indoor & outdoor use		
Vertical load	5-910 kg	3 990-13 610 kg	22 680-250 000 kg	6-270 kg	1 000-6 000 kg	13 610-20 410 kg
Accuracy[2]	+/- 0.03 deg	+/- 0.03 deg	+/- 0.02 deg	+/- 0.03 deg	+/- 0.03 deg	+/- 0.03 deg
Torque	1.5-50 kg-m	70-1 380 kg-m	1 380-2 490 kg-m	1.5-20/1.5-60 kg-m	70-390 /170-1 500 kg-m	390-4 150/2 765-35 950 kg
Encoder[3]	Incremental	Incremental	Absolute	Incremental	Incremental	Absolute
Datasheets						

	EL/AZ			AZ/EL/AZ		
Duty	LIGHT	MEDIUM	HEAVY	LIGHT	MEDIUM	HEAVY
Applications	• General purpose positioning subsystems • Far-field & near-field antenna measurements • Indoor & outdoor use		• General purpose positioning subsystems • Far-field & near-field antenna measurements aircraft measurements • Indoor & outdoor use	–	• General purpose positioning subsystems • Far-field & near-field antenna measurements • Indoor & outdoor use	• General purpose positioning subsystems • Far-field & near-field antenna measurements aircraft measurements • Indoor & outdoor use
Vertical load	20-91 kg	450-4 540 kg	13 610-22 680 kg	–	1 000-6 000 kg	12 970-18 140 kg
Accuracy[2]	+/- 0.03 ou +/- 0.05 deg	+/- 0.03 deg	+/- 0.02 ou +/- 0.04 deg	–	+/- 0.03 deg	+/- 0.02 ou +/- 0.03 deg
Torque	7-20.7 / 7-20.7 kg-m	70-1 380 / 70-1 380 kg-m	830-11 060 / 2 765-35 950 kg-m	–	70-390 / 170-1 500 / 170-390 kg-m	390-4 150 / 2 770-13 830 / 390-4 840 kg-m
Encoder[3]	Incremental	Incremental	Absolute	–	Incremental	Absolute
Datasheets						

	POLARIZATION		
Duty	LIGHT	MEDIUM	HEAVY
Applications	-	-	-
Operating load	5-113 kg	1 810-9 070 kg	11 980-14 970 kg
Accuracy[2]	+/- 0.04 ou +/- 0.25 deg	+/- 0.04 ou +/- 0.25 deg	+/- 0.02 deg
Torque	1.5-1.7 kg-m	70-1 380 kg-m	830-2 490 kg-m
Encoder[3]	Incremental	Incremental	Absolute
Datasheets			

AZ/EL/AZ heavy duty positioner

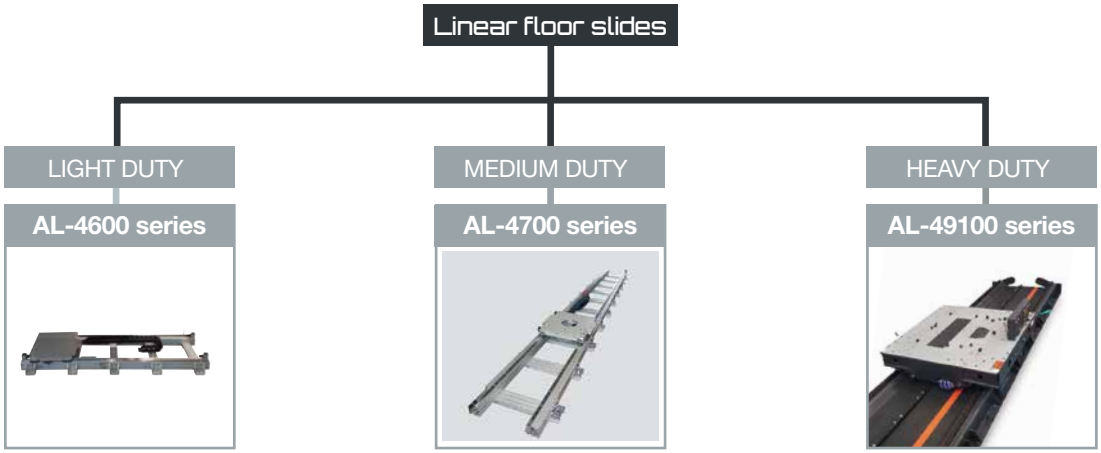
www.mvg-world.com/positioners

[1] AZ positioners can function as test chamber turntables
[2] See datasheet for options
[3] Absolute or incremental encoders are optional for most models

Linear positioners/ Floor slides

Linear positioners provide measurement flexibility by positioning the device under test (DUT) along a linear axis. Several can be combined to to increase freedom of movement and accuracy of positioning. They are to be selected according to application, size and weight of DUT, and necessary travel distance. Their durable construction ensures maximum reliability, low deflections, and trouble-free operation.

