# R&S®ATS1000
# ANTENNA TEST SYSTEM

## Specifications


Specifications
Version 05.00

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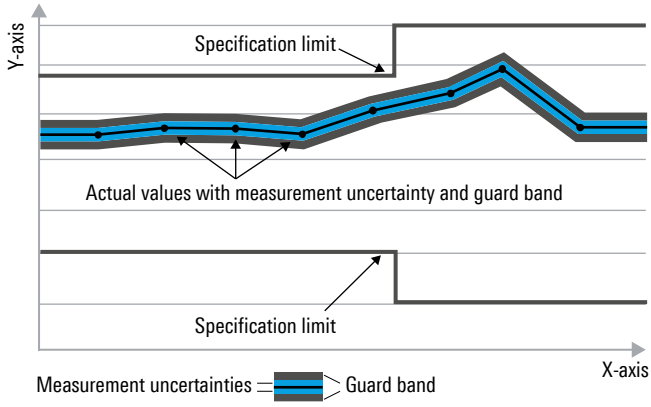
# Definitions

**General**
Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

**Specifications with limits**
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ± or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.




**Non-traceable specifications with limits (n. trc.)**
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

**Specifications without limits**
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value, e.g. dimensions or resolution of a setting parameter. Compliance is ensured by design.

**Typical data (typ.)**
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

**Nominal values (nom.)**
Characterize product performance by means of a representative value for the given parameter, e.g. nominal impedance. In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

**Measured values (meas.)**
Characterize expected product performance by means of measurement results gained from individual samples.

**Uncertainties**
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

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# Description

The R&S®ATS1000 antenna test system is a highly accurate solution for testing passive antennas as well as active TX/RX modules up to millimeterwave frequencies in a mobile shielded chamber. The R&S®ATS1000 includes multiple system components as listed below.

## R&S®ATS1000 shielded chamber

| | | |
|---|---|---|
| Shielding effectiveness | 18 GHz to 87 GHz | > 50 dB (meas.) |
| Absorber performance | reflectivity (18 GHz to 87 GHz) | < –45 dB (nom.) |
| Temperature range | operating temperature range | +5 °C to +35 °C |
| | storage temperature range | –20 °C to +60 °C |
| Relative humidity operation | | 75 % relative humidity,<br>noncondensing at +10 °C to +40 °C |
| Power supply | | 100 V to 230 V (–5 %/+10 %),<br>50 Hz to 60 Hz, max. 13 A |
| | connector | C20 |
| Door operation | | manually operated, electrical locking mechanism |
| Laser for DUT alignment [1] | wavelength | 650 nm |
| | output power | 7 mW |
| Dimensions | outside dimensions including handles (W × H × D) | 0.90 m × 1.99 m × 1.53 m<br>(2.95 ft × 6.53 ft × 5.02 ft) |
| | outside dimensions including lasers (W × H × D) | 0.99 m x 2.1 m x 1.53m<br>(3.25 ft × 7.22 ft × 5.02 ft) |
| | inside width (W × H × D) | 0.47 m × 1.25 m × 0.92 m<br>(1.54 ft × 4.10 ft × 3.02 ft) |
| Weight | without positioner | 300 kg (661.4 lb) |
| | with positioner | 350 kg (771.6 lb) |
| | with positioner and wooden transportation box | 540 kg (1190.5 lb) |

## R&S®ATS-CCP1 conical cut positioning system for R&S®ATS1000

| | | |
|---|---|---|
| Angular resolution | azimuth/elevation | 0.03° |
| Positioning repeatability | azimuth/elevation | 0.1° |
| Rotating speed azimuth | | up to 72°/s |
| Rotating angle azimuth | includes one RF rotary joint and multiple data cables: Ethernet, USB, DC lines | –10° to +365°, continuous |
| Rotating speed elevation | | up to 20°/s |
| Rotating angle elevation | includes two RF rotary joints | –10° to +168° |
| Measurement range length (adjustable) | including holder and R&S®TC-TA85CP test antenna | 550 mm/525 mm/500 mm<br>(21.7 in/20.7 in/19.7 in) |
| | manual height adjustment | ±7.5 cm (2.95 in) |
| Load capability | weight | 20 kg (44.1 lb), centered |
| | maximum dimensions of the DUT | 20 cm × 20 cm (7.9 in × 7.9 in) |
| Remote interfaces of controller [2] | | Ethernet |
| Transmission interfaces between chamber and controller | | 2 × fiber-optic cables |
| Material | elevation arm | fiberglass |

[1] Option installable outside the chamber on the right-hand side and top.

