



# MILLIMETER WAVE MEASUREMENT SYSTEM



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# Datasheet | Millimeter Measurement System

Part No. ETH-MMW-1000 (version 1A)

Ethertronics presents the **Ethertronics<sup>®</sup> ETH-MMW-1000 Millimeter Measurement System**.

A cost effective, compact and adaptable solution for testing antennas/devices at mmWave frequencies.

## Self-Contained Movable System

Compact and portable, the Ethertronics<sup>®</sup> ETH-MMW-1000 frees up space in laboratories and production environments.

The system integrates its Gigahertz Control Unit, Measurement PC and welcomes a Vector Network Analyzer, a Spectrum Analyzer or a Radiocom Tester.

Easily installed into a new or existing construction, the moveable chassis can be relocated within a test facility.

## Accurate and Cost Effective Far-Field Measurement System

The Ethertronics<sup>®</sup> ETH-MMW-1000 includes a distributed axis positioning system, consisting of:

- an azimuth mast rotator for rotating the DUT about the Phi axis,
- a Theta ring positioner for elevating the measurement Horns around the DUT.

Each measurement frequency band uses a dedicated RF path (High Performance RF cables, rectangular waveguides and Horns...).

The fully anechoic enclosure provides a shielded environment over a very wide frequency range (from 18 GHz to 110 GHz) and insures stable gain and phase measurement results .



## Main Features

### Technology

- Far-field / Spherical w/oversampling

### Measurement Capabilities (Passive and Active)

- Gain
- Directivity
- Efficiency
- Beamwidth
- Cross polar discrimination
- Sidelobe levels
- 3D radiation pattern
- Radiation pattern in any polarization
- TRP, TIS, EIRP and EIS

### Frequency range:

- 18 GHz to 110 GHz

### Max. Size of DUT:

- 45 cm

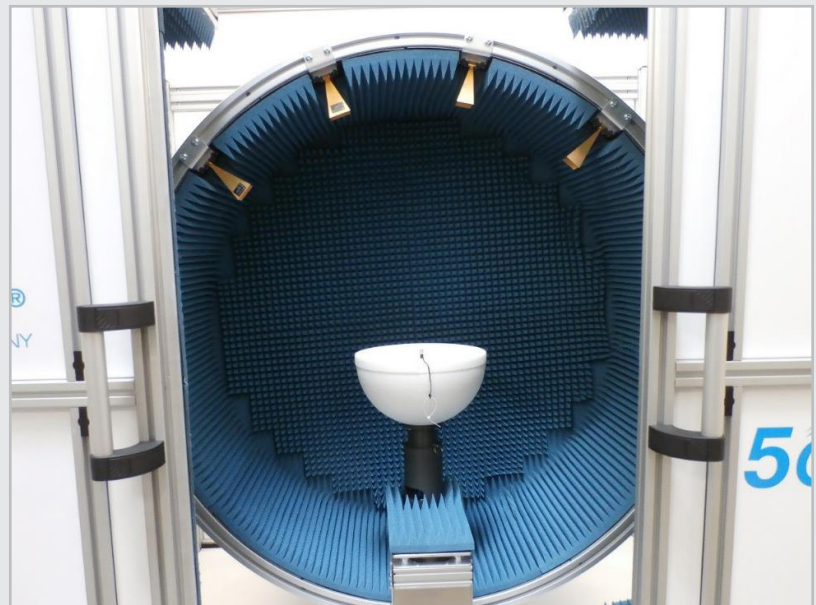
### Max. Mass of DUT:

- 10 kg on the mast

### Typical dynamic range:

- 50 dB

→ A simplified design, associated with a keen eye for detail, and the use of recognized quality components to maximize the performance...and the user experience.



### Testing Existing and Upcoming Technologies

The Ethertronics<sup>®</sup> ETH-MMW-1000 is a flexible turn-key solution, suitable for all testing needs for mmWave system development and validation.