Heavy duty floor slide with inclined positioner



Floor slide positioners - quick guide

	LINEAR FLOOR SLIDES	
Duty	LIGHT/MEDIUM	HEAVY
Application	Linear motion of antenna positioner assemblies, pylons, or other general purpose systems	
Vertical load	680 kg max	68 000 kg max
Accuracy	0.2 mm	0.3-1 mm
Speed	125 mm/sec	50-350 mm/sec
Linear motion (motorized/manual)	Manual or motor	Motorized
Encoder*	Incremental	Absolute
Datasheets		

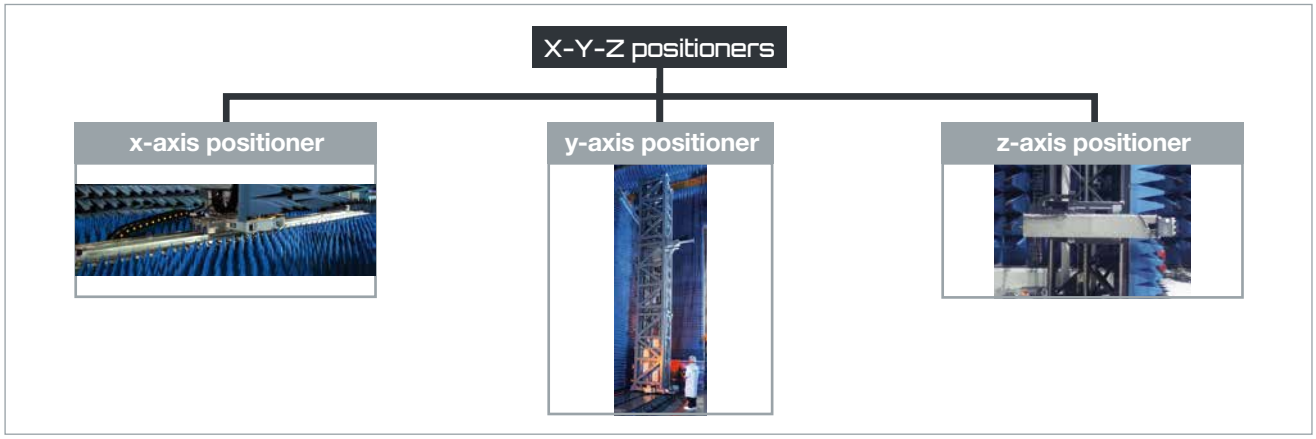
* Absolute for travel more than 3 m

www.mvg-world.com/positioners

Linear positioners / X-Y-Z scanners

Linear scanners are useful either for the accurate positioning of the DUT or the travel of the measurement probe during a near-field plane wave test. They are to be selected according to application, size of DUT, and necessary travel distance. The vertical, horizontal, and Z-Roll positioners can be ordered in various lengths to meet specific dimension requirements, and can be combined to increase freedom of the scan movement. Their durable construction ensures maximum reliability, low deflections, and trouble-free operation.

X-Y et Z axes configuration pour NF planar measurements



XYZ axis positioners - NF scanners - quick guide

	X - AXIS	Y - AXIS	Z- AXIS
Applications	Linear motion of measurement probe on X-axis	Linear motion of measurement probe on Y-axis	Linear motion of measurement probe on Z-axis
Accuracy*	0.05 mm - 0.2 mm	0.05 mm - 0.2 mm	0.03 mm
Speed	250 mm/sec	Up to 800 mm/sec	-
Travel	1-50 m	0.5-18 m	0.1-3 m
Datasheets			

