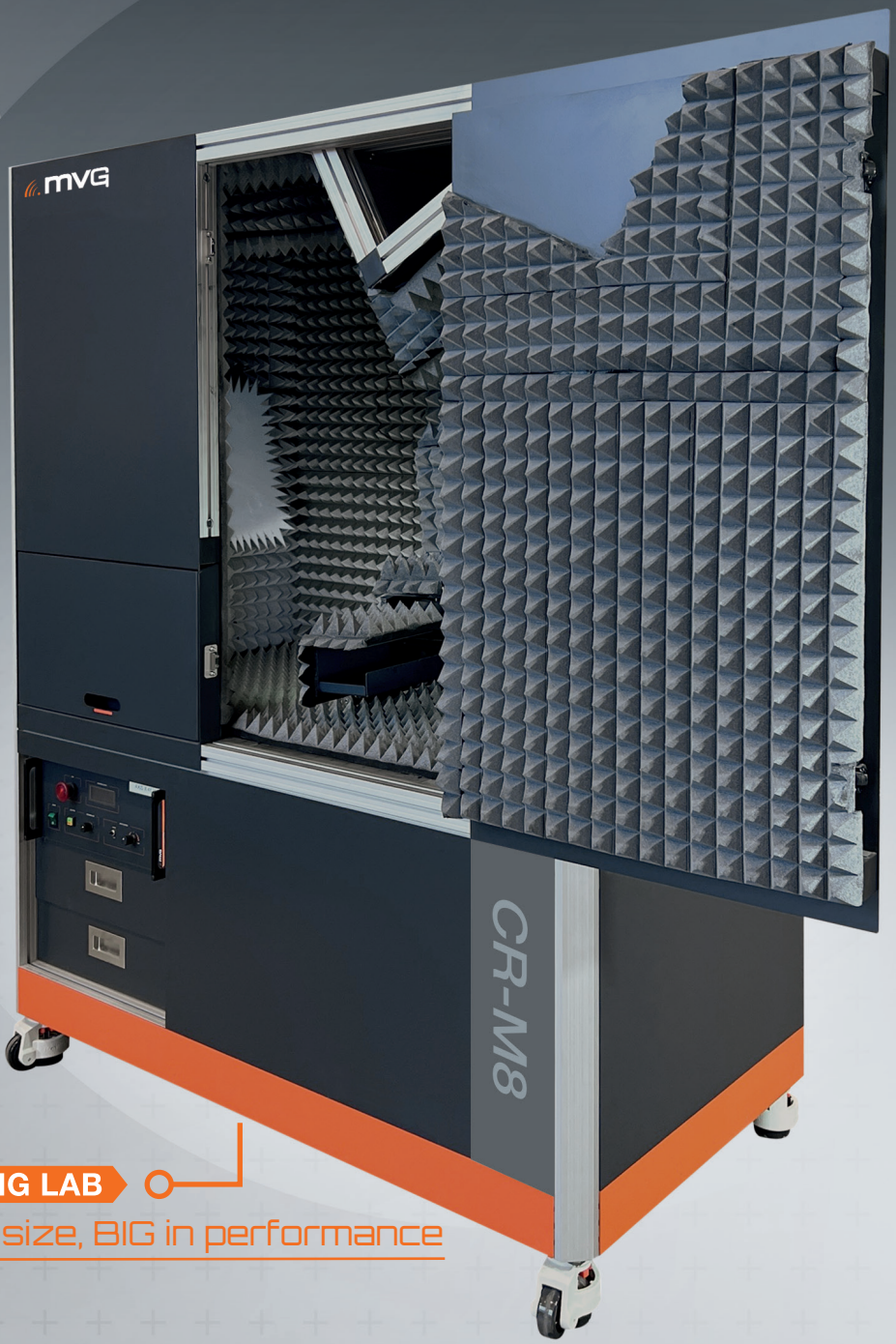
Mini-Compact Range

A full turn-key test system for high frequency antenna measurements and OTA testing



LITTLE BIG LAB

Little in size, BIG in performance

Made to meet the high frequency testing challenge! The Mini-Compact Range and chamber assembly has been designed for effective and efficient testing of microwave and millimeter wave high-gain antennas and radar. Providing a quiet zone diameter of up to 0.5 m and ensuring wide-band frequency testing for small antennas, it minimizes multi-path effects thanks to strategically engineered geometries and materials. The optimized positioning of equipment within the compact dimensions of the chamber ensures significant mitigation of cable and other losses. The compact and all-in-one transportable system adds flexibility and cost-effectiveness to any test lab.
Little in size, but big in performance, the mini-compact range is a full turn-key test system particularly well suited for the testing of high frequency directional antennas and small radar systems, as well as OTA testing and 5G applications.