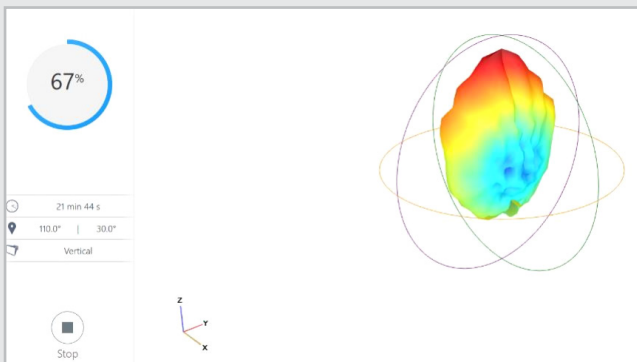
Hence, different combinations are possible, to cover one or several usual Millimeter wave bandwidths (18-26.5 GHz, 26.5-40 GHz, 33 to 50 GHz, 50 to 67 GHz...).

The System is supplied with the complete Ethertronics Software Suite:

- Ethertronics Antenna Measurement (Measurement Control, Data Acquisition)
- Ethertronics Antenna Viewer (Post-processing and tabular/graphical data output).

### System Configuration

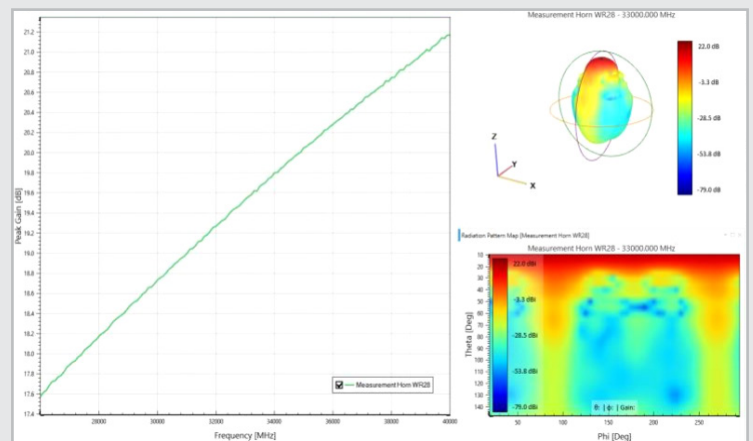
<b>Software</b>	Ethertronics Antenna Measurement (Measurement Control, Data Acquisition) Ethertronics Antenna Viewer (Post-processing and tabular/graphical data output)
<b>Equipment</b>	Autonomous Millimeter Measurement System, including: <ul style="list-style-type: none"> <li>• Complete frame equipped with mechanical positioners and sliding doors, rubberized absorbers</li> <li>• RF path assembled (RF Cables, Waveguides, Measurement Horns, Amplification stage, Switches...)</li> <li>• Integrated Gigahertz Control Unit</li> <li>• Integrated Computer (Windows 10)</li> <li>• (Optional) Vector Network Analyzer</li> </ul>
<b>Accessories</b>	Reference Horns (Optional) Mast adaptation part
<b>Services</b>	Installation Training Warranty (Optional) Post warranty service plans



### Screenshots of the Ethertronics Software

**Aside:** Ethertronics Antenna Measurement (*Measurement Control, Data Acquisition*)

**Below:** Ethertronics Antenna Viewer (*Post-processing*)



# Datasheet | Millimeter Measurement System

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## Standard System Components

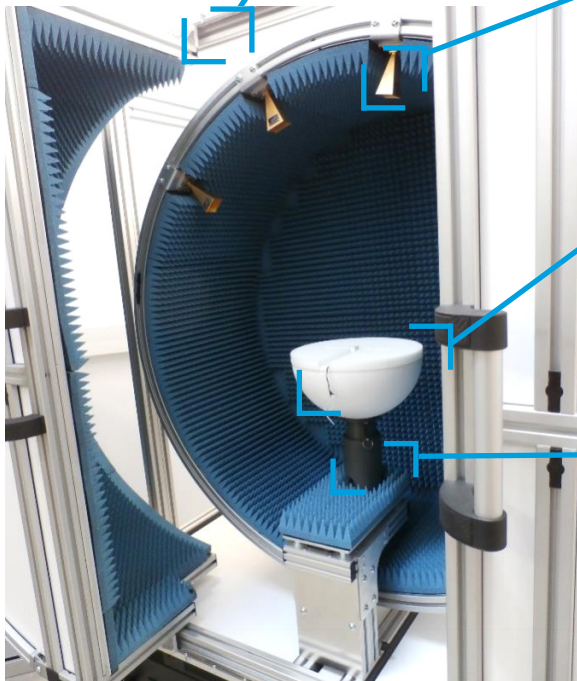


### Sliding door

Allows easy access to the center of the system, in order to position the DUT.