* Relative to length

www.mvg-world.com/positioners

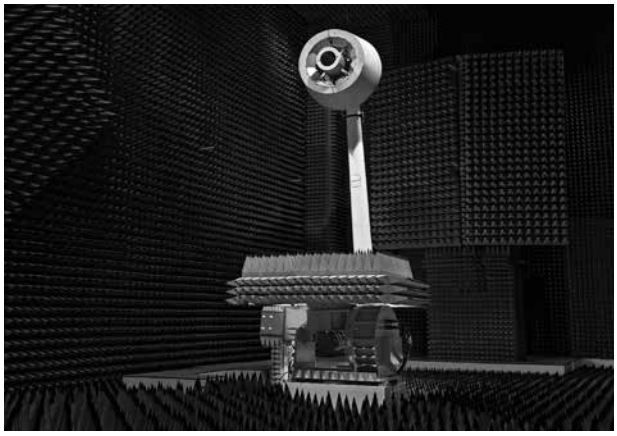
Planarity* - quick guide

	LIGHT SERIES	MEDIUM SERIES **	LARGE SERIES	EXTRA LARGE SERIES
HSCAN				
Planarity (RMS) Uncorrected	0.05 mm	0.2 mm	0.35 mm	0.5 mm
Planarity (RMS) Corrected	0.025 mm	0.1 mm	0.2 mm	0.25 mm
TSCAN				
Planarity (RMS)	0.024 mm (up to 4x2.5 m) 0.048 mm (up to 10x7 m)	0.048 mm (up to 15x8 m) 0.13 mm (up to 50x12 m)	0.048 mm (up to 30x13 m) 0.15 mm (up to 50x18 m)	0.048 mm (up to 30x13 m) 0.19 mm (up to 50x26 m)

* Non-exhaustive data, see datasheets or contact us for details / ** tscan- medium series refs: AL-49520 (T900)

Model towers

ORBIT/FR offers a wide selection of model tower assemblies to support antenna test ranges. Model towers act as the supporting interface between the antenna under test (AUT) and the rest of the positioning subsystem. They provide polarization and linear motion. A typical model tower includes a mast (vertical or inclined) and a linear offset slide (manual or motorized). Manual linear offset slide styles include hand-push, handwheel, and fixed step. Model tower assemblies may contain an integrated gearhead roll axis or a discrete roll, roll/EL or EL/roll positioner. The base plate of the model tower provides a convenient interface to the lower positioner.



Model tower positioning system in compact range

Model towers

AL-38000 series

- Light duty
- Manual or motorized aluminum linear offset slide
- Fiberglass or aluminum mast
- Discrete positioner or integrated gearhead

AL-48000 series

- Medium duty
- Manual or motorized aluminum linear offset slide
- Fiberglass or aluminum mast
- Discrete positioner or integrated gearhead

AL-58000 series

- Heavy duty
- Manual or motorized steel linear offset slide
- Steel mast
- Discrete positioner

Model towers - quick guide

	MODEL TOWERS		
Duty	LIGHT	MEDIUM	HEAVY
Applications	• General purpose positioning • Subsystems • Far-field & near-field antenna • Measurements • Indoor use		
Max operating load	68 kg	455 kg	8 000 kg
Max height	3 m	6 m	6 m
Max swing radius	1 000 mm	2 110 mm	6 000 mm
slide standard accuracy	+/- 0.13	+/- 0.13	+/- 0.2
Mast material	Fiberglass or metal	Fiberglass or metal	Steel
Slide construction	Aluminum	Aluminum	Steel
Datasheets			

Controllers

ORBIT/FR offers a wide selection of positioner controllers, Power Control Units (PCUs), and accessories to support antenna and RCS test range needs. Our motion control solutions provide unparalleled accuracy and precision. The MVG-Orbit/FR portfolio includes both sequential and simultaneous control products. The architecture of our positioner controllers, PCUs and LCUs, provides flexibility to tailor the configurations to your requirements. Our design team has leveraged years of experience in the field, both as users and designers, to develop a generation of controllers that reflects the needs of day-to-day users. This approach has resulted in a widely popular family of controllers that are easy to use and include many practical features.

OPTIMIZE EXISTING SYSTEMS WITH UPGRADES & RETROFITS

For operators of older positioning subsystems who are exploring retrofits and upgrades, our controllers provide an excellent path to modernization and supportability. By retrofitting older-generation control systems with more up-to-date controllers, MVG can provide a cost-effective alternative to replacing an entire positioning subsystem.