[2] Controller included in delivery.

## R&S®TC-TA85CP cross-polarized Vivaldi test antenna

| | | |
|---|---|---|
| Frequency range | nominal | 4 GHz to 85 GHz |
| Polarization | | dual linear polarized |
| RF connectors | | 2 × MMPX (male) |
| Impedance | | 50 Ω (nom.) |
| Dimensions | W × H × D | 77 mm × 28 mm × 28 mm<br>(3.1 in × 1.1 in × 1.1 in) |
| Weight | | approx. 14 g (0.027 lb) |

## R&S®AMS32 OTA performance measurement software [3]

| | | |
|---|---|---|
| Positioner controlling and passive antenna measurement | basic license | R&S®AMS32 |
| | triggered VNA measurements with continuous mode of positioner | R&S®AMS32-K48 |
| | visualization for far-field antenna tests | R&S®AMS32-K49 |

[3] For additional near-field to far-field transformation options, see R&S®AMS32 specifications (PD 3606.9062.22).

# Ordering information

## Basic configuration

| Designation | Type | Order No. |
|---|---|---|
| **Shielded chamber** | | |
| Antenna test system | R&S®ATS1000 | 1532.1010.03 |
| Mobile shielded chamber | R&S®ATS1000 KMAT | 1532.1010K03 |
| **Positioner** | | |
| Conical cut positioning system | R&S®ATS-CCP1 | 1529.7340.04 |
| Power filter, 230 V | R&S®ATS-F230V | 1532.1161.02 |
| **Measurement antenna** | | |
| Cross-polarized Vivaldi antenna | R&S®TC-TA85CP | 1531.8627.02 |
| Frequency range selection | | |
| RF cable set for R&S®ATS-CCP1 positioner, up to 40 GHz, incl. cables and rotary joints | R&S®ATS-CSRF1 | 1532.8243.02 |
| RF cable set for R&S®ATS-CCP1 positioner, up to 50 GHz, incl. cables and rotary joints | R&S®ATS-CSRF2 | 1532.8237.02 |
| RF cable set for R&S®ATS-CCP1 positioner, up to 67 GHz, incl. cables and rotary joints | R&S®ATS-CSRF3 | 1536.8602.02 |
| **DUT control, support and alignment** | | |
| DUT control cable set, incl. connector plate and feedthroughs, consisting of R&S®TS-F1ETRR1 (1 × Ethernet, RJ-45), R&S®TS-F1U2BA1 (1 × USB 2.0, type B) and R&S®TS-F1SD259 (1 × 9 pin D-Sub; using pins 1 to 8) | R&S®ATS-CSCO1 | 1532.8220.02 |
| Aluminium and Rohacell DUT adapter set | R&S®ATS-AZTAB2 | 1532.8189.02 |
| Lasers DUT alignment | R&S®ATS-LASER | 1532.0394.02 |

## Additional options

| Designation | Type | Order No. |
|---|---|---|
| RF cable, up to 40 GHz, 1.2 m, 2.92 mm (m) to 2.92 mm (f) | R&S®ATS-C40MF | 1535.7954.02 |
| RF cable, up to 50 GHz, 1.2 m, 2.4 mm (m) to 2.4 mm (f) | R&S®ATS-C50MF | 1535.7977.02 |
| RF cable set, up to 67 GHz, consisting of a 1.2 m long cable 1.85 mm (m) to 1.85 mm (m) and an adapter 1.85 mm (f) to 1.85 mm (f) | R&S®ATS-C67MF | 1533.4187.02 |
| DUT fixture, for R&S®ATS-CCP1 positioner (azimuth turntable) | R&S®ATS-AZTAB1 | 1532.7624.02 |
| **Additional accessories for calibration** | | |
| Standard gain horn antenna for calibration, 18 GHz to 26.5 GHz | R&S®TC-SGH26 | 1530.8630.02 |
| Standard gain horn antenna for calibration, 26.5 GHz to 40 GHz | R&S®TC-SGH40 | 1530.8617.02 |
| Standard gain horn antenna for calibration, 40 GHz to 60 GHz | R&S®TC-SGH60 | 1530.8623.02 |
| **Software options** | | |
| Basic license | R&S®AMS32 | 1508.6650.02 |
| Triggered VNA measurements with continuous mode of positioner | R&S®AMS32-K48 | 1508.6680.48 |
| Visualization for far-field antenna tests | R&S®AMS32-K49 | 1508.6680.49 |

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