SOLUTION FOR

- **mmWave Antenna Measurement**
- **mmWave OTA Testing**
- **Automotive radar testing**

MAIN FEATURES

Technology

- Compact Range

Measurement Main Capabilities

- Gain
- Beamwidth
- Cross polarization
- Sidelobe levels
- 3D radiation pattern
- Radiation pattern in any polarization (linear or circular)

Frequency Bands

- CR-M8: 18-110 GHz
- CR-M12: 8-110 GHz
- CR-M20: 4-110 GHz

Max. Size of DUT

- Up to 0.5 m diameter

Max. Weight of DUT

- Up to 100 lbs (45 kg) for Azimuth (AZ) Only
- Up to 29 lbs (13 kg) for Roll/AZ (according to EL axis)
- Up to 50 lbs (23 kg) for Roll/AZ with AL-161-1P

Typical Dynamic Range

- 80 dB

SYSTEM CONFIGURATIONS

Software

Measurement control, data acquisition and post processing

- ■ Wavestudio, Midas, 959 Spectrum

Equipment

- ■ Compact shielded anechoic chamber
- ■ DUT positioner:
  - Roll over azimuth model tower positioning configuration, with elevation (squint) axis (± 6 deg) and manual slide
  - Compact AZ/EL or EL/AZ mini positioner (NEW! option)
- ■ RF absorber*
- ■ Reflector system
- ■ Feed horns (One user-selectable band up to 90 GHz included)**
- ■ Feed polarization rotator with an easy "slide&lock" mechanism for feed replacement
- ■ Data acquisition and analysis workstation
- ■ AL- 4164 positioner controller***
- ■ Standard rotary joints and waveguide RJ mechanism for mmWave
- ■ mmWave boxes for required band
- ■ RF cables
- ○ Vector network analyzer

Add-ons

- □ Feed horns (additional bands)**
- □ RF system up converters/down converters above 50 GHz

Accessories

- □ Standard gain horns (SGH)**
- □ Generic mounting fixtures for both SGH and mmWave antennas

Services

- ■ Installation
- ■ Warranty
- ■ Training
- □ Post warranty service plans****

* See www.mvg-world.com/absorbers / ** www.mvg-world.com/antennas / *** www.mvg-world.com/positioners / **** Refer to www.mvg-world.com/en/services/post-warranty-service-plan

