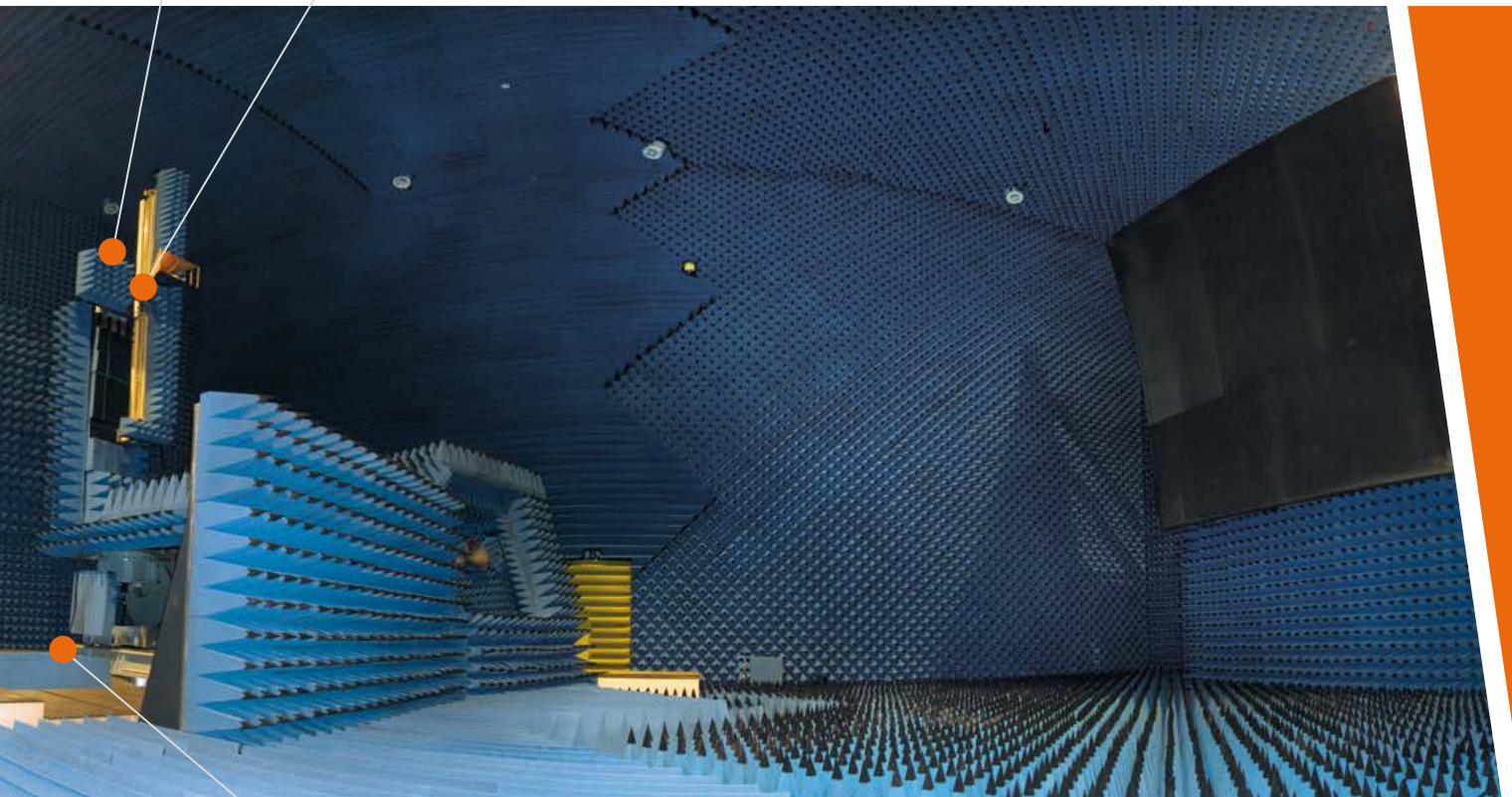




RF UNIT & RF SYSTEM OVERVIEW



Introduction

This document encompasses a short, practical overview of RF systems and units designed and manufactured by MVG. Inside you will find a diagram of typical test system configurations and brief descriptions of each product.

Conscientious 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 is found via the QR codes in the quickguide matrix 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.



FROM ORBIT/FR TO MVG

With over 30 years in the design and manufacture of advanced antenna positioning subsystems, 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 the RF systems and Units that you'll find in this overview, MVG continues to present quality engineered products with the most advanced technology in antenna measurement. Our mission: to offer you the broadest choice in EMC testing and antenna measurement solutions.

RF Systems & RF Units

The evaluation of antenna parameters such as radiation pattern, directivity, gain, and polarization is performed in antenna measurement ranges.

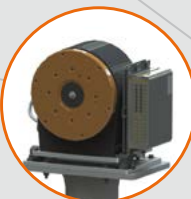
Various techniques exist to measure these parameters: The far-field technique, through the illumination of a uniform plane wave; the compact range, measuring the far-field via reflector technology; or the near-field technique using computational algorithms to transform the near-field to far-field data of the Antenna Under Test (AUT). Each technique demands system requirements and particular configurations for an optimal test environment.

Radio Frequency (RF) measurement units can be integrated into systems using these techniques to increase the accuracy of antenna measurements. RF systems are based on up and down frequency conversion through mixers or frequency multipliers. The mixer is a critical component in the instrumentation of antenna measurement. It converts the RF signal at one frequency into a signal at another frequency. It mixes the input RF signal at a frequency, f_{RF} , with the local oscillator signal at frequency, f_{LO} , to obtain a signal at an intermediate frequency f_{IF} . At the IF port a filter is connected to reject all spurious signals except for the f_{IF} frequency.