### Rectangular Horn Antenna

Dedicated to 1 polar/1 frequency bandwidth.



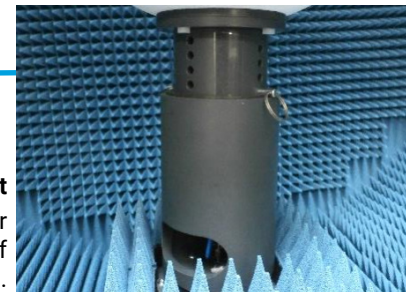
### Half sphere support interface (Ø 300 mm)

Includes dedicated notch to position the DUT (tablet/phone type) in vertical/horizontal position.



### PVC Mast

The height is easy to adjust in order to center the DUT in the middle of the rotating ring.



### Vector Network Analyzer

Placed in the bottom part of the frame, alongside the Integrated GigaHertz Control Unit and the PC Measurement.



### Steerable Lifting Wheels

Allow for optimal stability during measurements that still allows quick relocation within the Test Facility.



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## Electrical System Specifications

Electrical (VAC):	110-240 VAC
Voltage (Hz):	50/60 Hz
Amps (A):	10 A (220V) / 16 A (110V)
Plug type:	Type E/F (CEE 7/7) or NEMA 5-15
Shield material:	Aluminum plate
External connections:	HDMI(F)+ C14 (IEC 60320) + USB



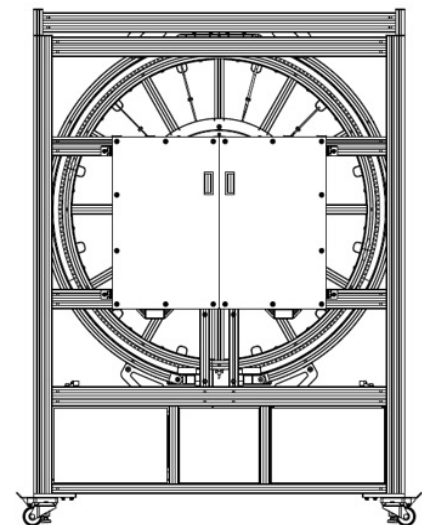
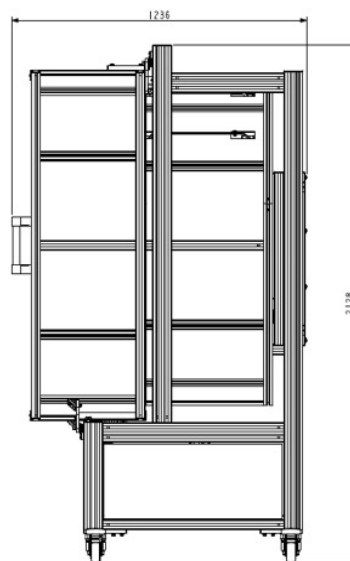
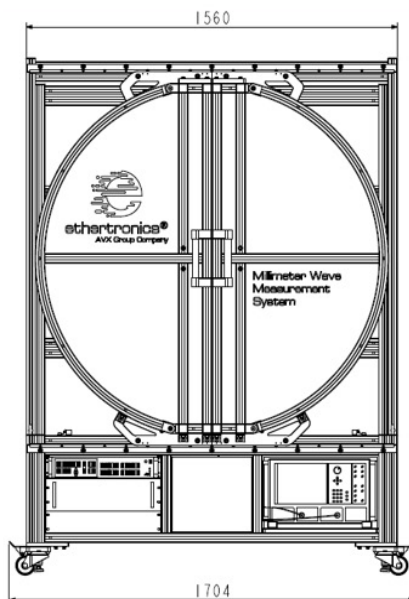
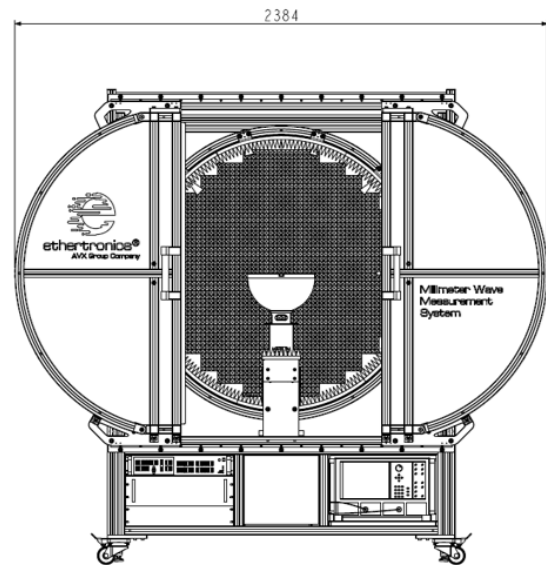
## Mechanical System Specifications