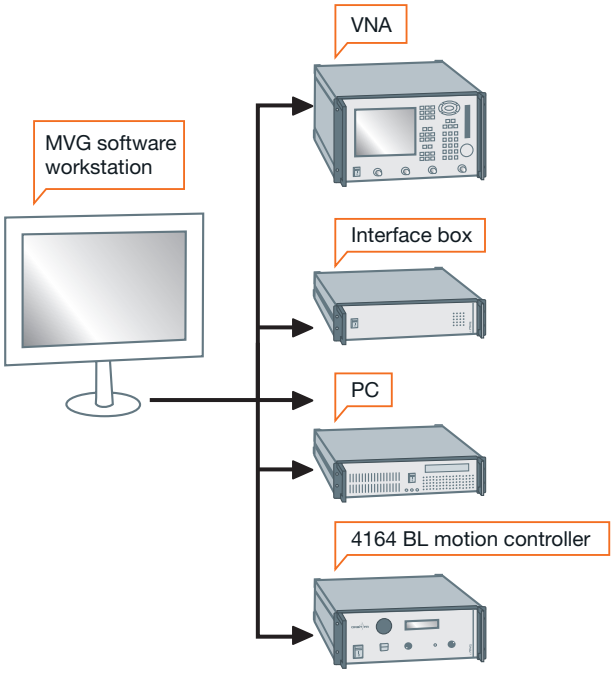
■ Included □ Optional ○ Required

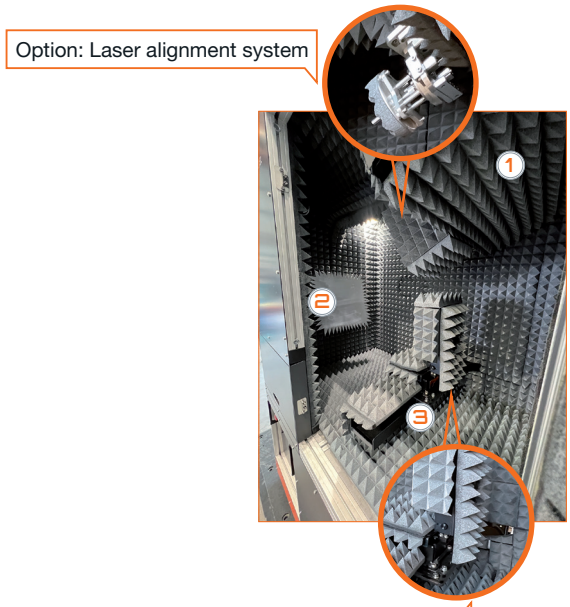
The basic configuration allows for full 3-D patterns to be collected using standard vector network analyzers. The chamber provides a modest level of shielding and easy access to the DUT positioner and compact range feed area. The smaller models (CR-M8, CR-M12) are portable, and mounted on a caster assembly for convenient transportation between different production or test sites.

A compact range feed polarization rotator enables the transmit polarization to be changed during a single test or in between tests. Linked axis motion of the transmit rotator and roll axis allows for automatic acquisition of E & H plane patterns in a single test. A squint (elevation) axis allows E&H plane patterns through the peak of the beam in case electrical and mechanical boresight do not coincide. The AL-4160 series controller supports the control of up to four (4) axes, and allows for simultaneous motion if required.

The data acquisition and analysis workstation comes equipped with MVG software, allowing for a versatile and powerful data acquisition and analysis tool. Upon request, the compact range reflector and positioning subsystem assembly can be procured without anechoic chamber walls for those customers with existing anechoic chambers.

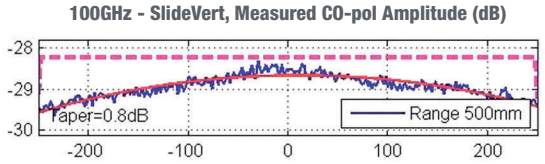
System Overview

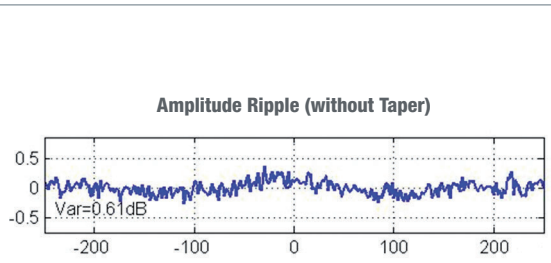


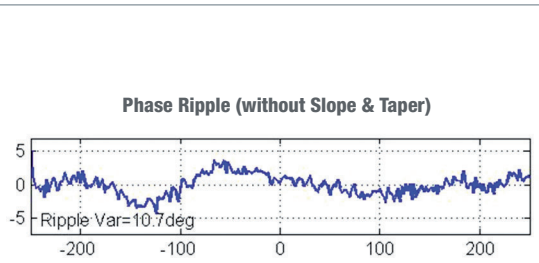


Typical Field Probing Performance

Scan Direction: horizontal, CR-Feed: vertical, Frequency: 100.0 GHz







Compact AZ/EL Light-duty Mini Positioner NEW!

New mini positioner designed for compact measurement solutions in mmWave applications

Standard System Components

1 Absorbers and anechoic chambers

- Dimension based on selected quiet zone size
- Moderate shielding

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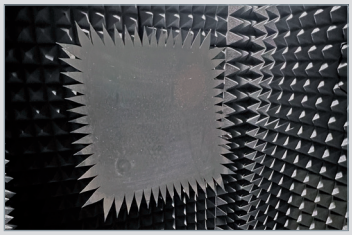
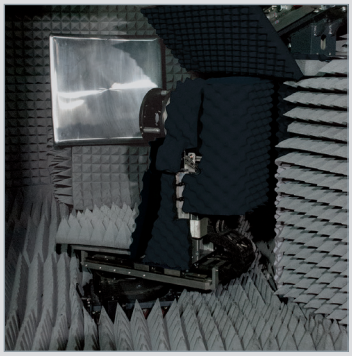
2 Reflector system



- Single-piece reflector
- Rolled-edge or serrated-edge*
- Floor-fed or corner-fed geometry*

