Radiation Measurement System
370/600 MHz to 4/6 GHz

The MegiQ Radiation Measurement System (RMS) is a compact test system that performs 3-axis radiation pattern measurement in non-anechoic spaces.

With a frequency range of 370 or 600 MHz to 4GHz or 6GHz it is well suited for characterization and measurement of Antenna Radiation Patterns, Antenna Gain, ERP, TRP, Field Strength.

Extensive evaluation has shown that – with reasonable setup - the accuracy of the RMS is similar to that of anechoic test labs.

Characterize wireless devices of today, like IOT devices, routers, phones, domotica products, electronic gadgets, tablets, laptops, RF-modules etc.

Measure Antenna Patterns in minutes
No anechoic chamber required

The RMS has proven to be a tremendous asset during the development and evaluation of wireless devices. The improved product performance as well as the savings on time consuming range tests and test-lab measurements will pay for the RMS in just a few projects.

Features
- Measurement of RF device constant carrier or packet stream radiation patterns.
- Frequency range 370 / 600 MHz to 4 / 6 GHz.
- Uncertainty 1dB (anechoic). Repeatability 0.5dB.
- Measuring distance 0.8 to 3 meter.
- 3-axis measurement. Plots per axis and 3D.
- Simultaneous Horizontal and Vertical polarization measurement.
- Simultaneous measurement of harmonic radiation.
- Narrow antenna beam width for non-anechoic environments.
- Minimum step size 2 degrees.
- Integrated PC software suite supports measurement setup, rotation control, graphing, data storage and report generation.
- Plots of radiated power ERP (dBm), Antenna Gain (dBi), Field Strength (dBuV/m).
- Calculation of TRP, Minimum, Maximum and Average radiation.
- Optional Generator output for standalone antenna measurement.
- Optional Heavy Duty turntable (30kg).
- Optional Laser direction pointer.

www.megiq.com

+31-40-369-0152
Measurement System

Measurement
- Antenna height 100cm to 170cm.
- Dual Polarization Antenna.
- Dual channel measuring receiver.
- Generator output (option).
- Rotation controller unit.
- Power supply.
- USB connection for computer control.

Turn Table
- Height 70cm and 130cm.
- Stepper motor drive.
- 30 seconds per rotation.
- Smooth acceleration.
- Table size 28 x 28cm.
- Max EUT weight: 7.5kg.
- Heavy Duty table: 100 x 50cm, 30kg.

The RMS rotates an object on the turntable and measures the radiation. With a rotation around the X, Y and Z axis the software plots the patterns and calculates statistics including Total Radiated Power (TRP). Each measuring point can contain a sweep of multiple frequencies, so that multiple radiation patterns can be measured in one rotation sequence.

With the Generator option the RMS can also perform an antenna sweep and show the antenna gain over frequency.

The RMS comes with an object fixture for small devices that allows easy positioning of the EUT in orthogonal positions on the object table. A labeling system helps the user to keep track of the axes.

The RMS system works well in a moderate space. A 4 x 4 x 3 meter room works well above 800MHz. For smaller spaces or lower frequencies a few strategic absorbers may be required.

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Software

The RMS software controls the measurement system and allows easy setup and performing the measurements, organizing the data and create reports. It will guide the user through the 3 rotation axis steps.

For EUT with a constant carrier or packet stream mode the RMS is used in a passive mode to rotate the EUT and record the field strength. For constant carriers, the receiver can measure multiple frequencies for each measurement point so that harmonic patterns (up to 4 or 6 GHz) can be measured simultaneously. The minimum step size is 2 degrees.

For EUT without a transmitter (prototype or standalone antenna) the Generator output can be used to feed a test signal to the EUT. In this mode the RMS can measure rotation patterns (at up to 30 frequencies simulations) or perform a frequency sweep of the antenna gain. The S-parameters of the feed coax can be imported to compensate for the loss and impedance of the cable.

In idle mode the RMS monitors the signal and shows the polarization in real time. It can also transmit a carrier with a calibrated power on the horizontal or vertical antenna.

The results can be presented in Antenna Gain (dBi), Radiated Power EiRP (dBm) or Field Strength (dBuV/m). The software calculates statistics such as Min/Max level, Average, Total Radiated Power (TRP), Antenna Efficiency (dBi) and Directivity (dB).

The rotation table can be controlled manually and a rotation offset aides in the rotation of large objects.
Measurements

Antenna rotation and linear patterns

Harmonics

Max gain and efficiency over frequency

Beam Max Gain, Front to Back ratio, Beam Width over frequency
# RMS Specifications

<table>
<thead>
<tr>
<th></th>
<th>RMS0440 / RMS0460</th>
<th>RMS0640 / RMS0660</th>
<th>unit</th>
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<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td></td>
<td></td>
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<tr>
<td>Frequency range</td>
<td>370 – 4000 / 370 - 6000</td>
<td>600 – 4000 / 600 – 6000</td>
<td>MHz</td>
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<tr>
<td>Frequency accuracy</td>
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<tr>
<td>Frequency resolution</td>
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<td>Antenna Height</td>
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<tr>
<td>Measuring distance</td>
<td>80 - 300</td>
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<td>cm</td>
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<td>Phase coherency</td>
<td>Phase coherent between H and V polarization</td>
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<td>Base Receiver bandwidth</td>
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<td>Minimum Field Strength</td>
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<td>dBuV/m</td>
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<td>dB</td>
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<td>Repeatability</td>
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<td>dB</td>
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<tr>
<td><strong>Turn Table</strong></td>
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<tr>
<td>Height</td>
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### Generator (option)

<table>
<thead>
<tr>
<th>Port Connector</th>
<th>SMA female</th>
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| Frequency range | 370 - 4000 MHz  
600 – 4000 MHz |
| Output level | -30 - +5 dBm |

### Heavy Duty Turn Table (option)

| Height | 110 cm |
| Platform | 100 x 50 cm |
| Max load | 30 kg |

### Laser Pointer (option)

| Laser class | Class 2 / < 1mW |

### PC Software

| Operating System | Windows XP – Windows 10 |
| PC minimum requirements | Pentium I3 – 2 GHz |
| PC recommended requirements | Pentium I5 – 2.4 GHz |

### Measurement Characteristics

| Physical Quantities | Effective Isotropic Radiated Power  
Field Strength  
Antenna Isotropic Gain  
Antenna efficiency |
|---------------------|--------------------------|
| Amplitude Statistics | Min, Max, Average  
Total Radiated Power  
Total Isotropic Gain |
| Beam Statistics | Beam Center  
3dB Beam Width  
10dB Beam Width  
Front / Back ratio |
| Graphs | Gain, Phase over Frequency  
Statistics over Frequency  
Polar Rotation Patterns  
Linear Rotation Patterns |