Controllers

Positioner controller

Hardware interface between host measurement computer & positioning subsystem

- Provides fully-automated or manual position control
- Available with or without built-in Power Control Units (PCUs) – without requires purchase of separate PCU
  Available as:
  - Sequential Control – Multiple axes, one axis at a time
  - Simultaneous Control – Multiple axes at one time

Power control units (PCU)

Hardware interface between sequential controller & positioning subsystem

- For heavy-duty positioners that exceed the output power rating
- For applications that include remote PCUs

Emergency stop unit (e-stop)

Provides system-level central connection point for external emergency stop buttons

- Reinforced safety management: disables system via single remote point

Local control unit (LCU) - wired

Hand-held remote control unit for higher degree of flexibility in operation.

- Controls up to 12 axes
- Limits maximum coarse and fine speed per axis
- Enables setting acceleration and deceleration per axis
- Integrated E-Stop button

Wireless local control unit (LCU)

Hand-held hardware interface between user and controller or PCU

- Integrated safety feature: priority control over controller or PCU
- Compatible with MVG-Orbit/FR controllers and PCUs
- Wireless

www.mvg-world.com/positioners

Controllers - quick guide

		CONTROLLERS		
Model		AL-4162	AL-4164	AL-48062
N° of axes		2 axes	4 axes	6 axes
Axis control		Simultaneous	Simultaneous	Sequencial
Encoder	Incremental	✓	✓	✓
	Absolute		✓ +	✓ +
Synchro	Single			✓
	Dual			✓

+ Options

Options


EN001

> ENCODER OPTIONS

Encoder options are available for customers desiring high accuracy positioning or for applications involving DSP-based motion control systems. These options are offered in incremental or absolute formats and replace the standard synchro assembly.


RJ40, RJ18,
RJ12, RJ50

> ROTARY JOINT OPTIONS

Coaxial single-channel rotary joint options include an internal RF path, an RJ mounting flange, and appropriate RF bulkhead connectors. Electrical travel limits remain but are typically disabled when this option is purchased.


SR402

> SLIP RING OPTIONS

These options support unrestricted (continuous) rotation of positioner axes. They can be ordered in two configurations: integrated wiring for upper positioner axes and/or point-to-point thru-paths for customer use. Please specify the desired configuration when ordering this option. These options include internal wiring and MS bulkhead connectors. Electrical travel limits remain but are typically disabled when this option is purchased.

> INTERNAL HARNESSING OPTION

This option supports restricted (non-continuous) rotation of positioner axes. It can be ordered in two configurations: integrated wiring for upper positioner axes and/or point-to-point thru-paths for customer use. Please specify the desired configuration when ordering this option.This option includes an internal wiring harness and MS bulkhead connectors. Electrical travel limits typically remain enabled when this option is purchased.

> CONNECTOR FORMAT OPTION

These options specify available connector formats for light, medium, and heavy duty positioners. Please specify the desired configuration when ordering this option.


TH002

> THRU-HOLE OPTIONS

These options provide a protective housing through the center of selected positioner models. They are available in either indoor or outdoor configurations. Applications for this option include cable pathways and stationary fixtures which pass through the center of the axis. Electrical travel limits typically remain enabled when this option is purchased. Consult your local sales representative when configuring this option.


ST002L

> STOW-LOCK OPTIONS

This option provides a stow-lock pin mechanism which mechanically locks the specified rotary axis to prevent excessive gear tooth loading. Typical applications include gear-train protection when storing/handling/shipping the positioner or whenever axis movement must be avoided (ex: when mounting a vehicle). Stow-locks operate in one of two positions: stowed in housing or installed in the axis. When the stow-lock pin is removed from its housing and installed on the positioner, a special circuit breaker (normally closed – N.C.) causes an electrical shutdown to prevent operation. Stow-locks are typically installed at 0º position. Special positions are available. Consult your local sales representative when configuring this option.


LS002

> LEVELING OPTIONS

Leveling options provide easy, quick and accurate leveling when installing medium and large sized positioners on uneven surfaces. They are available in varying quantities depending on the positioner model. Consult your local sales representative when configuring this option.

> MOUNTING THREAD OPTIONS

These options are available for applications requiring localized configurations.

> INTERLOCK PROTECTION CIRCUIT OPTIONS

Interlock circuits can be special-ordered for applications in which the design calls for preventing the operation of a specific axis while another axis is parked in a specific travel region. Applications include configurations utilizing model towers in which the interlocks are designed to prevent the model tower from colliding with a surface. Other applications include overload protection and safety work zones.

