

## AMS-7000 REVERB ANTENNA MEASUREMENT SYSTEM

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### 5G FR1 Over-The-Air (OTA) test solutions are now available!

ETS-Lindgren offers a turnkey package which will enable support for 5GNR SISO non-standalone [NSA] and/or standalone [SA] testing in the FR1 band.

## Key Features

- SISO TRP, TIS, and Throughput Measurements
- MIMO Throughput Measurements
- Antenna Efficiency Measurements
- Direct Correlation to CATL Lab Results
- Faster Test Times
- Operates with EMQuest Software
- Freestanding Moveable Cart Configuration

## Features

### Chamber

The AMS-7000 uses two Z fold tuners, a DUT turntable, and a measurement antenna turret to improve isotropicity and homogeneity. These features allow the system to make measurements at different speeds and levels of accuracy.

### SISO TRP, TIS, and Throughput

TRP measurements made in a reverb chamber rely on a continuous sampling of the average power density in an over-moded environment while the DUT is transmitting at its full power. The accuracy, with which the average power can be measured, directly correlates with the number of independent samples that are available to be taken. The TIS measurement is the converse of TRP; the power density in the chamber is controlled for the downlink path by the communication tester. The DUT responds to samples of this environment as it moves to a series of different locations in the varying modal environment. The TIS value is then derived from the reported data validity threshold after chamber corrections are applied. The reverb chamber's over-moded environment also means that the precise location of the DUT is not critical to achieve good measurement repeatability or accuracy, resulting in reduced setup time.

### MIMO Throughput Measurements

MIMO throughput is ultimately a measure of the ability of the DUT to maximize its data throughput under different controlled environmental multipath conditions. The reverb chamber is already a multipath environment with path lengths limited by the chamber dimensions exhibiting a signal decay profile dependent on the loss in the chamber.

For MIMO throughput measurements, a simplified representation of the real world environment can be created by duplicating how the averaging effect of the chamber would be seen by a MIMO device. Different delay profiles can be realized by changing the



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propagation models can be introduced with an optional channel emulator.

### Measurement Accuracy (Stir)

	Highest Accuracy	Faster Testing
TRP	0.3 dB [STD]	0.5 dB [STD]
TIS	0.3 dB [STD]	0.5 dB [STD]
Repeatability	0.2 dB [STD]	0.3 dB [STD]

### Test Times (Stir)

	Highest Accuracy	Faster Testing
TRP	2.5 min / channel	0.5 min / channel
TIS	5.0 min / channel	1.5 min / channel

### Correlation to CATL Lab Results

Reverb based measurements are in the process of being accepted by CTIA for SISO and MIMO TM2. The reverb chamber method is a fast, accurate, and repeatable alternative to any facility using the well-established anechoic chamber methods. While the reverberation method cannot provide antenna pattern information, results for TRP and TIS measurements in the system normally correlate to within 1.0 dB of results measured in a full-size anechoic chamber (highest accuracy mode).

### Faster Test Times

Measurement uncertainty is directly related to the number of measurement samples taken over time. By reducing the number of samples, faster TRP measurements with +/-1 dB correlation can be achieved in as little as 0.5 minutes per channel. For TIS, measurement time can be reduced to as little as 1.5 minutes per channel. The AMS-7000 is delivered with pre-configured options to measure at higher speed, higher accuracy, or a balance of the two at the user's discretion.

### EMQuest Antenna Measurement Software

The AMS-7000 system utilizes EMQuest Antenna Measurement Software. Most popular brands of instrumentation, communication testers, protocols etc. are supported by EMQuest, providing greater flexibility in configuring equipment. Other features

- Head and Hand Phantom Mounts
- Additional Antennas for MIMO Testing

## Specifications

### Electrical Specifications

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**Frequency Range:** 690 MHz to 10 GHz  
**Path Length:** Various Multi-path  
**Drive System Electrical (VAC):** 208/240 VAC, NEMA 6-15  
**Drive System (Amps):** 15 Amps  
**Equipment/DUT Electrical (VAC):** 115/230 VAC, NEMA 5-15  
**Equipment/DUT Electrical (Amps):** 5 Amps  
**Voltage (Hz):** 50/60 Hz  
**Plug Type:** NEMA or Schuko (Please Select One)  
**Shield Performance:** >100 dB, 700 MHz to 18 GHz  
**Shield Material:** Aluminum

### Physical Specifications

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**Test Volume (L x W x H):** 50 cm x 50 cm x 50 cm (20 in x 20 in x 20 in)  
**Outside Dimensions (L x W x H):** 2.2 m x 1.5 m x 2.1 m (83.6 in x 61.1 in x 82.7)  
**Chamber Dimensions:** 2.1 m x 1.3 m x 1.6 m (81.7 in x 50.2 in x 63.9 in)  
**Weight:** 500.0 kg (1100.0 lb)

### Other Specifications

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- RF-shielded Enclosure
- Single-leaf Manually-operated RF-shielded Door
- Power Line Filter for DUT Support
- Panel including one WGF-6 Fiber Optic Feedthrough, Six SMA, Two FSMA and Five N-type Connectors
- Vertical Tuner with Stepper Motor
- Horizontal Tuner with Stepper Motor
- 50 cm Turntable for Rotation of DUT within Test Volume
- Antenna Rotator
- Styrofoam Column for DUT Placement
- Absorber Loading Elements
- Antenna Rotators
- 3115 Calibration and Measurement Antennas
- 3102 Log Spiral Communication Antenna
- EMCenter™ Modular RF Platform
- Fully Integrated Rack System
- Factory Shield Verification Test in General Accordance with the Test methods of MIL-STD-285/IEEE-299 at 1 GHz Plane Wave Field
- Workstation Computer with Intel® Quad-core Processor
- EMQuest EMQ-100 Antenna Measurement Software
- Design, On-site Setup and General Operating Training