Placing transmit and receive units (the two main units of the RF system) in the vicinity of the RF probe/feed and the AUT:

- Offers an optimal dynamic range
- Provides high accuracy antenna measurements
- Allows accurate transmitted signals by avoiding phase and amplitude disturbances caused by flexing RF cables

Such an RF system configuration can be used with any type of Vector Network Analyzer, RF source and RF receiver.



Near Field Measurements



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Quick guide - RF Systems & Units

RF TRANSMIT & RECEIVE UNIT



- Frequency range: 0.5-50 GHz
- Transmit and Receive (TX/RX) Units are up and down frequency converters used in an MVG-Orbit/FR antenna measurement system. These RF modules are designed to be symmetrically placed on the probe/feed and/or AUT sides of the antenna measurement system.



www.mvg-world.com/rf-transmit-and-receive-unit

RECEIVE UNIT



- Frequency range: 0.5-50 GHz
- The Receive (RX) Unit is a simplified version of the Transmit and Receive Unit. These units allow only down frequency conversion and thus represent a cost-effective solution for antenna measurement systems. Receive Units offer the option to include a Low Noise Amplifier (LNA) to gain the received signals.



www.mvg-world.com/receive-unit

RF AMPLIFIER



- Frequency range: 0.5-50 GHz
- RF amplifiers are used to gain low-level RF signals, typically for compensating losses in RF cables.



www.mvg-world.com/rf-amplifier-unit

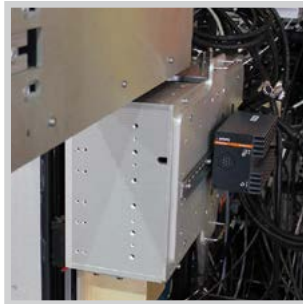


RF INTERFACE

- The RF Interface is a 2U (3.5") unit designed to fit in a standard 19" instrumentation rack. It is an optimal solution for providing both RF and LO signals to the mixers for different operational modes:
 - Far Field
 - Near Field
 - Compact Range
 - Hybrid – combined Near-Field and Far-Field.



www.mvg-world.com/rf-interface-unit



TX/RX SWITCH



- Frequency range: 0.5-50 GHz
- 50-ohm coaxial switches are designed to toggle between TX and RX operational modes. These RF units are designed to handle power levels up to 80 W at a switching time of 10 ms (milliseconds). The RF signals can be amplified with an internal broadband LNA.



www.mvg-world.com/txrx-switch-unit

AUT SWITCH



- Frequency range: 0.1-50 GHz
- Broadband AUT PIN diode absorptive switches are designed for multi-port antenna measurement. Fast switching RF response time allows on-the-fly RF signal measurements synchronized with the positioning system movement. These RF switches are designed to handle power levels up to 100 mW at a switching time of 50 ns (nanoseconds), and can be operated using remote logic controls. The RF signals can be amplified with an internal broadband LNA.



www.mvg-world.com/aut-switch-unit

POLARIZATION RF SWITCH



- Frequency range: 0.5-50 GHz
- Solid state absorptive polarization PIN switches are an optimal solution to operate dual polarized antennas. They are suitable for use with compact range feed antennas and for near field probes. Covering a wide frequency range, up to 50 GHz at a switching time of 50 nsec, these switching units work well with systems which combine low and high-power antenna measurement (with high power attenuator according to customer request).



www.mvg-world.com/polarization-rf-switch-unit

SMALL-SIZED 4-PORT SWITCH



- Frequency range: 0.5-40 GHz
- Broadband small-sized AUT PIN diode absorptive switches are designed for measurement systems where the space near the AUT is limited such as in the mini Compact Range. With exceptionally small dimensions, these units are specifically designed to fit in spaces close to the AUT. Fast switching response time allows on-the-fly RF signal measurements synchronized with the mechanical positioning system movement. These small-sized units are capable of handling power levels up to 100 mW (20 dBm) at a switching time of 50 ns (nanoseconds). This series is designed with combined remote logic controls and DC power. The RF signals are amplified with an internal broadband LNA.



www.mvg-world.com/small-sized-4-port-switch-unit

5G-OTA SWITCH



- Frequency range: 0.5-40 GHz
- 5G RF units combine 3 mechanical SPDT switches for 5G measurements, and are designed to toggle between different operational modes:
 - Uplink /Downlink - RF signal can be amplified with internal ultra-broadband LNA 42 dB gain.
 - Passive/Active antenna measurements modes
 - Feed/Calibration mode

These RF units are designed to handle power levels up to 80W at a switching time of 10 ms (milliseconds).



www.mvg-world.com/5g-ota-switch-unit

FEED SELECTOR



- Frequency range: DC-40 GHz
- Feed Selector coaxial switches are designed to be placed on a feed carousel to facilitate the toggle between different frequency bands of antennas, such as in Compact Range systems. These RF units offer either manual or automatic control.



www.mvg-world.com/feed-selector

MVG - Testing Connectivity for a Wireless World

The Microwave Vision Group (MVG) has developed unique expertise in the visualization of electromagnetic waves. These waves are at the heart of our daily lives: smartphones, computers, tablets, cars, trains, planes - these devices and vehicles would not work without them. MVG expertise brings measurement solutions to R&D teams for the characterization of antennas and their performance within these devices, and chamber solutions for EMC testing. MVG innovation remains focused on supplying the world with the most advanced EMF measurement technology to date.

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



Contact your local sales representative for more information

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