> BASE-RISER OPTIONS

Base-risers can be special-ordered for applications in which a positioner must be located at a specific height above its main mounting surface. They are typically the same diameter as the positioner's base and are constructed of the same material, steel or aluminum, as the positioner itself. Some base-risers can be designed for specific applications by including features such as lifting hooks, fork lift provisions, thru-holes, hatches, and ladders. Base-risers are typically constructed in a way that does not limit the positioner's total capacity and overall specifications. Important parameters include overall capacity, diameter, and height. Consult your local sales representative when configuring this option.

WG002

> WEDGE OPTIONS

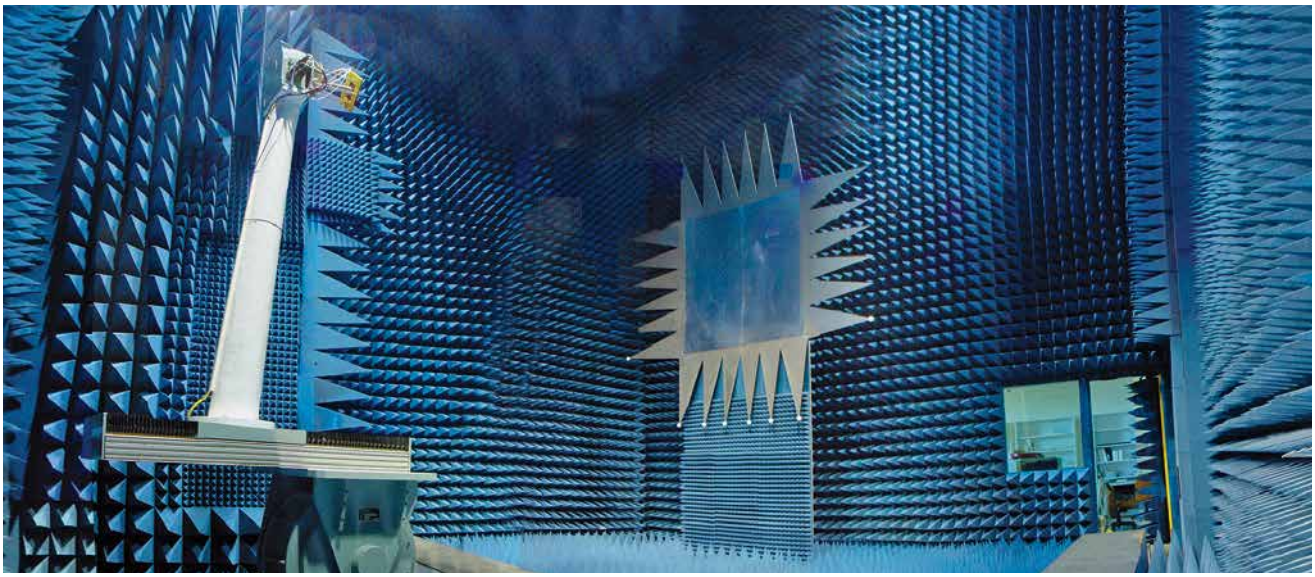
Wedge options can be special-ordered for applications in which the configuration requires the positioner to be pre-tilted. Applications include downward tilt of Roll/EL positioners in which the wedge's resulting tilt shifts the elevation travel beyond its normal downward-look angle. Wedges are constructed of the same material, steel or aluminum, as the positioner or base-riser and in a way that does not limit the positioner assembly's total capacity and overall specifications. Important parameters include tilt angle and overall height and width. Consult your local sales representative when configuring this option.