Positioners (Theta and Phi):	0-180° or/and 0-360° Rotation 0.01° Position resolution
Frame:	Aluminium Profile
Mast + interface:	PVC, Polystyren / Rohacell <sup>®</sup> 51, equipped with Slip Ring <i>Custom mast &amp; interface also available</i>
Total overall mass:	Around 430 kg (without VNA)
Shield material:	Aluminum
External dimensions:	See Aside

## DUT Specifications

DUT max. mass*:	10 kg
Maximum DUT size:	45 cm

\*Centered Load



\*All dimensions are in millimeter and provided in this document for informational purposes only

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## Frequency Range

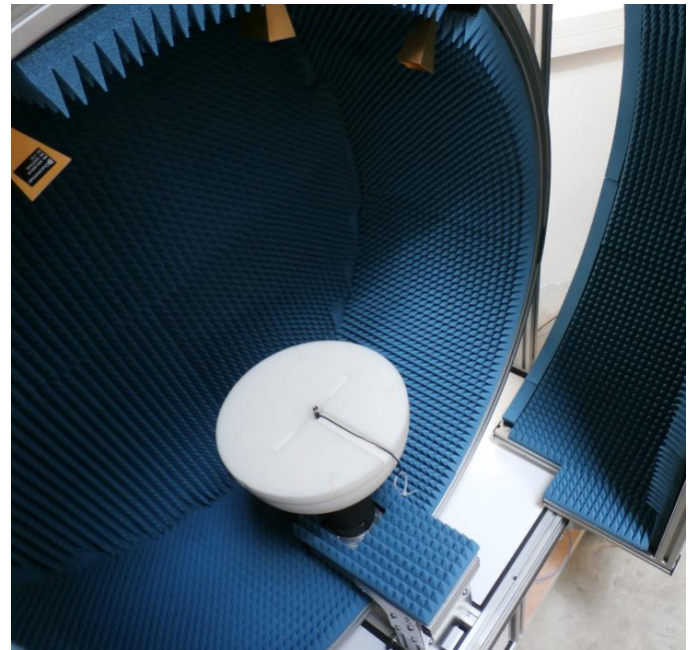
Different combinations are possible, to cover one or several usual Millimeter Wave bandwidths.	18 to 26.5 GHz
	26.5 to 40 GHz
	33 to 50 GHz
	40 to 60 GHz
	50 to 67 GHz
	50 to 75 GHz

## Custom Probe Configuration

In order to optimize the measurement time, the number of measurement probes dedicated to a bandwidth can be optimized. A minimum of 2 measurement probes is required to cover H and V polarizations but up to 12 probes on the ring positioner can be used.

## Measurement Time (with 2 measurement probes)

10 frequencies, 22.5° sampling	~ 4.5 min
10 frequencies, 10° sampling	~ 16.5 min
100 frequencies, 22.5° sampling	~ 5.5 min
100 frequencies, 10° sampling	~ 19 min



## Typical Dynamic Range

20 – 40 GHz	55 dB
40 – 67 GHz	50 dB
Typical cross polar level that can be measured	< -30 dB

## Peak Gain Accuracy

20 - 35 GHz	± 0.9 dB
35 - 50 GHz	± 0.9 dB
50 - 67 GHz	± 0.9 dB
Peak Gain repeatability	± 0.3 dB



**5G**

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