*(*see specific model specs)*

3 Positioning subsystem



- Standard AL-161 Roll positioner over AL-461 AZ positioner
- AL-4160 series positioner controller
- AL-161 Roll positioner with squint axis (± 6 deg) and manual slide

www.mvg-world.com/positioners

System Specifications

SYSTEMS	CR-M8	CR-M12	CR-M20
REFLECTOR SUBSYSTEM			
Reflector model	AL-260606	AL-23101	Al-23101-20
Geometry	Floor fed	Corner fed	Corner fed
Frequency range	18 to 110 GHz	8 to 110 GHz[1]	4 to 110 GHz
Quiet zone shape	Cylinder	Cylinder	Cylinder
Quiet zone dimensions (Ø x depth)	8 x 8 in 20 x 20 cm	12 x 12 in 30 x 30 cm	20 x 20 in 50 x 50 cm
Cross polarization (typ)	27 dB	30 dB	30 dB
Amplitude total variation[2]	• 18 to 26.5 GHz: 1.4 dB • 26.5 to 40 GHz: 1.3 dB • 40 to 110 GHz: 1.4 dB	• 8 to 12.4 GHz: 1.7 dB • 12.4 to 18 GHz: 1.5 dB • 18 to 110 GHz: 1.4 dB	• 4 to 6 GHz: 1.7 dB • 6 to 8 GHz: 1.5 dB • 8 to 110 GHz: 1.4 dB
Phase total variation[2]	• 18 to 40 GHz: 6° • 40-110 GHz: 0.2° x F	• 8 to 12.4 GHz: 12° • 12.4 to 18 GHz: 10° • 40-110 GHz: 0.25° x F	• 4 to 6 GHz: 12° • 6 to 8 GHz: 10° • 40-110 GHz: 0.25° x F
Reflector construction	Aluminum, rolled edge Aluminum, serrated edge	Aluminum, rolled edge*	Aluminum, rolled edge*
Nominal reflector size	16 x 16 in 41 x 41 cm	24 x 24 in 60 x 60 cm	40 x 40 in 100 x 100 cm
POSITIONING SUBSYSTEM[3]			
DUT positioner	Elevation/Azimuth Slide – N/A Elevation: ± 45 deg Azimuth: ± 90 deg	Roll / Squint / Slide / Azimuth Manual slide:150 mm travel Squint: ± 6 deg AL-161 roll	Roll / Squint / Slide / Azimuth Manual slide: 300 mm travel Squint: ± 10 deg AL-161 roll
Feed positioner[4]	AL-061-1P / Manual	AL-161-1P polarization	AL-161-1P polarization
Positioner controller	AL-4164	AL-4164	AL-4164
RF SUBSYSTEM			
Feeds[5] (frequency-dependant)	LGF-11 series MGF-14 series AL-061 roll (optional)	MGF-14 series Manual slide: 101 mm travel AL-161 roll	MGF-14 series Manual slide: 203 mm travel AL-161 roll
Optional RF receiver & accessories	• VNA[6] • LNA[7] • Polarization switch	• VNA • LNA • Polarization switch	• VNA • LNA • Polarization switch
Cabling	RF & Control	RF & control	RF & control
ANECHOIC CHAMBER			
Chamber enclosure construction	Portable aluminum structure Not shielded (optional[8])	Aluminum w/ door Chamber shielding 80 dB effectiveness (100 dB optional)	Aluminum w/ hinged access Chamber shielding 80 dB effectiveness (100 dB optional)
Max. chamber size (H x W x L)	195 x 86 x 150 cm	150 x 150 x 240 cm	290 x 240 x 400 cm
Anechoic treatment[9]	AEP-2: 60-90 GHz AEP-4: 18-40 GHz	AEP-4	AEP-8
Portability	Yes	Yes	Optional

1) Could be used down to 6 GHz
2) Defined at 95% confidence level
3) See www.mvg-world.com/positioners for more information
4) See www.mvg-world.com/antennas for more information
5) LGF- 11: 60-90 GHz /MGF-14: 18-40 GHz
6) Vector Network Analyser
7) Low Noise Amplifier
8) Optional shielded chamber 40-60 dB effectiveness
9) See www.mvg-world.com/absorbers for more information

Looking for larger ranges? MVG designs and manufactures many sizes of compact ranges. See mvg.link/compact_ranges for more options.

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