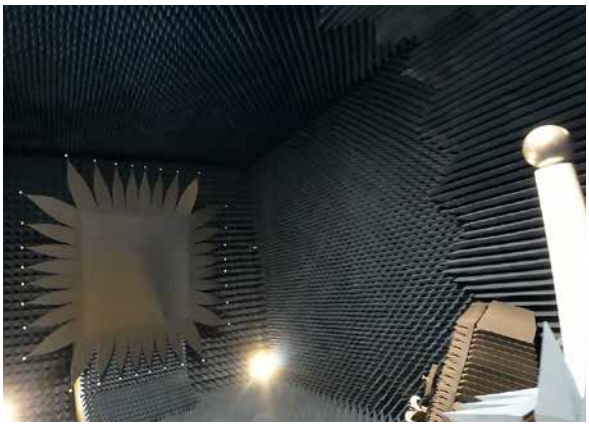
Counterweights

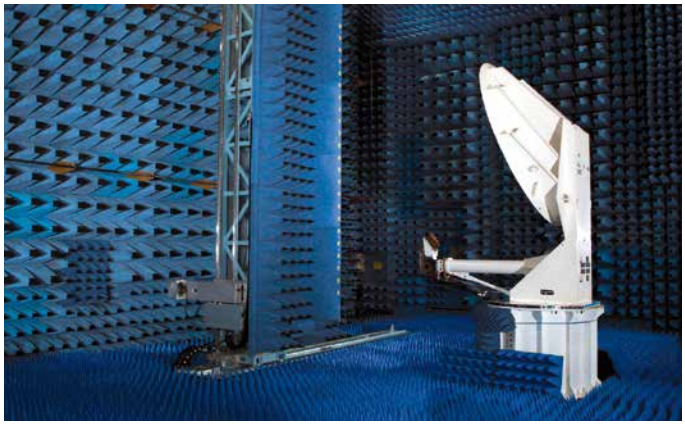
> COUNTERWEIGHT OPTIONS

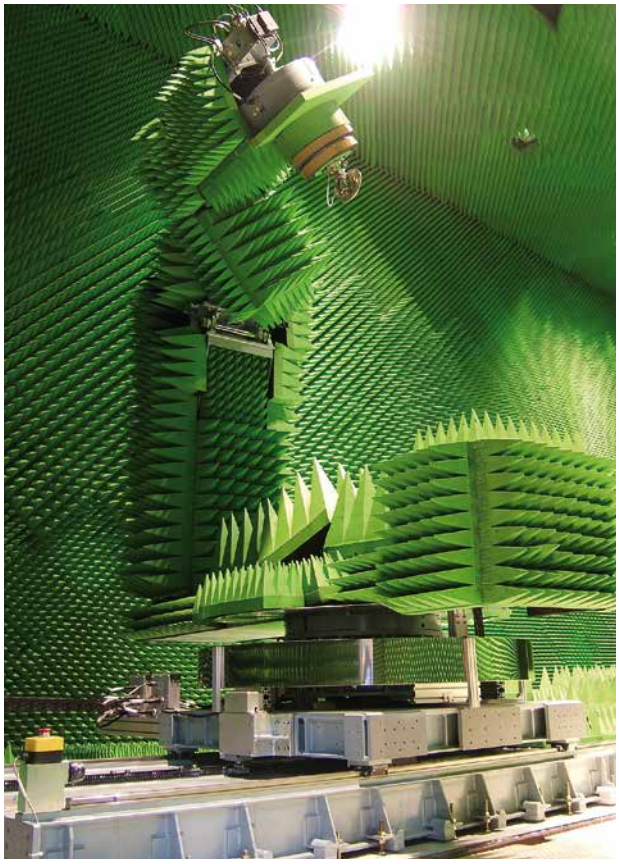
Counterweights can be special-ordered for applications in which the load is counter-balanced, optimizing torque and motion control. They typically vary by weight and length and are constructed of the same material, steel or aluminum, as the positioner itself. Counterweights add weight to the overall assembly and sometimes restrict travel. Important parameters include overall length, adjustable weight plates, indoor or outdoor use, and positioner configuration. Consult your local sales representative when configuring this option.

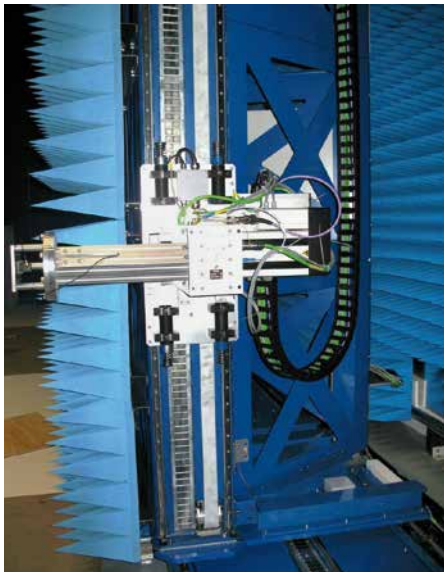
MVG - ORBIT/FR installations around the world

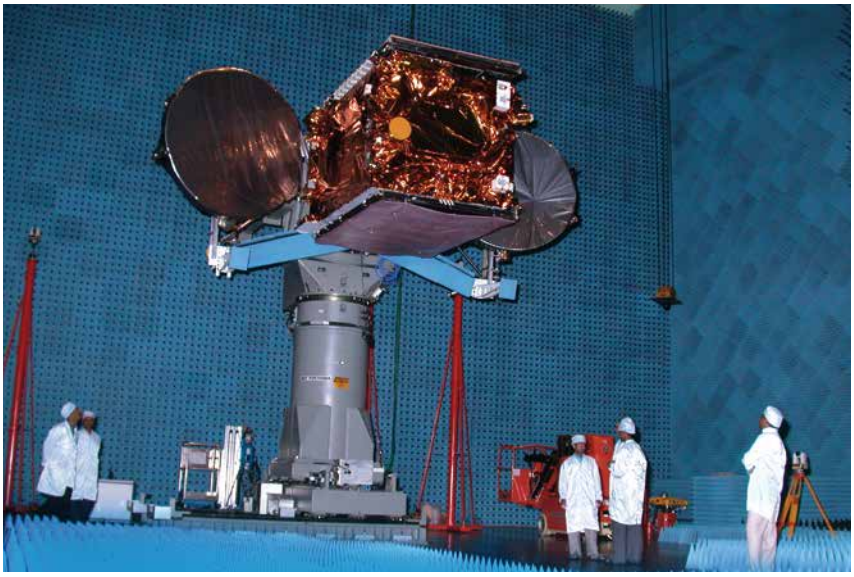












Over 35 years of engineering expertise at your service.

MVG - The Microwave Vision Group

From components and parts to full turn-key solutions, the right combination enables you to meet your specific measurement needs in a variety of testing configurations. Our offer allows you not only the facility of finding suitable off-the-shelf products, it also guarantees an upgrade path to enhance system capability.

MVG products are grouped into several families:

ANECHOIC CHAMBER TECHNOLOGY

- Absorbing materials: pyramidal, wedged, convoluted; standard, clean room absorbers, rubberized absorbers, HP absorbers, EMC absorbers, walkways
- Shielded chambers for Antenna Measurement and EMC: 10, 5, 3 m chambers, MIL-STD, compact chambers, shielded doors and rooms for testing and EMI, EMC, EMPP and more

POSITIONING SUBSYSTEMS

- Positioners: Rotary and Linear positioners, Model towers
- RCS Pylons: Standard and tailored models; choice of 3 tip types: AZ/EL Hat-type, AZ/EL Low profile, AZ only
- Controllers: Positioner controllers, Power Control Units, Local Control Units

SOFTWARE

- Measurement control, data acquisition and post processing software: MiDAS, Insight, 959 Spectrum, MV-Echo, SatEnv, WaveStudio measurement suite

MEASUREMENT SYSTEMS

- Multi-probe systems: Starlab, StarMIMO, SG 24, SG 64, SG 128, StarBot 4200, StarBot 4300, SG 3000 F, SG 3000 M, SG 4100 F, T-DualScan, G-DualScan, StarLab 50 GHz, MiniLab, AeroLab, StarWave, SG Evo
- Single probe systems: µlab, TScan, HScan
- RF system units
- Compact Ranges
- Reflectors: Serrated edge, Rolled edge

REFERENCE ANTENNAS AND MEASUREMENT PROBES

- Antennas and probes: Biconic, diagonal horns, dual polarized feeds, dual polarized OEWs, dual polarized probes, electric sleeve dipoles, feed horns, magnetic dipoles, monocones, monopoles, open quad ridge horns, closed quad ridge horns, open-ended waveguides, linear arrays, standard gain horns, wide-band horns

Notes

MVG - Testing Connectivity for a Wireless World

The Microwave Vision Group offers cutting-edge technologies for the visualization of electromagnetic waves. With advanced test solutions for antenna characterization, radar signature evaluation and electromagnetic measurements, we support company R&D teams in their drive to innovate and boost product development.

WORLDWIDE GROUP, LOCAL SUPPORT

Our teams, in offices around the world, guide and support you from purchase, through design, to delivery and installation. Because we are local, we can assure speed and attention in project follow through. This includes customer support and maintenance once the system is in place. For the exact addresses and up-to-date contact information:
www.mvg-world.com/mvg-offices

mvg Microwave Vision Group

For more information:
www.mvg-world.com/positioners

Contact us:
www.mvg-world.com/en/contact